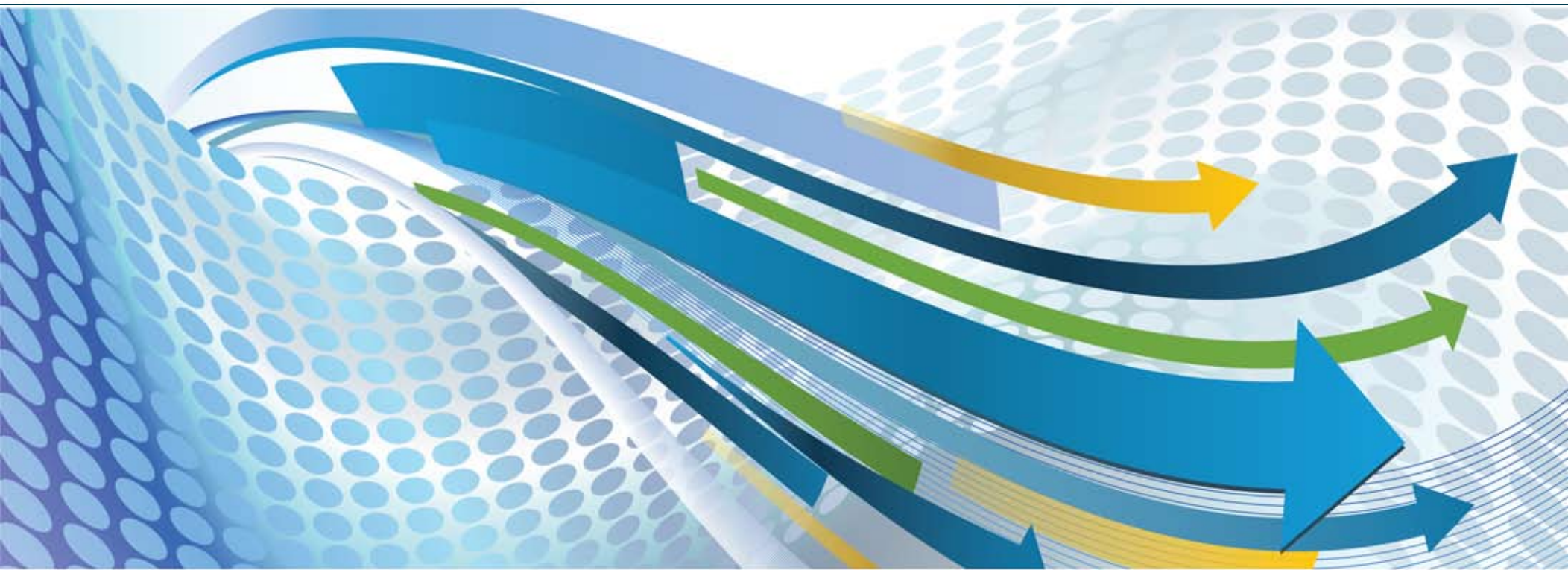


# Annual Energy Review 2011



*Independent Statistics & Analysis*  
U.S. Energy Information  
Administration

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## Annual Energy Review 2011

The *Annual Energy Review (AER)* is the U.S. Energy Information Administration's (EIA) primary report of annual historical energy statistics. For many series, data begin with the year 1949. Included are statistics on total energy production, consumption, trade, and energy prices; overviews of petroleum, natural gas, coal, electricity, nuclear energy, and renewable energy; financial and environment indicators; and data unit conversions.

Publication of this report is required under Public Law 95-91 (Department of Energy Organization Act), Section 205(c), and is in keeping with responsibilities given to the EIA under Section 205(a)(2), which states:

*"The Administrator shall be responsible for carrying out a central, comprehensive, and unified energy data and information program which will collect, evaluate, assemble, analyze, and disseminate data and information...."*

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# Annual Energy Review 2011

## September 2012

**U.S. Energy Information Administration**  
Office of Energy Statistics  
U.S. Department of Energy  
Washington, DC 20585

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# Preface

This thirtieth edition of the *Annual Energy Review* (AER) presents the U.S. Energy Information Administration's (EIA) most comprehensive look at integrated energy statistics. The summary statistics on the Nation's energy production, consumption, trade, stocks, and prices cover all major energy commodities and all energy-consuming sectors of the U.S. economy from 1949 through 2011. The AER is EIA's historical record of energy statistics and, because the coverage spans six decades, the statistics in this report are well-suited to long-term trend analysis.

The AER is a companion report to EIA's *Monthly Energy Review* (MER), and it covers most MER series over a much longer time span. Numerous additional series are included in the AER. The additional series are available because EIA's surveys, on which both reports are largely based, provide more extensive coverage of annual statistics than of monthly statistics.

AER statistics for recent years, particularly 2011, are more likely than statistics for earlier years to be revised by EIA as new information becomes available. The latest edition of the MER, therefore, is the recommended source for the most recent statistics for many of the series reported in the AER.

For the most part, fuel-specific statistics in the AER are expressed in physical units, such as barrels, cubic feet, short tons, and kilowatthours. Summary statistics in

Sections 1 and 2, however, are expressed in British thermal units (Btu), which allows different fuels to be compared and integrated summary statistics, such as the U.S. consumption of primary energy, to be calculated.

The AER emphasizes domestic energy statistics but also covers trade statistics. For example, statistics on petroleum imports by country of origin have been included in Section 5, "Petroleum," in order to give a complete picture of petroleum statistics.

Publication of the AER each year is in keeping with responsibilities given EIA in Section 205(a)(2) of the Department of Energy Organization Act, Public Law 95-91. The report is intended for use by Members of Congress, Federal and State agencies, energy analysts, and the general public. EIA welcomes suggestions from readers regarding its energy statistics. To make a suggestion or to obtain specific information regarding the contents of the AER, readers may contact any of the subject specialists listed as contacts on the preceding page.

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**Figures**

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**Appendix F. Alternatives for Estimating Energy Consumption**

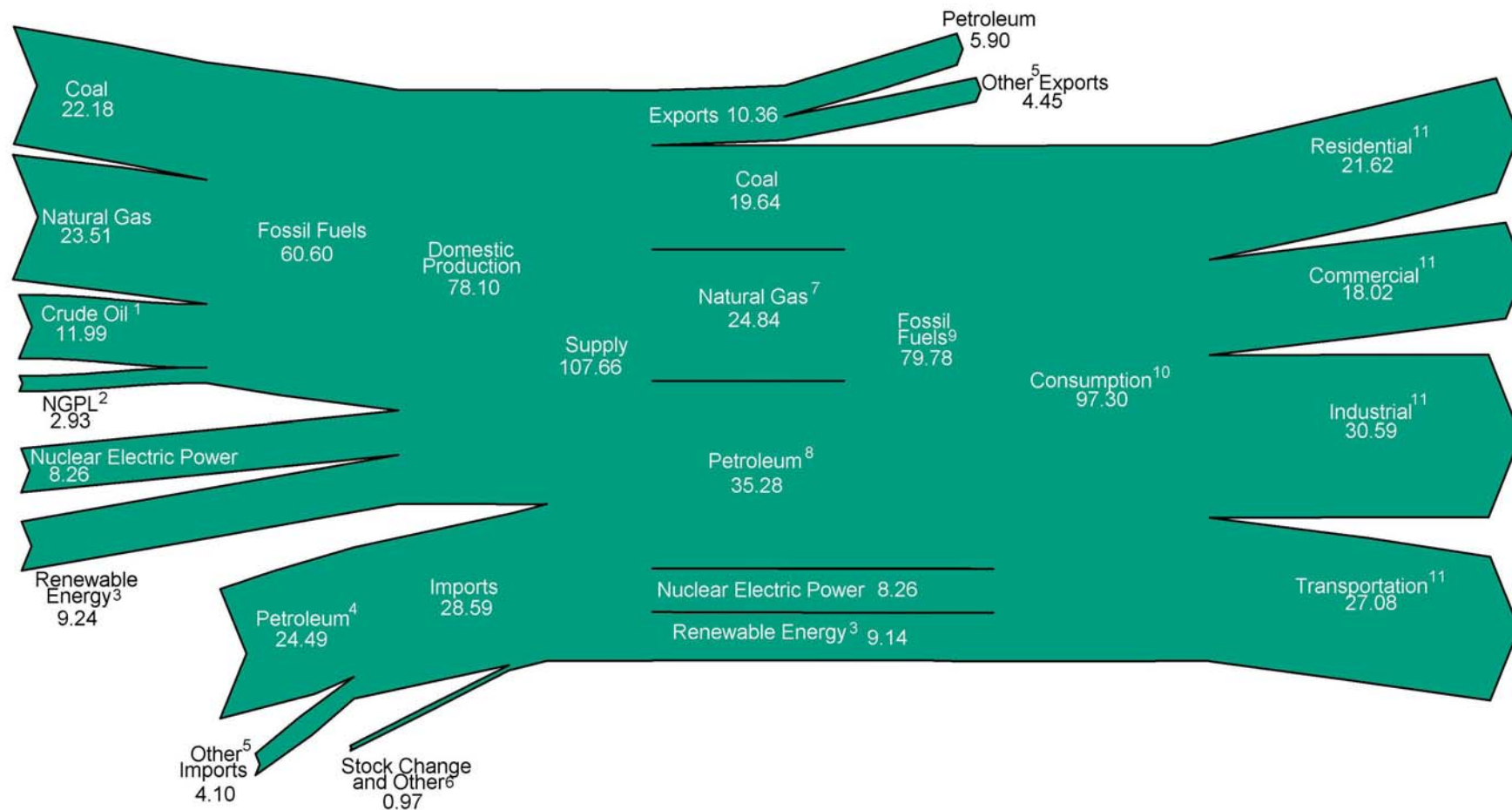
F1. Primary Energy Consumption and Delivered Total Energy, 2010. . . . . 347

# 1. Energy Overview

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**Figure 1.0 Energy Flow, 2011**  
(Quadrillion Btu)



<sup>1</sup> Includes lease condensate.

<sup>2</sup> Natural gas plant liquids.

<sup>3</sup> Conventional hydroelectric power, biomass, geothermal, solar/photovoltaic, and wind.

<sup>4</sup> Crude oil and petroleum products. Includes imports into the Strategic Petroleum Reserve.

<sup>5</sup> Natural gas, coal, coal coke, biofuels, and electricity.

<sup>6</sup> Adjustments, losses, and unaccounted for.

<sup>7</sup> Natural gas only; excludes supplemental gaseous fuels.

<sup>8</sup> Petroleum products, including natural gas plant liquids, and crude oil burned as fuel.

<sup>9</sup> Includes 0.01 quadrillion Btu of coal coke net imports.

<sup>10</sup> Includes 0.13 quadrillion Btu of electricity net imports.

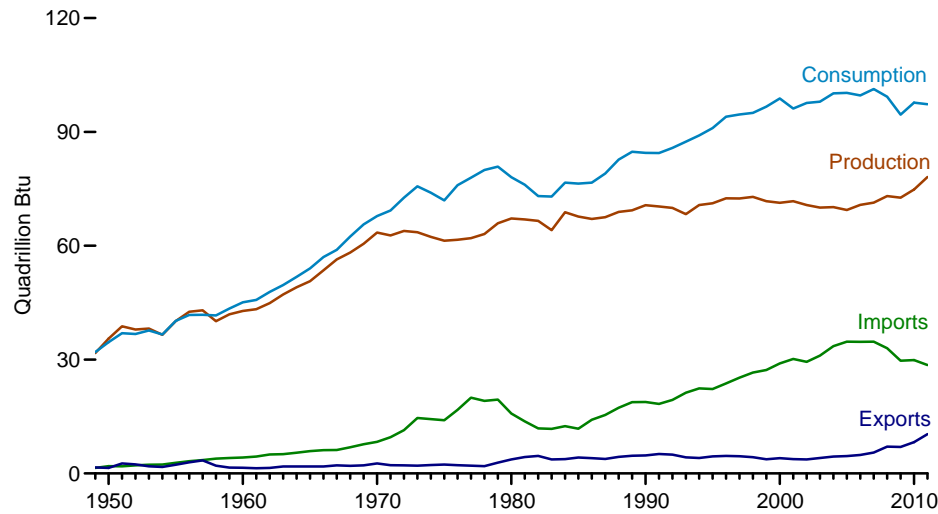
<sup>11</sup> Total energy consumption, which is the sum of primary energy consumption, electricity retail sales, and electrical system energy losses. Losses are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Note, "Electrical Systems Energy Losses," at end of Section 2.

Notes: • Data are preliminary. • Values are derived from source data prior to rounding for publication. • Totals may not equal sum of components due to independent rounding.

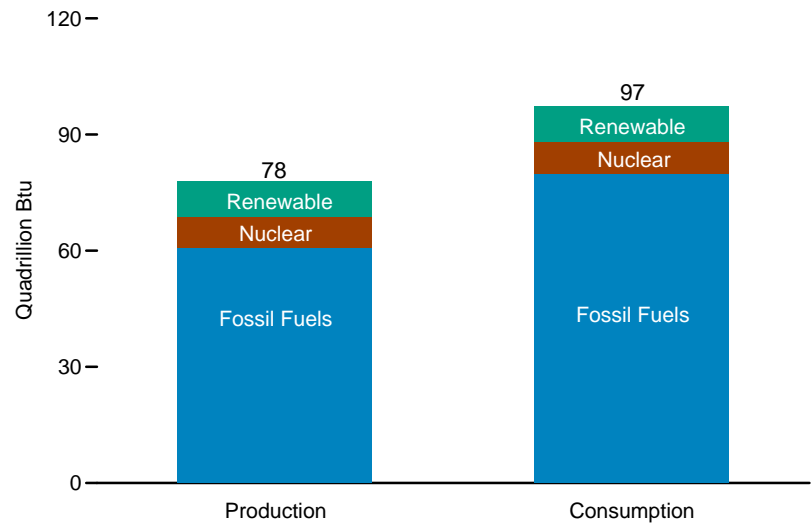
Sources: Tables 1.1, 1.2, 1.3, 1.4, and 2.1a.

**Figure 1.1 Primary Energy Overview**

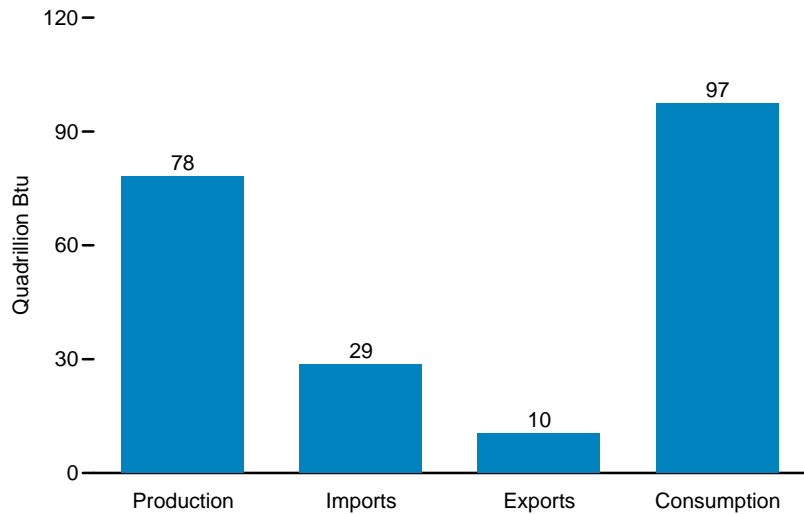
**Overview, 1949-2011**



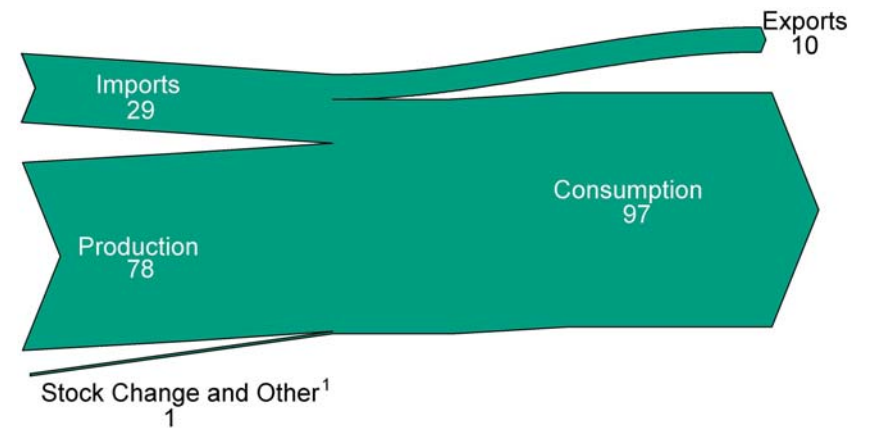
**Production and Consumption, 2011**



**Overview, 2011**



**Energy Flow, 2011**  
(Quadrillion Btu)



<sup>1</sup> Adjustments, losses, and unaccounted for.

Source: Table 1.1.



**Table 1.1 Primary Energy Overview, Selected Years, 1949-2011**  
(Quadrillion Btu)

Year	Production				Trade					Stock Change and Other <sup>8</sup>	Consumption			
	Fossil Fuels <sup>2</sup>	Nuclear Electric Power <sup>3</sup>	Renewable Energy <sup>4</sup>	Total	Imports		Exports		Net Imports <sup>1</sup>		Fossil Fuels <sup>9</sup>	Nuclear Electric Power <sup>3</sup>	Renewable Energy <sup>4</sup>	Total <sup>10</sup>
					Petroleum <sup>5</sup>	Total <sup>6</sup>	Coal	Total <sup>7</sup>						
1949	28.748	0.000	2.974	31.722	1.427	1.448	0.877	1.592	-0.144	0.403	29.002	0.000	2.974	31.982
1950	32.563	.000	2.978	35.540	1.886	1.913	.786	1.465	.448	-1.372	31.632	.000	2.978	34.616
1955	37.364	.000	2.784	40.148	2.752	2.790	1.465	2.286	.504	-4.444	37.410	.000	2.784	40.208
1960	39.869	.006	2.928	42.803	3.999	4.188	1.023	1.477	2.710	-.427	42.137	.006	2.928	45.086
1965	47.235	.043	3.396	50.674	5.402	5.892	1.376	1.829	4.063	-.722	50.577	.043	3.396	54.015
1970	59.186	.239	4.070	63.495	7.470	8.342	1.936	2.632	5.709	-1.367	63.522	.239	4.070	67.838
1975	54.733	1.900	4.687	61.320	12.948	14.032	1.761	2.323	11.709	-1.065	65.357	1.900	4.687	71.965
1976	54.723	2.111	4.727	61.561	15.672	16.760	1.597	2.172	14.588	-.175	69.107	2.111	4.727	75.975
1977	55.101	2.702	4.209	62.012	18.756	19.948	1.442	2.052	17.896	-1.946	70.991	2.702	4.209	77.961
1978	55.074	3.024	5.005	63.104	17.824	19.106	1.078	1.920	17.186	-.339	71.854	3.024	5.005	79.950
1979	58.006	2.776	5.123	65.904	17.933	19.460	1.753	2.855	16.605	-1.650	72.891	2.776	5.123	80.859
1980	59.008	2.739	5.428	67.175	14.658	15.796	2.421	3.695	12.101	-1.210	69.828	2.739	5.428	78.067
1981	58.529	3.008	5.414	66.951	12.639	13.719	2.944	4.307	9.412	-.257	67.571	3.008	5.414	76.106
1982	57.458	3.131	5.980	66.569	10.777	11.861	2.787	4.608	7.253	-.723	63.888	3.131	5.980	73.099
1983	54.416	3.203	6.496	64.114	10.647	11.752	2.045	3.693	8.059	.798	63.152	3.203	6.496	72.971
1984	58.849	3.553	6.438	68.840	11.433	12.471	2.151	3.786	8.685	-.892	66.506	3.553	6.438	76.632
1985	57.539	4.076	6.084	67.698	10.609	11.781	2.438	4.196	7.584	1.110	66.093	4.076	6.084	76.392
1986	56.575	4.380	6.111	67.066	13.201	14.151	2.248	4.021	10.130	-.549	66.033	4.380	6.111	76.647
1987	57.167	4.754	5.622	67.542	14.162	15.398	2.093	3.812	11.586	-.074	68.521	4.754	5.622	79.054
1988	57.875	5.587	5.457	68.919	15.747	17.296	2.499	4.366	12.929	.861	71.557	5.587	5.457	82.709
1989	57.483	5.602	6.235	69.320	17.162	18.766	2.637	4.661	14.105	1.361	72.911	5.602	6.235	84.786
1990	58.560	6.104	6.041	70.705	17.117	18.817	2.772	4.752	14.065	-.284	72.332	6.104	6.041	84.485
1991	57.872	6.422	6.069	70.362	16.348	18.335	2.854	5.141	13.194	.882	71.880	6.422	6.069	84.438
1992	57.655	6.479	5.821	<sup>R</sup> 69.956	16.968	19.372	2.682	4.937	14.435	1.392	73.396	6.479	5.821	85.783
1993	55.822	6.410	6.083	68.315	18.510	21.273	1.962	4.258	17.014	2.094	74.836	6.410	6.083	87.424
1994	58.044	6.694	5.988	70.726	19.243	22.390	1.879	4.061	18.329	.037	76.256	6.694	5.988	89.091
1995	57.540	7.075	6.558	71.174	18.881	22.260	2.318	4.511	17.750	2.105	77.259	7.075	6.560	91.029
1996	58.387	7.087	7.012	72.486	20.284	23.702	2.368	4.633	19.069	2.468	79.785	7.087	7.014	94.022
1997	58.857	6.597	7.018	72.472	21.740	25.215	2.193	4.514	20.701	1.429	80.873	6.597	7.016	94.602
1998	59.314	7.068	6.494	72.876	22.908	26.581	2.092	4.299	22.281	-.140	81.369	7.068	6.493	95.018
1999	57.614	7.610	6.517	71.742	23.133	27.252	1.525	3.715	23.537	1.373	82.427	7.610	6.516	96.652
2000	57.366	7.862	6.104	71.332	24.531	28.973	1.528	4.006	24.967	<sup>R</sup> 2.515	84.731	7.862	6.106	<sup>R</sup> 98.814
2001	<sup>R</sup> 58.541	8.029	5.164	71.735	25.398	30.157	1.265	3.771	26.386	-1.953	82.902	8.029	5.163	<sup>R</sup> 96.168
2002	<sup>R</sup> 56.837	8.145	5.734	<sup>R</sup> 70.716	24.674	29.408	1.032	3.669	25.739	<sup>R</sup> 1.190	<sup>R</sup> 83.699	8.145	5.729	<sup>R</sup> 97.645
2003	56.099	7.959	5.982	70.040	26.219	31.061	1.117	4.054	27.007	.931	84.014	7.959	5.983	97.978
2004	55.895	8.222	6.070	70.188	28.197	33.544	1.253	4.434	29.110	<sup>R</sup> .864	<sup>R</sup> 85.819	8.222	6.082	<sup>R</sup> 100.162
2005	55.038	8.161	6.229	<sup>R</sup> 69.428	29.248	34.709	1.273	4.560	30.149	<sup>R</sup> .705	<sup>R</sup> 85.794	8.161	6.242	<sup>R</sup> 100.282
2006	55.968	8.215	<sup>R</sup> 6.599	<sup>R</sup> 70.782	29.169	34.679	1.264	4.872	29.806	<sup>R</sup> -.959	<sup>R</sup> 84.702	8.215	<sup>R</sup> 6.649	<sup>R</sup> 99.629
2007	<sup>R</sup> 56.409	8.455	<sup>R</sup> 6.509	<sup>R</sup> 71.373	28.781	34.703	1.507	5.482	29.221	<sup>R</sup> .702	<sup>R</sup> 86.211	8.455	<sup>R</sup> 6.523	<sup>R</sup> 101.296
2008	57.482	8.427	<sup>R</sup> 7.202	<sup>R</sup> 73.111	27.685	32.992	2.071	7.060	25.932	<sup>R</sup> .231	<sup>R</sup> 83.549	8.427	<sup>R</sup> 7.186	<sup>R</sup> 99.275
2009	<sup>R</sup> 56.685	8.356	<sup>R</sup> 7.616	<sup>R</sup> 72.657	25.082	29.706	1.515	6.965	22.741	<sup>R</sup> -.839	<sup>R</sup> 78.488	8.356	<sup>R</sup> 7.600	<sup>R</sup> 94.559
2010	<sup>R</sup> 58.235	<sup>R</sup> 8.434	<sup>R</sup> 8.136	<sup>R</sup> 74.806	<sup>R</sup> 25.371	<sup>R</sup> 29.877	2.101	<sup>R</sup> 8.234	<sup>R</sup> 21.643	<sup>R</sup> 1.273	<sup>R</sup> 81.109	<sup>R</sup> 8.434	<sup>R</sup> 8.090	<sup>R</sup> 97.722
2011 <sup>P</sup>	60.601	8.259	9.236	78.096	24.491	28.587	2.751	10.356	18.232	.974	79.779	8.259	9.135	97.301

<sup>1</sup> Net imports equal imports minus exports. A minus sign indicates exports are greater than imports.

<sup>2</sup> Coal, natural gas (dry), crude oil, and natural gas plant liquids.

<sup>3</sup> Nuclear electricity net generation (converted to Btu using the nuclear heat rate—see Table A6).

<sup>4</sup> See Tables 10.1–10.2c for notes on series components and estimation; and see Note, "Renewable Energy Production and Consumption," at end of Section 10.

<sup>5</sup> Crude oil and petroleum products. Includes imports into the Strategic Petroleum Reserve.

<sup>6</sup> Also includes natural gas, coal, coal coke, fuel ethanol, biodiesel, and electricity.

<sup>7</sup> Also includes natural gas, petroleum, coal coke, biodiesel, and electricity.

<sup>8</sup> Calculated as consumption and exports minus production and imports. Includes petroleum stock change and adjustments; natural gas net storage withdrawals and balancing item; coal stock change, losses, and unaccounted for; fuel ethanol stock change; and biodiesel stock change and balancing item.

<sup>9</sup> Coal, coal coke net imports, natural gas, and petroleum. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of Section 5.

<sup>10</sup> Also includes electricity net imports.

R=Revised. P=Preliminary.

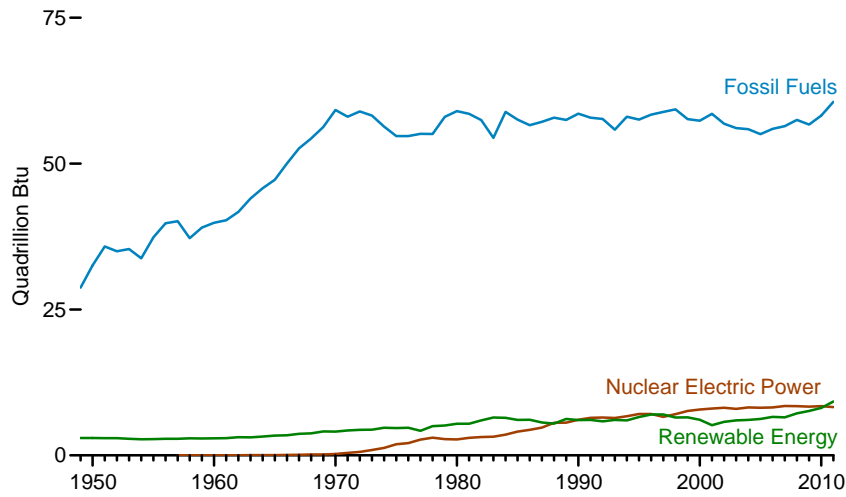
Notes: • See "Primary Energy," "Primary Energy Production," and "Primary Energy Consumption" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#summary> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all annual data beginning in 1949.

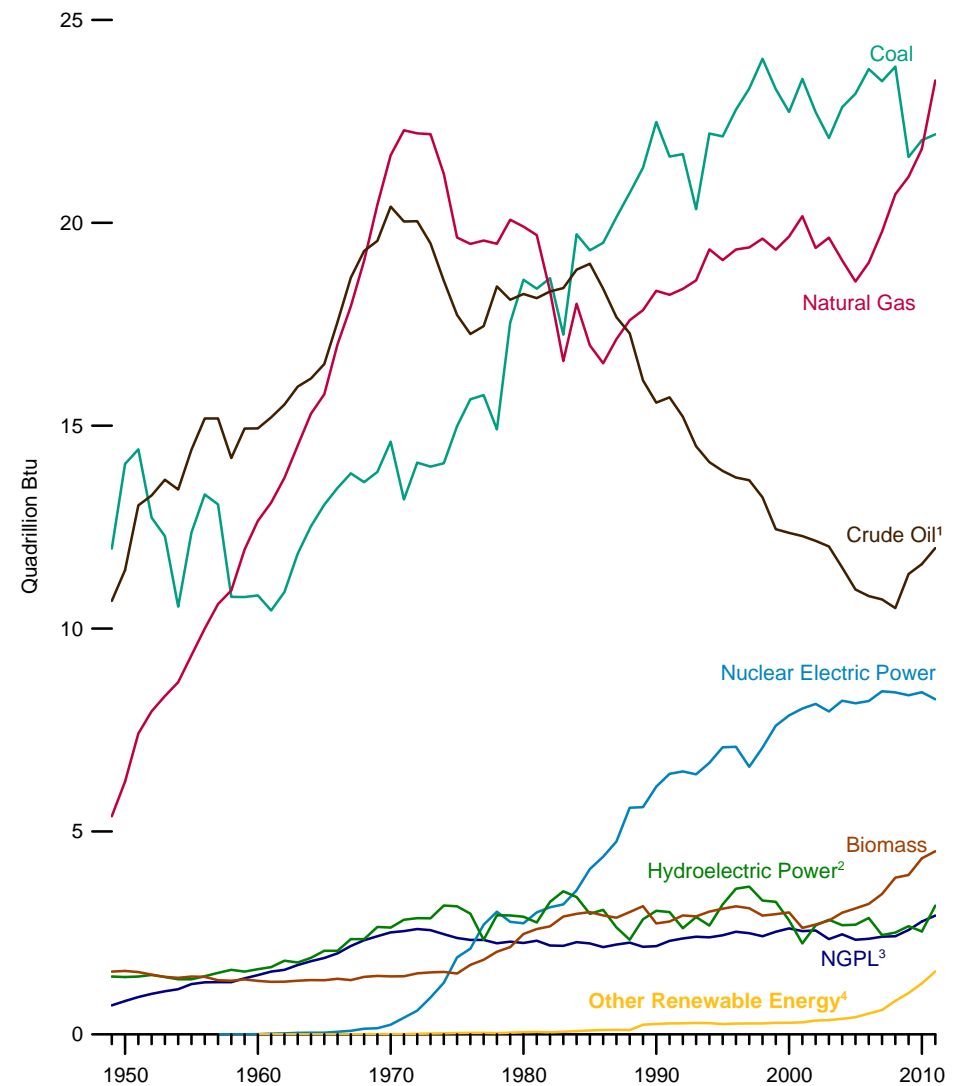
Sources: Tables 1.2, 1.3, and 1.4.

**Figure 1.2 Primary Energy Production by Source**

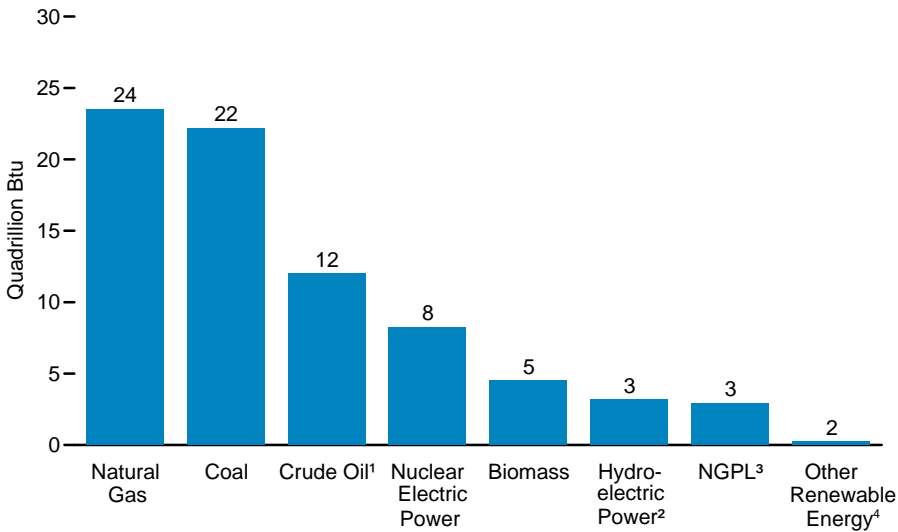
**By Source Category, 1949-2011**



**By Source, 1949-2011**



**By Source, 2011**



<sup>1</sup> Includes lease condensate.

<sup>2</sup> Conventional hydroelectric power.

<sup>3</sup> Natural gas plant liquids.

<sup>4</sup> Geothermal, solar/photovoltaic, and wind.

Source: Table 1.2.

**Table 1.2 Primary Energy Production by Source, Selected Years, 1949-2011**

(Quadrillion Btu)

Year	Fossil Fuels					Nuclear Electric Power <sup>5</sup>	Renewable Energy <sup>1</sup>						Total
	Coal <sup>2</sup>	Natural Gas (Dry)	Crude Oil <sup>3</sup>	NGPL <sup>4</sup>	Total		Hydro-electric Power <sup>6</sup>	Geothermal <sup>7</sup>	Solar/PV <sup>8</sup>	Wind <sup>9</sup>	Biomass <sup>10</sup>	Total	
1949	11.974	5.377	10.683	0.714	28.748	0.000	1.425	NA	NA	NA	1.549	2.974	31.722
1950	14.060	6.233	11.447	.823	32.563	.000	1.415	NA	NA	NA	1.562	2.978	35.540
1955	12.370	9.345	14.410	1.240	37.364	.000	1.360	NA	NA	NA	1.424	2.784	40.148
1960	10.817	12.656	14.935	1.461	39.869	.006	1.608	(s)	NA	NA	1.320	2.928	42.803
1965	13.055	15.775	16.521	1.883	47.235	.043	2.059	.002	NA	NA	1.335	3.396	50.674
1970	14.607	21.666	20.401	2.512	59.186	.239	2.634	.006	NA	NA	1.431	4.070	63.495
1975	14.989	19.640	17.729	2.374	54.733	1.900	3.155	.034	NA	NA	1.499	4.687	61.320
1976	15.654	19.480	17.262	2.327	54.723	2.111	2.976	.038	NA	NA	1.713	4.727	61.561
1977	15.755	19.565	17.454	2.327	55.101	2.702	2.333	.037	NA	NA	1.838	4.209	62.012
1978	14.910	19.485	18.434	2.245	55.074	3.024	2.937	.031	NA	NA	2.038	5.005	63.104
1979	17.540	20.076	18.104	2.286	58.006	2.776	2.931	.040	NA	NA	2.152	5.123	65.904
1980	18.598	19.908	18.249	2.254	59.008	2.739	2.900	.053	NA	NA	2.476	5.428	67.175
1981	18.377	19.699	18.146	2.307	58.529	3.008	2.758	.059	NA	NA	2.596	5.414	66.951
1982	18.639	18.319	18.309	2.191	57.458	3.131	3.266	.051	NA	NA	2.663	5.980	66.569
1983	17.247	16.593	18.392	2.184	54.416	3.203	3.527	.064	NA	(s)	2.904	6.496	64.114
1984	19.719	18.008	18.848	2.274	58.849	3.553	3.386	.081	(s)	(s)	2.971	6.438	68.840
1985	19.325	16.980	18.992	2.241	57.539	4.076	2.970	.097	(s)	(s)	3.016	6.084	67.698
1986	19.509	16.541	18.376	2.149	56.575	4.380	3.071	.108	(s)	(s)	2.932	6.111	67.066
1987	20.141	17.136	17.675	2.215	57.167	4.754	2.635	.112	(s)	(s)	2.875	5.622	67.542
1988	20.738	17.599	17.279	2.260	57.875	5.587	2.334	.106	(s)	(s)	3.016	5.457	68.919
1989	<sup>2</sup> 21.360	17.847	16.117	2.158	57.483	5.602	2.837	.162	.055	.022	3.159	6.235	69.320
1990	22.488	18.326	15.571	2.175	58.560	6.104	3.046	.171	.059	.029	2.735	6.041	70.705
1991	21.636	18.229	15.701	2.306	57.872	6.422	3.016	.178	.062	.031	2.782	6.069	70.362
1992	21.694	18.375	15.223	2.363	57.655	6.479	2.617	.179	.064	.030	2.932	5.821	<sup>R</sup> 69.956
1993	20.336	18.584	14.494	2.408	55.822	6.410	2.892	.186	.066	.031	2.908	6.083	68.315
1994	22.202	19.348	14.103	2.391	58.044	6.694	2.683	.173	.068	.036	3.028	5.988	70.726
1995	22.130	19.082	13.887	2.442	57.540	7.075	3.205	.152	.069	.033	3.099	6.558	71.174
1996	22.790	19.344	13.723	2.530	58.387	7.087	3.590	.163	.070	.033	3.155	7.012	72.486
1997	23.310	19.394	13.658	2.495	58.857	6.597	3.640	.167	.070	.034	3.108	7.018	72.472
1998	24.045	19.613	13.235	2.420	59.314	7.068	3.297	.168	.069	.031	2.929	6.494	72.876
1999	23.295	19.341	12.451	2.528	57.614	7.610	3.268	.171	.068	.046	2.965	6.517	71.742
2000	22.735	19.662	12.358	2.611	57.366	7.862	2.811	.164	<sup>R</sup> .066	.057	3.006	6.104	71.332
2001	<sup>2</sup> 23.547	20.166	12.282	2.547	58.541	8.029	2.242	.164	.064	.070	2.624	5.164	71.735
2002	22.732	<sup>R</sup> 19.382	12.163	2.559	<sup>R</sup> 56.837	8.145	2.689	.171	.063	.105	2.705	5.734	<sup>R</sup> 70.716
2003	22.094	19.633	12.026	2.346	56.099	7.959	2.825	.175	.062	.115	2.805	5.982	70.040
2004	22.852	19.074	11.503	2.466	55.895	8.222	2.690	.178	.063	.142	2.998	6.070	70.188
2005	23.185	18.556	10.963	2.334	55.038	8.161	2.703	.181	.063	.178	3.104	6.229	<sup>R</sup> 69.428
2006	23.790	19.022	10.801	2.356	55.968	8.215	2.869	.181	.068	.264	<sup>R</sup> 3.216	<sup>R</sup> 6.599	<sup>R</sup> 70.782
2007	23.493	<sup>R</sup> 19.786	10.721	2.409	<sup>R</sup> 56.409	8.455	2.446	.186	.076	.341	<sup>R</sup> 3.461	<sup>R</sup> 6.509	<sup>R</sup> 71.373
2008	23.851	20.703	10.509	2.419	57.482	8.427	2.511	.192	.089	.546	<sup>R</sup> 3.864	<sup>R</sup> 7.202	<sup>R</sup> 73.111
2009	<sup>R</sup> 21.624	<sup>R</sup> 21.139	11.348	2.574	<sup>R</sup> 56.685	8.356	2.669	.200	.098	.721	<sup>R</sup> 3.928	<sup>R</sup> 7.616	<sup>R</sup> 72.657
2010	<sup>R</sup> 22.038	<sup>R</sup> 21.823	<sup>R</sup> 11.593	<sup>R</sup> 2.781	<sup>R</sup> 58.235	<sup>R</sup> 8.434	<sup>R</sup> 2.539	<sup>R</sup> .208	<sup>R</sup> .126	<sup>R</sup> .923	<sup>R</sup> 4.341	<sup>R</sup> 8.136	<sup>R</sup> 74.806
2011 <sup>P</sup>	22.181	23.506	11.986	2.928	60.601	8.259	3.171	.226	.158	1.168	4.511	9.236	78.096

<sup>1</sup> Most data are estimates. See Tables 10.1–10.2c for notes on series components and estimation; and see Note, "Renewable Energy Production and Consumption," at end of Section 10.

<sup>2</sup> Beginning in 1989, includes waste coal supplied. Beginning in 2001, also includes a small amount of refuse recovery. See Table 7.1.

<sup>3</sup> Includes lease condensate.

<sup>4</sup> Natural gas plant liquids.

<sup>5</sup> Nuclear electricity net generation (converted to Btu using the nuclear heat rate—see Table A6).

<sup>6</sup> Conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>7</sup> Geothermal electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6), and geothermal heat pump and direct use energy.

<sup>8</sup> Solar thermal and photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels

heat rate—see Table A6), and solar thermal direct use energy.

<sup>9</sup> Wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>10</sup> Wood and wood-derived fuels, biomass waste, and total biomass inputs to the production of fuel ethanol and biodiesel.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.0005 quadrillion Btu.

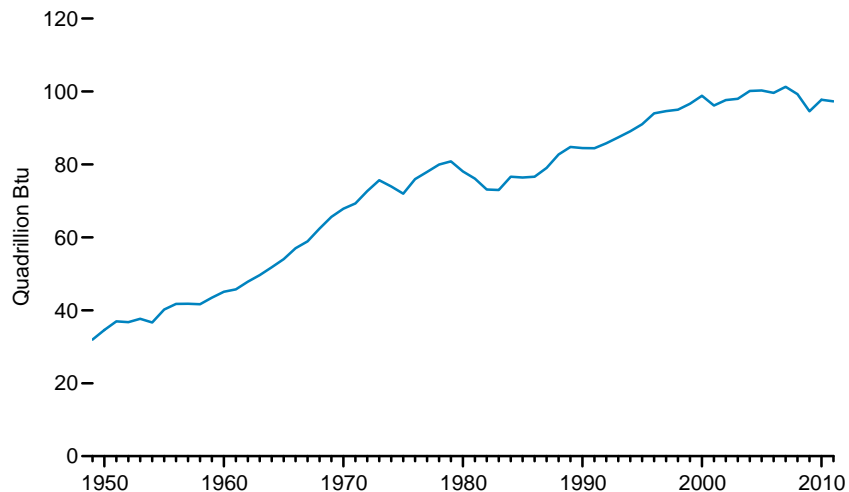
Notes: • See "Primary Energy Production" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#summary> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all annual data beginning in 1949.

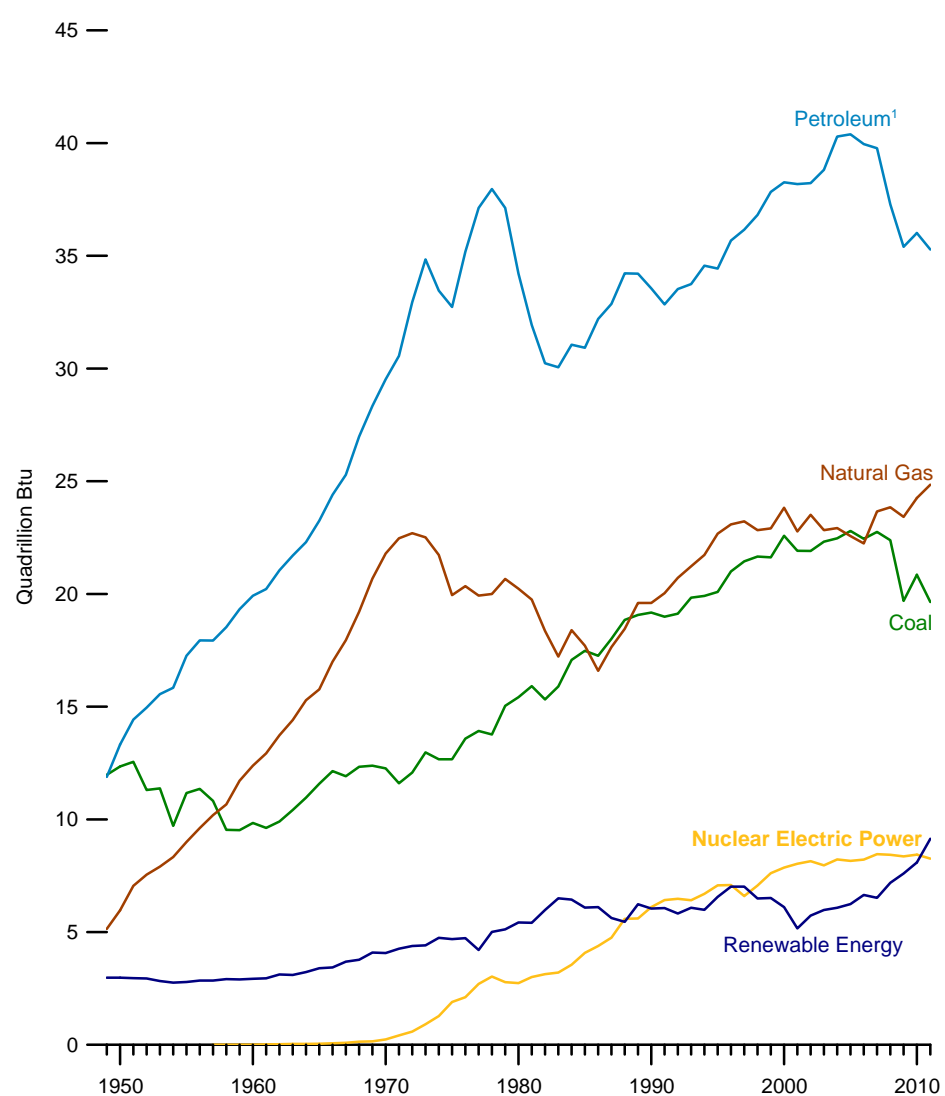
Sources: Tables 5.1, 6.1, 7.1, 8.2a, 10.1, A2, A4, A5, and A6.

**Figure 1.3 Primary Energy Consumption Estimates by Source**

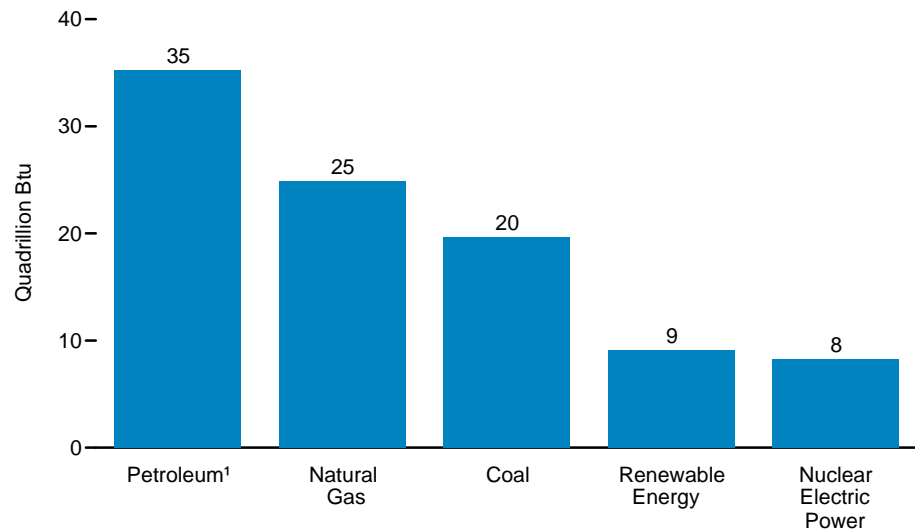
**Total, 1949-2011**



**By Major Source, 1949-2011**



**By Major Source, 2011**



<sup>1</sup> Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel. Does not include biofuels that have been blended with petroleum—biofuels are included in “Renewable Energy.” For petroleum, product supplied is used as an approximation of

petroleum consumption. See Note 1, “Petroleum Products Supplied and Petroleum Consumption,” at the end of Section 5  
Sources: Tables 1.2 and 1.3.

**Table 1.3 Primary Energy Consumption Estimates by Source, Selected Years, 1949-2011**  
(Quadrillion Btu)

Year	Fossil Fuels					Nuclear Electric Power	Renewable Energy <sup>1</sup>					Electricity Net Imports <sup>3</sup>	Total
	Coal	Coal Coke Net Imports <sup>3</sup>	Natural Gas <sup>4</sup>	Petroleum <sup>5</sup>	Total		Noncombustible <sup>2</sup>			Biomass <sup>7</sup>	Total		
							Captured Energy <sup>6</sup>	Adjustment for Fossil Fuel Equivalence <sup>6</sup>	Total <sup>6,7</sup>				
1949	11.981	-0.007	5.145	11.883	29.002	0.000	0.323	1.101	1.425	1.549	2.974	0.005	31.982
1950	12.347	.001	5.968	13.315	31.632	.000	.344	1.071	1.415	1.562	2.978	.006	34.616
1955	11.167	-.010	8.998	17.255	37.410	.000	.397	.963	1.360	1.424	2.784	.014	40.208
1960	9.838	-.006	12.385	19.919	42.137	.006	.510	1.098	1.608	1.320	2.928	.015	45.086
1965	11.581	-.018	15.769	23.246	50.577	.043	.673	1.388	2.061	1.335	3.396	(s)	54.015
1970	12.265	-.058	21.795	29.521	63.522	.239	.858	1.781	2.639	1.431	4.070	.007	67.838
1975	12.663	.014	19.948	32.732	65.357	1.900	1.045	2.143	3.188	1.499	4.687	.021	71.965
1976	13.584	(s)	20.345	35.178	69.107	2.111	.991	2.022	3.014	1.713	4.727	.029	75.975
1977	13.922	.015	19.931	37.124	70.991	2.702	.775	1.595	2.371	1.838	4.209	.059	77.961
1978	13.766	.125	20.000	37.963	71.854	3.024	.977	1.990	2.968	2.038	5.005	.067	79.950
1979	15.040	.063	20.666	37.122	72.891	2.776	.979	1.992	2.971	2.152	5.123	.069	80.859
1980	15.423	-.035	20.235	34.205	69.828	2.739	.970	1.983	2.953	2.476	5.428	.071	78.067
1981	15.908	-.016	19.747	31.932	67.571	3.008	.920	1.898	2.817	2.596	5.414	.113	76.106
1982	15.322	-.022	18.356	30.232	63.888	3.131	1.082	2.234	3.316	2.663	5.980	.100	73.099
1983	15.894	-.016	17.221	30.052	63.152	3.203	1.165	2.426	3.591	2.904	6.496	.121	72.971
1984	17.071	-.011	18.394	31.053	66.506	3.553	1.133	2.334	3.467	2.971	6.438	.135	76.632
1985	17.478	-.013	17.703	30.925	66.093	4.076	1.002	2.066	3.068	3.016	6.084	.140	76.392
1986	17.260	-.017	16.591	32.198	66.033	4.380	1.038	2.141	3.179	2.932	6.111	.122	76.647
1987	18.008	.009	17.640	32.864	68.521	4.754	.900	1.847	2.747	2.875	5.622	.158	79.054
1988	18.846	.040	18.448	34.223	71.557	5.587	.807	1.634	2.441	3.016	5.457	.108	82.709
1989	19.070	.030	19.602	34.209	72.911	5.602	1.048	2.028	3.076	3.159	6.235	.037	84.786
1990	19.173	.005	19.603	33.552	72.332	6.104	1.128	2.177	3.306	2.735	6.041	.008	84.485
1991	18.992	.010	20.033	32.846	71.880	6.422	1.121	2.166	3.287	2.782	6.069	.067	84.438
1992	19.122	.035	20.714	33.525	73.396	6.479	1.001	1.889	2.890	2.932	5.821	.087	85.783
1993	19.835	.027	21.229	33.745	74.836	6.410	1.100	2.074	3.174	2.908	6.083	.095	87.424
1994	19.909	.058	21.728	34.561	76.256	6.694	1.030	1.930	2.961	3.028	5.988	.153	89.091
1995	20.089	.061	22.671	34.438	77.259	7.075	1.197	2.262	3.459	3.101	6.560	.134	91.029
1996	21.002	.023	23.085	35.675	79.785	7.087	1.326	2.530	3.857	3.157	7.014	.137	94.022
1997	21.445	.046	23.223	36.159	80.873	6.597	1.360	2.550	3.910	3.105	7.016	.116	94.602
1998	21.656	.067	22.830	36.816	81.369	7.068	1.247	2.318	3.565	2.927	6.493	.088	95.018
1999	21.623	.058	22.909	37.838	82.427	7.610	1.240	2.312	3.552	2.963	6.516	.099	96.652
2000	22.580	.065	23.824	38.262	84.731	7.862	1.090	2.008	3.098	3.008	6.106	.115	<sup>R</sup> 98.814
2001	21.914	.029	22.773	38.186	82.902	8.029	.893	1.647	2.540	2.622	5.163	.075	96.168
2002	21.904	.061	<sup>R</sup> 23.510	38.224	<sup>R</sup> 83.699	8.145	1.070	1.959	3.029	2.701	5.729	.072	<sup>R</sup> 97.645
2003	22.321	.051	22.831	38.811	84.014	7.959	1.114	2.062	3.176	2.807	5.983	.022	97.978
2004	22.466	.138	<sup>R</sup> 22.923	40.292	<sup>R</sup> 85.819	8.222	1.103	1.969	3.073	3.010	6.082	.039	<sup>R</sup> 100.162
2005	22.797	.044	<sup>R</sup> 22.565	40.388	<sup>R</sup> 85.794	8.161	1.127	1.998	3.125	<sup>R</sup> 3.117	6.242	.085	<sup>R</sup> 100.282
2006	22.447	.061	<sup>R</sup> 22.239	39.955	<sup>R</sup> 84.702	8.215	1.229	2.153	3.382	<sup>R</sup> 3.267	<sup>R</sup> 6.649	.063	<sup>R</sup> 99.629
2007	22.749	.025	<sup>R</sup> 23.663	39.774	<sup>R</sup> 86.211	8.455	1.125	1.924	3.048	<sup>R</sup> 3.474	<sup>R</sup> 6.523	.107	<sup>R</sup> 101.296
2008	22.385	.041	<sup>R</sup> 23.843	37.280	<sup>R</sup> 83.549	8.427	1.238	2.099	3.338	<sup>R</sup> 3.849	<sup>R</sup> 7.186	.112	<sup>R</sup> 99.275
2009	19.692	-.024	<sup>R</sup> 23.416	35.403	<sup>R</sup> 78.488	8.356	1.382	2.306	3.688	<sup>R</sup> 3.912	<sup>R</sup> 7.600	.116	<sup>R</sup> 94.559
2010	<sup>R</sup> 20.850	-.006	<sup>R</sup> 24.256	<sup>R</sup> 36.010	<sup>R</sup> 81.109	<sup>R</sup> 8.434	<sup>R</sup> 1.440	<sup>R</sup> 2.355	<sup>R</sup> 3.796	<sup>R</sup> 4.294	<sup>R</sup> 8.090	<sup>R</sup> .089	<sup>R</sup> 97.722
2011 <sup>P</sup>	19.643	.011	24.843	35.283	79.779	8.259	1.785	2.939	4.724	4.411	9.135	.127	97.301

<sup>1</sup> Most data are estimates. See Note, "Renewable Energy Production and Consumption," at end of Section 10.

<sup>2</sup> Conventional hydroelectric power, geothermal, solar thermal, photovoltaic, and wind. See Note 1, "Noncombustible Renewable Energy," at end of section.

<sup>3</sup> Net imports equal imports minus exports. A minus sign indicates exports are greater than imports.

<sup>4</sup> Natural gas only; excludes supplemental gaseous fuels. See Note 1, "Supplemental Gaseous Fuels," at end of Section 6.

<sup>5</sup> Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel. Does not include biofuels that have been blended with petroleum—biofuels are included in "Biomass." For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of Section 5.

<sup>6</sup> See Note 1, "Noncombustible Renewable Energy," at end of section.

<sup>7</sup> See Table 10.1 for a breakdown of individual sources.

R=Revised. P=Preliminary. (s)=Less than 0.0005 and greater than -0.0005 quadrillion Btu.

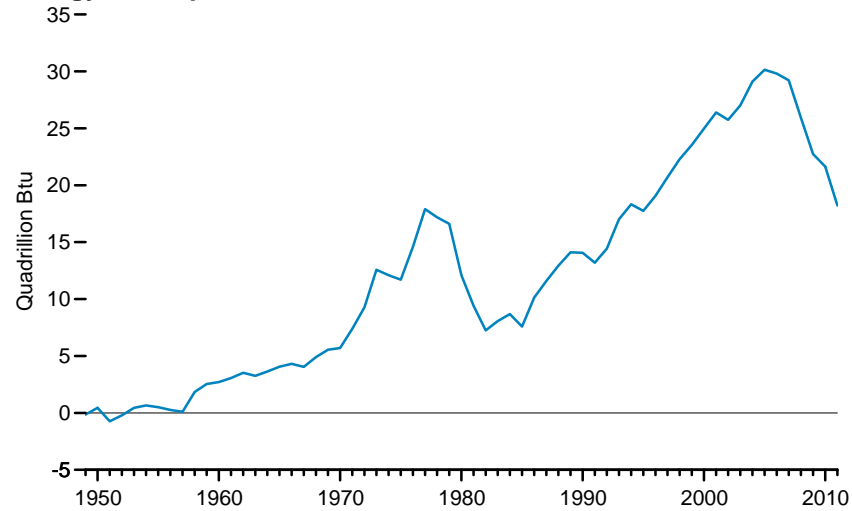
Notes: • See "Primary Energy Consumption" in Glossary. • See Table E1 for estimated energy consumption for 1635–1945. • See Note 3, "Electricity Imports and Exports," at end of Section 8. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#summary> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all annual data beginning in 1949.

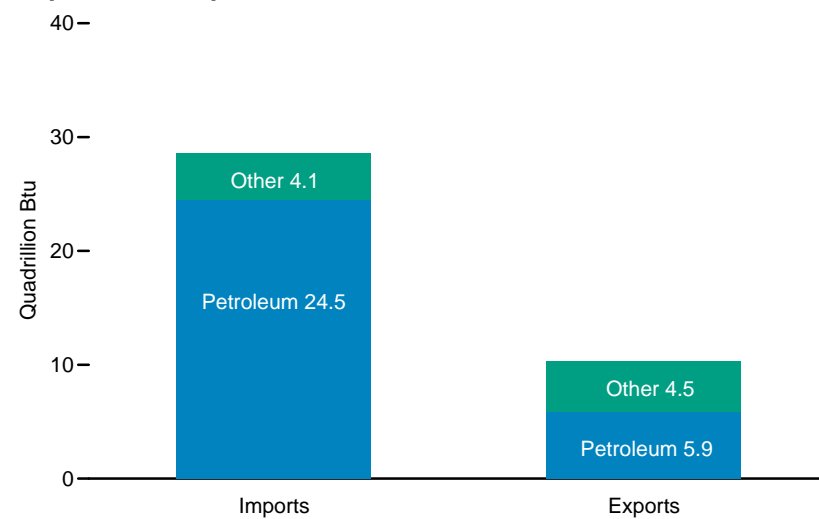
Sources: Tables 5.12, 6.1, 7.1, 7.8, 8.1, 8.2a, 10.1, 10.3, A4, A5, and A6.

**Figure 1.4 Primary Energy Trade by Source, 1949-2011**

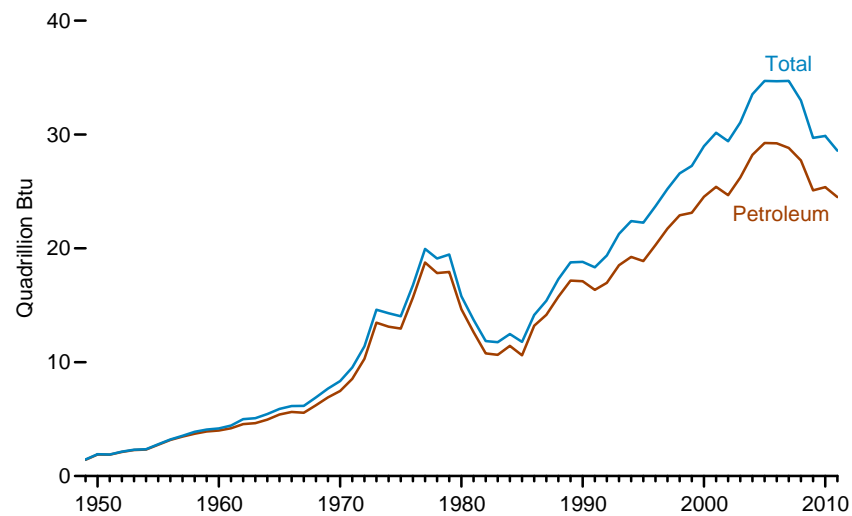
**Energy Net Imports**



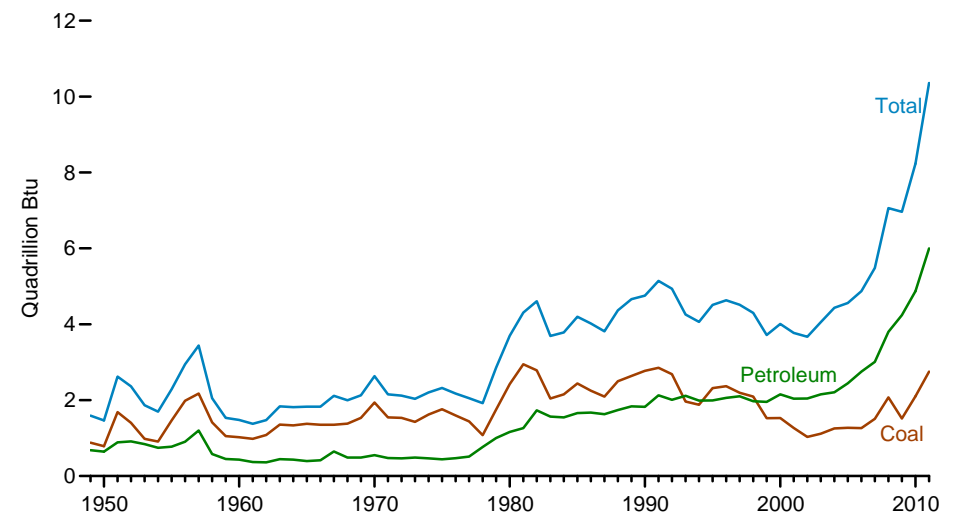
**Imports and Exports, 2011**



**Energy Imports**



**Energy Exports**



Note: Negative net imports are net exports.

Source: Table 1.4.

**Table 1.4 Primary Energy Trade by Source, Selected Years, 1949-2011**  
(Quadrillion Btu)

Year	Imports									Exports									Net Imports <sup>1</sup>	
	Coal	Coal Coke	Natural Gas	Petroleum			Bio-fuels <sup>4</sup>	Elec-tricity	Total	Coal	Coal Coke	Natural Gas	Petroleum			Bio-fuels <sup>5</sup>	Elec-tricity	Total		Total
				Crude Oil <sup>2</sup>	Petroleum Products <sup>3</sup>	Total							Crude Oil <sup>2</sup>	Petroleum Products <sup>3</sup>	Total					
1949	0.008	0.007	0.000	0.915	0.513	1.427	NA	0.006	1.448	0.877	0.014	0.021	0.192	0.488	0.680	NA	0.001	1.592	-0.144	
1950	.009	.011	.000	1.056	.830	1.886	NA	.007	1.913	.786	.010	.027	.202	.440	.642	NA	.001	1.465	.448	
1955	.008	.003	.011	1.691	1.061	2.752	NA	.016	2.790	1.465	.013	.032	.067	.707	.774	NA	.002	2.286	.504	
1960	.007	.003	.161	2.196	1.802	3.999	NA	.018	4.188	1.023	.009	.012	.018	.413	.431	NA	.003	1.477	2.710	
1965	.005	.002	.471	2.654	2.748	5.402	NA	.012	5.892	1.376	.021	.027	.006	.386	.392	NA	.013	1.829	4.063	
1970	.001	.004	.846	2.814	4.656	7.470	NA	.021	8.342	1.936	.061	.072	.029	.520	.549	NA	.014	2.632	5.709	
1975	.024	.045	.978	8.721	4.227	12.948	NA	.038	14.032	1.761	.032	.074	.012	.427	.439	NA	.017	2.323	11.709	
1976	.030	.033	.988	11.239	4.434	15.672	NA	.037	16.760	1.597	.033	.066	.017	.452	.469	NA	.008	2.172	14.588	
1977	.041	.045	1.037	14.027	4.728	18.756	NA	.069	19.948	1.442	.031	.056	.106	.408	.514	NA	.009	2.052	17.896	
1978	.074	.142	.995	13.460	4.364	17.824	NA	.072	19.106	1.078	.017	.053	.335	.432	.767	NA	.005	1.920	17.186	
1979	.051	.099	1.300	13.825	4.108	17.933	NA	.077	19.460	1.753	.036	.056	.497	.505	1.002	NA	.007	2.855	16.605	
1980	.030	.016	1.006	11.195	3.463	14.658	NA	.085	15.796	2.421	.051	.049	.609	.551	1.160	NA	.014	3.695	12.101	
1981	.026	.013	.917	9.336	3.303	12.639	NA	.124	13.719	2.944	.029	.060	.482	.781	1.264	NA	.010	4.307	9.412	
1982	.019	.003	.950	7.418	3.360	10.777	NA	.112	11.861	2.787	.025	.052	.500	1.231	1.732	NA	.012	4.608	7.253	
1983	.032	.001	.940	7.079	3.568	10.647	NA	.132	11.752	2.045	.016	.055	.348	1.217	1.565	NA	.011	3.693	8.059	
1984	.032	.014	.847	7.302	4.131	11.433	NA	.144	12.471	2.151	.026	.055	.384	1.161	1.545	NA	.009	3.786	8.685	
1985	.049	.014	.952	6.814	3.796	10.609	NA	.157	11.781	2.438	.028	.056	.432	1.225	1.657	NA	.017	4.196	7.584	
1986	.055	.008	.748	9.002	4.199	13.201	NA	.139	14.151	2.248	.025	.062	.326	1.344	1.670	NA	.016	4.021	10.130	
1987	.044	.023	.992	10.067	4.095	14.162	NA	.178	15.398	2.093	.014	.055	.319	1.311	1.630	NA	.020	3.812	11.586	
1988	.053	.067	1.296	11.027	4.720	15.747	NA	.133	17.296	2.499	.027	.075	.329	1.412	1.741	NA	.024	4.366	12.929	
1989	.071	.057	1.387	12.596	4.565	17.162	NA	.089	18.766	2.637	.027	.109	.300	1.536	1.836	NA	.052	4.661	14.105	
1990	.067	.019	1.551	12.766	4.351	17.117	NA	.063	18.817	2.772	.014	.087	.230	1.594	1.824	NA	.055	4.752	14.065	
1991	.085	.029	1.798	12.553	3.794	16.348	NA	.075	18.335	2.854	.020	.132	.246	1.882	2.128	NA	.008	5.141	13.194	
1992	.095	.052	2.161	13.253	3.714	16.968	NA	.096	19.372	2.682	.017	.220	.188	1.819	2.008	NA	.010	4.937	14.435	
1993	.205	.053	2.397	14.749	3.760	18.510	.001	.107	21.273	1.962	.026	.142	.208	1.907	2.115	NA	.012	4.258	17.014	
1994	.222	.083	2.682	15.340	3.904	19.243	.001	.160	22.390	1.879	.024	.164	.209	1.779	1.988	NA	.007	4.061	18.329	
1995	.237	.095	2.901	15.669	3.211	18.881	.001	.146	22.260	2.318	.034	.156	.200	1.791	1.991	NA	.012	4.511	17.750	
1996	.203	.063	3.002	16.341	3.943	20.284	.001	.148	23.702	2.368	.040	.155	.233	1.825	2.059	NA	.011	4.633	19.069	
1997	.187	.078	3.063	17.876	3.864	21.740	(s)	.147	25.215	2.193	.031	.159	.228	1.872	2.100	NA	.031	4.514	20.701	
1998	.218	.095	3.225	18.916	3.992	22.908	(s)	.135	26.581	2.092	.028	.161	.233	1.740	1.972	NA	.047	4.299	22.281	
1999	.227	.080	3.664	18.935	4.198	23.133	(s)	.147	27.252	1.525	.022	.164	.250	1.705	1.955	NA	.049	3.715	23.537	
2000	.313	.094	3.869	19.783	4.749	24.531	(s)	.166	28.973	1.528	.028	.245	.106	2.048	2.154	NA	.051	4.006	24.967	
2001	.495	.063	4.068	20.348	5.051	25.398	.002	.131	30.157	1.265	.033	.377	.043	1.996	2.039	(s)	.056	3.771	26.386	
2002	.422	.080	4.104	19.920	4.754	24.674	.002	.125	29.408	1.032	.020	.520	.019	2.023	2.042	(s)	.054	3.669	25.739	
2003	.626	.068	4.042	21.060	5.159	26.219	.002	.104	31.061	1.117	.018	.686	.026	2.124	2.151	.001	.082	4.054	27.007	
2004	.682	.170	4.365	22.082	6.114	28.197	.013	.117	33.544	1.253	.033	.862	.057	2.151	2.208	.001	.078	4.434	29.110	
2005	.762	.088	4.450	22.091	7.157	29.248	.012	.150	34.709	1.273	.043	.735	.067	2.374	2.442	.001	.065	4.560	30.149	
2006	.906	.101	4.291	22.085	7.084	29.169	.066	.146	34.679	1.264	.040	.730	.052	2.699	2.751	.004	.083	4.872	29.806	
2007	.909	.061	4.723	21.914	6.868	28.781	.054	.175	34.703	1.507	.036	.830	.058	2.949	3.007	.035	.069	5.482	29.221	
2008	.855	.089	4.084	21.448	6.237	27.685	.084	.195	32.992	2.071	.049	.972	.061	3.739	3.800	.086	.083	7.060	25.932	
2009	.566	.009	3.845	19.699	5.383	25.082	.026	.178	29.706	1.515	.032	1.082	.093	4.147	4.240	.034	.062	6.965	22.741	
2010	.484	.030	<sup>R</sup> 3.834	<sup>R</sup> 20.140	<sup>R</sup> 5.231	<sup>R</sup> 25.371	.004	.154	<sup>R</sup> 29.877	2.101	.036	1.147	.088	<sup>R</sup> 4.750	<sup>R</sup> 4.838	<sup>R</sup> .046	<sup>R</sup> .065	<sup>R</sup> 8.234	<sup>R</sup> 21.643	
2011 <sup>P</sup>	.327	.035	3.540	19.561	4.930	24.491	.016	.178	28.587	2.751	.024	1.521	.100	5.801	5.901	.108	.051	10.356	18.232	

<sup>1</sup> Net imports equal imports minus exports. Minus sign indicates exports are greater than imports.

<sup>2</sup> Crude oil and lease condensate. Imports data include imports into the Strategic Petroleum Reserve, which began in 1977.

<sup>3</sup> Petroleum products, unfinished oils, pentanes plus, and gasoline blending components. Does not include biofuels.

<sup>4</sup> Fuel ethanol (minus denaturant) and biodiesel.

<sup>5</sup> Biodiesel only.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.0005 quadrillion Btu.

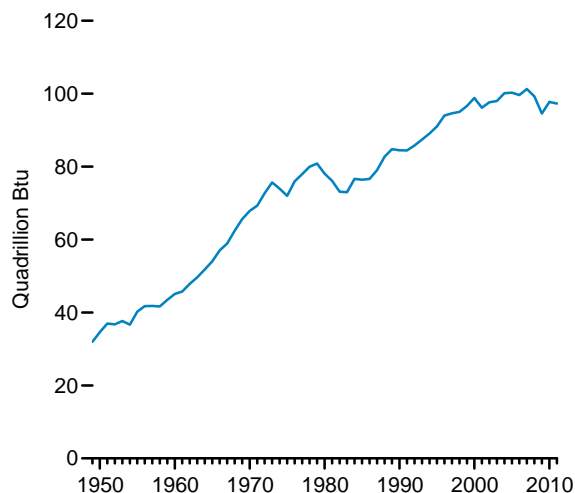
Notes: • Includes trade between the United States (50 States and the District of Columbia) and its territories and possessions. • See "Primary Energy" in Glossary. • See Note 3, "Electricity Imports and Exports," at end of Section 8. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#summary> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all annual data beginning in 1949.

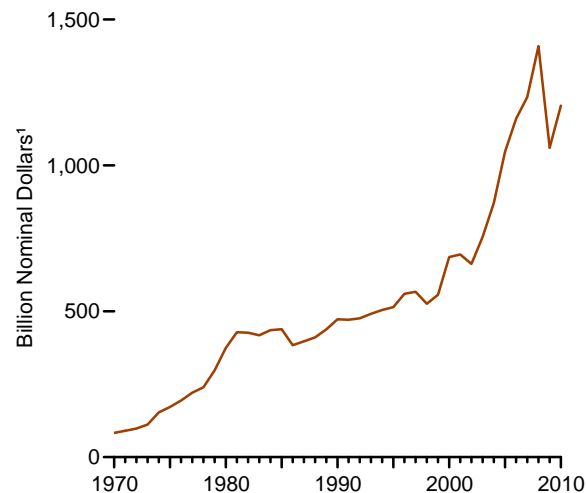
Sources: Tables 5.1b, 5.3, 5.5, 6.1, 7.1, 7.8, 8.1, 10.3, 10.4, A2, A3, A4, A5, and A6.

**Figure 1.5 Energy Consumption and Expenditures Indicators Estimates**

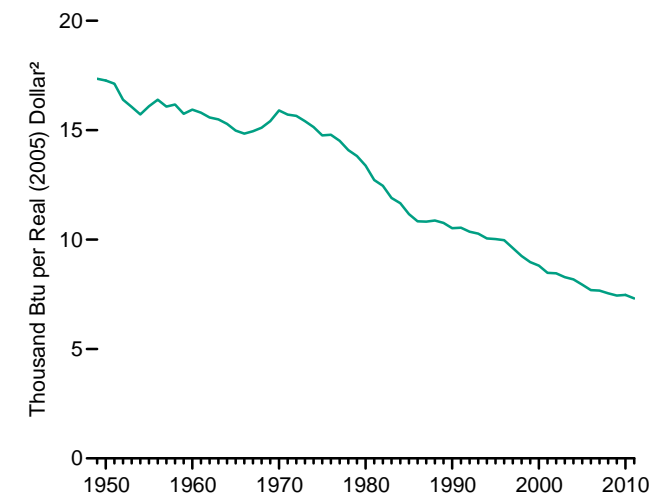
**Energy Consumption, 1949-2011**



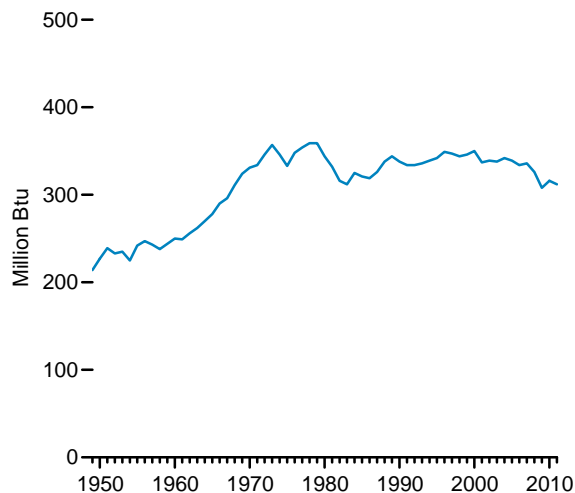
**Energy Expenditures, 1970-2010**



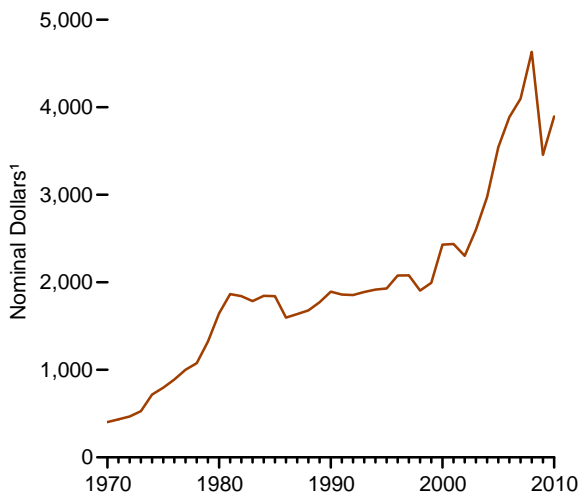
**Energy Consumption per Real Dollar<sup>2</sup> of Gross Domestic Product, 1949-2011**



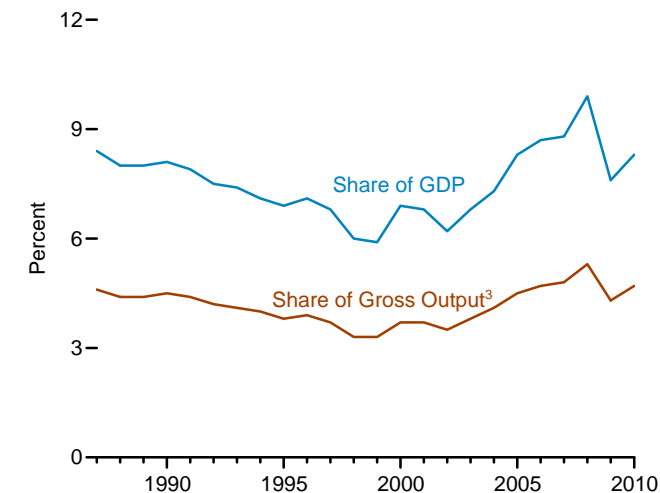
**Energy Consumption per Capita, 1949-2011**



**Energy Expenditures per Capita, 1970-2010**



**Energy Expenditures as Share of Gross Domestic Product and Gross Output,<sup>3</sup> 1987-2010**



<sup>1</sup> See "Nominal Dollars" in Glossary.

<sup>2</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>3</sup> Gross output is the value of gross domestic product (GDP) plus the value of intermediate inputs used to produce GDP.

Source: Table 1.5.



**Table 1.5 Energy Consumption, Expenditures, and Emissions Indicators Estimates, Selected Years, 1949-2011**

Year	Energy Consumption	Energy Consumption per Capita	Energy Expenditures <sup>1</sup>	Energy Expenditures per Capita	Gross Output <sup>3</sup>	Energy Expenditures <sup>1</sup> as Share of Gross Output <sup>3</sup>	Gross Domestic Product (GDP)	Energy Expenditures <sup>1</sup> as Share of GDP	Gross Domestic Product (GDP)	Energy Consumption per Real Dollar of GDP	Carbon Dioxide Emissions <sup>2</sup> per Real Dollar of GDP
	Quadrillion Btu	Million Btu	Million Nominal Dollars <sup>4</sup>	Nominal Dollars <sup>4</sup>	Billion Nominal Dollars <sup>4</sup>	Percent	Billion Nominal Dollars <sup>4</sup>	Percent	Billion Real (2005) Dollars <sup>5</sup>	Thousand Btu per Real (2005) Dollar <sup>5</sup>	Metric Tons Carbon Dioxide per Million Real (2005) Dollars <sup>5</sup>
1949	31.982	214	NA	NA	NA	NA	267.2	NA	R1,843.1	R17.35	R1,197
1950	34.616	227	NA	NA	NA	NA	293.7	NA	R2,004.2	R17.27	R1,189
1955	40.208	242	NA	NA	NA	NA	414.7	NA	R2,498.2	R16.09	R1,075
1960	45.086	250	NA	NA	NA	NA	526.4	NA	R2,828.5	R15.94	R1,030
1965	54.015	278	NA	NA	NA	NA	719.1	NA	R3,607.0	R14.98	R960
1970	67.838	331	82,860	404	NA	NA	1,038.3	8.0	R4,266.3	R15.90	R999
1975	71.965	333	R171,837	R796	NA	NA	1,637.7	10.5	R4,875.4	R14.76	R910
1976	75.975	348	R193,896	889	NA	NA	1,824.6	10.6	R5,136.9	R14.79	R916
1977	77.961	354	R220,476	1,001	NA	NA	2,030.1	10.9	R5,373.1	R14.51	R902
1978	79.950	359	R239,255	R1,075	NA	NA	2,293.8	10.4	R5,672.8	R14.09	R863
1979	80.859	359	R297,549	1,322	NA	NA	2,562.2	11.6	R5,850.1	R13.82	R849
1980	78.067	344	R374,347	1,647	NA	NA	2,788.1	13.4	R5,834.0	R13.38	R818
1981	76.106	332	R427,898	R1,865	NA	NA	3,126.8	13.7	R5,982.1	R12.72	R776
1982	73.099	316	R426,479	R1,841	NA	NA	3,253.2	13.1	R5,865.9	R12.46	751
1983	72.971	312	R417,476	R1,786	NA	NA	3,534.6	11.8	R6,130.9	R11.90	R715
1984	76.632	325	R435,195	1,845	NA	NA	3,930.9	11.1	R6,571.5	R11.90	R702
1985	76.392	321	R438,347	1,842	NA	NA	4,217.5	10.4	R6,843.4	R11.16	672
1986	76.647	319	R383,518	1,597	NA	NA	4,460.1	8.6	R7,080.5	R10.83	R651
1987	79.054	326	R396,587	R1,637	8,639.9	4.6	4,736.4	8.4	R7,307.0	R10.82	R652
1988	82.709	338	R410,515	R1,679	9,359.5	4.4	5,100.4	8.0	R7,607.4	R10.87	R655
1989	84.786	344	R437,679	1,773	9,969.6	4.4	5,482.1	8.0	R7,879.2	R10.76	643
1990	84.485	338	R472,653	1,893	10,511.1	4.5	5,800.5	8.1	R8,027.1	10.52	R628
1991	84.438	334	R470,668	1,860	10,676.5	4.4	5,992.1	7.9	R8,008.3	R10.54	R624
1992	85.783	334	R475,644	R1,854	11,242.4	4.2	6,342.3	7.5	R8,280.0	R10.36	615
1993	87.424	336	R491,231	R1,890	11,857.6	4.1	6,667.4	7.4	R8,516.2	R10.27	R609
1994	89.091	339	504,073	1,916	12,647.2	4.0	7,085.2	7.1	R8,863.1	R10.05	593
1995	91.029	342	513,947	1,930	13,451.6	3.8	7,414.7	6.9	R9,086.0	R10.02	R585
1996	94.022	349	559,890	2,078	14,259.9	3.9	7,838.5	7.1	R9,425.8	9.97	R584
1997	94.602	347	566,714	2,079	15,160.5	3.7	8,332.4	6.8	R9,845.9	R9.61	566
1998	95.018	344	525,515	1,905	15,987.4	3.3	8,793.5	6.0	R10,274.7	R9.25	547
1999	96.652	346	R556,379	1,994	17,017.4	3.3	9,353.5	5.9	R10,770.7	8.97	R528
2000	R98.814	350	R685,902	2,431	18,305.7	3.7	9,951.5	6.9	R11,216.4	R8.81	523
2001	96.168	337	694,484	R2,437	18,576.5	3.7	10,286.2	6.8	R11,337.5	8.48	508
2002	R97.645	R339	R662,414	R2,303	18,874.2	3.5	10,642.3	6.2	R11,543.1	8.46	503
2003	97.978	338	754,708	R2,601	19,832.3	3.8	R11,142.2	6.8	R11,836.4	R8.28	495
2004	R100.162	342	R871,097	R2,975	21,267.7	4.1	R11,853.3	7.3	R12,246.9	R8.18	R488
2005	R100.282	339	R1,046,897	R3,543	23,046.9	4.5	R12,623.0	8.3	R12,623.0	R7.94	R475
2006	R99.629	334	R1,159,687	R3,887	24,477.0	4.7	R13,377.2	8.7	R12,958.5	R7.69	R457
2007	R101.296	336	R1,234,282	R4,097	25,819.7	4.8	R14,028.7	8.8	R13,206.4	R7.67	R456
2008	R99.275	326	R1,408,845	R4,633	26,561.9	5.3	R14,291.5	R9.9	R13,161.9	R7.54	R444
2009	R94.559	308	R1,061,220	R3,459	24,568.6	4.3	R13,939.0	R7.6	R12,703.1	R7.44	R427
2010	R97.722	R316	R1,204,827	R3,895	25,811.4	4.7	R14,526.5	R8.3	R13,088.0	R7.47	R429
2011 <sup>P</sup>	97.301	312	NA	NA	NA	NA	15,094.0	NA	13,315.1	7.31	412

<sup>1</sup> Expenditures include taxes where data are available.

<sup>2</sup> Carbon dioxide emissions from energy consumption. See Table 11.1.

<sup>3</sup> Gross output is the value of GDP plus the value of intermediate inputs used to produce GDP.

<sup>4</sup> See "Nominal Dollars" in Glossary.

<sup>5</sup> In chained (2005) dollars. See "Chained Dollars" in Glossary.

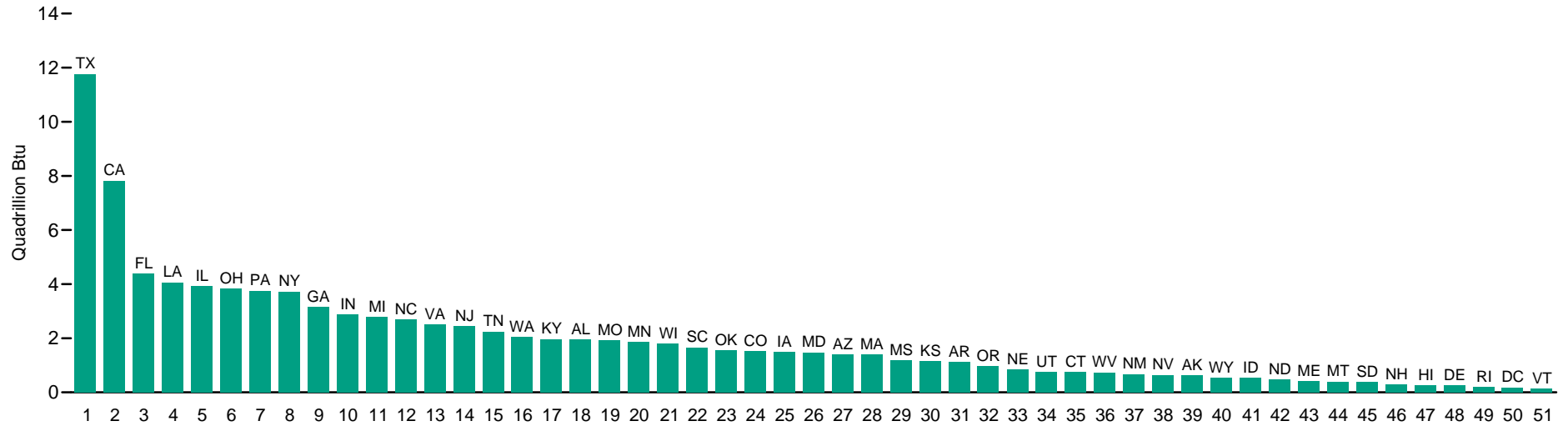
R=Revised. P=Preliminary. NA=Not available.

Web Page: For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#summary>.

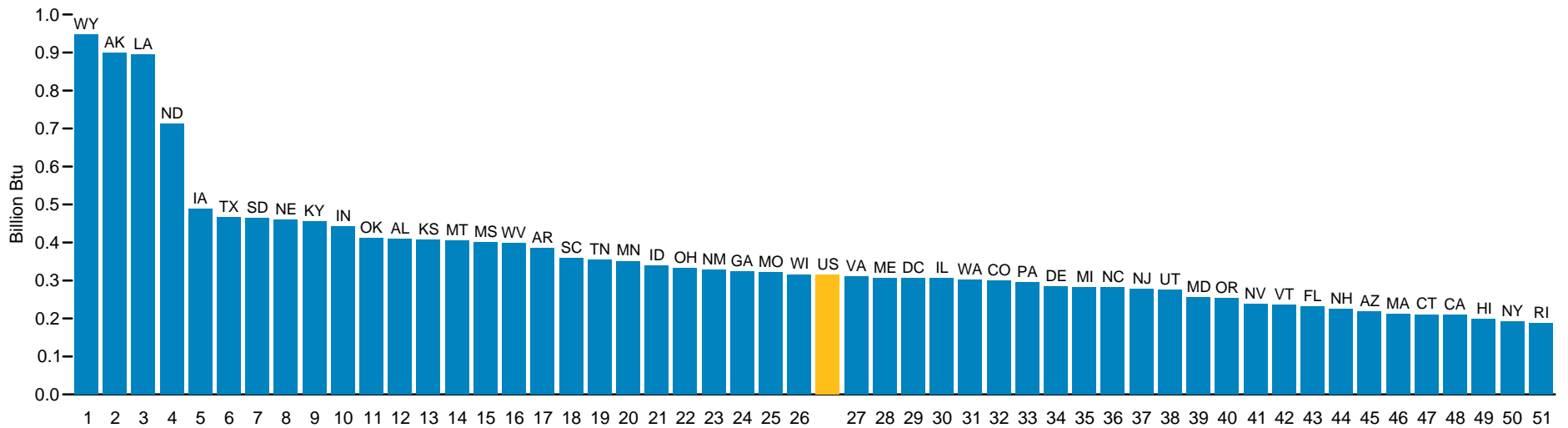
Sources: **Energy Consumption:** Table 1.3. **Energy Expenditures:** Table 3.5. **Gross Domestic Product:** Table D1. **Population Data:** Table D1. **Gross Output:** U.S. Department of Commerce, Bureau of Economic Analysis, Gross Domestic Product by Industry Data, Gross Output, All Industries. **Carbon Dioxide Emissions:** Table 11.1. **Other Columns:** Calculated by U.S. Energy Information Administration.

**Figure 1.6 State-Level Energy Consumption Estimates and Estimated Consumption per Capita, 2010**

**Consumption**



**Consumption per Capita**



Source: Table 1.6.

**Table 1.6 State-Level Energy Consumption, Expenditure, and Price Estimates, 2010**

Rank	Consumption		Consumption per Capita		Expenditures <sup>1</sup>		Expenditures <sup>1</sup> per Capita		Prices <sup>1</sup>	
	Trillion Btu		Million Btu		Million Dollars <sup>2</sup>		Dollars <sup>2</sup>		Dollars <sup>2</sup> per Million Btu	
1	Texas	11,769.9	Wyoming	948.1	Texas	137,532	Alaska	8,807	Hawaii	30.75
2	California	7,825.7	Alaska	898.5	California	117,003	Louisiana	8,661	District of Columbia	26.19
3	Florida	4,381.9	Louisiana	894.4	New York	61,619	Wyoming	7,904	Connecticut	25.63
4	Louisiana	4,065.4	North Dakota	712.6	Florida	60,172	North Dakota	6,740	Vermont	24.20
5	Illinois	3,936.7	Iowa	489.3	Pennsylvania	48,701	Texas	5,446	New Hampshire	23.87
6	Ohio	3,833.7	Texas	466.1	Ohio	45,081	Iowa	4,841	Massachusetts	23.32
7	Pennsylvania	3,758.8	South Dakota	464.9	Illinois	44,989	Maine	4,746	Rhode Island	23.12
8	New York	3,728.4	Nebraska	461.1	Louisiana	39,369	South Dakota	4,651	Delaware	22.95
9	Georgia	3,155.7	Kentucky	454.7	New Jersey	37,362	Montana	4,610	New York	22.91
10	Indiana	2,871.1	Indiana	442.3	Georgia	37,338	Kentucky	4,526	Maryland	22.48
11	Michigan	2,798.1	Oklahoma	412.6	Michigan	34,540	Alabama	4,494	Arizona	21.78
12	North Carolina	2,705.2	Alabama	409.5	North Carolina	32,989	Mississippi	4,446	Florida	21.66
13	Virginia	2,502.1	Kansas	407.6	Virginia	29,826	Nebraska	4,421	New Jersey	20.91
14	New Jersey	2,447.5	Montana	405.1	Indiana	27,374	Kansas	4,357	Nevada	20.87
15	Tennessee	2,250.6	Mississippi	400.4	Tennessee	25,153	Vermont	4,344	California	20.66
16	Washington	2,036.5	West Virginia	398.4	Massachusetts	24,512	Oklahoma	4,268	Alaska	20.25
17	Kentucky	1,976.5	Arkansas	385.3	Washington	22,893	West Virginia	4,251	North Carolina	19.98
18	Alabama	1,959.7	South Carolina	358.3	Missouri	22,885	New Jersey	4,246	Pennsylvania	19.56
19	Missouri	1,928.4	Tennessee	354.0	Maryland	21,517	Indiana	4,217	New Mexico	19.40
20	Minnesota	1,867.3	Minnesota	351.6	Alabama	21,507	Hawaii	4,191	Virginia	18.91
21	Wisconsin	1,800.1	Idaho	339.7	Wisconsin	21,483	Arkansas	4,128	Oregon	18.89
22	South Carolina	1,661.6	Ohio	332.3	Minnesota	20,869	South Carolina	4,034	Maine	18.78
23	Oklahoma	1,551.6	New Mexico	329.2	Kentucky	19,675	District of Columbia	4,033	Missouri	18.54
24	Colorado	1,516.9	Georgia	324.9	Arizona	19,374	Delaware	4,019	Tennessee	18.33
25	Iowa	1,492.3	Missouri	321.6	South Carolina	18,705	Connecticut	3,977	South Carolina	18.26
26	Maryland	1,481.1	Wisconsin	316.3	Colorado	16,751	New Hampshire	3,971	Michigan	18.22
27	Arizona	1,399.6	Virginia	311.8	Oklahoma	16,049	Tennessee	3,956	Wisconsin	18.22
28	Massachusetts	1,396.9	Maine	306.8	Iowa	14,766	Minnesota	3,930	Washington	18.11
29	Mississippi	1,189.2	District of Columbia	306.6	Connecticut	14,221	Ohio	3,907	Georgia	17.96
30	Kansas	1,165.3	Illinois	306.5	Mississippi	13,206	Georgia	3,844	Ohio	17.93
31	Arkansas	1,125.6	Washington	302.0	Oregon	12,592	Pennsylvania	3,829	Montana	17.73
32	Oregon	977.1	Colorado	300.5	Kansas	12,457	Missouri	3,817	Kansas	17.72
33	Nebraska	843.8	Pennsylvania	295.6	Arkansas	12,061	Wisconsin	3,774	Mississippi	17.63
34	Utah	763.7	Delaware	284.7	Nevada	9,294	Massachusetts	3,739	Alabama	17.49
35	Connecticut	754.0	Michigan	283.3	Utah	8,332	Maryland	3,719	Texas	17.46
36	West Virginia	738.9	North Carolina	283.0	Nebraska	8,091	Virginia	3,717	Colorado	17.24
37	New Mexico	680.1	New Jersey	278.1	West Virginia	7,882	Idaho	3,622	Illinois	17.17
38	Nevada	646.1	Utah	275.2	New Mexico	7,435	New Mexico	3,599	West Virginia	17.09
39	Alaska	641.7	Maryland	256.0	Maine	6,300	Rhode Island	3,506	South Dakota	16.92
40	Wyoming	535.3	Oregon	254.6	Alaska	6,289	Illinois	3,503	Kentucky	16.89
41	Idaho	533.8	Nevada	238.9	Hawaii	5,714	Michigan	3,497	Minnesota	16.82
42	North Dakota	480.7	Vermont	235.9	Idaho	5,691	North Carolina	3,451	Oklahoma	16.78
43	Maine	407.3	Florida	232.6	New Hampshire	5,229	Nevada	3,437	Arkansas	16.76
44	Montana	401.4	New Hampshire	224.4	Montana	4,568	Washington	3,395	Idaho	16.68
45	South Dakota	379.6	Arizona	218.2	North Dakota	4,547	Colorado	3,319	Utah	16.66
46	New Hampshire	295.5	Massachusetts	213.1	Wyoming	4,462	Oregon	3,281	Nebraska	16.27
47	Hawaii	272.2	Connecticut	210.9	South Dakota	3,798	Florida	3,194	Iowa	15.46
48	Delaware	256.2	California	209.6	Rhode Island	3,690	New York	3,177	Wyoming	15.16
49	Rhode Island	197.2	Hawaii	199.6	Delaware	3,616	California	3,134	Indiana	14.75
50	District of Columbia	185.5	New York	192.2	Vermont	2,719	Arizona	3,021	Louisiana	14.73
51	Vermont	147.6	Rhode Island	187.4	District of Columbia	2,439	Utah	3,002	North Dakota	13.73
	<b>United States</b>	<b>3,497,710.6</b>	<b>United States</b>	<b>315.9</b>	<b>United States</b>	<b>51,204,827</b>	<b>United States</b>	<b>3,895</b>	<b>United States</b>	<b>18.73</b>

<sup>1</sup> Prices and expenditures include taxes where data are available.

<sup>2</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>3</sup> Includes -6.2 trillion Btu of coal coke net imports, which are not allocated to the States.

<sup>4</sup> The U.S. consumption value in this table does not match those in Tables 1.1 and 1.3 because it: 1) does not include biodiesel; and 2) is the sum of State values, which use State average heat contents to convert physical units of coal and natural gas to Btu.

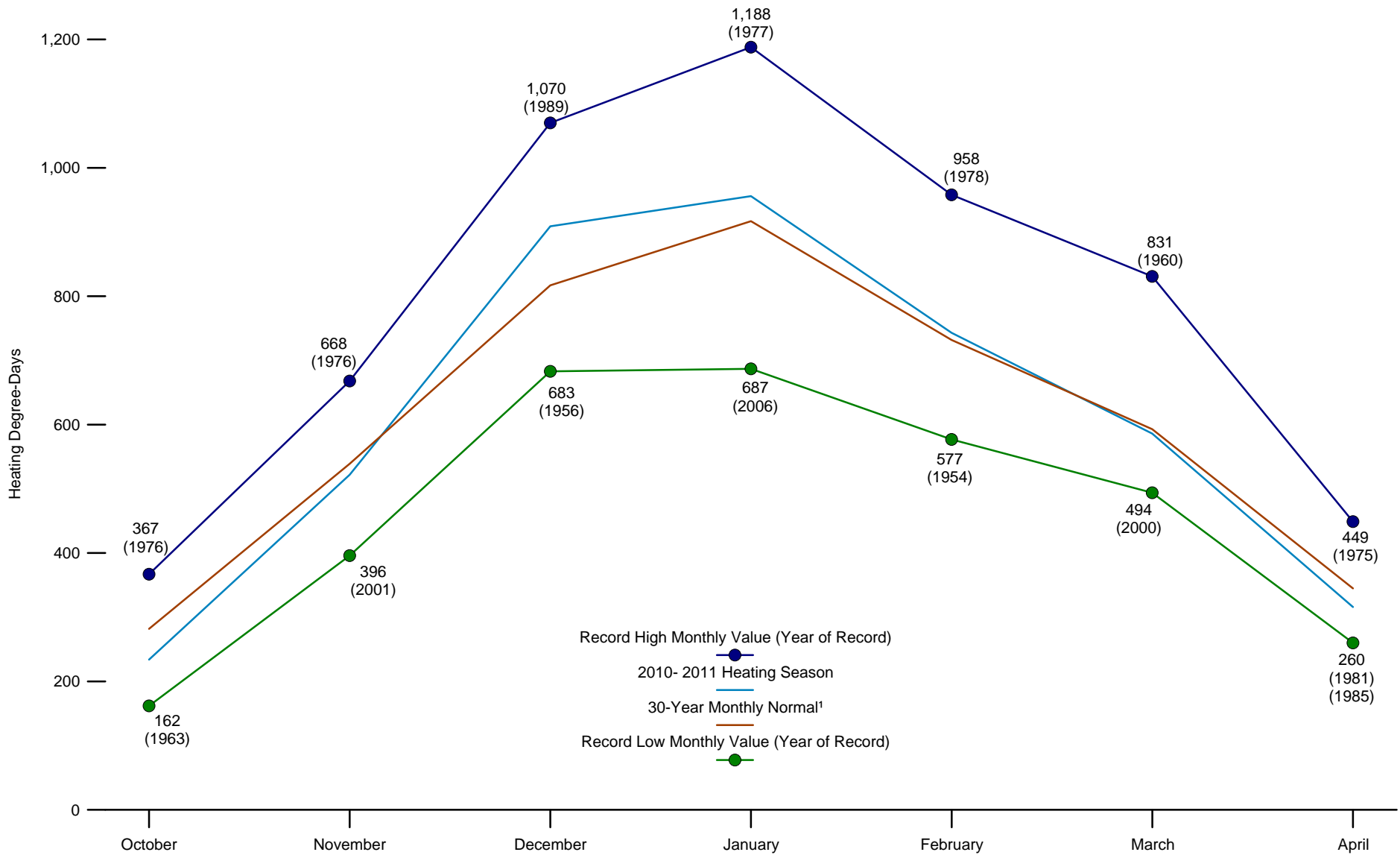
<sup>5</sup> Includes \$158 million for coal coke net imports, which are not allocated to the States.

Note: Rankings based on unrounded data.

Web Page: For related information, see <http://www.eia.gov/state/seds/seds-data-complete.cfm>.

Sources: **Consumption:** U.S. Energy Information Administration (EIA), "State Energy Data 2010: Consumption" (June 2012), Tables C10 and C11. **Expenditures and Prices:** EIA, "State Energy Data 2010: Prices and Expenditures" (June 2012), Table E15. "State Energy Data 2010" includes State-level data by end-use sector and type of energy. Consumption estimates are annual 1960 through 2010, and price and expenditure estimates are annual 1970 through 2010.

**Figure 1.7 Heating Degree-Days by Month, 1949-2011**



<sup>1</sup> Based on calculations of data from 1971 through 2000.

Source: Table 1.7.

**Table 1.7 Heating Degree-Days by Month, Selected Years, 1949-2011**

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1949	858	701	611	330	128	21	7	9	94	209	503	763	4,234
1950	761	721	693	412	162	40	11	18	85	196	565	872	4,536
1955	927	759	600	272	121	48	9	6	56	237	600	886	4,521
1960	884	780	831	278	160	33	7	11	48	254	502	936	4,724
1965	907	780	738	355	114	48	11	14	78	271	494	739	4,549
1970	1,063	758	685	344	120	31	4	9	55	253	541	801	4,664
1975	821	742	686	449	117	37	5	13	100	235	462	805	4,472
1976	974	609	544	309	178	28	8	19	81	367	668	941	4,726
1977	1,188	751	529	270	119	38	6	13	59	295	493	844	4,605
1978	1,061	958	677	350	157	31	7	11	59	283	517	847	4,958
1979	1,079	950	575	364	148	37	6	15	58	271	528	750	4,781
1980	887	831	680	338	142	49	5	10	54	316	564	831	4,707
1981	984	689	620	260	165	25	6	11	76	327	504	845	4,512
1982	1,067	776	620	408	114	62	7	19	75	264	515	692	4,619
1983	874	706	588	421	189	35	6	5	53	251	509	990	4,627
1984	1,000	645	704	371	172	28	7	7	88	223	565	704	4,514
1985	1,057	807	557	260	123	47	5	17	69	243	506	951	4,642
1986	859	734	542	295	123	30	9	18	76	258	558	793	4,295
1987	920	714	573	309	107	20	8	13	61	345	491	773	4,334
1988	1,004	778	594	344	134	30	3	5	72	352	506	831	4,653
1989	789	832	603	344	163	32	5	14	73	259	542	1,070	4,726
1990	728	655	535	321	184	29	6	10	56	246	457	789	4,016
1991	921	639	564	287	98	30	6	7	69	242	586	751	4,200
1992	852	644	603	345	152	46	14	24	74	301	564	822	4,441
1993	860	827	664	368	128	38	11	9	89	302	580	824	4,700
1994	1,031	813	594	293	174	21	6	16	65	268	479	723	4,483
1995	847	750	556	375	174	31	4	7	77	233	605	872	4,531
1996	945	748	713	360	165	27	8	9	72	276	630	760	4,713
1997	932	672	552	406	198	31	7	16	63	273	592	800	4,542
1998	765	623	596	331	109	41	4	5	33	245	482	717	3,951
1999	861	647	645	319	139	31	5	12	62	275	413	760	4,169
2000	886	643	494	341	115	29	12	12	69	244	610	1,005	4,460
2001	935	725	669	302	115	29	8	6	69	260	396	689	4,203
2002	776	669	622	281	184	23	3	8	37	298	560	812	4,273
2003	944	801	572	344	165	41	4	5	62	260	477	784	4,459
2004	968	766	495	303	107	37	7	20	47	251	487	802	4,290
2005	859	676	648	305	186	25	3	6	39	236	466	866	4,315
2006	687	731	600	264	137	23	2	9	82	304	467	690	3,996
2007	841	853	502	372	111	24	5	7	44	175	521	800	4,255
2008	892	741	617	319	183	26	5	13	52	281	534	831	4,494
2009	969	705	583	330	132	40	14	12	60	330	441	877	4,493
2010	940	820	552	263	132	27	5	7	50	234	522	909	4,461
2011 <sup>P</sup>	956	743	586	316	166	35	4	6	67	259	469	713	4,320
Normal <sup>1</sup>	917	732	593	345	159	39	9	15	77	282	539	817	4,524

<sup>1</sup> Based on calculations of data from 1971 through 2000.

P=Preliminary.

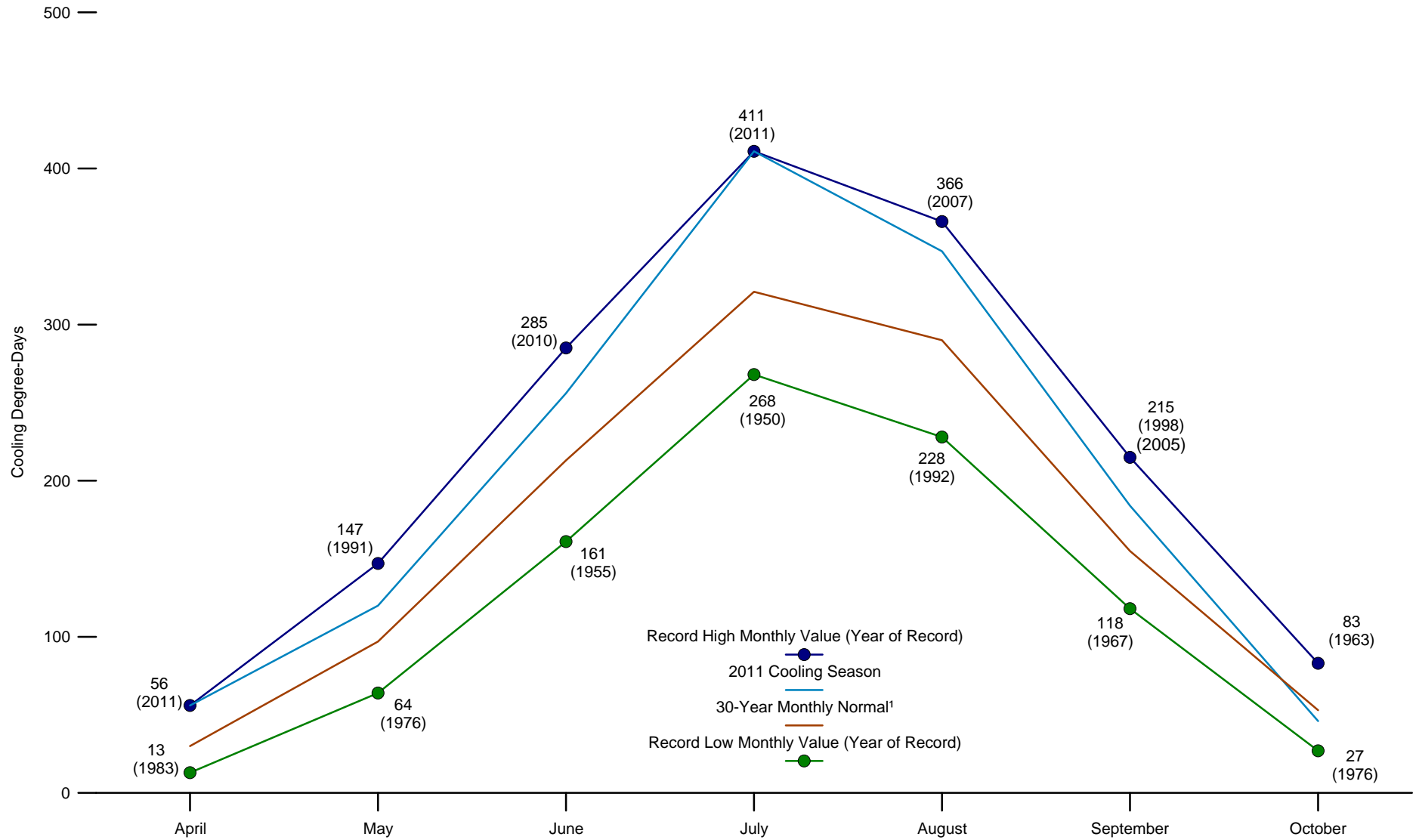
Notes: • This table excludes Alaska and Hawaii. • Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations below the mean daily temperature of 65° F. For example, a weather station recording a mean daily temperature of 40° F would report 25 heating degree-days. • Temperature information recorded by weather stations is used to calculate State-wide degree-day averages based on resident State population. Beginning in July 2001, data are weighted by the 2000 population. The population-weighted State figures are aggregated into Census divisions and the national average.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all data beginning in 1949.

• For current data, see <http://www.eia.gov/totalenergy/data/monthly/#summary>.

Sources: • 1949-2010—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina, Historical Climatology Series 5-1. Data are compiled from about 8,000 weather stations. • 2011 and Normal—U.S. Department of Commerce, NOAA, National Weather Service Climate Prediction Center, Camp Springs, Maryland, *Degree Days Statistics*. The data are based on mean daily temperatures recorded at about 200 major weather stations around the country.

**Figure 1.8 Cooling Degree-Days by Month, 1949-2011**



<sup>1</sup> Based on calculations of data from 1971 through 2000.

Source: Table 1.8.

**Table 1.8 Cooling Degree-Days by Month, Selected Years, 1949-2011**

Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
1949	16	14	14	27	110	253	367	294	131	70	12	10	1,318
1950	27	12	13	21	105	201	268	244	128	78	9	4	1,110
1955	6	7	20	45	121	161	381	355	182	50	10	6	1,344
1960	7	4	6	37	76	215	301	302	181	59	15	3	1,206
1965	9	7	10	42	125	179	280	273	155	48	19	6	1,153
1970	3	4	10	36	104	201	323	313	185	48	6	9	1,242
1975	14	11	14	24	117	203	301	296	120	55	12	5	1,172
1976	5	11	23	27	64	208	282	243	127	27	8	4	1,029
1977	2	5	21	35	121	212	351	293	180	44	15	6	1,285
1978	3	1	10	31	93	218	310	300	180	52	19	9	1,226
1979	4	4	13	32	82	187	295	266	160	53	11	6	1,113
1980	9	4	13	23	95	199	374	347	192	42	10	5	1,313
1981	3	6	10	52	75	257	333	275	138	43	12	5	1,209
1982	6	10	21	26	115	165	318	262	140	47	15	11	1,136
1983	6	5	9	13	72	193	353	362	172	58	12	5	1,260
1984	5	6	14	24	92	233	291	312	143	70	9	15	1,214
1985	3	5	22	39	108	193	313	269	145	68	25	4	1,194
1986	8	10	17	33	106	231	340	259	161	52	23	9	1,249
1987	5	7	13	23	127	244	334	298	156	40	14	8	1,269
1988	5	5	13	28	89	218	359	348	149	45	18	6	1,283
1989	15	7	19	36	88	208	312	266	138	49	16	2	1,156
1990	15	14	21	29	86	234	316	291	172	57	16	9	1,260
1991	10	9	19	42	147	235	336	305	149	62	8	9	1,331
1992	6	10	15	29	77	170	286	228	150	49	13	7	1,040
1993	13	5	11	19	91	207	347	317	146	47	11	4	1,218
1994	7	9	18	37	76	262	328	263	141	50	20	9	1,220
1995	7	7	18	29	91	202	348	363	150	61	12	5	1,293
1996	7	6	8	26	116	226	299	287	139	45	14	7	1,180
1997	8	11	31	19	81	189	315	268	171	48	10	5	1,156
1998	12	7	10	23	135	228	350	337	215	62	20	11	1,410
1999	12	11	12	40	94	219	374	305	152	55	17	6	1,297
2000	10	10	25	28	131	221	284	302	156	50	8	4	1,229
2001	3	12	11	37	114	220	302	333	138	46	18	11	1,245
2002	8	6	17	53	92	243	370	332	202	57	11	5	1,396
2003	5	7	24	30	110	187	336	345	156	65	21	4	1,290
2004	6	6	28	29	138	208	299	252	177	67	17	5	1,232
2005	10	7	12	24	82	250	367	351	215	55	20	4	1,397
2006	13	5	18	53	109	236	388	337	138	46	14	11	1,368
2007	10	5	29	23	119	236	310	366	191	82	16	12	1,399
2008	7	11	17	31	91	264	334	283	171	48	12	8	1,277
2009	7	7	17	29	117	222	284	307	169	47	16	7	1,229
2010	3	2	7	34	126	285	380	356	195	55	13	1	1,457
2011 <sup>P</sup>	3	10	20	56	120	256	411	347	184	46	16	8	1,477
Normal <sup>1</sup>	R 9	8	18	R30	R97	R213	R321	R290	R155	R53	R15	R 7	R1,216

<sup>1</sup> Based on calculations of data from 1971 through 2000.

R=Revised. P=Preliminary.

Notes: • This table excludes Alaska and Hawaii. • Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations above the mean daily temperature of 65° F. For example, a weather station recording a mean daily temperature of 78° F would report 13 cooling degree-days. • Temperature information recorded by weather stations is used to calculate State-wide degree-day averages based on resident State population. Beginning in 2002, data are weighted by the 2000 population. The population-weighted State figures are aggregated into Census divisions and the national average.

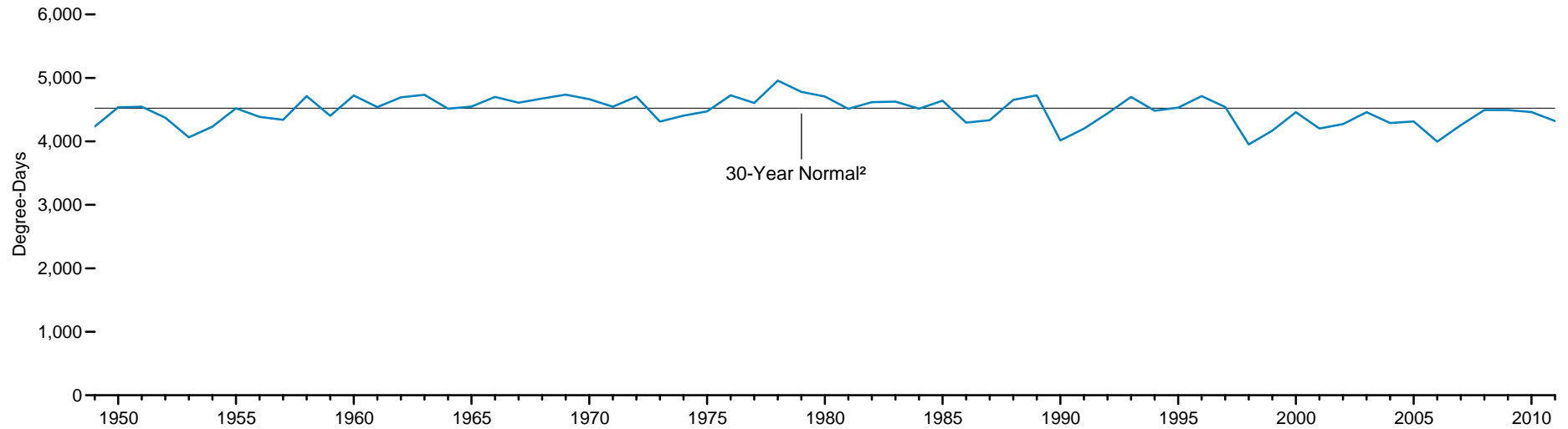
Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all data beginning in 1949.

• For current data, see <http://www.eia.gov/totalenergy/data/monthly/#summary>.

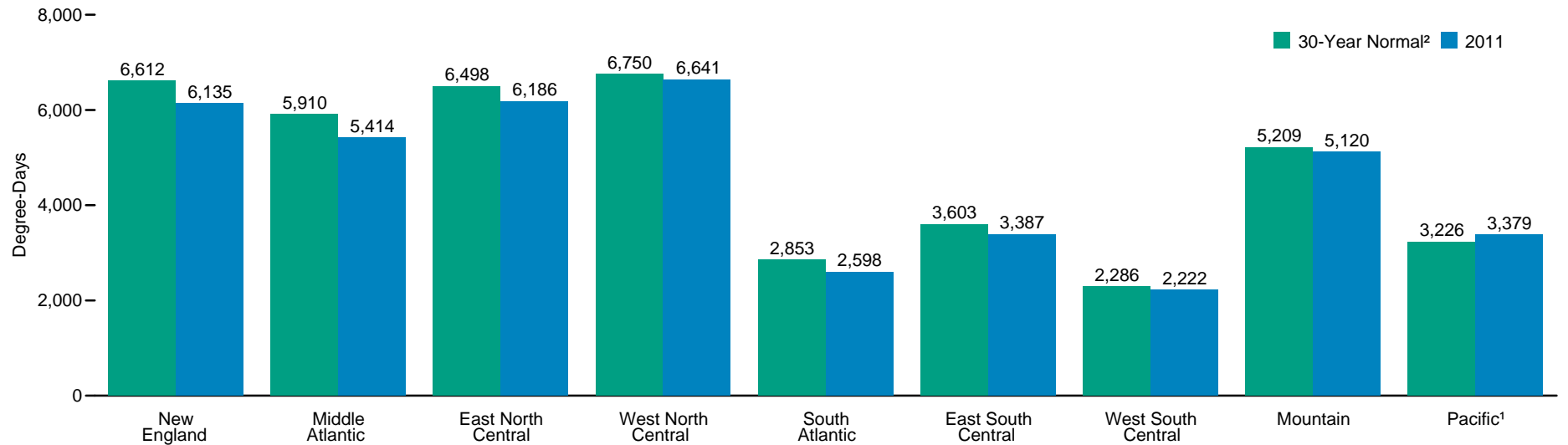
Sources: • 1949-2010—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina, Historical Climatology Series 5-2. Data are compiled from about 8,000 weather stations. • 2011 and Normal—U.S. Department of Commerce, NOAA, National Weather Service Climate Prediction Center, Camp Springs, Maryland, *Degree Days Statistics*. The data are based on mean daily temperatures recorded at about 200 major weather stations around the country.

**Figure 1.9 Heating Degree-Days by Census Division**

**U.S.<sup>1</sup> Heating Degree-Days, 1949-2011**



**Heating Degree-Days by Census Division, 2011**



<sup>1</sup> Excludes Alaska and Hawaii.

<sup>2</sup> Based on calculations of data from 1971 through 2000.

Note: See Appendix C for map of Census divisions.

Source: Table 1.9.



**Table 1.9 Heating Degree-Days by Census Division, Selected Years, 1949-2011**

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific <sup>1</sup>	United States <sup>1</sup>
1949	5,829	5,091	5,801	6,479	2,367	2,942	2,133	5,483	3,729	4,234
1950	6,470	5,765	6,619	7,136	2,713	3,315	1,974	4,930	3,355	4,536
1955	6,577	5,708	6,101	6,630	2,786	3,314	2,083	5,517	3,723	4,521
1960	6,561	5,901	6,544	6,884	3,147	3,958	2,551	5,328	3,309	4,724
1965	6,825	5,933	6,284	6,646	2,830	3,374	2,078	5,318	3,378	4,549
1970	6,839	5,943	6,455	6,835	2,997	3,685	2,396	5,436	3,257	4,664
1975	6,362	5,477	6,169	6,678	2,640	3,336	2,187	5,693	3,623	4,472
1976	6,839	6,097	6,768	6,670	3,040	3,881	2,446	5,303	3,115	4,726
1977	6,579	5,889	6,538	6,506	3,047	3,812	2,330	5,060	3,135	4,605
1978	7,061	6,330	7,095	7,324	3,187	4,062	2,764	5,370	3,168	4,958
1979	6,348	5,851	6,921	7,369	2,977	3,900	2,694	5,564	3,202	4,781
1980	6,900	6,143	6,792	6,652	3,099	3,855	2,378	5,052	2,986	4,707
1981	6,612	5,989	6,446	6,115	3,177	3,757	2,162	4,671	2,841	4,512
1982	6,697	5,866	6,542	7,000	2,721	3,357	2,227	5,544	3,449	4,619
1983	6,305	5,733	6,423	6,901	3,057	3,892	2,672	5,359	3,073	4,627
1984	6,442	5,777	6,418	6,582	2,791	3,451	2,194	5,592	3,149	4,514
1985	6,571	5,660	6,546	7,119	2,736	3,602	2,466	5,676	3,441	4,642
1986	6,517	5,665	6,150	6,231	2,686	3,294	2,058	4,870	2,807	4,295
1987	6,546	5,699	5,810	5,712	2,937	3,466	2,292	5,153	3,013	4,334
1988	6,715	6,088	6,590	6,634	3,122	3,800	2,346	5,148	2,975	4,653
1989	6,887	6,134	6,834	6,996	2,944	3,713	2,439	5,173	3,061	4,726
1990	5,848	4,998	5,681	6,011	2,230	2,929	1,944	5,146	3,148	4,016
1991	5,960	5,177	5,906	6,319	2,503	3,211	2,178	5,259	3,109	4,200
1992	6,844	5,964	6,297	6,262	2,852	3,498	2,145	5,054	2,763	4,441
1993	6,728	5,948	6,646	7,168	2,981	3,768	2,489	5,514	3,052	4,700
1994	6,672	5,934	6,378	6,509	2,724	3,394	2,108	5,002	3,155	4,483
1995	6,559	5,831	6,664	6,804	2,967	3,626	2,145	4,953	2,784	4,531
1996	6,679	5,986	6,947	7,345	3,106	3,782	2,285	5,011	2,860	4,713
1997	6,661	5,809	6,617	6,761	2,845	3,664	2,418	5,188	2,754	4,542
1998	5,680	4,812	5,278	5,774	2,429	3,025	2,021	5,059	3,255	3,951
1999	5,952	5,351	5,946	5,921	2,652	3,142	1,835	4,768	3,158	4,169
2000	6,489	5,774	6,284	6,456	2,959	3,548	2,194	4,881	3,012	4,460
2001	6,055	5,323	5,824	6,184	2,641	3,312	2,187	4,895	3,136	4,203
2002	6,099	5,372	6,122	6,465	2,671	3,420	2,307	5,018	3,132	4,273
2003	6,851	6,090	6,528	6,539	2,891	3,503	2,230	4,605	2,918	4,459
2004	6,612	5,749	6,199	6,290	2,748	3,289	2,088	4,844	2,925	4,290
2005	6,551	5,804	6,241	6,202	2,844	3,402	2,051	4,759	2,959	4,315
2006	5,809	5,050	5,712	5,799	2,535	3,239	1,863	4,778	3,116	3,996
2007	6,501	5,623	6,096	6,374	2,584	3,213	2,156	4,830	3,113	4,255
2008	6,395	5,643	6,696	7,112	2,782	3,641	2,178	5,114	3,186	4,494
2009	6,646	5,799	6,540	6,837	2,879	3,588	2,212	5,016	3,150	4,493
2010	5,942	5,455	6,207	6,584	3,219	3,994	2,521	4,954	3,171	4,461
2011 <sup>P</sup>	6,135	5,414	6,186	6,641	2,598	3,387	2,222	5,120	3,379	4,320
Normal <sup>2</sup>	6,612	5,910	6,498	6,750	2,853	3,603	2,286	5,209	3,226	4,524

<sup>1</sup> Excludes Alaska and Hawaii.

<sup>2</sup> Based on calculations of data from 1971 through 2000.

P=Preliminary.

Notes: • Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations below the mean daily temperature of 65° F. For example, a weather station recording a mean daily temperature of 40° F would report 25 heating degree-days. • Temperature information recorded by weather stations is used to calculate State-wide degree-day averages based on resident State population. Beginning in July 2001, data are weighted by the 2000 population. The population-weighted State figures are aggregated into Census divisions and the national average. • See Appendix C for map of Census

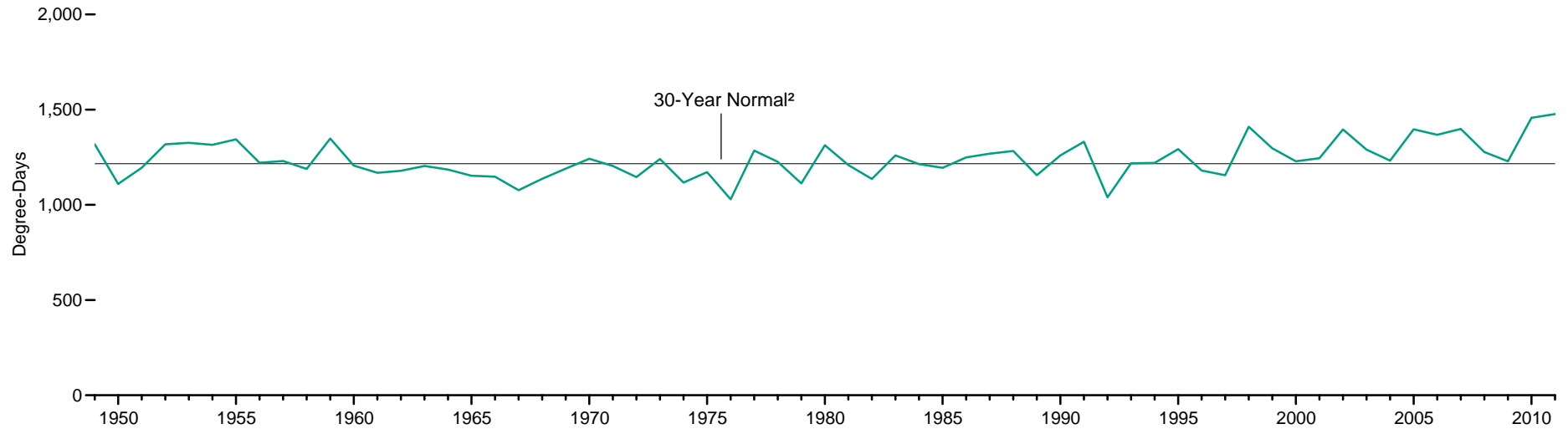
divisions.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all data beginning in 1949. • For current data, see <http://www.eia.gov/totalenergy/data/monthly/#summary>.

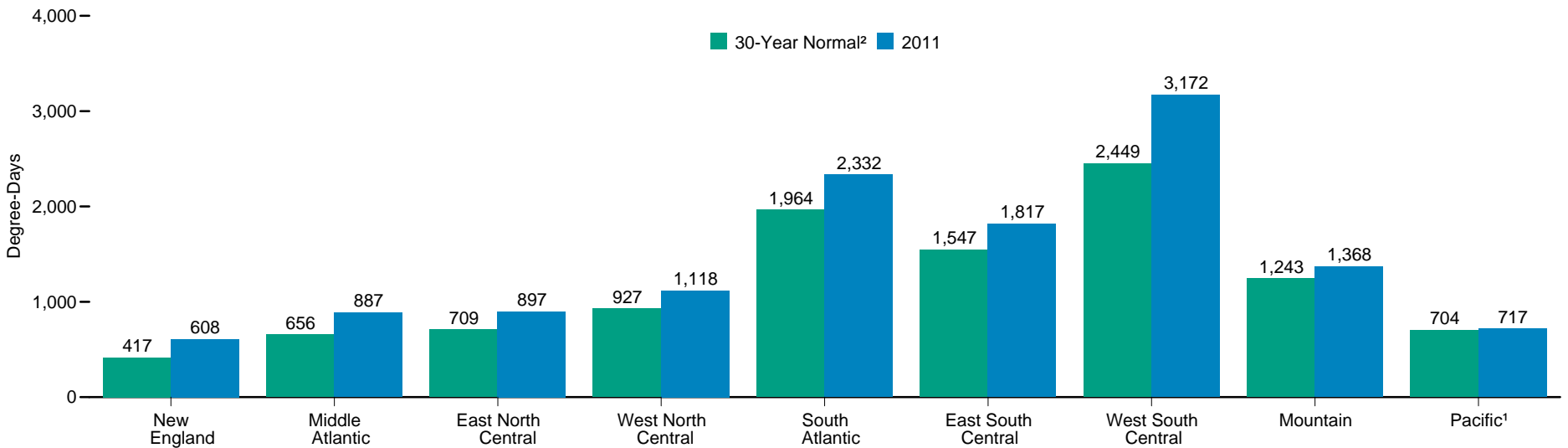
Sources: • 1949-2010—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina, Historical Climatology Series 5-1. Data are compiled from about 8,000 weather stations. • 2011 and Normal—U.S. Department of Commerce, NOAA, National Weather Service Climate Prediction Center, Camp Springs, Maryland, *Degree Days Statistics*. The data are the sum of monthly values and are based on mean daily temperatures recorded at about 200 major weather stations around the country.

**Figure 1.10 Cooling Degree-Days by Census Division**

**U.S.<sup>1</sup> Cooling Degree-Days, 1949-2011**



**Cooling Degree-Days by Census Division, 2011**



<sup>1</sup> Excludes Alaska and Hawaii.

<sup>2</sup> Based on calculations of data from 1971 through 2000.

Note: See Appendix C for map of Census divisions.

Source: Table 1.10.

**Table 1.10 Cooling Degree-Days by Census Division, Selected Years, 1949-2011**

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific <sup>1</sup>	United States <sup>1</sup>
1949	654	901	949	1,038	2,128	1,776	2,510	1,198	593	1,318
1950	353	542	602	729	1,919	1,568	2,473	1,120	597	1,110
1955	602	934	1,043	1,238	2,045	1,791	2,643	1,124	560	1,344
1960	368	640	722	961	1,926	1,613	2,492	1,308	770	1,206
1965	352	638	688	914	1,931	1,634	2,579	961	542	1,153
1970	479	779	827	1,066	2,007	1,662	2,375	1,163	689	1,242
1975	467	708	788	1,003	2,011	1,520	2,261	1,031	547	1,172
1976	402	597	619	939	1,675	1,232	2,035	1,058	620	1,029
1977	407	689	823	1,122	2,020	1,808	2,720	1,256	715	1,285
1978	378	615	741	1,027	1,972	1,685	2,638	1,174	738	1,226
1979	434	588	618	871	1,833	1,412	2,242	1,164	770	1,113
1980	487	793	816	1,217	2,075	1,834	2,734	1,202	658	1,313
1981	436	657	658	924	1,889	1,576	2,498	1,331	876	1,209
1982	321	541	643	859	1,958	1,537	2,502	1,121	619	1,136
1983	538	799	934	1,178	1,925	1,579	2,288	1,174	776	1,260
1984	468	649	724	955	1,865	1,508	2,469	1,190	956	1,214
1985	372	627	643	830	2,004	1,596	2,599	1,210	737	1,194
1986	301	626	738	1,021	2,149	1,792	2,618	1,188	664	1,249
1987	406	729	918	1,115	2,067	1,718	2,368	1,196	706	1,269
1988	545	782	975	1,230	1,923	1,582	2,422	1,320	729	1,283
1989	426	658	652	864	1,977	1,417	2,295	1,330	685	1,156
1990	477	656	647	983	2,143	1,622	2,579	1,294	827	1,260
1991	511	854	959	1,125	2,197	1,758	2,499	1,182	672	1,331
1992	276	460	449	637	1,777	1,293	2,201	1,206	905	1,040
1993	486	764	735	817	2,092	1,622	2,369	1,113	708	1,218
1994	548	722	664	887	2,005	1,448	2,422	1,436	801	1,220
1995	507	803	921	985	2,081	1,671	2,448	1,234	754	1,293
1996	400	623	629	821	1,867	1,474	2,515	1,381	856	1,180
1997	395	586	574	873	1,886	1,393	2,361	1,335	921	1,156
1998	505	788	889	1,138	2,277	1,928	3,026	1,271	732	1,410
1999	631	882	855	970	2,024	1,733	2,645	1,242	635	1,297
2000	317	542	658	1,023	1,929	1,736	2,787	1,488	756	1,229
2001	519	722	744	1,028	1,891	1,535	2,565	1,498	794	1,245
2002	570	863	933	1,087	2,209	1,808	2,545	1,543	739	1,396
2003	522	685	645	946	2,007	1,494	2,522	1,639	941	1,290
2004	402	670	604	752	2,037	1,549	2,485	1,376	823	1,232
2005	642	990	960	1,094	2,081	1,696	2,636	1,457	728	1,397
2006	528	778	752	1,079	2,037	1,670	2,776	1,586	916	1,368
2007	484	788	900	1,135	2,212	1,927	2,488	1,663	811	1,399
2008	497	745	698	847	1,987	1,560	2,494	1,504	868	1,277
2009	362	587	547	720	2,025	1,497	2,570	1,504	884	1,229
2010	657	997	975	1,123	2,267	2,004	2,750	1,450	655	1,457
2011 <sup>P</sup>	608	887	897	1,118	2,332	1,817	3,172	1,368	717	1,477
Normal <sup>2</sup>	R 417	R 656	R 709	R 927	R1,964	R1,547	R2,449	R1,243	R 704	R1,216

<sup>1</sup> Excludes Alaska and Hawaii.

<sup>2</sup> Based on calculations of data from 1971 through 2000.

R=Revised. P=Preliminary.

Notes: • Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations above the mean daily temperature of 65° F. For example, a weather station recording a mean daily temperature of 78° F would report 13 cooling degree-days. • Temperature information recorded by weather stations is used to calculate State-wide degree-day averages based on resident State population. Beginning in 2002, data are weighted by the 2000 population. The population-weighted State figures are aggregated into Census divisions and the national average. • See Appendix C for map of Census

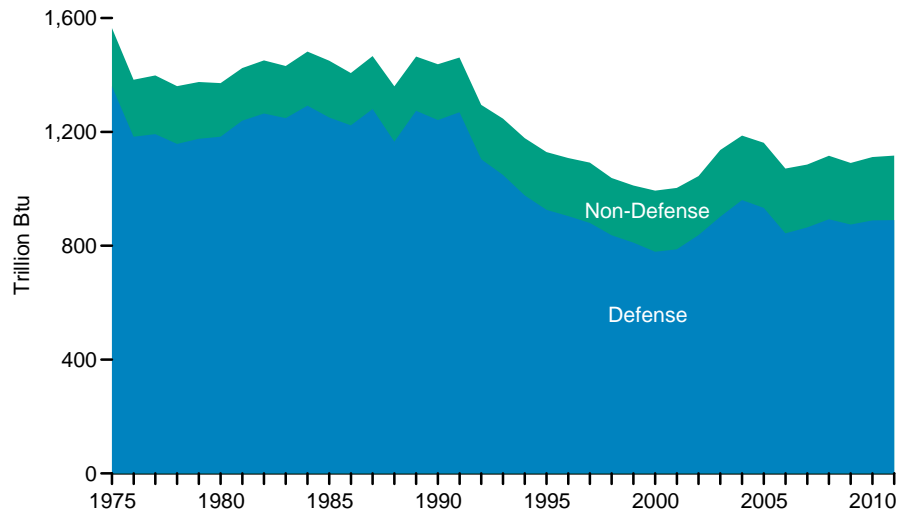
divisions.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all data beginning in 1949. • For current data, see <http://www.eia.gov/totalenergy/data/monthly/#summary>.

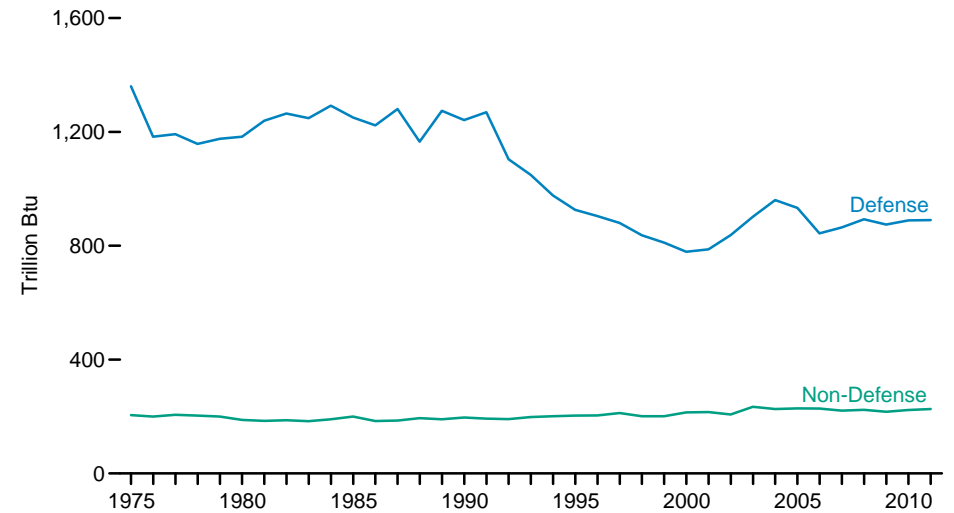
Sources: • 1949-2010—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina, Historical Climatology Series 5-2. Data are compiled from about 8,000 weather stations. • 2011 and Normal—U.S. Department of Commerce, NOAA, National Weather Service Climate Prediction Center, Camp Springs, Maryland, *Degree Days Statistics*. The data are the sum of monthly values and are based on mean daily temperatures recorded at about 200 major weather stations around the country.

**Figure 1.11 U.S. Government Energy Consumption by Agency**

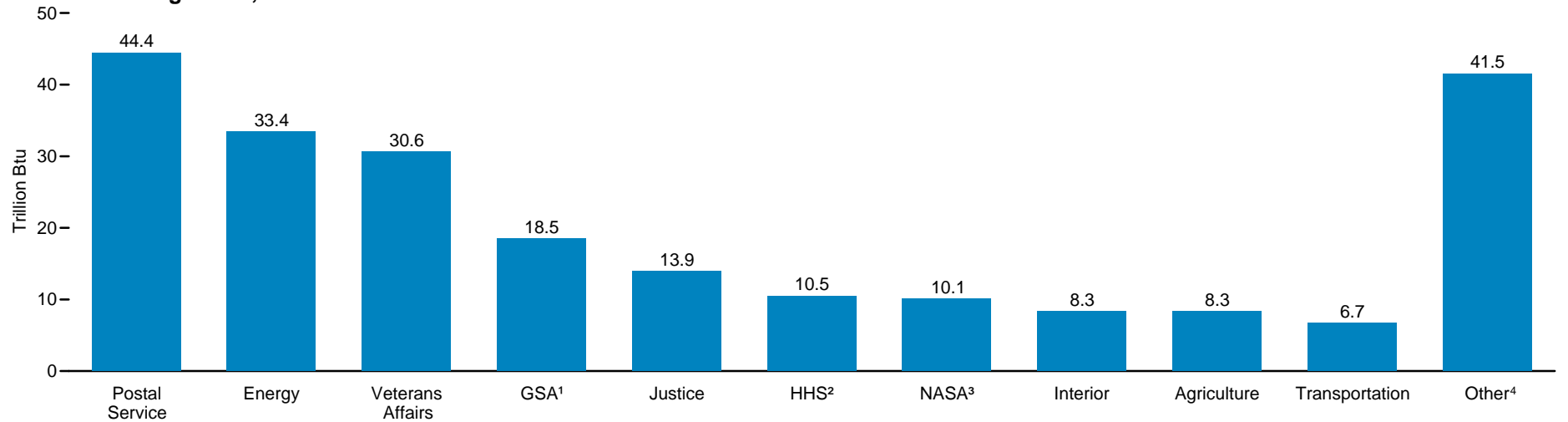
**Total and U.S. Department of Defense, Fiscal Years 1975-2011**



**U.S. Department of Defense and Non-Defense Agencies, Fiscal Years 1975-2011**



**Non-Defense Agencies, Fiscal Year 2011**



<sup>1</sup> General Services Administration.

<sup>2</sup> Health and Human Services.

<sup>3</sup> National Aeronautics and Space Administration.

<sup>4</sup> See Table 1.11 for list of agencies.

Note: The U.S. Government's fiscal year was October 1 through September 30, except in 1975 and 1976 when it was July 1 through June 30.

Source: Table 1.11.

**Table 1.11 U.S. Government Energy Consumption by Agency, Fiscal Years 1975-2011**

(Trillion Btu)

Year	Agriculture	Defense	Energy	GSA <sup>1</sup>	HHS <sup>2</sup>	Interior	Justice	NASA <sup>3</sup>	Postal Service	Transportation	Veterans Affairs	Other <sup>4</sup>	Total
1975	9.5	1,360.2	50.4	22.3	6.5	9.4	5.9	13.4	30.5	19.3	27.1	10.5	1,565.0
1976	9.3	1,183.3	50.3	20.6	6.7	9.4	5.7	12.4	30.0	19.5	25.0	11.2	1,383.4
1977	8.9	1,192.3	51.6	20.4	6.9	9.5	5.9	12.0	32.7	20.4	25.9	11.9	1,398.5
1978	9.1	1,157.8	50.1	20.4	6.5	9.2	5.9	11.2	30.9	20.6	26.8	12.4	1,360.9
1979	9.2	1,175.8	49.6	19.6	6.4	10.4	6.4	11.1	29.3	19.6	25.7	12.3	1,375.4
1980	8.6	1,183.1	47.4	18.1	6.0	8.5	5.7	10.4	27.2	19.2	24.8	12.3	1,371.2
1981	7.9	1,239.5	47.3	18.0	6.7	7.6	5.4	10.0	27.9	18.8	24.0	11.1	1,424.2
1982	7.6	1,264.5	49.0	18.1	6.4	7.4	5.8	10.1	27.5	19.1	24.2	11.6	1,451.4
1983	7.4	1,248.3	49.5	16.1	6.2	7.7	5.5	10.3	26.5	19.4	24.1	10.8	1,431.8
1984	7.9	1,292.1	51.6	16.2	6.4	8.4	6.4	10.6	27.7	19.8	24.6	10.7	1,482.5
1985	8.4	1,250.6	52.2	20.7	6.0	7.8	8.2	10.9	27.8	19.6	25.1	13.1	1,450.3
1986	6.8	1,222.8	46.9	14.0	6.2	6.9	8.6	11.2	28.0	19.4	25.0	10.8	1,406.7
1987	7.3	1,280.5	48.5	13.1	6.6	6.6	8.1	11.3	28.5	19.0	24.9	11.9	1,466.3
1988	7.8	1,165.8	49.9	12.4	6.4	7.0	9.4	11.3	29.6	18.7	26.3	15.8	1,360.3
1989	8.7	1,274.4	44.2	12.7	6.7	7.1	7.7	12.4	30.3	18.5	26.2	15.6	1,464.7
1990	9.6	1,241.7	43.5	17.5	7.1	7.4	7.0	12.4	30.6	19.0	24.9	17.5	1,438.0
1991	9.6	1,269.3	42.1	14.0	6.2	7.1	8.0	12.5	30.8	19.0	25.1	18.1	1,461.7
1992	9.1	1,104.0	44.3	13.8	6.8	7.0	7.5	12.6	31.7	17.0	25.3	15.7	1,294.8
1993	9.3	1,048.8	43.4	14.1	7.2	7.5	9.1	12.4	33.7	19.4	25.7	16.2	1,246.8
1994	9.4	977.0	42.1	14.0	7.5	7.9	10.3	12.6	35.0	19.8	25.6	17.1	1,178.2
1995	9.0	926.0	47.3	13.7	6.1	6.4	10.2	12.4	36.2	18.7	25.4	17.9	1,129.3
1996	9.1	904.5	44.6	14.5	6.6	4.3	12.1	11.5	36.4	19.6	26.8	18.5	1,108.5
1997	7.4	880.0	43.1	14.4	7.9	6.6	12.0	12.0	40.8	19.1	27.3	21.6	1,092.0
1998	7.9	837.1	31.5	14.1	7.4	6.4	15.8	11.7	39.5	18.5	27.6	20.3	1,037.9
1999	7.8	810.7	27.0	14.4	7.1	7.5	15.4	11.4	39.8	22.6	27.5	20.6	1,011.6
2000	7.4	779.1	30.5	17.6	8.0	7.8	19.7	11.1	43.3	21.2	27.0	21.0	993.8
2001	7.4	787.2	31.1	18.4	8.5	9.5	19.7	10.9	43.4	17.8	27.7	21.4	1,003.0
2002	7.2	837.5	30.7	17.5	8.0	8.2	17.7	10.7	41.6	18.3	27.7	19.8	1,044.8
2003	7.7	902.3	31.6	19.6	10.1	8.2	22.7	10.8	50.9	5.6	30.5	36.2	1,136.3
2004	7.0	960.7	31.4	18.3	8.8	8.7	17.5	9.9	50.5	5.2	29.9	39.2	1,187.0
2005	7.5	933.2	29.6	18.4	9.6	8.6	18.8	10.3	53.5	5.0	30.0	37.2	1,161.6
2006	6.8	843.7	32.9	18.2	9.3	8.1	23.5	10.2	51.8	4.6	29.3	33.2	1,071.5
2007	6.8	864.6	31.5	19.1	9.9	7.5	20.7	10.6	45.8	5.6	30.0	33.2	1,085.3
2008	6.5	893.0	31.5	18.8	10.5	7.9	18.9	10.2	47.0	6.4	28.9	36.6	1,116.2
2009	6.6	<sup>R</sup> 874.3	31.1	18.6	10.8	7.9	16.5	10.2	44.2	4.3	29.9	<sup>R</sup> 36.5	<sup>R</sup> 1,090.9
2010	6.8	<sup>R</sup> 889.3	<sup>R</sup> 31.7	18.8	10.3	8.3	<sup>R</sup> 15.7	10.1	<sup>R</sup> 42.3	5.7	30.2	<sup>R</sup> 42.8	<sup>R</sup> 1,112.0
2011 <sup>P</sup>	8.3	890.3	33.4	18.5	10.5	8.3	13.9	10.1	44.4	6.7	30.6	41.5	1,116.6

<sup>1</sup> General Services Administration.

<sup>2</sup> Health and Human Services.

<sup>3</sup> National Aeronautics and Space Administration.

<sup>4</sup> Includes National Archives and Records Administration, U.S. Department of Commerce, Tennessee Valley Authority, U.S. Department of Labor, National Science Foundation, Federal Trade Commission, Federal Communications Commission, Environmental Protection Agency, U.S. Department of Homeland Security, U.S. Department of Housing and Urban Development, Railroad Retirement Board, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, U.S. Department of State, U.S. Department of the Treasury, Small Business Administration, Office of Personnel Management, Central Intelligence Agency, Consumer Product Safety Commission, Social Security Administration, U.S. Information Agency (International Broadcasting Bureau), Corporation for National Community Service, Court Services and Offender Supervision Agency, Federal Housing Finance Agency, National Labor Relations Board, Securities and Exchange Commission, National Capital Planning Commission, Office of Special Counsel, and Peace Corps and Broadcasting Board of Governors.  
R=Revised. P=Preliminary.

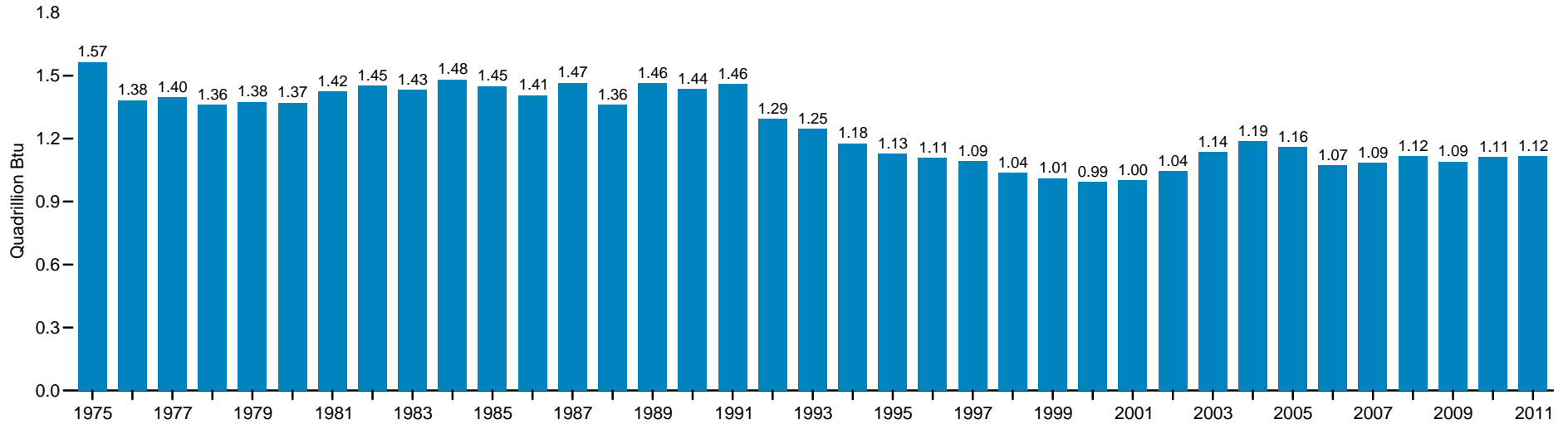
Notes: • For 1975 and 1976, the U.S. Government's fiscal year was July 1 through June 30. Beginning in 1977, the U.S. Government's fiscal year is October 1 through September 30 (for example, fiscal year 2011 is October 2010 through September 2011). • Data in this table are developed using the following conversion factors (which in most cases are different from those in Tables A1-A6)—coal: 24.580 million Btu/short ton; natural gas: 1,031 Btu/cubic foot; aviation gasoline: 5.250 million Btu/barrel; fuel oil: 5.8254 million Btu/barrel; jet fuel: 5.460 million Btu/barrel; liquefied petroleum gases: 4.011 million Btu/barrel; motor gasoline: 5.250 million Btu/barrel; electricity: 3,412 Btu/kilowatt-hour; and purchased steam: 1,000 Btu/pound. • Data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. • Totals may not equal sum of components due to independent rounding.

Web Page: See [http://www1.eere.energy.gov/femp/regulations/facility\\_reporting.html](http://www1.eere.energy.gov/femp/regulations/facility_reporting.html) for related information.

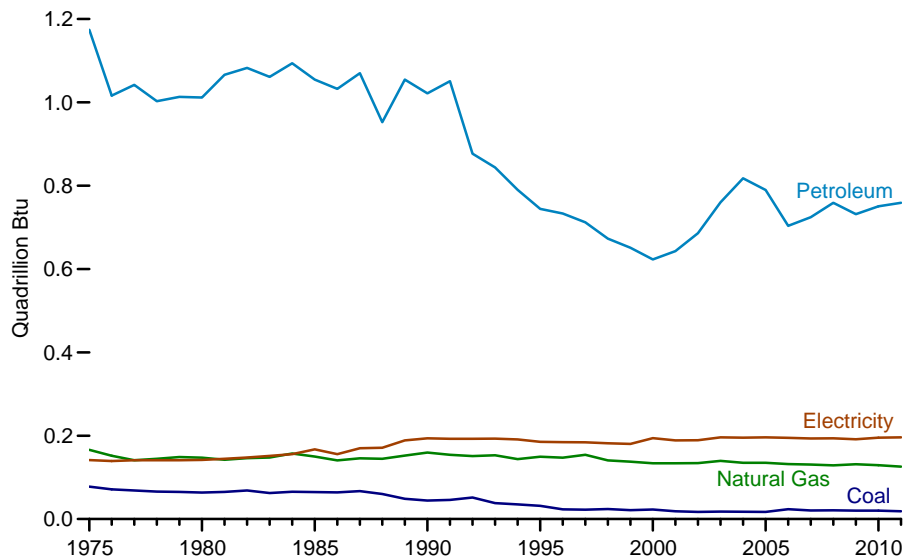
Source: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Federal Energy Management Program.

**Figure 1.12 U.S. Government Energy Consumption by Source, Fiscal Years 1975-2011**

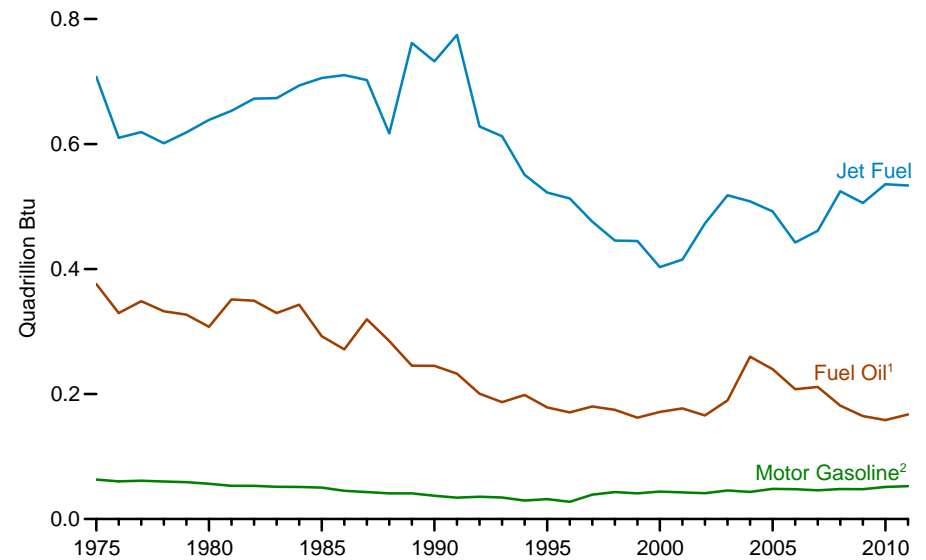
**Total U.S. Government Energy Consumption**



**By Major Energy Source**



**By Selected Petroleum Product**



<sup>1</sup> Distillate fuel oil and residual fuel oil.

<sup>2</sup> Includes ethanol blended into motor gasoline.

Note: U.S. Government's fiscal year was October 1 through September 30, except in 1975

and 1976 when it was July 1 through June 30.

Source: Table 1.12.

**Table 1.12 U.S. Government Energy Consumption by Source, Fiscal Years 1975-2011**  
(Trillion Btu)

Year	Coal	Natural Gas <sup>1</sup>	Petroleum						Electricity	Purchased Steam and Other <sup>6</sup>	Total
			Aviation Gasoline	Fuel Oil <sup>2</sup>	Jet Fuel	LPG <sup>3</sup> and Other <sup>4</sup>	Motor Gasoline <sup>5</sup>	Total			
1975	77.9	166.2	22.0	376.0	707.4	5.6	63.2	1,174.2	141.5	5.1	1,565.0
1976	71.3	151.8	11.6	329.7	610.0	4.7	60.4	1,016.4	139.3	4.6	1,383.4
1977	68.4	141.2	8.8	348.5	619.2	4.1	61.4	1,042.1	141.1	5.7	1,398.5
1978	66.0	144.7	6.2	332.3	601.1	3.0	60.1	1,002.9	141.0	6.4	1,360.9
1979	65.1	148.9	4.7	327.1	618.6	3.7	59.1	1,013.1	141.2	7.1	1,375.4
1980	63.5	147.3	4.9	307.7	638.7	4.0	56.5	1,011.8	141.9	6.8	1,371.2
1981	65.1	142.2	4.6	351.3	653.3	3.7	53.2	1,066.2	144.5	6.2	1,424.2
1982	68.6	146.2	3.6	349.4	672.7	3.9	53.1	1,082.8	147.5	6.2	1,451.4
1983	62.4	147.8	2.6	329.5	673.4	4.0	51.6	1,061.1	151.5	9.0	1,431.8
1984	65.3	157.4	1.9	342.9	693.7	4.1	51.2	1,093.8	155.9	10.1	1,482.5
1985	64.8	149.9	1.9	292.6	705.7	4.0	50.4	1,054.6	167.2	13.9	1,450.3
1986	63.8	140.9	1.4	271.6	710.2	3.9	45.3	1,032.4	155.8	13.7	1,406.7
1987	67.0	145.6	1.0	319.5	702.3	4.0	43.1	1,069.9	169.9	13.9	1,466.3
1988	60.2	144.6	6.0	284.8	617.2	3.2	41.2	952.4	171.2	32.0	1,360.3
1989	48.7	152.4	.8	245.3	761.7	5.7	41.1	1,054.5	188.6	20.6	1,464.7
1990	44.3	159.4	.5	245.2	732.4	6.4	37.2	1,021.7	193.6	19.1	1,438.0
1991	45.9	154.1	.4	232.6	774.5	9.0	34.1	1,050.7	192.7	18.3	1,461.7
1992	51.7	151.2	1.0	200.6	628.2	11.4	35.6	876.8	192.5	22.5	1,294.8
1993	38.3	152.9	.7	187.0	612.4	9.3	34.5	843.9	193.1	18.6	1,246.8
1994	35.0	143.9	.6	198.5	550.7	10.9	29.5	790.2	190.9	18.2	1,178.2
1995	31.7	149.7	.3	178.5	522.3	11.4	31.9	744.4	185.3	18.2	1,129.3
1996	23.3	147.4	.2	170.6	513.0	21.7	27.6	733.2	184.5	20.1	1,108.5
1997	22.5	154.0	.3	180.1	475.7	17.2	39.0	712.2	184.0	19.2	1,092.0
1998	23.9	140.7	.2	174.6	445.5	9.4	43.1	672.8	181.8	18.8	1,037.9
1999	21.2	137.6	.1	162.2	444.7	2.9	41.1	650.9	180.4	21.5	1,011.6
2000	22.7	134.0	.2	171.4	403.1	4.3	43.9	622.9	194.0	20.2	993.8
2001	18.8	133.9	.2	177.0	415.2	7.9	42.5	642.9	188.8	18.6	1,003.0
2002	16.9	134.1	.2	165.7	472.9	6.0	41.3	686.1	189.1	18.5	1,044.8
2003	17.7	139.7	.3	189.8	517.9	6.6	45.7	760.3	196.1	22.5	1,136.3
2004	17.4	134.8	.2	259.8	508.2	6.0	43.5	817.8	195.4	21.6	1,187.0
2005	17.1	135.1	.4	239.8	492.2	9.0	48.2	789.6	195.9	23.9	1,161.6
2006	23.5	132.0	.6	207.8	442.6	4.7	47.8	703.5	194.9	17.7	1,071.5
2007	20.4	130.8	.4	211.4	461.1	5.6	46.0	724.5	193.2	16.4	1,085.3
2008	20.8	128.9	.4	181.4	524.3	4.6	48.1	758.8	193.6	14.1	1,116.2
2009	20.3	<sup>R</sup> 131.4	.3	<sup>R</sup> 164.8	505.6	<sup>R</sup> 13.3	<sup>R</sup> 47.7	<sup>R</sup> 731.7	<sup>R</sup> 191.5	<sup>R</sup> 16.1	<sup>R</sup> 1,090.9
2010	20.1	<sup>R</sup> 129.3	.4	<sup>R</sup> 158.4	535.8	4.8	<sup>R</sup> 51.3	<sup>R</sup> 750.7	<sup>R</sup> 195.1	<sup>R</sup> 16.8	<sup>R</sup> 1,112.0
2011 <sup>P</sup>	18.6	125.7	.9	167.3	533.6	4.7	52.5	759.0	195.9	17.4	1,116.6

<sup>1</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>2</sup> Distillate fuel oil and residual fuel oil.

<sup>3</sup> Liquefied petroleum gases.

<sup>4</sup> Other types of fuel used in vehicles and equipment, primarily alternative fuels like methanol, ethanol, compressed natural gas, and biodiesel.

<sup>5</sup> Includes ethanol blended into motor gasoline.

<sup>6</sup> "Other" is chilled water, renewable energy, and other fuels reported as used in facilities.

R=Revised. P=Preliminary.

Notes: • For 1975 and 1976, the U.S. Government's fiscal year was July 1 through June 30. Beginning in 1977, the U.S. Government's fiscal year is October 1 through September 30 (for example, fiscal year 2011 is October 2010 through September 2011). • Data in this table are developed using the following conversion factors (which in most cases are different from those in Tables A1-A6)—coal: 24.580 million

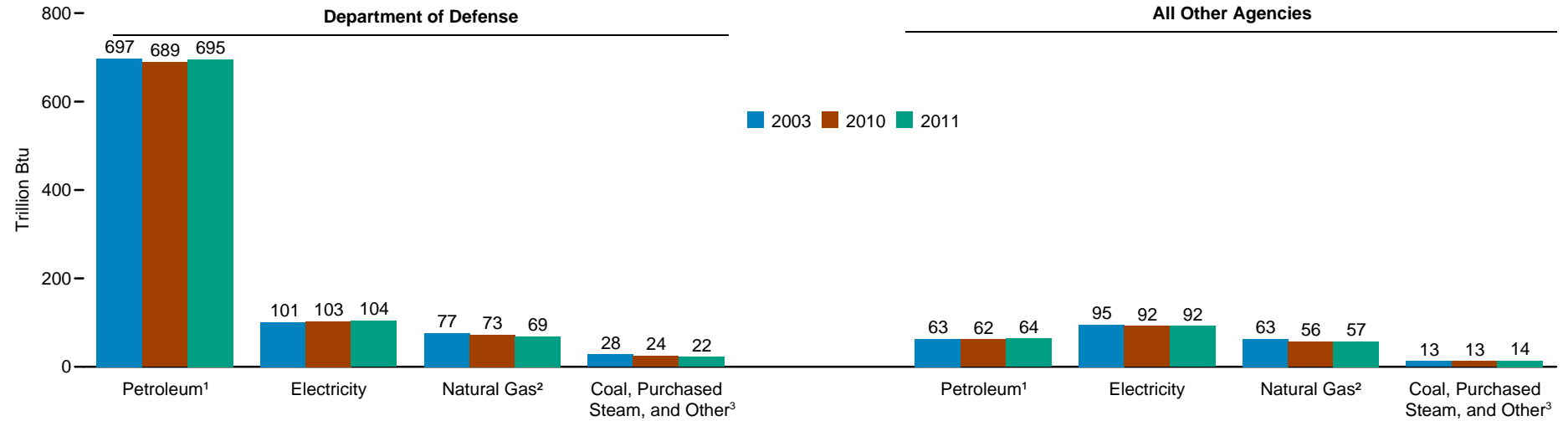
Btu/short ton; natural gas: 1,031 Btu/cubic foot; aviation gasoline: 5.250 million Btu/barrel; fuel oil: 5.8254 million Btu/barrel; jet fuel: 5.460 million Btu/barrel; liquefied petroleum gases: 4.011 million Btu/barrel; motor gasoline: 5.250 million Btu/barrel; electricity: 3,412 Btu/kilowatt-hour; and purchased steam: 1,000 Btu/pound. • Data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. • Totals may not equal sum of components due to independent rounding.

Web Page: See [http://www1.eere.energy.gov/femp/regulations/facility\\_reporting.html](http://www1.eere.energy.gov/femp/regulations/facility_reporting.html) for related information.

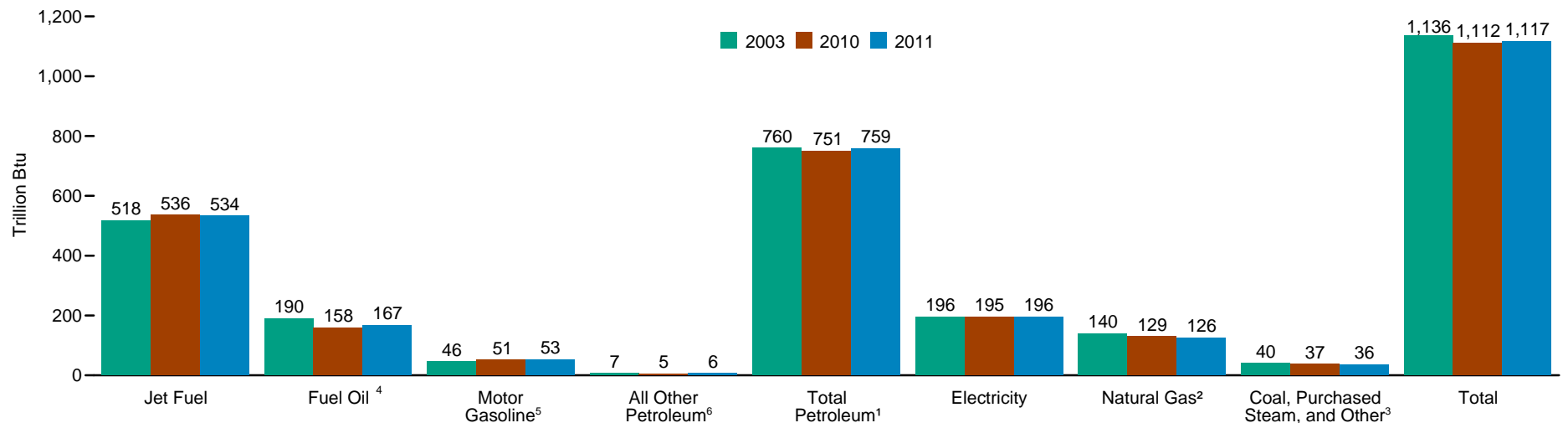
Source: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Federal Energy Management Program.

**Figure 1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years 2003, 2010, and 2011**

**By Agency**



**By Source**



<sup>1</sup> Includes small amount of renewable energy; see Table 1.13, footnote 8.

<sup>2</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>3</sup> Chilled water, renewable energy, and other fuels reported as used in facilities.

<sup>4</sup> Distillate fuel oil and residual fuel oil.

<sup>5</sup> Includes ethanol blended into motor gasoline.

<sup>6</sup> Aviation gasoline, liquefied petroleum gas, and other types of fuel used in vehicles and equipment, primarily alternative fuels like methanol, ethanol, compressed natural gas, and biodiesel.

Note: The U.S. Government's fiscal year runs from October 1 through September 30.  
Source: Table 1.13.



**Table 1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years 2003, 2010, and 2011**  
(Trillion Btu)

Resource and Fiscal Years	Agriculture	Defense	Energy	GSA <sup>1</sup>	HHS <sup>2</sup>	Interior	Justice	NASA <sup>3</sup>	Postal Service	Transportation	Veterans Affairs	Other <sup>4</sup>	Total
<b>Coal</b>													
2003 .....	(s)	15.4	2.0	0.0	(s)	(s)	0.0	0.0	0.0	0.0	0.2	0.0	17.7
2010 .....	(s)	15.5	4.5	.0	0.0	0.0	.0	.0	(s)	.0	.1	.0	20.1
2011 P .....	0.0	14.3	4.2	.0	.0	.0	.0	.0	(s)	.0	.1	.0	18.6
<b>Natural Gas <sup>5</sup></b>													
2003 .....	1.4	76.6	7.0	7.6	3.7	1.3	8.6	2.9	10.4	.7	15.6	4.2	139.7
2010 .....	1.4	72.9	7.1	7.0	5.9	1.1	6.8	2.6	4.5	.3	14.9	R 4.7	R 129.3
2011 P .....	1.7	68.6	7.4	7.1	5.9	1.2	4.2	2.5	6.3	.8	15.1	5.0	125.7
<b>Petroleum</b>													
2003 .....	3.3	697.1	3.0	.2	1.5	4.4	6.5	1.4	18.2	1.6	2.8	20.3	760.3
2010 .....	3.2	688.8	2.8	.2	.8	3.8	3.4	1.2	19.4	1.5	2.1	R 23.4	R 750.7
2011 P .....	4.6	695.3	3.6	.2	.9	3.7	4.1	1.1	20.5	1.1	2.3	21.6	759.0
<b>Aviation Gasoline</b>													
2003 .....	(s)	(s)	(s)	.0	.0	(s)	.1	(s)	.0	(s)	.0	(s)	.3
2010 .....	(s)	.2	.0	.0	.0	(s)	.1	(s)	.0	(s)	.0	(s)	.4
2011 P .....	.1	.2	.0	.0	.0	(s)	.1	(s)	.0	(s)	.0	.5	.9
<b>Fuel Oil <sup>6</sup></b>													
2003 .....	.4	166.5	2.0	.1	.9	1.2	.4	.4	5.1	.3	1.9	10.7	189.8
2010 .....	.6	138.2	1.6	.1	.6	1.3	.3	.3	4.6	.2	1.1	R 9.5	R 158.4
2011 P .....	.6	146.1	2.4	.1	.6	1.4	.3	.2	4.9	.1	1.1	9.5	167.3
<b>Jet Fuel</b>													
2003 .....	.0	509.9	(s)	.0	.0	.1	1.5	.6	.0	.6	.0	5.2	517.9
2010 .....	.0	529.0	.2	.0	.0	(s)	.2	.8	.0	.5	.0	5.1	535.8
2011 P .....	.9	526.7	.2	.0	.0	(s)	.6	.7	.0	.5	.0	4.0	533.6
<b>LPG <sup>7</sup> and Other <sup>8</sup></b>													
2003 .....	.7	4.2	.1	(s)	.1	.7	(s)	.1	.2	.1	(s)	.3	6.6
2010 .....	.4	2.7	.4	(s)	.1	.4	.1	.1	.3	(s)	.1	.3	4.8
2011 P .....	.4	2.6	.4	(s)	.1	.2	.2	.1	.3	(s)	.1	.3	4.7
<b>Motor Gasoline <sup>9</sup></b>													
2003 .....	2.2	16.5	.9	.1	.5	2.4	4.5	.2	12.9	.7	.9	4.1	45.7
2010 .....	2.2	18.6	.6	.1	.2	2.1	2.8	.1	14.5	.6	.9	R 8.5	R 51.3
2011 P .....	2.6	19.7	.7	.1	.2	2.0	3.0	.1	15.4	.4	1.1	7.3	52.5
<b>Electricity</b>													
2003 .....	2.6	101.1	18.0	10.0	3.6	2.4	7.0	5.8	21.7	3.2	10.2	10.5	196.1
2010 .....	1.9	R 103.2	R 17.1	9.9	3.4	R 2.7	5.4	R 5.4	17.8	R 4.0	R 11.1	R 13.3	R 195.1
2011 P .....	1.8	104.1	17.9	9.5	3.5	2.7	5.3	5.4	16.9	4.1	11.4	13.4	195.9
<b>Purchased Steam and Other <sup>10</sup></b>													
2003 .....	.3	12.2	1.6	1.8	1.3	.1	.7	.8	.7	(s)	1.7	1.2	22.5
2010 .....	.3	R 8.8	R .2	1.8	.1	.8	.1	R .8	.5	R (s)	2.0	R 1.4	R 16.8
2011 P .....	.2	8.0	.4	1.8	.2	.7	.4	1.1	.7	.7	1.7	1.5	17.4
<b>Total Energy</b>													
2003 .....	7.7	902.3	31.6	19.6	10.1	8.2	22.7	10.8	50.9	5.6	30.5	36.2	1,136.3
2010 .....	6.8	R 889.3	R 31.7	18.8	10.3	8.3	R 15.7	10.1	R 42.3	5.7	30.2	R 42.8	R 1,112.0
2011 P .....	8.3	890.3	33.4	18.5	10.5	8.3	13.9	10.1	44.4	6.7	30.6	41.5	1,116.6

<sup>1</sup> General Services Administration.

<sup>2</sup> Health and Human Services.

<sup>3</sup> National Aeronautics and Space Administration.

<sup>4</sup> Includes National Archives and Records Administration, U.S. Department of Commerce, Tennessee Valley Authority, U.S. Department of Labor, National Science Foundation, Federal Trade Commission, Federal Communications Commission, Environmental Protection Agency, U.S. Department of Homeland Security, U.S. Department of Housing and Urban Development, Railroad Retirement Board, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, U.S. Department of State, U.S. Department of the Treasury, Office of Personnel Management, Consumer Product Safety Commission, Central Intelligence Agency, Social Security Administration, U.S. Information Agency (International Broadcasting Bureau), Corporation for National Community Service, Court Services and Offender Supervision Agency, Federal Housing Finance Agency, National Labor Relations Board, Small Business Administration, Securities and Exchange Commission, National Capital Planning Commission, Office of Special Counsel, and Peace Corps and Broadcasting Board of Governors.

<sup>5</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>6</sup> Distillate fuel oil and residual fuel oil.

<sup>7</sup> Liquefied petroleum gases.

<sup>8</sup> Other types of fuel used in vehicles and equipment, primarily alternative fuels like methanol, ethanol,

compressed natural gas, and biodiesel.

<sup>9</sup> Includes ethanol blended into motor gasoline.

<sup>10</sup> Chilled water, renewable energy, and other fuels reported as used in facilities.

R=Revised, P=Preliminary, (s)=Less than 0.05 trillion.

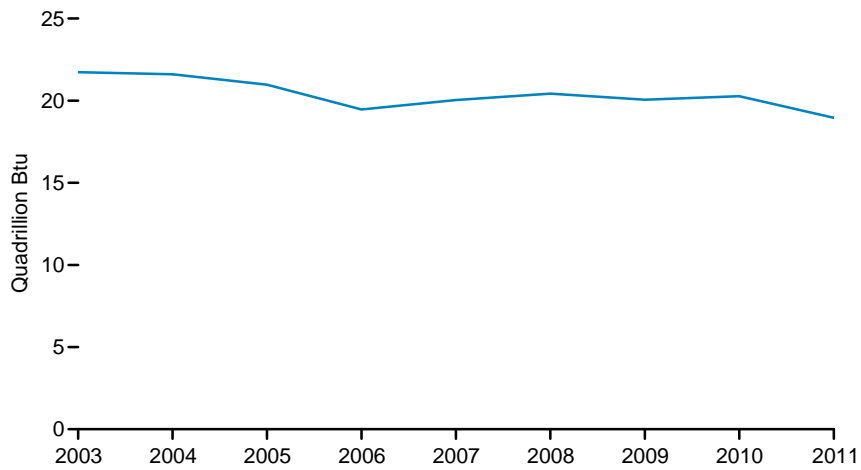
Notes: • Beginning in 1977, the U.S. Government's fiscal year is October 1 through September 30 (for example, fiscal year 2011 is October 2010 through September 2011). • Data in this table are developed using the following conversion factors (which in most cases are different from those in Tables A1-A6)—coal: 24,580 million Btu/short ton; natural gas: 1,031 Btu/cubic foot; aviation gasoline: 5,250 million Btu/barrel; fuel oil: 5,8254 million Btu/barrel; jet fuel: 5,460 million Btu/barrel; liquefied petroleum gases: 4,011 million Btu/barrel; motor gasoline: 5,250 million Btu/barrel; electricity: 3,412 Btu/kilowatt-hour; and purchased steam: 1,000 Btu/pound. • Data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. • Totals may not equal sum of components due to independent rounding.

Web Page: See [http://www1.eere.energy.gov/femp/regulations/facility\\_reporting.html](http://www1.eere.energy.gov/femp/regulations/facility_reporting.html) for related information.

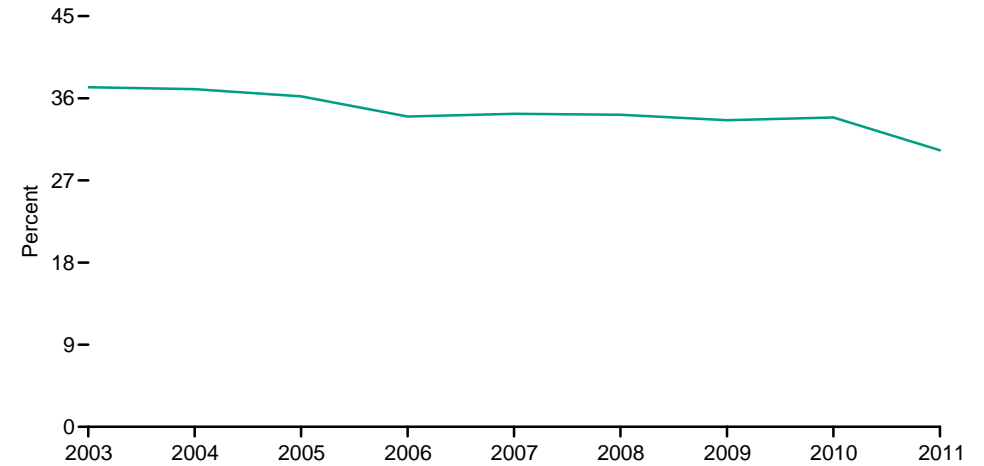
Source: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Federal Energy Management Program.

**Figure 1.14 Sales of Fossil Fuels Produced on Federal and American Indian Lands**

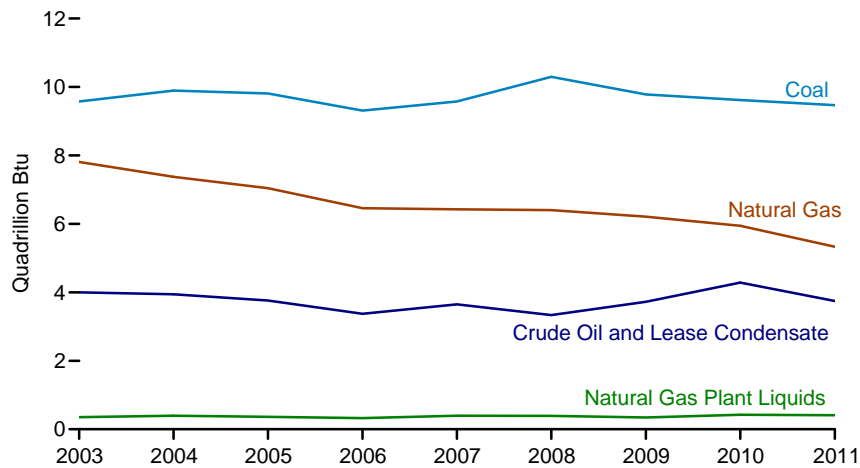
**Total, Fiscal Years<sup>1</sup> 2003-2011**



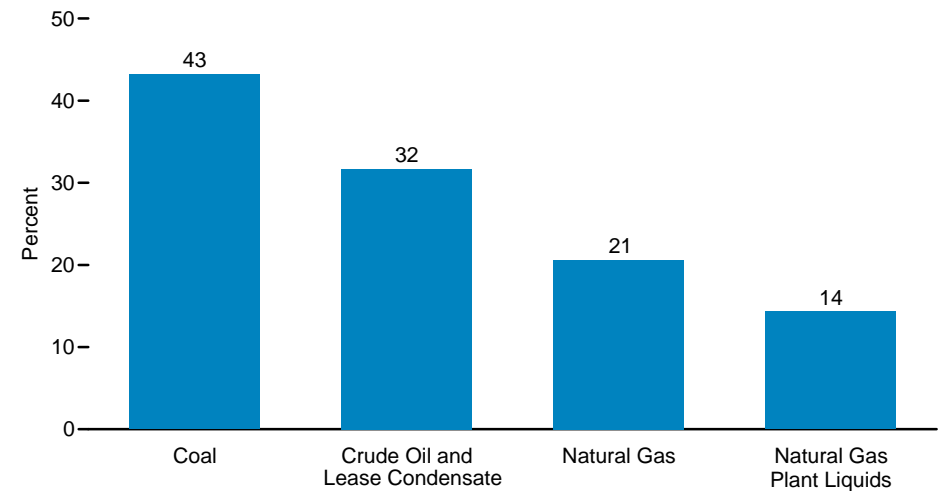
**Federal and American Indian Lands Fossil Fuels Sales as Share of Total U.S. Fossil Fuels Production, Fiscal Years<sup>1</sup> 2003-2011**



**By Source, Fiscal Years<sup>1</sup> 2003-2011**



**Federal and American Indian Lands Fossil Fuels Sales as Share of Total U.S. Fossil Fuels Production, By Source, Fiscal Year<sup>1</sup> 2011**



<sup>1</sup> The U.S. Government's fiscal year runs from October 1 through September 30. The fiscal year is designated by the calendar year in which it ends.

Source: Table 1.14.

**Table 1.14 Sales of Fossil Fuels Produced on Federal and American Indian Lands, Fiscal Years 2003-2011**

Fiscal Year <sup>7</sup>	Crude Oil and Lease Condensate			Natural Gas Plant Liquids <sup>1</sup>			Natural Gas <sup>2</sup>			Coal <sup>3</sup>			Total Fossil Fuels <sup>4</sup>	
	Sales <sup>5,6</sup>		Sales as Share of Total U.S. Production	Sales <sup>5,6</sup>		Sales as Share of Total U.S. Production	Sales <sup>5,6</sup>		Sales as Share of Total U.S. Production	Sales <sup>5,6</sup>		Sales as Share of Total U.S. Production	Sales <sup>5,6</sup>	Sales as Share of Total U.S. Production
	Million Barrels	Quadrillion Btu	Percent	Million Barrels	Quadrillion Btu	Percent	Trillion Cubic Feet	Quadrillion Btu	Percent	Million Short Tons	Quadrillion Btu	Percent	Quadrillion Btu	Percent
2003	R689	R4.00	R33.3	R94	R0.35	R14.9	R7.08	R7.81	R35.5	R466	R9.58	R43.3	R21.74	R37.2
2004	R680	R3.94	R33.8	R105	R.39	R16.0	R6.68	R7.38	R34.0	R484	R9.89	R43.9	R21.60	R37.0
2005	R649	R3.76	R33.4	R98	.36	R15.0	R6.38	R7.04	R33.3	R482	R9.81	R42.6	R20.98	R36.2
2006	R582	R3.37	R31.8	R87	R.32	R14.2	R5.85	R6.46	R30.8	R458	R9.31	R39.7	R19.46	R34.0
2007	R629	R3.65	R33.9	R107	R.40	R16.6	R5.83	R6.42	R29.2	R471	R9.57	R41.0	R20.04	R34.3
2008	R575	R3.34	R31.5	R106	R.39	R15.9	R5.82	R6.40	R27.7	R509	R10.30	R43.8	R20.43	R34.2
2009	R642	R3.72	R33.7	R93	R.34	R13.8	R5.64	R6.21	R26.1	R488	R9.78	R43.8	R20.05	R33.6
2010	R739	R4.29	R37.2	R115	R.42	R15.4	R5.42	R5.95	R24.6	R478	R9.62	R44.8	R20.27	R33.9
2011 <sup>P</sup>	646	3.74	31.7	111	.41	14.3	4.86	5.33	20.6	470	9.47	43.2	18.95	30.3

<sup>1</sup> Includes those quantities for which royalties were paid based on the value of the natural gas plant liquids produced. Additional quantities of natural gas plant liquids were produced; however, the royalties paid were based on the value of natural gas processed. These latter quantities are included with natural gas.

<sup>2</sup> Sales and production volumes are for marketed production. See "Natural Gas Marketed Production" in Glossary.

<sup>3</sup> Excludes waste coal. See "Waste Coal" in Glossary.

<sup>4</sup> The sum of crude oil and lease condensate, natural gas plant liquids, natural gas, and coal.

<sup>5</sup> Sales of fossil fuels produced in offshore and onshore areas the Federal Government owns or administers, including American Indian lands.

<sup>6</sup> Sales volumes are reported for the fiscal year in which the sales occurred as opposed to the date of the royalty payment. Volumes include fossil fuels for which royalties were paid, as well as those amounts exempt from royalty payments, such as additions to the Strategic Petroleum Reserve.

<sup>7</sup> The U.S. Government's fiscal year runs from October 1 through September 30. The fiscal year is designated by the calendar year in which it ends.

R=Revised. P=Preliminary.

Note: Totals may not equal sum of components due to independent rounding.

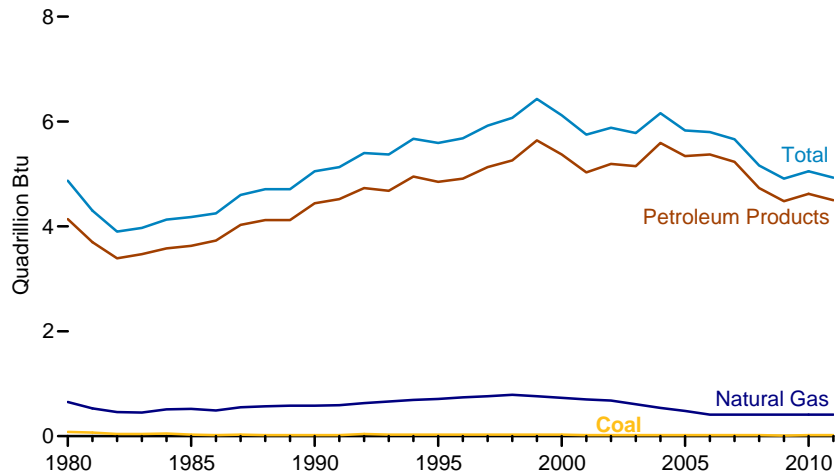
Sources: **Sales, Physical Data (Columns 1, 4, 7, and 10):** U.S. Department of the Interior, Office of Natural Resources Revenue (ONRR), data for "Sales Year" (as opposed to "Accounting Year") revenue and non-revenue sales volumes (as of Feb. 6, 2012). For natural gas, the ONRR "Gas" data have been adjusted to remove nitrogen (using unpublished ONRR data). See [http://www.onrr.gov/ONRRWebStats/Disbursements\\_Royalties.aspx?report=AllReportedRoyaltyRevenues&yeartype=](http://www.onrr.gov/ONRRWebStats/Disbursements_Royalties.aspx?report=AllReportedRoyaltyRevenues&yeartype=)

[http://www.onrr.gov/ONRRWebStats/Disbursements\\_Royalties.aspx?report=AllNonRevenueVolumesByCategoryAndCommodity&yeartype=FY&year=2011&datatype=PY](http://www.onrr.gov/ONRRWebStats/Disbursements_Royalties.aspx?report=AllNonRevenueVolumesByCategoryAndCommodity&yeartype=FY&year=2011&datatype=PY).

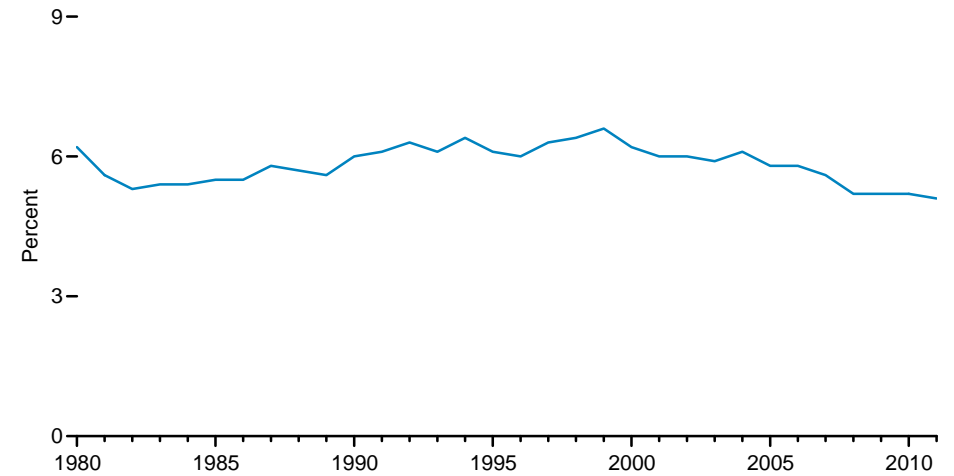
**Sales, Btu Data (Columns 2, 5, 8, 11, and 13):** Calculated by the U.S. Energy Information Administration (EIA). Monthly estimates of the ONRR physical sales data are created by dividing the fiscal-year values by 12. These monthly estimates are converted to Btu using the appropriate heat content factors in Appendix A (crude oil and natural gas plants liquids production factors in Table A2; natural gas marketed production factors in Table A4; and coal production factors in Table A5). For the individual fuels, fiscal-year Btu estimates are calculated by summing the October-September monthly Btu values for each fiscal year. For total fossil fuels, the fiscal-year Btu estimates are the sum of the fiscal-year Btu values for crude oil and lease condensate, natural gas plant liquids, natural gas, and coal. **Sales As Share of Total U.S. Production:** Calculated by EIA by dividing fiscal-year Btu data for sales by fiscal-year Btu data for total U.S. production, then multiplying by 100. For crude oil and lease condensate total U.S. production, monthly values from the *Monthly Energy Review (MER)* (May 2012), Table 3.1, are converted to Btu using the crude oil production factors in Table A2. For natural gas plant liquids total U.S. production, monthly values from the MER (May 2012), Table 3.1, are converted to Btu using the natural gas plant liquids production factors in Table A2. For natural gas total U.S. marketed production, monthly values from the MER (May 2012), Table 4.1, are converted to Btu using the natural gas marketed production factors in Table A4. For coal total U.S. production, monthly values from the MER (May 2012), Table 6.1, are converted to Btu using the coal production factors in Table A5. For the individual fuels, fiscal-year total U.S. production Btu values are calculated by summing the October-September monthly Btu values for each fiscal year. For fossil fuels total U.S. production, the fiscal-year Btu values are the sum of the fiscal-year total U.S. production Btu values for crude oil and lease condensate, natural gas plant liquids, natural gas, and coal.

**Figure 1.15 Non-Combustion Use of Fossil Fuels**

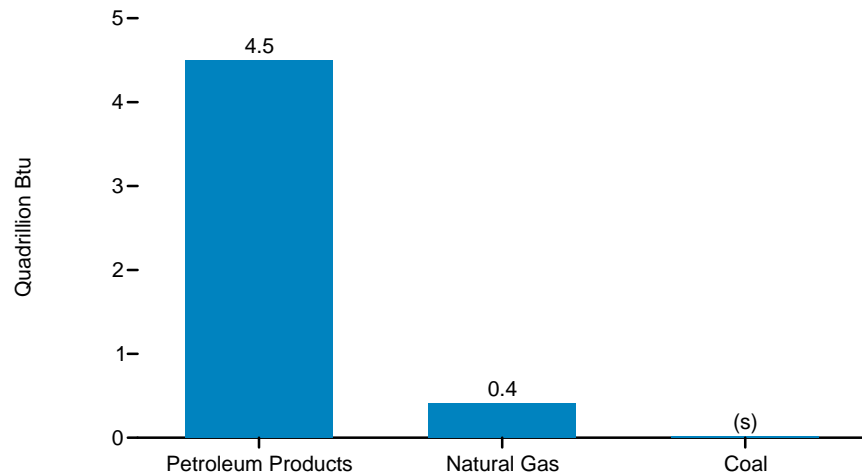
**Total, 1980-2011**



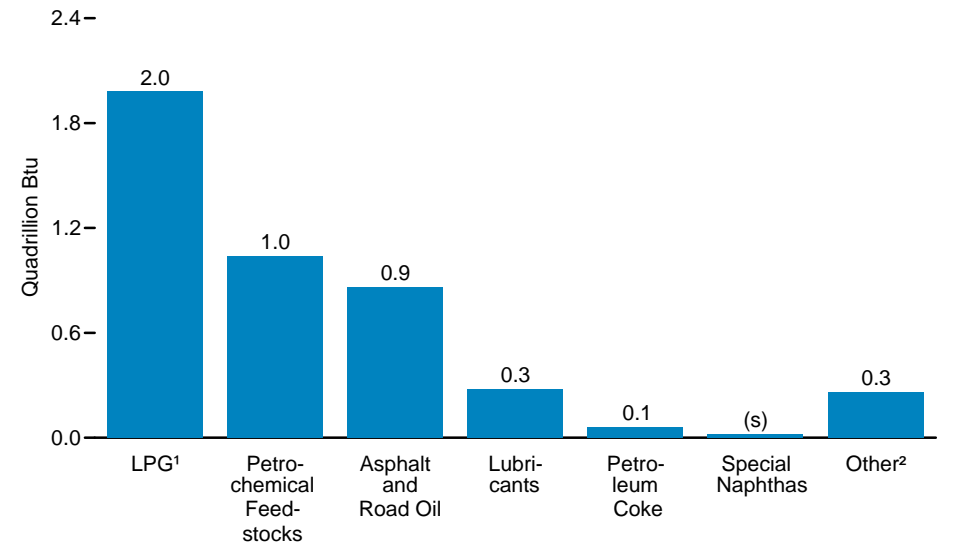
**As Share of Total Energy Consumption, 1980-2011**



**By Fuel, 2011**



**By Petroleum Product, 2011**



<sup>1</sup> Liquefied petroleum gases and pentanes plus are aggregated to avoid disclosure of proprietary information.

<sup>2</sup> Distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.

(s)=Less than 0.05 quadrillion Btu.

Note: See Note 2, "Non-Combustion Use of Fossil Fuels" at end of section.

Source: Table 1.15.

**Table 1.15 Non-Combustion Use of Fossil Fuels, Selected Years, 1980-2011**

Year	Petroleum Products								Natural Gas <sup>4</sup>	Coal	Total	Percent of Total Energy Consumption
	Asphalt and Road Oil	Liquefied Petroleum Gases <sup>1</sup>	Lubricants	Petro-chemical Feedstocks <sup>2</sup>	Petroleum Coke	Special Naphthas	Other <sup>3</sup>	Total				
Physical Units <sup>5</sup>												
1980	145	230	58	253	R14	37	58	R795	639	2.4	--	--
1985	156	R278	53	144	R16	30	41	R719	500	1.1	--	--
1990	176	R373	60	199	20	20	39	R887	R567	.6	--	--
1991	162	R426	53	203	17	17	44	R922	573	.6	--	--
1992	166	R448	54	214	R28	20	35	R966	R606	1.2	--	--
1993	174	R436	55	216	R18	20	35	R955	R640	.9	--	--
1994	176	R483	58	224	R21	15	35	R1,013	673	.9	--	--
1995	178	R479	57	215	R20	13	33	R996	R695	.9	--	--
1996	177	R502	55	217	R20	14	33	R1,019	R718	.9	--	--
1997	184	R501	58	250	R15	14	34	R1,056	R740	.9	--	--
1998	190	R485	61	252	25	20	39	R1,073	762	.8	--	--
1999	200	R566	62	238	36	28	37	R1,166	R736	.8	--	--
2000	192	R545	61	243	16	19	38	R1,114	R710	.8	--	--
2001	189	R492	56	214	29	15	39	R1,034	R683	.7	--	--
2002	187	R526	55	229	24	20	38	R1,078	657	.7	--	--
2003	184	R511	51	247	20	15	36	R1,064	R592	.7	--	--
2004	196	R536	52	287	36	10	34	R1,151	R528	.7	--	--
2005	199	R498	51	266	31	12	34	R1,092	R463	.7	--	--
2006	R190	R521	42	265	35	13	41	R1,108	R398	.6	--	--
2007	180	R526	52	242	33	15	40	R1,089	R398	.6	--	--
2008	152	R484	48	210	37	16	41	R989	R398	.6	--	--
2009	R132	R532	43	185	R30	9	41	R972	R398	.4	--	--
2010	132	R581	48	R196	R10	5	43	R1,015	R398	.6	--	--
2011 <sup>P</sup>	130	575	46	187	11	4	44	996	398	.6	--	--
Quadrillion Btu												
1980	0.96	0.78	0.35	1.43	R0.09	0.19	0.34	R4.14	0.65	0.08	R4.87	R6.2
1985	1.03	R.96	.32	.82	R.10	.16	.24	3.63	.52	.03	4.18	5.5
1990	1.17	R1.33	.36	1.12	.12	.11	.23	R4.44	R.58	.02	R5.05	R6.0
1991	1.08	R1.52	.32	1.15	.11	.09	.26	R4.52	.59	.02	R5.13	R6.1
1992	1.10	R1.61	.33	1.20	.17	.10	.21	R4.73	R.63	.04	R5.40	R6.3
1993	1.15	R1.55	.34	1.22	R.11	.10	.20	R4.68	R.66	.03	R5.37	R6.1
1994	1.17	R1.75	.35	1.26	R.13	.08	.20	4.95	R.69	.03	5.67	6.4
1995	1.18	R1.72	.35	1.21	R.12	.07	.20	R4.85	R.71	.03	R5.59	R6.1
1996	1.18	R1.80	.34	1.21	R.12	.07	.20	R4.91	R.74	.03	R5.68	R6.0
1997	1.22	R1.80	.35	1.40	R.09	.07	.20	R5.13	R.76	.03	R5.92	6.3
1998	1.26	1.73	.37	1.40	.15	.11	.23	R5.26	.79	.03	R6.07	R6.4
1999	1.32	R2.04	.37	1.33	.22	.15	.22	R5.64	R.76	.03	R6.43	R6.6
2000	1.28	R1.96	.37	1.35	.10	.10	.22	R5.37	R.73	.03	R6.12	R6.2
2001	1.26	R1.76	.34	1.19	.17	.08	.23	R5.03	R.70	.02	R5.75	R6.0
2002	1.24	R1.87	.33	1.27	.15	.10	.22	R5.19	.68	.02	R5.88	R6.0
2003	1.22	R1.83	.31	1.37	.12	.08	.21	R5.15	R.61	.02	R5.78	R5.9
2004	1.30	R1.92	.31	1.59	.22	.05	.20	R5.59	R.54	.02	R6.16	6.1
2005	1.32	R1.78	.31	1.47	.19	.06	.20	R5.34	R.48	.02	R5.83	5.8
2006	1.26	R1.85	.25	1.48	.21	.07	.24	R5.37	R.41	.02	R5.80	5.8
2007	1.20	R1.86	.31	1.35	.20	.08	.24	R5.23	R.41	.02	R5.66	R5.6
2008	1.01	R1.70	.29	1.17	.23	.08	.24	R4.73	R.41	.02	R5.16	R5.2
2009	.87	R1.85	.26	1.03	.18	.05	.24	R4.48	R.41	.01	4.91	5.2
2010	.88	R2.02	.29	1.09	R.06	.03	.25	R4.62	R.41	.02	R5.05	R5.2
2011 <sup>P</sup>	.86	1.98	.28	1.04	.06	.02	.26	4.50	.41	.02	4.93	5.1

<sup>1</sup> Liquefied petroleum gases and pentanes plus are aggregated to avoid disclosure of proprietary information.

<sup>2</sup> Includes still gas not burned as refinery fuel.

<sup>3</sup> Distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.

<sup>4</sup> U.S. Energy Information Administration (EIA) has altered the methodology for the natural gas estimates. The estimates are linearly interpolated between Manufacturing Energy Consumption Survey (MECS) years and held constant until data are available for the most recent MECS year.

<sup>5</sup> Petroleum—million barrels; natural gas—billion cubic feet; and coal—million short tons.

R=Revised. P=Preliminary. --=Not applicable.

Notes: • Estimates of consumption for non-combustion use shown in this table are included in total energy consumption (see Table 1.3). • See Note 2, "Non-Combustion Use of Fossil Fuels," at end of section. • Because of changes in methodology, data series may be revised annually. • Estimates of

non-combustion use in this table are considered industrial uses with the exception of approximately half of the lubricants which are considered transportation use. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#summary> for all data beginning in 1980.

• For related information, see <http://www.eia.gov/environment/>.

Sources: **Petroleum Products:** • 1980—EIA, Energy Data Reports, *Petroleum Statement, Annual and Sales of Liquefied Petroleum Gases and Ethane in 1980*. • 1981 forward—EIA, *Petroleum Supply Annual*, annual reports, and unpublished data. **Natural Gas:** • 1980—Bureau of the Census, 1980 Survey of Manufactures, *Hydrocarbon, Coal, and Coke Materials Consumed*. • 1981 forward—U.S. Department of Commerce. **Coal:** • 1980 forward—EIA estimates based on the methodology underlying the nonfuel emissions calculations in EIA's *Emissions of Greenhouse Gases in the United States 2008*. **Percent of Total Energy Consumption:** Derived by dividing total by total consumption on Table 1.3.

## Energy Overview

**Note 1. Noncombustible Renewable Energy.** Noncombustible renewable energy is the sum of hydroelectric power, geothermal, solar/PV, and wind. In Table 1.3, total primary consumption of noncombustible renewable energy is reported as the sum of “Captured Energy” and the “Adjustment for Fossil Fuel Equivalence.”

Captured energy represents the energy from noncombustible renewable resources that is actually “captured” for final use. It includes the electricity generated from noncombustible resources (i.e., net generation from Table 8.2a converted to Btu using the energy conversion factor of 3,412 Btu/kWh) and the direct consumption of noncombustible renewable energy. Direct consumption of noncombustible renewable energy includes: solar thermal direct use energy, residential and commercial self-generated photovoltaic energy, geothermal energy from heat pumps, and direct use of geothermal energy.

The adjustment for fossil-fuel equivalence represents the energy losses that would have occurred if electricity from noncombustible renewable resources had been generated using the average fossil-fuel mix in a given year. The fossil-fuel

equivalent value is determined by converting electricity generation to Btu using the average fossil-fuel heat rate from Table A6. The “Adjustment for Fossil Fuel Equivalence” is then calculated as the difference between the fossil-fuel equivalent value of electricity generated and “captured” electricity generation.

For more information, see Appendix F.

**Note 2. Non-Combustion Use of Fossil Fuels.** Most fossil fuels consumed in the United States and elsewhere are combusted to produce heat and power. However, some are used directly for non-combustion use as construction materials, lubricants, chemical feedstocks, solvents, and waxes. For example, asphalt and road oil are used for roofing and paving; liquefied petroleum gases are used to create intermediate products that are used in making plastics; lubricants, including motor oil and greases, are used in vehicles and various industrial processes; petrochemical feedstocks are used to make plastics, synthetic fabrics, and related products; and natural gas is used to make nitrogenous fertilizers and as feedstock in the chemical industry. Estimates of non-combustion use of fossil fuels are based on the methodology underlying the nonfuel emissions calculations in EIA’s “Emissions of Greenhouse Gases in the United States,” Chapter 2, at [http://www.eia.gov/environment/emissions/ghg\\_report/](http://www.eia.gov/environment/emissions/ghg_report/).

## **2. Energy Consumption by Sector**

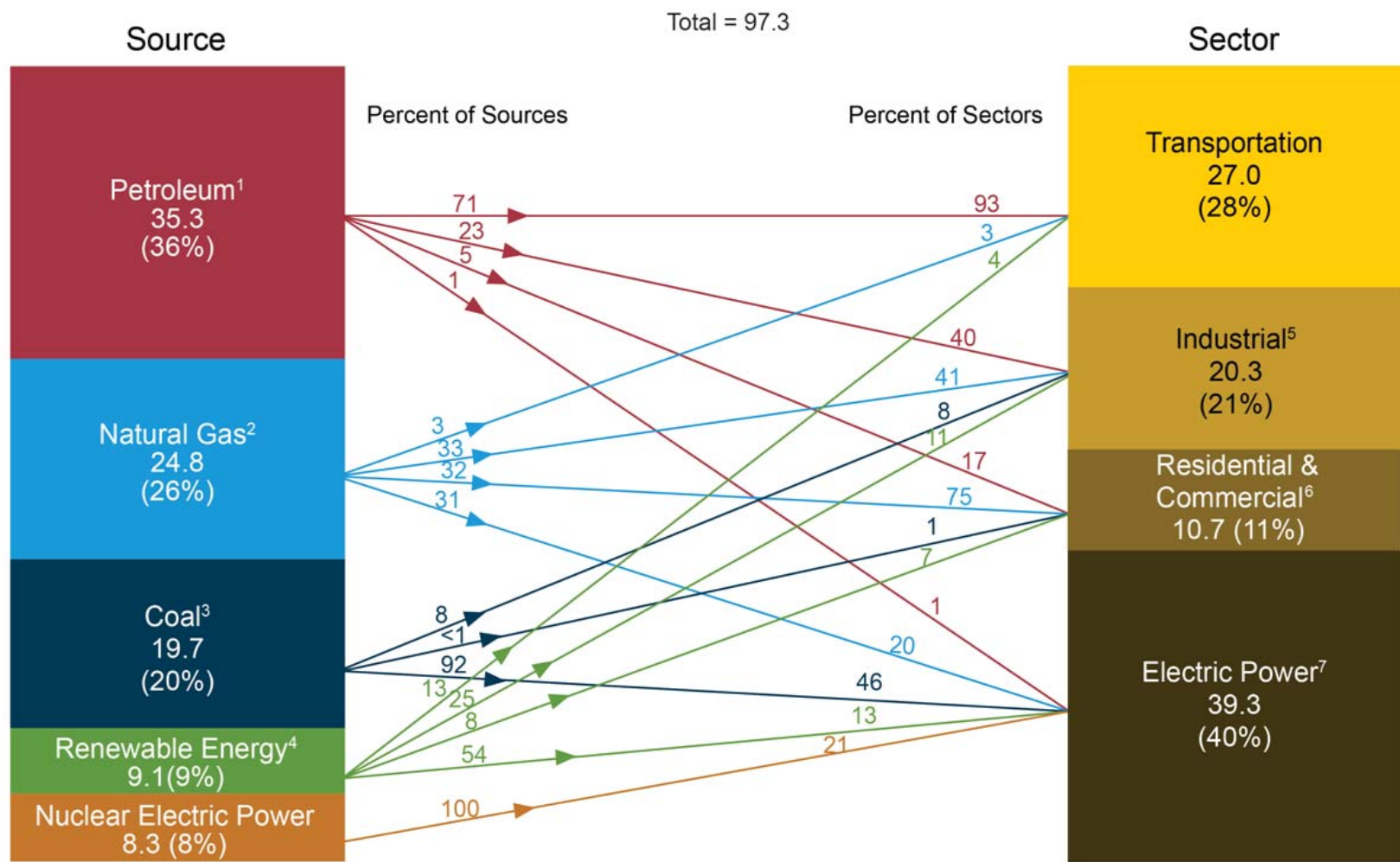
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**Figure 2.0 Primary Energy Consumption by Source and Sector, 2011**

(Quadrillion Btu)



<sup>1</sup> Does not include biofuels that have been blended with petroleum—biofuels are included in "Renewable Energy."

<sup>2</sup> Excludes supplemental gaseous fuels.

<sup>3</sup> Includes less than 0.1 quadrillion Btu of coal coke net imports.

<sup>4</sup> Conventional hydroelectric power, geothermal, solar/photovoltaic, wind, and biomass.

<sup>5</sup> Includes industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

<sup>6</sup> Includes commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

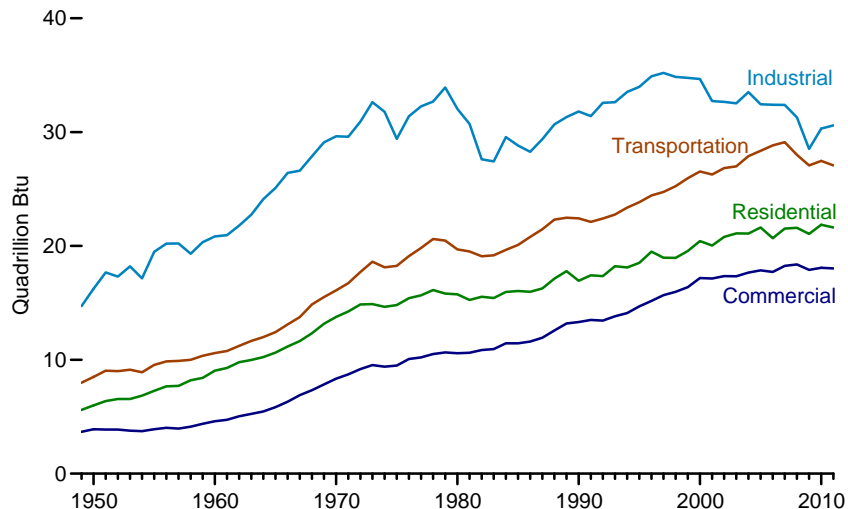
<sup>7</sup> Electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes 0.1 quadrillion Btu of electricity net imports not shown under "Source."

Notes: Primary energy in the form that it is first accounted for in a statistical energy balance, before any transformation to secondary or tertiary forms of energy (for example, coal is used to generate electricity). • Sum of components may not equal total due to independent rounding.

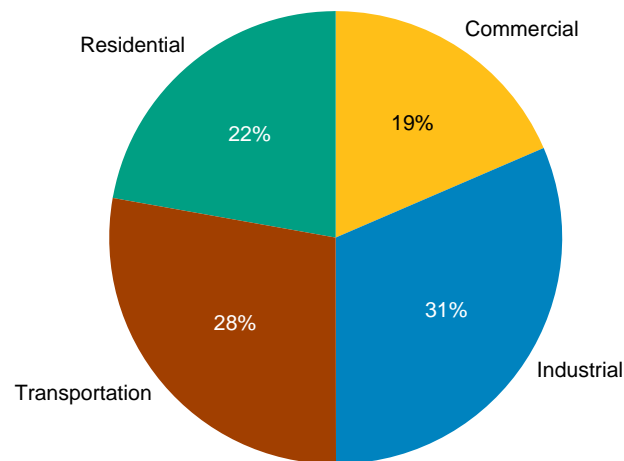
Sources: U.S. Energy Information Administration, *Annual Energy Review 2011*, Tables 1.3, 2.1b-2.1f, 10.3, and 10.4.

## Figure 2.1a Energy Consumption Estimates by Sector Overview

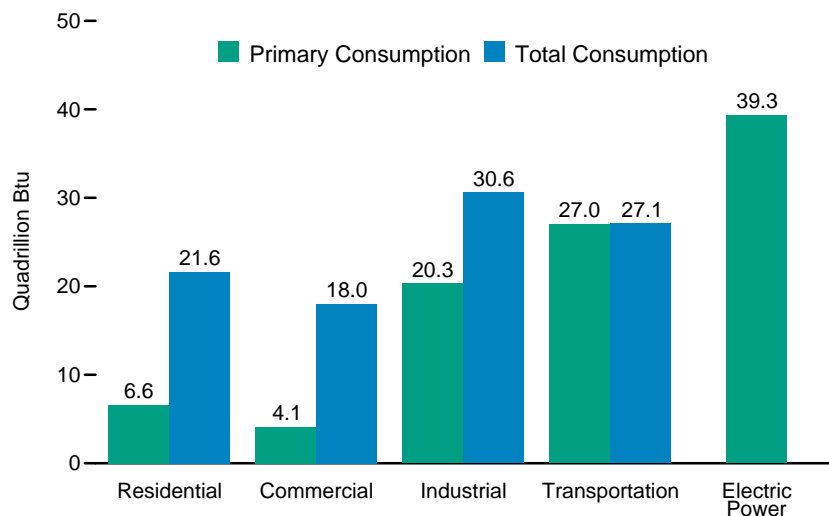
### Total Consumption by End-Use Sector, 1949-2011



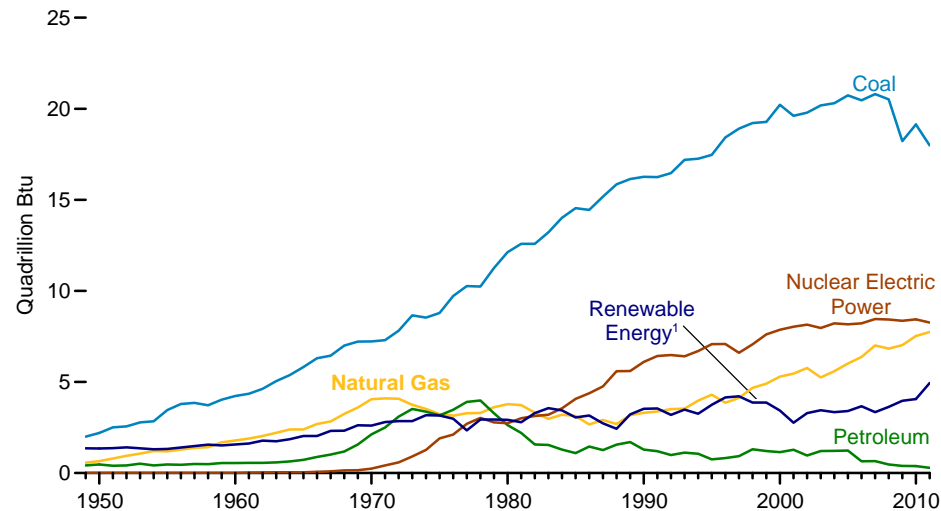
### End-Use Sector Shares of Total Consumption, 2011



### Primary and Total Consumption by Sector, 2011



### Electric Power Sector, 1949-2011

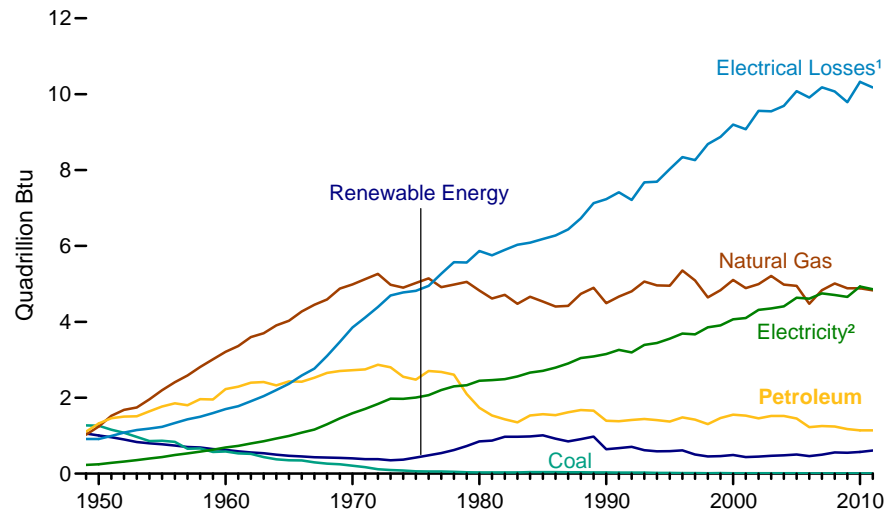


<sup>1</sup> Conventional hydroelectric power, geothermal, solar/photovoltaic, wind, and biomass.  
 Note: • See "Primary Energy Consumption" in Glossary. • Sum of components may not equal 100 percent due to independent rounding.

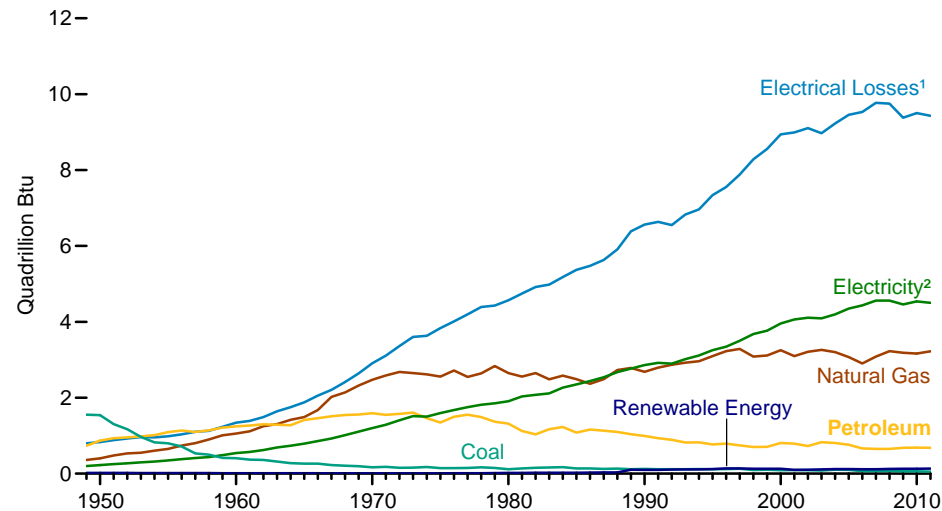
Sources: Tables 2.1a and 2.1f.

**Figure 2.1b Energy Consumption Estimates by End-Use Sector, 1949-2011**

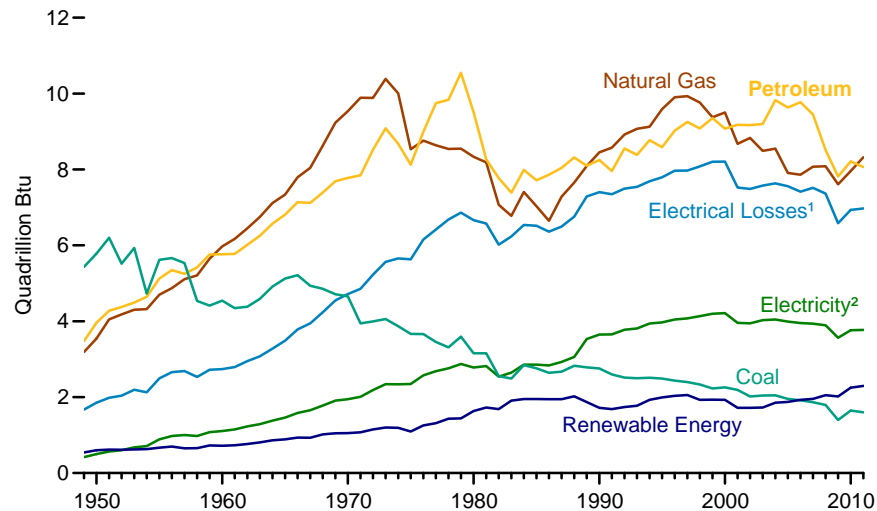
**Residential, By Major Source**



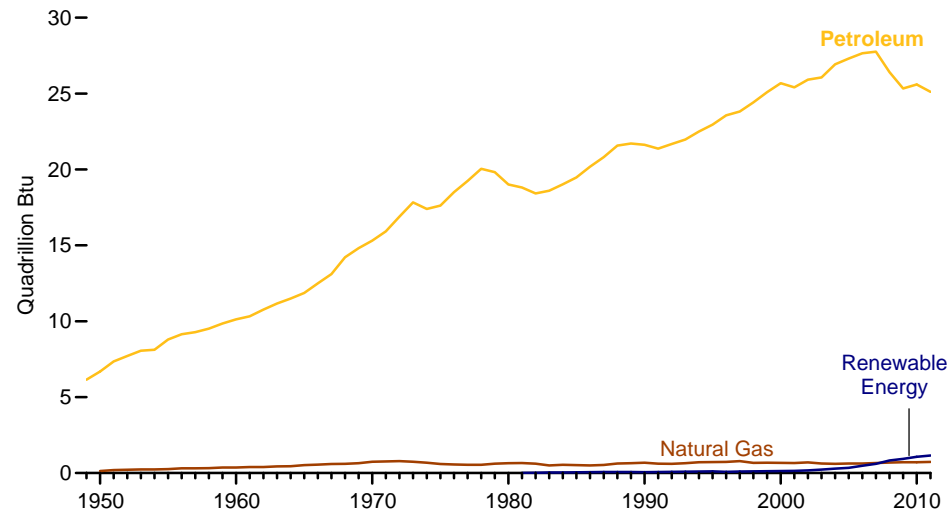
**Commercial, By Major Source**



**Industrial, By Major Source**



**Transportation, By Major Source**



<sup>1</sup> Electrical system energy losses associated with the generation, transmission, and distribution of energy in the form of electricity.

<sup>2</sup> Electricity retail sales.  
Sources: Tables 2.1b–2.1e.

**Table 2.1a Energy Consumption Estimates by Sector, Selected Years, 1949-2011**

(Trillion Btu)

Year	End-Use Sectors								Electric Power Sector <sup>3,4</sup>	Balancing Item <sup>7</sup>	Total Primary <sup>8</sup>
	Residential		Commercial <sup>1</sup>		Industrial <sup>2</sup>		Transportation				
	Primary <sup>5</sup>	Total <sup>6</sup>	Primary <sup>5</sup>	Total <sup>6</sup>	Primary <sup>5</sup>	Total <sup>6</sup>	Primary <sup>5</sup>	Total <sup>6</sup>			
1949	4,460	5,599	2,669	3,669	12,633	14,724	7,880	7,990	4,339	(s)	31,982
1950	4,829	5,989	2,834	3,893	13,890	16,241	8,383	8,492	4,679	(s)	34,616
1955	5,608	7,278	2,561	3,895	16,103	19,485	9,474	9,550	6,461	(s)	40,208
1960	6,651	9,039	2,723	4,609	16,996	20,842	10,560	10,596	8,158	(s)	45,086
1965	7,279	10,639	3,177	5,845	20,148	25,098	12,399	12,432	11,012	(s)	54,015
1970	8,322	13,766	4,237	8,346	22,964	29,628	16,062	16,098	16,253	(s)	67,838
1975	7,990	14,813	4,059	9,492	21,434	29,413	18,210	18,245	20,270	1	71,965
1976	8,391	15,410	4,371	10,063	22,665	31,393	19,067	19,101	21,473	8	75,975
1977	8,194	15,662	4,258	10,208	23,165	32,263	19,786	19,822	22,551	7	77,961
1978	8,260	16,132	4,309	10,512	23,244	32,688	20,583	20,617	23,553	2	79,950
1979	7,919	15,813	4,366	10,648	24,192	33,925	20,437	20,472	23,943	2	80,859
1980	7,439	15,753	4,105	10,578	22,595	32,039	19,659	19,697	24,269	-1	78,067
1981	7,045	15,262	3,837	10,616	21,318	30,712	19,478	19,514	24,425	3	76,106
1982	7,147	15,531	3,864	10,860	19,053	27,614	19,052	19,089	23,979	4	73,099
1983	6,832	15,425	3,840	10,938	18,548	27,428	19,134	19,177	24,614	3	72,971
1984	7,211	15,960	4,001	11,444	20,174	29,570	19,609	19,656	25,635	3	76,632
1985	7,148	16,041	3,732	11,451	19,443	28,816	20,041	20,088	26,032	-4	76,392
1986	6,906	15,975	3,693	11,606	19,078	28,274	20,740	20,789	26,227	3	76,647
1987	6,923	16,263	3,774	11,946	19,953	29,379	21,419	21,469	26,988	-3	79,054
1988	7,357	17,133	3,994	12,578	20,862	30,677	22,267	22,318	28,227	3	82,709
1989	7,567	17,786	4,043	13,193	20,874	31,320	22,424	22,478	<sup>4</sup> 29,869	9	84,786
1990	6,557	16,945	3,896	13,320	21,180	31,810	22,366	22,420	30,495	-9	84,485
1991	6,747	17,420	3,945	13,500	20,824	31,399	22,065	22,118	30,856	1	84,438
1992	6,950	17,356	3,991	13,441	21,756	32,571	22,363	22,415	30,723	(s)	85,783
1993	7,146	18,218	3,973	13,820	21,753	32,629	22,715	22,768	31,847	-10	87,424
1994	6,978	18,112	4,016	14,098	22,393	33,521	23,311	23,366	32,399	-6	89,091
1995	6,936	18,519	4,101	14,690	22,719	33,971	23,791	23,846	33,479	3	91,029
1996	<sup>R</sup> 7,467	19,504	4,273	15,172	23,410	34,904	24,383	24,437	34,485	4	94,022
1997	7,033	18,965	4,295	15,681	23,686	35,200	24,695	24,750	34,886	6	94,602
1998	6,413	18,955	4,005	15,968	23,177	34,843	25,201	25,256	36,225	-3	95,018
1999	6,775	19,557	4,053	16,376	22,950	34,764	25,891	25,949	36,976	6	96,652
2000	7,159	20,425	4,278	17,175	22,824	34,664	26,489	26,548	38,062	2	<sup>R</sup> 98,814
2001	6,868	20,042	4,084	17,137	21,794	32,720	26,213	26,275	37,215	-6	96,168
2002	<sup>R</sup> 6,912	<sup>R</sup> 20,791	<sup>R</sup> 4,132	<sup>R</sup> 17,345	<sup>R</sup> 21,799	<sup>R</sup> 32,662	<sup>R</sup> 26,781	<sup>R</sup> 26,842	38,016	5	<sup>R</sup> 97,645
2003	7,211	21,110	4,283	17,343	21,503	32,532	26,920	26,994	38,062	-1	97,978
2004	6,993	21,093	4,232	17,659	<sup>R</sup> 22,412	<sup>R</sup> 33,520	27,817	27,895	38,713	-6	<sup>R</sup> 100,162
2005	6,909	21,626	4,051	<sup>R</sup> 17,857	<sup>R</sup> 21,411	<sup>R</sup> 32,446	28,272	28,353	39,638	(s)	<sup>R</sup> 100,282
2006	<sup>R</sup> 6,168	<sup>R</sup> 20,688	<sup>R</sup> 3,747	<sup>R</sup> 17,711	<sup>R</sup> 21,536	<sup>R</sup> 32,401	28,751	28,830	39,428	(s)	<sup>R</sup> 99,629
2007	<sup>R</sup> 6,598	<sup>R</sup> 21,531	<sup>R</sup> 3,922	<sup>R</sup> 18,255	<sup>R</sup> 21,370	<sup>R</sup> 32,394	<sup>R</sup> 29,029	<sup>R</sup> 29,117	40,377	<sup>R</sup> -1	<sup>R</sup> 101,296
2008	6,817	21,596	4,073	18,381	<sup>R</sup> 20,480	<sup>R</sup> 31,290	27,925	28,008	39,978	(s)	<sup>R</sup> 99,275
2009	6,619	<sup>R</sup> 21,064	4,061	17,899	<sup>R</sup> 18,813	<sup>R</sup> 28,525	<sup>R</sup> 26,989	<sup>R</sup> 27,071	38,077	(s)	<sup>R</sup> 94,559
2010	<sup>R</sup> 6,603	<sup>R</sup> 21,862	<sup>R</sup> 4,039	<sup>R</sup> 18,078	<sup>R</sup> 20,062	<sup>R</sup> 30,309	<sup>R</sup> 27,384	<sup>R</sup> 27,466	<sup>R</sup> 39,626	<sup>R</sup> 8	<sup>R</sup> 97,722
2011 <sup>P</sup>	6,585	21,619	4,090	18,021	20,291	30,592	26,999	27,079	39,346	-9	97,301

<sup>1</sup> Commercial sector, including commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>2</sup> Industrial sector, including industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

<sup>3</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

<sup>4</sup> Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

<sup>5</sup> See "Primary Energy Consumption" in Glossary.

<sup>6</sup> Total energy consumption in the end-use sectors consists of primary energy consumption, electricity retail sales, and electrical system energy losses. See Note, "Electrical System Energy Losses," at end of section.

<sup>7</sup> A balancing item. The sum of primary consumption in the five energy-use sectors equals the sum of total consumption in the four end-use sectors. However, total energy consumption does not equal the sum of the sectoral components due to the use of sector-specific conversion factors for natural gas and coal.

<sup>8</sup> Primary energy consumption total. See Table 1.3.

R=Revised. P=Preliminary. (s)=Less than 0.5 trillion Btu and greater than -0.5 trillion Btu.

Notes: • See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8.

• Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#consumption> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#consumption> for all annual data beginning in 1949.

Sources: Tables 1.3 and 2.1b-2.1f.

**Table 2.1b Residential Sector Energy Consumption Estimates, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Primary Consumption <sup>1</sup>								Total Primary	Electricity Retail Sales <sup>8</sup>	Electrical System Energy Losses <sup>9</sup>	Total
	Fossil Fuels				Renewable Energy <sup>2</sup>							
	Coal	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Total	Geothermal <sup>5</sup>	Solar/PV <sup>6</sup>	Biomass <sup>7</sup>	Total				
1949	1,272	1,027	1,106	3,405	NA	NA	1,055	1,055	4,460	228	911	5,599
1950	1,261	1,240	1,322	3,824	NA	NA	1,006	1,006	4,829	246	913	5,989
1955	867	2,198	1,767	4,833	NA	NA	775	775	5,608	438	1,232	7,278
1960	585	3,212	2,227	6,024	NA	NA	627	627	6,651	687	1,701	9,039
1965	352	4,028	2,432	6,811	NA	NA	468	468	7,279	993	2,367	10,639
1970	209	4,987	2,725	7,922	NA	NA	401	401	8,322	1,591	3,852	13,766
1975	63	5,023	2,479	7,564	NA	NA	425	425	7,990	2,007	4,817	14,813
1976	59	5,147	2,703	7,910	NA	NA	482	482	8,391	2,069	4,950	15,410
1977	57	4,913	2,681	7,652	NA	NA	542	542	8,194	2,202	5,267	15,662
1978	49	4,981	2,607	7,638	NA	NA	622	622	8,260	2,301	5,571	16,132
1979	37	5,055	2,099	7,191	NA	NA	728	728	7,919	2,330	5,564	15,813
1980	31	4,825	1,734	6,589	NA	NA	850	850	7,439	2,448	5,866	15,753
1981	30	4,614	1,531	6,175	NA	NA	870	870	7,045	2,464	5,752	15,262
1982	32	4,711	1,434	6,177	NA	NA	970	970	7,147	2,489	5,895	15,531
1983	31	4,478	1,353	5,862	NA	NA	970	970	6,832	2,562	6,031	15,425
1984	40	4,661	1,531	6,231	NA	NA	980	980	7,211	2,662	6,087	15,960
1985	39	4,534	1,565	6,138	NA	NA	1,010	1,010	7,148	2,709	6,184	16,041
1986	40	4,405	1,541	5,986	NA	NA	920	920	6,906	2,795	6,274	15,975
1987	37	4,420	1,617	6,073	NA	NA	850	850	6,923	2,902	6,438	16,263
1988	37	4,735	1,675	6,447	NA	NA	910	910	7,357	3,046	6,729	17,133
1989	31	4,899	1,660	6,590	5	52	920	977	7,567	3,090	7,129	17,786
1990	31	4,491	1,394	5,916	6	56	580	641	6,557	3,153	7,235	16,945
1991	25	4,667	1,381	6,073	6	57	610	673	6,747	3,260	7,414	17,420
1992	26	4,805	1,414	6,244	6	R60	640	706	6,950	3,193	7,212	17,356
1993	26	5,063	1,439	6,528	7	61	550	618	7,146	3,394	7,677	18,218
1994	21	4,960	1,408	6,389	6	63	520	589	6,978	3,441	7,693	18,112
1995	17	4,954	1,374	6,345	7	64	520	591	6,936	3,557	8,026	18,519
1996	17	5,354	1,484	6,854	7	65	540	612	R7,467	3,694	8,344	19,504
1997	16	5,093	1,422	6,531	8	64	430	502	7,033	3,671	8,261	18,965
1998	12	4,646	1,304	5,962	8	64	380	452	6,413	3,856	8,686	18,955
1999	14	4,835	1,465	6,314	9	63	390	461	6,775	3,906	8,875	19,557
2000	11	5,105	1,554	6,670	9	R61	420	489	7,159	4,069	9,197	20,425
2001	12	4,889	1,529	6,430	9	59	370	438	6,868	4,100	9,074	20,042
2002	12	R4,995	1,457	R6,464	10	57	380	448	R6,912	4,317	9,562	R20,791
2003	12	5,209	1,519	6,741	13	57	400	470	7,211	4,353	9,546	21,110
2004	11	4,981	1,520	6,513	14	57	410	481	6,993	4,408	9,691	21,093
2005	8	4,946	1,451	6,406	16	58	430	504	6,909	4,638	10,079	21,626
2006	6	4,476	1,224	5,706	18	63	R380	R462	R6,168	4,611	9,909	R20,688
2007	8	R4,835	1,254	R6,097	22	70	R410	R502	R6,598	4,750	10,182	R21,531
2008	8	5,010	1,243	6,261	26	80	450	R557	6,817	4,708	10,071	21,596
2009	8	4,883	1,176	6,067	33	89	430	552	6,619	4,656	9,789	R21,064
2010	7	R4,883	R1,142	R6,032	37	R114	420	R571	R6,603	R4,933	R10,326	R21,862
2011 <sup>P</sup>	6	4,830	1,139	5,975	40	140	430	610	6,585	4,858	10,176	21,619

<sup>1</sup> See "Primary Energy Consumption" in Glossary.

<sup>2</sup> Data are estimates. See Table 10.2a for notes on series components.

<sup>3</sup> Natural gas only; excludes the estimated portion of supplemental gaseous fuels. See Note 1, "Supplemental Gaseous Fuels," at end of Section 6.

<sup>4</sup> Based on petroleum product supplied. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of Section 5.

<sup>5</sup> Geothermal heat pump and direct use energy.

<sup>6</sup> Solar thermal direct use energy, and photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6). Includes small amounts of distributed solar thermal and PV energy used in the commercial, industrial, and electric power sectors.

<sup>7</sup> Wood and wood-derived fuels.

<sup>8</sup> Electricity retail sales to ultimate customers reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>9</sup> Total losses are calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Note, "Electrical System Energy Losses," at end of section.

R=Revised. P=Preliminary. NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#consumption> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#consumption> for all annual data beginning in 1949.

Sources: Tables 2.1f, 5.14a, 6.5, 7.3, 8.9, 10.2a, A4, A5, and A6.

**Table 2.1c Commercial Sector Energy Consumption Estimates, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Primary Consumption <sup>1</sup>											Total Primary	Electricity Retail Sales <sup>11</sup>	Electrical System Energy Losses <sup>12</sup>	Total
	Fossil Fuels				Renewable Energy <sup>2</sup>										
	Coal	Natural Gas <sup>3</sup>	Petroleum <sup>4,5</sup>	Total	Hydroelectric Power <sup>6</sup>	Geothermal <sup>7</sup>	Solar/PV <sup>8</sup>	Wind <sup>9</sup>	Biomass <sup>10</sup>	Total					
1949	1,554	360	735	2,649	NA	NA	NA	NA	20	20	2,669	200	800	3,669	
1950	1,542	401	872	2,815	NA	NA	NA	NA	19	19	2,834	225	834	3,893	
1955	801	651	1,095	2,547	NA	NA	NA	NA	15	15	2,561	350	984	3,895	
1960	407	1,056	1,248	2,711	NA	NA	NA	NA	12	12	2,723	543	1,344	4,609	
1965	265	1,490	1,413	3,168	NA	NA	NA	NA	9	9	3,177	789	1,880	5,845	
1970	165	2,473	1,592	4,229	NA	NA	NA	NA	8	8	4,237	1,201	2,908	8,346	
1975	147	2,558	1,346	4,051	NA	NA	NA	NA	8	8	4,059	1,598	3,835	9,492	
1976	144	2,718	1,500	4,362	NA	NA	NA	NA	9	9	4,371	1,678	4,014	10,063	
1977	148	2,548	1,552	4,248	NA	NA	NA	NA	10	10	4,258	1,754	4,196	10,208	
1978	165	2,643	1,490	4,297	NA	NA	NA	NA	12	12	4,309	1,813	4,390	10,512	
1979	149	2,836	1,367	4,352	NA	NA	NA	NA	14	14	4,366	1,854	4,428	10,648	
1980	115	2,651	1,318	4,084	NA	NA	NA	NA	21	21	4,105	1,906	4,567	10,578	
1981	137	2,557	1,122	3,816	NA	NA	NA	NA	21	21	3,837	2,033	4,746	10,616	
1982	155	2,650	1,037	3,842	NA	NA	NA	NA	22	22	3,864	2,077	4,919	10,860	
1983	162	2,486	1,170	3,818	NA	NA	NA	NA	22	22	3,840	2,116	4,982	10,938	
1984	169	2,582	1,227	3,978	NA	NA	NA	NA	22	22	4,001	2,264	5,179	11,444	
1985	137	2,488	1,083	3,708	NA	NA	NA	NA	24	24	3,732	2,351	5,368	11,451	
1986	135	2,367	1,162	3,665	NA	NA	NA	NA	27	27	3,693	2,439	5,475	11,606	
1987	125	2,489	1,131	3,745	NA	NA	NA	NA	30	30	3,774	2,539	5,633	11,946	
1988	131	2,731	1,099	3,961	NA	NA	NA	NA	33	33	3,994	2,675	5,909	12,578	
1989	115	2,785	1,041	3,941	1	3	-	-	99	102	4,043	2,767	6,384	13,193	
1990	124	2,682	991	3,798	1	3	-	-	94	98	3,896	2,860	6,564	13,320	
1991	116	2,795	935	3,846	1	3	-	-	95	100	3,945	2,918	6,636	13,500	
1992	117	2,871	893	3,881	1	3	-	-	105	109	3,991	2,900	6,550	13,441	
1993	117	2,923	819	3,859	1	3	-	-	109	114	3,973	3,019	6,828	13,820	
1994	118	2,962	825	3,905	1	4	-	-	106	112	4,016	3,116	6,966	14,098	
1995	117	3,096	769	3,982	1	5	-	-	113	118	4,101	3,252	7,338	14,690	
1996	122	3,226	790	4,138	1	5	-	-	129	135	4,273	3,344	7,555	15,172	
1997	129	3,285	743	4,157	1	6	-	-	131	138	4,295	3,503	7,883	15,681	
1998	93	3,083	702	3,878	1	7	-	-	118	127	4,005	3,678	8,285	15,968	
1999	103	3,115	707	3,925	1	7	-	-	121	129	4,053	3,766	8,557	16,376	
2000	92	3,252	807	4,150	1	8	-	-	119	128	4,278	3,956	8,942	17,175	
2001	97	3,097	790	3,984	1	8	-	-	92	101	4,084	4,062	8,990	17,137	
2002	90	R3,212	726	R4,028	(s)	9	-	-	95	104	R4,132	4,110	9,104	R17,345	
2003	82	3,261	827	4,170	1	11	-	-	101	113	4,283	4,090	8,969	17,343	
2004	103	3,201	809	4,113	1	12	-	-	105	118	4,232	4,198	9,229	17,659	
2005	97	3,073	761	3,932	1	14	-	-	105	R120	4,051	4,351	9,455	R17,857	
2006	65	2,902	663	3,629	1	14	-	-	R103	R118	R3,747	4,435	9,529	R17,711	
2007	70	R3,085	649	R3,805	1	14	-	-	R103	118	R3,922	4,560	9,773	R18,255	
2008	69	3,228	651	3,948	1	15	(s)	-	109	125	4,073	4,558	9,749	18,381	
2009	63	3,187	682	3,932	1	17	(s)	(s)	112	129	4,061	4,460	9,378	17,899	
2010	R60	R3,164	R685	R3,908	1	19	(s)	(s)	R111	R130	R4,039	R4,539	R9,501	R18,078	
2011 <sup>P</sup>	51	3,225	683	3,959	1	20	(s)	(s)	110	131	4,090	4,501	9,429	18,021	

<sup>1</sup> See "Primary Energy Consumption" in Glossary.

<sup>2</sup> Most data are estimates. See Table 10.2a for notes on series components and estimation.

<sup>3</sup> Natural gas only; excludes the estimated portion of supplemental gaseous fuels. See Note 1, "Supplemental Gaseous Fuels," at end of Section 6.

<sup>4</sup> Based on petroleum product supplied. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of Section 5.

<sup>5</sup> Does not include biofuels that have been blended with petroleum—biofuels are included in "Biomass."

<sup>6</sup> Conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>7</sup> Geothermal heat pump and direct use energy.

<sup>8</sup> Photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6) at commercial plants with capacity of 1 megawatt or greater.

<sup>9</sup> Wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>10</sup> Wood and wood-derived fuels; municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass; and fuel ethanol (minus denaturant). Through 2000, also

includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>11</sup> Electricity retail sales to ultimate customers reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>12</sup> Total losses are calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Note, "Electrical System Energy Losses," at end of section.

R=Revised. P=Preliminary. NA=Not available. --=No data reported. (s)=Less than 0.5 trillion Btu.

Notes: • The commercial sector includes combined-heat-and-power (CHP) and commercial electricity-only plants. See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#consumption> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#consumption> for all annual data beginning in 1949.

Sources: Tables 2.1f, 5.14a, 6.5, 7.3, 8.9, 10.2a, A4, A5, and A6.

**Table 2.1d Industrial Sector Energy Consumption Estimates, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Primary Consumption <sup>1</sup>												Total Primary	Electricity Retail Sales <sup>11</sup>	Electrical System Energy Losses <sup>12</sup>	Total
	Fossil Fuels					Renewable Energy <sup>2</sup>										
	Coal	Coal Coke Net Imports	Natural Gas <sup>3</sup>	Petroleum <sup>4,5</sup>	Total	Hydroelectric Power <sup>6</sup>	Geothermal <sup>7</sup>	Solar/PV <sup>8</sup>	Wind <sup>9</sup>	Biomass <sup>10</sup>	Total					
1949	5,433	-7	3,188	3,475	12,090	76	NA	NA	NA	468	544	12,633	418	1,672	14,724	
1950	5,781	1	3,546	3,960	13,288	69	NA	NA	NA	532	602	13,890	500	1,852	16,241	
1955	5,620	-10	4,701	5,123	15,434	38	NA	NA	NA	631	669	16,103	887	2,495	19,485	
1960	4,543	-6	5,973	5,766	16,277	39	NA	NA	NA	680	719	16,996	1,107	2,739	20,842	
1965	5,127	-18	7,339	6,813	19,260	33	NA	NA	NA	855	888	20,148	1,463	3,487	25,098	
1970	4,656	-58	9,536	7,776	21,911	34	NA	NA	NA	1,019	1,053	22,964	1,948	4,716	29,628	
1975	3,667	14	8,532	8,127	20,339	32	NA	NA	NA	1,063	1,096	21,434	2,346	5,632	29,413	
1976	3,661	(s)	8,762	8,990	21,412	33	NA	NA	NA	1,220	1,253	22,665	2,573	6,155	31,393	
1977	3,454	15	8,635	9,747	21,851	33	NA	NA	NA	1,281	1,314	23,165	2,682	6,416	32,263	
1978	3,314	125	8,539	9,835	21,812	32	NA	NA	NA	1,400	1,432	23,244	2,761	6,683	32,688	
1979	3,593	63	8,549	10,548	22,753	34	NA	NA	NA	1,405	1,439	24,192	2,873	6,860	33,925	
1980	3,155	-35	8,333	9,509	20,962	33	NA	NA	NA	1,600	1,633	22,595	2,781	6,664	32,039	
1981	3,157	-16	8,185	8,265	19,590	33	NA	NA	NA	1,695	1,728	21,318	2,817	6,576	30,712	
1982	2,552	-22	7,068	7,772	17,370	33	NA	NA	NA	1,650	1,683	19,053	2,542	6,020	27,614	
1983	2,490	-16	6,776	7,390	16,640	33	NA	NA	NA	1,874	1,908	18,548	2,648	6,232	27,428	
1984	2,842	-11	7,405	7,987	18,222	33	NA	NA	NA	1,918	1,951	20,174	2,859	6,538	29,570	
1985	2,760	-13	7,032	7,714	17,492	33	NA	NA	NA	1,918	1,951	19,443	2,855	6,518	28,816	
1986	2,641	-17	6,646	7,860	17,130	33	NA	NA	NA	1,915	1,948	19,078	2,834	6,362	28,274	
1987	2,673	9	7,283	8,042	18,006	33	NA	NA	NA	1,914	1,947	19,953	2,928	6,497	29,379	
1988	2,828	40	7,655	8,317	18,840	33	NA	NA	NA	1,989	2,022	20,862	3,059	6,757	30,677	
1989	2,787	30	8,088	8,098	19,003	28	2	-	-	1,841	1,871	20,874	3,158	7,288	31,320	
1990	2,756	5	8,451	8,251	19,463	31	2	-	-	1,684	1,717	21,180	3,226	7,404	31,810	
1991	2,601	10	8,572	7,958	19,141	30	2	-	-	1,652	1,684	20,824	3,230	7,345	31,399	
1992	2,515	35	8,918	8,552	20,019	31	2	-	-	1,705	1,737	21,756	3,319	7,496	32,571	
1993	2,496	27	9,070	8,386	19,980	30	2	-	-	1,741	1,773	21,753	3,334	7,541	32,629	
1994	2,510	58	9,126	8,771	20,465	62	3	-	-	1,862	1,927	22,393	3,439	7,689	33,521	
1995	2,488	61	9,592	8,586	20,727	55	3	-	-	1,934	1,992	22,719	3,455	7,796	33,971	
1996	2,434	23	9,901	9,019	21,377	61	3	-	-	1,969	2,033	23,410	3,527	7,968	34,904	
1997	2,395	46	9,933	9,255	21,629	58	3	-	-	1,996	2,057	23,686	3,542	7,972	35,200	
1998	2,335	67	9,763	9,082	21,248	55	3	-	-	1,872	1,929	23,177	3,587	8,079	34,843	
1999	2,227	58	9,375	9,356	21,016	49	4	-	-	1,882	1,934	22,950	3,611	8,203	34,764	
2000	2,256	65	9,500	9,075	20,896	42	4	-	-	1,881	1,928	22,824	3,631	8,208	34,664	
2001	2,192	29	8,676	9,178	20,075	33	5	-	-	1,681	1,719	21,794	3,400	7,526	32,720	
2002	2,019	61	R8,832	9,168	R20,079	39	5	-	-	1,676	1,720	R21,799	3,379	7,484	R32,662	
2003	2,041	51	R8,488	9,197	19,777	43	3	-	-	1,679	1,726	21,503	3,454	7,575	32,532	
2004	2,047	138	R8,550	9,825	R20,559	33	4	-	-	1,817	1,853	R22,412	3,473	7,635	R33,520	
2005	1,954	44	R7,907	9,633	R19,538	32	4	-	-	1,837	1,873	R21,411	3,477	7,557	R32,446	
2006	1,914	61	R7,861	9,770	R19,606	29	4	-	-	1,897	1,930	R21,536	3,451	7,415	R32,401	
2007	1,865	25	R8,074	9,451	R19,414	16	5	-	-	R1,936	R1,956	R21,370	3,507	7,517	R32,394	
2008	1,796	41	R8,083	8,511	R18,431	17	5	-	-	R2,028	R2,049	R20,480	3,444	7,365	R31,290	
2009	1,396	-24	7,609	7,816	R16,797	18	4	-	-	R1,994	R2,016	R18,813	3,130	6,582	R28,525	
2010	R1,649	-6	R7,959	R8,210	R17,812	16	4	(s)	-	R2,230	R2,250	R20,062	R3,313	R6,934	R30,309	
2011 <sup>P</sup>	1,599	11	8,321	8,064	17,995	18	4	(s)	(s)	2,273	2,295	20,291	3,329	6,973	30,592	

<sup>1</sup> See "Primary Energy Consumption" in Glossary.

<sup>2</sup> Most data are estimates. See Table 10.2b for notes on series components and estimation.

<sup>3</sup> Natural gas only; excludes the estimated portion of supplemental gaseous fuels. See Note 1, "Supplemental Gaseous Fuels," at end of Section 6.

<sup>4</sup> Based on petroleum product supplied. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of Section 5.

<sup>5</sup> Does not include biofuels that have been blended with petroleum—biofuels are included in "Biomass."

<sup>6</sup> Conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>7</sup> Geothermal heat pump and direct use energy.

<sup>8</sup> Photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6) at industrial plants with capacity of 1 megawatt or greater.

<sup>9</sup> Wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>10</sup> Wood and wood-derived fuels; municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass; fuel ethanol (minus denaturant); and losses and co-products from the production of fuel ethanol and biodiesel. Through 2000, also includes non-renewable waste

(municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>11</sup> Electricity retail sales to ultimate customers reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>12</sup> Total losses are calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Note, "Electrical System Energy Losses," at end of section.

R=Revised. P=Preliminary. NA=Not available. - =No data reported. (s)=Less than +0.5 trillion Btu and greater than -0.5 trillion Btu.

Notes: • The industrial sector includes industrial combined-heat-and-power (CHP) and industrial electricity-only plants. See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#consumption> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#consumption> for all annual data beginning in 1949.

Sources: Tables 2.1f, 5.14b, 6.5, 7.3, 7.8, 8.9, 10.2b, A4, A5, and A6.

**Table 2.1e Transportation Sector Energy Consumption Estimates, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Primary Consumption <sup>1</sup>					Total Primary	Electricity Retail Sales <sup>7</sup>	Electrical System Energy Losses <sup>8</sup>	Total
	Fossil Fuels			Total	Renewable Energy <sup>2</sup>				
	Coal	Natural Gas <sup>3</sup>	Petroleum <sup>4,5</sup>		Biomass <sup>6</sup>				
1949	1,727	NA	6,152	7,880	NA	7,880	22	88	7,990
1950	1,564	130	6,690	8,383	NA	8,383	23	86	8,492
1955	421	254	8,799	9,474	NA	9,474	20	56	9,550
1960	75	359	10,125	10,560	NA	10,560	10	26	10,596
1965	16	517	11,866	12,399	NA	12,399	10	24	12,432
1970	7	745	15,310	16,062	NA	16,062	11	26	16,098
1975	1	595	17,615	18,210	NA	18,210	10	24	18,245
1976	(s)	559	18,508	19,067	NA	19,067	10	24	19,101
1977	(s)	543	19,243	19,786	NA	19,786	10	25	19,822
1978	( <sup>9</sup> )	539	20,044	20,583	NA	20,583	10	24	20,617
1979	( <sup>9</sup> )	612	19,825	20,437	NA	20,437	10	24	20,472
1980	( <sup>9</sup> )	650	19,009	19,659	NA	19,659	11	27	19,697
1981	( <sup>9</sup> )	658	18,813	19,471	7	19,478	11	25	19,514
1982	( <sup>9</sup> )	612	18,422	19,034	18	19,052	11	26	19,089
1983	( <sup>9</sup> )	505	18,595	19,100	34	19,134	13	30	19,177
1984	( <sup>9</sup> )	545	19,023	19,567	41	19,609	14	33	19,656
1985	( <sup>9</sup> )	519	19,472	19,992	50	20,041	14	32	20,088
1986	( <sup>9</sup> )	499	20,183	20,682	57	20,740	15	34	20,789
1987	( <sup>9</sup> )	535	20,817	21,353	66	21,419	16	35	21,469
1988	( <sup>9</sup> )	632	21,568	22,199	67	22,267	16	35	22,318
1989	( <sup>9</sup> )	649	21,707	22,356	68	22,424	16	38	22,478
1990	( <sup>9</sup> )	680	21,626	22,306	60	22,366	16	37	22,420
1991	( <sup>9</sup> )	620	21,374	21,995	70	22,065	16	37	22,118
1992	( <sup>9</sup> )	608	21,675	22,283	80	22,363	16	36	22,415
1993	( <sup>9</sup> )	645	21,977	22,621	94	22,715	16	37	22,768
1994	( <sup>9</sup> )	709	22,497	23,206	105	23,311	17	38	23,366
1995	( <sup>9</sup> )	724	22,955	23,679	112	23,791	17	38	23,846
1996	( <sup>9</sup> )	737	23,565	24,302	81	24,383	17	38	24,437
1997	( <sup>9</sup> )	780	23,813	24,593	102	24,695	17	38	24,750
1998	( <sup>9</sup> )	666	24,422	25,088	113	25,201	17	38	25,256
1999	( <sup>9</sup> )	675	25,098	25,774	118	25,891	17	40	25,949
2000	( <sup>9</sup> )	672	25,682	26,354	135	26,489	18	42	26,548
2001	( <sup>9</sup> )	658	25,412	26,070	142	26,213	20	43	26,275
2002	( <sup>9</sup> )	R699	25,913	R26,612	170	R26,781	19	42	R26,842
2003	( <sup>9</sup> )	627	26,063	26,690	230	26,920	23	51	26,994
2004	( <sup>9</sup> )	602	26,925	27,527	290	27,817	25	54	27,895
2005	( <sup>9</sup> )	624	27,309	27,933	339	28,272	26	56	28,353
2006	( <sup>9</sup> )	625	27,651	28,276	475	28,751	25	54	28,830
2007	( <sup>9</sup> )	R663	27,763	R28,427	602	R29,029	28	60	R29,117
2008	( <sup>9</sup> )	692	26,407	27,099	826	27,925	26	56	28,008
2009	( <sup>9</sup> )	R715	25,339	R26,054	R935	R26,989	27	56	R27,071
2010	( <sup>9</sup> )	R716	R25,595	R26,310	R1,074	R27,384	26	55	R27,466
2011 <sup>P</sup>	( <sup>9</sup> )	735	25,110	25,845	1,154	26,999	26	54	27,079

<sup>1</sup> See "Primary Energy Consumption" in Glossary.

<sup>2</sup> Data are estimates. See Table 10.2b for notes on series components.

<sup>3</sup> Natural gas only; does not include supplemental gaseous fuels—see Note 1, "Supplemental Gaseous Fuels," at end of Section 6. Data are for natural gas consumed in the operation of pipelines (primarily in compressors) and small amounts consumed as vehicle fuel—see Table 6.5.

<sup>4</sup> Based on petroleum product supplied. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of Section 5.

<sup>5</sup> Does not include biofuels that have been blended with petroleum—biofuels are included in "Biomass."

<sup>6</sup> Fuel ethanol (minus denaturant) and biodiesel.

<sup>7</sup> Electricity retail sales to ultimate customers reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>8</sup> Total losses are calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Note, "Electrical System Energy Losses," at end of section.

<sup>9</sup> Beginning in 1978, the small amounts of coal consumed for transportation are reported as industrial sector consumption.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#consumption> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#consumption> for all annual data beginning in 1949.

Sources: Tables 2.1f, 5.14c, 6.5, 7.3, 8.9, 10.2b, A4, A5, and A6.



**Table 2.1f Electric Power Sector Energy Consumption, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Primary Consumption <sup>1</sup>												Electricity Net Imports <sup>11</sup>	Total Primary
	Fossil Fuels				Nuclear Electric Power <sup>5</sup>	Renewable Energy <sup>2</sup>								
	Coal	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Total		Hydroelectric Power <sup>6</sup>	Geothermal <sup>7</sup>	Solar/PV <sup>8</sup>	Wind <sup>9</sup>	Biomass <sup>10</sup>	Total			
1949	1,995	569	415	2,979	0	1,349	NA	NA	NA	6	1,355	5	4,339	
1950	2,199	651	472	3,322	0	1,346	NA	NA	NA	5	1,351	6	4,679	
1955	3,458	1,194	471	5,123	0	1,322	NA	NA	NA	3	1,325	14	6,461	
1960	4,228	1,785	553	6,565	6	1,569	(s)	NA	NA	2	1,571	15	8,158	
1965	5,821	2,395	722	8,938	43	2,026	2	NA	NA	3	2,031	(s)	11,012	
1970	7,227	4,054	2,117	13,399	239	2,600	6	NA	NA	4	2,609	7	16,253	
1975	8,786	3,240	3,166	15,191	1,900	3,122	34	NA	NA	2	3,158	21	20,270	
1976	9,720	3,152	3,477	16,349	2,111	2,943	38	NA	NA	3	2,983	29	21,473	
1977	10,262	3,284	3,901	17,446	2,702	2,301	37	NA	NA	5	2,343	59	22,551	
1978	10,238	3,297	3,987	17,522	3,024	2,905	31	NA	NA	3	2,940	67	23,553	
1979	11,260	3,613	3,283	18,156	2,776	2,897	40	NA	NA	5	2,942	69	23,943	
1980	12,123	3,778	2,634	18,534	2,739	2,867	53	NA	NA	5	2,925	71	24,269	
1981	12,583	3,730	2,202	18,516	3,008	2,725	59	NA	NA	4	2,788	113	24,425	
1982	12,582	3,312	1,568	17,462	3,131	3,233	51	NA	NA	3	3,286	100	23,979	
1983	13,213	2,972	1,544	17,729	3,203	3,494	64	NA	(s)	4	3,562	121	24,614	
1984	14,019	3,199	1,286	18,504	3,553	3,353	81	(s)	(s)	9	3,443	135	25,635	
1985	14,542	3,135	1,090	18,767	4,076	2,937	97	(s)	(s)	14	3,049	140	26,032	
1986	14,444	2,670	1,452	18,566	4,380	3,038	108	(s)	(s)	12	3,158	122	26,227	
1987	15,173	2,916	1,257	19,346	4,754	2,602	112	(s)	(s)	15	2,729	158	26,988	
1988	15,850	2,693	1,563	20,106	5,587	2,302	106	(s)	(s)	17	2,425	108	28,227	
1989 <sup>12</sup>	16,137	3,173	1,703	21,013	5,602	2,808	152	3	22	232	3,217	37	29,869	
1990	16,261	3,309	1,289	20,859	6,104	3,014	161	4	29	317	3,524	8	30,495	
1991	16,250	3,377	1,198	20,825	6,422	2,985	167	5	31	354	3,542	67	30,856	
1992	16,466	3,512	991	20,968	6,479	2,586	167	4	30	402	3,189	87	30,723	
1993	17,196	3,538	1,124	21,857	6,410	2,861	173	5	31	415	3,484	95	31,847	
1994	17,261	3,977	1,059	22,297	6,694	2,620	160	5	36	434	3,255	153	32,399	
1995	17,466	4,302	755	22,523	7,075	3,149	138	5	33	422	3,747	134	33,479	
1996	18,429	3,862	817	23,109	7,087	3,528	148	5	33	438	4,153	137	34,485	
1997	18,905	4,126	927	23,957	6,597	3,581	150	5	34	446	4,216	116	34,886	
1998	19,216	4,675	1,306	25,197	7,068	3,241	151	5	31	444	3,872	88	36,225	
1999	19,279	4,902	1,211	25,393	7,610	3,218	152	5	46	453	3,874	99	36,976	
2000	20,220	5,293	1,144	26,658	7,862	2,768	144	5	57	453	3,427	115	38,062	
2001	19,614	5,458	1,277	26,348	8,029	2,209	142	6	70	337	2,763	75	37,215	
2002	19,783	5,767	961	26,511	8,145	2,650	147	6	105	380	3,288	72	38,016	
2003	20,185	5,246	1,205	26,636	7,959	2,781	148	5	115	397	3,445	22	38,062	
2004	20,305	5,595	1,212	27,112	8,222	2,656	148	6	142	388	3,340	39	38,713	
2005	20,737	6,015	1,235	27,986	8,161	2,670	147	6	178	406	3,406	85	39,638	
2006	20,462	6,375	648	27,485	8,215	2,839	145	5	264	412	3,665	63	39,428	
2007	20,808	7,005	657	28,470	8,455	2,430	145	6	341	423	3,345	107	40,377	
2008	20,513	6,829	468	27,810	8,427	2,494	146	9	546	435	3,630	112	39,978	
2009	18,225	7,022	390	25,638	8,356	2,650	146	9	721	441	3,967	116	38,077	
2010	19,133	R7,527	378	R27,039	R8,434	R2,521	R148	R12	R923	R459	R4,064	R89	R39,626	
2011 <sup>P</sup>	17,986	7,740	288	26,014	8,259	3,153	163	18	1,168	444	4,945	127	39,346	

<sup>1</sup> See "Primary Energy Consumption" in Glossary.

<sup>2</sup> See Table 10.2c for notes on series components.

<sup>3</sup> Natural gas only; excludes the estimated portion of supplemental gaseous fuels. See Note 1, "Supplemental Gaseous Fuels," at end of Section 6.

<sup>4</sup> See Table 5.14c for series components.

<sup>5</sup> Nuclear electricity net generation (converted to Btu using the nuclear heat rate—see Table A6).

<sup>6</sup> Conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>7</sup> Geothermal electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>8</sup> Solar thermal and photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>9</sup> Wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>10</sup> Wood and wood-derived fuels; and municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste

(municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>11</sup> Net imports equal imports minus exports.

<sup>12</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities and independent power producers.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

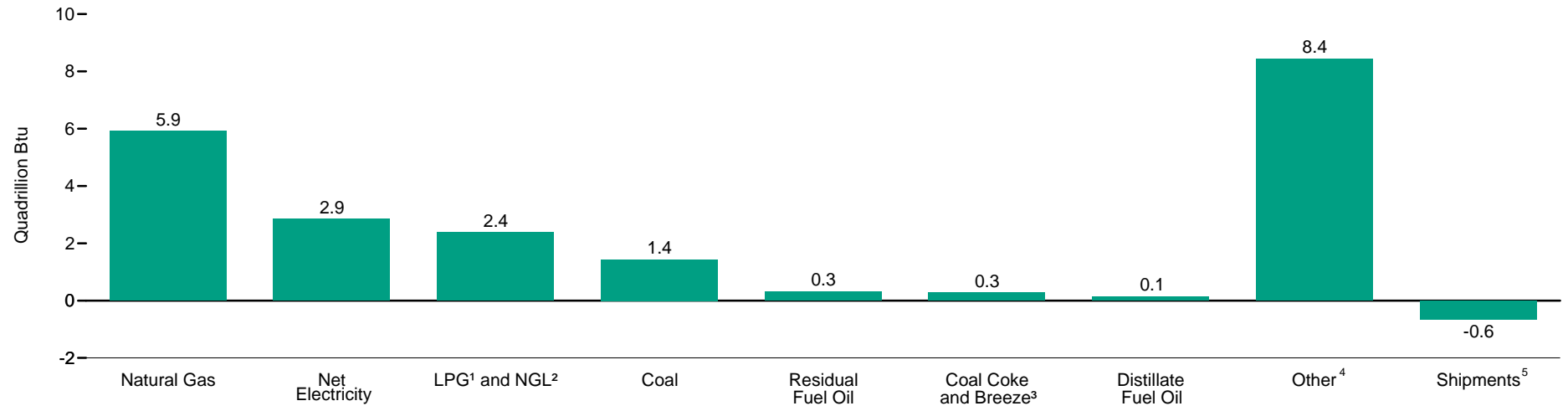
Notes: • Data are for fuels consumed to produce electricity and useful thermal output. • The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. • See Note 3, "Electricity Imports and Exports," at end of Section 8. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#consumption> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#consumption> for all annual data beginning in 1949.

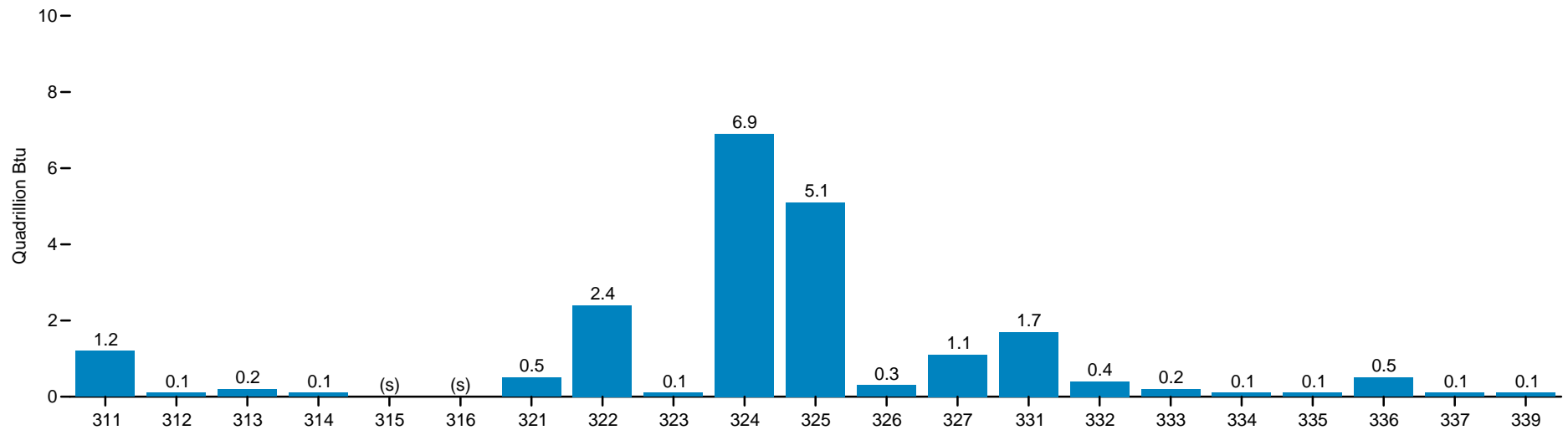
Sources: Tables 5.14c, 6.5, 7.3, 8.1, 8.2b, 10.2c, A4, A5, and A6.

**Figure 2.2 Manufacturing Energy Consumption for All Purposes, 2006**

**By Energy Source**



**By North American Industry Classification System (NAICS) Code<sup>6</sup>**



<sup>1</sup> Liquefied petroleum gases.  
<sup>2</sup> Natural gas liquids.  
<sup>3</sup> See "Breeze" in Glossary.  
<sup>4</sup> Includes all other types of energy that respondents indicated were consumed or allocated.  
<sup>5</sup> Energy sources produced onsite from the use of other energy sources but sold or transferred to another entity.

<sup>6</sup> See Table 2.2 for Manufacturing Group titles of industries that correspond to the 3-digit NAICS codes.  
 (s)=Less than 0.05 quadrillion Btu.  
 Source: Table 2.2.

**Table 2.2 Manufacturing Energy Consumption for All Purposes, 2006**  
(Trillion Btu )

NAICS <sup>1</sup> Code	Manufacturing Group	Coal	Coal Coke and Breeze <sup>2</sup>	Natural Gas	Distillate Fuel Oil	LPG <sup>3</sup> and NGL <sup>4</sup>	Residual Fuel Oil	Net Electricity <sup>5</sup>	Other <sup>6</sup>	Shipments of Energy Sources <sup>7</sup>	Total <sup>8</sup>
311	Food .....	147	1	638	16	3	26	251	105	(s)	1,186
312	Beverage and Tobacco Products .....	20	0	41	1	1	3	30	11	-0	107
313	Textile Mills .....	32	0	65	(s)	(s)	2	66	12	-0	178
314	Textile Product Mills .....	3	0	46	(s)	1	Q	20	(s)	-0	72
315	Apparel .....	0	0	7	(s)	(s)	(s)	7	(s)	-0	14
316	Leather and Allied Products .....	0	0	1	(s)	(s)	(s)	1	(s)	-0	3
321	Wood Products .....	Q	Q	87	21	4	4	91	228	-0	451
322	Paper .....	221	0	474	13	5	91	247	1,302	-0	2,354
323	Printing and Related Support .....	0	0	39	(s)	1	(s)	45	(s)	-0	85
324	Petroleum and Coal Products .....	102	1	849	33	29	58	137	5,744	-89	6,864
325	Chemicals .....	182	3	1,746	8	2,304	87	517	707	-406	5,149
326	Plastics and Rubber Products .....	Q	0	128	3	5	9	182	(s)	-0	337
327	Nonmetallic Mineral Products .....	320	11	460	30	5	3	147	138	-0	1,114
331	Primary Metals .....	373	253	627	7	4	19	458	139	-145	1,736
332	Fabricated Metal Products .....	0	Q	240	2	5	(s)	143	Q	-0	396
333	Machinery .....	1	0	84	2	3	Q	111	2	-0	204
334	Computer and Electronic Products .....	0	0	45	1	(s)	(s)	94	2	-0	142
335	Electrical Equipment, Appliances, and Components .....	(s)	0	42	Q	1	0	44	21	-5	103
336	Transportation Equipment .....	5	Q	249	3	5	7	195	13	-0	477
337	Furniture and Related Products .....	3	0	17	Q	1	(s)	32	8	-0	61
339	Miscellaneous .....	0	0	25	(s)	1	Q	33	Q	-0	66
—	Total Manufacturing .....	1,433	272	5,911	143	2,376	314	2,851	8,443	-645	21,098

<sup>1</sup> North American Industry Classification System (NAICS).

<sup>2</sup> See "Breeze" in Glossary.

<sup>3</sup> Liquefied petroleum gases.

<sup>4</sup> Natural gas liquids.

<sup>5</sup> "Net Electricity" is the sum of purchases, transfers in, and onsite generation from noncombustible renewable energy sources, minus quantities sold and transferred out; it excludes onsite generation from combustible fuels.

<sup>6</sup> Includes all other types of energy that respondents indicated were consumed or allocated, such as asphalt and road oil, lubricants, naphtha less than 401 degrees Fahrenheit, other oils greater than or equal to 401 degrees Fahrenheit, special naphthas, waxes, and miscellaneous nonfuel products, which are nonfuel products assigned to the petroleum refining industry group (NAICS Code 324110).

<sup>7</sup> Energy sources produced onsite from the use of other energy sources but sold or transferred to

another entity. Note that shipments of energy sources are subtracted from consumption.

<sup>8</sup> The sum of coal, coal coke and breeze, natural gas, distillate fuel oil, liquefied petroleum gases, natural gas liquids, residual fuel oil, net electricity, and other, minus shipments of energy sources.

(s)=Less than 0.5 trillion Btu and greater than -0.5 trillion Btu. Q=Data withheld because the relative standard error was greater than 50 percent.

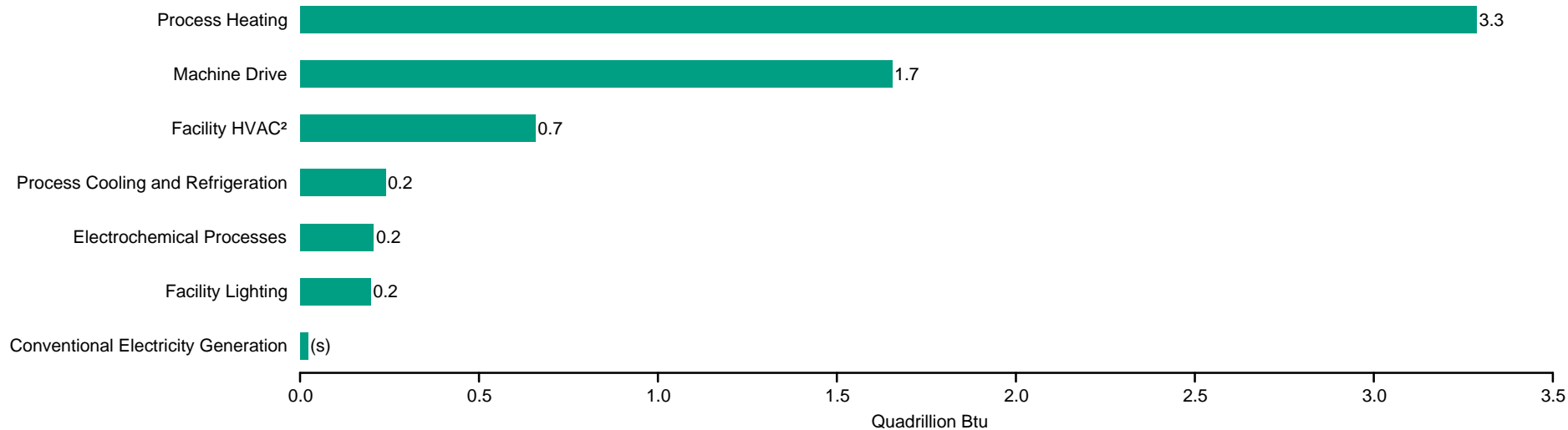
Notes: • Data are estimates for the first use of energy for heat and power and as feedstocks or raw material inputs. "First use" is the consumption of energy that was originally produced offsite or was produced onsite from input materials not classified as energy. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/emeu/mecs>.

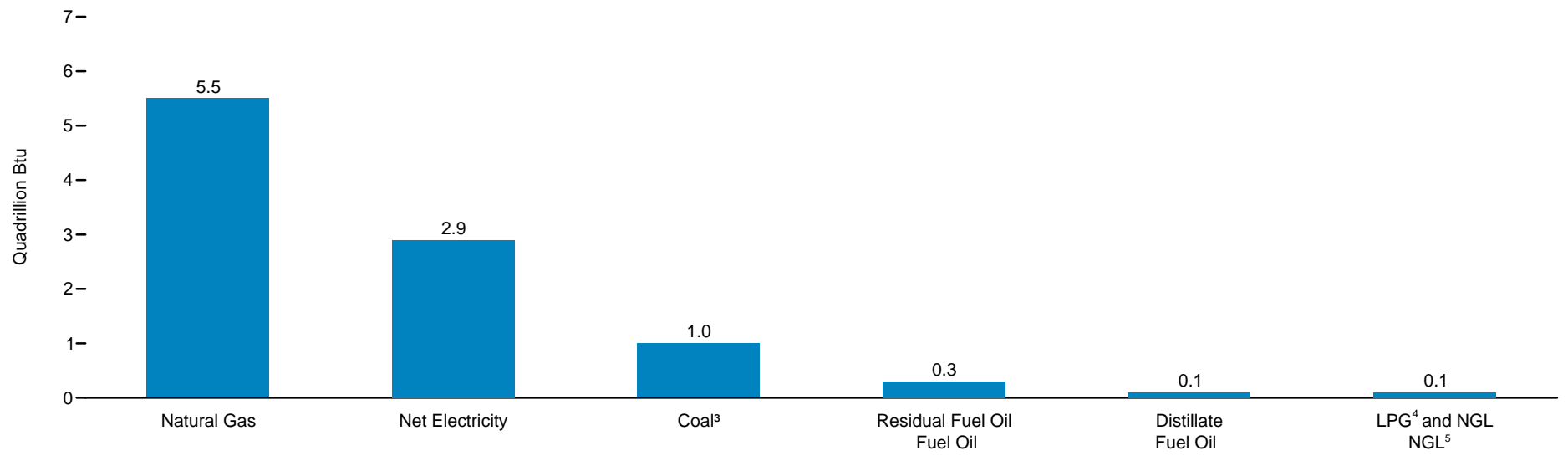
Source: U.S. Energy Information Administration, Form EIA-846, "2006 Manufacturing Energy Consumption Survey" and Form EIA-810, "Monthly Refinery Report" for 2006.

**Figure 2.3 Manufacturing Energy Consumption for Heat, Power, and Electricity Generation, 2006**

**By Selected End Use<sup>1</sup>**



**By Energy Source**



<sup>1</sup> Excludes inputs of unallocated energy sources (5,820 trillion Btu).

<sup>2</sup> Heating, ventilation, and air conditioning. Excludes steam and hot water.

<sup>3</sup> Excludes coal coke and breeze.

<sup>4</sup> Liquefied petroleum gases.

<sup>5</sup> Natural gas liquids.

(s)=Less than 0.05 quadrillion Btu.

Source: Table 2.3.

**Table 2.3 Manufacturing Energy Consumption for Heat, Power, and Electricity Generation by End Use, 2006**

End-Use Category	Net Electricity <sup>1</sup>	Residual Fuel Oil	Distillate Fuel Oil	LPG <sup>2</sup> and NGL <sup>3</sup>	Natural Gas	Coal <sup>4</sup>	Total <sup>5</sup>
	Million Kilowatthours	Million Barrels			Billion Cubic Feet	Million Short Tons	
<b>Indirect End Use (Boiler Fuel)</b> .....	<b>12,109</b>	<b>21</b>	<b>4</b>	<b>2</b>	<b>2,059</b>	<b>25</b>	<b>--</b>
Conventional Boiler Use .....	12,109	11	3	2	1,245	6	--
CHP <sup>6</sup> and/or Cogeneration Process .....	--	10	1	(s)	814	19	--
<b>Direct End Use</b>							
<b>All Process Uses</b> .....	<b>657,810</b>	<b>10</b>	<b>9</b>	<b>10</b>	<b>2,709</b>	<b>19</b>	<b>--</b>
Process Heating .....	101,516	9	3	8	2,417	16	--
Process Cooling and Refrigeration .....	60,381	(s)	(s)	(s)	31	(s)	--
Machine Drive .....	422,408	(s)	4	(s)	126	3	--
Electrochemical Processes .....	60,323	--	--	--	--	--	--
Other Process Uses .....	13,181	(s)	1	1	136	(s)	--
<b>All Non-Process Uses</b> .....	<b>157,829</b>	<b>1</b>	<b>9</b>	<b>7</b>	<b>426</b>	<b>(s)</b>	<b>--</b>
Facility Heating, Ventilation, and Air Conditioning <sup>7</sup> ...	77,768	1	1	1	367	(s)	--
Facility Lighting .....	58,013	--	--	--	--	--	--
Other Facility Support .....	17,644	(s)	(s)	(s)	29	(s)	--
Onsite Transportation .....	2,197	--	6	5	3	--	--
Conventional Electricity Generation .....	--	(s)	1	(s)	19	(s)	--
Other Non-Process Use .....	2,208	(s)	1	(s)	8	(s)	--
<b>End Use Not Reported</b> .....	<b>7,634</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>164</b>	<b>2</b>	<b>--</b>
<b>Total</b> .....	<b>835,382</b>	<b>40</b>	<b>22</b>	<b>21</b>	<b>5,357</b>	<b>46</b>	<b>--</b>
					Trillion Btu		
<b>Indirect End Use (Boiler Fuel)</b> .....	<b>41</b>	<b>133</b>	<b>23</b>	<b>8</b>	<b>2,119</b>	<b>547</b>	<b>2,871</b>
Conventional Boiler Use .....	41	71	17	8	1,281	129	1,547
CHP <sup>6</sup> and/or Cogeneration Process .....	--	62	6	1	838	417	1,324
<b>Direct End Use</b>							
<b>All Process Uses</b> .....	<b>2,244</b>	<b>62</b>	<b>52</b>	<b>39</b>	<b>2,788</b>	<b>412</b>	<b>5,597</b>
Process Heating .....	346	59	19	32	2,487	345	3,288
Process Cooling and Refrigeration .....	206	(s)	1	(s)	32	(s)	239
Machine Drive .....	1,441	2	24	2	129	56	1,654
Electrochemical Processes .....	206	--	--	--	--	--	206
Other Process Uses .....	45	Q	8	5	140	10	208
<b>All Non-Process Uses</b> .....	<b>539</b>	<b>6</b>	<b>50</b>	<b>27</b>	<b>438</b>	<b>6</b>	<b>1,066</b>
Facility Heating, Ventilation, and Air Conditioning <sup>7</sup> ...	265	4	4	5	378	2	658
Facility Lighting .....	198	--	--	--	--	--	198
Other Facility Support .....	60	1	(s)	(s)	30	(s)	91
Onsite Transportation .....	7	--	35	20	3	--	65
Conventional Electricity Generation .....	--	(s)	4	(s)	19	3	26
Other Non-Process Use .....	8	(s)	6	1	8	(s)	23
<b>End Use Not Reported</b> .....	<b>26</b>	<b>49</b>	<b>4</b>	<b>5</b>	<b>168</b>	<b>52</b>	<b>304</b>
<b>Total</b> .....	<b>2,850</b>	<b>251</b>	<b>129</b>	<b>79</b>	<b>5,512</b>	<b>1,016</b>	<b>9,838</b>

<sup>1</sup> "Net Electricity" is the sum of purchases, transfers in, and onsite generation from noncombustible renewable energy sources, minus quantities sold and transferred out; it excludes onsite generation from combustible fuels.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Natural gas liquids.

<sup>4</sup> Excludes coal coke and breeze.

<sup>5</sup> Total of listed energy sources. Excludes inputs of unallocated energy sources (5,820 trillion Btu).

<sup>6</sup> Combined-heat-and-power plants.

<sup>7</sup> Excludes steam and hot water.

-- = Not applicable. (s)=Estimate less than 0.5. Q=Withheld because relative standard error is greater than 50 percent.

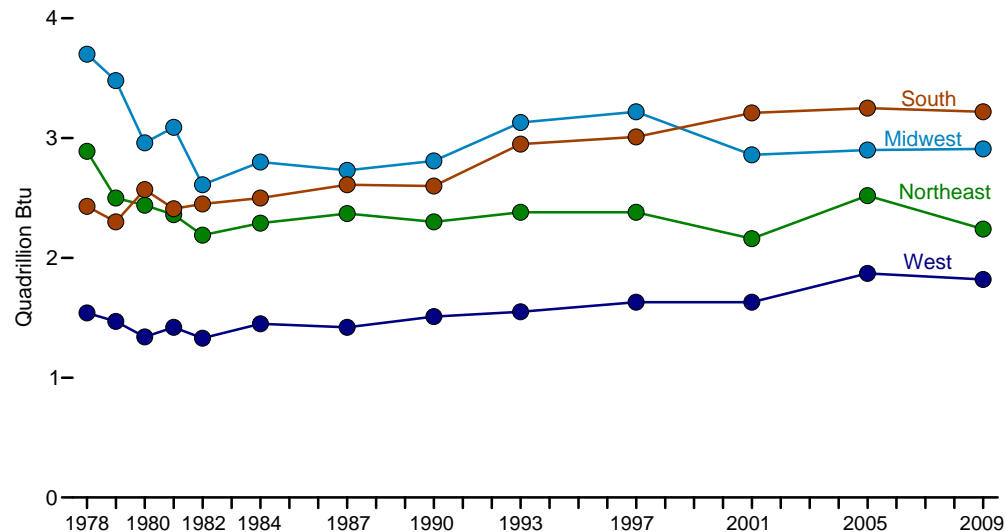
Notes: • Data are estimates for the total consumption of energy for the production of heat, power, and electricity generation, regardless of where the energy was produced. Specifically, the estimates include the quantities of energy that were originally produced onsite and purchased by or transferred to the establishment, plus those that were produced onsite from other energy or input materials not classified as energy, or were extracted from captive (onsite) mines or wells. • Allocations to end uses are made on the basis of reasonable approximations by respondents. • Totals may not equal sum of components due to independent rounding, the presence of estimates that round to zero, and the presence of estimates that are withheld because the relative standard error is greater than 50 percent.

Web Page: For related information, see <http://www.eia.gov/emeu/mecs>.

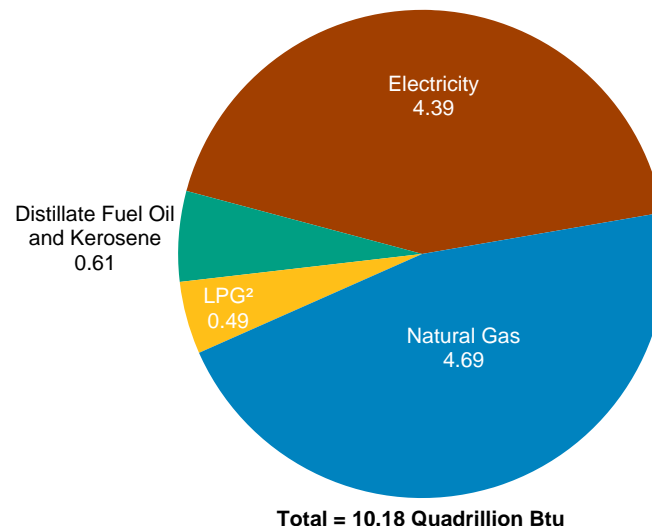
Source: U.S. Energy Information Administration, Form EIA-846, "2006 Manufacturing Energy Consumption Survey."

**Figure 2.4 Household Energy Consumption**

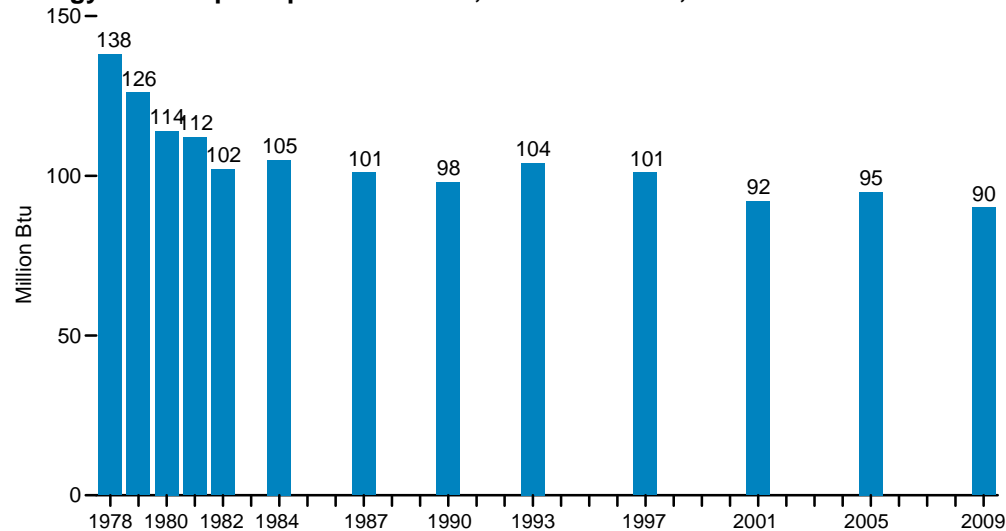
**Household Energy Consumption by Census Region, Selected Years, 1978-2009<sup>1</sup>**



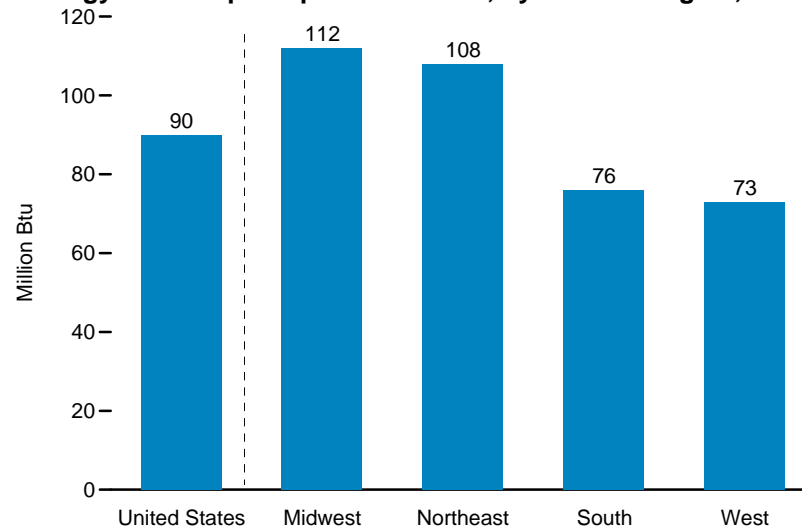
**Household Energy Consumption by Source, 2009**



**Energy Consumption per Household, Selected Years, 1978-2009<sup>1</sup>**



**Energy Consumption per Household, by Census Region, 2009**



<sup>1</sup> For years not shown, there are no data available.

<sup>2</sup> Liquefied petroleum gases.

Notes: • Data include natural gas, electricity, distillate fuel oil, kerosene, and liquefied petroleum gases; data do not include wood. • Data for 1978-1984 are for April of the year shown through March of following year; data for 1987 forward are for the calendar year. • See Appendix C for map of Census regions.  
Source: Table 2.4.

**Table 2.4 Household <sup>1</sup> Energy Consumption by Census Region, Selected Years, 1978-2009**  
(Quadrillion Btu, Except as Noted)

Census Region <sup>2</sup>	1978	1979	1980	1981	1982	1984	1987	1990	1993	1997	2001	2005	2009
<b>United States Total</b> (does not include wood) .....	<b>10.56</b>	<b>9.74</b>	<b>9.32</b>	<b>9.29</b>	<b>8.58</b>	<b>9.04</b>	<b>9.13</b>	<b>9.22</b>	<b>10.01</b>	<b>10.25</b>	<b>9.86</b>	<b>10.55</b>	<b>10.18</b>
Natural Gas .....	5.58	5.31	4.97	5.27	4.74	4.98	4.83	4.86	5.27	5.28	4.84	4.79	4.69
Electricity <sup>3</sup> .....	2.47	2.42	2.48	2.42	2.35	2.48	2.76	3.03	3.28	3.54	3.89	4.35	4.39
Distillate Fuel Oil and Kerosene .....	2.19	1.71	1.52	1.28	1.20	1.26	1.22	1.04	1.07	1.07	.75	.88	.61
Liquefied Petroleum Gases .....	.33	.31	.35	.31	.29	.31	.32	.28	.38	.36	.38	.52	.49
Wood <sup>4</sup> .....	NA	NA	.85	.87	.97	.98	.85	.58	.55	.43	.37	.43	.50
Consumption per Household (million Btu) <sup>3</sup> .....	138	126	114	112	102	105	101	98	104	101	92	95	90
<b>Northeast Total</b> (does not include wood) .....	<b>2.89</b>	<b>2.50</b>	<b>2.44</b>	<b>2.36</b>	<b>2.19</b>	<b>2.29</b>	<b>2.37</b>	<b>2.30</b>	<b>2.38</b>	<b>2.38</b>	<b>2.16</b>	<b>2.52</b>	<b>2.24</b>
Natural Gas .....	1.14	1.05	.94	1.01	.96	.93	1.03	1.03	1.11	1.03	.98	1.15	1.06
Electricity <sup>3</sup> .....	.39	.39	.41	.40	.37	.41	.44	.47	.47	.49	.53	.58	.57
Distillate Fuel Oil and Kerosene .....	1.32	1.03	1.07	.93	.83	.93	.87	.78	.78	.84	.60	.72	.52
Liquefied Petroleum Gases .....	.03	.03	.03	.03	.02	.03	.02	.02	.03	.03	.05	.07	.08
Wood <sup>4</sup> .....	NA	NA	.26	.27	.24	.21	.17	.12	.14	.14	.10	.09	.10
Consumption per Household (million Btu) <sup>3</sup> .....	166	145	138	132	122	125	124	120	122	121	107	122	108
<b>Midwest Total</b> (does not include wood) .....	<b>3.70</b>	<b>3.48</b>	<b>2.96</b>	<b>3.09</b>	<b>2.61</b>	<b>2.80</b>	<b>2.73</b>	<b>2.81</b>	<b>3.13</b>	<b>3.22</b>	<b>2.86</b>	<b>2.91</b>	<b>2.91</b>
Natural Gas .....	2.53	2.48	2.05	2.22	1.78	1.99	1.83	1.88	2.07	2.20	1.84	1.72	1.75
Electricity <sup>3</sup> .....	.60	.59	.60	.56	.56	.55	.61	.66	.74	.75	.81	.94	.94
Distillate Fuel Oil and Kerosene .....	.46	.31	.17	.19	.16	.13	.16	.13	.13	.11	.06	.06	.03
Liquefied Petroleum Gases .....	.12	.10	.15	.13	.11	.13	.13	.13	.19	.17	.15	.18	.19
Wood <sup>4</sup> .....	NA	NA	.25	.25	.27	.27	.25	.17	.11	.08	.09	.13	.14
Consumption per Household (million Btu) <sup>3</sup> .....	180	168	141	146	122	129	123	122	134	134	117	113	112
<b>South Total</b> (does not include wood) .....	<b>2.43</b>	<b>2.30</b>	<b>2.57</b>	<b>2.41</b>	<b>2.45</b>	<b>2.50</b>	<b>2.61</b>	<b>2.60</b>	<b>2.95</b>	<b>3.01</b>	<b>3.21</b>	<b>3.25</b>	<b>3.22</b>
Natural Gas .....	.96	.91	1.12	1.15	1.14	1.15	1.09	1.03	1.18	1.13	1.13	.94	.94
Electricity <sup>3</sup> .....	1.00	.97	1.06	1.01	1.01	1.06	1.22	1.36	1.51	1.67	1.89	2.07	2.09
Distillate Fuel Oil and Kerosene .....	.32	.28	.25	.14	.18	.16	.17	.11	.13	.10	.08	.07	.05
Liquefied Petroleum Gases .....	.15	.14	.14	.12	.12	.12	.12	.10	.13	.12	.12	.18	.14
Wood <sup>4</sup> .....	NA	NA	.23	.21	.33	.33	.26	.17	.17	.12	.09	.12	.16
Consumption per Household (million Btu) <sup>3</sup> .....	99	92	95	87	87	85	84	81	88	84	83	80	76
<b>West Total</b> (does not include wood) .....	<b>1.54</b>	<b>1.47</b>	<b>1.34</b>	<b>1.42</b>	<b>1.33</b>	<b>1.45</b>	<b>1.42</b>	<b>1.51</b>	<b>1.55</b>	<b>1.63</b>	<b>1.63</b>	<b>1.87</b>	<b>1.82</b>
Natural Gas .....	.95	.88	.86	.90	.85	.91	.88	.92	.91	.93	.90	.98	.94
Electricity <sup>3</sup> .....	.48	.47	.41	.46	.41	.47	.48	.54	.56	.64	.66	.76	.79
Distillate Fuel Oil and Kerosene .....	.09	.09	.04	.03	.03	.04	.02	.02	.03	.03	.02	.03	.01
Liquefied Petroleum Gases .....	.03	.04	.04	.04	.04	.03	.05	.03	.04	.04	.06	.10	.08
Wood <sup>4</sup> .....	NA	NA	.11	.13	.13	.17	.17	.12	.12	.10	.10	.09	.10
Consumption per Household (million Btu) <sup>3</sup> .....	110	100	84	87	81	85	78	78	76	75	70	77	73

<sup>1</sup> Includes energy consumption in occupied primary housing units only, which differs from residential sector energy consumption.

<sup>2</sup> See Appendix C for map of Census regions.

<sup>3</sup> Retail electricity. One kilowatthour = 3,412 Btu.

<sup>4</sup> Wood is not included in the region and U.S. totals, or in the consumption-per-household data.

NA=Not available.

Notes: • Data are estimates, and are for major energy sources only. • For years not shown, there are

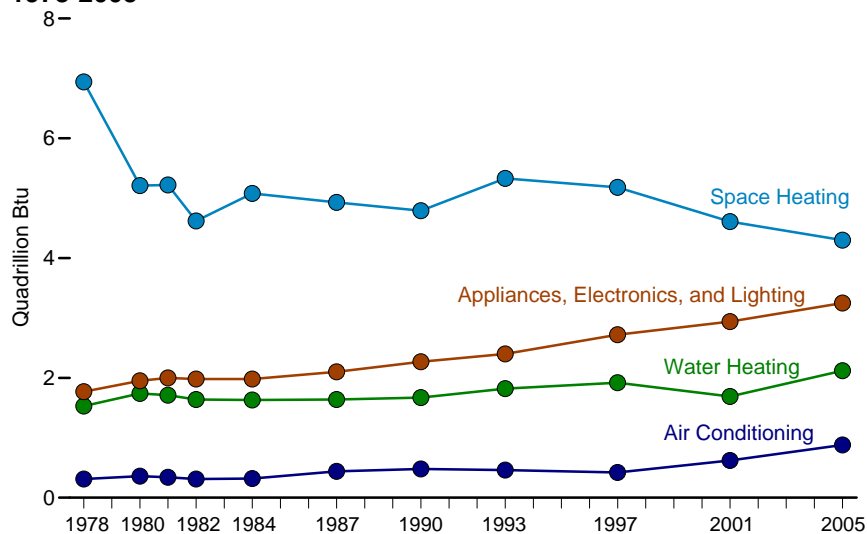
no data available. • Data for 1978–1984 are for April of year shown through March of following year; data for 1987 forward are for the calendar year. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/consumption/residential/>.

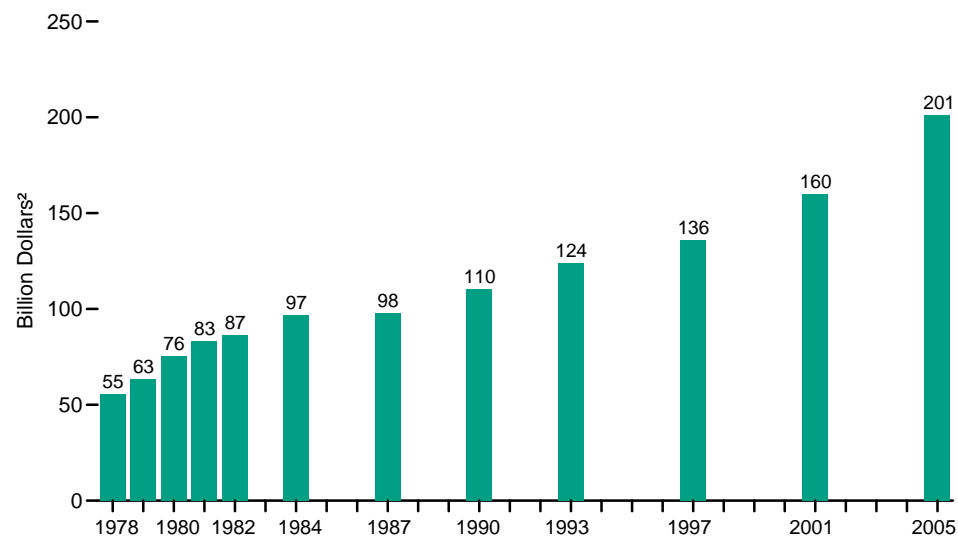
Sources: • 1978 and 1979—U.S. Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." • 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

**Figure 2.5 Household Energy Consumption and Expenditures**

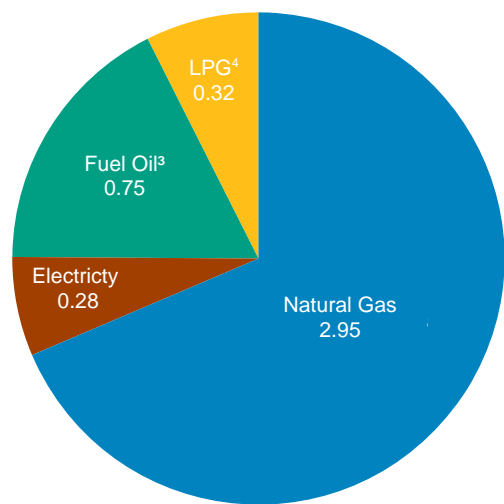
**Household Energy Consumption by End Use, Selected Years, 1978-2005<sup>1</sup>**



**Household Energy Expenditures, Selected Years, 1978-2005<sup>1</sup>**

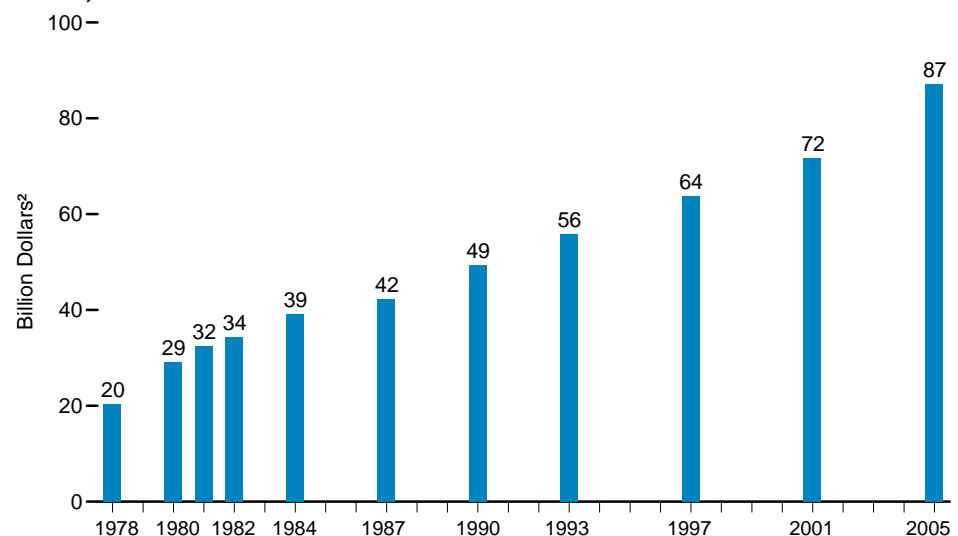


**Household Energy Consumption for Space Heating by Fuel 2005**



Total = 4.30 Quadrillion Btu

**Appliances, Electronics, and Lighting Expenditures, Selected Years, 1978-2005<sup>1</sup>**



<sup>4</sup>Liquefied petroleum gases.  
Source: Table 2.5.

<sup>1</sup> For years not shown, there are no data available.  
<sup>2</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.  
<sup>3</sup> Distillate fuel oil and kerosene.



**Table 2.5 Household <sup>1</sup> Energy Consumption and Expenditures by End Use, Selected Years, 1978-2005**

Year	Space Heating					Air Conditioning	Water Heating					Appliances, <sup>2</sup> Electronics, and Lighting			
	Natural Gas	Elec-tricity <sup>3</sup>	Fuel Oil <sup>4</sup>	LPG <sup>5</sup>	Total	Electricity <sup>3</sup>	Natural Gas	Elec-tricity <sup>3</sup>	Fuel Oil <sup>4</sup>	LPG <sup>5</sup>	Total	Natural Gas	Elec-tricity <sup>3</sup>	LPG <sup>5</sup>	Total
<b>Consumption (quadrillion Btu)</b>															
1978	4.26	0.40	2.05	0.23	6.94	0.31	1.04	0.29	0.14	0.06	1.53	0.28	1.46	0.03	1.77
1980	3.41	.27	1.30	.23	5.21	.36	1.15	.30	.22	.07	1.74	.36	1.54	.05	1.95
1981	3.69	.26	1.06	.21	5.22	.34	1.13	.30	.22	.06	1.71	.43	1.52	.05	2.00
1982	3.14	.25	1.04	.19	4.62	.31	1.15	.28	.15	.06	1.64	.43	1.50	.05	1.98
1984	3.51	.25	1.11	.21	5.08	.32	1.10	.32	.15	.06	1.63	.35	1.59	.04	1.98
1987	3.38	.28	1.05	.22	4.93	.44	1.10	.31	.17	.06	1.64	.34	1.72	.04	2.10
1990	3.37	.30	.93	.19	4.79	.48	1.16	.34	.11	.06	1.67	.33	1.91	.03	2.27
1993	3.67	.41	.95	.30	5.33	.46	1.31	.34	.12	.05	1.82	.29	2.08	.03	2.40
1997	3.61	.40	.91	.26	5.18	.42	1.29	.39	.16	.08	1.92	.37	2.33	.02	2.72
2001	3.32	.39	.62	.28	4.61	.62	1.15	.36	.13	.05	1.69	.37	2.52	.05	2.94
2005	2.95	.28	.75	.32	4.30	.88	1.41	.42	.14	.15	2.12	.43	2.77	.05	3.25
<b>Expenditures (billion nominal dollars <sup>6</sup>)</b>															
1978	11.49	3.53	8.06	1.05	24.13	3.97	2.88	3.15	0.56	0.36	6.95	0.93	19.24	0.25	20.42
1980	13.22	3.78	10.48	1.78	29.26	5.84	4.51	4.45	1.76	.57	11.29	1.91	26.74	.44	29.09
1981	16.62	3.93	9.44	1.78	31.77	6.23	5.13	4.94	1.94	.51	12.52	2.17	29.70	.52	32.39
1982	17.74	4.21	8.80	1.69	32.44	6.23	6.51	5.00	1.28	.54	13.33	2.58	31.29	.52	34.39
1984	20.66	4.62	8.51	2.00	35.79	7.06	6.63	6.44	1.09	.58	14.74	2.31	36.36	.54	39.21
1987	18.05	5.53	6.25	1.85	31.68	9.77	6.02	6.45	.94	.50	13.91	2.02	39.83	.46	42.31
1990	18.59	6.16	7.42	2.01	34.18	11.23	6.59	7.21	.83	.65	15.28	2.03	46.95	.48	49.46
1993	21.95	8.66	6.24	2.81	39.66	11.31	8.08	7.58	.74	.58	16.98	1.98	53.52	.42	55.92
1997	24.11	8.56	6.57	2.79	42.03	10.20	8.84	8.99	1.04	.89	19.76	2.86	60.57	.36	63.79
2001	31.84	8.98	5.66	4.04	50.52	15.94	11.31	8.47	1.15	.69	21.62	3.83	66.94	.86	71.63
2005	31.97	7.42	10.99	6.35	56.73	25.26	15.57	11.13	2.00	3.28	31.98	4.80	80.92	1.37	87.09

<sup>1</sup> Includes energy consumption in occupied primary housing units only, which differs from residential sector energy consumption.

<sup>2</sup> Includes refrigerators.

<sup>3</sup> Retail electricity. One kilowatthour=3,412 Btu.

<sup>4</sup> Distillate fuel oil and kerosene.

<sup>5</sup> Liquefied petroleum gases.

<sup>6</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

Notes: • 2009 data for this table were not available in time for publication. • Data are estimates.

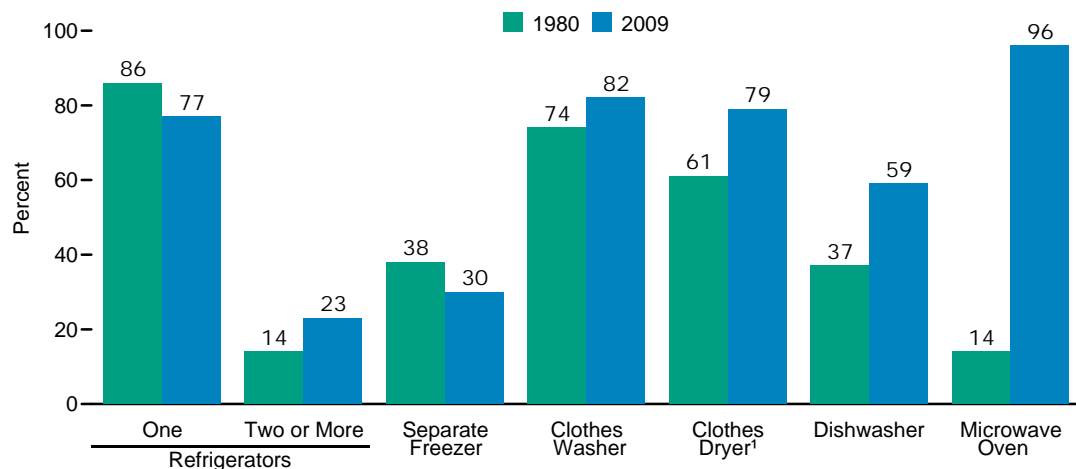
• For years not shown, there are no data available. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/consumption/residential/>.

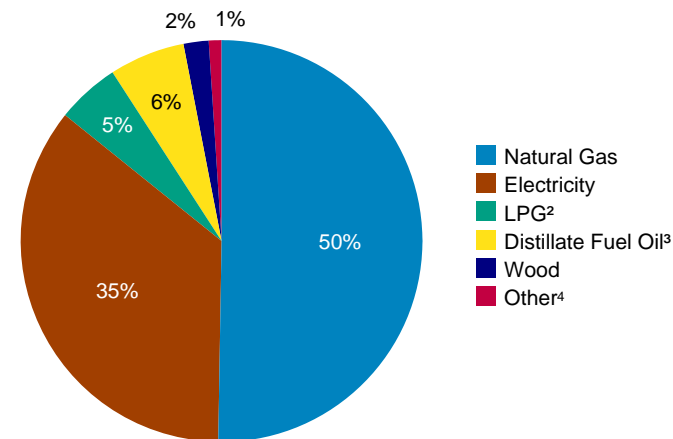
Sources: • 1978—U.S. Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." • 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

**Figure 2.6 Household End Uses: Fuel Types, Appliances, and Electronics**

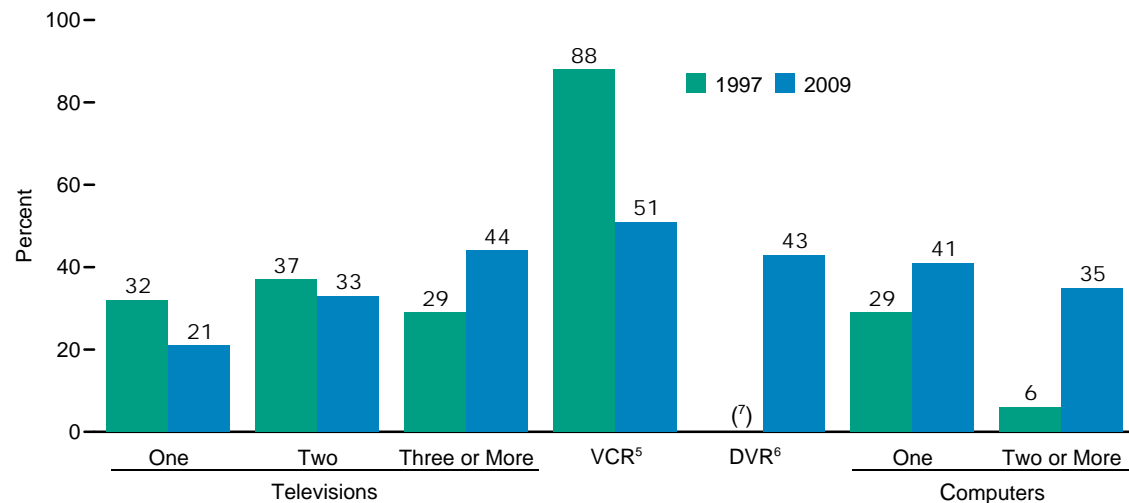
**Share of Households With Selected Appliances, 1980 and 2009**



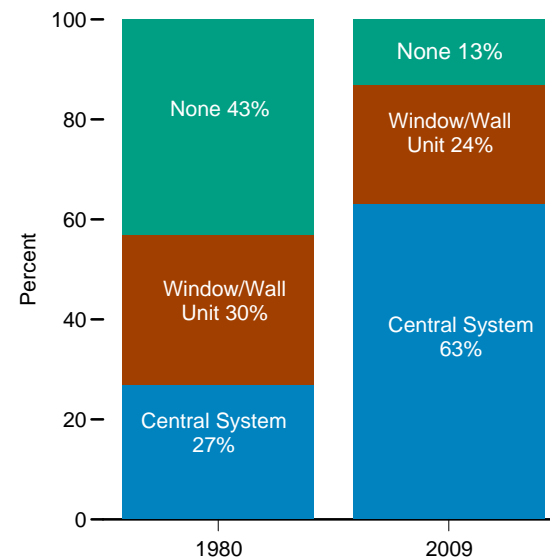
**Space Heating by Main Fuel, 2009**



**Share of Households With Selected Electronics, 1997 and 2009**



**Air-Conditioning Equipment, 1980 and 2009**



<sup>1</sup> Natural gas and electric.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Includes kerosene.

<sup>4</sup> Coal, solar, other fuel, or no heating equipment.

<sup>5</sup> Video Cassette Recorder.

<sup>6</sup> Digital Video Recorder.

<sup>7</sup> Not collected in 1997.

Note: Total may not equal sum of components due to independent rounding.

Source: Table 2.6.

**Table 2.6 Household End Uses: Fuel Types, Appliances, and Electronics, Selected Years, 1978-2009**

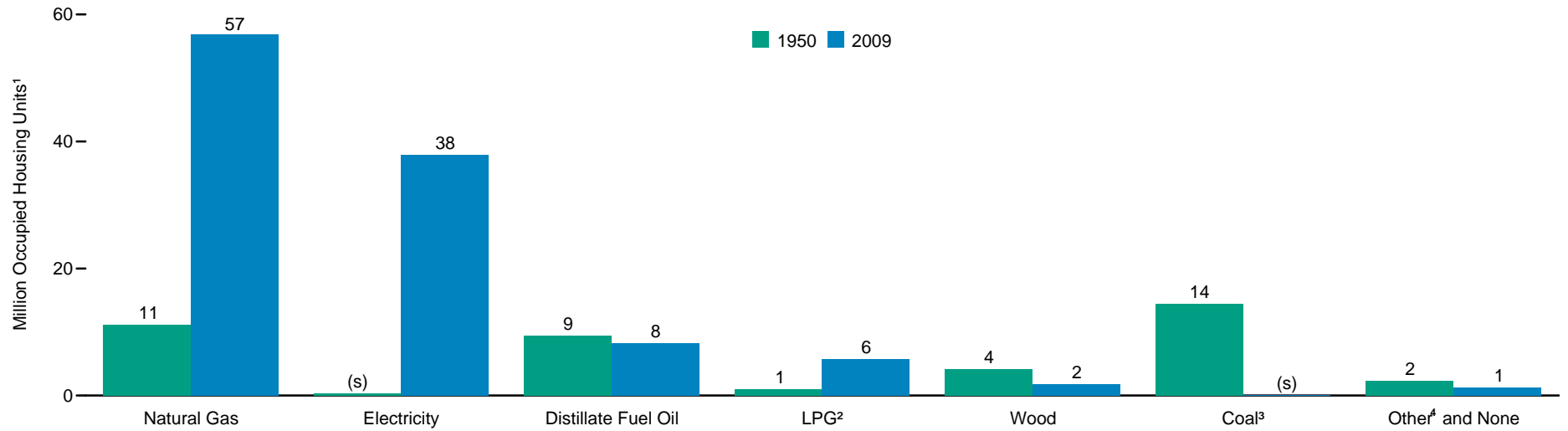
Appliance	Year													Change
	1978	1979	1980	1981	1982	1984	1987	1990	1993	1997	2001	2005	2009	1980 to 2009
<b>Total Households (millions)</b> .....	77	78	82	83	84	86	91	94	97	101	107	111	114	32
Percent of Households														
<b>Space Heating - Main Fuel <sup>1</sup></b>														
Natural Gas .....	55	55	55	56	57	55	55	55	53	52	55	52	50	-5
Electricity <sup>2</sup> .....	16	17	18	17	16	17	20	23	26	29	29	30	35	17
Liquefied Petroleum Gases .....	4	5	5	4	5	5	5	5	5	5	5	5	5	0
Distillate Fuel Oil <sup>3</sup> .....	20	17	15	14	13	12	12	11	11	9	7	7	6	-9
Wood .....	2	4	6	6	7	7	6	4	3	2	2	3	2	-4
Other <sup>4</sup> or No Equipment .....	3	2	2	3	3	3	3	2	2	2	2	3	1	-1
<b>Air Conditioning - Equipment</b>														
Central System <sup>5</sup> .....	23	24	27	27	28	30	34	39	44	47	55	59	63	36
Window/Wall Unit <sup>5</sup> .....	33	31	30	31	30	30	30	29	25	25	23	25	24	-6
None .....	44	45	43	42	42	40	36	32	32	28	23	16	13	-30
<b>Water Heating - Main Fuel</b>														
Natural Gas .....	55	55	54	55	56	54	54	53	53	52	54	53	51	-3
Electricity <sup>2</sup> .....	33	33	32	33	32	33	35	37	38	39	38	39	41	9
Liquefied Petroleum Gases .....	4	4	4	4	4	4	3	3	3	3	3	4	4	0
Distillate Fuel Oil <sup>3</sup> .....	8	7	9	7	7	6	6	5	5	5	4	4	3	-6
Other or No Water Heating .....	0	0	1	1	1	1	1	1	1	1	0	0	1	0
<b>Appliances</b>														
Refrigerator <sup>6</sup> .....	100	NA	100	100	100	100	100	100	100	100	100	100	100	0
One .....	86	NA	86	87	86	88	86	84	85	85	83	78	77	-9
Two or More .....	14	NA	14	13	13	12	14	15	15	15	17	22	23	9
Separate Freezer .....	35	NA	38	38	37	37	34	34	35	33	32	32	30	-8
Clothes Washer .....	74	NA	74	73	71	73	75	76	77	77	79	83	82	8
Clothes Dryer .....	59	NA	61	61	60	62	66	69	70	71	74	79	79	18
Natural Gas .....	14	NA	14	16	15	16	15	16	14	15	16	17	15	1
Electric .....	45	NA	47	45	45	46	51	53	57	55	57	61	63	16
Dishwasher .....	35	NA	37	37	36	38	43	45	45	50	53	58	59	22
Range/Stove/Oven .....	99	NA	99	100	99	99	99	100	100	99	100	99	99	0
Natural Gas .....	48	NA	46	46	47	46	43	42	33	35	35	35	34	-12
Electric .....	53	NA	57	56	56	57	60	59	63	62	62	62	60	3
Microwave Oven .....	8	NA	14	17	21	34	61	79	84	83	86	88	96	82
<b>Electronics</b>														
Television .....	NA	NA	98	98	98	98	98	99	99	99	99	99	99	1
One .....	NA	NA	47	51	49	46	40	35	34	32	27	21	21	-26
Two .....	NA	NA	38	34	35	34	35	36	36	37	36	35	33	-5
Three or More .....	NA	NA	14	14	15	18	23	28	28	29	36	43	44	30
Video Cassette Recorder (VCR) ....	NA	NA	NA	NA	NA	NA	NA	NA	NA	88	<sup>7</sup> 90	80	51	NA
Digital Video Recorder (DVR) .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43	NA
Computer .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	35	56	68	76	NA
One .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	29	42	45	41	NA
Two or More .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	15	23	35	NA
Printer .....	NA	NA	NA	NA	NA	NA	NA	NA	5	12	49	59	60	NA

<sup>1</sup> Includes households that have but do not use space heating equipment.  
<sup>2</sup> Retail (delivered) electricity.  
<sup>3</sup> Includes kerosene.  
<sup>4</sup> Coal, solar, or other fuels.  
<sup>5</sup> Households with both a central system and a window or wall unit are counted only under "Central System." Includes households that have but do not use air conditioning equipment.  
<sup>6</sup> Fewer than 0.5 percent of the households do not have a refrigerator.  
<sup>7</sup> The 2001 "Residential Energy Consumption Survey (RECS)" only had one question for VCRs and

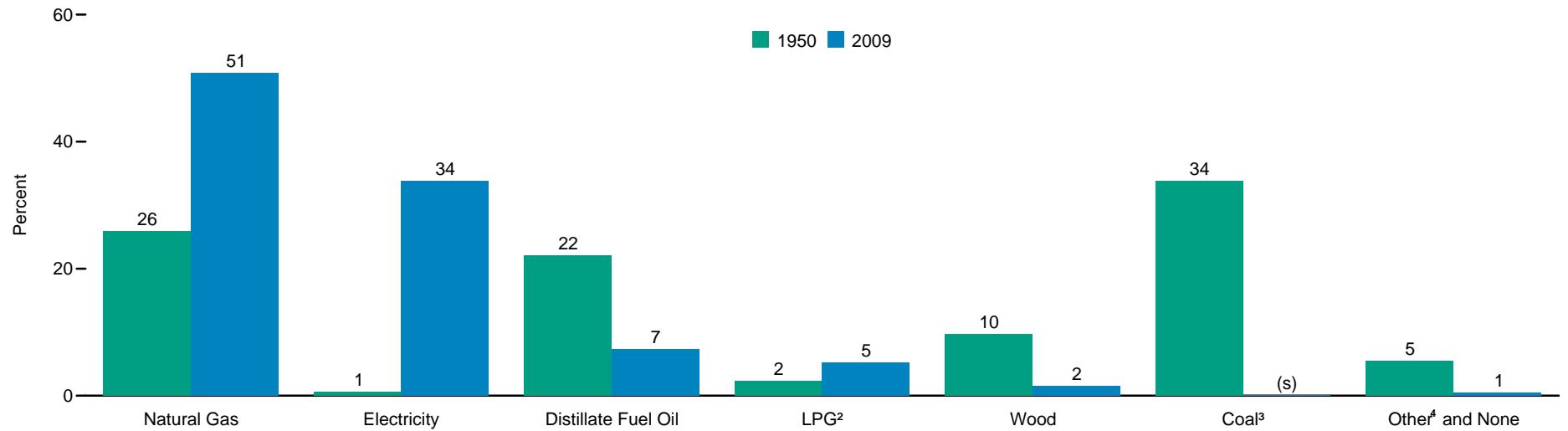
DVD players.  
 NA=Not available.  
 Notes: • Data are estimates. • For years not shown, there are no data available. • Totals may not equal sum of components due to independent rounding.  
 Web Page: For related information, see <http://www.eia.gov/consumption/residential/>.  
 Sources: • 1978 and 1979—U.S. Energy Information Administration (EIA), Form EIA-84, "RECS."  
 • 1980 forward—EIA, Form EIA-457, "RECS."

**Figure 2.7 Type of Heating in Occupied Housing Units, 1950 and 2009**

**By Fuel Type**



**By Fuel Type, Share of Total**



<sup>1</sup> Sum of components do not equal total due to independent rounding.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Includes coal coke.

<sup>4</sup> Kerosene, solar, and other.

(s)=Less than 0.5.

Source: Table 2.7.

**Table 2.7 Type of Heating in Occupied Housing Units, Selected Years, 1950-2009**

Year	Coal <sup>1</sup>	Distillate Fuel Oil	Kerosene	Liquefied Petroleum Gases	Natural Gas	Electricity	Wood	Solar	Other <sup>2</sup>	None <sup>3</sup>	Total
Million Occupied Housing Units											
1950	14.48	9.46	( <sup>4</sup> )	0.98	11.12	0.28	4.17	NA	0.77	1.57	42.83
1960	6.46	17.16	( <sup>4</sup> )	2.69	22.85	.93	2.24	NA	.22	.48	53.02
1970	1.82	16.47	( <sup>4</sup> )	3.81	35.01	4.88	.79	NA	.27	.40	63.45
1973	.80	17.24	( <sup>4</sup> )	4.42	38.46	7.21	.60	NA	.15	.45	69.34
1975	.57	16.30	( <sup>4</sup> )	4.15	40.93	9.17	.85	NA	.08	.47	72.52
1977	.45	15.62	.44	4.18	41.54	11.15	1.24	NA	.15	.51	75.28
1979	.36	15.30	.41	4.13	43.32	13.24	1.14	NA	.10	.57	78.57
1981	.36	14.13	.37	4.17	46.08	15.49	1.89	NA	.10	.59	83.18
1983 <sup>5</sup>	.43	12.59	.45	3.87	46.70	15.68	4.09	NA	.16	.68	84.64
1985	.45	12.44	1.06	3.58	45.33	18.36	6.25	.05	.37	.53	88.43
1987	.41	12.74	1.08	3.66	45.96	20.61	5.45	.05	.28	.66	90.89
1989	.34	12.47	1.07	3.66	47.40	23.06	4.59	.04	.40	.66	93.68
1991	.32	11.47	.99	3.88	47.02	23.71	4.44	.03	.41	.86	93.15
1993	.30	11.17	1.02	3.92	47.67	25.11	4.10	.03	.50	.91	94.73
1995	.21	10.98	1.06	4.25	49.20	26.77	3.53	.02	.64	1.04	97.69
1997	.18	10.10	.75	5.40	51.05	29.20	1.79	.03	.36	.62	99.49
1999	.17	10.03	.72	5.91	52.37	31.14	1.70	.02	.21	.54	102.80
2001 <sup>6</sup>	.13	9.81	.65	6.04	54.13	32.41	1.67	.02	.19	.39	105.44
2003	.13	9.50	.64	6.13	54.93	32.34	1.56	.02	.16	.44	105.84
2005	.10	9.38	.55	6.23	56.32	34.26	1.41	.02	.21	.40	108.87
2007	.09	8.74	.57	6.10	56.68	36.08	1.47	.02	.46	.48	110.69
2009	.10	8.21	.60	5.82	56.81	37.85	1.78	.01	.24	.38	111.81
Percent											
1950	33.8	22.1	( <sup>4</sup> )	2.3	26.0	0.6	9.7	NA	1.8	3.7	100.0
1960	12.2	32.4	( <sup>4</sup> )	5.1	43.1	1.8	4.2	NA	.4	.9	100.0
1970	2.9	26.0	( <sup>4</sup> )	6.0	55.2	7.7	1.3	NA	.4	.6	100.0
1973	1.2	24.9	( <sup>4</sup> )	6.4	55.5	10.4	.9	NA	.2	.7	100.0
1975	.8	22.5	( <sup>4</sup> )	5.7	56.4	12.6	1.2	NA	.1	.6	100.0
1977	.6	20.7	.6	5.6	55.2	14.8	1.6	NA	.2	.7	100.0
1979	.5	19.5	.5	5.3	55.1	16.9	1.4	NA	.1	.7	100.0
1981	.4	17.0	.4	5.0	55.4	18.6	2.3	NA	.1	.7	100.0
1983 <sup>5</sup>	.5	14.9	.5	4.6	55.2	18.5	4.8	NA	.2	.8	100.0
1985	.5	14.1	1.2	4.1	51.3	20.8	7.1	.1	.4	.6	100.0
1987	.4	14.0	1.2	4.0	50.6	22.7	6.0	.1	.3	.7	100.0
1989	.4	13.3	1.1	3.9	50.6	24.6	4.9	(s)	.4	.7	100.0
1991	.3	12.3	1.1	4.2	50.5	25.5	4.8	(s)	.4	.9	100.0
1993	.3	11.8	1.1	4.1	50.3	26.5	4.3	(s)	.5	1.0	100.0
1995	.2	11.2	1.1	4.4	50.4	27.4	3.6	(s)	.7	1.1	100.0
1997	.2	10.2	.8	5.4	51.3	29.4	1.8	(s)	.4	.6	100.0
1999	.2	9.8	.7	5.7	50.9	30.3	1.7	(s)	.2	.5	100.0
2001 <sup>6</sup>	.1	9.3	.6	5.7	51.3	30.7	1.6	(s)	.2	.4	100.0
2003	.1	9.0	.6	5.8	51.9	30.6	1.5	(s)	.1	.4	100.0
2005	.1	8.6	.5	5.7	51.7	31.5	1.3	(s)	.2	.4	100.0
2007	.1	7.9	.5	5.5	51.2	32.6	1.3	(s)	.4	.4	100.0
2009	.1	7.3	.5	5.2	50.8	33.9	1.6	(s)	.2	.3	100.0

<sup>1</sup> Includes coal coke.

<sup>2</sup> Includes briquettes (made of pitch and sawdust), coal dust, waste material (such as corncobs), purchased steam, and other fuels not separately displayed.

<sup>3</sup> In 1950 and 1960, also includes nonreporting units, which totaled 997 and 2,000 units, respectively.

<sup>4</sup> Included in "Distillate Fuel Oil."

<sup>5</sup> Beginning in 1983, the *American Housing Survey for the United States* has been a biennial survey.

<sup>6</sup> Beginning in 2001, data are consistent with the 2000 Census. For 2001 data consistent with the 1990 Census, see *American Housing Survey for the United States: 2001*.

NA=Not available. (s)=Less than 0.05 percent.

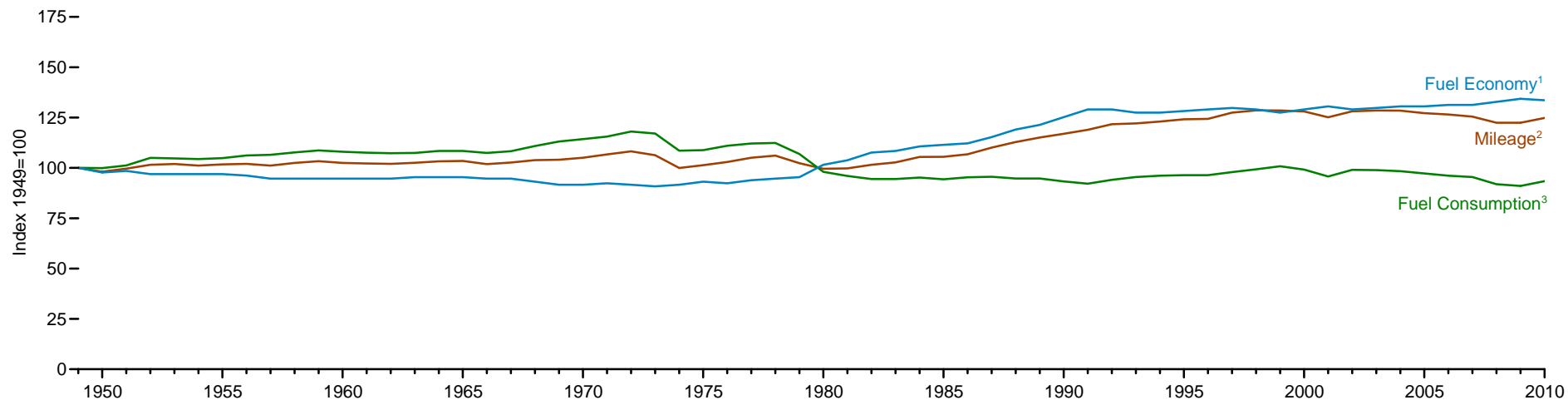
Notes: • Includes mobile homes and individual housing units in apartment buildings. Housing units with more than one type of heating system are classified according to the principal type of heating system. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#consumption> for all data beginning in 1950. • For related information, see <http://www.census.gov/hhes/www/ahs.html>.

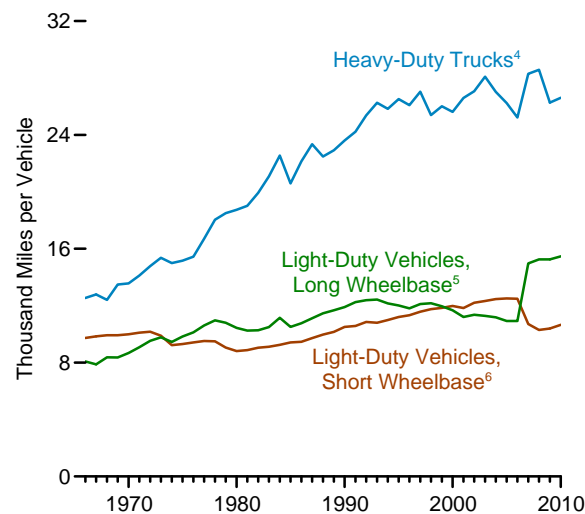
Sources: • 1950, 1960, and 1970—Bureau of the Census, *Census of Population and Housing*. • 1973-1981—Bureau of the Census, *American Housing Survey for the United States*, annual surveys, Table 2-5. • 1983 forward—Bureau of the Census, *American Housing Survey for the United States*, biennial surveys, Table 2-5.

**Figure 2.8 Motor Vehicle Mileage, Fuel Consumption, and Fuel Economy**

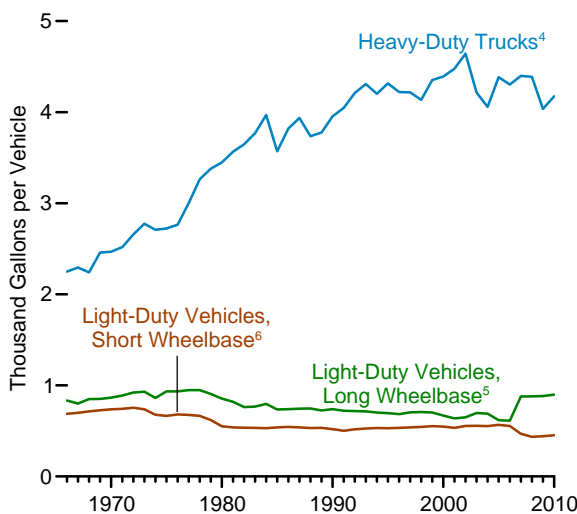
**All Motor Vehicles, 1949-2010**



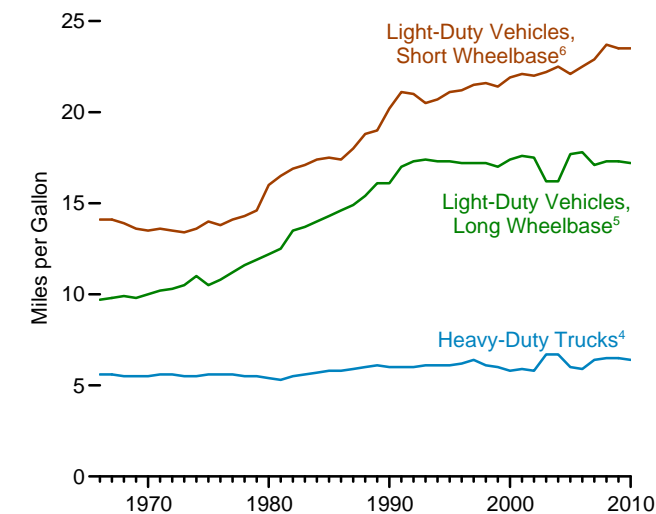
**Mileage, 1966-2010**



**Fuel Consumption, 1966-2010**



**Fuel Economy, 1966-2010**



<sup>1</sup> Miles per gallon.

<sup>2</sup> Miles per vehicle.

<sup>3</sup> Gallons per vehicle.

<sup>4</sup> Through 2006, data are for single-unit trucks with 2 axles and 6 or more tires, and combination trucks. Beginning in 2007, data are for single-unit trucks with 2 axles and 6 or more tires or a gross vehicle weight rating exceeding 10,000 pounds, and combination trucks.

<sup>5</sup> Through 2006, data are for vans, pickup trucks, sport utility vehicles, and a small number of trucks with 2 axles and 4 tires, such as step vans. Beginning in 2007, data are for large passenger cars, vans, pickup trucks, and sport utility vehicles with a wheelbase larger than 121 inches.

<sup>6</sup> Through 2006, data are for passenger cars (and, through 1989, for motorcycles). Beginning in 2007, data are for passenger cars, light trucks, vans, and sport utility vehicles with a wheelbase equal to or less than 121 inches.

Source: Table 2.8.

**Table 2.8 Motor Vehicle Mileage, Fuel Consumption, and Fuel Economy, Selected Years, 1949-2010**

Year	Light-Duty Vehicles, Short Wheelbase <sup>1</sup>			Light-Duty Vehicles, Long Wheelbase <sup>2</sup>			Heavy-Duty Trucks <sup>3</sup>			All Motor Vehicles <sup>4</sup>		
	Mileage	Fuel Consumption	Fuel Economy	Mileage	Fuel Consumption	Fuel Economy	Mileage	Fuel Consumption	Fuel Economy	Mileage	Fuel Consumption	Fuel Economy
	Miles per Vehicle	Gallons per Vehicle	Miles per Gallon	Miles per Vehicle	Gallons per Vehicle	Miles per Gallon	Miles per vehicle	Gallons per vehicle	Miles per Gallon	Miles per Vehicle	Gallons per Vehicle	Miles per Gallon
1949	9,388	627	15.0	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )	9,712	1,080	9.0	9,498	726	13.1
1950	9,060	603	15.0	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )	10,316	1,229	8.4	9,321	725	12.8
1955	9,447	645	14.6	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )	10,576	1,293	8.2	9,661	761	12.7
1960	9,518	668	14.3	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )	10,693	1,333	8.0	9,732	784	12.4
1965	9,603	661	14.5	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )	10,851	1,387	7.8	9,826	787	12.5
1970	9,989	737	13.5	8,676	866	10.0	13,565	2,467	5.5	9,976	830	12.0
1975	9,309	665	14.0	9,829	934	10.5	15,167	2,722	5.6	9,627	790	12.2
1976	9,418	681	13.8	10,127	934	10.8	15,438	2,764	5.6	9,774	806	12.1
1977	9,517	676	14.1	10,607	947	11.2	16,700	3,002	5.6	9,978	814	12.3
1978	9,500	665	14.3	10,968	948	11.6	18,045	3,263	5.5	10,077	816	12.4
1979	9,062	620	14.6	10,802	905	11.9	18,502	3,380	5.5	9,722	776	12.5
1980	8,813	551	16.0	10,437	854	12.2	18,736	3,447	5.4	9,458	712	13.3
1981	8,873	538	16.5	10,244	819	12.5	19,016	3,565	5.3	9,477	697	13.6
1982	9,050	535	16.9	10,276	762	13.5	19,931	3,647	5.5	9,644	686	14.1
1983	9,118	534	17.1	10,497	767	13.7	21,083	3,769	5.6	9,760	686	14.2
1984	9,248	530	17.4	11,151	797	14.0	22,550	3,967	5.7	10,017	691	14.5
1985	9,419	538	17.5	10,506	735	14.3	20,597	3,570	5.8	10,020	685	14.6
1986	9,464	543	17.4	10,764	738	14.6	22,143	3,821	5.8	10,143	692	14.7
1987	9,720	539	18.0	11,114	744	14.9	23,349	3,937	5.9	10,453	694	15.1
1988	9,972	531	18.8	11,465	745	15.4	22,485	3,736	6.0	10,721	688	15.6
1989	10,157	533	19.0	11,676	724	16.1	22,926	3,776	6.1	10,932	688	15.9
1990	10,504	520	20.2	11,902	738	16.1	23,603	3,953	6.0	11,107	677	16.4
1991	10,571	501	21.1	12,245	721	17.0	24,229	4,047	6.0	11,294	669	16.9
1992	10,857	517	21.0	12,381	717	17.3	25,373	4,210	6.0	11,558	683	16.9
1993	10,804	527	20.5	12,430	714	17.4	26,262	4,309	6.1	11,595	693	16.7
1994	10,992	531	20.7	12,156	701	17.3	25,838	4,202	6.1	11,683	698	16.7
1995	11,203	530	21.1	12,018	694	17.3	26,514	4,315	6.1	11,793	700	16.8
1996	11,330	534	21.2	11,811	685	17.2	26,092	4,221	6.2	11,813	700	16.9
1997	11,581	539	21.5	12,115	703	17.2	27,032	4,218	6.4	12,107	711	17.0
1998	11,754	544	21.6	12,173	707	17.2	25,397	4,135	6.1	12,211	721	16.9
1999	11,848	553	21.4	11,957	701	17.0	26,014	4,352	6.0	12,206	732	16.7
2000	11,976	547	21.9	11,672	669	17.4	25,617	4,391	5.8	12,164	720	16.9
2001	11,831	534	22.1	11,204	636	17.6	26,602	4,477	5.9	11,887	695	17.1
2002	12,202	555	22.0	11,364	650	17.5	27,071	4,642	5.8	12,171	719	16.9
2003	12,325	556	22.2	11,287	697	16.2	28,093	4,215	6.7	12,208	718	17.0
2004	12,460	553	22.5	11,184	690	16.2	27,023	4,057	6.7	12,200	714	17.1
2005	12,510	567	22.1	10,920	617	17.7	26,235	4,385	6.0	12,082	706	17.1
2006	12,485	554	22.5	10,920	612	17.8	25,231	4,304	5.9	12,017	698	17.2
2007	<sup>1,R</sup> 10,710	<sup>1,R</sup> 468	<sup>1,R</sup> 22.9	<sup>2,R</sup> 14,970	<sup>2,R</sup> 877	<sup>2,R</sup> 17.1	<sup>3,R</sup> 28,290	<sup>3,R</sup> 4,398	<sup>3,R</sup> 6.4	<sup>R</sup> 11,915	693	17.2
2008	<sup>R</sup> 10,290	<sup>R</sup> 435	<sup>R</sup> 23.7	<sup>R</sup> 15,256	<sup>R</sup> 880	<sup>R</sup> 17.3	<sup>R</sup> 28,573	<sup>R</sup> 4,387	<sup>R</sup> 6.5	<sup>R</sup> 11,631	667	17.4
2009	10,391	442	23.5	15,252	882	17.3	26,274	4,037	6.5	11,631	661	17.6
2010 <sup>P</sup>	10,649	453	23.5	15,463	898	17.2	26,609	4,174	6.4	11,853	678	17.5

<sup>1</sup> Through 2006, data are for passenger cars (and, through 1989, for motorcycles). Beginning in 2007, data are for passenger cars, light trucks, vans, and sport utility vehicles with a wheelbase equal to or less than 121 inches.

<sup>2</sup> Through 2006, data are for vans, pickup trucks, sport utility vehicles, and a small number of trucks with 2 axles and 4 tires, such as step vans. Beginning in 2007, data are for large passenger cars, vans, pickup trucks, and sport utility vehicles with a wheelbase larger than 121 inches.

<sup>3</sup> Through 2006, data are for single-unit trucks with 2 axles and 6 or more tires, and combination trucks. Beginning in 2007, data are for single-unit trucks with 2 axles and 6 or more tires or a gross vehicle weight rating exceeding 10,000 pounds, and combination trucks.

<sup>4</sup> Includes buses and motorcycles, which are not separately displayed.

<sup>5</sup> Included in "Heavy-Duty Trucks."

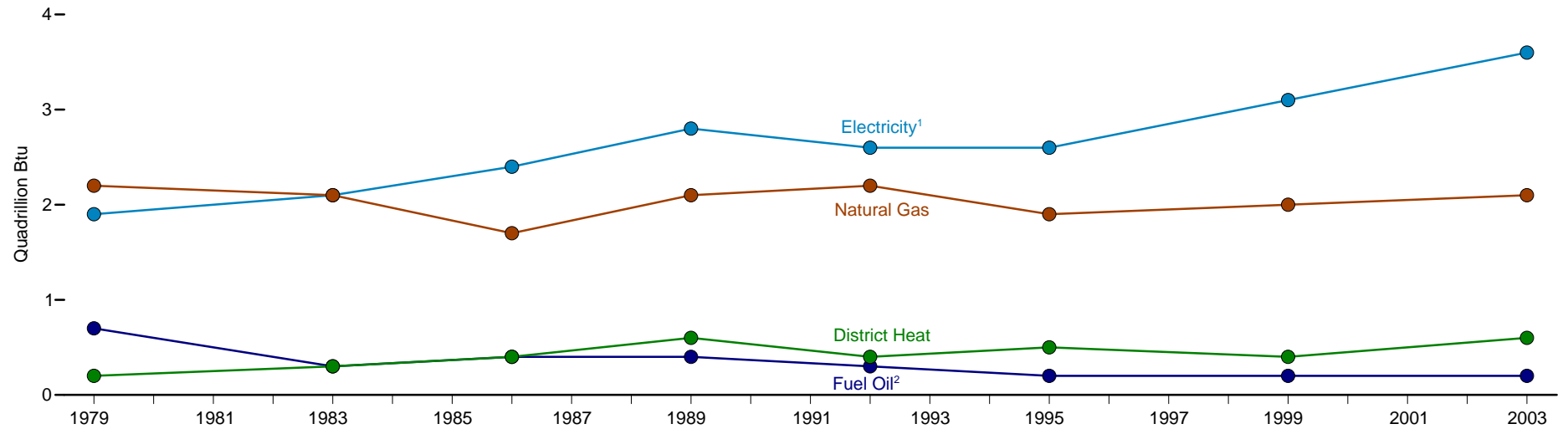
R=Revised. P=Preliminary.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#consumption> for all data beginning in 1949. • For related information, see <http://www.fhwa.dot.gov/policyinformation/statistics.cfm>.

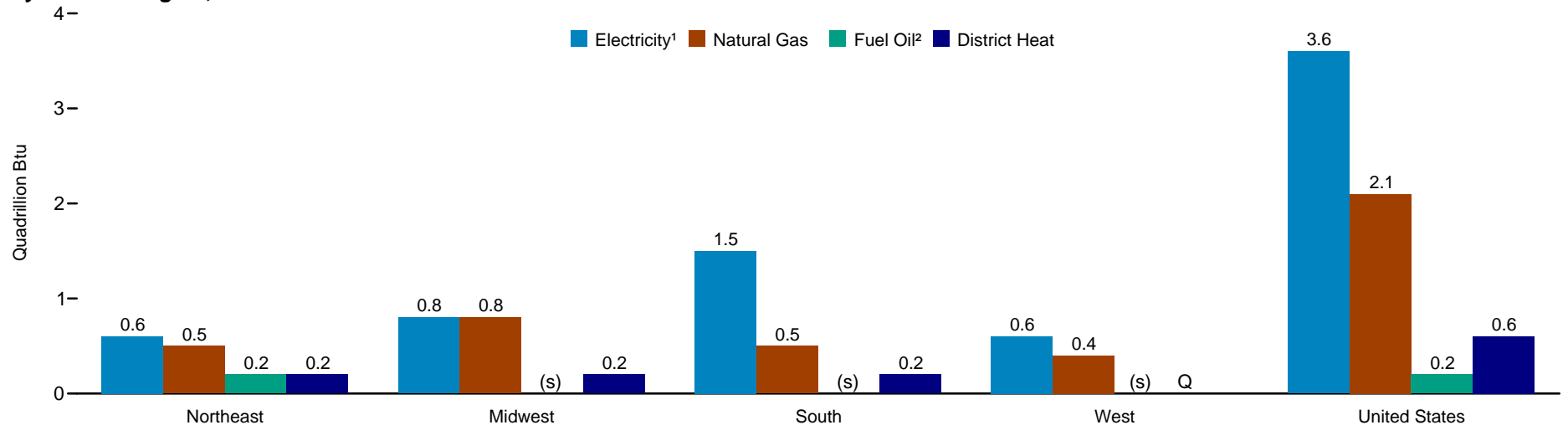
Sources: **Light-Duty Vehicles, Short Wheelbase, 1990-1994:** U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 1998*, Table 4-13. **All Other Data:** • 1949-1994—Federal Highway Administration (FHWA), *Highway Statistics Summary to 1995*, Table VM-201A. • 1995 forward—FHWA, *Highway Statistics*, annual reports, Table VM-1.

**Figure 2.9 Commercial Buildings Consumption by Energy Source**

**By Survey Year, 1979-2003**



**By Census Region, 2003**



<sup>1</sup> Electricity only; excludes electrical system energy losses.

<sup>2</sup> Distillate fuel oil, residual fuel oil, and kerosene.

(s)=Less than 0.05 quadrillion Btu.

Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

Note: See Appendix C for map of Census regions.

Source: Table 2.9.



**Table 2.9 Commercial Buildings Consumption by Energy Source, Selected Years, 1979-2003**  
(Trillion Btu)

Energy Source and Year	Square Footage Category			Principal Building Activity								Census Region <sup>1</sup>				All Buildings
	1,001 to 10,000	10,001 to 100,000	Over 100,000	Education	Food Sales	Food Service	Health Care	Lodging	Mercantile and Service	Office	All Other	Northeast	Midwest	South	West	
<b>Major Sources <sup>2</sup></b>																
1979	1,255	2,202	1,508	511	( <sup>3</sup> )	336	469	278	894	861	1,616	1,217	1,826	1,395	526	4,965
1983	1,242	1,935	1,646	480	( <sup>3</sup> )	414	463	362	812	1,018	1,274	858	1,821	1,462	682	4,823
1986	1,273	2,008	1,696	633	147	247	456	299	985	1,008	1,202	1,037	1,585	1,459	896	4,977
1989	1,259	2,402	2,127	704	139	255	449	425	1,048	1,230	1,538	1,354	1,659	1,648	1,126	5,788
1992	1,258	2,301	1,932	637	137	307	403	463	892	1,247	1,404	1,090	1,578	1,825	998	5,490
1995 <sup>4</sup>	1,332	2,152	1,838	614	137	332	561	461	973	1,019	1,225	1,035	1,497	1,684	1,106	5,321
1999	1,381	2,300	2,053	649	201	447	515	450	1,145	1,089	1,237	1,116	1,509	1,961	1,147	5,733
2003	1,248	2,553	2,721	820	251	427	594	510	1,333	1,134	1,455	1,396	1,799	2,265	1,063	6,523
<b>Electricity <sup>5</sup></b>																
1979	429	872	608	163	( <sup>3</sup> )	171	129	119	361	424	543	425	593	662	227	1,908
1983	469	903	758	152	( <sup>3</sup> )	212	147	151	426	509	532	324	673	801	331	2,129
1986	654	927	809	179	99	121	132	120	536	641	563	430	584	867	510	2,390
1989	572	1,145	1,056	217	105	113	154	138	550	781	715	586	609	975	604	2,773
1992	586	991	1,033	235	113	138	138	189	444	704	649	419	622	1,002	566	2,609
1995 <sup>4</sup>	618	1,064	926	221	119	166	211	187	508	676	521	436	558	1,027	587	2,608
1999	698	1,235	1,164	257	165	216	232	196	659	767	606	543	662	1,247	645	3,098
2003	685	1,405	1,469	371	208	217	248	235	883	719	679	587	799	1,542	631	3,559
<b>Natural Gas</b>																
1979	646	996	532	214	( <sup>3</sup> )	145	221	115	422	272	784	443	1,007	470	255	2,174
1983	684	809	597	246	( <sup>3</sup> )	188	218	170	327	365	576	278	978	523	311	2,091
1986	485	715	523	254	45	114	205	105	332	258	409	244	742	426	311	1,723
1989	568	836	670	323	27	128	186	187	417	238	566	353	831	498	391	2,073
1992	572	1,017	586	291	24	157	189	193	381	388	552	354	747	697	376	2,174
1995 <sup>4</sup>	535	830	580	245	18	158	258	213	395	239	420	297	750	528	371	1,946
1999	604	803	616	227	31	216	217	181	446	219	486	299	709	618	396	2,023
2003	482	909	709	268	39	203	243	215	403	269	460	462	751	527	360	2,100
<b>Fuel Oil <sup>6</sup></b>																
1979	177	272	231	107	( <sup>3</sup> )	15	97	20	103	107	232	285	133	237	26	681
1983	85	140	90	61	( <sup>3</sup> )	Q	28	18	43	75	79	172	28	104	Q	314
1986	114	206	121	103	Q	Q	Q	20	105	39	130	270	63	86	23	442
1989	101	170	86	71	Q	Q	17	10	76	43	122	237	61	50	Q	357
1992	86	111	75	62	Q	Q	21	16	55	47	67	194	26	48	Q	272
1995 <sup>4</sup>	71	104	60	57	Q	Q	21	Q	49	28	70	168	16	45	7	235
1999	29	73	60	48	Q	Q	19	Q	18	29	65	138	5	29	8	179
2003	71	74	83	47	Q	Q	11	35	41	18	68	181	24	15	9	228
<b>District Heat <sup>7</sup></b>																
1979	Q	61	136	27	( <sup>3</sup> )	Q	22	24	Q	58	57	64	93	Q	Q	201
1983	Q	83	202	21	( <sup>3</sup> )	Q	70	22	Q	68	87	84	141	34	30	289
1986	Q	159	243	97	Q	Q	80	Q	12	71	99	94	196	81	51	422
1989	19	252	315	Q	Q	Q	92	Q	Q	167	134	179	159	126	121	585
1992	Q	182	238	49	NC	Q	55	65	Q	109	135	123	183	78	51	435
1995 <sup>4</sup>	Q	154	271	91	Q	Q	70	57	Q	75	214	135	173	83	Q	533
1999	Q	158	213	117	Q	Q	46	68	Q	74	126	136	132	67	98	433
2003	Q	165	460	134	NC	Q	Q	Q	Q	128	247	166	225	182	Q	636

<sup>1</sup> See Appendix C for map of Census regions.

<sup>2</sup> Includes electricity, natural gas, fuel oil, and district heat.

<sup>3</sup> Included in "Food Service."

<sup>4</sup> Beginning in 1995, excludes commercial buildings at multi-building manufacturing facilities, and parking garages.

<sup>5</sup> Electricity only; excludes electricity system energy losses.

<sup>6</sup> Distillate fuel oil, residual fuel oil, and kerosene.

<sup>7</sup> Through 1983, includes purchased steam only. Beginning in 1986, includes purchased and non-purchased steam and hot water.

Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20

buildings were sampled. NC=No cases in the sample.

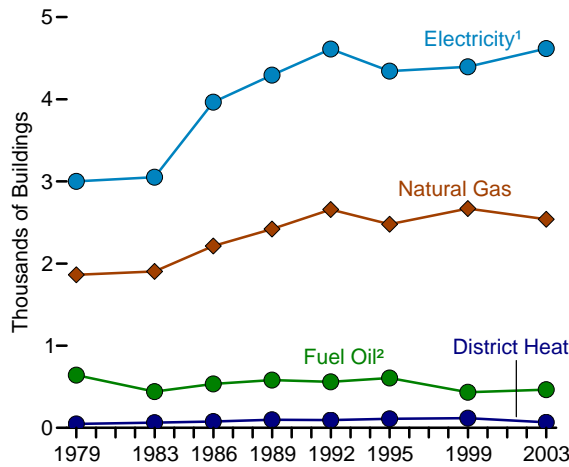
Note: Data are estimates. Statistics for individual fuels are for all buildings using each fuel. Statistics for "Major Sources" are for the sum of "Electricity," "Natural Gas," "Fuel Oil," and "District Heat," across all buildings using any of those fuels.

Web Page: For related information, see <http://www.eia.gov/consumption/commercial/>.

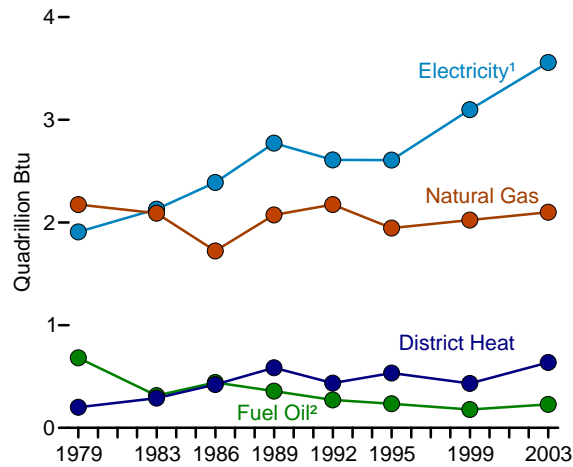
Sources: • 1979—U.S. Energy Information Administration (EIA), Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 forward—EIA, Form EIA-871A-F, "Commercial Buildings Energy Consumption Survey."

**Figure 2.10 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-2003**

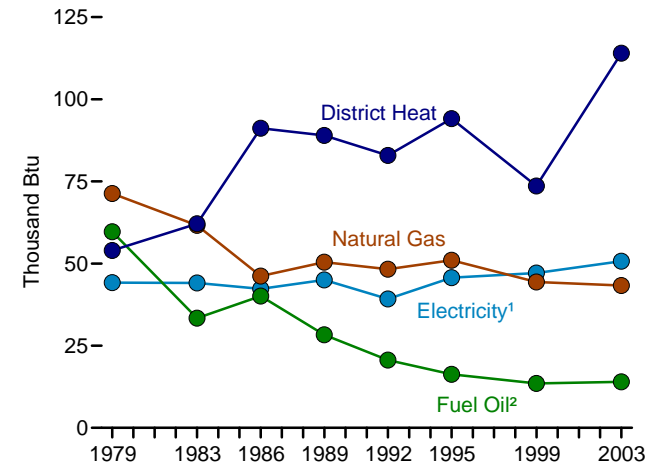
**Buildings by Energy Source Used**



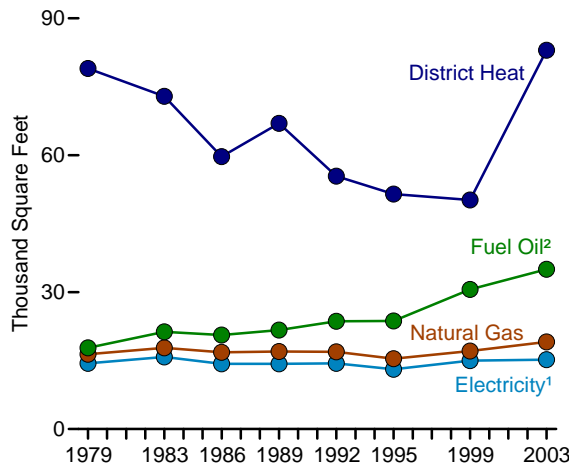
**Consumption**



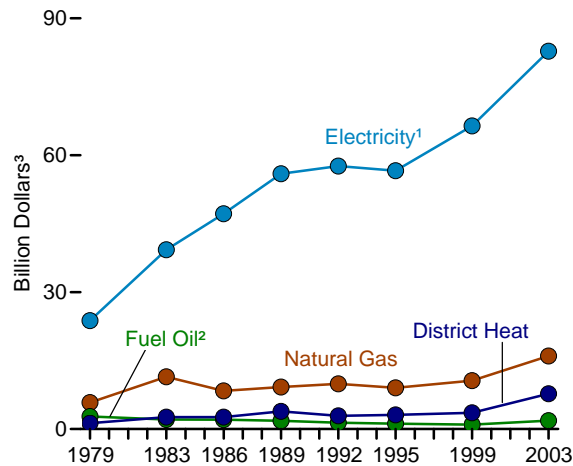
**Consumption per Square Foot**



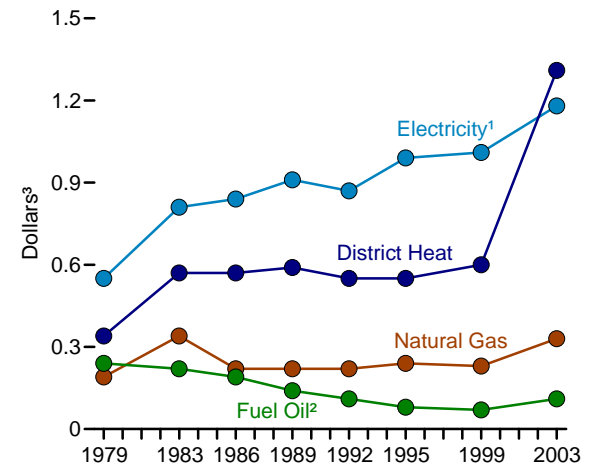
**Square Footage per Building by Energy Source Used**



**Expenditures**



**Expenditures Per Square Foot**



<sup>1</sup> Electricity only; excludes electrical system energy losses.

<sup>2</sup> Distillate fuel oil, residual fuel oil, and kerosene.

<sup>3</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

Note: For years not shown, there are no data available.

Source: Table 2.10.

**Table 2.10 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-2003**

Energy Source and Year	Building Characteristics			Energy Consumption				Energy Expenditures			
	Number of Buildings	Total Square Feet	Square Feet per Building	Total	Per Building	Per Square Foot	Per Employee	Total	Per Building	Per Square Foot	Per Million Btu
	Thousands	Millions	Thousands	Trillion Btu	Million Btu	Thousand Btu	Million Btu	Million Dollars <sup>1</sup>	Thousand Dollars <sup>1</sup>	Dollars <sup>1</sup>	Dollars <sup>1</sup>
<b>Major Sources <sup>2</sup></b>											
1979 .....	3,073	43,546	14.2	5,008	1,630	115.0	85.0	33,821	11.0	0.78	6.75
1983 .....	3,185	49,471	15.5	4,856	1,525	98.2	65.7	55,764	17.5	1.13	11.48
1986 .....	4,154	58,199	14.0	5,040	1,213	86.6	68.6	60,762	14.6	1.04	12.06
1989 .....	4,528	63,184	14.0	5,788	1,278	91.6	81.9	70,826	15.6	1.12	12.24
1992 .....	4,806	67,876	14.1	5,490	1,142	80.9	77.1	71,821	14.9	1.06	13.08
1995 <sup>3</sup> .....	4,579	58,772	12.8	5,321	1,162	90.5	69.3	69,918	15.3	1.19	13.14
1999 .....	4,657	67,338	14.5	5,733	1,231	85.1	70.0	81,552	17.5	1.21	14.22
2003 .....	4,859	71,658	14.7	6,523	1,342	91.0	( <sup>5</sup> )	107,897	22.2	1.51	16.54
<b>Electricity <sup>4</sup></b>											
1979 .....	3,001	43,153	14.4	1,908	636	44.2	32.4	23,751	7.9	.55	12.45
1983 .....	3,052	48,327	15.8	2,129	697	44.1	28.9	39,279	12.9	.81	18.45
1986 .....	3,965	56,508	14.3	2,390	603	42.3	32.7	47,186	11.9	.84	19.74
1989 .....	4,294	61,563	14.3	2,773	646	45.0	39.3	55,943	13.0	.91	20.17
1992 .....	4,611	66,525	14.4	2,609	566	39.2	36.6	57,619	12.5	.87	22.09
1995 <sup>3</sup> .....	4,343	57,076	13.1	2,608	600	45.7	34.1	56,621	13.0	.99	21.71
1999 .....	4,395	65,716	15.0	3,098	706	47.1	37.9	66,424	15.1	1.01	21.44
2003 .....	4,617	70,181	15.2	3,559	771	50.7	( <sup>5</sup> )	82,783	17.9	1.18	23.26
<b>Natural Gas</b>											
1979 .....	1,864	30,477	16.4	2,174	1,167	71.3	52.5	5,814	3.1	.19	2.67
1983 .....	1,904	33,935	17.8	2,091	1,098	61.6	40.6	11,443	6.0	.34	5.47
1986 .....	2,214	37,263	16.8	1,723	778	46.2	35.2	8,355	3.8	.22	4.85
1989 .....	2,420	41,143	17.0	2,073	857	50.4	43.2	9,204	3.8	.22	4.44
1992 .....	2,657	44,994	16.9	2,174	818	48.3	42.5	9,901	3.7	.22	4.55
1995 <sup>3</sup> .....	2,478	38,145	15.4	1,946	785	51.0	38.7	9,018	3.6	.24	4.63
1999 .....	2,670	45,525	17.1	2,023	758	44.4	36.0	10,609	4.0	.23	5.24
2003 .....	2,538	48,473	19.1	2,100	828	43.3	( <sup>5</sup> )	16,010	6.3	.33	7.62
<b>Fuel Oil <sup>6</sup></b>											
1979 .....	641	11,397	17.8	681	1,063	59.7	40.5	2,765	4.3	.24	4.06
1983 .....	441	9,409	21.3	314	714	33.4	19.8	2,102	4.8	.22	6.68
1986 .....	534	11,005	20.6	442	827	40.1	27.7	2,059	3.9	.19	4.66
1989 .....	581	12,600	21.7	357	614	28.3	21.0	1,822	3.1	.14	5.11
1992 .....	560	13,215	23.6	272	487	20.6	15.1	1,400	2.5	.11	5.14
1995 <sup>3</sup> .....	607	14,421	23.7	235	387	16.3	10.2	1,175	1.9	.08	5.00
1999 .....	434	13,285	30.6	179	412	13.5	9.1	956	2.2	.07	5.35
2003 .....	465	16,265	35.0	228	490	14.0	( <sup>5</sup> )	1,826	3.9	.11	8.01
<b>District Heat <sup>7</sup></b>											
1979 .....	47	3,722	79.0	201	4,267	54.0	26.5	1,267	26.9	.34	6.30
1983 .....	64	4,643	72.9	289	4,530	62.1	34.4	2,627	41.2	.57	9.10
1986 .....	77	4,625	59.7	422	5,446	91.2	52.4	2,620	33.8	.57	6.21
1989 .....	98	6,578	67.0	585	5,964	89.0	56.5	3,857	39.3	.59	6.59
1992 .....	95	5,245	55.4	435	4,596	82.9	60.9	2,901	30.7	.55	6.67
1995 <sup>3</sup> .....	110	5,658	51.5	533	4,849	94.1	51.2	3,103	28.3	.55	5.83
1999 .....	117	5,891	50.2	433	3,692	73.6	50.1	3,564	30.4	.60	8.23
2003 .....	67	5,576	83.0	636	9,470	114.0	( <sup>5</sup> )	7,279	108.4	1.31	11.45

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Includes electricity, natural gas, fuel oil, and district heat.

<sup>3</sup> Beginning in 1995, excludes commercial buildings at multi-building manufacturing facilities, and parking garages.

<sup>4</sup> Electricity only; excludes electricity system energy losses.

<sup>5</sup> Total number of employees not collected in 2003.

<sup>6</sup> Distillate fuel oil, residual fuel oil, and kerosene.

<sup>7</sup> Through 1983, includes purchased steam only. Beginning in 1986, includes purchased and

non-purchased steam and hot water.

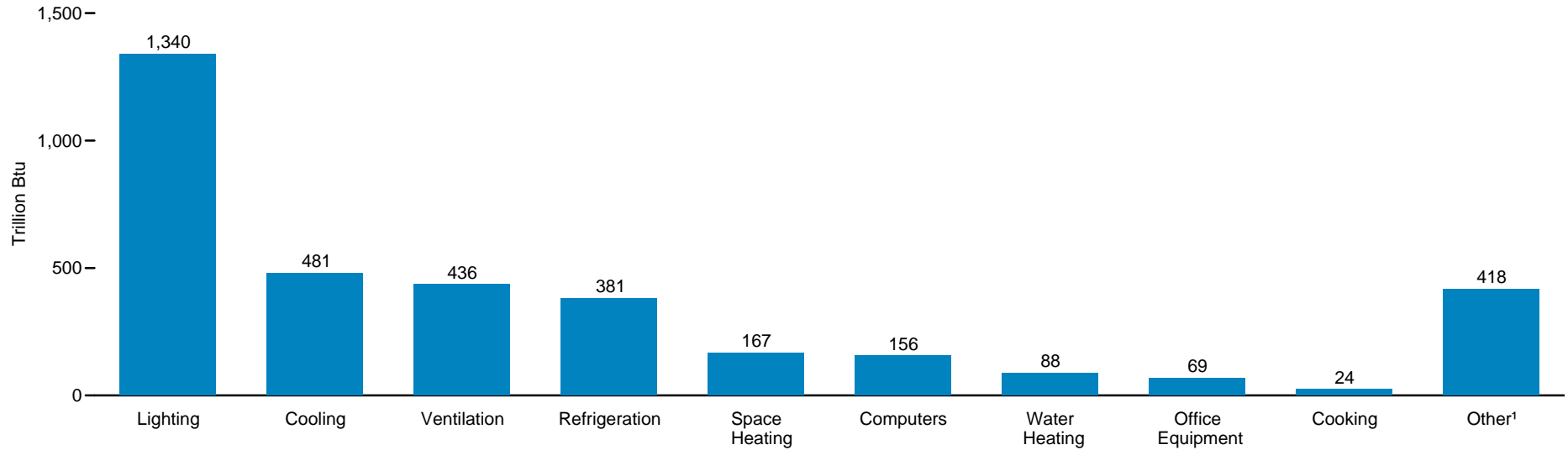
Note: Data are estimates. Statistics for individual fuels are for all buildings using each fuel. Statistics for major sources are for all buildings, even buildings using no major fuel.

Web Page: For related information, see <http://www.eia.gov/consumption/commercial/>.

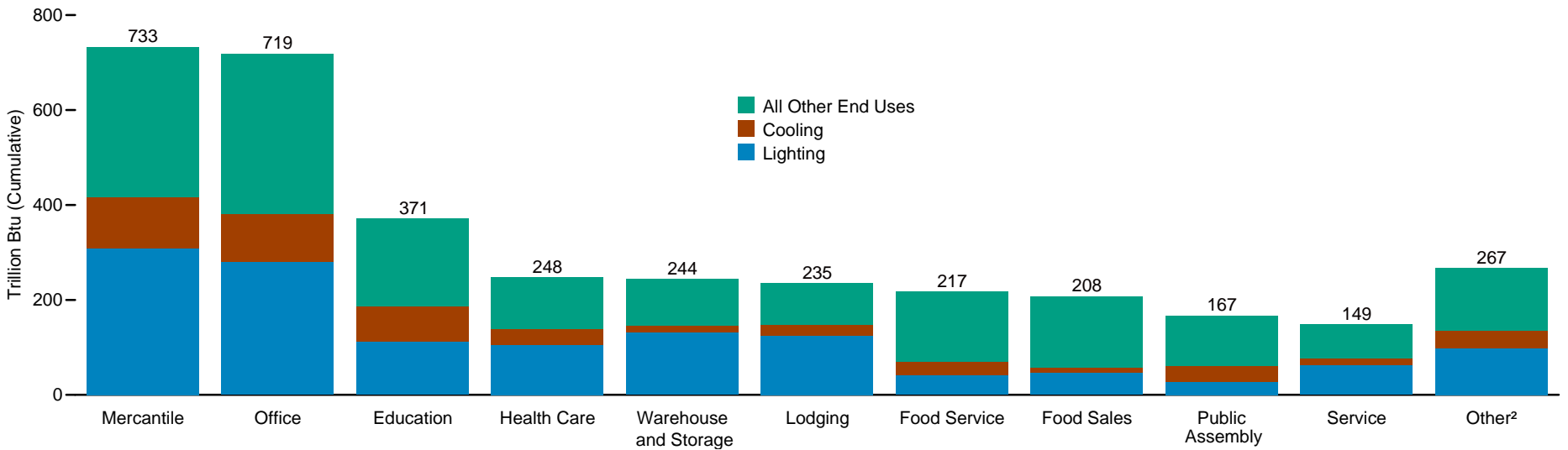
Sources: • 1979—U.S. Energy Information Administration (EIA), Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 forward—EIA, Form EIA-871A-F, "Commercial Buildings Energy Consumption Survey."

**Figure 2.11 Commercial Buildings Electricity Consumption by End Use, 2003**

**By End Use**



**By Principal Building Activity**



<sup>1</sup> Examples of "other" include medical, electronic, and testing equipment; conveyors, wrappers, hoists, and compactors; washers, disposals, dryers, and cleaning equipment; escalators, elevators, dumb waiters, and window washers; shop tools and electronic testing equipment; sign motors, time clocks, vending machines, phone equipment, and sprinkler controls; scoreboards, fire alarms, intercoms, television sets, radios, projectors, and door operators.

<sup>2</sup> Religious worship, public order and safety, vacant, and buildings that do not fit into any of the other named categories.

Note: Data are estimates for electricity consumption, excluding electrical system energy losses.

Source: Table 2.11.

**Table 2.11 Commercial Buildings Electricity Consumption by End Use, 2003**

(Trillion Btu)

End Use	Space Heating	Cooling	Ventilation	Water Heating	Lighting	Cooking	Refrigeration	Office Equipment	Computers	Other <sup>1</sup>	Total
<b>All Buildings</b> .....	167	481	436	88	1,340	24	381	69	156	418	3,559
<b>Principal Building Activity</b>											
Education .....	15	74	83	11	113	2	16	4	32	21	371
Food Sales .....	6	12	7	Q	46	2	119	2	2	10	208
Food Service .....	10	28	24	10	42	13	70	2	2	15	217
Health Care .....	6	34	42	2	105	1	8	4	10	36	248
Inpatient .....	3	25	38	2	76	1	4	2	7	21	178
Outpatient .....	3	9	4	(s)	28	(s)	4	2	3	15	69
Lodging .....	14	24	14	12	124	2	12	Q	6	24	235
Mercantile .....	58	109	68	38	308	2	49	8	11	83	733
Retail (Other Than Mall) .....	6	25	16	2	111	(s)	22	3	4	22	211
Enclosed and Strip Malls .....	52	84	51	36	197	2	27	5	8	61	523
Office .....	33	101	63	7	281	1	35	32	74	91	719
Public Assembly .....	5	35	63	(s)	27	(s)	9	Q	3	23	167
Public Order and Safety .....	2	8	10	3	18	(s)	3	1	2	10	57
Religious Worship .....	3	11	5	(s)	17	(s)	6	(s)	1	18	62
Service .....	6	15	24	(s)	63	Q	9	1	3	28	149
Warehouse and Storage .....	5	13	20	2	132	Q	36	2	5	30	244
Other <sup>2</sup> .....	2	16	11	Q	59	Q	10	Q	5	22	133
Vacant .....	1	2	1	Q	4	Q	(s)	Q	(s)	7	15

<sup>1</sup> Examples of "other" include medical, electronic, and testing equipment; conveyors, wrappers, hoists, and compactors; washers, disposals, dryers and cleaning equipment; escalators, elevators, dumb waiters, and window washers; shop tools and electronic testing equipment; sign motors, time clocks, vending machines, phone equipment, and sprinkler controls; scoreboards, fire alarms, intercoms, television sets, radios, projectors, and door operators.

<sup>2</sup> Includes buildings that do not fit into any of the other named categories.

(s)=Less than 0.5 trillion Btu. Q=Data withheld because either the relative standard error was greater

than 50 percent or fewer than 20 buildings were sampled.

Notes: • Data are estimates for electricity consumption, excluding electrical system energy losses.

• One kilowatthour = 3,412 Btu.

Web Page: For related information, see <http://www.eia.gov/consumption/commercial/>.

Source: U.S. Energy Information Administration, "Commercial Buildings Energy Consumption Survey 2003," Table E3A.

## Energy Consumption by Sector

**Note. Electrical System Energy Losses.** Electrical system energy losses are calculated as the difference between total primary consumption by the electric power sector—see Table 2.1f—and the total energy content of electricity retail sales—see Tables 8.9 and A6. Most of these losses occur at steam-electric power plants (conventional and nuclear) in the conversion of heat energy into mechanical energy to turn electric generators. The loss is a thermodynamically necessary feature of the steam-electric cycle. Part of the energy input-to-output

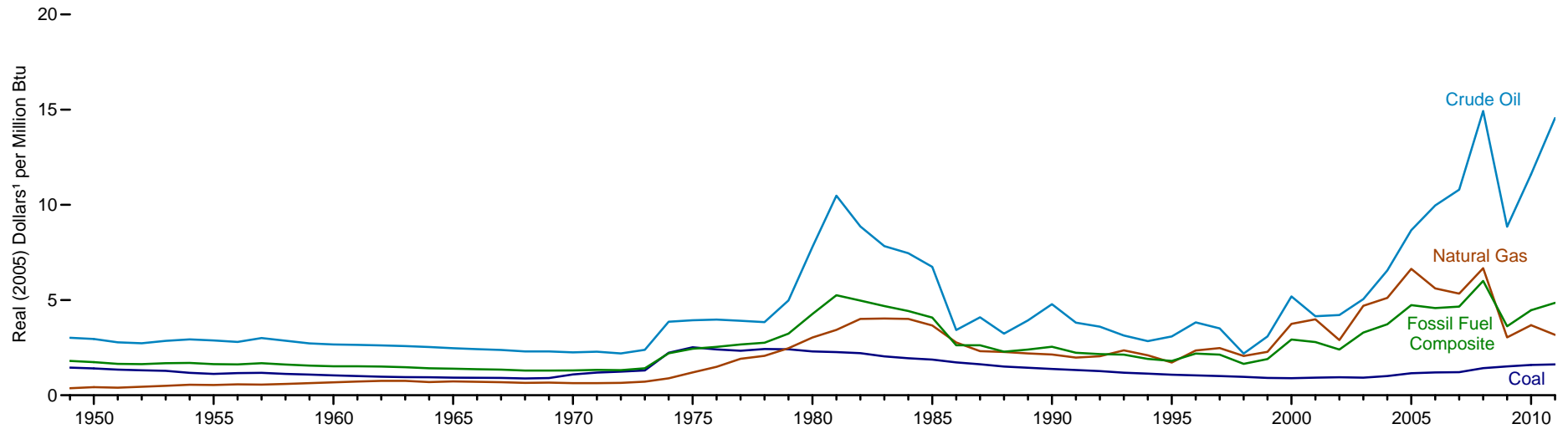
losses is a result of imputing fossil energy equivalent inputs for hydroelectric, geothermal, solar thermal, photovoltaic, and wind energy sources. In addition to conversion losses, other losses included power plant use of electricity, transmission and distribution of electricity from power plants to end-use consumers (also called “line losses”), and unaccounted for electricity. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity sales. Overall, about two thirds of total energy input is lost in conversion. Currently, of electricity generated, approximately 5 percent is lost in plant use and 7 percent is lost in transmission and distribution.

## **3. Financial Indicators**

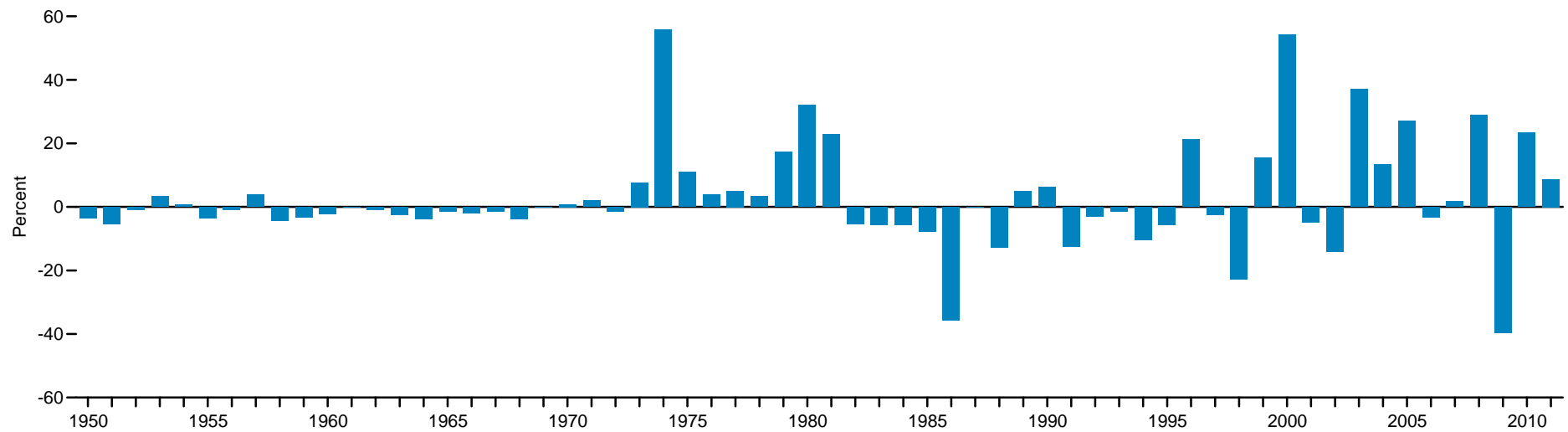
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### Figure 3.1 Fossil Fuel Production Prices

#### Prices, 1949-2011



#### Fossil Fuel Composite Price,<sup>2</sup> Change From Previous Year, 1950-2011



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>2</sup> Based on real prices in chained (2005) dollars. See "Chained Dollars" in Glossary. Source: Table 3.1.



**Table 3.1 Fossil Fuel Production Prices, Selected Years, 1949-2011**

(Dollars per Million Btu)

Year	Coal <sup>1</sup>		Natural Gas <sup>2</sup>		Crude Oil <sup>3</sup>		Fossil Fuel Composite <sup>4</sup>		
	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Percent Change <sup>7</sup>
1949	0.21	1.45	0.05	0.37	0.44	3.02	0.26	1.81	--
1950	.21	1.41	.06	.43	.43	R2.95	.26	1.74	-3.6
1955	.19	1.12	.09	.54	.48	2.88	.27	R1.63	-3.6
1960	.19	1.04	.13	.68	.50	2.67	.28	1.52	-2.3
1965	.18	.92	.15	.73	.49	R2.47	.28	1.39	-1.5
1970	.27	1.09	.15	.63	.55	R2.25	.32	1.31	.8
1975	.85	2.52	.40	1.20	1.32	3.94	.82	2.45	10.9
1976	.86	2.41	.53	R1.49	1.41	3.98	.90	2.54	3.8
1977	.88	2.34	.72	R1.91	1.48	3.91	1.01	2.67	5.1
1978	.98	2.43	.84	2.07	1.55	3.84	1.12	2.76	3.4
1979	1.06	R2.41	1.08	2.47	2.18	4.98	1.42	R3.23	17.3
1980	1.10	2.30	1.45	3.03	3.72	R7.79	2.04	R4.27	32.1
1981	1.18	R2.26	1.80	R3.43	5.48	R10.48	R2.74	R5.25	22.9
1982	1.23	2.21	2.22	4.01	4.92	8.87	2.76	R4.97	-5.3
1983	1.18	R2.04	2.32	4.03	4.52	R7.83	2.70	R4.68	-5.8
1984	1.16	1.95	2.40	4.01	4.46	R7.46	2.65	R4.42	-5.6
1985	1.15	1.87	2.26	R3.66	4.15	R6.74	2.51	4.08	-7.8
1986	1.09	R1.72	1.75	R2.77	2.16	R3.42	1.65	R2.62	-35.6
1987	1.05	R1.62	1.50	2.32	2.66	4.10	1.70	R2.62	(s)
1988	1.01	1.51	1.52	R2.27	2.17	3.24	1.53	2.29	-12.8
1989	1.00	1.44	1.53	R2.19	2.73	3.93	1.67	2.40	5.0
1990	1.00	1.38	1.55	2.14	3.45	4.78	1.84	2.55	6.2
1991	.99	R1.32	1.48	1.98	2.85	R3.81	1.67	2.23	-12.5
1992	.97	1.27	1.57	2.05	2.76	3.60	1.66	R2.16	-3.1
1993	.93	R1.18	1.84	2.36	2.46	3.14	1.67	2.13	-1.4
1994	.91	R1.13	1.67	R2.09	2.27	R2.84	1.53	1.91	-10.4
1995	.88	1.08	1.40	1.72	2.52	3.09	1.47	R1.80	-5.5
1996	.87	1.04	1.96	R2.35	3.18	3.83	1.82	2.19	21.3
1997	.85	1.01	2.10	2.48	2.97	3.51	1.81	R2.13	-2.5
1998	.83	R.96	1.77	2.07	1.87	2.19	1.41	1.65	-22.8
1999	.79	.91	1.98	2.28	2.68	3.09	1.65	1.90	15.4
2000	.80	.90	3.32	3.75	4.61	R5.19	2.60	2.93	54.2
2001	.84	.92	3.62	3.99	3.77	4.15	2.53	2.79	-4.8
2002	.87	.94	2.67	2.90	3.88	4.21	2.21	2.40	-14.1
2003	.87	.93	R4.42	R4.70	4.75	5.05	R3.10	3.29	R37.2
2004	.98	1.01	4.95	5.11	6.34	6.55	3.61	3.73	R13.4
2005	1.16	1.16	6.64	6.64	8.67	8.67	4.74	4.74	R27.0
2006	1.24	1.20	5.79	5.61	10.29	9.97	4.73	4.58	-3.3
2007	1.29	1.21	R5.67	R5.34	11.47	R10.80	4.95	R4.66	R1.8
2008	1.55	1.42	7.25	6.67	16.21	14.93	6.52	6.01	R28.9
2009	1.67	1.52	3.33	3.04	9.72	R8.85	3.97	3.62	-39.7
2010	1.77	R1.59	R4.08	R3.68	12.88	R11.61	R4.96	R4.47	R23.4
2011 <sup>P</sup>	1.83	1.62	3.60	3.18	16.51	14.56	5.50	4.85	8.7

<sup>1</sup> Free-on-board (F.O.B.) rail/barge prices, which are the F.O.B. prices of coal at the point of first sale, excluding freight or shipping and insurance costs. See "Free on Board (F.O.B.)\*" in Glossary.

<sup>2</sup> Wellhead prices (converted to dollars per million Btu using marketed production heat contents). See "Natural Gas Wellhead Price" in Glossary.

<sup>3</sup> Domestic first purchase prices. See "Crude Oil Domestic First Purchase Price" in Glossary.

<sup>4</sup> Derived by multiplying the price per Btu of each fossil fuel by the total Btu content of the production of each fossil fuel and dividing this accumulated value of total fossil fuel production by the accumulated Btu content of total fossil fuel production.

<sup>5</sup> See "Nominal Dollars" in Glossary.

<sup>6</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>7</sup> Based on real values.

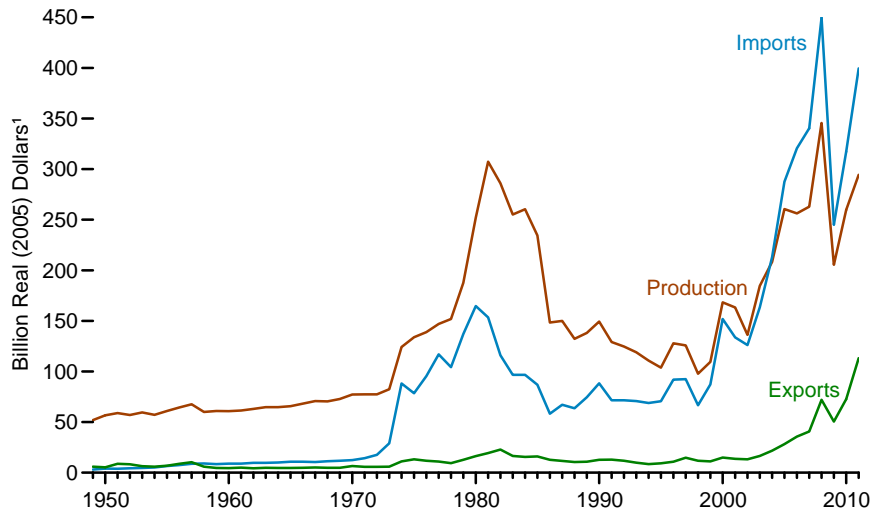
R=Revised. P=Preliminary. -- = Not applicable. (s)=Less than 0.05 percent and greater than -0.05 percent.

Web Page: For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#financial>.

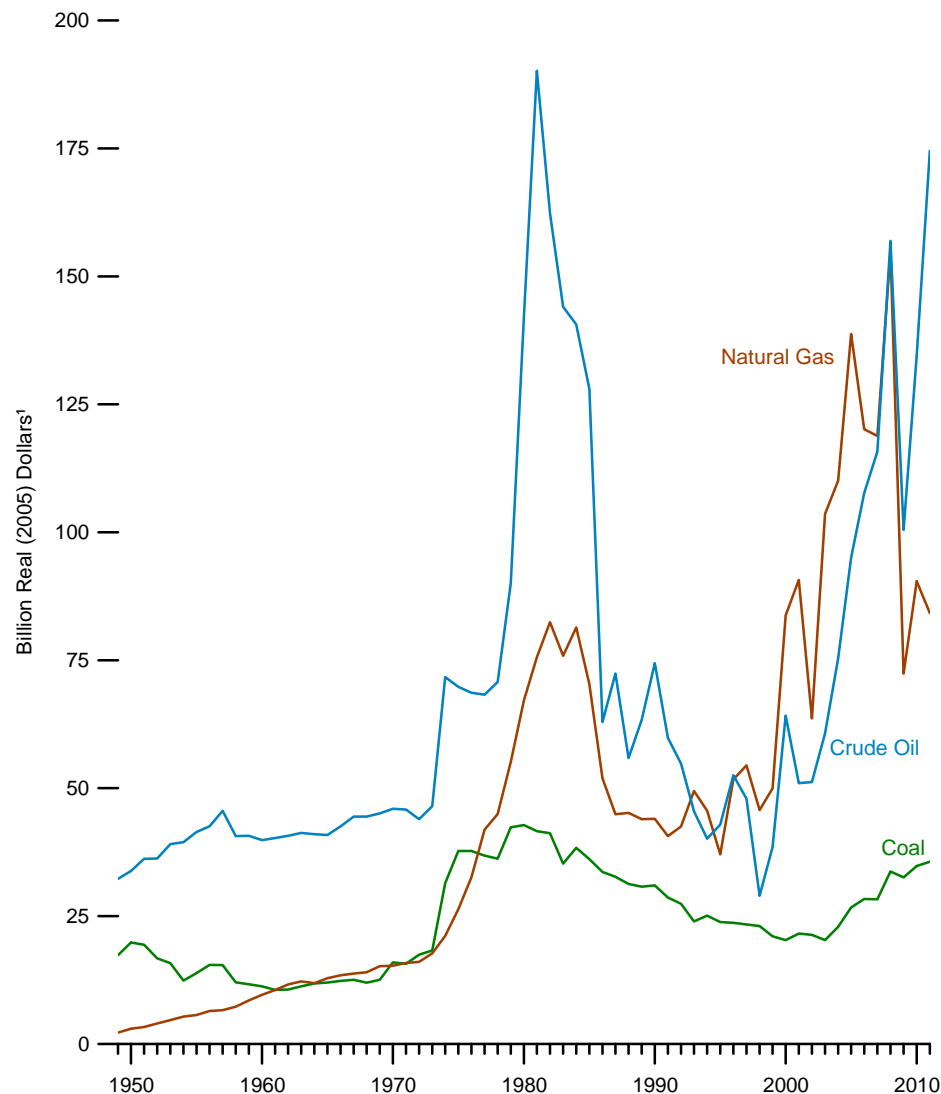
Sources: Tables 5.18, 6.7, 7.9, A2, A4, and A5.

**Figure 3.2 Value of Fossil Fuel Production, Imports, and Exports**

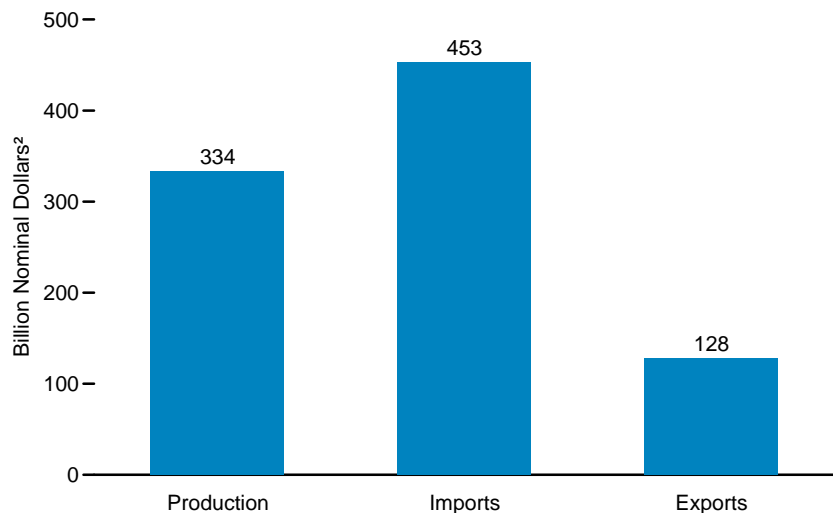
**Overview, 1949-2011**



**Production by Fuel, 1949-2011**



**Overview, 2011**



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>2</sup> See "Nominal Dollars" in Glossary. Sources: Tables 3.2, 3.7, and 3.8.

**Table 3.2 Value of Fossil Fuel Production, Selected Years, 1949-2011**  
(Billion Dollars)

Year	Coal <sup>1</sup>		Natural Gas <sup>2</sup>		Crude Oil <sup>3,4</sup>		Total	
	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>
1949	2.52	R17.37	0.33	2.24	4.68	R32.27	7.52	R51.88
1950	2.91	R19.84	.44	3.00	4.95	R33.80	8.30	R56.64
1955	2.30	R13.87	.94	5.67	6.88	R41.45	10.12	R60.99
1960	2.10	R11.27	1.79	9.61	7.42	R39.84	11.30	R60.72
1965	2.40	R12.03	2.57	R12.87	8.15	R40.86	13.11	R65.76
1970	3.88	R15.96	3.73	R15.31	11.19	R45.96	18.80	R77.23
1975	12.67	R37.71	8.85	R26.34	23.45	R69.80	44.96	R133.85
1976	13.40	R37.72	11.57	R32.58	24.37	R68.63	49.34	R138.92
1977	13.91	R36.81	15.82	R41.87	25.79	R68.26	55.52	R146.94
1978	14.65	R36.23	18.18	R44.95	28.60	R70.74	61.43	R151.92
1979	18.55	R42.36	24.16	R55.15	39.45	R90.08	82.16	R187.59
1980	20.45	R42.79	32.09	R67.14	67.93	R142.14	120.47	R252.07
1981	21.75	R41.61	39.51	R75.59	99.40	R190.16	160.66	R307.36
1982	22.84	R41.18	45.71	R82.42	90.03	R162.34	158.58	R285.94
1983	20.32	R35.24	43.73	R75.85	83.05	R144.05	147.10	R255.15
1984	22.94	R38.36	48.69	R81.40	84.10	R140.60	155.74	R260.35
1985	22.27	R36.13	43.35	R70.34	78.88	R128.00	144.50	R234.47
1986	21.18	R33.62	32.71	R51.92	39.63	R62.92	93.52	R148.47
1987	21.20	R32.70	29.11	R44.91	46.93	R72.40	97.24	R150.02
1988	20.97	R31.28	30.28	R45.17	37.48	R55.90	88.73	R132.34
1989	21.40	R30.76	30.58	R43.95	44.07	R63.34	96.05	R138.05
1990	22.39	R30.99	31.80	R44.00	53.77	R74.42	107.96	R149.40
1991	21.40	R28.61	30.39	R40.62	44.77	R59.84	96.57	R129.06
1992	20.98	R27.39	32.56	R42.51	41.97	R54.79	95.50	R124.68
1993	18.77	R23.97	38.72	R49.46	35.61	R45.49	93.10	R118.92
1994	20.06	R25.09	36.46	R45.61	32.07	R40.12	88.59	R110.83
1995	19.45	R23.84	30.24	R37.05	35.00	R42.89	84.69	R103.78
1996	19.68	R23.67	42.99	R51.70	43.68	R52.52	106.35	R127.89
1997	19.77	R23.36	46.09	R54.46	40.57	R47.94	106.43	R125.77
1998	19.75	R23.07	39.12	R45.71	24.80	R28.98	83.68	R97.77
1999	18.30	R21.07	43.37	R49.94	33.40	R38.46	95.08	R109.48
2000	18.02	R20.30	74.33	R83.77	56.93	R64.17	149.27	R168.25
2001	19.60	R21.60	82.28	R90.69	46.25	R50.97	148.13	R163.27
2002	19.68	R21.34	58.66	R63.63	47.21	R51.20	125.54	R136.17
2003	19.13	R20.32	97.47	R103.55	57.14	R60.70	173.75	R184.58
2004	22.16	R22.90	106.57	R110.10	72.93	R75.35	201.66	R208.35
2005	26.69	26.69	138.74	138.74	95.03	95.03	260.46	260.46
2006	29.25	R28.34	124.03	R120.15	111.16	R107.68	264.44	R256.16
2007	30.04	R28.28	126.23	R118.83	122.96	R115.75	279.23	R262.86
2008	36.62	R33.72	R168.26	R154.96	170.38	R156.92	R375.27	R345.61
2009	35.73	R32.56	R79.45	R72.40	110.25	R100.48	R225.43	R205.44
2010	R38.61	R34.79	R100.36	R90.42	R149.32	R134.54	R288.30	R259.75
2011 <sup>P</sup>	40.39	35.63	95.47	84.22	197.83	174.51	333.69	294.36

<sup>1</sup> Coal values are based on free-on-board (F.O.B.) rail/barge prices, which are the F.O.B. prices of coal at the point of first sale, excluding freight or shipping and insurance costs. See "Free on Board (F.O.B.)" in Glossary.

<sup>2</sup> Natural gas values are for marketed production based on wellhead prices. See "Natural Gas Marketed Production" and "Natural Gas Wellhead Price" in Glossary.

<sup>3</sup> Includes lease condensate.

<sup>4</sup> Crude oil values are based on domestic first purchase prices. See "Crude Oil Domestic First Purchase Price" in Glossary.

<sup>5</sup> See "Nominal Dollars" in Glossary.

<sup>6</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

R=Revised. P=Preliminary.

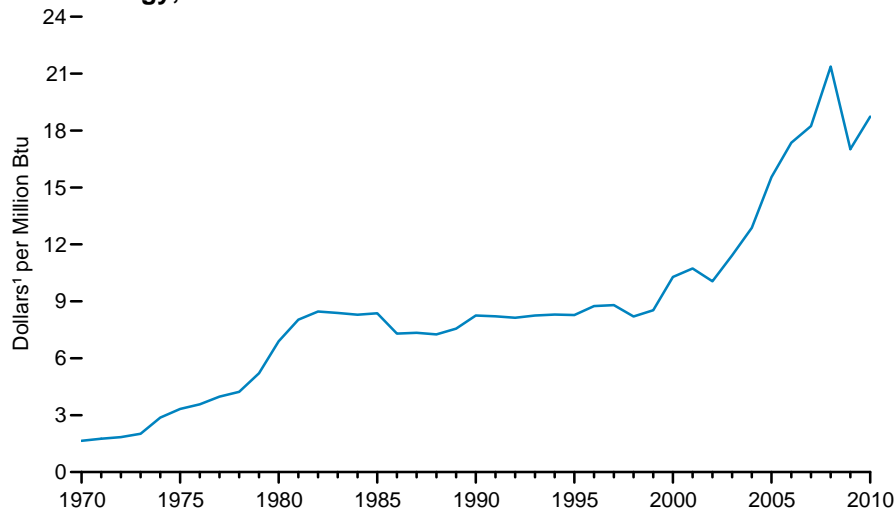
Note: Totals may not equal sum of components due to independent rounding.

Web Page: For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#financial>.

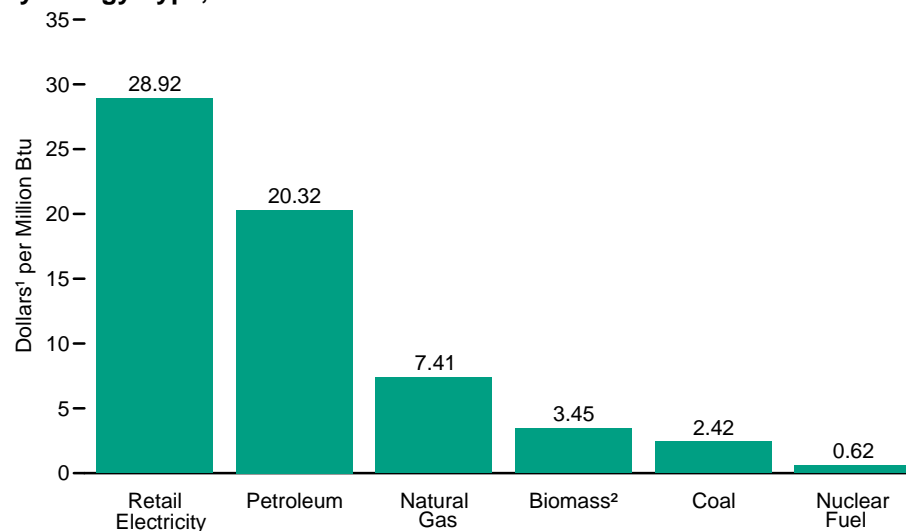
Sources: Tables 5.1b, 5.18, 6.2, 6.7, 7.2, and 7.9.

**Figure 3.3 Consumer Price Estimates for Energy by Source**

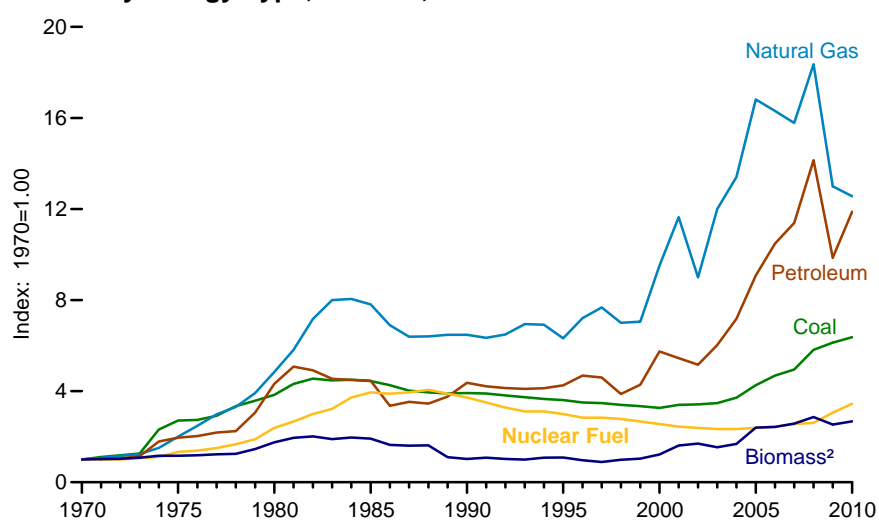
**Total Energy, 1970-2010**



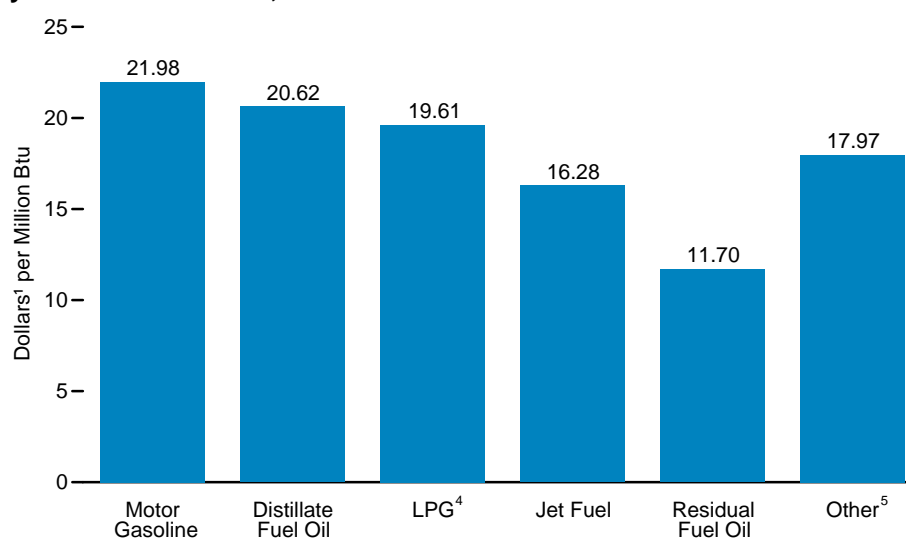
**By Energy Type, 2010**



**Prices³ by Energy Type, Indexed, 1970-2010**



**By Petroleum Product, 2010**



<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Wood and wood-derived fuels, and biomass waste; excludes fuel ethanol and biodiesel. Prior to 2001, also includes non-biomass waste.

<sup>3</sup> Based on nominal dollars.

<sup>4</sup> Liquefied petroleum gases.

<sup>5</sup> Consumption-weighted average price for asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

Source: Table 3.3.

**Table 3.3 Consumer Price Estimates for Energy by Source, 1970-2010**  
(Dollars <sup>1</sup> per Million Btu)

Year	Primary Energy <sup>2</sup>												Electric Power Sector <sup>11,12</sup>	Retail Electricity <sup>13</sup>	Total Energy <sup>9,10,14</sup>
	Coal	Natural Gas <sup>3</sup>	Petroleum							Nuclear Fuel	Biomass <sup>8</sup>	Total <sup>9,10</sup>			
			Distillate Fuel Oil	Jet Fuel <sup>4</sup>	LPG <sup>5</sup>	Motor Gasoline <sup>6</sup>	Residual Fuel Oil	Other <sup>7</sup>	Total						
1970	0.38	0.59	1.16	0.73	1.43	2.85	0.42	1.38	1.71	0.18	1.29	1.08	0.32	4.98	1.65
1971	.42	.63	1.22	.77	1.46	2.90	.58	1.45	1.78	.18	1.31	1.15	.38	5.30	1.76
1972	.45	.68	1.22	.79	1.49	2.88	.62	1.49	1.78	.18	1.33	1.18	.42	5.54	1.84
1973	.48	.73	1.46	.92	R2.00	3.10	.75	1.58	1.97	.19	1.39	1.29	.47	5.86	2.02
1974	.88	.89	2.44	1.58	R2.80	4.32	1.82	2.60	R3.06	.20	1.50	1.94	.87	7.42	2.87
1975	1.03	1.18	2.60	2.05	R2.96	4.65	1.93	2.94	R3.35	.24	1.50	2.19	.97	8.61	3.33
1976	1.04	1.46	2.77	2.25	R3.20	4.84	1.90	3.08	R3.47	.25	1.53	2.34	1.03	9.13	3.57
1977	1.11	1.76	3.11	2.59	R3.66	5.13	2.14	3.27	3.73	.27	1.58	2.58	1.17	10.11	3.98
1978	1.27	1.95	3.26	2.87	R3.61	5.24	2.08	3.45	3.84	.30	1.61	R2.72	1.27	10.92	4.23
1979	1.36	2.31	4.69	3.90	R4.50	7.11	2.83	4.70	5.23	.34	1.88	3.47	1.50	11.78	5.21
1980	1.46	2.86	6.70	6.36	R5.64	9.84	3.88	7.04	7.40	.43	2.26	4.57	1.77	13.95	6.89
1981	1.64	3.43	8.03	7.57	R6.19	10.94	4.91	8.67	8.68	.48	2.52	5.25	2.04	16.14	8.03
1982	1.73	4.23	7.78	7.23	R6.68	10.39	4.65	7.87	R8.40	.54	2.60	R5.33	2.05	18.16	8.46
1983	1.70	4.72	7.32	6.53	R7.20	9.12	4.50	7.60	7.77	.58	2.44	R5.12	2.02	18.62	8.39
1984	1.71	4.75	7.37	6.25	R6.95	8.89	4.75	7.72	7.68	.67	2.53	5.04	2.02	18.50	R8.29
1985	1.69	4.61	7.22	5.91	R6.63	9.01	4.30	7.55	7.63	.71	2.47	R4.93	1.91	19.05	8.37
1986	1.62	4.07	5.68	3.92	R6.49	6.79	2.37	5.80	R5.74	.70	2.12	3.97	1.60	19.05	7.30
1987	1.53	3.77	5.97	4.03	R6.11	7.23	2.86	5.63	6.04	.71	2.07	4.00	1.57	18.74	7.34
1988	1.50	3.78	5.83	3.80	R5.92	7.33	2.35	5.26	5.91	.73	2.09	3.89	1.49	18.68	7.26
1989	1.48	3.82	6.43	4.39	R5.58	8.02	2.72	5.50	6.43	.70	1.42	4.07	1.51	18.98	R7.56
1990	1.49	3.82	7.68	5.68	R6.83	9.12	3.17	5.82	7.47	.67	1.32	R4.46	1.48	19.32	R8.25
1991	1.48	3.74	7.29	4.83	R6.87	8.93	2.62	5.73	R7.20	.63	1.39	R4.29	1.40	19.84	R8.21
1992	1.45	3.83	7.09	4.52	R6.25	8.96	2.28	5.51	7.07	.59	1.32	4.24	1.38	20.06	8.13
1993	1.42	4.10	7.08	4.29	R6.27	8.83	2.26	5.49	R7.01	.56	1.28	R4.26	1.40	20.38	8.25
1994	1.39	4.08	6.99	3.95	6.61	8.96	2.32	5.47	7.06	.56	1.39	4.27	1.36	20.33	8.30
1995	1.37	3.73	6.98	4.00	6.51	9.22	2.46	5.74	7.28	.54	1.40	4.23	1.29	20.29	8.28
1996	1.33	4.25	7.87	4.82	7.98	9.85	2.80	6.20	8.01	.51	1.25	4.63	1.35	20.16	8.75
1997	1.32	4.53	7.66	4.53	7.39	9.81	2.93	5.89	7.86	.51	1.15	4.66	1.38	20.13	8.80
1998	1.29	4.13	6.57	3.35	5.95	8.45	2.15	5.02	6.63	.50	1.27	4.08	1.32	19.80	8.20
1999	1.27	4.16	7.19	4.01	6.60	9.31	2.51	5.30	7.33	.48	1.34	4.37	1.33	19.52	8.53
2000	1.24	R5.61	9.86	6.64	9.55	11.89	4.32	7.04	9.82	.46	R1.57	5.70	1.71	20.03	10.28
2001	1.29	6.87	9.18	5.72	R9.53	11.34	3.99	6.41	9.32	.44	2.08	5.83	1.85	21.41	10.73
2002	1.30	5.31	8.64	5.33	8.09	10.69	3.91	6.59	8.83	.43	2.19	5.25	1.54	21.15	10.06
2003	1.32	7.08	10.05	6.46	10.32	12.34	4.75	7.62	10.31	.42	1.98	6.28	1.84	21.85	11.42
2004	1.41	7.91	12.23	8.93	12.24	14.67	4.92	8.56	12.27	.42	2.17	7.37	2.00	22.38	12.87
2005	1.62	9.92	16.41	12.86	14.58	17.89	6.65	10.98	15.53	.43	3.10	9.24	2.61	23.92	15.55
2006	1.78	9.62	18.55	14.80	16.85	20.27	7.93	13.37	17.92	.44	R3.13	10.21	2.48	26.15	17.36
2007	1.88	9.31	19.87	16.01	18.76	22.01	8.57	14.94	19.47	.46	R3.32	R10.74	2.68	26.84	18.24
2008	2.21	10.83	26.33	22.56	23.35	25.53	12.64	18.83	24.18	.47	R3.69	12.93	3.21	28.64	21.37
2009	2.33	R7.67	16.98	12.61	16.38	18.51	9.69	R14.30	R16.87	.55	R3.27	9.37	R2.45	28.90	R17.02
2010	2.42	7.41	20.62	16.28	19.61	21.98	11.70	17.97	20.32	.62	3.45	10.63	2.62	28.92	18.73

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Consumption-weighted average prices for all sectors, including the electric power sector.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Through 2004, includes kerosene-type and naphtha-type jet fuel. Beginning in 2005, includes kerosene-type jet fuel only.

<sup>5</sup> Liquefied petroleum gases.

<sup>6</sup> Beginning in 1993, includes fuel ethanol blended into motor gasoline.

<sup>7</sup> Consumption-weighted average price for asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

<sup>8</sup> Wood and wood-derived fuels, and biomass waste; excludes fuel ethanol and biodiesel. Through 2000, also includes non-biomass waste.

<sup>9</sup> Includes coal coke imports and exports, which are not separately displayed. In 2010, coal coke imports averaged 13.37 dollars per million Btu, and coal coke exports averaged 6.74 dollars per million Btu.

<sup>10</sup> Includes electricity imports, which are not separately displayed. For 1981-1992, also includes fuel ethanol blended into motor gasoline that is not included in the motor gasoline data for those years.

<sup>11</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS (North American

Industry Classification System) 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

<sup>12</sup> Consumption-weighted average electric power sector price for coal, natural gas, petroleum, nuclear fuel, wood, waste, and electricity imports.

<sup>13</sup> Retail electricity prices paid by ultimate customers, reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>14</sup> Consumption-weighted average price for primary energy and retail electricity in the four end-use sectors (residential, commercial, industrial, and transportation); excludes energy in the electric power sector.

R=Revised.

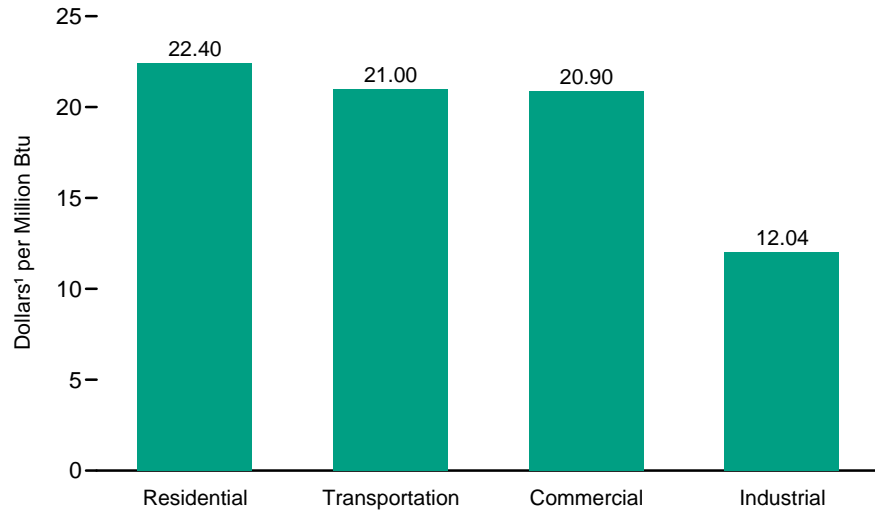
Notes: • Prices include taxes where data are available. • There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy.

Web Page: For related information, see <http://www.eia.gov/state/seds/seds-data-complete.cfm>.

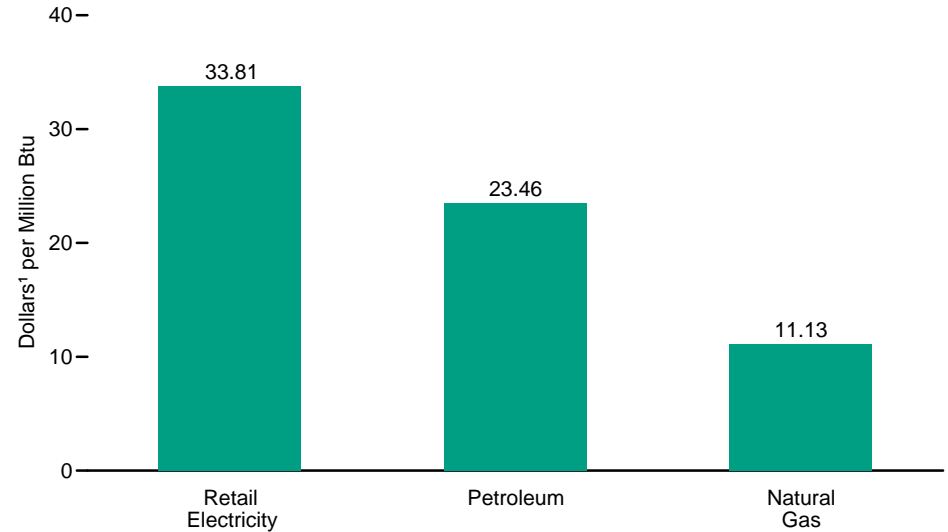
Source: U.S. Energy Information Administration, "State Energy Data 2010: Prices and Expenditures" (June 2012), U.S. Table ET1.

**Figure 3.4 Consumer Price Estimates for Energy by End-Use Sector, 2010**

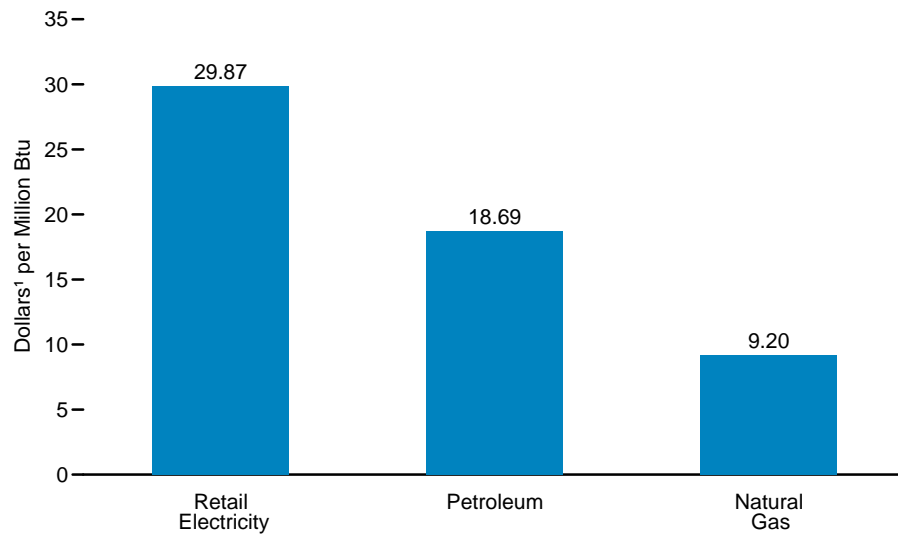
**By Sector**



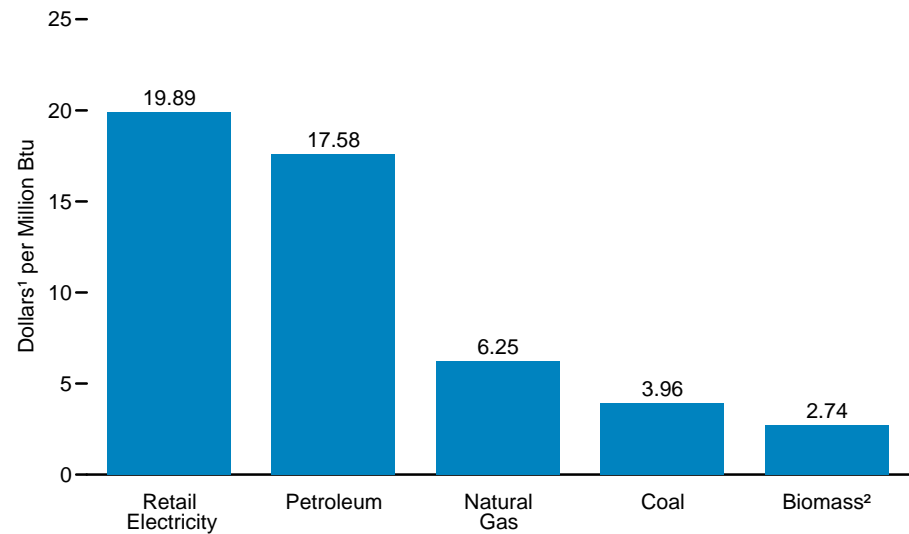
**Residential Sector by Major Source**



**Commercial Sector by Major Source**



**Industrial Sector by Major Source**



<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Wood and wood-derived fuels, and biomass waste; excludes fuel ethanol and biodiesel.

Notes: • Consumer prices are intended to represent prices paid by consumers. As such they include taxes where data are available. • There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy.

Source: Table 3.4.

**Table 3.4 Consumer Price Estimates for Energy by End-Use Sector, 1970-2010**

(Dollars <sup>1</sup> per Million Btu)

Year	Residential				Commercial				Industrial					Transportation		
	Natural Gas <sup>2</sup>	Petroleum	Retail Electricity <sup>3</sup>	Total <sup>4</sup>	Natural Gas <sup>2</sup>	Petroleum <sup>5</sup>	Retail Electricity <sup>3</sup>	Total <sup>6,7</sup>	Coal	Natural Gas <sup>2</sup>	Petroleum <sup>5</sup>	Biomass <sup>8</sup>	Retail Electricity <sup>3</sup>	Total <sup>7,9</sup>	Petroleum <sup>5</sup>	Total <sup>7,10</sup>
1970	1.06	1.54	6.51	2.10	0.75	R0.90	6.09	1.97	0.45	0.38	0.98	1.59	2.99	0.84	2.31	2.31
1971	1.12	1.59	6.80	2.24	.80	1.02	6.44	2.15	.50	.41	1.05	1.59	3.22	R.93	2.37	2.37
1972	1.18	R1.61	7.09	2.37	.86	1.05	6.71	2.32	.55	.46	1.05	1.59	3.40	.99	2.38	2.38
1973	1.26	R2.09	7.44	2.71	.91	R1.20	7.06	2.55	.63	.50	1.18	1.60	3.66	1.10	2.57	2.57
1974	1.42	2.85	9.09	3.38	1.05	R2.25	8.91	R3.40	1.22	.67	R2.25	1.60	4.95	1.78	3.70	3.70
1975	1.67	R3.02	10.29	3.80	1.32	R2.39	10.11	R4.06	1.50	.95	R2.47	1.60	6.07	R2.21	4.02	4.02
1976	1.94	R3.24	10.93	R4.13	1.61	R2.49	10.82	4.38	1.50	1.21	R2.58	1.60	6.48	2.43	4.20	4.21
1977	2.30	3.64	11.87	4.76	2.00	R2.84	11.99	5.12	1.56	1.48	R2.85	1.59	7.33	2.78	4.47	R4.47
1978	2.52	R3.77	12.63	5.13	2.20	R2.92	12.78	R5.49	1.73	1.66	R2.97	1.60	8.18	R3.04	4.59	4.59
1979	2.92	R5.32	13.60	5.99	2.69	R4.14	13.72	R6.27	1.75	1.96	R4.00	1.60	8.94	3.63	6.19	6.19
1980	3.60	7.24	15.71	7.46	3.32	R5.62	16.06	7.83	1.87	2.52	R5.76	1.67	10.81	4.71	8.60	8.61
1981	4.19	R8.65	18.17	8.82	3.91	R6.95	18.44	R9.47	2.06	3.07	R6.87	1.67	12.57	5.52	9.83	9.84
1982	5.05	R8.66	20.11	R9.77	4.70	R6.62	20.11	R10.34	2.09	3.80	R6.53	1.67	14.51	R6.06	9.42	9.43
1983	5.88	R8.39	21.04	10.66	5.43	R6.49	20.57	R10.91	1.91	4.10	R6.60	1.67	14.54	R6.22	R8.43	R8.44
1984	5.95	R8.44	20.96	10.66	5.40	R6.48	20.89	R11.12	1.91	4.13	R6.58	1.67	14.16	6.12	8.25	8.26
1985	5.94	R8.14	21.66	10.91	5.34	R6.46	21.30	R11.63	1.90	3.87	R6.32	1.67	14.57	R6.04	8.26	8.27
1986	5.67	R6.77	21.75	10.75	4.94	R4.44	21.10	R11.20	1.80	3.20	R4.93	1.65	14.45	R5.37	6.21	6.22
1987	5.39	R6.59	21.82	10.71	4.64	R4.75	20.44	R10.96	1.67	2.88	R4.98	1.65	13.98	5.17	6.57	6.59
1988	5.32	R6.57	21.92	10.66	4.51	R4.50	20.34	R10.81	1.68	2.90	R4.63	1.65	13.78	R5.01	6.56	6.57
1989	5.47	R7.54	22.41	11.02	4.61	R5.09	20.77	R11.25	1.68	2.93	R4.70	1.20	13.85	4.92	7.17	7.18
1990	5.63	R8.69	22.96	11.87	4.70	R6.04	21.20	R11.87	1.69	2.95	R5.50	.99	13.92	R5.24	8.27	8.28
1991	5.66	R8.48	23.57	12.08	4.69	R5.59	21.73	R12.05	1.67	2.80	R5.33	1.14	14.18	R5.19	7.98	7.99
1992	5.73	R7.80	24.06	R11.97	4.75	R5.37	22.15	R12.15	1.69	2.91	R5.02	1.13	14.18	R5.14	7.91	R7.92
1993	5.99	R7.64	24.40	R12.27	5.08	R5.14	22.40	R12.55	1.63	3.12	R4.95	1.12	14.22	R5.17	7.87	7.88
1994	6.23	R7.57	24.57	R12.60	5.35	R5.05	22.35	R12.72	1.62	3.09	R5.06	1.15	14.00	R5.16	7.91	7.92
1995	5.89	R7.49	24.63	R12.60	4.94	R5.14	22.29	R12.62	1.63	2.80	R5.23	1.21	13.68	R4.98	8.08	8.09
1996	6.16	R8.63	24.50	R12.69	5.26	R6.17	22.17	R12.76	1.62	3.30	R6.08	1.01	13.49	R5.41	8.76	8.77
1997	6.75	R8.61	24.71	R13.25	5.67	R6.10	22.03	R13.03	1.62	3.53	R5.71	1.01	13.29	R5.35	8.69	8.70
1998	6.61	R7.55	24.21	R13.44	5.38	R5.09	21.48	R13.05	1.58	3.16	R4.55	1.24	13.13	4.91	7.47	7.48
1999	6.50	R7.78	23.93	R13.15	5.22	R5.56	21.01	R12.84	1.58	3.21	R5.10	1.38	12.98	R5.13	8.23	8.23
2000	R7.63	R11.12	24.14	R14.21	R6.54	R8.27	21.52	R13.90	1.55	R4.60	R7.35	1.43	13.60	R6.43	10.71	10.72
2001	9.42	R11.23	25.16	R15.62	8.32	R7.88	22.99	R15.54	1.63	5.71	R6.81	1.95	14.78	R6.90	10.20	10.21
2002	7.69	R9.99	24.75	R14.65	6.49	R7.14	22.81	R14.66	1.75	R4.48	R6.49	2.11	14.30	R6.31	9.64	9.65
2003	9.24	R11.85	25.56	R15.81	8.07	R8.62	23.54	R15.63	1.74	6.20	R7.86	1.62	14.97	R7.49	11.20	11.21
2004	10.47	R13.33	26.22	R17.01	9.19	R10.16	23.95	R16.55	1.99	7.02	R9.41	1.79	15.38	R8.47	13.43	13.43
2005	12.34	R16.76	27.68	R19.16	10.98	R13.55	25.40	R18.59	2.56	9.08	R11.99	2.73	16.77	R10.41	R16.88	16.89
2006	13.35	R19.22	30.49	R21.49	11.60	R15.91	27.72	R20.63	2.83	R8.77	R14.32	R2.65	18.02	R11.39	R19.12	R19.12
2007	R12.70	R21.11	31.22	R21.56	R10.99	R17.52	28.27	R20.73	2.92	R8.29	R15.90	R2.52	18.71	R11.93	20.61	20.61
2008	13.52	R25.80	33.01	R23.06	11.89	R22.96	30.38	R22.44	3.51	10.06	R20.49	R2.83	19.96	R14.32	25.24	25.23
2009	11.81	R20.76	33.72	R22.05	R9.70	R15.45	29.81	R20.67	3.87	R6.46	R13.87	R2.62	20.00	R11.05	17.54	17.54
2010	11.13	23.46	33.81	22.40	9.20	18.69	29.87	20.90	3.96	6.25	17.58	2.74	19.89	12.04	21.01	21.00

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>3</sup> Retail electricity prices paid by ultimate customers, reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>4</sup> Includes coal, and wood and wood-derived fuels, which are not separately displayed.

<sup>5</sup> Beginning in 1993, includes fuel ethanol blended into motor gasoline.

<sup>6</sup> Includes coal, wood and wood-derived fuels, and biomass waste, which are not separately displayed.

Through 2000, also includes non-biomass waste.

<sup>7</sup> For 1981–1992, includes fuel ethanol blended into motor gasoline that is not included in the petroleum data for those years.

<sup>8</sup> Wood and wood-derived fuels, and biomass waste; excludes fuel ethanol and biodiesel. Through 2000, also includes non-biomass waste.

<sup>9</sup> Includes coal coke imports and exports, which are not separately displayed.

<sup>10</sup> Includes coal, natural gas, and retail electricity, which are not separately displayed.

R=Revised.

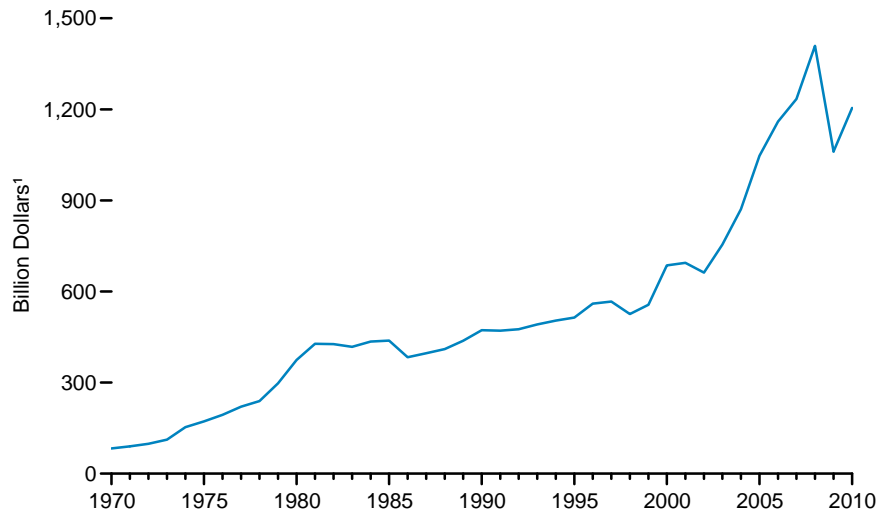
Notes: • Prices include taxes where data are available. • There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy.

Web Page: For related information, see <http://www.eia.gov/state/seds/seds-data-complete.cfm>.

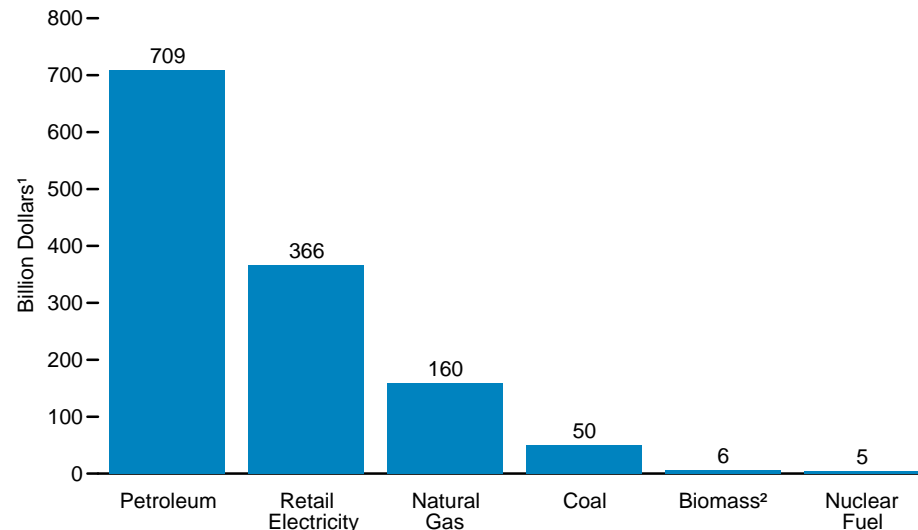
Source: U.S. Energy Information Administration, "State Energy Data 2010: Prices and Expenditures" (June 2012), U.S. Tables ET3–ET6.

**Figure 3.5 Consumer Expenditure Estimates for Energy by Source**

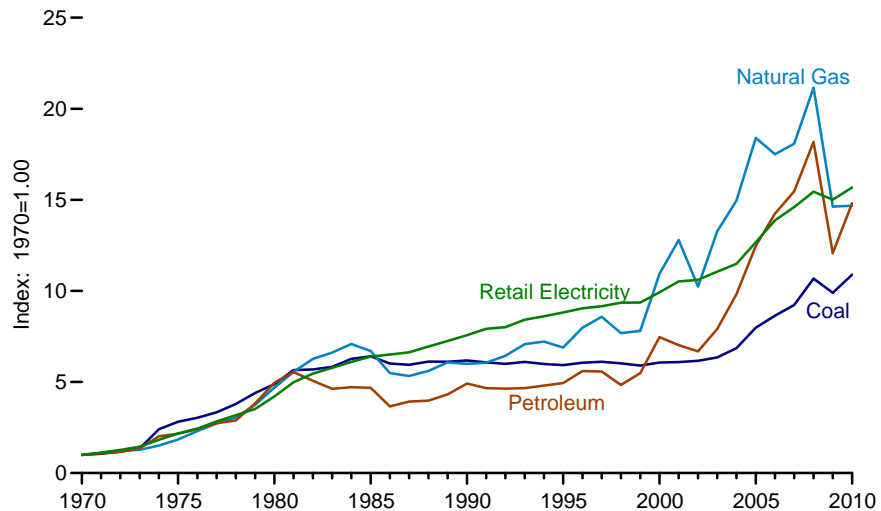
**Total Energy, 1970-2010**



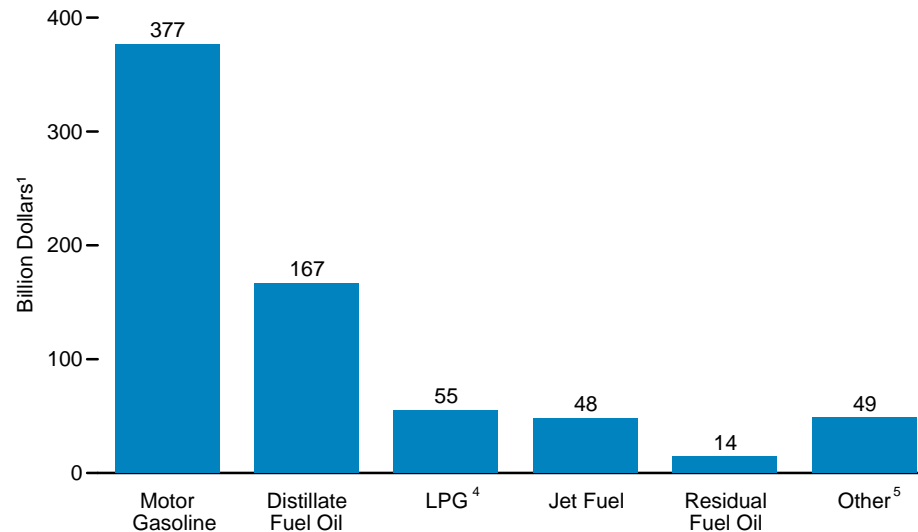
**By Energy Type, 2010**



**Expenditures<sup>3</sup> by Energy Type, Indexed, 1970-2010**



**By Petroleum Product, 2010**



<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Wood and wood-derived fuels, and biomass waste; excludes fuel ethanol and biodiesel.

<sup>3</sup> Based on nominal dollars.

<sup>4</sup> Liquefied petroleum gases.

<sup>5</sup> Asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

Source: Table 3.5.



**Table 3.5 Consumer Expenditure Estimates for Energy by Source, 1970-2010**

(Million Dollars <sup>1</sup>)

Year	Primary Energy <sup>2</sup>													Electric Power Sector <sup>11,12</sup>	Retail Electricity <sup>13</sup>	Total Energy <sup>10,14</sup>
	Coal	Coal Coke Net Imports <sup>3</sup>	Natural Gas <sup>4</sup>	Petroleum							Nuclear Fuel	Biomass <sup>9</sup>	Total <sup>10</sup>			
				Distillate Fuel Oil	Jet Fuel <sup>5</sup>	LPG <sup>6</sup>	Motor Gasoline <sup>7</sup>	Residual Fuel Oil	Other <sup>8</sup>	Total						
1970	4,630	-75	10,891	6,253	1,441	2,395	31,596	2,046	4,172	47,904	44	438	63,872	-4,357	23,345	82,860
1971	4,902	-40	12,065	6,890	1,582	2,483	33,478	2,933	4,449	51,816	73	446	69,312	-5,491	26,202	90,023
1972	5,415	-26	13,198	7,552	1,682	2,834	35,346	3,458	4,777	55,648	104	476	74,893	-6,551	29,712	98,054
1973	6,243	7	13,933	9,524	2,001	R <sup>3,881</sup>	39,667	4,667	5,318	R <sup>65,057</sup>	177	502	R <sup>86,053</sup>	-7,952	33,774	R <sup>111,875</sup>
1974	11,118	150	16,380	15,217	3,208	R <sup>5,254</sup>	54,194	10,547	8,284	R <sup>96,704</sup>	259	544	R <sup>125,322</sup>	-14,558	42,586	R <sup>153,351</sup>
1975	13,021	82	20,061	15,680	4,193	R <sup>5,221</sup>	59,446	10,374	8,493	R <sup>103,407</sup>	448	534	R <sup>137,702</sup>	-16,545	50,680	R <sup>171,837</sup>
1976	14,051	44	25,097	18,402	4,567	R <sup>5,992</sup>	64,977	11,648	9,925	R <sup>115,512</sup>	520	622	R <sup>156,002</sup>	-19,078	56,972	R <sup>193,896</sup>
1977	15,416	67	29,602	22,004	5,517	R <sup>6,839</sup>	70,591	14,381	11,790	R <sup>131,121</sup>	743	694	R <sup>177,966</sup>	-23,715	66,225	R <sup>220,476</sup>
1978	17,551	362	33,185	23,587	6,205	R <sup>6,646</sup>	74,513	13,747	13,348	R <sup>138,047</sup>	915	782	R <sup>191,221</sup>	-26,125	74,159	R <sup>239,255</sup>
1979	20,376	259	40,785	32,854	8,603	R <sup>9,389</sup>	95,916	17,656	18,785	R <sup>183,204</sup>	941	964	R <sup>246,969</sup>	-31,472	82,051	R <sup>297,549</sup>
1980	22,607	-78	51,061	40,797	13,923	R <sup>10,926</sup>	124,408	21,573	26,049	R <sup>237,676</sup>	1,189	1,232	R <sup>314,279</sup>	-38,027	98,095	R <sup>374,347</sup>
1981	26,159	-31	60,544	48,200	15,607	R <sup>11,922</sup>	138,138	22,668	28,571	R <sup>265,106</sup>	1,436	1,429	R <sup>355,717</sup>	-44,274	116,455	R <sup>427,898</sup>
1982	26,349	-52	68,292	44,087	14,974	R <sup>12,972</sup>	130,305	17,632	22,447	R <sup>242,418</sup>	1,684	1,510	R <sup>341,439</sup>	-42,354	127,393	R <sup>426,479</sup>
1983	26,987	-44	72,000	41,846	13,979	R <sup>14,147</sup>	115,803	14,099	21,573	R <sup>221,446</sup>	1,859	1,517	R <sup>325,311</sup>	-42,566	134,731	R <sup>417,476</sup>
1984	29,025	-22	77,169	44,668	15,097	R <sup>14,197</sup>	114,429	14,410	22,812	R <sup>225,612</sup>	2,384	1,608	R <sup>337,460</sup>	-44,686	142,420	R <sup>435,195</sup>
1985	29,678	-34	72,938	43,972	14,747	R <sup>13,752</sup>	118,048	11,493	22,088	R <sup>224,100</sup>	2,878	1,597	R <sup>333,084</sup>	-43,970	149,233	R <sup>438,347</sup>
1986	27,855	-40	59,702	35,113	10,505	R <sup>12,843</sup>	91,529	7,486	17,647	R <sup>175,122</sup>	3,061	1,352	R <sup>268,741</sup>	-37,016	151,793	R <sup>383,518</sup>
1987	27,532	7	58,019	37,729	11,448	R <sup>12,969</sup>	99,864	8,062	17,687	R <sup>187,758</sup>	3,378	1,300	R <sup>280,084</sup>	-38,182	154,685	R <sup>396,587</sup>
1988	28,333	116	61,089	38,776	11,318	R <sup>12,906</sup>	103,323	7,259	16,779	R <sup>190,360</sup>	4,057	1,378	R <sup>287,005</sup>	-38,553	162,063	R <sup>410,515</sup>
1989	28,284	137	66,198	43,159	13,434	R <sup>12,266</sup>	112,720	8,357	17,060	R <sup>206,996</sup>	3,939	2,270	R <sup>309,176</sup>	-40,829	169,332	R <sup>437,679</sup>
1990	28,602	22	65,278	49,335	17,784	R <sup>13,840</sup>	126,558	8,721	19,255	R <sup>235,493</sup>	4,104	1,997	R <sup>336,588</sup>	-40,626	176,691	R <sup>472,653</sup>
1991	28,129	44	65,956	45,269	14,609	R <sup>15,116</sup>	123,118	6,784	18,213	R <sup>223,110</sup>	4,073	2,165	R <sup>324,653</sup>	-38,752	184,767	R <sup>470,668</sup>
1992	27,776	126	70,086	45,019	13,559	R <sup>14,303</sup>	125,249	5,585	18,345	R <sup>222,060</sup>	3,802	2,194	R <sup>327,401</sup>	-38,663	186,906	R <sup>475,644</sup>
1993	28,229	96	77,052	45,732	13,002	R <sup>14,114</sup>	126,560	5,449	18,285	R <sup>223,142</sup>	3,597	2,193	R <sup>335,016</sup>	-40,317	196,532	R <sup>491,231</sup>
1994	27,715	214	78,581	47,002	12,474	16,243	130,068	5,296	18,687	229,770	3,777	2,521	343,593	-40,352	200,831	504,073
1995	27,431	234	75,020	47,533	12,526	16,197	136,647	4,676	19,225	236,803	3,810	2,938	347,144	-39,073	205,876	513,947
1996	28,028	156	86,904	56,455	15,770	21,086	148,344	5,313	21,144	268,112	3,624	2,668	390,437	-41,652	211,105	559,890
1997	28,277	170	93,382	55,922	15,000	19,781	149,668	5,206	21,631	267,208	3,369	2,425	395,817	-42,947	213,843	566,714
1998	27,888	188	83,620	48,350	11,239	15,241	132,730	4,280	19,835	231,675	3,555	2,477	350,464	-43,311	218,361	525,515
1999	27,310	140	84,960	54,565	13,878	19,038	149,260	4,686	21,250	262,676	3,643	R <sup>2,646</sup>	R <sup>382,655</sup>	-44,689	218,413	R <sup>556,379</sup>
2000	28,080	146	119,094	78,209	23,777	27,970	192,153	8,870	26,496	357,475	3,628	R <sup>3,174</sup>	R <sup>514,379</sup>	-60,054	231,577	R <sup>685,902</sup>
2001	28,202	82	139,388	75,035	19,602	25,543	185,752	7,266	23,097	336,294	3,524	3,494	513,673	-64,672	245,483	694,484
2002	28,511	180	R <sup>111,536</sup>	69,285	17,802	22,980	179,796	6,156	24,167	320,185	3,504	4,005	R <sup>469,045</sup>	-54,230	247,598	R <sup>662,414</sup>
2003	29,402	169	144,489	83,873	21,096	28,161	209,493	8,325	28,061	379,010	3,362	3,599	561,401	-64,685	257,992	754,708
2004	31,764	1,125	R <sup>162,843</sup>	105,772	30,219	34,408	254,873	9,717	35,212	470,200	3,445	3,692	R <sup>674,684</sup>	-71,720	268,133	R <sup>871,097</sup>
2005	36,932	633	R <sup>200,356</sup>	143,598	44,679	38,874	312,047	13,951	44,136	597,285	3,469	R <sup>5,897</sup>	R <sup>847,085</sup>	-95,975	295,787	R <sup>1,046,897</sup>
2006	40,005	509	R <sup>190,590</sup>	164,399	50,007	45,355	357,286	12,432	52,986	682,465	3,637	R <sup>6,101</sup>	R <sup>925,829</sup>	-90,104	323,962	R <sup>1,159,687</sup>
2007	42,717	347	R <sup>196,957</sup>	177,172	53,754	51,081	389,282	14,129	55,211	740,628	3,871	R <sup>6,357</sup>	R <sup>994,077</sup>	-100,719	340,925	R <sup>1,234,282</sup>
2008	49,438	1,465	R <sup>230,465</sup>	221,435	72,046	59,875	438,237	17,984	61,417	870,993	3,976	R <sup>6,953</sup>	R <sup>1,166,847</sup>	R <sup>-118,571</sup>	360,570	R <sup>1,408,845</sup>
2009	R <sup>45,825</sup>	-42	R <sup>159,362</sup>	131,050	36,353	43,466	R <sup>317,082</sup>	11,310	R <sup>39,268</sup>	R <sup>578,529</sup>	4,560	R <sup>5,116</sup>	R <sup>795,506</sup>	R <sup>-84,723</sup>	350,438	R <sup>1,061,220</sup>
2010	50,407	158	159,821	166,595	48,244	55,157	376,512	14,308	48,656	709,471	5,234	6,424	933,562	-94,635	365,900	1,204,827

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Expenditures by all sectors, including the electric power sector.

<sup>3</sup> Values derive from U.S. Department of Commerce, Bureau of the Census, "Monthly Report IM-145" and "Monthly Report EM-545," and may differ slightly from those shown on Table 3.9, which derive from Bureau of the Census, *U.S. International Trade in Goods and Services*, FT600 series.

<sup>4</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>5</sup> Through 2004, includes kerosene-type and naphtha-type jet fuel. Beginning in 2005, includes kerosene-type jet fuel only.

<sup>6</sup> Liquefied petroleum gases.

<sup>7</sup> Beginning in 1993, includes fuel ethanol blended into motor gasoline.

<sup>8</sup> Asphalt and road oil, aviation gasoline, kerosene, lubricants, petrochemical feedstocks, petroleum coke, special naphthas, waxes, and miscellaneous petroleum products.

<sup>9</sup> Wood and wood-derived fuels, and biomass waste; excludes fuel ethanol and biodiesel. Through 2000, also includes non-biomass waste.

<sup>10</sup> Includes electricity imports, which are not separately displayed. For 1981-1992, also includes fuel ethanol blended into motor gasoline that is not included in the motor gasoline data for those years.

<sup>11</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS (North American Industry

Classification System) 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

<sup>12</sup> Expenditures by the electric power sector for coal, natural gas, petroleum, nuclear fuel, wood, waste, and electricity imports. Values are negative so the columns will sum to the "Total Energy" column.

<sup>13</sup> Retail electricity expenditures by ultimate customers, reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>14</sup> Expenditures for primary energy and retail electricity by the four end-use sectors (residential, commercial, industrial, and transportation); excludes expenditures for energy by the electric power sector. R=Revised.

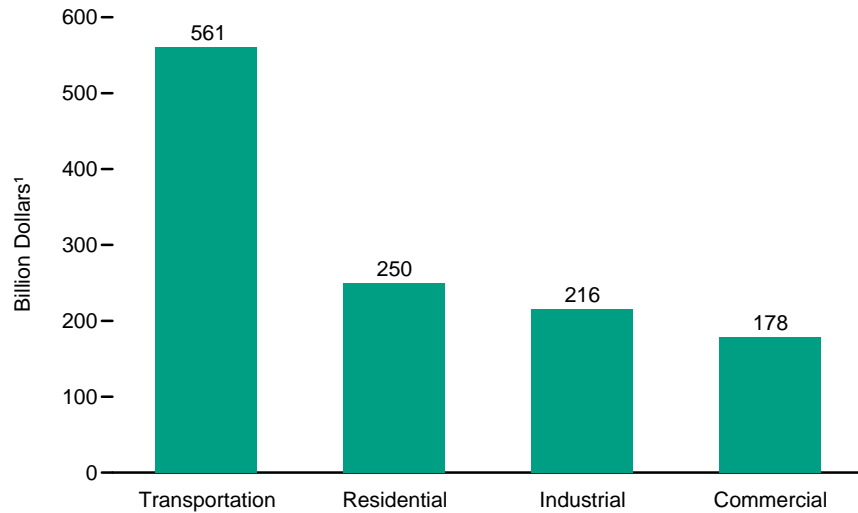
Notes: • Expenditures include taxes where data are available. • There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy. • Totals may not equal the sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/state/seds/seds-data-complete.cfm>.

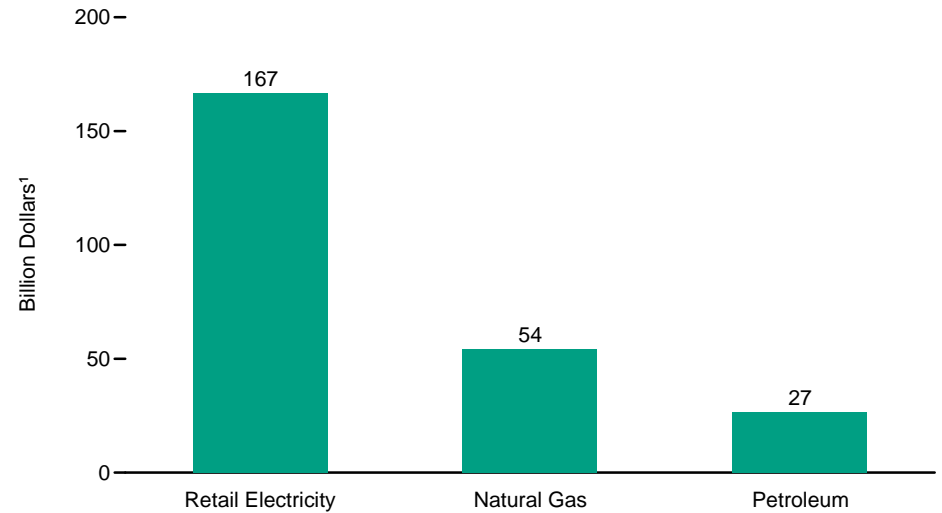
Source: U.S. Energy Information Administration, "State Energy Data 2010: Prices and Expenditures" (June 2012), U.S. Table ET1.

**Figure 3.6 Consumer Expenditure Estimates for Energy by End-Use Sector, 2010**

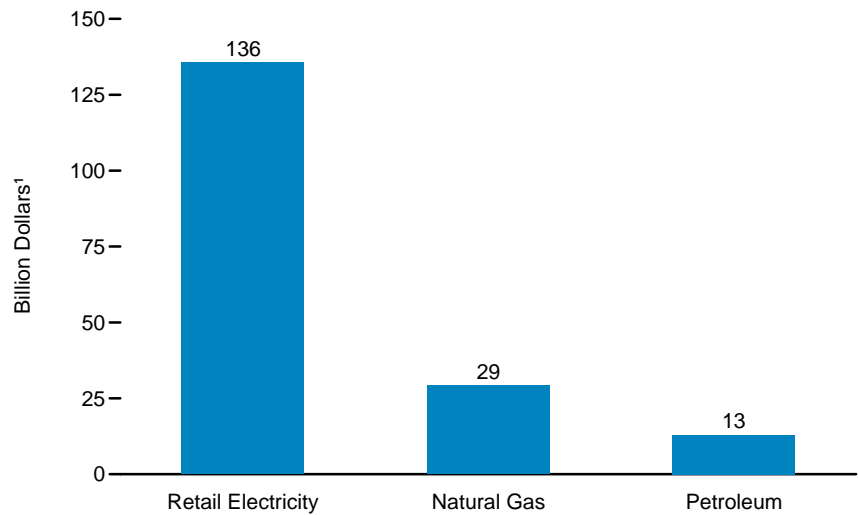
**By Sector**



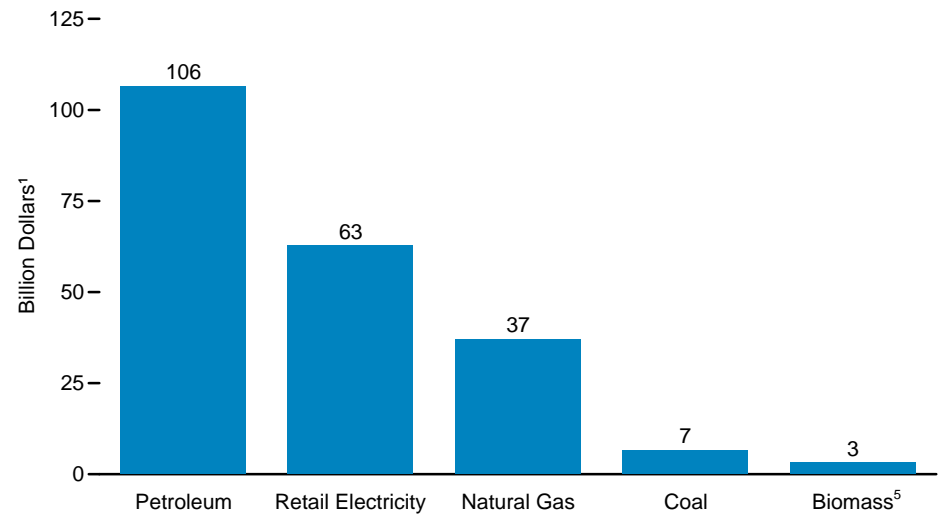
**Residential Sector by Major Source²**



**Commercial Sector by Major Source³**



**Industrial Sector by Major Source⁴**



¹ Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

² Expenditures for coal and wood and wood-derived fuels are not displayed.

³ Expenditures for coal, wood and wood-derived fuels, and biomass waste are not displayed.

⁴ Expenditures for imports and exports of coal coke are not displayed.

⁵ Wood and wood-derived fuels, and biomass waste; excludes fuel ethanol and biodiesel.

Notes: • Petroleum accounts for nearly all transportation sector expenditures. • There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy. • Totals may not equal the sum of components due to independent rounding.

Source: Table 3.6.

**Table 3.6 Consumer Expenditure Estimates for Energy by End-Use Sector, 1970-2010**

(Million Dollars <sup>1</sup>)

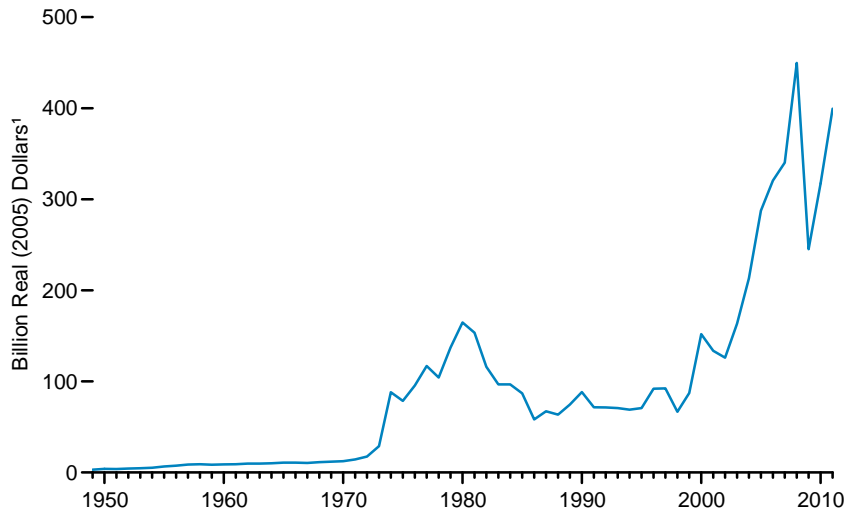
Year	Residential				Commercial				Industrial					Transportation		
	Natural Gas <sup>2</sup>	Petroleum	Retail Electricity <sup>3</sup>	Total <sup>4</sup>	Natural Gas <sup>2</sup>	Petroleum <sup>5</sup>	Retail Electricity <sup>3</sup>	Total <sup>6,7</sup>	Coal	Natural Gas <sup>2</sup>	Petroleum <sup>5</sup>	Biomass <sup>8</sup>	Retail Electricity <sup>3</sup>	Total <sup>7,9</sup>	Petroleum <sup>5</sup>	Total <sup>7,10</sup>
1970	5,272	4,186	10,352	20,112	1,844	1,440	7,319	10,678	2,082	2,625	6,069	366	5,624	16,691	35,327	35,379
1971	5,702	4,367	11,589	21,934	2,060	1,574	8,301	12,021	1,971	3,019	6,663	374	6,256	18,244	37,766	37,824
1972	6,223	4,623	13,034	24,095	2,289	1,653	9,443	13,464	2,212	3,335	7,180	404	7,173	20,278	40,154	40,218
1973	6,282	R <sub>5</sub> 849	14,712	R <sub>27</sub> 209	2,421	1,936	10,707	15,149	2,527	3,936	8,600	425	8,284	23,779	45,846	45,918
1974	6,949	R <sub>7</sub> 288	17,924	R <sub>32</sub> 459	2,741	3,290	13,373	19,579	4,704	4,971	15,408	421	11,184	36,837	64,368	64,476
1975	8,410	R <sub>7</sub> 486	20,644	R <sub>36</sub> 835	3,385	3,219	16,157	22,956	5,498	5,844	15,544	386	13,760	41,113	70,813	70,933
1976	9,992	R <sub>8</sub> 755	22,621	R <sub>41</sub> 682	4,379	3,739	18,148	26,447	5,448	7,484	18,384	443	16,083	47,887	77,759	77,880
1977	11,324	R <sub>9</sub> 772	26,132	R <sub>47</sub> 594	5,094	4,411	21,023	30,725	5,360	8,958	22,190	464	18,956	55,996	86,047	86,160
1978	12,565	R <sub>9</sub> 831	29,069	R <sub>51</sub> 854	5,812	4,350	23,166	33,563	5,722	10,114	23,203	511	21,798	61,710	92,003	92,128
1979	14,772	R <sub>11</sub> 157	31,683	R <sub>58</sub> 149	7,623	5,659	25,433	38,944	6,247	12,110	33,705	512	24,797	77,630	122,688	122,826
1980	17,497	R <sub>12</sub> 554	38,458	R <sub>69</sub> 277	8,858	7,409	30,611	47,074	5,888	16,350	42,765	529	28,863	94,316	163,517	163,680
1981	19,502	R <sub>13</sub> 250	44,780	R <sub>78</sub> 486	10,085	7,794	37,484	55,629	6,441	20,432	47,171	558	34,007	108,581	184,946	185,203
1982	23,987	R <sub>12</sub> 413	50,045	R <sub>87</sub> 506	12,565	6,865	41,759	61,503	5,301	20,504	41,841	540	35,364	103,503	173,553	173,968
1983	26,564	R <sub>11</sub> 350	53,918	R <sub>92</sub> 812	13,602	7,592	43,529	65,028	4,735	21,461	38,437	610	37,017	102,220	156,841	157,417
1984	27,873	R <sub>12</sub> 919	55,777	R <sub>97</sub> 657	14,012	7,948	47,304	69,593	5,420	23,763	41,470	622	39,050	110,309	156,979	157,636
1985	27,136	R <sub>12</sub> 741	58,672	R <sub>99</sub> 619	13,368	6,996	50,092	70,725	5,252	21,615	38,876	619	40,190	106,528	160,745	161,475
1986	25,147	R <sub>10</sub> 433	60,776	R <sub>97</sub> 173	11,770	5,166	51,449	68,637	4,745	16,479	30,567	639	39,271	91,669	125,353	126,039
1987	23,926	R <sub>10</sub> 658	63,318	R <sub>98</sub> 635	11,601	5,377	51,900	69,098	4,448	15,909	31,092	636	39,109	91,210	136,807	137,644
1988	25,332	R <sub>11</sub> 008	66,793	R <sub>103</sub> 907	12,377	4,950	54,411	71,969	4,744	17,257	29,123	662	40,507	92,418	141,382	142,221
1989	26,951	R <sub>12</sub> 522	69,243	R <sub>109</sub> 553	12,908	5,293	57,460	75,911	4,650	18,770	28,561	1,323	42,255	95,705	155,591	156,510
1990	25,439	R <sub>12</sub> 116	72,378	R <sub>110</sub> 905	12,681	5,986	60,627	79,605	4,636	19,348	34,132	906	43,358	102,411	178,852	179,732
1991	26,508	R <sub>11</sub> 703	76,828	R <sub>115</sub> 999	13,175	5,224	63,407	82,098	4,332	18,912	32,494	1,034	44,201	101,028	170,589	R <sub>171</sub> 543
1992	27,599	R <sub>11</sub> 026	76,848	R <sub>116</sub> 394	13,685	4,796	64,233	83,007	4,245	20,553	32,208	1,079	45,474	103,699	171,482	172,544
1993	30,533	R <sub>10</sub> 990	82,814	R <sub>125</sub> 141	14,967	4,209	67,626	87,095	4,060	22,367	31,518	1,146	45,726	104,913	173,704	174,082
1994	31,028	10,656	84,552	126,962	15,927	4,162	69,637	90,010	4,060	22,556	33,612	1,279	46,257	107,978	178,724	179,123
1995	29,362	10,289	87,610	127,961	15,383	3,956	72,481	92,106	4,068	21,487	34,177	1,699	45,402	107,067	186,411	186,813
1996	33,219	12,796	90,503	137,340	17,106	4,879	74,121	96,414	3,943	26,167	40,853	1,432	46,102	118,654	207,078	207,483
1997	34,590	12,239	90,704	138,201	18,755	4,531	77,153	100,758	3,887	28,411	39,886	1,435	45,610	119,400	207,940	208,353
1998	30,875	9,852	93,360	134,602	16,667	3,575	78,999	99,492	3,566	24,515	32,143	1,600	45,634	107,647	183,368	183,775
1999	31,577	11,397	93,482	R <sub>136</sub> 999	16,351	3,931	79,141	99,681	3,457	24,079	36,966	1,786	45,429	111,857	207,433	207,843
2000	38,959	17,283	98,209	R <sub>155</sub> 299	21,339	6,674	85,129	113,423	3,507	34,624	52,066	1,888	47,859	140,090	276,642	277,090
2001	46,189	17,169	103,158	167,241	25,879	6,225	93,402	125,790	3,572	38,597	47,173	2,216	48,519	140,158	260,785	261,295
2002	38,490	14,549	106,834	160,542	20,926	5,187	93,763	120,164	3,526	R <sub>31</sub> 199	45,685	2,592	46,606	R <sub>129</sub> 788	251,441	251,919
2003	48,278	18,010	111,249	178,374	26,411	7,137	96,263	130,132	3,552	41,168	54,228	1,935	49,962	151,015	294,544	295,188
2004	52,265	20,264	115,577	189,080	29,518	8,233	100,546	138,694	4,064	R <sub>47</sub> 464	71,052	1,919	51,491	R <sub>177</sub> 114	365,526	366,208
2005	61,196	24,320	128,393	215,186	33,838	10,331	110,522	R <sub>155</sub> 165	5,004	R <sub>55</sub> 300	88,285	3,451	56,229	R <sub>208</sub> 902	466,785	467,644
2006	59,834	23,531	140,582	R <sub>225</sub> 244	33,736	10,563	122,914	R <sub>167</sub> 630	5,405	R <sub>52</sub> 571	106,621	R <sub>3</sub> 509	59,764	R <sub>228</sub> 377	537,500	538,436
2007	61,598	26,468	148,295	R <sub>237</sub> 897	34,005	11,410	128,903	R <sub>174</sub> 798	5,439	R <sub>51</sub> 126	113,491	R <sub>3</sub> 180	62,934	R <sub>236</sub> 517	584,045	585,070
2008	67,851	32,071	155,433	257,448	38,476	14,996	138,469	R <sub>192</sub> 540	6,290	R <sub>61</sub> 877	131,958	R <sub>3</sub> 402	65,840	R <sub>270</sub> 833	686,871	688,024
2009	R <sub>57</sub> 841	24,425	157,008	R <sub>240</sub> 773	31,012	R <sub>10</sub> 584	132,940	R <sub>175</sub> 023	5,388	R <sub>36</sub> 302	R <sub>80</sub> 591	R <sub>2</sub> 310	59,662	R <sub>184</sub> 210	R <sub>460</sub> 142	R <sub>461</sub> 214
2010	54,439	26,791	166,782	249,739	29,183	12,863	135,559	178,128	6,591	36,993	106,495	3,190	62,745	216,172	559,758	560,787

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.  
<sup>2</sup> Natural gas, plus a small amount of supplemental gaseous fuels.  
<sup>3</sup> Retail electricity expenditures by ultimate customers, reported by electric utilities and, beginning in 1996, other energy service providers.  
<sup>4</sup> Includes coal and wood and wood-derived fuels, which are not separately displayed.  
<sup>5</sup> Beginning in 1993, includes fuel ethanol blended into motor gasoline.  
<sup>6</sup> Includes coal, wood and wood-derived fuels, and biomass waste, which are not separately displayed. Through 2000, also includes non-biomass waste.  
<sup>7</sup> For 1981–1992, includes fuel ethanol blended into motor gasoline that is not included in the petroleum data for those years.  
<sup>8</sup> Wood and wood-derived fuels, and biomass waste; excludes fuel ethanol and biodiesel. Through

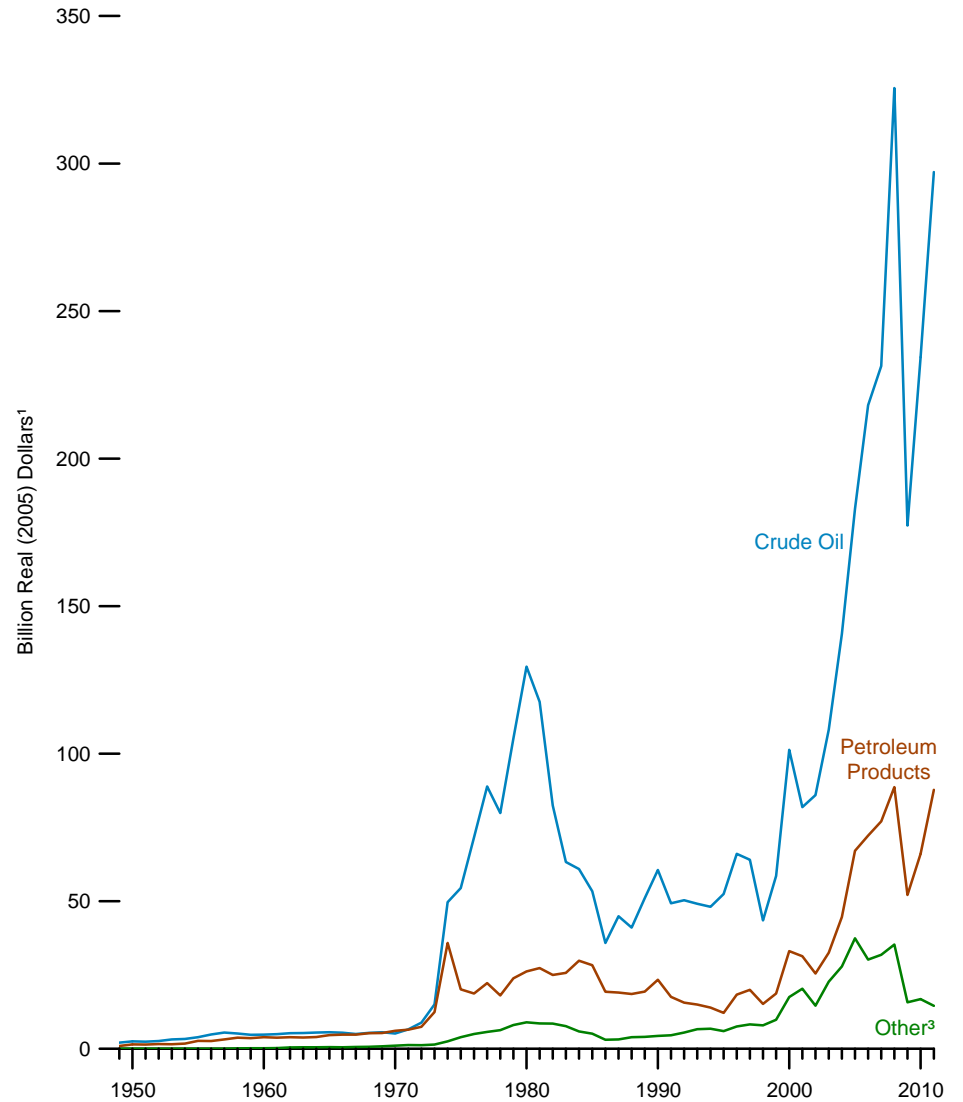
2000, also includes non-biomass waste.  
<sup>9</sup> Includes coal coke imports and exports, which are not separately displayed.  
<sup>10</sup> Includes coal, natural gas, and retail electricity, which are not separately displayed.  
 R=Revised.  
 Notes: • Expenditures include taxes where data are available. • There are no direct fuel costs for hydroelectric, geothermal, wind, or solar energy. • Totals may not equal the sum of components due to independent rounding.  
 Web Page: For related information, see <http://www.eia.gov/state/seds/seds-data-complete.cfm>.  
 Source: U.S. Energy Information Administration, "State Energy Data 2010: Prices and Expenditures" (June 2012), U.S. Tables ET3–ET6.

**Figure 3.7 Value of Fossil Fuel Imports**

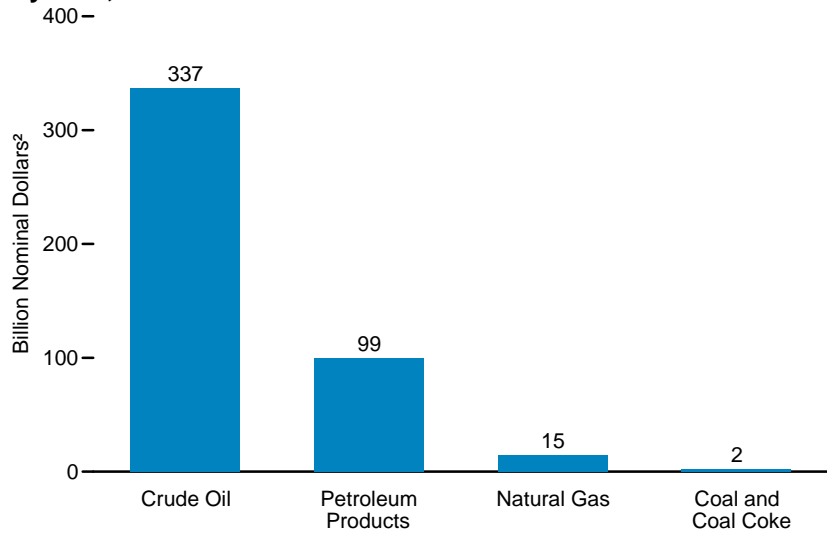
**Total, 1949-2011**



**By Fuel, 1949-2011**



**By Fuel, 2011**



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>2</sup> See "Nominal Dollars" in Glossary.

<sup>3</sup> Natural gas, coal, and coal coke.  
Source: Table 3.7.

**Table 3.7 Value of Fossil Fuel Imports, Selected Years, 1949-2011**

(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil <sup>1</sup>		Petroleum Products <sup>2</sup>		Total	
	Nominal <sup>3</sup>	Real <sup>4</sup>	Nominal <sup>3</sup>	Real <sup>4</sup>	Nominal <sup>3</sup>	Real <sup>4</sup>	Nominal <sup>3</sup>	Real <sup>4</sup>	Nominal <sup>3</sup>	Real <sup>4</sup>	Nominal <sup>3</sup>	Real <sup>4</sup>
1949	(s)	0.02	(s)	0.03	0.00	0.00	0.30	2.10	0.14	0.95	0.45	3.09
1950	(s)	.02	.01	.04	.00	.00	.37	2.52	.21	R1.46	.59	4.04
1955	(s)	.02	(s)	.01	(s)	.01	.65	R3.94	.44	2.66	1.10	6.64
1960	(s)	.01	(s)	.01	(s)	.03	.90	4.81	.73	3.93	1.66	R8.91
1965	(s)	.01	(s)	.01	.11	.53	1.12	5.62	.92	R4.63	2.15	R10.79
1970	(s)	(s)	(s)	.01	.26	1.06	1.26	5.18	1.48	R6.09	3.00	R12.34
1975	.02	.06	.16	.47	1.15	3.43	18.29	R54.45	6.77	R20.15	26.39	R78.56
1976	.02	.05	.11	.31	1.66	R4.67	25.46	R71.67	6.65	R18.73	33.90	R95.43
1977	.04	.10	.13	.35	2.00	R5.29	33.59	R88.91	8.42	R22.28	44.18	R116.93
1978	.07	.18	.41	1.01	2.06	5.10	32.30	R79.88	7.30	R18.06	42.15	R104.23
1979	.05	.12	.34	.78	3.13	7.14	46.06	R105.16	10.45	R23.86	60.03	R137.05
1980	.03	.06	.05	.11	4.21	8.82	61.90	R129.52	12.54	R26.24	78.74	R164.75
1981	.03	.06	.04	.08	4.41	R8.44	61.46	R117.58	14.30	R27.35	80.24	R153.51
1982	.02	.04	.01	.02	4.69	R8.46	45.72	R82.45	13.86	R25.00	64.31	R115.96
1983	.04	.07	(s)	(s)	4.39	R7.61	36.49	R63.30	14.84	R25.74	55.77	R96.73
1984	.05	.08	.05	.08	3.44	5.75	36.44	R60.93	17.87	R29.87	57.84	R96.70
1985	.07	.11	.04	.07	3.05	4.95	32.90	R53.39	17.47	R28.34	53.53	R86.86
1986	.08	.13	.03	.04	1.82	2.90	22.61	R35.89	12.18	R19.34	36.72	R58.29
1987	.06	.09	.05	.08	R1.94	R2.99	29.13	R44.94	12.37	R19.08	43.54	R67.17
1988	.06	.10	.19	.29	2.38	3.55	27.55	R41.09	12.43	R18.55	42.62	R63.57
1989	.10	.14	.22	.31	2.51	R3.61	35.53	R51.06	13.50	R19.40	R51.86	R74.53
1990	.09	.13	.07	.10	2.97	R4.11	43.78	R60.59	16.90	R23.39	63.83	R88.32
1991	.11	.15	.09	.12	R3.25	R4.34	36.90	R49.32	13.17	R17.60	R53.52	R71.53
1992	.13	.17	.14	.19	R3.95	R5.16	38.55	R50.33	11.98	R15.65	R54.76	R71.49
1993	.25	.32	.17	.21	4.77	R6.09	38.47	R49.14	11.74	R15.00	55.40	R70.76
1994	.27	.34	.27	.34	R4.91	6.14	38.48	R48.14	11.14	R13.94	R55.08	R68.90
1995	.32	.40	.33	.40	4.23	5.19	42.81	R52.46	9.95	R12.19	57.64	R70.64
1996	.27	.33	.24	.29	5.79	R6.96	54.93	R66.06	15.27	R18.36	R76.50	R92.00
1997	.26	.30	.25	.30	6.50	7.68	54.23	R64.08	<sup>5</sup> 16.93	<sup>5</sup> R20.00	78.16	R92.36
1998	.28	.33	.29	.34	6.21	7.26	37.25	R43.53	13.01	R15.20	57.05	R66.66
1999	.28	.32	.23	.26	8.03	R9.25	50.89	R58.60	16.28	R18.75	75.71	R87.18
2000	.38	.42	.25	.28	14.94	R16.84	89.88	R101.30	29.38	R33.11	134.81	R151.95
2001	.67	.74	.19	.21	17.62	R19.42	74.29	R81.89	28.45	R31.36	121.23	R133.62
2002	.60	.65	.24	R.26	R12.65	R13.72	79.25	R85.96	23.52	R25.51	R116.26	R126.11
2003	.79	.84	.24	.25	20.39	R21.66	101.80	R108.14	30.64	R32.55	153.85	R163.43
2004	1.02	1.06	1.23	1.27	24.74	R25.56	136.03	R140.55	43.24	R44.67	206.26	R213.11
2005	1.42	1.42	.78	.78	35.25	35.25	182.94	182.94	67.12	67.12	287.52	287.52
2006	1.78	1.72	.64	.62	28.80	R27.90	225.16	R218.11	74.56	R72.22	330.93	R320.57
2007	1.73	1.63	.48	.45	31.65	R29.80	245.77	R231.36	81.85	R77.05	361.48	R340.29
2008	2.05	1.88	1.68	1.54	34.66	R31.92	353.54	R325.59	96.31	R88.70	488.23	R449.64
2009	1.45	1.32	.09	.08	15.72	R14.32	194.60	R177.35	57.23	R52.16	269.09	R245.23
2010	1.39	R1.25	.40	.36	R16.91	R15.23	R260.11	R234.35	R73.36	R66.09	R352.16	R317.29
2011	P1.35	P1.19	P.55	P.49	E14.61	E12.89	P336.80	P297.10	P99.49	P87.76	P452.79	P399.43

<sup>1</sup> Beginning in 1977, includes imports for the Strategic Petroleum Reserve.

<sup>2</sup> Includes petroleum preparations, liquefied propane and butane, and, beginning in 1997, other mineral fuels.

<sup>3</sup> See "Nominal Dollars" in Glossary.

<sup>4</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>5</sup> There is a discontinuity in this time series between 1996 and 1997 due to the addition of the commodity category "Other Mineral Fuels."

R=Revised. P=Preliminary. E=Estimate. (s)=Less than 0.005 billion.

Notes: • Includes value of imports into Puerto Rico from foreign countries; excludes receipts into the 50 States and the District of Columbia from the Virgin Islands and Puerto Rico. • Totals may not equal sum of components due to independent rounding.

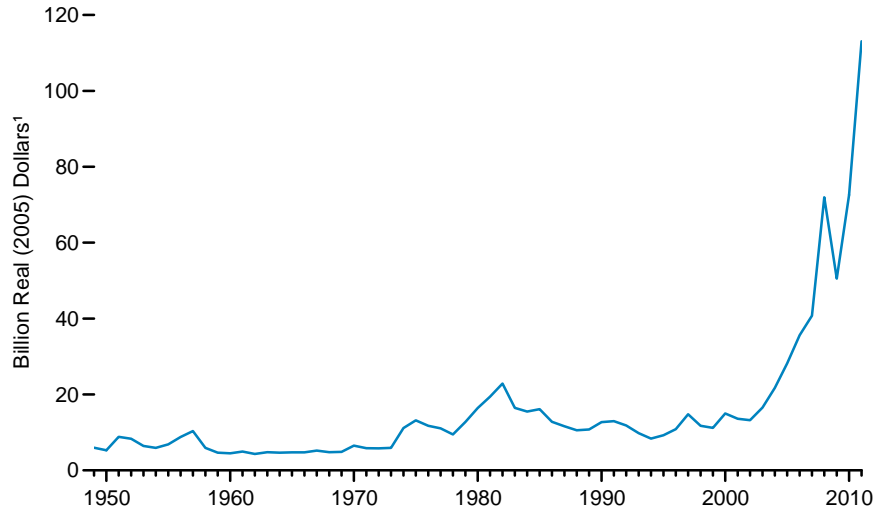
Web Page: For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#financial>.

Sources: **Coal and Coal Coke:** Bureau of the Census, Foreign Trade Division, unpublished data.

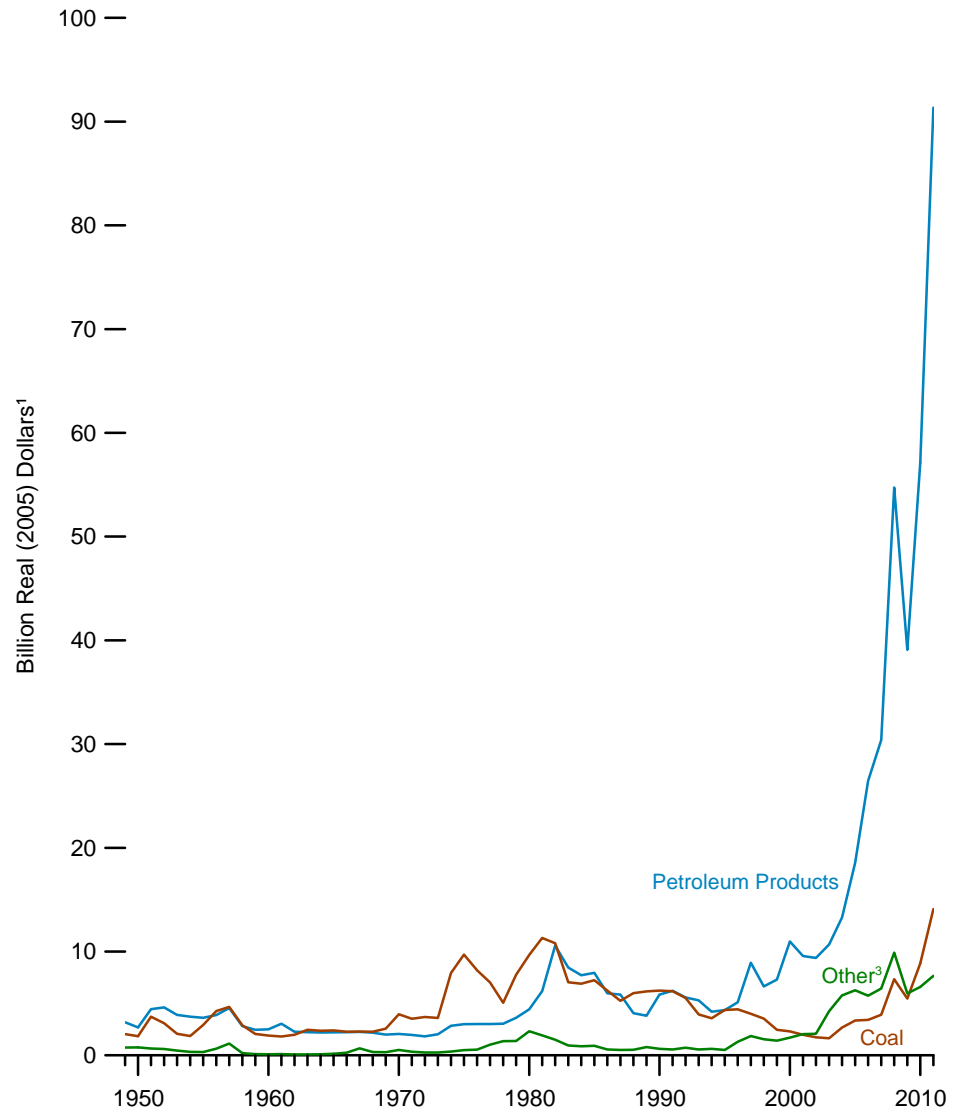
**Natural Gas:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1971—Bureau of the Census, *U.S. Imports for Consumption and General Imports*, FT246. • 1972 and 1973—Federal Power Commission (FPC), *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG*. • 1974-1977—FPC, *United States Imports and Exports of Natural Gas*, annual reports. • 1978-1981—U.S. Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual reports. • 1982-2009—EIA, *Natural Gas Monthly (NGM)*, monthly reports. • 2010—EIA, NGM (April 2012), Table 4. • 2011—EIA estimate based on volume and revenue data from U.S. Department of Energy, Office of Fossil Energy. **Crude Oil and Petroleum Products:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1988—Bureau of the Census, *U.S. Imports for Consumption*, FT135. • 1989 forward—Bureau of the Census, Foreign Trade Division, *U.S. Merchandise Trade*, FT900, "Exports and Imports of Goods by Principal SITC Commodity Groupings," Annual Revisions and December 2011 issue.

**Figure 3.8 Value of Fossil Fuel Exports**

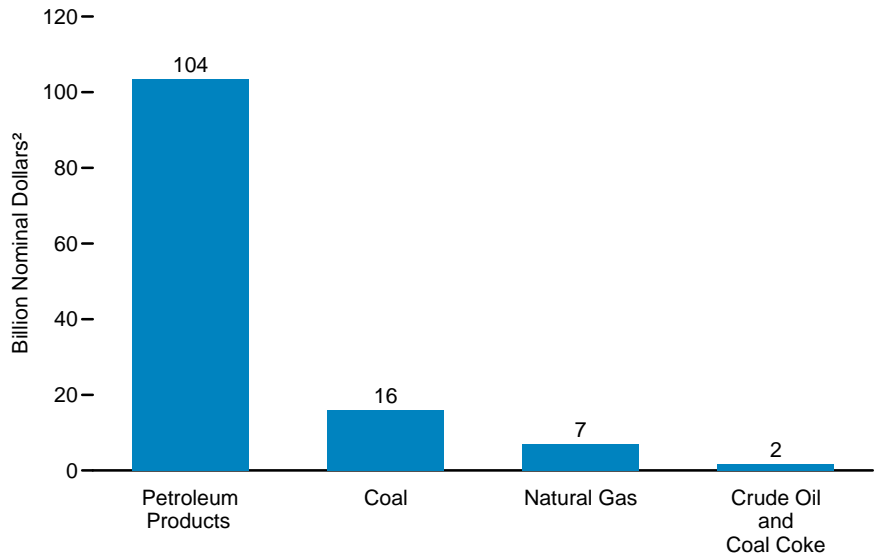
**Total, 1949-2011**



**By Fuel, 1949-2011**



**By Fuel, 2011**



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>2</sup> See "Nominal Dollars" in Glossary.

<sup>3</sup> Natural gas, crude oil, and coal coke. Source: Table 3.8.

**Table 3.8 Value of Fossil Fuel Exports, Selected Years, 1949-2011**  
(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil		Petroleum Products <sup>1</sup>		Total	
	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>
1949	0.30	2.05	0.01	0.06	(s)	0.01	0.10	0.68	0.46	R3.18	0.87	R5.98
1950	.27	1.84	.01	.04	(s)	.02	.10	.70	.39	2.69	.78	R5.29
1955	.48	2.92	.01	.05	.01	.04	.04	.23	.60	3.61	1.14	R6.85
1960	.35	1.90	.01	.04	(s)	.02	.01	.04	.47	2.51	.84	4.51
1965	.48	2.39	.02	.08	.01	.04	(s)	.02	.44	2.21	.95	4.74
1970	.96	3.95	.08	.32	.03	.12	.02	.08	.50	2.06	1.59	R6.53
1975	3.26	R9.70	.07	.22	.09	.27	(s)	(s)	1.01	3.00	4.43	R13.19
1976	2.91	R8.19	.07	.19	.10	.28	.03	.08	1.07	3.01	4.17	R11.75
1977	2.66	7.03	.07	.19	.11	.28	.21	.55	1.14	3.01	4.18	R11.07
1978	2.05	5.07	.05	.12	.11	.28	.39	.96	1.23	3.05	3.83	R9.48
1979	3.40	7.76	.08	.18	.13	.29	.39	.90	1.58	3.62	5.58	R12.75
1980	4.63	R9.68	.13	.27	.23	.48	.75	1.57	2.12	4.44	7.86	R16.44
1981	5.92	R11.32	.07	.14	.35	.67	.58	1.10	3.24	R6.19	10.16	R19.43
1982	5.99	R10.80	.06	.11	.30	.54	.47	.85	5.86	R10.57	12.68	R22.87
1983	4.06	7.04	.05	.08	.28	.48	.22	.39	4.88	R8.46	9.48	R16.45
1984	4.13	6.91	.07	.12	.27	.45	.19	.31	4.62	7.72	9.27	R15.50
1985	4.47	7.25	.08	.12	.26	.43	.23	.37	4.90	R7.94	9.93	R16.11
1986	3.93	6.24	.07	.10	.17	.27	.12	.19	3.77	5.98	8.05	R12.78
1987	3.40	R5.25	.05	.07	.17	.26	.13	.19	3.80	5.86	7.54	R11.63
1988	4.01	5.99	.08	.12	.20	.30	.08	.12	2.72	R4.06	7.09	R10.58
1989	4.29	R6.16	.08	.12	.27	.39	.21	.30	2.65	R3.81	7.49	R10.77
1990	4.51	R6.24	.05	.07	.27	.37	.14	.19	4.23	5.86	9.20	R12.73
1991	4.62	R6.17	.05	.07	.33	.45	.03	.04	4.65	6.22	9.69	R12.95
1992	4.24	R5.53	.04	.06	.49	.64	.03	.04	4.27	R5.57	9.07	R11.84
1993	3.09	R3.94	.06	.08	.36	.46	.02	.03	4.15	5.30	7.68	9.81
1994	2.85	R3.56	.04	.05	.40	.51	.05	.06	3.36	4.21	R6.70	R8.39
1995	3.57	4.37	.05	.06	.37	.45	.01	.01	3.56	R4.36	7.55	R9.25
1996	3.69	R4.43	.06	.07	.46	.55	.56	.67	4.25	5.12	9.02	R10.84
1997	3.39	R4.00	.05	.06	.47	.56	1.04	1.23	4.75	4.89	12.51	R14.78
1998	3.04	3.55	.04	.05	.39	.46	.90	1.05	5.68	6.64	10.04	R11.74
1999	2.13	2.46	.03	.03	.43	.49	.77	.89	6.35	7.31	9.71	R11.18
2000	2.04	2.30	.05	.06	1.00	1.13	.46	.52	9.73	10.97	13.28	R14.97
2001	1.80	1.98	.11	.12	1.56	R1.72	.19	.21	8.68	R9.57	12.34	R13.60
2002	1.60	1.74	.06	.07	1.76	1.91	.09	.10	8.65	R9.38	12.17	R13.20
2003	1.55	1.64	.07	.07	3.77	4.00	.16	.17	10.05	10.68	15.59	R16.56
2004	2.60	2.68	.11	.11	5.20	R5.37	.28	.29	12.85	13.28	21.04	R21.73
2005	3.35	3.35	.15	.15	5.53	5.53	.60	.60	18.56	18.56	28.18	28.18
2006	3.52	3.41	.13	.12	4.94	4.79	.85	.83	27.32	26.46	36.77	35.61
2007	4.16	3.91	.13	.12	5.69	R5.36	1.02	R.96	32.28	R30.39	43.27	R40.74
2008	7.96	7.33	.21	.19	8.26	7.61	2.27	2.09	59.43	R54.73	78.13	R71.96
2009	5.99	R5.46	.14	.12	4.79	4.37	1.62	R1.47	42.89	R39.09	55.43	R50.52
2010	9.84	R8.86	.24	.22	R5.71	R5.14	R1.37	R1.23	R63.41	R57.13	R80.57	72.59
2011	P15.97	P14.08	P.21	P.19	E7.01	E6.18	P1.46	P1.29	P103.54	P91.34	P128.18	P113.08

<sup>1</sup> Includes petroleum preparations, liquefied propane and butane, and, beginning in 1997, other mineral fuels.

<sup>2</sup> See "Nominal Dollars" in Glossary.

<sup>3</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>4</sup> There is a discontinuity in this time series between 1996 and 1997 due to the addition of the commodity category "Other Mineral Fuels."

R=Revised. P=Preliminary. E=Estimate. (s)=Less than 0.005 billion.

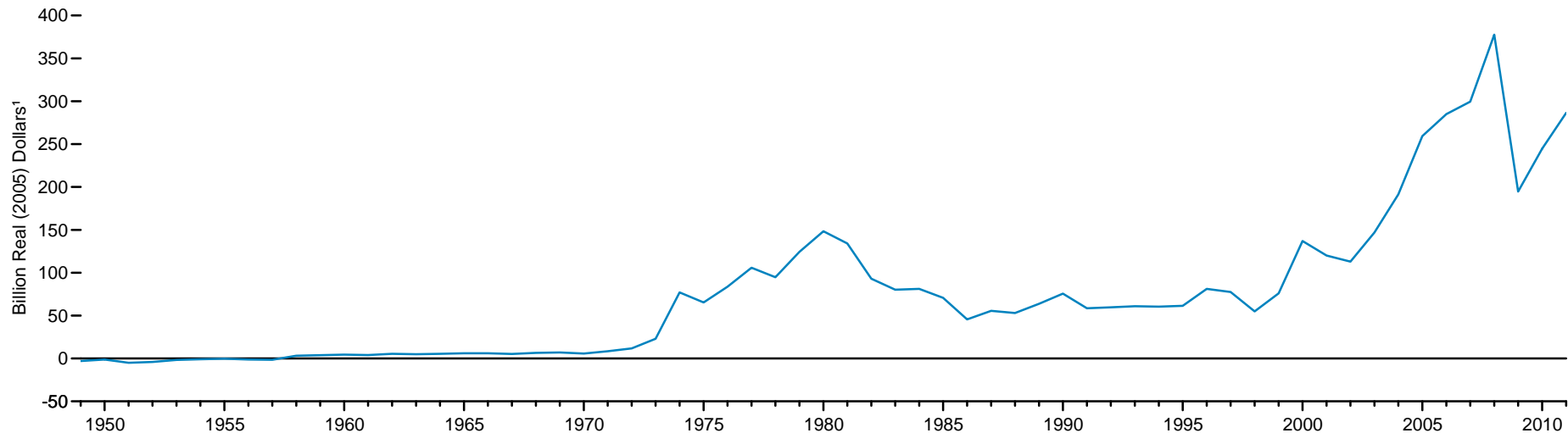
Notes: • Includes value of exports from Puerto Rico to foreign countries; excludes shipments from the 50 States and the District of Columbia to the Virgin Islands and Puerto Rico. • Totals may not equal sum of components due to independent rounding.

Web Page: For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#financial>.

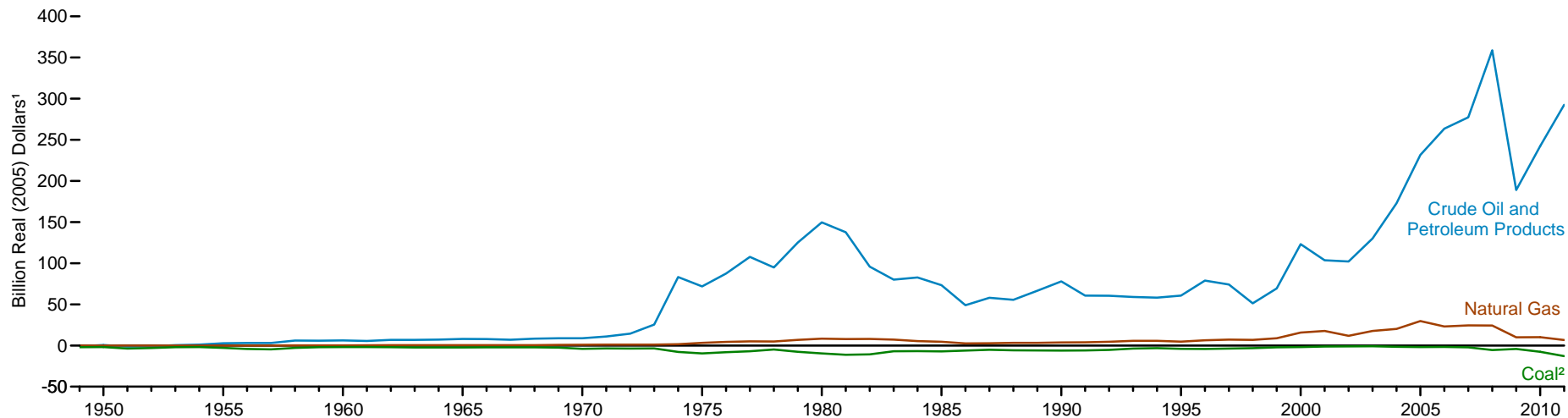
Sources: **Coal and Coal Coke:** Bureau of the Census, Foreign Trade Division, unpublished data. **Natural Gas:** • 1949-1971—Bureau of the Census, *U.S. Exports*, FT410. • 1972 and 1973—Federal Power Commission (FPC), *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG*. • 1974-1977—FPC, *United States Imports and Exports of Natural Gas*, annual reports. • 1978-1981—U.S. Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual reports. • 1982-2009—EIA, *Natural Gas Monthly (NGM)*, monthly reports. • 2010—EIA, NGM (April 2012), Table 5. • 2011—EIA estimate based on volume and revenue data from U.S. Department of Energy, Office of Fossil Energy. **Crude Oil and Petroleum Products:** • 1949-1988—Bureau of the Census, *U.S. Exports*, FT410. • 1989 forward—Bureau of the Census, Foreign Trade Division, *U.S. Merchandise Trade*, FT900, "Exports and Imports of Goods by Principal SITC Commodity Groupings," Annual Revisions and December 2011 issue.

**Figure 3.9 Value of Fossil Fuel Net Imports, 1949-2011**

**Value of Fossil Fuel Net Imports**



**Value of Fossil Fuel Net Imports by Fuel**



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>2</sup> Includes small amounts of coal coke.

Note: Negative net imports indicate that the value of exports is greater than the value of imports.

Source: Table 3.9.



**Table 3.9 Value of Fossil Fuel Net Imports, Selected Years, 1949-2011**  
(Billion Dollars)

Year	Coal		Coal Coke		Natural Gas		Crude Oil		Petroleum Products <sup>1</sup>		Total	
	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>
1949	-0.29	R-2.03	(s)	-0.03	(s)	-0.01	0.21	1.42	-0.32	-2.24	-0.42	-2.89
1950	-.27	-1.82	(s)	-.01	(s)	-.02	.27	1.82	-.18	-1.23	-.18	-1.26
1955	-.48	R-2.90	-.01	-.04	-.01	-.03	.62	3.71	-.16	-.95	-.04	-.22
1960	-.35	-1.89	-.01	-.03	.02	.13	.89	4.77	.26	1.42	.82	4.40
1965	-.48	R-2.38	-.01	-.07	.10	.49	1.11	R5.59	.48	2.43	1.21	R6.05
1970	-.96	-3.95	-.08	-.31	.23	R.93	1.24	R5.10	.98	4.03	1.41	5.81
1975	-3.24	-9.64	.08	.24	1.06	3.16	18.29	R54.45	5.76	R17.15	21.96	R65.36
1976	-2.89	R-8.14	.04	.12	1.56	4.39	25.43	R71.59	5.58	R15.71	29.72	R83.68
1977	-2.62	R-6.92	.06	.16	1.89	R5.01	33.38	R88.35	7.28	R19.26	40.00	R105.86
1978	-1.98	R-4.88	.36	.89	1.95	4.82	31.91	R78.91	6.07	R15.01	38.31	R94.75
1979	-3.35	R-7.64	.26	.59	3.00	6.85	45.66	R104.26	8.87	R20.24	54.44	R124.30
1980	-4.60	R-9.62	-.08	-.16	3.98	8.34	61.15	R127.95	10.42	R21.80	70.88	R148.31
1981	-5.89	R-11.26	-.03	-.06	4.06	R7.77	60.88	R116.47	11.06	R21.16	70.09	R134.08
1982	-5.97	R-10.76	-.05	-.09	4.39	R7.92	45.25	R81.60	8.00	R14.43	51.63	R93.09
1983	-4.01	R-6.96	-.04	-.08	4.11	7.13	36.27	R62.91	9.96	R17.28	46.28	R80.28
1984	-4.09	R-6.83	-.02	-.04	3.17	5.30	36.26	R60.62	13.25	R22.15	48.57	R81.19
1985	-4.39	R-7.13	-.03	R-.05	R2.78	4.52	32.68	R53.02	12.57	R20.40	43.60	R70.75
1986	-3.85	R-6.11	-.04	-.06	1.65	2.62	22.49	R35.71	8.42	R13.36	28.67	R45.51
1987	-3.35	-5.17	.01	.01	R1.77	R2.73	29.00	R44.75	8.57	R13.22	36.00	R55.54
1988	-3.95	-5.89	.12	.17	2.18	3.25	27.47	R40.97	9.71	R14.48	35.53	R52.99
1989	-4.19	R-6.02	.14	.20	R2.25	R3.23	35.32	R50.77	10.85	R15.59	R44.36	R63.76
1990	-4.42	R-6.11	.02	.03	2.71	3.75	43.65	R60.40	12.67	R17.53	54.63	R75.60
1991	-4.51	R-6.02	.04	.06	R2.91	R3.89	36.87	R49.27	8.52	R11.38	R43.83	R58.58
1992	-4.11	-5.37	.10	.13	3.47	R4.53	38.52	R50.29	7.72	R10.07	R45.69	R59.65
1993	-2.83	-3.62	.11	.14	4.41	R5.63	38.45	R49.11	7.59	9.70	47.72	R60.95
1994	-2.58	R-3.22	.23	.29	4.50	5.63	38.43	R48.07	7.78	R9.73	48.37	R60.51
1995	-3.24	R-3.97	.27	.34	3.86	R4.74	42.81	R52.46	6.39	7.83	50.09	R61.38
1996	-3.41	R-4.10	.18	.22	5.33	R6.41	54.37	R65.38	11.01	R13.24	67.49	R81.15
1997	-3.13	-3.70	.20	.23	6.02	7.12	53.19	R62.85	49.37	4R11.08	65.65	R77.58
1998	-2.75	-3.22	.25	.29	5.82	R6.80	36.36	R42.48	7.33	R8.57	47.00	R54.92
1999	-1.85	-2.14	.20	.23	7.61	8.76	50.12	R57.71	9.94	R11.44	66.00	R76.00
2000	-1.66	-1.88	.20	.23	13.94	R15.71	89.41	R100.78	19.65	R22.14	121.53	R136.98
2001	-1.13	-1.24	.08	.09	16.05	R17.69	74.11	R81.68	19.77	R21.79	108.89	R120.02
2002	-1.00	-1.09	.18	.20	R10.89	R11.81	79.16	R85.86	14.87	R16.13	R104.10	R112.91
2003	-.76	-.81	.17	.18	16.62	17.66	101.64	R107.97	20.59	R21.87	138.26	R146.87
2004	-1.57	-1.63	1.12	1.16	19.54	20.19	135.75	R140.26	30.38	R31.39	185.23	R191.38
2005	-1.93	-1.93	.63	.63	29.72	29.72	182.35	182.35	48.56	48.56	259.34	259.34
2006	-1.74	-1.69	.51	.49	23.86	R23.11	224.30	R217.28	47.24	R45.76	294.17	R284.96
2007	-2.42	-2.28	.35	.33	25.96	R24.44	244.76	R230.41	49.57	R46.67	318.21	R299.56
2008	-5.92	-5.45	1.47	1.35	26.40	R24.31	351.27	R323.50	36.89	R33.97	410.10	R377.69
2009	-4.55	R-4.14	-.04	-.04	10.92	R9.96	192.99	R175.87	14.34	R13.07	213.66	R194.72
2010	-8.45	R-7.61	.16	.14	R11.20	R10.09	258.74	R233.11	R9.95	R8.96	R271.60	R244.70
2011	P-14.61	P-12.89	P.34	P.30	E7.60	E6.70	P335.34	P295.81	P-4.05	P-3.58	P324.61	P286.35

<sup>1</sup> Includes petroleum preparations, liquefied propane and butane, and, beginning in 1997, other mineral fuels.

<sup>2</sup> See "Nominal Dollars" in Glossary.

<sup>3</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>4</sup> There is a discontinuity in this time series between 1996 and 1997 due to the addition of the commodity category "Other Mineral Fuels."

R=Revised. P=Preliminary. E=Estimate. (s)=Less than 0.005 billion and greater than -0.005 billion.

Notes: • Net imports equal imports minus exports. Minus sign indicates that the value of exports is greater than the value of imports. • Totals may not equal sum of components due to independent rounding. • Data on this table may not equal data on Table 3.7 minus data on Table 3.8 due to independent rounding.

Web Page: For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#financial>.

Sources: Tables 3.7 and 3.8.

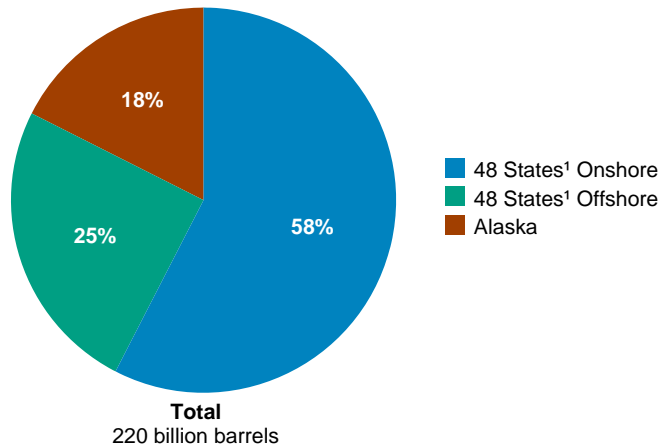
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## **4. Energy Resources**

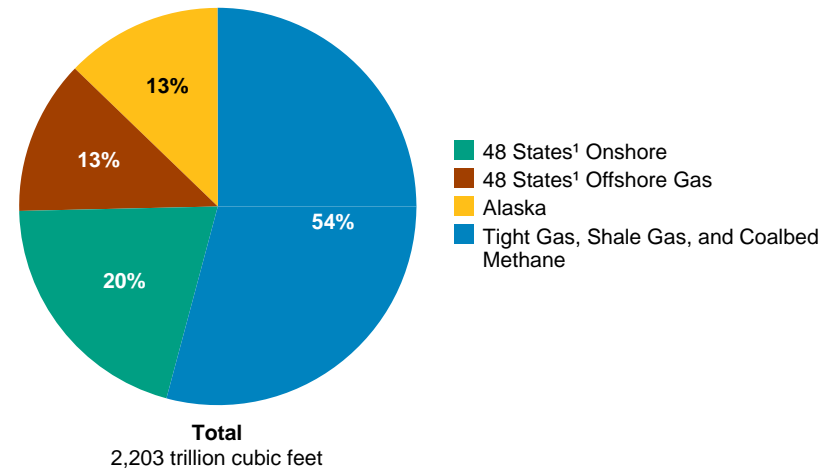
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**Figure 4.1 Technically Recoverable Crude Oil and Natural Gas Resource Estimates, 2009**

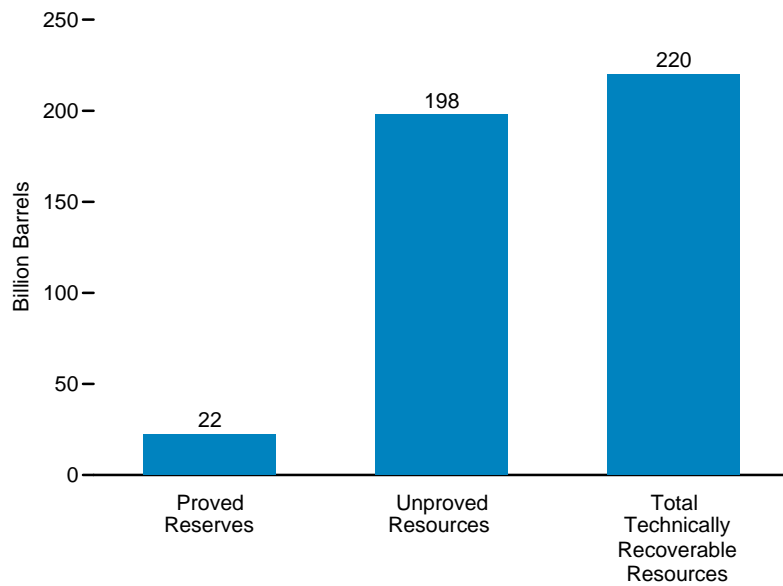
**Crude Oil and Lease Condensate, Total Technically Recoverable Resources**



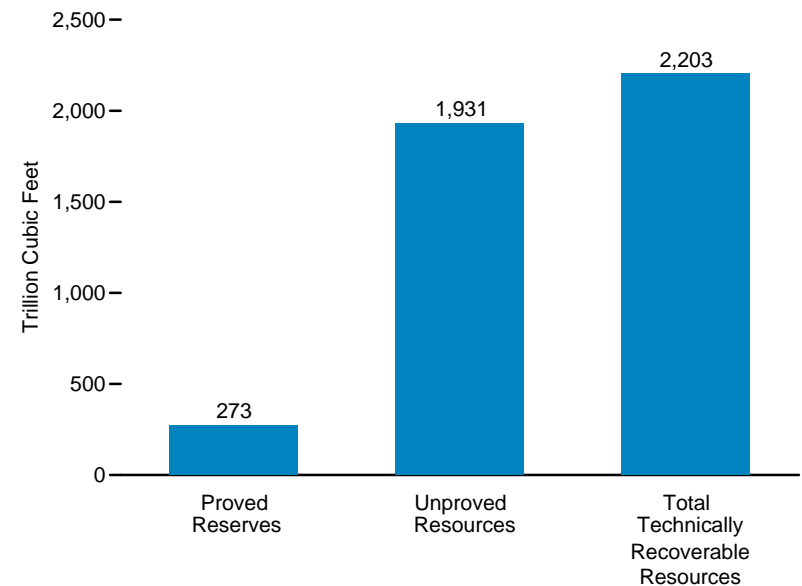
**Dry Natural Gas, Total Technically Recoverable Resources**



**Crude Oil and Lease Condensate by Type**



**Dry Natural Gas by Type**



<sup>1</sup> "48 States" is the United States excluding Alaska and Hawaii.

Note: Sum of components may not equal 100 percent due to independent rounding.

Source: Table 4.1.

**Table 4.1 Technically Recoverable Crude Oil and Natural Gas Resource Estimates, 2009**

Region	Proved Reserves <sup>1</sup>	Unproved Resources	Total Technically Recoverable Resources <sup>2</sup>
<b>Crude Oil and Lease Condensate (billion barrels)</b>			
48 States <sup>3</sup> Onshore .....	14.2	112.6	126.7
48 States <sup>3</sup> Offshore .....	4.6	50.3	54.8
Alaska .....	3.6	35.0	38.6
<b>Total U.S.</b> .....	<b>22.3</b>	<b>197.9</b>	<b>220.2</b>
<b>Dry Natural Gas <sup>4</sup> (trillion cubic feet)</b>			
<b>Conventionally Reservoired Fields <sup>5</sup></b> .....	<b>105.5</b>	<b>904.0</b>	<b>1,009.5</b>
48 States <sup>3</sup> Onshore Gas <sup>6</sup> .....	81.4	369.7	451.1
48 States <sup>3</sup> Offshore Gas <sup>7</sup> .....	15.0	262.6	277.6
Alaska .....	9.1	271.7	280.8
<b>Tight Gas, <sup>8</sup> Shale Gas, <sup>9</sup> and Coalbed Methane <sup>10</sup></b> .....	<b>167.1</b>	<b>1,026.7</b>	<b>1,193.8</b>
<b>Total U.S.</b> .....	<b>272.5</b>	<b>1,930.7</b>	<b>2,203.3</b>

<sup>1</sup> See "Proved Reserves, Crude Oil," "Proved Reserves, Lease Condensate," and "Proved Reserves, Natural Gas" in Glossary.

<sup>2</sup> "Technically recoverable" resources are those that are producible using current technology without reference to the economic viability thereof.

<sup>3</sup> "48 States" is the United States excluding Alaska and Hawaii.

<sup>4</sup> Excludes natural gas plant liquids. See "Natural Gas, Dry" in Glossary.

<sup>5</sup> Conventionally reservoired deposits are discrete subsurface accumulations of crude oil or natural gas usually defined, controlled, or limited by hydrocarbon/water contacts.

<sup>6</sup> Includes associated-dissolved (AD) natural gas that occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with crude oil (dissolved gas).

<sup>7</sup> Includes Federal offshore and State offshore waters (near-shore, shallow-water areas under State jurisdiction).

<sup>8</sup> Natural gas produced from a non-shale formation with extremely low permeability.

<sup>9</sup> See "Shale Gas" in Glossary.

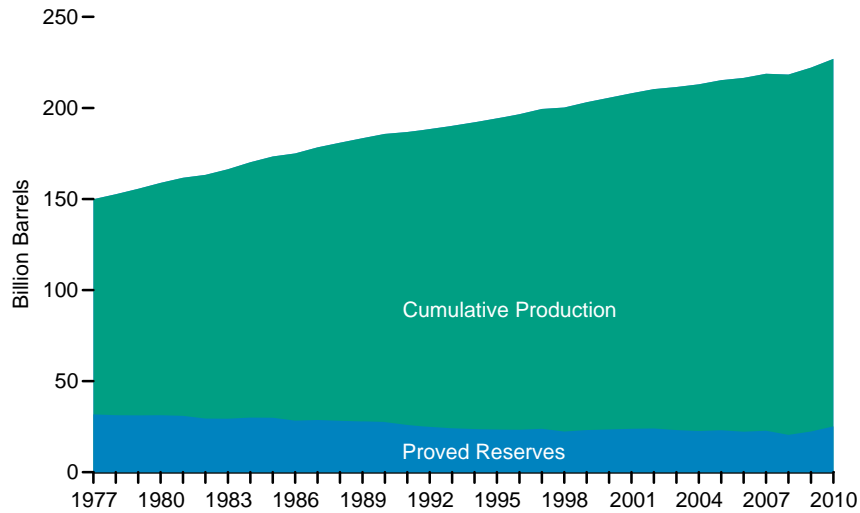
<sup>10</sup> See "Coalbed Methane" in Glossary.

Notes: • See Tables 4.2 and 4.3 for more recent proved reserves data. • Data are at end of year. • Resources in areas where drilling is officially prohibited are not included. Estimates of the resources in the Northern Atlantic, Northern and Central Pacific, and within a 50-mile buffer off the Mid and Southern Atlantic Outer Continental Shelf (OCS) are also excluded from the technically recoverable volumes. • Totals may not equal sum of components due to independent rounding.

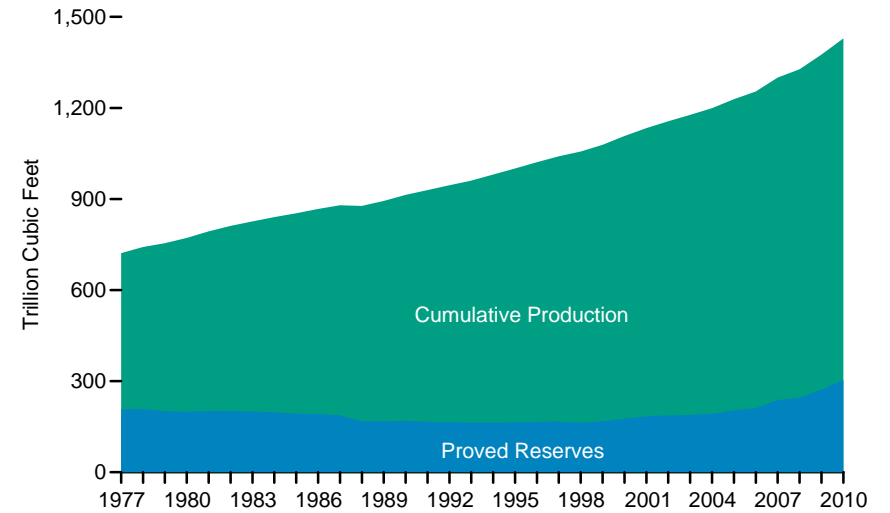
Sources: **Proved Reserves:** U.S. Energy Information Administration (EIA), *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves, 2010* (August 2012). **Unproved Resources:** U.S. Geological Survey National Oil and Gas Resource Assessment Team, with adjustments made to the shale gas data by EIA, Office of Energy Analysis. **Total Technically Recoverable Resources:** Calculated as the sum of proved reserves and unproved resources.

**Figure 4.2 Crude Oil and Natural Gas Cumulative Production and Proved Reserves, 1977-2010**

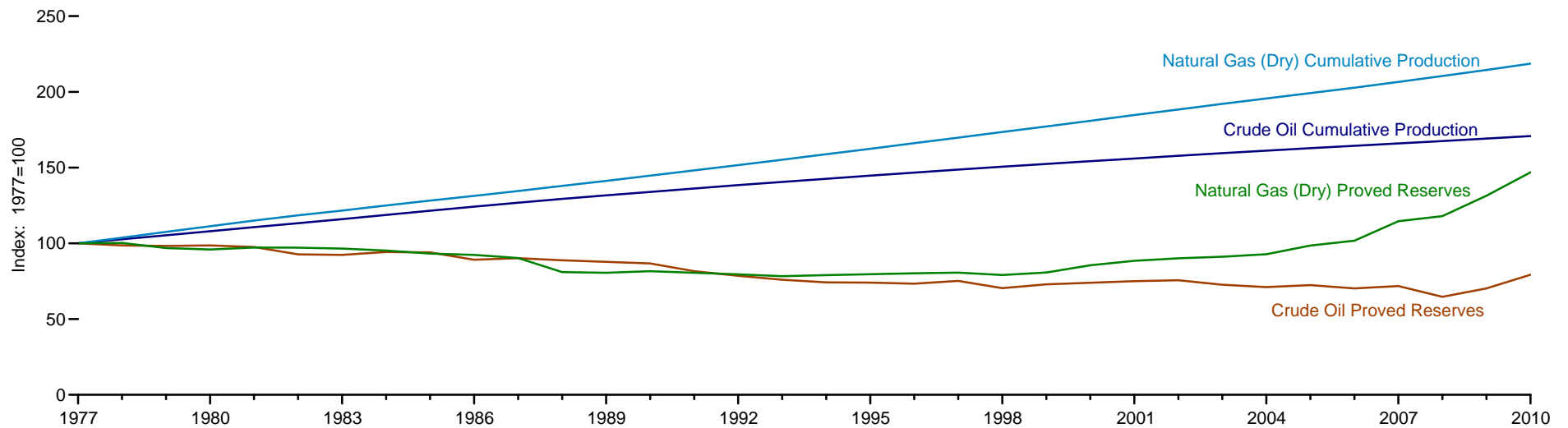
**Crude Oil**



**Natural Gas (Dry)**



**Cumulative Production and Proved Reserves, Indexed**



Notes: • Data are at end of year. • Crude oil includes lease condensate.

Source: Table 4.2.

**Table 4.2 Crude Oil and Natural Gas Cumulative Production and Proved Reserves, 1977-2010**

Year	Crude Oil and Lease Condensate <sup>1</sup>		Natural Gas (Dry)	
	Cumulative Production	Proved Reserves <sup>2</sup>	Cumulative Production	Proved Reserves <sup>3</sup>
	Billion Barrels		Trillion Cubic Feet	
1977	118.1	31.8	514.4	207.4
1978	121.3	31.4	533.6	208.0
1979	124.4	31.2	553.2	201.0
1980	127.5	31.3	572.6	199.0
1981	130.7	31.0	591.8	201.7
1982	133.8	29.5	609.6	201.5
1983	137.0	29.3	625.7	200.2
1984	140.2	30.0	643.2	197.5
1985	143.5	29.9	659.6	193.4
1986	146.7	28.3	675.7	191.6
1987	149.7	28.7	692.3	187.2
1988	152.7	28.2	709.4	168.0
1989	155.5	27.9	726.7	167.1
1990	158.2	27.6	744.5	169.3
1991	160.9	25.9	762.2	167.1
1992	163.5	25.0	780.1	165.0
1993	166.0	24.1	798.2	162.4
1994	168.4	23.6	817.0	163.8
1995	170.8	23.5	835.6	165.1
1996	173.2	23.3	854.5	166.5
1997	175.6	23.9	873.4	167.2
1998	177.8	22.4	892.4	164.0
1999	180.0	23.2	911.2	167.4
2000	182.1	23.5	930.4	177.4
2001	184.2	23.8	950.0	183.5
2002	186.3	24.0	968.9	186.9
2003	188.4	23.1	988.0	189.0
2004	190.4	22.6	1,006.6	192.5
2005	192.3	23.0	1,024.7	204.4
2006	194.1	22.3	1,043.2	211.1
2007	196.0	22.8	1,062.4	237.7
2008	197.8	20.6	1,082.6	244.7
2009	199.8	22.3	1,103.2	272.5
2010	201.8	25.2	1,124.6	304.6

<sup>1</sup> Lease condensate is the portion of natural gas liquids that is separated from the wellhead gas stream at a lease or field separation facility.

<sup>2</sup> See "Proved Reserves, Crude Oil" and "Proved Reserves, Lease Condensate" in Glossary.

<sup>3</sup> See "Proved Reserves, Natural Gas" in Glossary.

Note: Data are at end of year.

Web Pages: See <http://www.eia.gov/petroleum/> and <http://www.eia.gov/naturalgas/> for related

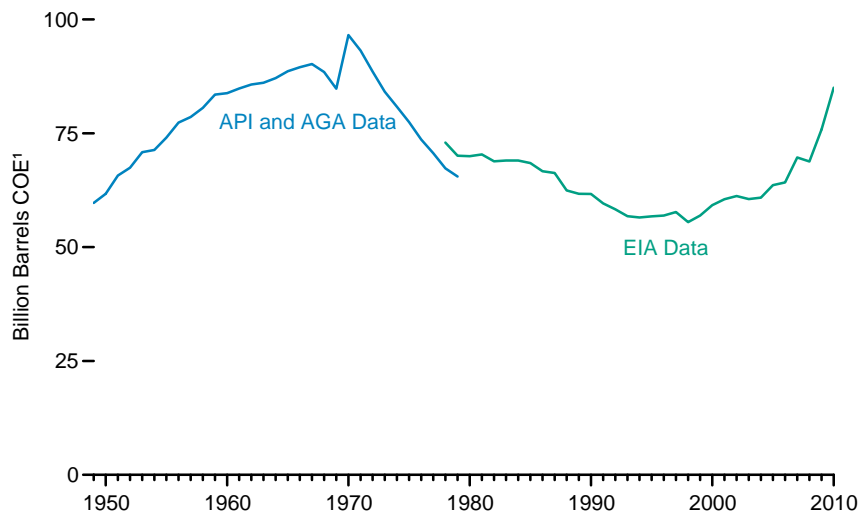
information.

Sources: **Cumulative Production:** Calculated from U.S. Energy Information Administration (EIA), *Petroleum Supply Annual*, annual reports and *Natural Gas Annual*, annual reports. **Proved Reserves:**

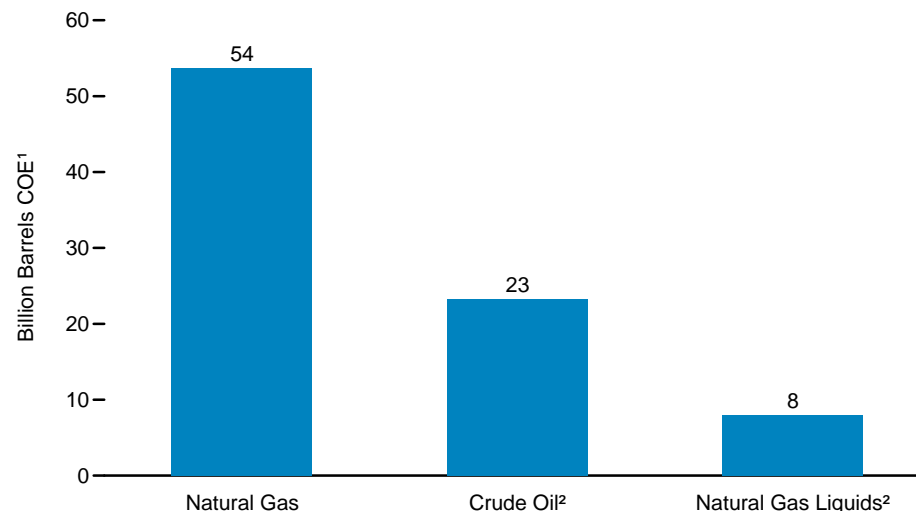
- 1977-2000—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports.
- 2001-2010—EIA, *Summary: U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves 2010* (August 2012), Table 7.

**Figure 4.3 Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves**

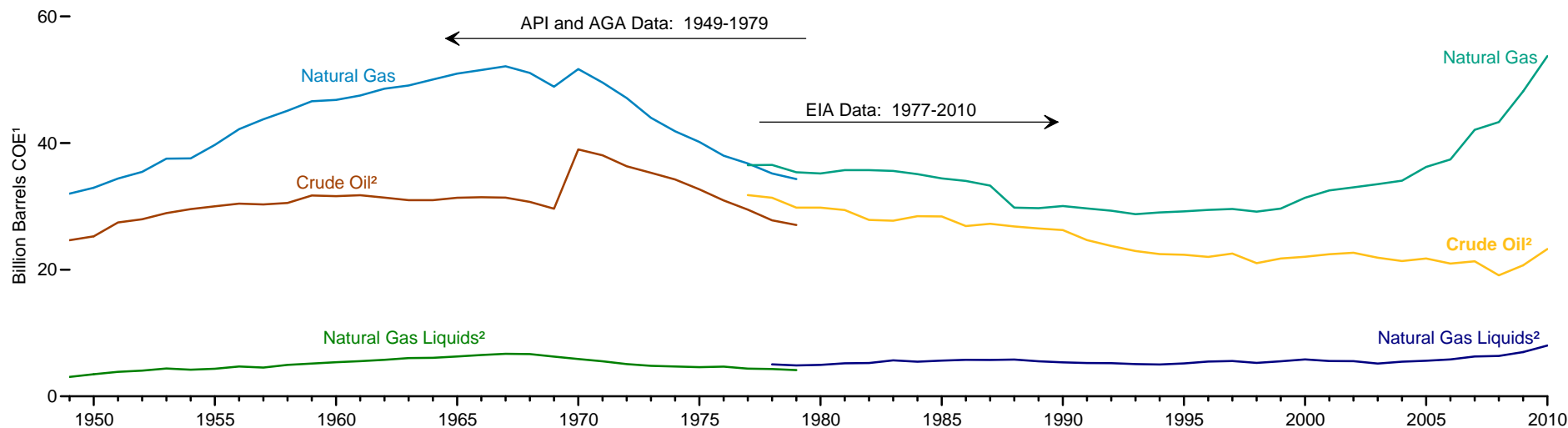
**Total, 1949-2010**



**By Type, 2010**



**By Type, 1949-2010**



<sup>1</sup> COE=crude oil equivalent.

<sup>2</sup> To the extent that lease condensate is measured or estimated it is included in "Natural Gas Liquids"; otherwise, lease condensate is included in "Crude Oil."

Notes: • Data are at end of year. • API=American Petroleum Institute. AGA=American Gas Association. EIA=U.S. Energy Information Administration. Source: Table 4.3.



**Table 4.3 Crude Oil, Natural Gas, and Natural Gas Liquids Proved Reserves, Selected Years, 1949-2010**

Year	Crude Oil <sup>1</sup>	Natural Gas (Dry)		Natural Gas Liquids <sup>1</sup>		Total
	Billion Barrels	Trillion Cubic Feet <sup>2</sup>	Billion Barrels COE <sup>3</sup>	Billion Barrels	Billion Barrels COE <sup>3</sup>	Billion Barrels COE <sup>3</sup>
<b>American Petroleum Institute and American Gas Association Data</b>						
1949	24.6	179.4	32.0	3.7	3.1	59.7
1950	25.3	184.6	32.9	4.3	3.5	61.7
1955	30.0	222.5	39.7	5.4	4.4	74.1
1960	31.6	262.3	46.8	6.8	5.4	83.8
1965	31.4	286.5	51.0	8.0	6.3	88.6
1970	39.0	290.7	51.7	7.7	5.9	96.6
1971	38.1	278.8	49.6	7.3	5.5	93.2
1972	36.3	266.1	47.1	6.8	5.1	88.5
1973	35.3	250.0	44.0	6.5	4.8	84.1
1974	34.2	237.1	41.9	6.4	4.7	80.8
1975	32.7	228.2	40.2	6.3	4.6	77.5
1976	30.9	216.0	38.0	6.4	4.7	73.6
1977	29.5	208.9	36.8	6.0	4.4	70.6
1978	27.8	200.3	35.2	5.9	4.3	67.3
1979	27.1	194.9	34.3	5.7	4.1	65.5
<b>U.S. Energy Information Administration Data</b>						
1977	31.8	207.4	36.5	NA	NA	NA
1978	31.4	208.0	36.5	6.8	5.0	73.0
1979	29.8	201.0	35.4	6.6	4.9	70.1
1980	29.8	199.0	35.2	6.7	5.0	70.0
1981	29.4	201.7	35.7	7.1	5.2	70.4
1982	27.9	201.5	35.7	7.2	5.3	68.8
1983	27.7	200.2	35.6	7.9	5.7	69.0
1984	28.4	197.5	35.1	7.6	5.5	69.0
1985	28.4	193.4	34.4	7.9	5.6	68.5
1986	26.9	191.6	34.0	8.2	5.8	66.7
1987	27.3	187.2	33.3	8.1	5.8	66.3
1988	26.8	168.0	29.8	8.2	5.8	62.4
1989	26.5	167.1	29.7	7.8	5.5	61.7
1990	26.3	169.3	30.0	7.6	5.4	61.7
1991	24.7	167.1	29.7	7.5	5.3	59.6
1992	23.7	165.0	29.3	7.5	5.2	58.3
1993	23.0	162.4	28.8	7.2	5.1	56.8
1994	22.5	163.8	29.0	7.2	5.0	56.5
1995	22.4	165.1	29.2	7.4	5.2	56.8
1996	22.0	166.5	29.4	7.8	5.5	56.9
1997	22.5	167.2	29.6	8.0	5.6	57.7
1998	21.0	164.0	29.2	7.5	5.3	55.5
1999	21.8	167.4	29.6	7.9	5.5	56.9
2000	22.0	177.4	31.4	8.3	5.8	59.2
2001	22.4	183.5	32.5	8.0	5.6	60.5
2002	22.7	186.9	<sup>R</sup> 33.0	8.0	5.6	<sup>R</sup> 61.2
2003	21.9	189.0	33.5	7.5	5.2	60.6
2004	21.4	192.5	34.1	7.9	5.5	60.9
2005	21.8	204.4	36.2	8.2	5.6	63.6
2006	21.0	211.1	37.4	8.5	5.8	64.2
2007	21.3	237.7	<sup>R</sup> 42.1	9.1	6.3	<sup>R</sup> 69.7
2008	19.1	244.7	43.3	9.3	6.4	68.8
2009	20.7	272.5	48.2	10.2	7.0	75.8
2010	23.3	304.6	53.7	11.7	8.0	85.0

<sup>1</sup> To the extent that lease condensate is measured or estimated it is included in "Natural Gas Liquids"; otherwise, lease condensate is included in "Crude Oil."

<sup>2</sup> The American Gas Association estimates of natural gas proved reserves include volumes of natural gas held in underground storage. In 1979, this volume amounted to 4.9 trillion cubic feet. U.S. Energy Information Administration (EIA) data do not include natural gas in underground storage.

<sup>3</sup> Natural gas is converted to crude oil equivalent (COE) by multiplying by the natural gas dry production approximate heat content (see Table A4) and then dividing by the crude oil production approximate heat content (see Table A2). The lease condensate portion of natural gas liquids is converted to COE by multiplying by the lease condensate production approximate heat content (5.5 million Btu per barrel) and then dividing by the crude oil production approximate heat content. Other natural gas liquids are converted to COE by multiplying by the natural gas plant liquids production approximate heat content (see Table A2) and then dividing by the crude oil production approximate heat content.

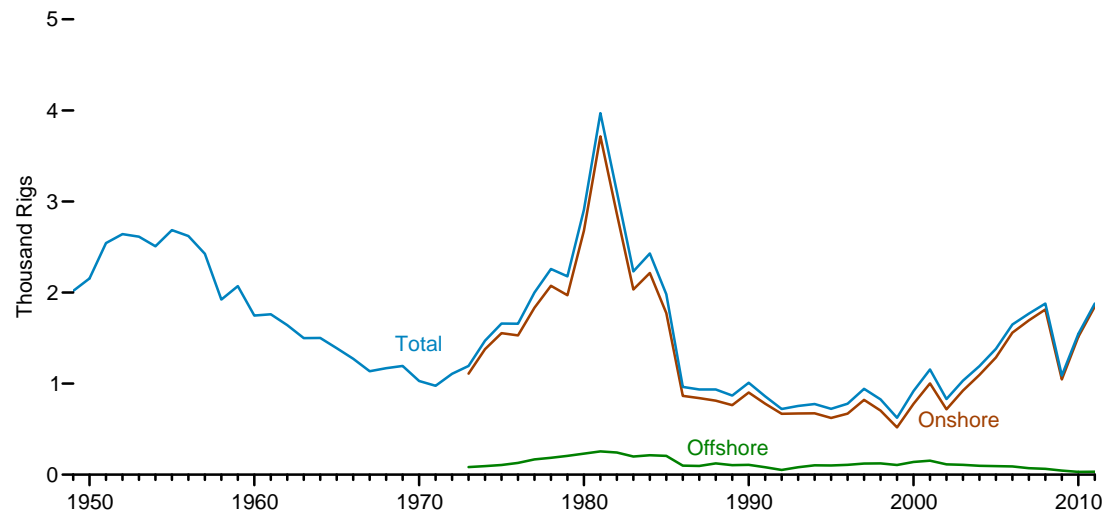
R=Revised. NA=Not available.  
Notes: • Data are at end of year. • See "Proved Reserves, Crude Oil," "Proved Reserves, Natural Gas," and "Proved Reserves, Natural Gas Liquids" in Glossary.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#resources> for all data beginning in 1949. • For related information, see <http://www.eia.gov/petroleum/>.

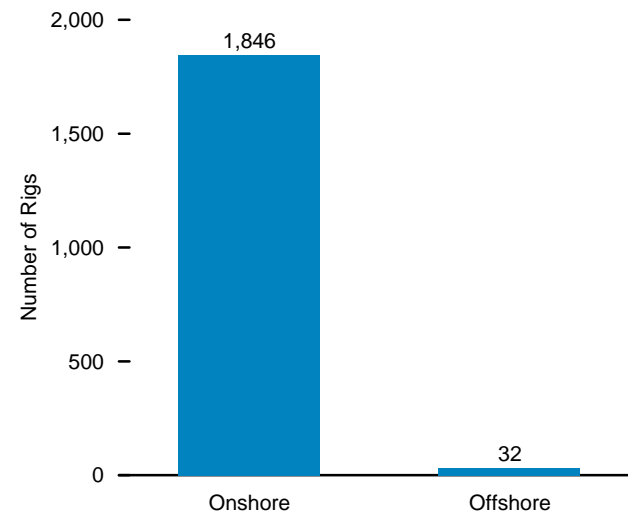
Sources: **American Petroleum Institute and American Gas Association Data:** American Petroleum Institute, American Gas Association, and Canadian Petroleum Association (published jointly), *Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States and Canada as of December 31, 1979*, Volume 34 (June 1980). **U.S. Energy Information Administration Data:** • 1977-2008—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, annual reports. • 2009 and 2010—EIA, *Summary: U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2010* (August 2012), Tables 7 and 17.

**Figure 4.4 Crude Oil and Natural Gas Rotary Rigs in Operation**

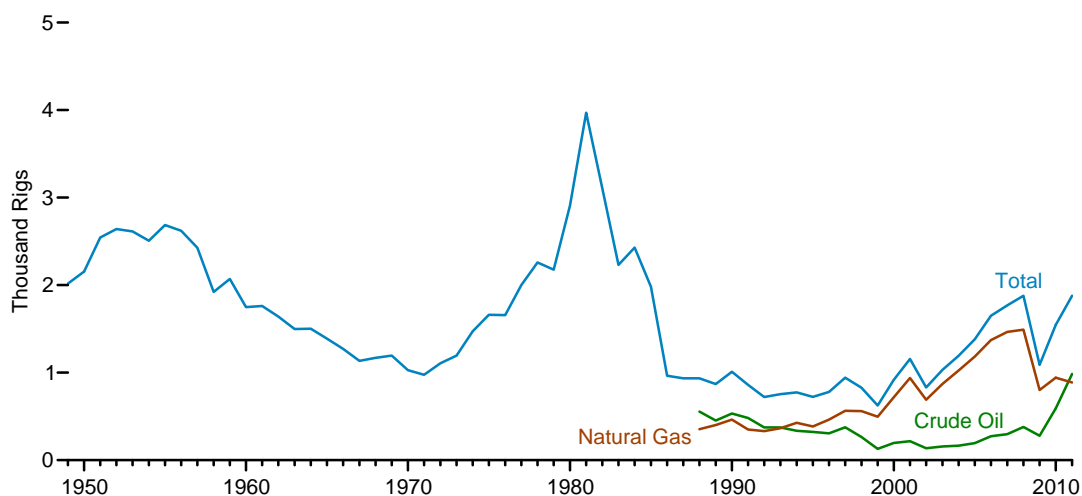
**By Site, 1949-2011**



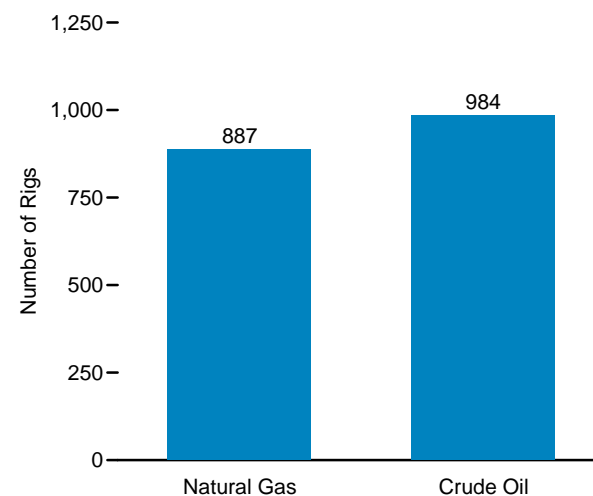
**By Site, 2011**



**By Type, 1949-2011**



**By Type,<sup>1</sup> 2011**



<sup>1</sup> Rigs drilling for miscellaneous purposes, such as service wells, injection wells, and stratigraphic tests, are not shown.

Source: Table 4.4.

**Table 4.4 Crude Oil and Natural Gas Rotary Rigs in Operation, Selected Years, 1949-2011**  
(Number of Rigs)

Year	By Site		By Type		Total <sup>1</sup>
	Onshore	Offshore	Crude Oil	Natural Gas	
1949	NA	NA	NA	NA	2,017
1950	NA	NA	NA	NA	2,154
1955	NA	NA	NA	NA	2,686
1960	NA	NA	NA	NA	1,748
1965	NA	NA	NA	NA	1,388
1970	NA	NA	NA	NA	1,028
1975	1,554	106	NA	NA	1,660
1976	1,529	129	NA	NA	1,658
1977	1,834	167	NA	NA	2,001
1978	2,074	185	NA	NA	2,259
1979	1,970	207	NA	NA	2,177
1980	2,678	231	NA	NA	2,909
1981	3,714	256	NA	NA	3,970
1982	2,862	243	NA	NA	3,105
1983	2,033	199	NA	NA	2,232
1984	2,215	213	NA	NA	2,428
1985	1,774	206	NA	NA	1,980
1986	865	99	NA	NA	964
1987	841	95	NA	NA	936
1988	813	123	554	354	936
1989	764	105	453	401	869
1990	902	108	532	464	1,010
1991	779	81	482	351	860
1992	669	52	373	331	721
1993	672	82	373	364	754
1994	673	102	335	427	775
1995	622	101	323	385	723
1996	671	108	306	464	779
1997	821	122	376	564	943
1998	703	123	264	560	827
1999	519	106	128	496	625
2000	778	140	197	720	918
2001	1,003	153	217	939	1,156
2002	717	113	137	691	830
2003	924	108	157	872	1,032
2004	1,095	97	165	1,025	1,192
2005	1,287	94	194	1,184	1,381
2006	1,559	90	274	1,372	1,649
2007	1,695	72	297	1,466	1,768
2008	1,814	65	379	1,491	1,879
2009	1,046	44	278	801	1,089
2010	1,514	31	591	943	1,546
2011	1,846	32	984	887	1,879

<sup>1</sup> Sum of rigs drilling for crude oil, rigs drilling for natural gas, and other rigs (not shown) drilling for miscellaneous purposes, such as service wells, injection wells, and stratigraphic tests.  
NA=Not available.

Notes: • Data are not for the exact calendar year but are an average for the 52 or 53 consecutive whole weeks that most nearly coincide with the calendar year. • Geographic coverage is the 50 States and the

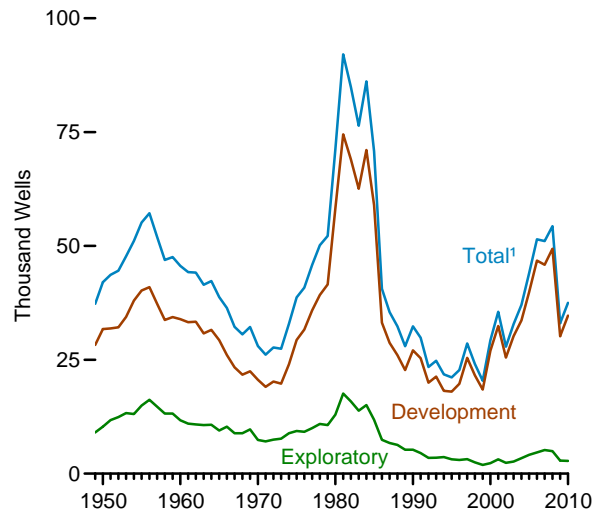
District of Columbia. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#crude> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#resources> for all annual data beginning in 1949.

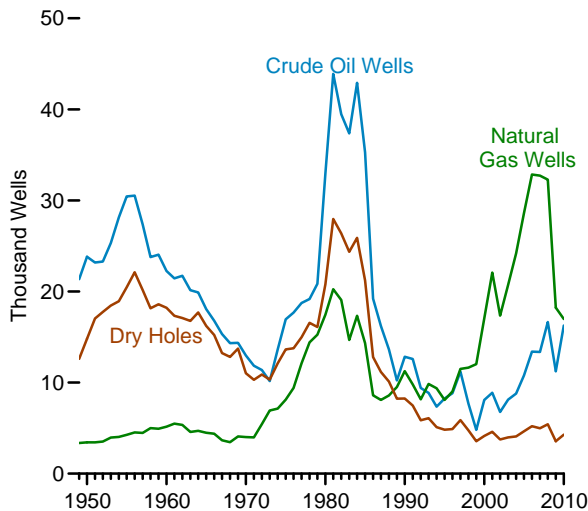
Source: Baker Hughes, Inc., Houston, TX, *Rotary Rigs Running—By State*, used with permission. See [http://investor.shareholder.com/bhi/rig\\_counts/rc\\_index.cfm](http://investor.shareholder.com/bhi/rig_counts/rc_index.cfm).

**Figure 4.5 Crude Oil and Natural Gas Exploratory and Development Wells**

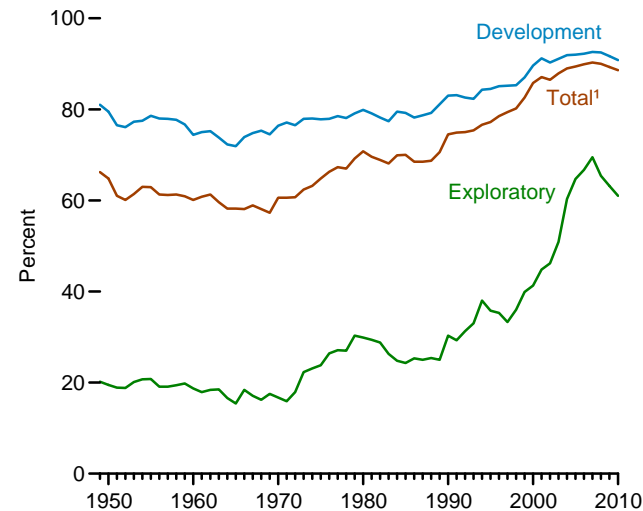
**Total Wells Drilled, 1949-2010**



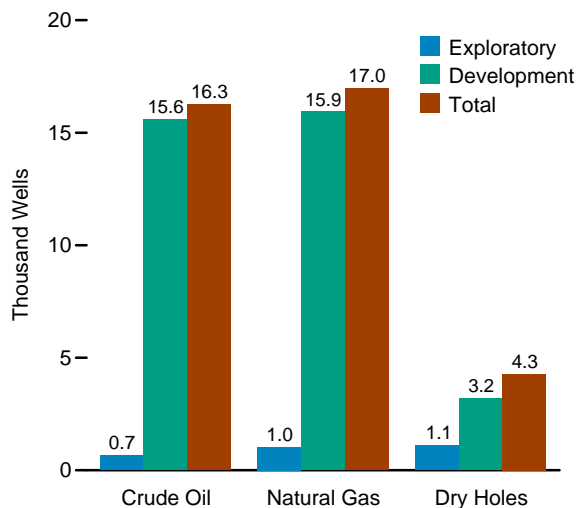
**Total Wells Drilled by Type, 1949-2010**



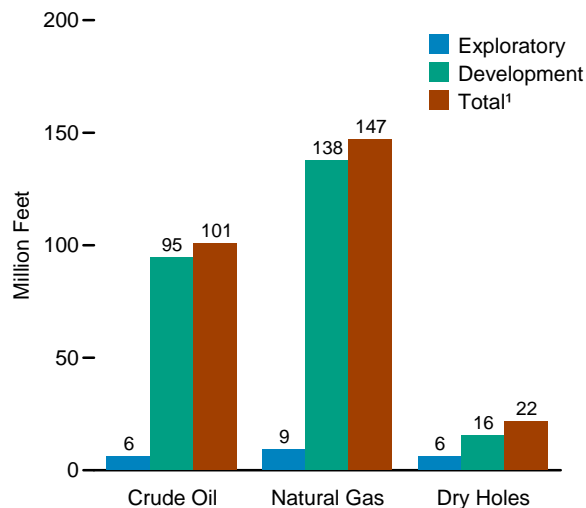
**Successful Wells, 1949-2010**



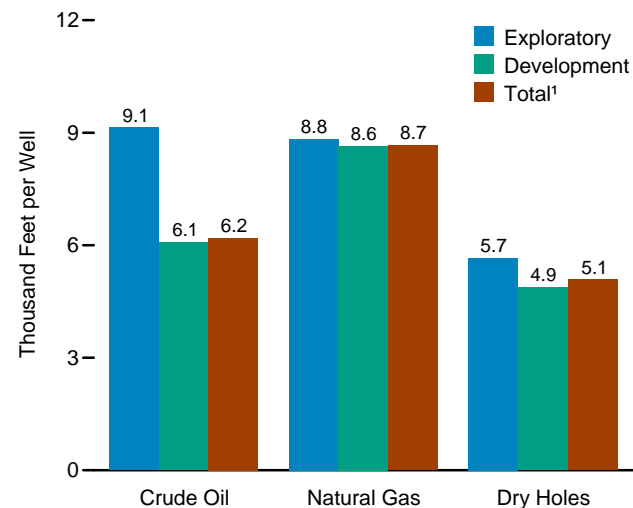
**Wells Drilled, 2010**



**Footage Drilled, 2010**



**Average Depth, 2010**



<sup>1</sup> Data are for exploratory and development wells combined.

Sources: Tables 4.5-4.7.

**Table 4.5 Crude Oil and Natural Gas Exploratory and Development Wells, Selected Years, 1949-2010**

Year	Wells Drilled				Successful Wells	Footage Drilled <sup>1</sup>				Average Footage Drilled			
	Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total		Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total	Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total
	Number					Percent	Thousand Feet				Feet per Well		
1949	21,352	3,363	12,597	37,312	66.2	79,428	12,437	43,754	135,619	3,720	3,698	3,473	3,635
1950	23,812	3,439	14,799	42,050	64.8	92,695	13,685	50,977	157,358	3,893	3,979	3,445	3,742
1955	30,432	4,266	20,452	55,150	62.9	121,148	19,930	85,103	226,182	3,981	4,672	4,161	4,101
1960	22,258	5,149	18,212	45,619	60.1	86,568	28,246	77,361	192,176	3,889	5,486	4,248	4,213
1965	18,065	4,482	16,226	38,773	58.2	73,322	24,931	76,629	174,882	4,059	5,562	4,723	4,510
1970	12,968	4,011	11,031	28,010	60.6	56,859	23,623	58,074	138,556	4,385	5,860	5,265	4,943
1975	16,948	8,127	13,646	38,721	64.8	66,819	44,454	69,220	180,494	3,943	5,470	5,073	4,661
1976	17,688	9,409	13,758	40,855	66.3	68,892	49,113	68,977	186,982	3,895	5,220	5,014	4,577
1977	18,745	12,122	14,985	45,852	67.3	75,451	63,686	76,728	215,866	4,025	5,254	5,120	4,708
1978	19,181	14,413	16,551	50,145	67.0	77,041	75,841	85,788	238,669	4,017	5,262	5,183	4,760
1979	20,851	15,254	16,099	52,204	69.2	82,688	80,468	81,642	244,798	3,966	5,275	5,071	4,689
1980	32,959	17,461	20,785	71,205	70.8	125,262	92,106	99,575	316,943	3,801	5,275	4,791	4,451
1981	43,887	20,250	27,953	92,090	69.6	172,167	108,353	134,934	415,454	3,923	5,351	4,827	4,511
1982	39,459	19,076	26,379	84,914	68.9	149,674	107,149	123,746	380,569	3,793	5,617	4,691	4,482
1983	37,366	14,684	24,355	76,405	68.1	136,849	78,108	105,222	320,179	3,662	5,319	4,320	4,191
1984	42,906	17,338	25,884	86,128	69.9	162,653	91,480	119,860	373,993	3,791	5,276	4,631	4,342
1985	35,261	14,324	21,211	70,796	70.0	137,728	76,293	100,388	314,409	3,906	5,326	4,733	4,441
1986	19,213	8,599	12,799	40,611	68.5	76,825	45,039	60,961	182,825	3,999	5,238	4,763	4,502
1987	16,210	8,096	11,167	35,473	68.5	66,358	42,584	53,588	162,530	4,094	5,260	4,799	4,582
1988	13,646	8,578	10,119	32,343	68.7	58,639	45,363	52,517	156,519	4,297	5,288	5,190	4,839
1989	10,230	9,522	8,236	27,988	70.6	43,266	49,081	42,099	134,446	4,229	5,154	5,112	4,804
1990	12,839	11,246	8,245	32,330	74.5	R56,591	R57,028	R42,433	R156,052	R4,408	R5,071	R5,147	R4,827
1991	12,588	9,793	7,481	29,862	74.9	R56,196	R51,032	R37,750	R144,978	R4,464	R5,211	R5,046	R4,855
1992	9,402	8,163	5,862	23,427	75.0	R45,748	R44,727	R29,451	R119,926	R4,866	R5,479	R5,024	R5,119
1993	8,856	9,839	6,096	24,791	75.4	R44,236	R58,240	R31,018	R133,494	R4,995	R5,919	R5,088	R5,385
1994	7,348	9,375	5,096	21,819	76.6	R38,620	R58,340	R27,771	R124,731	R5,256	R6,223	R5,450	R5,717
1995	8,248	8,082	4,814	21,144	77.2	R41,076	R49,746	R26,349	R117,171	R4,980	R6,155	R5,473	R5,542
1996	8,836	9,027	4,890	22,753	78.5	R42,472	R56,042	R27,851	R126,365	R4,807	R6,208	R5,696	R5,554
1997	11,206	11,498	5,874	28,578	79.4	R56,371	R71,270	R33,640	R161,281	R5,030	R6,198	R5,727	R5,644
1998	7,682	11,639	4,761	24,082	80.2	R38,579	R70,099	R28,540	R137,218	R5,022	R6,023	R5,995	R5,698
1999	4,805	12,027	3,550	20,382	82.6	R22,024	R60,217	R20,608	R102,849	4,584	R5,007	R5,805	R5,046
2000	8,090	17,051	4,146	29,287	85.8	R36,745	R83,618	R24,076	R144,439	R4,542	R4,904	R5,807	R4,932
2001	8,888	22,072	4,598	35,558	87.1	R43,172	R110,734	R26,221	R180,127	R4,857	R5,017	R5,703	R5,066
2002	6,775	17,342	3,754	27,871	86.5	R30,892	R93,041	R21,232	R145,165	R4,560	R5,365	R5,656	R5,208
2003	8,129	20,722	3,982	32,833	87.9	R38,588	R115,916	R22,744	R177,248	R4,747	R5,594	R5,712	R5,398
2004	8,789	24,186	4,082	37,057	89.0	R42,109	R138,449	R23,714	R204,272	R4,791	R5,724	R5,809	R5,512
2005	10,779	R28,590	4,653	R44,022	89.4	R51,449	R163,820	R25,044	R240,313	R4,773	R5,730	R5,382	R5,459
2006	R13,404	R32,838	R5,206	R51,448	89.9	R63,340	R191,646	R27,778	R282,764	R4,725	R5,836	R5,336	R5,496
2007	R13,361	R32,719	R4,978	R51,058	90.3	R64,792	R208,907	R27,754	R301,453	R4,849	R6,385	R5,575	R5,904
2008	R16,645	R32,274	R5,428	R54,347	R90.0	R82,646	R223,224	R28,572	R334,442	R4,965	R6,917	R5,264	R6,154
2009	R11,261	R18,234	R3,552	R33,047	R89.3	R62,771	R156,200	R20,520	R239,491	R5,574	R8,566	R5,777	R7,247
2010	R16,254	R16,973	R4,277	R37,504	R88.6	R100,682	R146,973	R21,719	R269,374	R6,194	R8,659	R5,078	R7,183

<sup>1</sup> See "Footage Drilled" in Glossary.

<sup>2</sup> See "Crude Oil Well" in Glossary.

<sup>3</sup> See "Natural Gas Well" in Glossary.

<sup>4</sup> See "Dry Hole" in Glossary.

R=Revised.

Notes: • 2011 data for this table were not available in time for publication. • Data are estimates. • Data are for exploratory and development wells combined; see Table 4.6 for exploratory wells only, and Table 4.7 for development wells only. • Service wells, stratigraphic tests, and core tests are excluded. • For 1949–1959, data represent wells completed in a given year. For 1960–1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. The as-received well completion data for recent years are incomplete due to delays in the reporting of wells drilled. The U.S. Energy Information

Administration (EIA) therefore statistically imputes the missing data. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

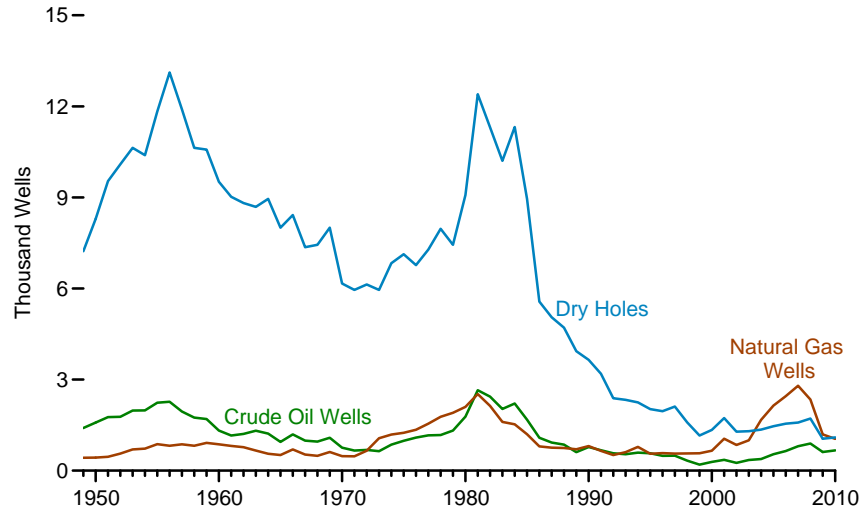
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#crude> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#resources> for all annual data beginning in 1949.

• See <http://www.eia.gov/petroleum/> for related information.

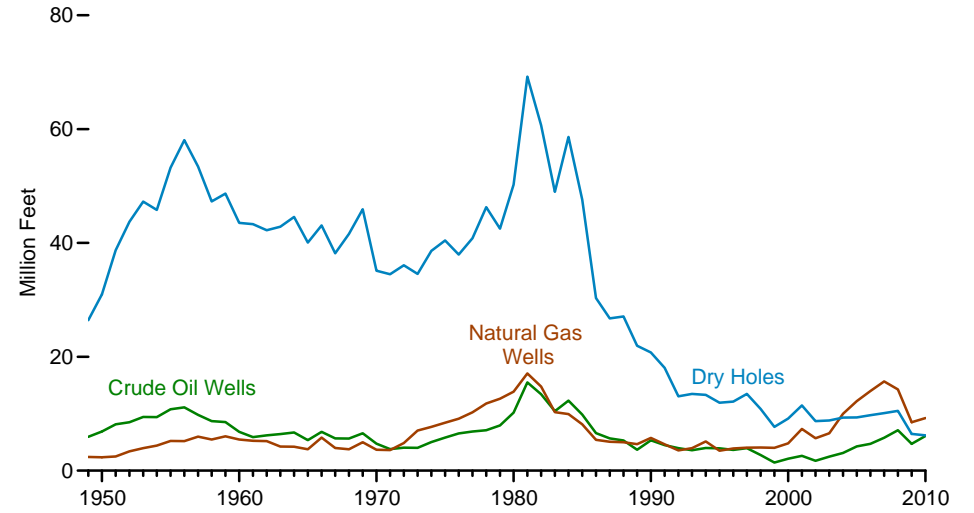
Sources: • 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue. • 1966-1969—American Petroleum Institute (API), *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970-1989—EIA computations based on well reports submitted to the API. • 1990 forward—EIA computations based on well reports submitted to IHS, Inc., Denver, CO.

**Figure 4.6 Crude Oil and Natural Gas Exploratory Wells, 1949-2010**

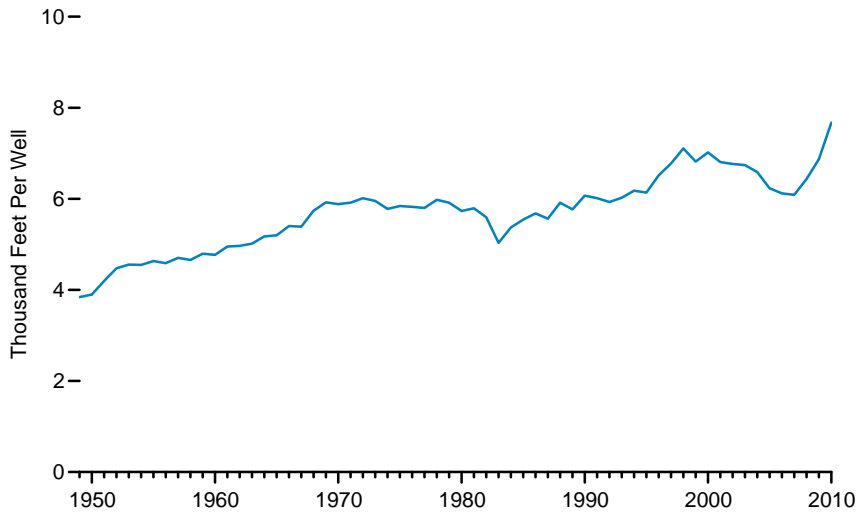
**Exploratory Wells Drilled by Well Type**



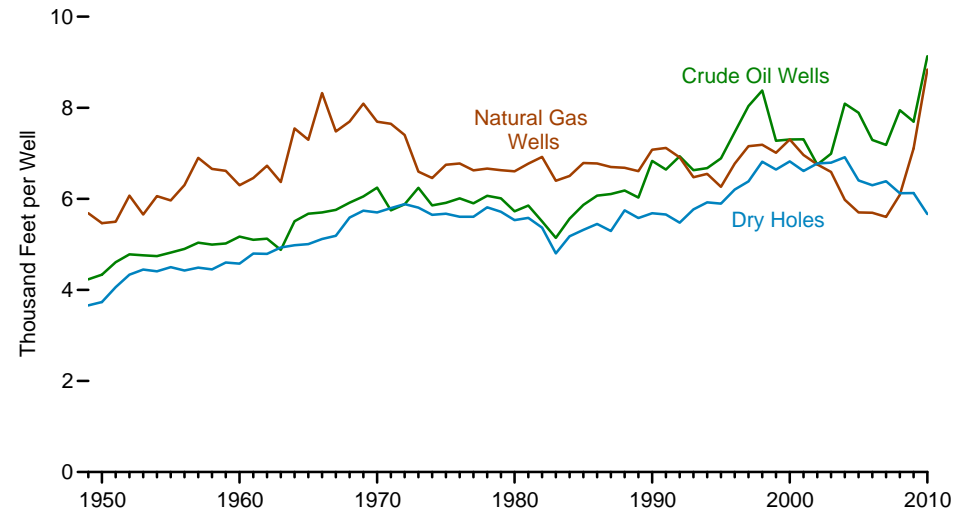
**Exploratory Footage Drilled by Well Type**



**Exploratory Wells Average Depth, All Wells**



**Exploratory Wells Average Depth by Well Type**



Note: These graphs depict exploratory wells only; see Figure 4.5 for all wells and Figure 4.7 for development wells only.

Source: Table 4.6.

**Table 4.6 Crude Oil and Natural Gas Exploratory Wells, Selected Years, 1949-2010**

Year	Wells Drilled				Successful Wells	Footage Drilled <sup>1</sup>				Average Footage Drilled			
	Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total		Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total	Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total
	Number					Percent	Thousand Feet				Feet per Well		
1949	1,406	424	7,228	9,058	20.2	5,950	2,409	26,439	34,798	4,232	5,682	3,658	3,842
1950	1,583	431	8,292	10,306	19.5	6,862	2,356	30,957	40,175	4,335	5,466	3,733	3,898
1955	2,236	874	11,832	14,942	20.8	10,774	5,212	53,220	69,206	4,819	5,964	4,498	4,632
1960	1,321	868	9,515	11,704	18.7	6,829	5,466	43,535	55,831	5,170	6,298	4,575	4,770
1965	946	515	8,005	9,466	15.4	5,366	3,757	40,081	49,204	5,672	7,295	5,007	5,198
1970	757	477	6,162	7,396	16.7	4,729	3,678	35,123	43,530	6,247	7,695	5,700	5,885
1975	982	1,248	7,129	9,359	23.8	5,806	8,422	40,448	54,677	5,913	6,748	5,674	5,842
1976	1,086	1,346	6,772	9,204	26.4	6,527	9,121	37,969	53,617	6,010	6,777	5,607	5,825
1977	1,164	1,548	7,283	9,995	27.1	6,870	10,255	40,823	57,949	5,902	6,625	5,605	5,798
1978	1,171	1,771	7,965	10,907	27.0	7,105	11,798	46,295	65,197	6,067	6,662	5,812	5,978
1979	1,321	1,907	7,437	10,665	30.3	7,941	12,643	42,512	63,096	6,011	6,630	5,716	5,916
1980	1,777	2,099	9,081	12,957	29.9	10,177	13,862	50,249	74,288	5,727	6,604	5,533	5,733
1981	2,651	2,522	12,400	17,573	29.4	15,515	17,079	69,214	101,808	5,853	6,772	5,582	5,793
1982	2,437	2,133	11,307	15,877	28.8	13,413	14,763	60,680	88,856	5,504	6,921	5,367	5,597
1983	2,030	1,605	10,206	13,841	26.3	10,437	10,264	48,989	69,690	5,141	6,395	4,800	5,035
1984	2,209	1,528	11,321	15,058	24.8	12,294	9,935	58,624	80,853	5,565	6,502	5,178	5,369
1985	1,680	1,200	8,954	11,834	24.3	9,854	8,144	47,604	65,602	5,865	6,787	5,317	5,544
1986	1,084	797	5,567	7,448	25.3	6,579	5,401	30,325	42,305	6,069	6,777	5,447	5,680
1987	926	756	5,052	6,734	25.0	5,652	5,064	26,746	37,462	6,104	6,698	5,294	5,563
1988	855	747	4,711	6,313	25.4	5,286	4,992	27,079	37,357	6,182	6,683	5,748	5,917
1989	607	706	3,934	5,247	25.0	3,659	4,664	21,947	30,270	6,028	6,606	5,579	5,769
1990	778	811	3,652	5,241	30.3	<sup>R</sup> 5,316	<sup>R</sup> 5,740	<sup>R</sup> 20,761	<sup>R</sup> 31,817	<sup>R</sup> 6,833	<sup>R</sup> 7,078	<sup>R</sup> 5,685	<sup>R</sup> 6,071
1991	673	649	3,191	4,513	29.3	4,470	<sup>R</sup> 4,619	18,049	<sup>R</sup> 27,138	6,642	<sup>R</sup> 7,117	5,656	6,013
1992	571	513	2,384	3,468	31.3	<sup>R</sup> 3,959	3,544	13,058	<sup>R</sup> 20,561	<sup>R</sup> 6,933	6,908	5,477	<sup>R</sup> 5,929
1993	539	610	2,334	3,483	33.0	<sup>R</sup> 3,572	<sup>R</sup> 3,950	<sup>R</sup> 13,465	<sup>R</sup> 20,987	<sup>R</sup> 6,627	<sup>R</sup> 6,475	<sup>R</sup> 5,769	<sup>R</sup> 6,026
1994	595	782	2,247	3,624	38.0	782	5,121	<sup>R</sup> 13,306	<sup>R</sup> 22,398	6,674	<sup>R</sup> 6,549	5,922	<sup>R</sup> 6,180
1995	570	558	2,024	3,152	35.8	<sup>R</sup> 3,927	<sup>R</sup> 3,494	<sup>R</sup> 11,927	<sup>R</sup> 19,348	<sup>R</sup> 6,889	<sup>R</sup> 6,262	5,893	<sup>R</sup> 6,138
1996	489	576	1,956	3,021	35.3	<sup>R</sup> 3,650	<sup>R</sup> 3,902	12,137	<sup>R</sup> 19,689	<sup>R</sup> 7,464	<sup>R</sup> 6,774	6,205	<sup>R</sup> 6,517
1997	491	562	2,113	3,166	33.3	<sup>R</sup> 3,946	<sup>R</sup> 4,022	<sup>R</sup> 13,485	<sup>R</sup> 21,453	<sup>R</sup> 8,037	<sup>R</sup> 7,157	<sup>R</sup> 6,382	<sup>R</sup> 6,776
1998	327	566	1,590	2,483	36.0	2,740	<sup>R</sup> 4,068	<sup>R</sup> 10,836	<sup>R</sup> 17,644	8,379	<sup>R</sup> 7,187	<sup>R</sup> 6,815	<sup>R</sup> 7,106
1999	197	570	1,157	1,924	39.9	1,433	<sup>R</sup> 3,997	7,687	<sup>R</sup> 13,117	7,274	<sup>R</sup> 7,012	6,644	<sup>R</sup> 6,818
2000	288	657	1,341	2,286	41.3	2,103	<sup>R</sup> 4,798	<sup>R</sup> 9,147	<sup>R</sup> 16,048	7,302	<sup>R</sup> 7,303	<sup>R</sup> 6,821	<sup>R</sup> 7,020
2001	357	1,052	1,733	3,142	44.8	<sup>R</sup> 2,608	<sup>R</sup> 7,323	<sup>R</sup> 11,458	<sup>R</sup> 21,389	<sup>R</sup> 7,305	<sup>R</sup> 6,961	<sup>R</sup> 6,612	<sup>R</sup> 6,807
2002	258	844	1,282	2,384	46.2	<sup>R</sup> 1,742	<sup>R</sup> 5,701	<sup>R</sup> 8,687	<sup>R</sup> 16,130	<sup>R</sup> 6,752	<sup>R</sup> 6,755	<sup>R</sup> 6,776	<sup>R</sup> 6,766
2003	350	997	1,297	2,644	50.9	<sup>R</sup> 2,446	<sup>R</sup> 6,569	<sup>R</sup> 8,810	<sup>R</sup> 17,825	<sup>R</sup> 6,989	<sup>R</sup> 6,589	<sup>R</sup> 6,793	<sup>R</sup> 6,742
2004	383	1,671	1,350	3,404	60.3	<sup>R</sup> 3,098	<sup>R</sup> 9,988	<sup>R</sup> 9,331	<sup>R</sup> 22,417	<sup>R</sup> 8,089	<sup>R</sup> 5,977	<sup>R</sup> 6,912	<sup>R</sup> 6,585
2005	539	<sup>R</sup> 2,141	1,462	<sup>R</sup> 4,142	64.7	<sup>R</sup> 4,252	<sup>R</sup> 12,208	<sup>R</sup> 9,359	<sup>R</sup> 25,819	<sup>R</sup> 7,889	<sup>R</sup> 5,702	<sup>R</sup> 6,402	<sup>R</sup> 6,233
2006	<sup>R</sup> 646	<sup>R</sup> 2,456	<sup>R</sup> 1,547	<sup>R</sup> 4,649	<sup>R</sup> 66.7	<sup>R</sup> 4,710	<sup>R</sup> 13,987	<sup>R</sup> 9,745	<sup>R</sup> 28,442	<sup>R</sup> 7,291	<sup>R</sup> 5,695	<sup>R</sup> 6,299	<sup>R</sup> 6,118
2007	<sup>R</sup> 806	<sup>R</sup> 2,794	<sup>R</sup> 1,582	<sup>R</sup> 5,182	<sup>R</sup> 69.5	<sup>R</sup> 5,790	<sup>R</sup> 15,658	<sup>R</sup> 10,102	<sup>R</sup> 31,550	<sup>R</sup> 7,184	<sup>R</sup> 5,604	<sup>R</sup> 6,386	<sup>R</sup> 6,088
2008	<sup>R</sup> 892	<sup>R</sup> 2,345	<sup>R</sup> 1,715	<sup>R</sup> 4,952	<sup>R</sup> 65.4	<sup>R</sup> 7,088	<sup>R</sup> 14,276	<sup>R</sup> 10,500	<sup>R</sup> 31,864	<sup>R</sup> 7,946	<sup>R</sup> 6,088	<sup>R</sup> 6,122	<sup>R</sup> 6,435
2009	<sup>R</sup> 612	<sup>R</sup> 1,196	<sup>R</sup> 1,052	<sup>R</sup> 2,860	<sup>R</sup> 63.2	<sup>R</sup> 4,711	<sup>R</sup> 8,499	<sup>R</sup> 6,443	<sup>R</sup> 19,653	<sup>R</sup> 7,698	<sup>R</sup> 7,106	<sup>R</sup> 6,125	<sup>R</sup> 6,872
2010	<sup>R</sup> 668	<sup>R</sup> 1,044	<sup>R</sup> 1,093	<sup>R</sup> 2,805	<sup>R</sup> 61.0	<sup>R</sup> 6,099	<sup>R</sup> 9,226	<sup>R</sup> 6,192	<sup>R</sup> 21,517	<sup>R</sup> 9,130	<sup>R</sup> 8,837	<sup>R</sup> 5,665	<sup>R</sup> 7,671

<sup>1</sup> See "Footage Drilled" in Glossary.

<sup>2</sup> See "Crude Oil Well" in Glossary.

<sup>3</sup> See "Natural Gas Well" in Glossary.

<sup>4</sup> See "Dry Hole" in Glossary.

R=Revised.

Notes: • 2011 data for this table were not available in time for publication. • Data are estimates.

• Data are for exploratory wells only; see Table 4.5 for exploratory and development wells combined, and Table 4.7 for development wells only. • For 1949–1959, data represent wells completed in a given year. For 1960–1969, data are for well completion reports received by the American Petroleum Institute (API) during the reporting year. For 1970 forward, the data represent wells completed in a given year. The as-received well completion data for recent years are incomplete due to delays in the reporting of wells

drilled. The U.S. Energy Information Administration (EIA) therefore statistically imputes the missing data. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#crude> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#resources> for all annual data beginning in 1949.

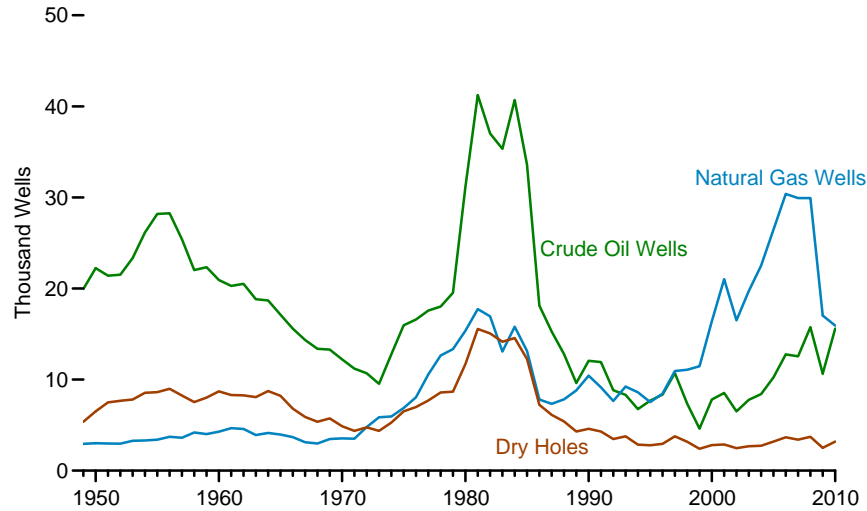
• See <http://www.eia.gov/petroleum/> for related information.

Sources: • 1949–1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue.

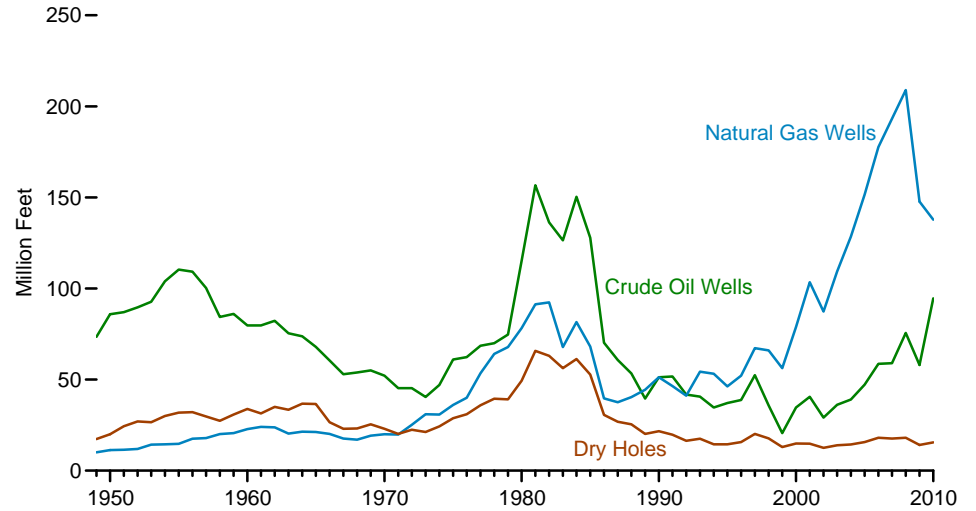
• 1966–1969—American Petroleum Institute (API), *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970–1989—EIA computations based on well reports submitted to the API. • 1990 forward—EIA computations based on well reports submitted to IHS, Inc., Denver, CO.

**Figure 4.7 Crude Oil and Natural Gas Development Wells, 1949-2010**

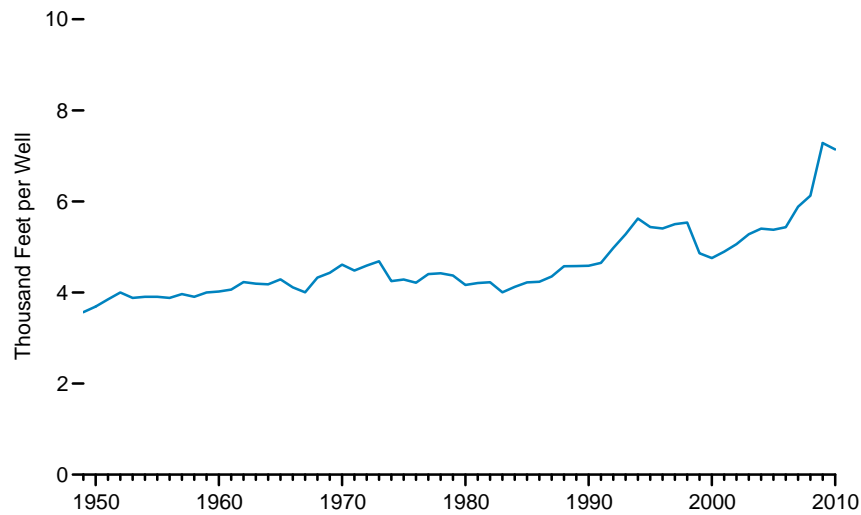
**Development Wells Drilled by Well Type**



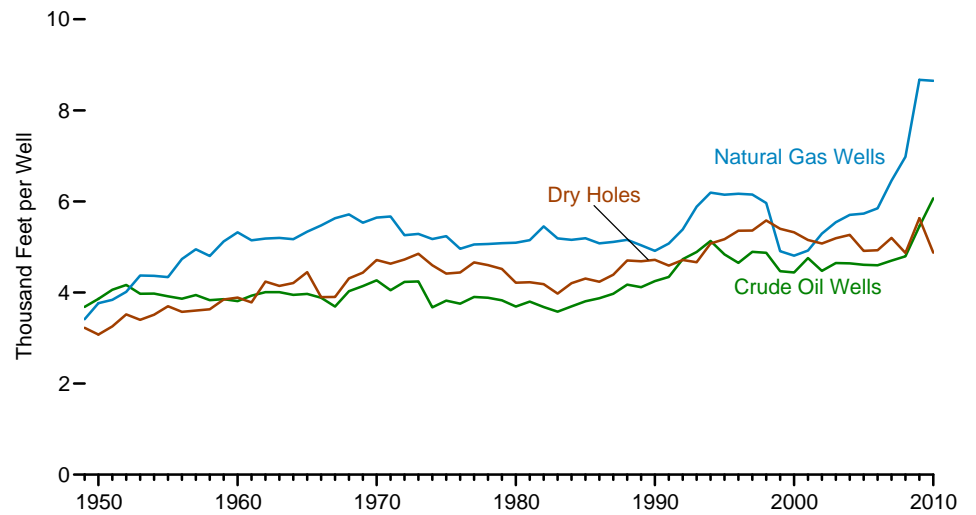
**Development Footage Drilled by Well Type**



**Development Wells Average Depth, All Wells**



**Development Wells Average Depth by Well Type**



Note: These graphs depict development wells only; see Figure 4.5 for all wells and Figure 4.6 for exploratory wells only.

Source: Table 4.7.



**Table 4.7 Crude Oil and Natural Gas Development Wells, Selected Years, 1949-2010**

Year	Wells Drilled				Successful Wells	Footage Drilled <sup>1</sup>				Average Footage Drilled			
	Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total		Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total	Crude Oil <sup>2</sup>	Natural Gas <sup>3</sup>	Dry Holes <sup>4</sup>	Total
	Number					Percent	Thousand Feet				Feet per Well		
1949	19,946	2,939	5,369	28,254	81.0	73,478	10,028	17,315	100,821	3,684	3,412	3,225	3,568
1950	22,229	3,008	6,507	31,744	79.5	85,833	11,329	20,020	117,183	3,861	3,766	3,077	3,691
1955	28,196	3,392	8,620	40,208	78.6	110,374	14,718	31,883	156,976	3,915	4,339	3,699	3,904
1960	20,937	4,281	8,697	33,915	74.4	79,739	22,780	33,826	136,345	3,809	5,321	3,889	4,020
1965	17,119	3,967	8,221	29,307	71.9	67,956	21,174	36,548	125,678	3,970	5,337	4,446	4,288
1970	12,211	3,534	4,869	20,614	76.4	52,130	19,945	22,951	95,026	4,269	5,644	4,714	4,610
1975	15,966	6,879	6,517	29,362	77.8	61,013	36,032	28,772	125,817	3,821	5,238	4,415	4,285
1976	16,602	8,063	6,986	31,651	77.9	62,365	39,992	31,008	133,365	3,756	4,960	4,439	4,214
1977	17,581	10,574	7,702	35,857	78.5	68,581	53,431	35,905	157,917	3,901	5,053	4,662	4,404
1978	18,010	12,642	8,586	39,238	78.1	69,936	64,043	39,493	173,472	3,883	5,066	4,600	4,421
1979	19,530	13,347	8,662	41,539	79.1	74,747	67,825	39,130	181,702	3,827	5,082	4,517	4,374
1980	31,182	15,362	11,704	58,248	79.9	115,085	78,244	49,326	242,655	3,691	5,093	4,214	4,166
1981	41,236	17,728	15,553	74,517	79.1	156,652	91,274	65,720	313,646	3,799	5,149	4,226	4,209
1982	37,022	16,943	15,072	69,037	78.2	136,261	92,386	63,066	291,713	3,681	5,453	4,184	4,225
1983	35,336	13,079	14,149	62,564	77.4	126,412	67,844	56,233	250,489	3,577	5,187	3,974	4,004
1984	40,697	15,810	14,563	71,070	79.5	150,359	81,545	61,236	293,140	3,695	5,158	4,205	4,125
1985	33,581	13,124	12,257	58,962	79.2	127,874	68,149	52,784	248,807	3,808	5,193	4,306	4,220
1986	18,129	7,802	7,232	33,163	78.2	70,246	39,638	30,636	140,520	3,875	5,080	4,236	4,237
1987	15,284	7,340	6,115	28,739	78.7	60,706	37,520	26,842	125,068	3,972	5,112	4,390	4,352
1988	12,791	7,831	5,408	26,030	79.2	53,353	40,371	25,438	119,162	4,171	5,155	4,704	4,578
1989	9,623	8,816	4,302	22,741	81.1	39,607	44,417	20,152	104,176	4,116	5,038	4,684	4,581
1990	12,061	10,435	4,593	27,089	83.0	R51,275	R51,288	R21,672	R124,235	R4,251	R4,915	R4,718	R4,586
1991	11,915	9,144	4,290	25,349	83.1	R51,726	R46,413	R19,701	R117,840	R4,341	R5,076	R4,592	R4,649
1992	8,831	7,650	3,478	19,959	82.6	R41,789	R41,183	R16,393	R99,365	R4,732	R5,383	R4,713	R4,978
1993	8,317	9,229	3,762	21,308	82.3	R40,664	R54,290	R17,553	R112,507	R4,889	R5,883	R4,666	R5,280
1994	6,753	8,593	2,849	18,195	84.3	R34,649	R53,219	R14,465	R102,333	R5,131	R6,193	R5,077	R5,624
1995	7,678	7,524	2,790	17,992	84.5	R37,149	R46,252	R14,422	R97,823	R4,838	R6,147	R5,169	R5,437
1996	8,347	8,451	2,934	19,732	85.1	R38,822	R52,140	R15,714	R106,676	R4,651	R6,170	R5,356	R5,406
1997	10,715	10,936	3,761	25,412	85.2	R52,425	R67,248	R20,155	R139,828	R4,893	R6,149	R5,359	R5,502
1998	7,355	11,073	3,171	21,599	85.3	R35,839	R66,031	R17,704	R119,574	R4,873	R5,963	R5,583	R5,536
1999	4,608	11,457	2,393	18,458	87.0	R20,591	R56,220	R12,921	R89,732	4,469	R4,907	R5,399	R4,861
2000	7,802	16,394	2,805	27,001	89.6	R34,642	R78,820	R14,929	R128,391	R4,440	R4,808	5,322	R4,755
2001	8,531	21,020	2,865	32,416	91.2	R40,564	R103,411	R14,763	R158,738	R4,755	R4,920	R5,153	R4,897
2002	6,517	16,498	2,472	25,487	90.3	R29,150	R87,340	R12,545	R129,035	R4,473	R5,294	R5,075	R5,063
2003	7,779	19,725	2,685	30,189	91.1	R36,142	R109,347	R13,934	R159,423	R4,646	R5,544	R5,190	R5,281
2004	8,406	22,515	2,732	33,653	91.9	R39,011	R128,461	R14,383	R181,855	R4,641	R5,706	R5,265	R5,404
2005	10,240	26,449	3,191	39,880	92.0	R47,197	R151,612	R15,685	R214,494	R4,609	R5,732	R4,915	R5,378
2006	R12,758	R30,382	R3,659	R46,799	92.2	R58,630	R177,659	R18,033	R254,322	R4,596	R5,848	R4,928	R5,434
2007	R12,555	R29,925	R3,396	R45,876	R92.6	R59,002	R193,249	R17,652	R269,903	R4,699	R6,458	R5,198	R5,883
2008	R15,753	R29,929	R3,713	R49,395	R92.5	R75,558	R208,948	R18,072	R302,578	R4,796	R6,981	R4,867	R6,126
2009	R10,649	R17,038	R2,500	R30,187	91.7	R58,060	R147,701	R14,077	R219,838	R5,452	R8,669	R5,631	R7,283
2010	R15,586	R15,929	R3,184	R34,699	R90.8	R94,583	R137,747	R15,527	R247,857	R6,068	R8,648	R4,877	R7,143

<sup>1</sup> See "Footage Drilled" in Glossary.  
<sup>2</sup> See "Crude Oil Well" in Glossary.  
<sup>3</sup> See "Natural Gas Well" in Glossary.  
<sup>4</sup> See "Dry Hole" in Glossary.  
R=Revised.

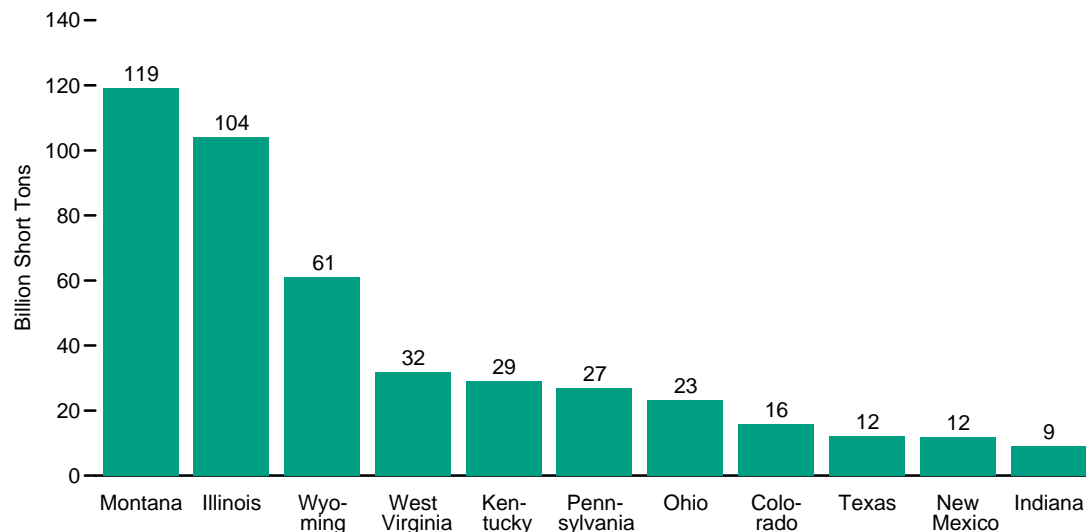
Notes: • 2011 data for this table were not available in time for publication. • Data are estimates.  
• Data are for development wells only; see Table 4.5 for exploratory and development wells combined, and Table 4.6 for exploratory wells only. • Service wells, stratigraphic tests, and core tests are excluded.  
• For 1949–1959, data represent wells completed in a given year. For 1960–1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. The as-received well completion data for recent years are incomplete due to delays in the reporting of wells drilled. The U.S. Energy Information

Administration (EIA) therefore statistically imputes the missing data. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

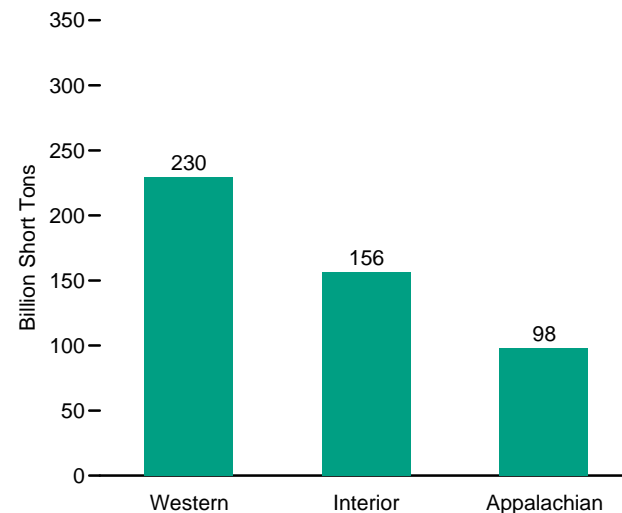
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#crude> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#resources> for all annual data beginning in 1949.  
• See <http://www.eia.gov/petroleum/> for related information.  
Sources: • 1949–1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue.  
• 1966–1969—American Petroleum Institute (API), *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970–1989—EIA computations based on well reports submitted to the API. • 1990 forward—EIA computations based on well reports submitted to IHS, Inc., Denver, CO.

**Figure 4.8 Coal Demonstrated Reserve Base, January 1, 2011**

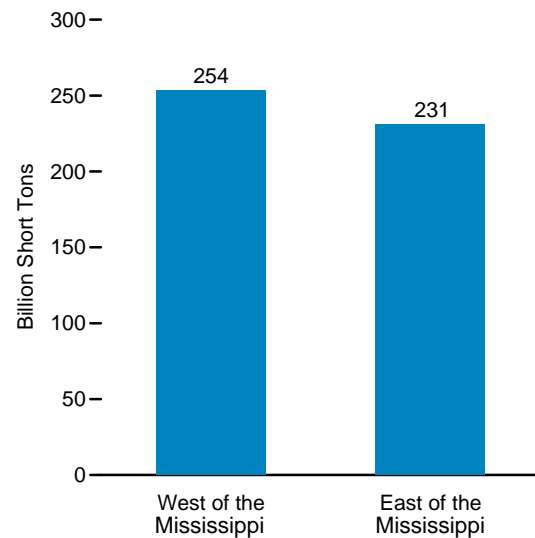
**By Key State**



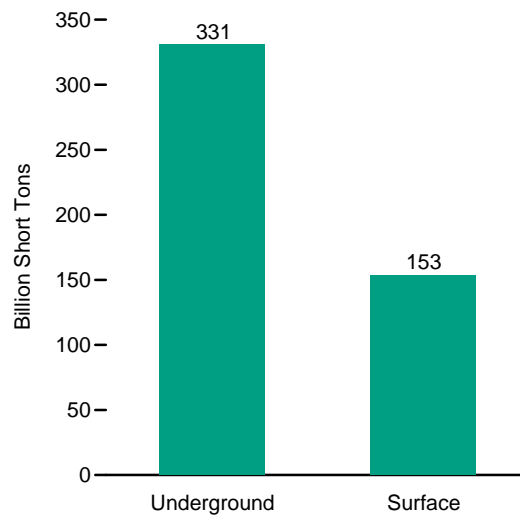
**By Region**



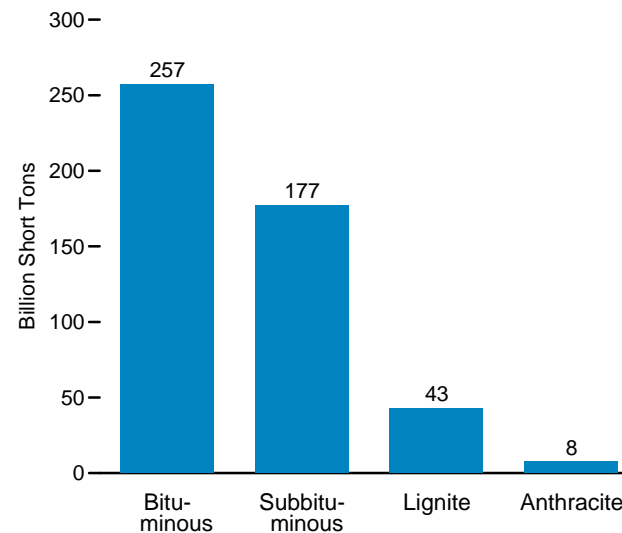
**West and East of the Mississippi**



**By Mining Method**



**By Rank**



Source: Table 4.8.

**Table 4.8 Coal Demonstrated Reserve Base, January 1, 2011**  
(Billion Short Tons)

Region and State	Anthracite		Bituminous Coal		Subbituminous Coal		Lignite	Total		
	Underground	Surface	Underground	Surface	Underground	Surface	Surface <sup>1</sup>	Underground	Surface	Total
<b>Appalachian</b> .....	<b>4.0</b>	<b>3.3</b>	<b>68.2</b>	<b>21.9</b>	<b>0.0</b>	<b>0.0</b>	<b>1.1</b>	<b>72.1</b>	<b>26.3</b>	<b>98.4</b>
Alabama .....	.0	.0	.9	2.1	.0	.0	1.1	.9	3.1	4.0
Kentucky, Eastern .....	.0	.0	.8	9.1	.0	.0	.0	.8	9.1	9.8
Ohio .....	.0	.0	17.4	5.7	.0	.0	.0	17.4	5.7	23.1
Pennsylvania .....	3.8	3.3	18.9	.8	.0	.0	.0	22.7	4.2	26.9
Virginia .....	.1	.0	.9	.5	.0	.0	.0	1.0	.5	1.5
West Virginia .....	.0	.0	28.3	3.4	.0	.0	.0	28.3	3.4	31.7
Other <sup>2</sup> .....	.0	.0	1.1	.3	.0	.0	.0	1.1	.3	1.4
<b>Interior</b> .....	<b>.1</b>	<b>(s)</b>	<b>116.6</b>	<b>27.1</b>	<b>.0</b>	<b>.0</b>	<b>12.6</b>	<b>116.7</b>	<b>39.6</b>	<b>156.4</b>
Illinois .....	.0	.0	87.6	16.5	.0	.0	.0	87.6	16.5	104.2
Indiana .....	.0	.0	8.6	.6	.0	.0	.0	8.6	.6	9.2
Iowa .....	.0	.0	1.7	.5	.0	.0	.0	1.7	.5	2.2
Kentucky, Western .....	.0	.0	15.6	3.6	.0	.0	.0	15.6	3.6	19.2
Missouri .....	.0	.0	1.5	4.5	.0	.0	.0	1.5	4.5	6.0
Oklahoma .....	.0	.0	1.2	.3	.0	.0	.0	1.2	.3	1.5
Texas .....	.0	.0	.0	.0	.0	.0	12.1	.0	12.1	12.1
Other <sup>3</sup> .....	.1	(s)	.3	1.1	.0	.0	0.4	.4	1.5	1.9
<b>Western</b> .....	<b>(s)</b>	<b>.0</b>	<b>21.2</b>	<b>2.3</b>	<b>121.2</b>	<b>55.9</b>	<b>29.2</b>	<b>142.4</b>	<b>87.4</b>	<b>229.7</b>
Alaska .....	.0	.0	.6	.1	4.8	.6	(s)	5.4	.7	6.1
Colorado .....	(s)	.0	7.5	.6	3.7	.0	4.2	11.2	4.8	15.9
Montana .....	.0	.0	1.4	.0	69.6	32.3	15.8	70.9	48.0	119.0
New Mexico .....	(s)	.0	2.7	.9	3.4	5.0	.0	6.1	5.9	12.0
North Dakota .....	.0	.0	.0	.0	.0	.0	8.9	.0	8.9	8.9
Utah .....	.0	.0	4.9	.3	(s)	.0	.0	4.9	.3	5.2
Washington .....	.0	.0	.3	.0	1.0	.0	(s)	1.3	(s)	1.3
Wyoming .....	.0	.0	3.8	.5	38.6	18.1	.0	42.5	18.5	61.0
Other <sup>4</sup> .....	.0	.0	(s)	.0	(s)	(s)	.4	(s)	.4	.4
<b>U.S. Total</b> .....	<b>4.1</b>	<b>3.4</b>	<b>206.0</b>	<b>51.2</b>	<b>121.1</b>	<b>55.9</b>	<b>42.8</b>	<b>331.2</b>	<b>153.3</b>	<b>484.5</b>
States East of the Mississippi River .....	4.0	3.3	180.0	42.6	.0	.0	1.1	184.0	47.0	231.0
States West of the Mississippi River .....	.1	(s)	25.9	8.6	121.1	55.9	41.7	147.2	106.3	253.5

<sup>1</sup> Lignite resources are not mined underground in the United States.

<sup>2</sup> Georgia, Maryland, North Carolina, and Tennessee.

<sup>3</sup> Arkansas, Kansas, Louisiana, and Michigan.

<sup>4</sup> Arizona, Idaho, Oregon, and South Dakota.

(s)=Less than 0.05 billion short tons.

Notes: • See *U.S. Coal Reserves: 1997 Update* on the Web Page for a description of the methodology used to produce these data. • Data represent remaining measured and indicated coal reserves, analyzed

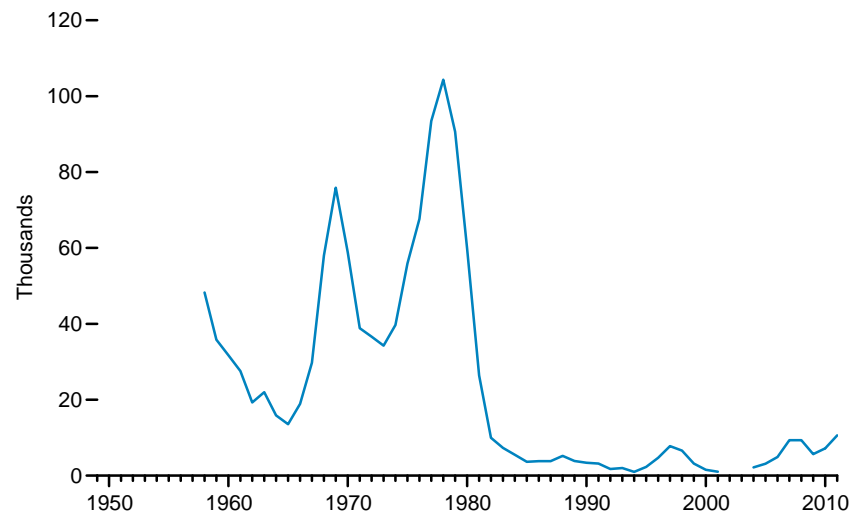
and on file, meeting minimum seam and depth criteria, and in the ground as of January 1, 2011. These coal resources are not totally recoverable. Net recoverability with current mining technologies ranges from 0 percent (in far northern Alaska) to more than 90 percent. Fifty-four percent of the demonstrated reserve base of coal in the United States is estimated to be recoverable. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/coal/>.

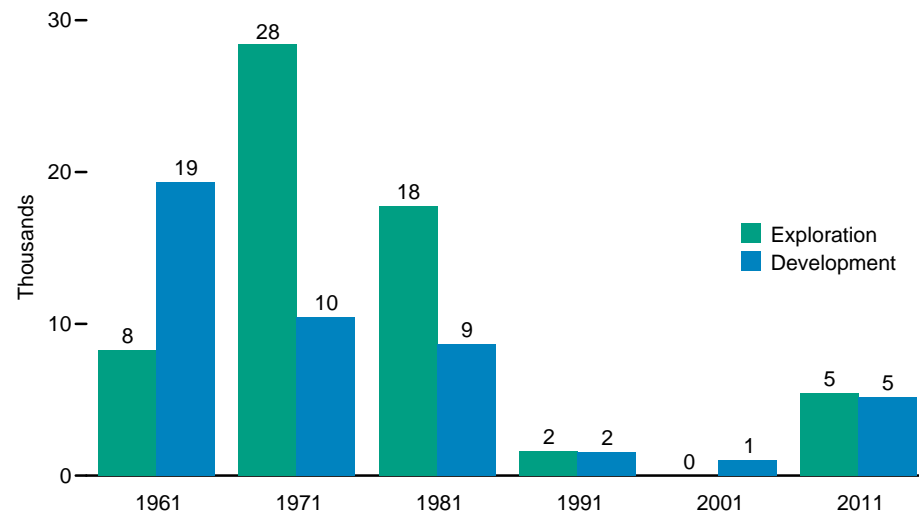
Source: U.S. Energy Information Administration, Coal Reserves Database.

**Figure 4.9 Uranium Exploration and Development Drilling**

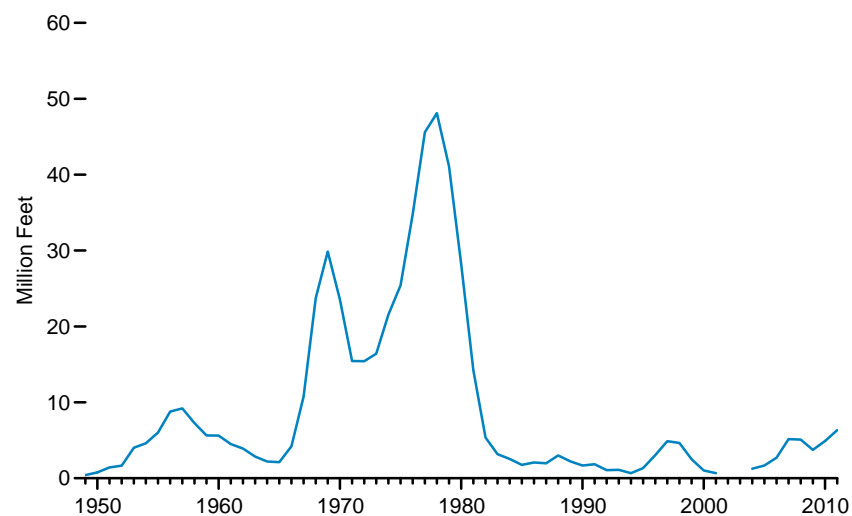
**Total Holes Drilled, 1958-2011<sup>1</sup>**



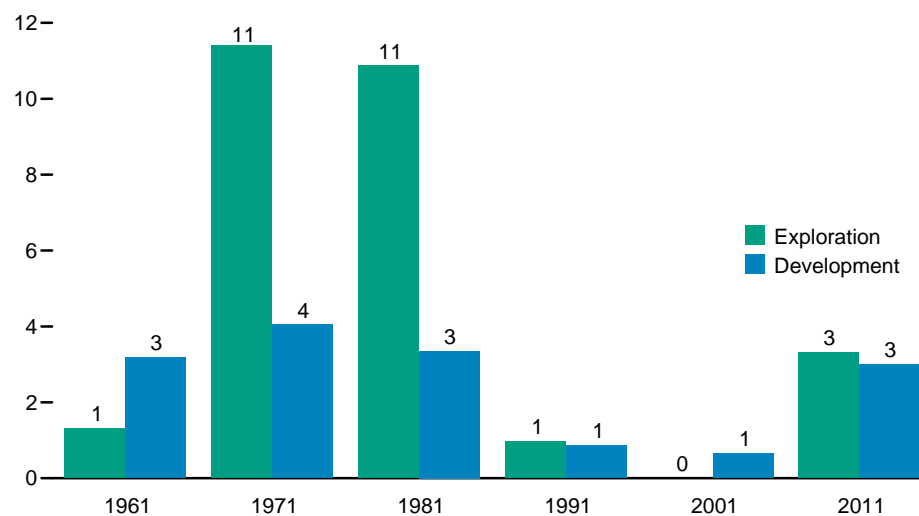
**Holes Drilled, Selected Years**



**Total Footage Drilled, 1949-2011<sup>1</sup>**



**Footage Drilled, Selected Years**



<sup>1</sup> In 2002 and 2003, data are withheld to avoid disclosure.

Source: Table 4.9.

**Table 4.9 Uranium Exploration and Development Drilling, Selected Years, 1949-2011**

Year	Exploration <sup>1</sup>		Development <sup>2</sup>		Total	
	Holes Drilled	Footage Drilled	Holes Drilled	Footage Drilled	Holes Drilled	Footage Drilled
	Thousands	Million Feet	Thousands	Million Feet	Thousands	Million Feet
1949	NA	0.36	NA	0.05	NA	0.41
1950	NA	.57	NA	.21	NA	.78
1955	NA	5.27	NA	.76	NA	6.03
1960	7.34	1.40	24.40	4.21	31.73	5.61
1965	6.23	1.16	7.33	.95	13.56	2.11
1970	43.98	17.98	14.87	5.55	58.85	23.53
1975	34.29	15.69	21.60	9.73	55.89	25.42
1976	40.41	20.36	27.23	14.44	67.64	34.80
1977	62.60	27.96	30.86	17.62	93.45	45.58
1978	75.07	28.95	29.29	19.15	104.35	48.10
1979	60.46	28.07	30.19	13.01	90.65	41.08
1980	39.61	19.60	20.19	8.59	59.80	28.19
1981	17.75	10.87	8.67	3.35	26.42	14.22
1982	6.97	4.23	3.00	1.13	9.97	5.36
1983	4.29	2.09	3.01	1.08	7.30	3.17
1984	4.80	2.26	.72	.29	5.52	2.55
1985	2.88	1.42	.77	.34	3.65	1.76
1986	1.99	1.10	1.85	.97	3.83	2.07
1987	1.82	1.11	1.99	.86	3.81	1.97
1988	2.03	1.28	3.18	1.73	5.21	3.01
1989	2.09	1.43	1.75	.80	3.84	2.23
1990	1.51	.87	1.91	.81	3.42	1.68
1991	1.62	.97	1.57	.87	3.20	1.84
1992	.94	.56	.83	.50	1.77	1.06
1993	.36	.22	1.67	.89	2.02	1.11
1994	.52	.34	.48	.32	1.00	.66
1995	.58	.40	1.73	.95	2.31	1.35
1996	1.12	.88	3.58	2.16	4.70	3.05
1997	1.94	1.33	5.86	3.56	7.79	4.88
1998	1.37	.89	5.23	3.75	6.60	4.64
1999	.27	.18	2.91	2.33	3.18	2.50
2000	W	W	W	W	1.55	1.02
2001	.00	.00	1.02	.66	1.02	.66
2002	W	W	W	W	W	W
2003	NA	NA	NA	NA	W	W
2004	W	W	W	W	2.19	1.25
2005	W	W	W	W	3.14	1.67
2006	1.47	.82	3.43	1.89	4.90	2.71
2007	4.35	2.20	5.00	2.95	9.35	5.15
2008	5.20	2.54	4.16	2.55	9.36	5.09
2009	1.79	1.05	3.89	2.69	5.68	3.74
2010	2.44	1.46	4.77	3.44	7.21	4.90
2011	5.44	3.32	5.16	3.00	10.60	6.33

<sup>1</sup> Includes surface drilling in search of new ore deposits or extensions of known deposits and drilling at the location of a discovery up to the time the company decides sufficient ore reserves are present to justify commercial exploitation.

<sup>2</sup> Includes all surface drilling on an ore deposit to determine more precisely size, grade, and configuration subsequent to the time that commercial exploitation is deemed feasible.

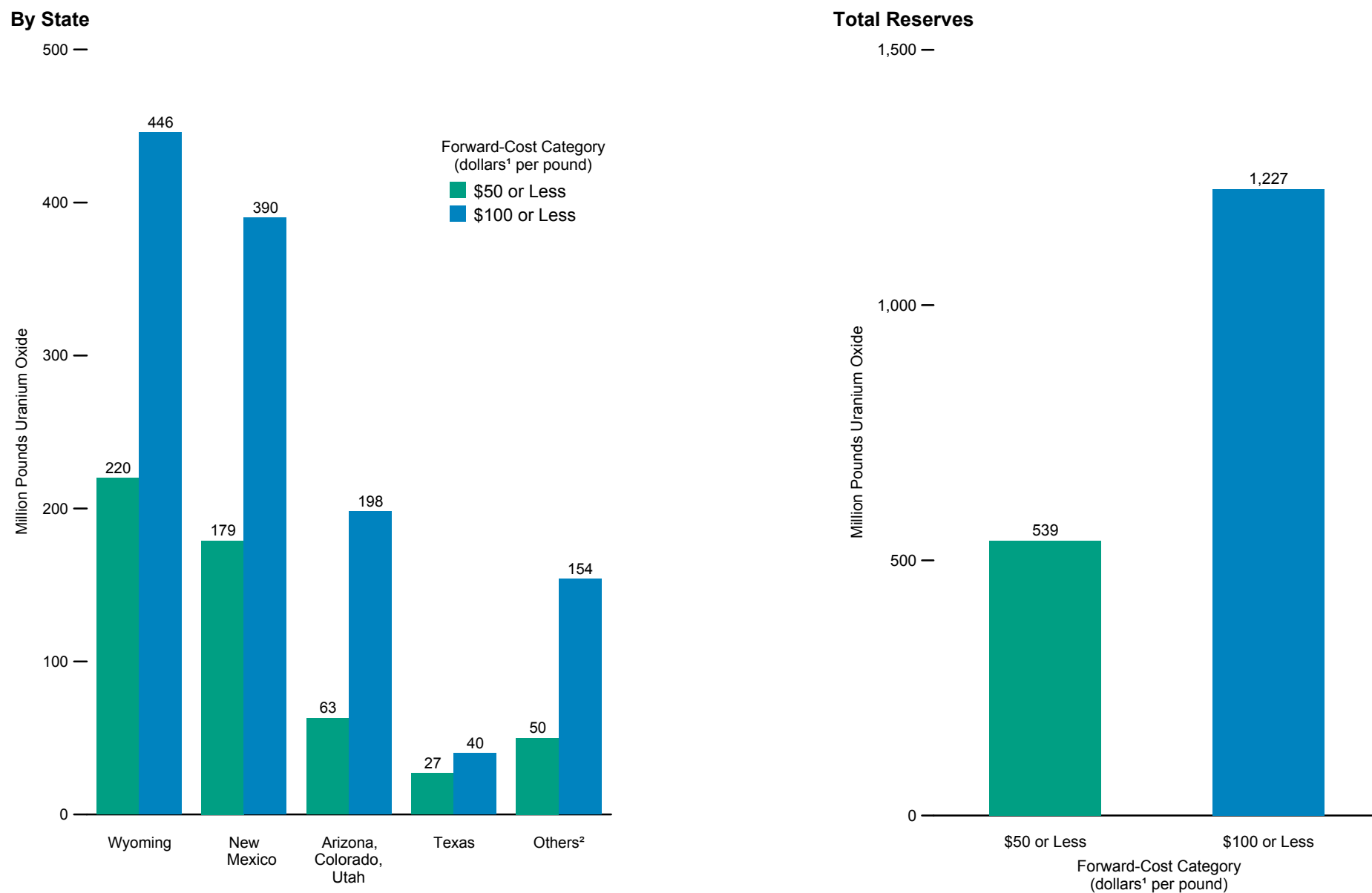
NA=Not available. W=Value withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#resources> for all data beginning in 1949. • For related information, see <http://www.eia.gov/nuclear/>.

Sources: • 1949-1981—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry, January 1, 1983*, Report No. GJO-100 (1983), Table VIII-5. • 1982-2002—U.S. Energy Information Administration (EIA), *Uranium Industry Annual*, annual reports. • 2003-2005—EIA, "Domestic Uranium Production Report," annual reports. • 2006 forward—EIA, "2011 Domestic Uranium Production Report" (May 2012), Table 1.

**Figure 4.10 Uranium Reserves, 2008**



<sup>1</sup> See "Nominal Dollars" in Glossary.

<sup>2</sup> Alaska, California, Idaho, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Virginia, and Washington.

Notes: • See "Uranium Oxide" in Glossary. • Data are at end of year.

Source: Table 4.10.

**Table 4.10 Uranium Reserves,<sup>1</sup> 2008**  
(Million Pounds Uranium Oxide)

State	Forward-Cost <sup>2</sup> Category (dollars <sup>3</sup> per pound)	
	\$50 or Less	\$100 or Less
<b>Total</b> .....	<b>539</b>	<b>1,227</b>
Wyoming .....	220	446
New Mexico .....	179	390
Arizona, Colorado, Utah .....	63	198
Texas .....	27	40
Others <sup>4</sup> .....	50	154

<sup>1</sup> The U.S. Energy Information Administration (EIA) category of uranium reserves is equivalent to the internationally reported category of "Reasonably Assured Resources" (RAR).

<sup>2</sup> Forward costs include the costs for power and fuel, labor, materials, insurance, severance and ad valorem taxes, and applicable administrative costs. Past capital costs are considered "sunk" costs and mining of the individual deposits may or may not return such costs to investors. Sunk costs for such items as exploration and land acquisition are excluded as are the costs for income taxes, profit, and the cost of money. The forward costs used to estimate U.S. uranium ore reserves are independent of the price at which uranium produced from the estimated reserves might be sold in the commercial market. Reserves values in forward-cost categories are cumulative; that is, the quantity at each level of forward cost includes

all reserves at the lower cost in that category.

<sup>3</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

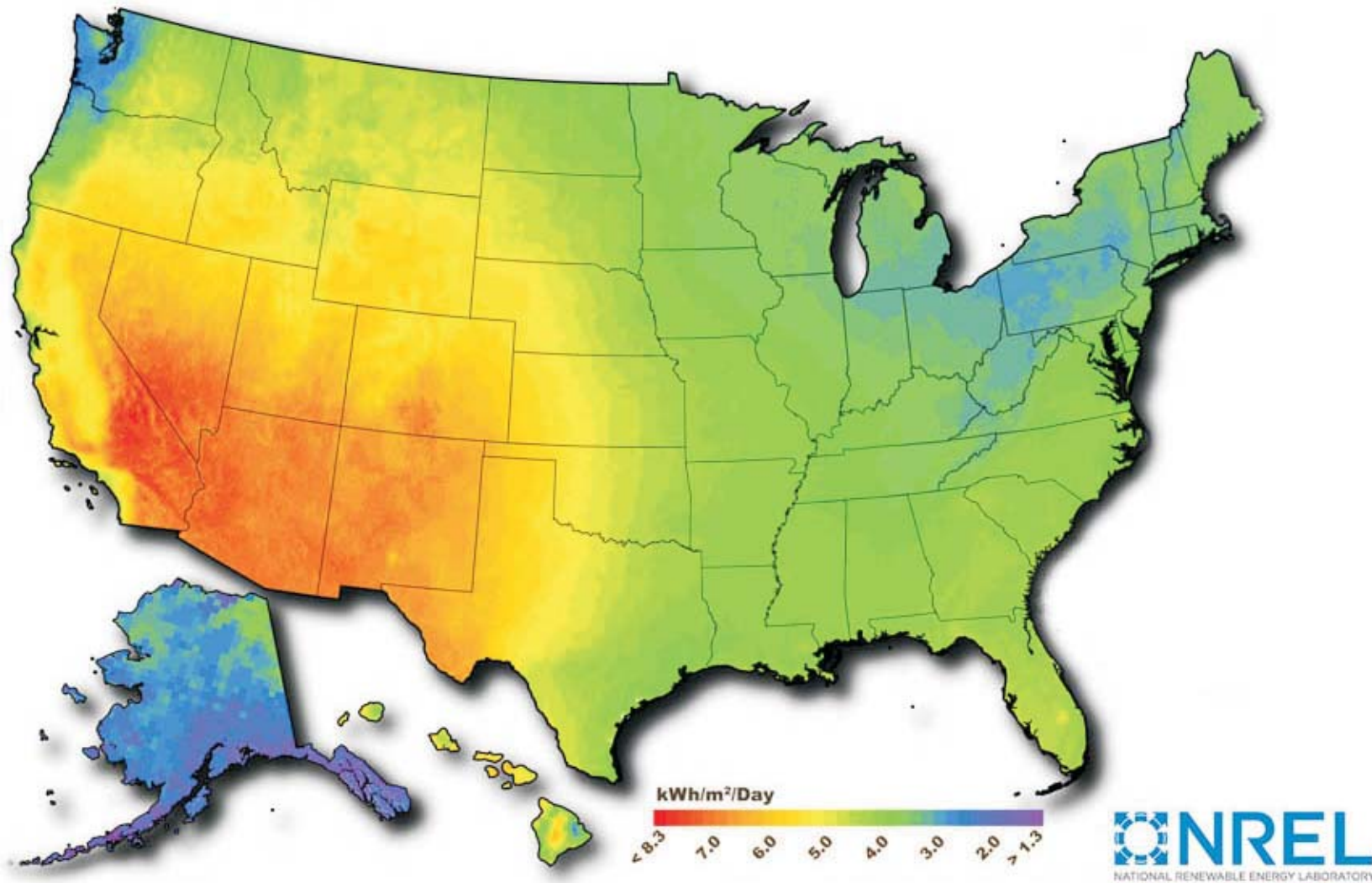
<sup>4</sup> Alaska, California, Idaho, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Virginia, and Washington.

Notes: • Estimates are at end of year. • See "Uranium Oxide" in Glossary. • For updates, see <http://www.eia.gov/cneaf/nuclear/page/reserves/ures.html>.

Web Page: For related information, see <http://www.eia.gov/nuclear/>.

Sources: EIA, *U.S. Uranium Reserves Estimates* (July 2010), Table 1.

**Figure 4.11 Concentrating Solar Resources**



Notes: • Annual average direct normal solar resource data are shown. • kWh/m<sup>2</sup>/Day = kilowatthours per square meter per day.

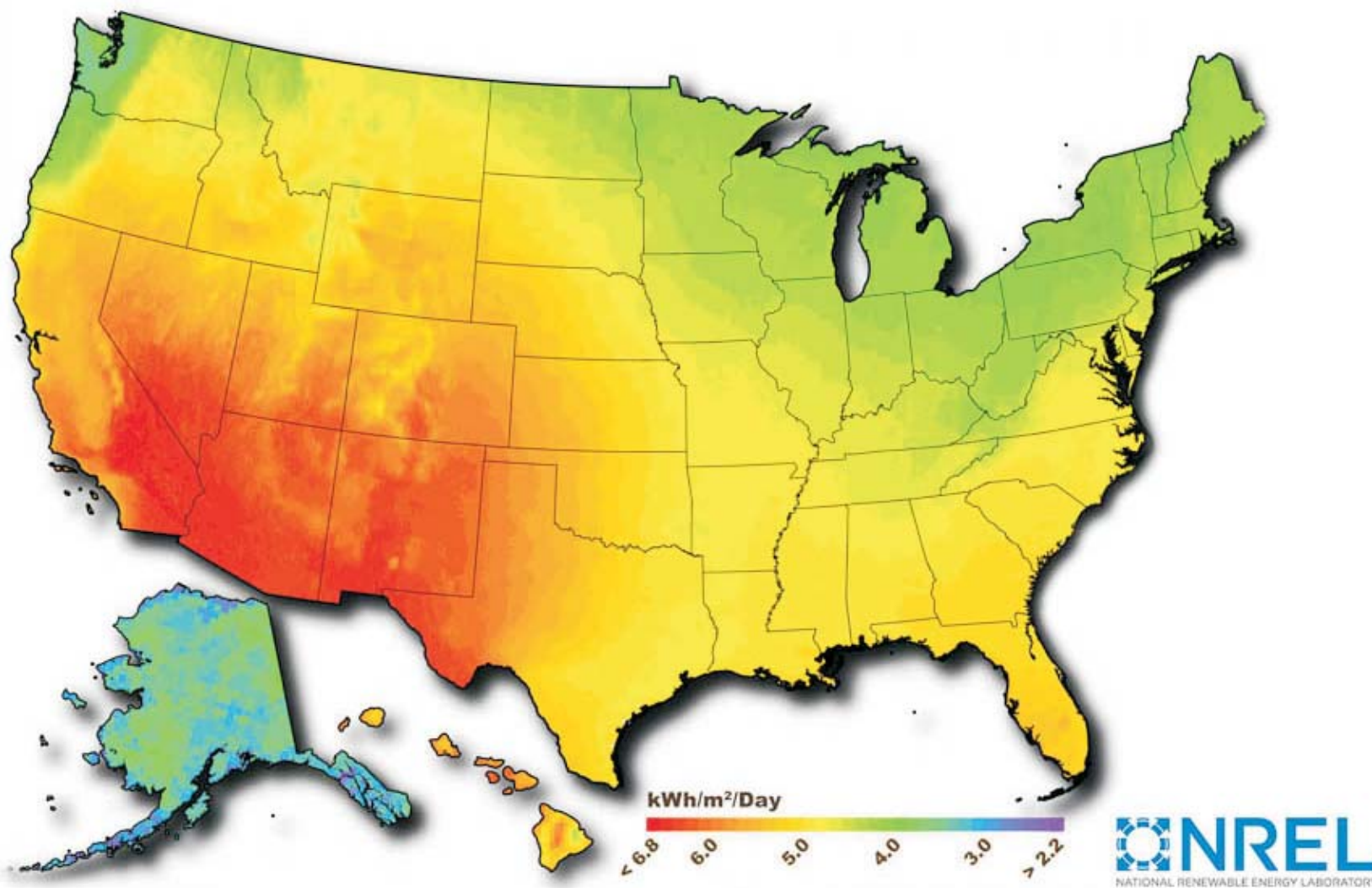
Web Page: For related information, see <http://www.nrel.gov/gis/maps.html>.

Sources: This map was created by the National Renewable Energy Laboratory for the

Department of Energy (October 20, 2008). The data for Hawaii and the 48 contiguous States are a 10-kilometer (km) satellite modeled dataset (SUNY/NREL, 2007) representing data from 1998-2005. The data for Alaska are a 40-km dataset produced by the Climatological Solar Radiation Model (NREL, 2003).



Figure 4.12 Photovoltaic Solar Resources

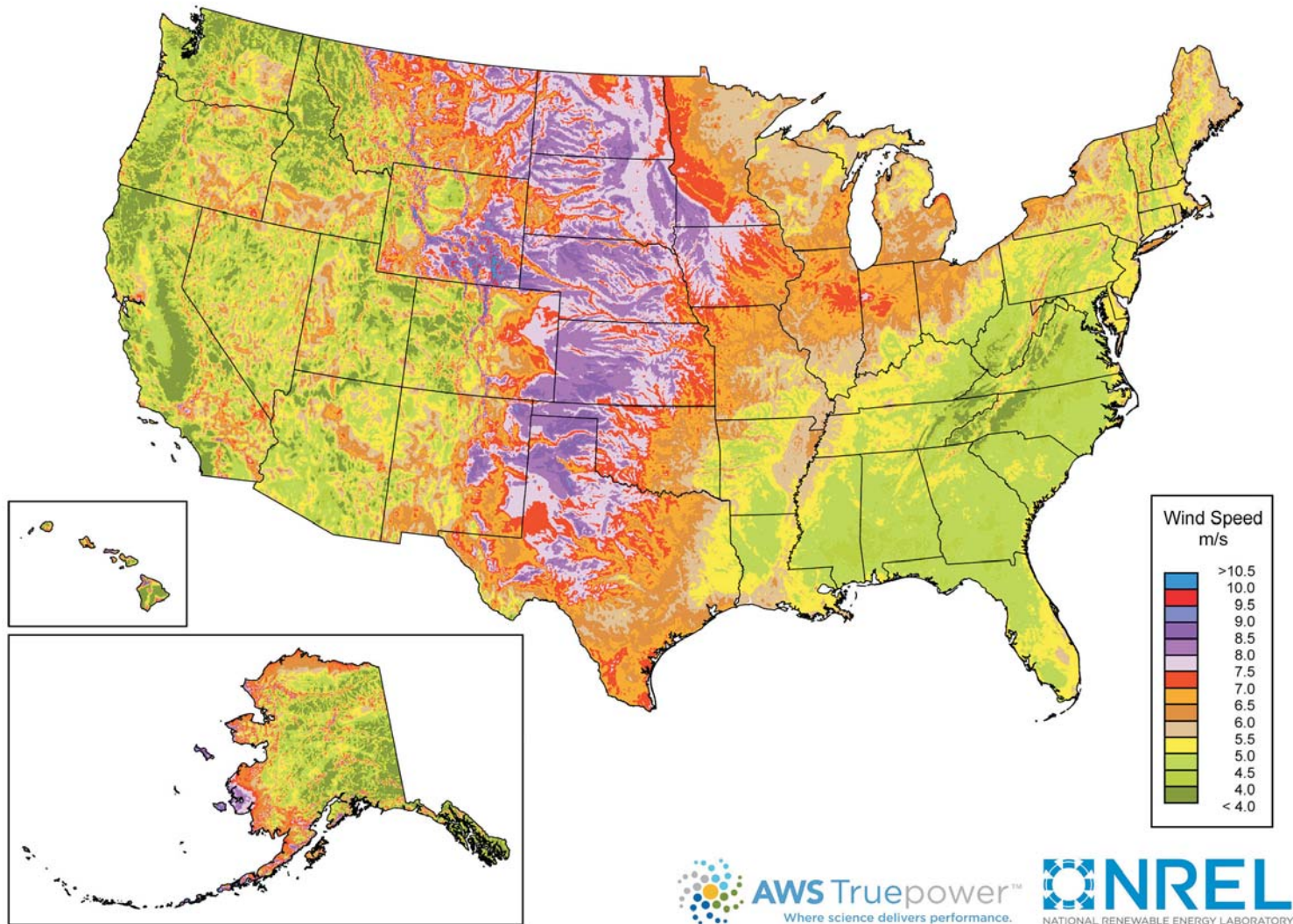


Notes: • Annual average solar resource data are shown for a tilt=latitude collector. • kWh/m<sup>2</sup>/Day = kilowatt-hours per square meter per day.

Web Page: For related information, see <http://www.nrel.gov/gis/maps.html>.

Sources: This map was created by the National Renewable Energy Laboratory for the Department of Energy (October 20, 2008). The data for Hawaii and the 48 contiguous States are a 10-kilometer (km) satellite modeled dataset (SUNY/NREL, 2007) representing data from 1998-2005. The data for Alaska are a 40-km dataset produced by the Climatological Solar Radiation Model (NREL, 2003).

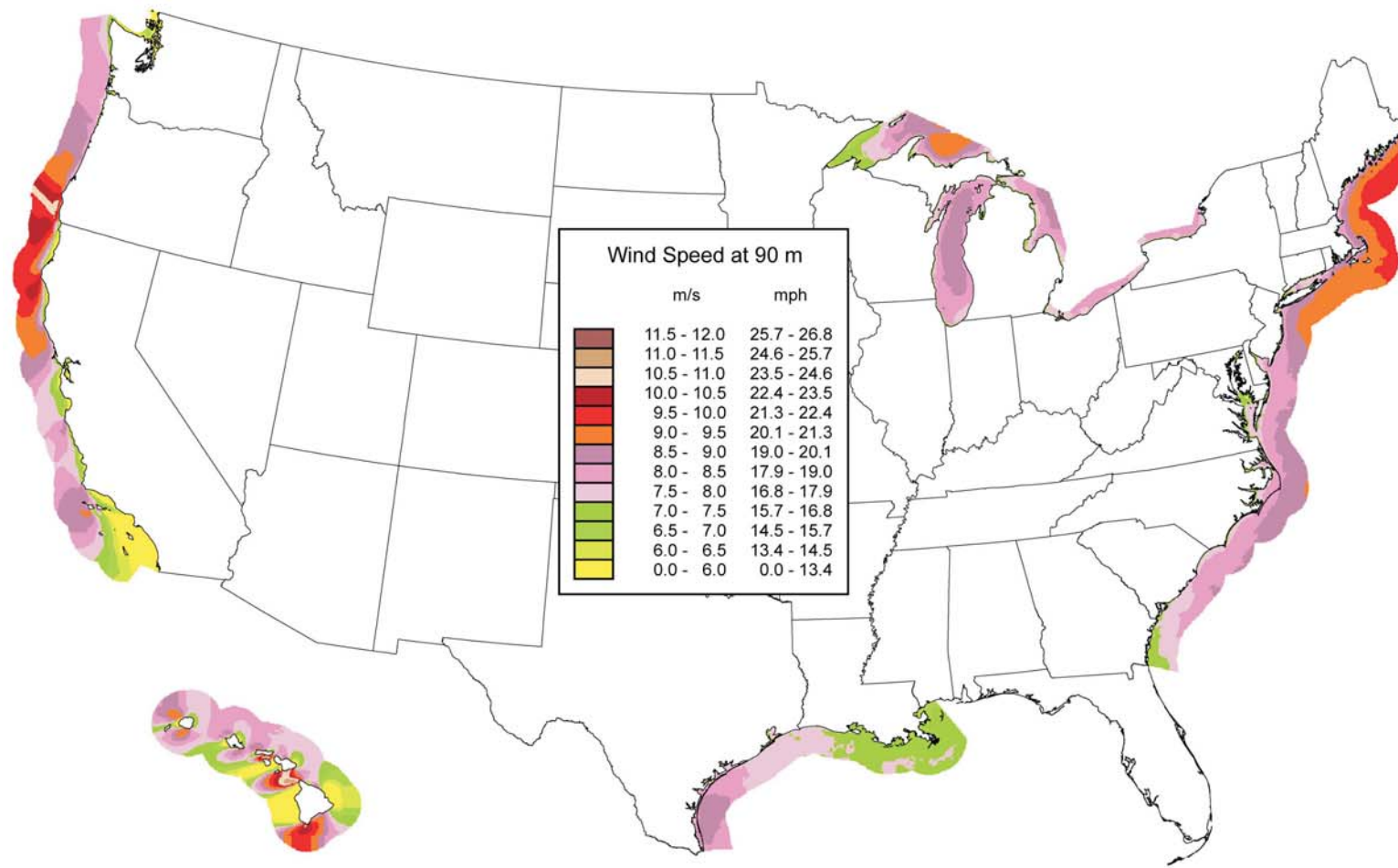
Figure 4.13 Onshore Wind Resources



Notes: • Data are annual average wind speed at 80 meters. • m/s = meters per second.  
Web Page: For related information, see <http://www.nrel.gov/gis/maps.html>.  
Sources: This map was created by the National Renewable Energy Laboratory for the Department of Energy (April 1, 2011). Wind resource estimates developed by AWS

Truepower, LLC for windNavigator®. See <http://www.windnavigator.com> and <http://www.awstruepower.com>. Spatial resolution of wind resource data: 2.5 kilometers. Projection: Albers Equal Area WGS84.

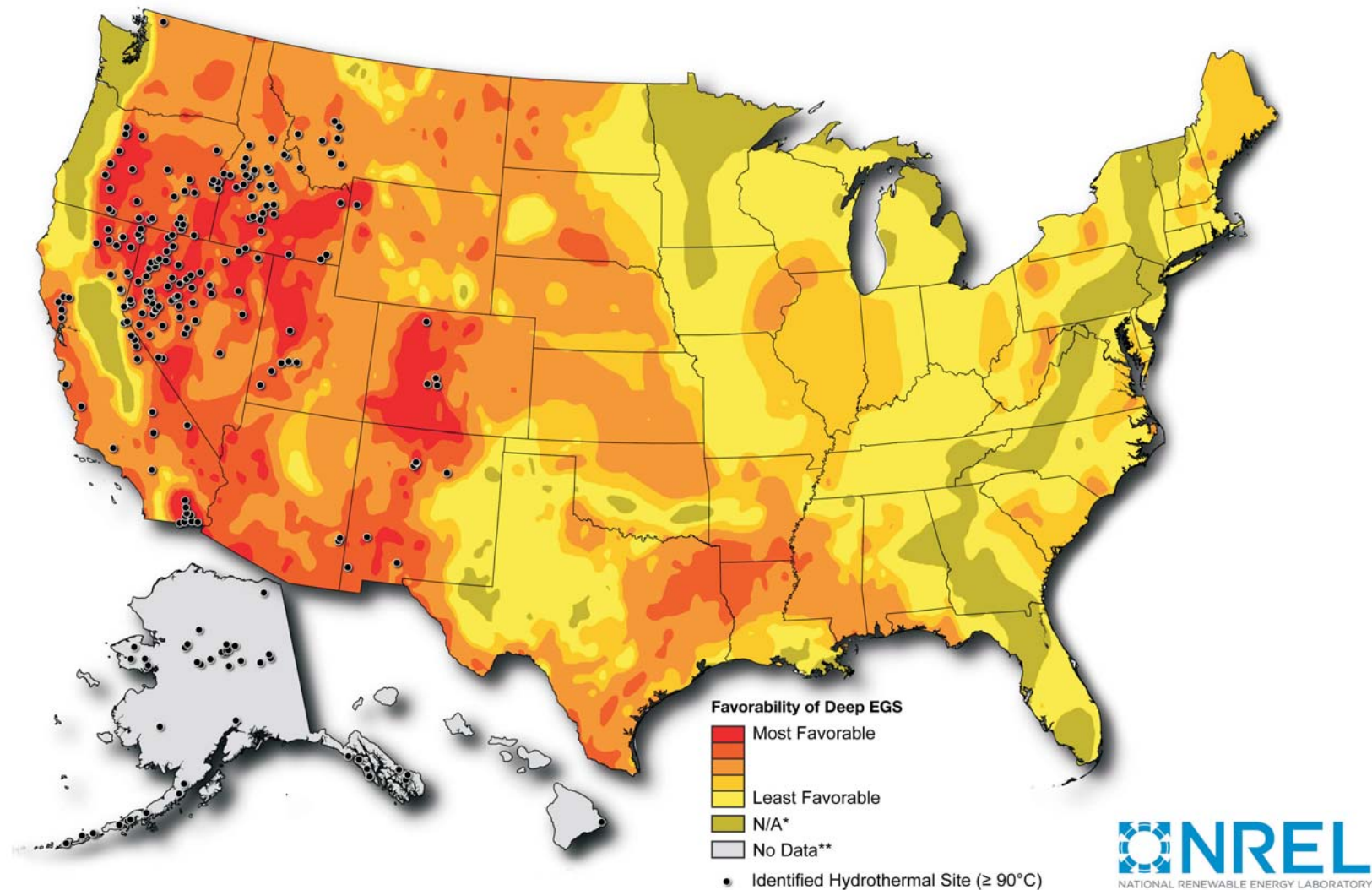
**Figure 4.14 Offshore Wind Resources**



Notes: • Data are annual average wind speed at 90 meters. • m/s = meters per second.  
 • mph = miles per hour.

Web Page: For related information, see <http://www.nrel.gov/gis/maps.html>.  
 Source: This map was created by the National Renewable Energy Laboratory for the Department of Energy (January 10, 2011).

Figure 4.15 Geothermal Resources

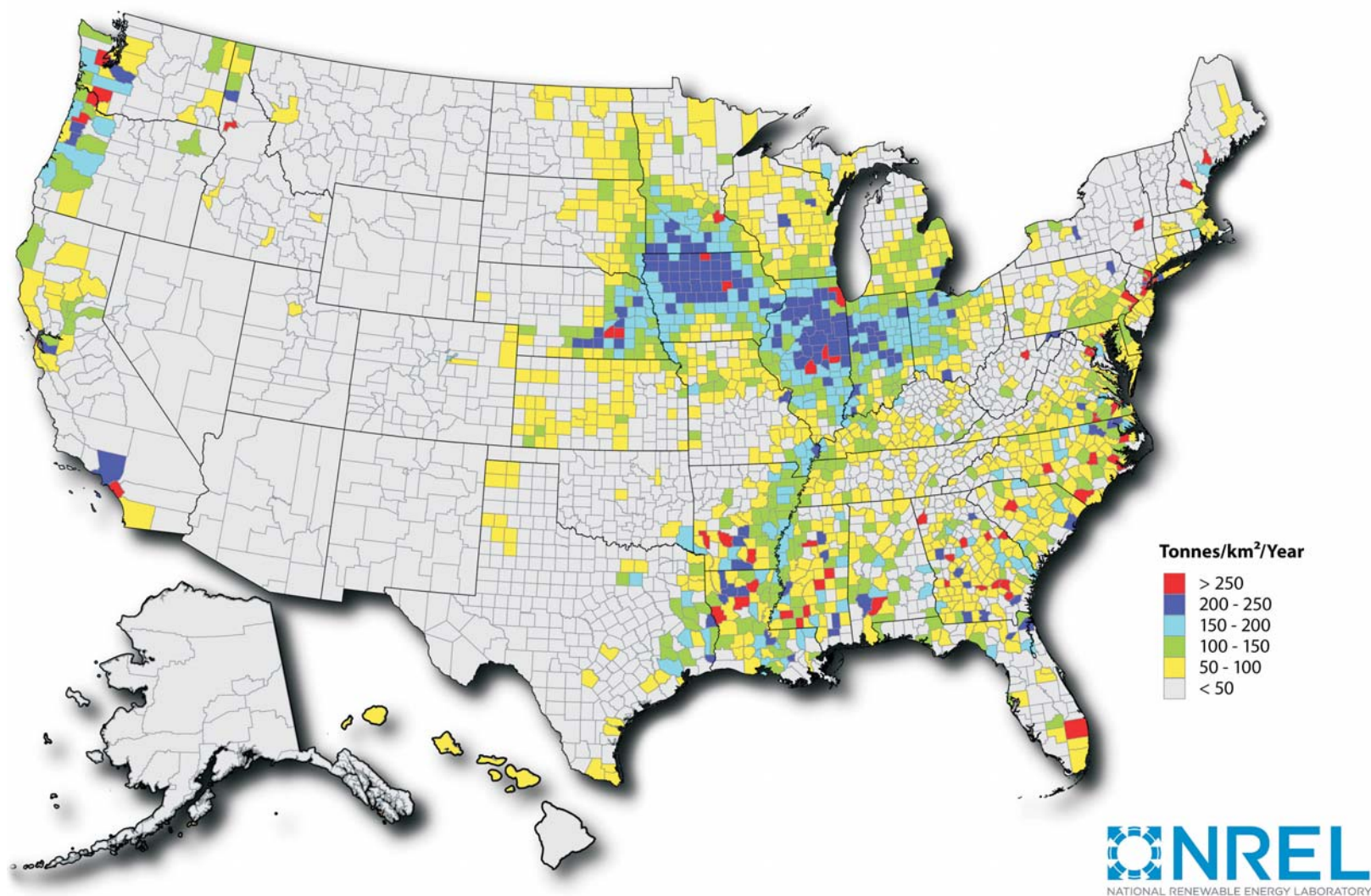


Notes: • Data are for locations of identified hydrothermal sites and favorability of deep enhanced geothermal systems (EGS). • Map does not include shallow EGS resources located near hydrothermal sites or USGS assessment of undiscovered hydrothermal resources. • \*\*N/A" regions have temperatures less than  $150^{\circ}\text{C}$  at 10 kilometers (km) depth and were not assessed for deep EGS potential. • \*\*Temperature at depth data for deep EGS in Alaska and Hawaii not available.

Web Page: For related information, see <http://www.nrel.gov/gis/maps.html>.

Sources: This map was created by the National Renewable Energy Laboratory for the Department of Energy (October 13, 2009). Source data for deep EGS includes temperature at depth from 3 to 10 km provided by Southern Methodist University Geothermal Laboratory (Blackwell & Richards, 2010) and analyses (for regions with temperatures  $\geq 150^{\circ}\text{C}$ ) performed by NREL (2009). Source data for identified hydrothermal sites from USGS Assessment of Moderate- and High-Temperature Geothermal Resources of the United States (2008).

Figure 4.16 Biomass Resources



Notes: • Data are for total biomass per square kilometer. • km<sup>2</sup> = square kilometer. • This study estimates the biomass resources currently available in the United States by county. It includes the following feedstock categories: crop residues (5 year average: 2003-2007), forest and primary mill residues (2007), secondary mill and urban wood waste (2002), methane emissions from landfills (2008), domestic wastewater treatment (2007), and animal manure (2002). For more information on the data development, please refer to <http://www.nrel.gov/docs/fy06osti/39181.pdf>.

Although, the document contains the methodology for the development of an older assessment, the information is applicable to this assessment as well. The difference is only in the data's time period.

Web Page: For related information, see <http://www.nrel.gov/gis/maps.html>.

Source: This map was created by the National Renewable Energy Laboratory for the Department of Energy (September 23, 2009).

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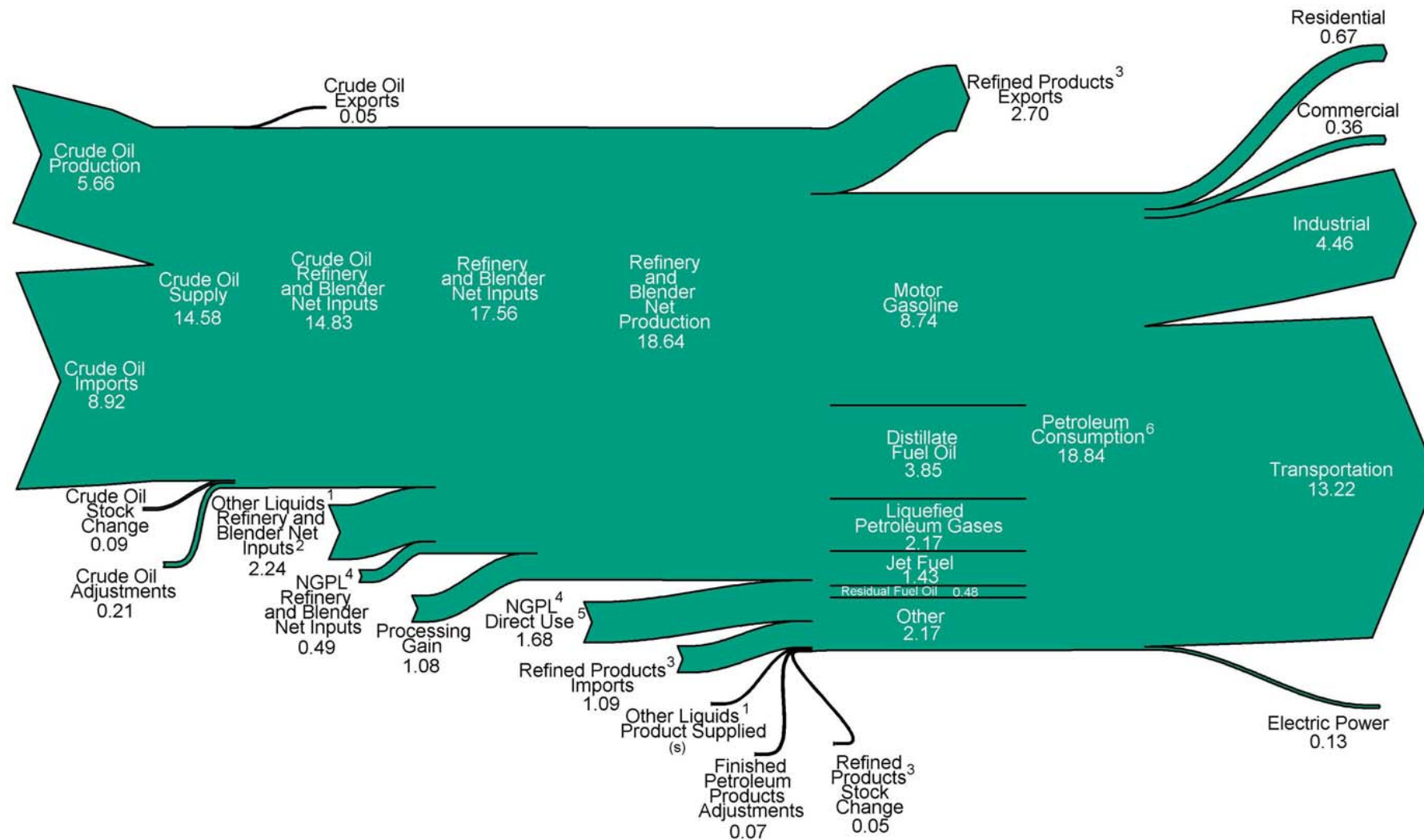
## **5. Petroleum and Other Liquids**

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**Figure 5.0. Petroleum Flow, 2011**  
(Million Barrels per Day)



<sup>1</sup> Unfinished oils, hydrogen/oxygenates/renewables/other hydrocarbons, and motor gasoline and aviation gasoline blending components.

<sup>2</sup> Renewable fuels and oxygenate plant net production (0.972), net imports (1.164) and adjustments (0.122) minus stock change (0.019) and product supplied (0.001).

<sup>3</sup> Finished petroleum products, liquefied petroleum gases, and pentanes plus.

<sup>4</sup> Natural gas plant liquids.

<sup>5</sup> Field production (2.183) and renewable fuels and oxygenate plant net production (-0.19) minus refinery and blender net inputs (0.489).

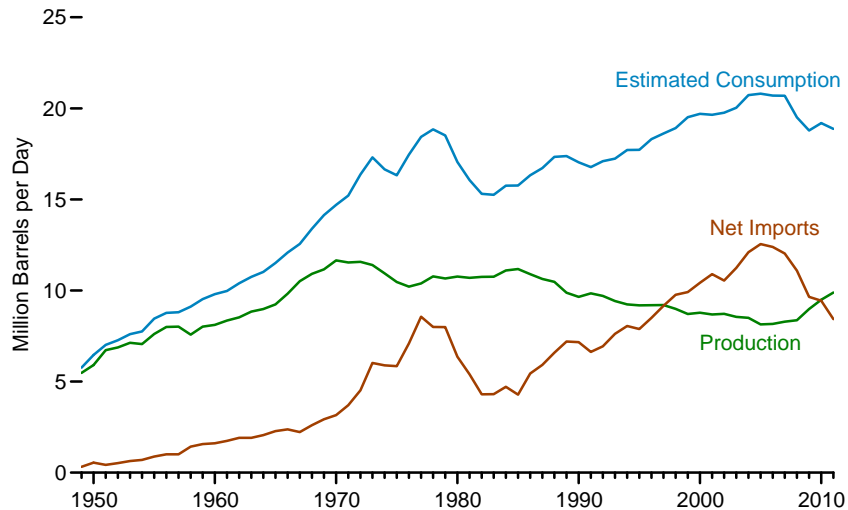
<sup>6</sup> Petroleum products supplied.  
(s)=Less than 0.005.

Notes: • Data are preliminary. • Values are derived from source data prior to rounding for publication. • Totals may not equal sum of components due to independent rounding.

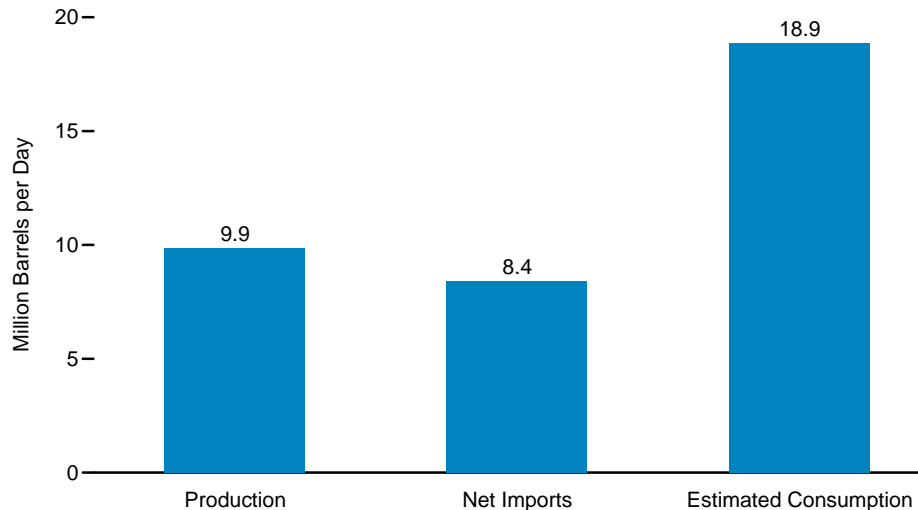
Sources: Tables 5.1b, 5.3, 5.5, 5.8, 5.11, 5.13a-5.13d, 5.16; U.S. Energy Information Administration, *Petroleum Supply Monthly* (February 2012), Table 4; and revisions to crude oil production and adjustments (see sources for Table 5.1b).

**Figure 5.1a Petroleum and Other Liquids Overview**

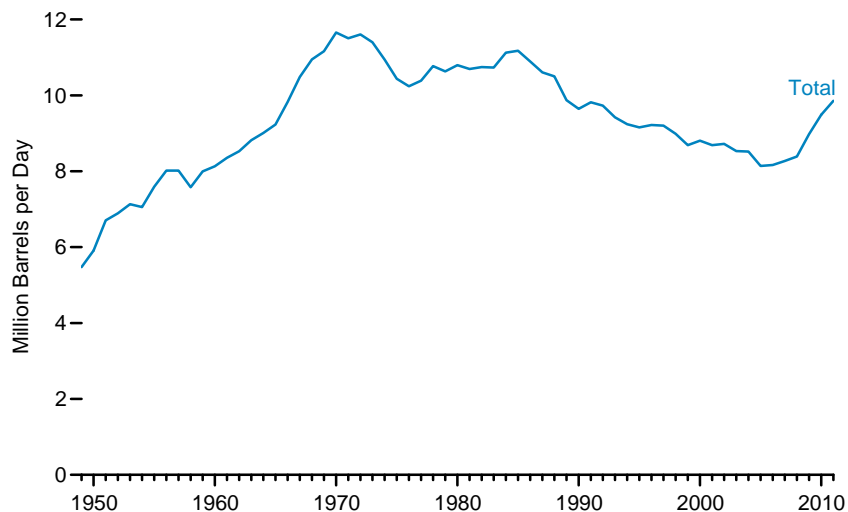
**Overview, 1949-2011**



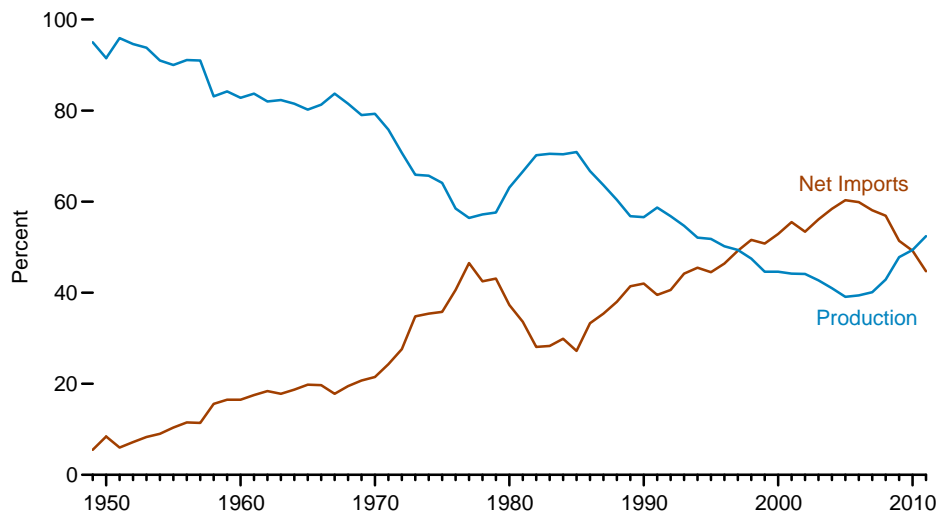
**Overview, 2011**



**Production, 1949-2011**



**Production and Net Imports, Share of Estimated Consumption, 1949-2011**

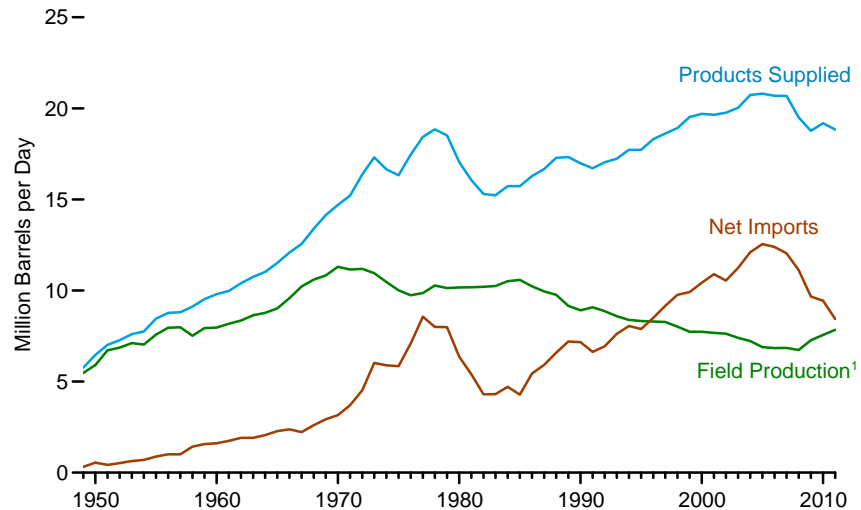


Note: Production includes production of crude oil (including lease condensate), natural gas plant liquids, fuel ethanol (minus denaturant), and biodiesel; and processing gain.

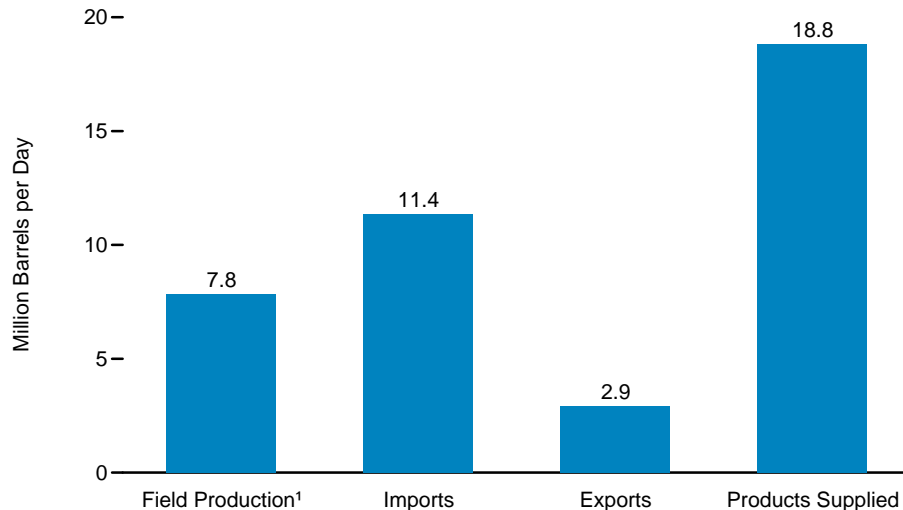
Source: Table 5.1a.

# Figure 5.1b Petroleum Overview

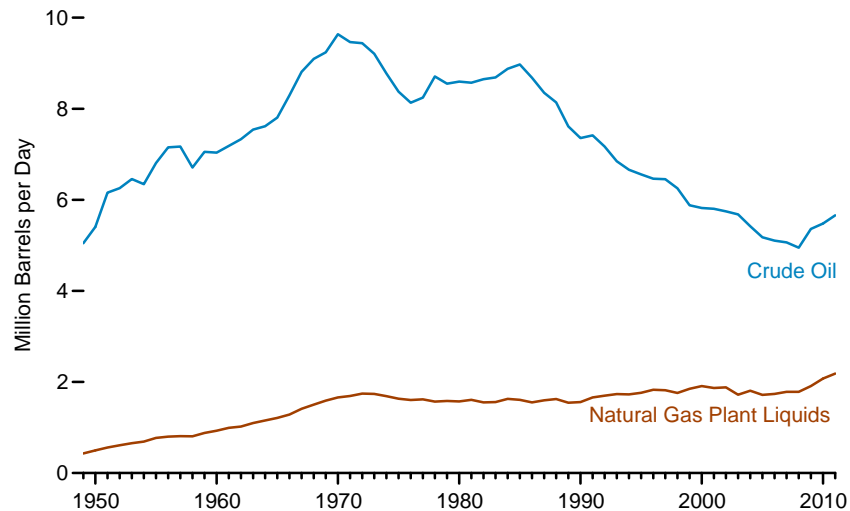
Overview, 1949-2011



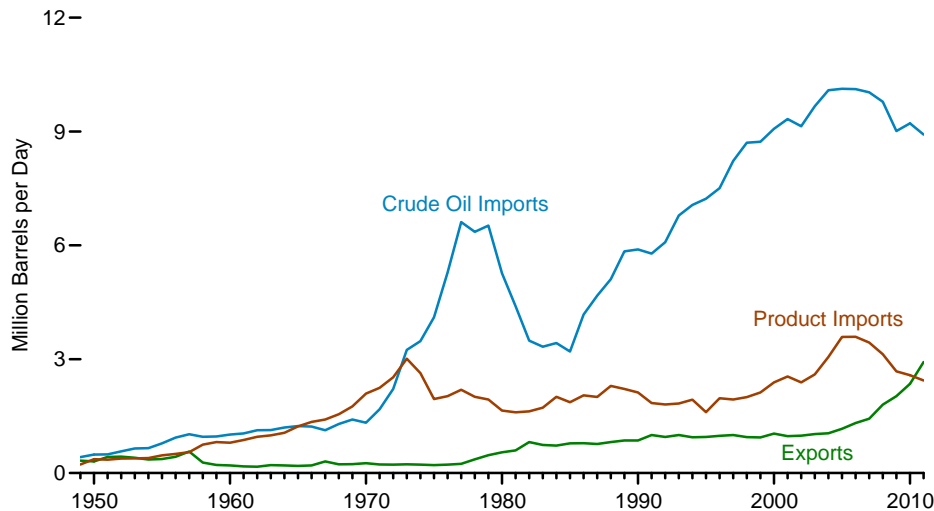
Overview, 2011



Crude Oil and Natural Gas Plant Liquids Field Production, 1949-2011



Trade, 1949-2011



<sup>1</sup> Crude oil and natural gas plant liquids field production.

Sources: Tables 5.1b and 5.3

**Table 5.1a Petroleum and Other Liquids Overview, Selected Years, 1949-2011**

Year	Production <sup>1</sup>	Production as Share of Estimated Consumption	Net Imports <sup>2</sup>	Net Imports as Share of Estimated Consumption	Balancing Item <sup>3</sup>	Estimated Consumption <sup>4</sup>
	Thousand Barrels per Day	Percent	Thousand Barrels per Day	Percent	Thousand Barrels per Day	
1949	5,475	95.0	318	5.5	-30	5,763
1950	5,908	91.5	545	8.4	5	6,458
1955	7,611	90.0	880	10.4	-37	8,455
1960	8,110	82.8	1,613	16.5	74	9,797
1965	9,234	80.2	2,281	19.8	-2	11,512
1970	11,656	79.3	3,161	21.5	-119	14,697
1975	10,467	64.1	5,846	35.8	8	16,322
1976	10,213	58.5	7,090	40.6	159	17,461
1977	10,387	56.4	8,565	46.5	-520	18,431
1978	10,771	57.2	8,002	42.5	74	18,847
1979	10,662	57.6	7,985	43.1	-135	18,513
1980	10,767	63.1	6,365	37.3	-76	17,056
1981	10,693	66.6	5,401	33.6	-31	16,063
1982	10,744	70.2	4,298	28.1	268	15,310
1983	10,761	70.5	4,312	28.3	185	15,258
1984	11,095	70.4	4,715	29.9	-52	15,758
1985	11,177	70.9	4,286	27.2	302	15,766
1986	10,893	66.7	5,439	33.3	-5	16,326
1987	10,636	63.6	5,914	35.4	168	16,717
1988	10,473	60.4	6,587	38.0	277	17,336
1989	9,874	56.8	7,202	41.4	303	17,379
1990	9,645	56.6	7,161	42.0	230	17,036
1991	9,846	58.7	6,626	39.5	297	16,769
1992	9,703	56.8	6,938	40.6	455	17,096
1993	9,422	54.7	7,618	44.2	195	17,235
1994	9,239	52.1	8,054	45.5	424	17,716
1995	9,183	51.8	7,886	44.5	654	17,723
1996	9,194	50.2	8,498	46.4	616	18,308
1997	9,201	49.4	9,158	49.2	260	18,619
1998	8,987	47.5	9,764	51.6	165	18,915
1999	8,711	44.6	9,912	50.8	894	19,517
2000	8,784	44.6	10,419	52.9	496	19,699
2001	8,686	44.2	10,900	55.5	60	19,647
2002	8,720	44.1	10,547	53.4	493	19,760
2003	8,554	42.7	11,238	56.1	239	20,031
2004	8,498	41.0	12,097	58.4	133	20,728
2005	8,140	39.1	12,549	60.3	114	20,803
2006	8,163	39.4	12,391	59.9	143	20,697
2007	8,292	40.1	12,027	58.1	376	20,695
2008	8,364	42.9	11,090	56.9	51	19,506
2009	<sup>R</sup> 8,981	47.8	9,654	51.4	154	<sup>R</sup> 18,789
2010	<sup>R</sup> 9,490	<sup>R</sup> 49.4	<sup>R</sup> 9,435	49.2	<sup>R</sup> 267	<sup>R</sup> 19,192
2011	<sup>E</sup> 9,884	<sup>E</sup> 52.4	<sup>P</sup> 8,432	<sup>F</sup> 44.7	<sup>F</sup> 561	<sup>P</sup> 18,877

<sup>1</sup> Crude oil (including lease condensate) production; natural gas plant liquids production; and processing gain (refinery and blender net production minus refinery and blender net inputs). Beginning in 1981, also includes fuel ethanol (minus denaturant) production. Beginning in 2001, also includes biodiesel production.

<sup>2</sup> Net imports equal imports minus exports. Includes petroleum (excluding biofuels) net imports. Beginning in 1993, also includes fuel ethanol (minus denaturant) net imports. Beginning in 2001, also includes biodiesel net imports. Beginning in 2009, also includes a small amount of other biofuels (such as bio-jet fuel and bio-ETBE) imports.

<sup>3</sup> Includes petroleum and biofuels stock withdrawals (stock change multiplied by -1); petroleum adjustments; and biodiesel balancing item.

<sup>4</sup> Includes estimated consumption of petroleum. Beginning in 1981, also includes estimated consumption of fuel ethanol minus denaturant. Beginning in 2001, also includes estimated consumption of biodiesel. Techniques used to estimate consumption vary depending on the product. Petroleum product supplied is used as an approximation of petroleum consumption, which is adjusted to exclude biofuels in order to prevent double counting. See Note 1, "Petroleum Products Supplied and Petroleum

Consumption," at end of section. Estimated consumption of fuel ethanol minus denaturant in 2011 is calculated as fuel ethanol refinery and blender net inputs minus fuel ethanol adjustments minus the amount of denaturant in fuel ethanol consumed; for other years, see sources in Table 10.3. Estimated consumption of biodiesel in 2011 is calculated as biodiesel production plus biodiesel net imports minus biodiesel stock change; for other years, see sources in Table 10.4.

R=Revised. P=Preliminary. E=Estimate.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> and <http://www.eia.gov/renewable/> for related information.

Sources: **Production:** Tables 5.1b, 10.3, and 10.4. **Net Imports:** Tables 5.1b, 10.3, and 10.4; and U.S. Energy Information Administration (EIA), *Petroleum Supply Annual (PSA)*, *Petroleum Supply Monthly (PSM)*, and earlier publications—see sources for Table 5.1b. **Balancing Item:** Calculated as estimated consumption minus production and net imports. **Estimated Consumption:** Tables 5.1b, 10.3, and 10.4; and EIA, PSA, PSM, and earlier publications—see sources for Table 5.1b.

**Table 5.1b Petroleum Overview, Selected Years, 1949-2011**  
(Thousand Barrels per Day)

Year	Field Production <sup>1</sup>					Renewable Fuels and Oxygenates <sup>5</sup>	Processing Gain <sup>6</sup>	Trade			Stock Change <sup>8,10</sup>	Adjustments <sup>11</sup>	Petroleum Products Supplied <sup>8</sup>
	Crude Oil <sup>2</sup>			Natural Gas Plant Liquids <sup>4</sup>	Total			Imports <sup>7,8</sup>	Exports	Net Imports <sup>8,9</sup>			
	48 States <sup>3</sup>	Alaska	Total										
1949	5,046	0	5,046	430	5,477	NA	-2	645	327	318	-8	-38	5,763
1950	5,407	0	5,407	499	5,906	NA	2	850	305	545	-56	-51	6,458
1955	6,807	0	6,807	771	7,578	NA	34	1,248	368	880	(s)	-37	8,455
1960	7,034	2	7,035	929	7,965	NA	146	1,815	202	1,613	-83	-8	9,797
1965	7,774	30	7,804	1,210	9,014	NA	220	2,468	187	2,281	-8	-10	11,512
1970	9,408	229	9,637	1,660	11,297	NA	359	3,419	259	3,161	103	-16	14,697
1975	8,183	191	8,375	1,633	10,007	NA	460	6,056	209	5,846	32	41	16,322
1976	7,958	173	8,132	1,604	9,736	NA	477	7,313	223	7,090	-58	101	17,461
1977	7,781	464	8,245	1,618	9,862	NA	524	8,807	243	8,565	548	28	18,431
1978	7,478	1,229	8,707	1,567	10,275	NA	496	8,363	362	8,002	-94	-20	18,847
1979	7,151	1,401	8,552	1,584	10,135	NA	527	8,456	471	7,985	173	38	18,513
1980	6,980	1,617	8,597	1,573	10,170	NA	597	6,909	544	6,365	140	64	17,056
1981	6,962	1,609	8,572	1,609	10,180	NA	508	5,996	595	5,401	160	129	16,058
1982	6,953	1,696	8,649	1,550	10,199	NA	531	5,113	815	4,298	-147	121	15,296
1983	6,974	1,714	8,688	1,559	10,246	NA	488	5,051	739	4,312	-20	165	15,231
1984	7,157	1,722	8,879	1,630	10,509	NA	553	5,437	722	4,715	280	228	15,726
1985	7,146	1,825	8,971	1,609	10,581	NA	557	5,067	781	4,286	-103	200	15,726
1986	6,814	1,867	8,680	1,551	10,231	NA	616	6,224	785	5,439	202	197	16,281
1987	6,387	1,962	8,349	1,595	9,944	NA	639	6,678	764	5,914	41	209	16,665
1988	6,123	2,017	8,140	1,625	9,765	NA	655	7,402	815	6,587	-28	249	17,283
1989	5,739	1,874	7,613	1,546	9,159	NA	661	8,061	859	7,202	-43	260	17,325
1990	5,582	1,773	7,355	1,559	8,914	NA	683	8,018	857	7,161	107	338	16,988
1991	5,618	1,798	7,417	1,659	9,076	NA	715	7,627	1,001	6,626	-10	287	16,714
1992	5,457	1,714	7,171	1,697	8,868	NA	772	7,888	950	6,938	-68	386	17,033
1993	5,264	1,582	6,847	1,736	8,582	NA	766	8,620	1,003	7,618	151	422	17,237
1994	5,103	1,559	6,662	1,727	8,388	NA	768	8,996	942	8,054	15	523	17,718
1995	5,076	1,484	6,560	1,762	8,322	NA	774	8,835	949	7,886	-246	496	17,725
1996	5,071	1,393	6,465	1,830	8,295	NA	837	9,478	981	8,498	-151	528	18,309
1997	5,156	1,296	6,452	1,817	8,269	NA	850	10,162	1,003	9,158	143	487	18,620
1998	5,077	1,175	6,252	1,759	8,011	NA	886	10,708	945	9,764	239	495	18,917
1999	4,832	1,050	5,881	1,850	7,731	NA	886	10,852	940	9,912	-422	567	19,519
2000	4,851	970	5,822	1,911	7,733	NA	948	11,459	1,040	10,419	-69	532	19,701
2001	4,839	963	5,801	1,868	7,670	NA	903	11,871	971	10,900	325	501	19,649
2002	4,761	984	5,746	1,880	7,626	NA	957	11,530	984	10,546	-105	527	19,761
2003	4,706	974	5,681	1,719	7,400	NA	974	12,264	1,027	11,238	56	478	20,034
2004	4,510	908	5,419	1,809	7,228	NA	1,051	13,145	1,048	12,097	209	564	20,731
2005	4,314	864	5,178	1,717	6,895	NA	989	13,714	1,165	12,549	145	513	20,802
2006	4,361	741	5,102	1,739	6,841	NA	994	13,707	1,317	12,390	60	522	20,687
2007	4,342	722	5,064	1,783	6,847	NA	996	13,468	1,433	12,036	-148	653	20,680
2008	4,268	683	4,950	1,784	6,734	NA	993	12,915	1,802	11,114	195	852	19,498
2009	4,715	645	5,361	1,910	7,270	746	979	11,691	2,024	9,667	109	218	18,771
2010	<sup>R</sup> 4,874	<sup>R</sup> 601	<sup>R</sup> 5,476	<sup>R</sup> 2,074	<sup>R</sup> 7,550	<sup>R</sup> 907	<sup>R</sup> 1,068	<sup>R</sup> 11,793	<sup>R</sup> 2,353	<sup>R</sup> 9,441	<sup>R</sup> 49	<sup>R</sup> 264	<sup>R</sup> 19,180
2011	<sup>E</sup> 5,090	<sup>E</sup> 72	<sup>E</sup> 5,662	<sup>P</sup> 2,183	<sup>E</sup> 7,844	<sup>P</sup> 954	<sup>P</sup> 1,085	<sup>P</sup> 11,360	<sup>P</sup> 2,924	<sup>P</sup> 8,436	<sup>P</sup> -115	<sup>P</sup> 402	<sup>P</sup> 18,835

<sup>1</sup> Crude oil production on leases, and natural gas liquids (liquefied petroleum gases, pentanes plus, and a small amount of finished petroleum products) production at natural gas processing plants. Excludes what was previously classified as "Field Production" of finished motor gasoline, motor gasoline blending components, and other hydrocarbons and oxygenates; these are now included in "Adjustments."

<sup>2</sup> Includes lease condensate.

<sup>3</sup> United States excluding Alaska and Hawaii.

<sup>4</sup> See Table 5.10.

<sup>5</sup> Renewable fuels and oxygenate plant net production.

<sup>6</sup> Refinery and blender net production minus refinery and blender net inputs. See Table 5.8.

<sup>7</sup> Includes crude oil imports for the Strategic Petroleum Reserve, which began in 1977. See Table 5.17.

<sup>8</sup> Beginning in 1993, includes fuel ethanol blended into motor gasoline. Beginning in 2009, also includes biodiesel and other renewable fuels blended into petroleum.

<sup>9</sup> Net imports equal imports minus exports.

<sup>10</sup> A negative value indicates a decrease in stocks and a positive value indicates an increase. Includes crude oil stocks in the Strategic Petroleum Reserve, but excludes distillate fuel oil stocks in the Northeast Heating Oil Reserve. See Table 5.16.

<sup>11</sup> An adjustment for crude oil, finished motor gasoline, motor gasoline blending components, fuel

ethanol, and distillate fuel oil. See EIA, *Petroleum Supply Monthly (PSM)*, Appendix B.

R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 500 barrels per day and greater than -500 barrels per day.

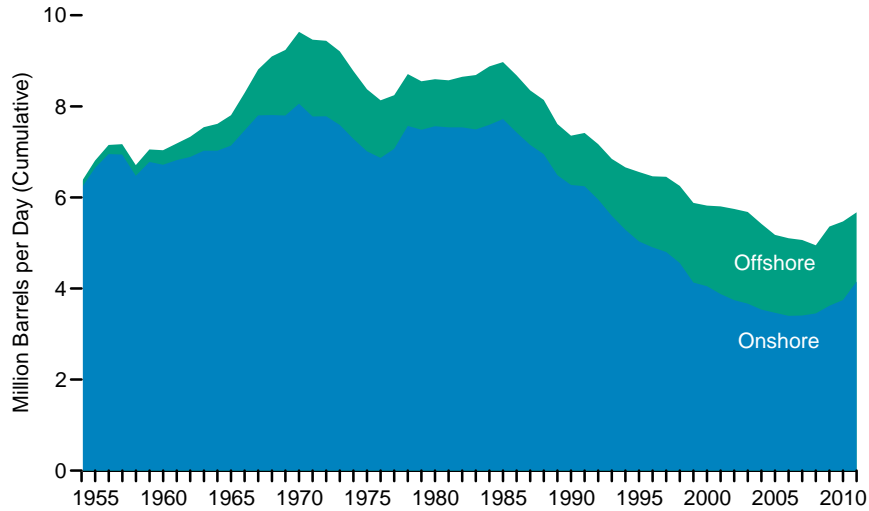
Notes: • See Note 1, "Petroleum Products Supplied and Petroleum Consumption," and Note 2, "Changes Affecting Petroleum Production and Product Supplied Statistics," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> for related information.

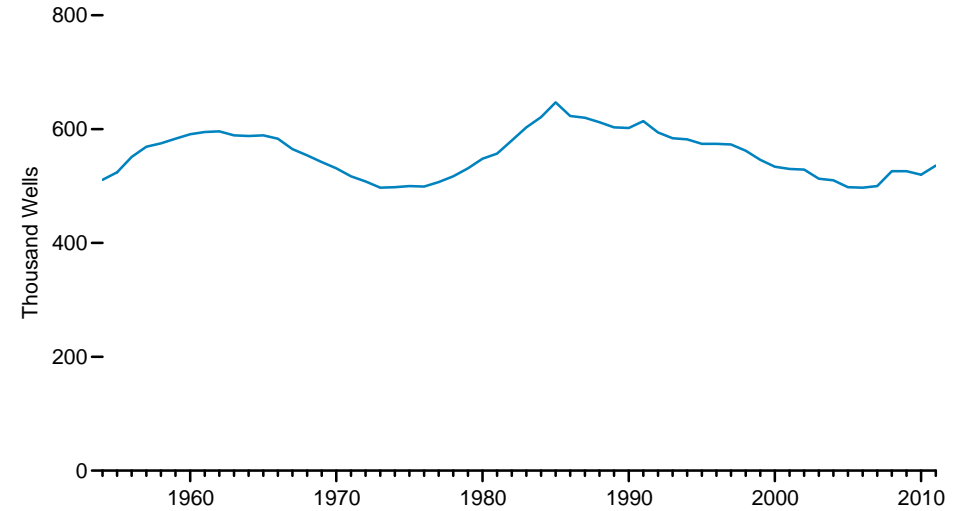
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. • 1976-1980—U.S. Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual*, annual reports. • 1981-2009—EIA, *Petroleum Supply Annual (PSA)*, annual reports. • 2010 and 2011—EIA, PSA, annual report; *Petroleum Supply Monthly*, monthly reports; and revisions to crude oil production, total field production, and adjustments, published in the *Monthly Energy Review* (May 2012), Table 3.1 (based on crude oil production data from: State government agencies; U.S. Department of the Interior, Bureau of Safety and Environmental Enforcement, and predecessor agencies; and Form EIA-182, "Domestic Crude Oil First Purchase Report").

**Figure 5.2 Crude Oil Production and Crude Oil Well Productivity, 1954-2011**

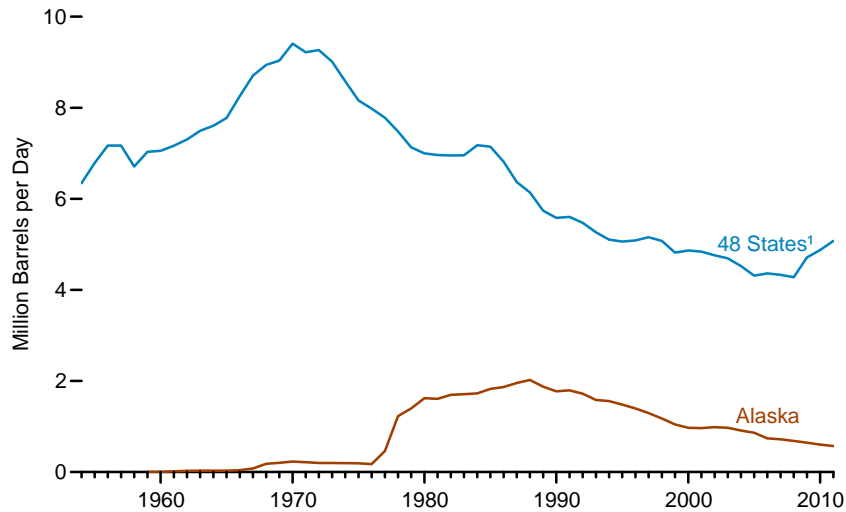
**Crude Oil Production by Location**



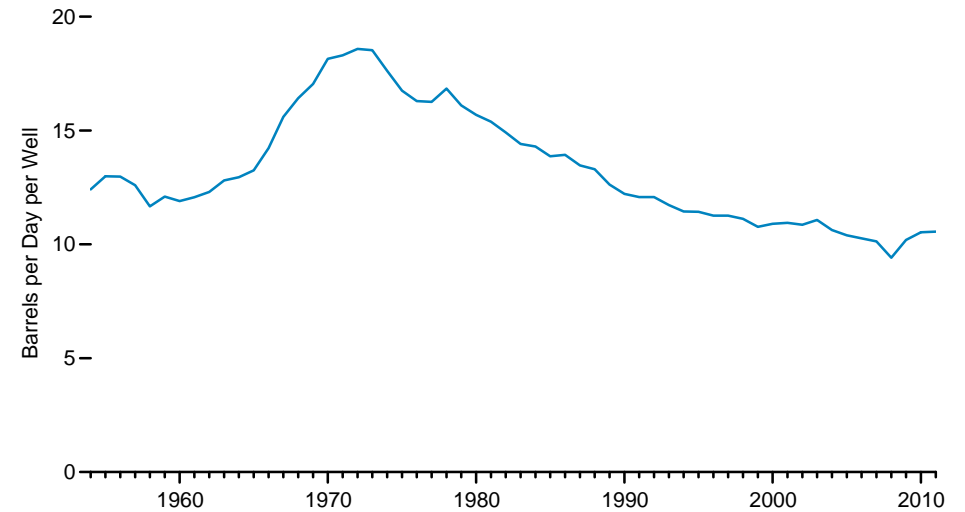
**Number of Producing Wells**



**Crude Oil Production, 48 States<sup>1</sup> and Alaska**



**Crude Oil Well Average Productivity**



<sup>1</sup> United States excluding Alaska and Hawaii.  
Note: Crude oil includes lease condensate.

Source: Table 5.2.

**Table 5.2 Crude Oil Production and Crude Oil Well Productivity, Selected Years, 1954-2011**

Year	Crude Oil Production							Crude Oil Well <sup>1</sup> Productivity		
	48 States <sup>2</sup>	Alaska <sup>3</sup>	Total	Onshore	Offshore			Total	Producing Wells <sup>4</sup>	Average Productivity <sup>5</sup>
					Federal	State	Total			
	Thousand Barrels per Day				Thousand Barrels per Day				Thousands	Barrels per Day per Well
1954	6,342	0	6,342	6,209	NA	NA	133	6,342	511	12.4
1955	6,807	0	6,807	6,645	NA	NA	162	6,807	524	13.0
1960	7,034	2	7,035	6,716	NA	NA	319	7,035	591	11.9
1965	7,774	30	7,804	7,140	NA	NA	665	7,804	589	13.2
1970	9,408	229	9,637	8,060	NA	NA	1,577	9,637	531	18.1
1975	8,183	191	8,375	7,012	NA	NA	1,362	8,375	500	16.8
1976	7,958	173	8,132	6,868	NA	NA	1,264	8,132	499	16.3
1977	7,781	464	8,245	7,069	NA	NA	1,176	8,245	507	16.3
1978	7,478	1,229	8,707	7,571	NA	NA	1,136	8,707	517	16.8
1979	7,151	1,401	8,552	7,485	NA	NA	1,067	8,552	531	16.1
1980	6,980	1,617	8,597	7,562	NA	NA	1,034	8,597	548	15.7
1981	6,962	1,609	8,572	7,537	773	261	1,034	8,572	557	15.4
1982	6,953	1,696	8,649	7,538	863	247	1,110	8,649	580	14.9
1983	6,974	1,714	8,688	7,492	960	236	1,196	8,688	603	14.4
1984	7,157	1,722	8,879	7,596	1,039	244	1,283	8,879	621	14.3
1985	7,146	1,825	8,971	7,722	1,023	227	1,250	8,971	647	13.9
1986	6,814	1,867	8,680	7,426	1,038	216	1,254	8,680	623	13.9
1987	6,387	1,962	8,349	7,153	977	219	1,196	8,349	620	13.5
1988	6,123	2,017	8,140	6,949	904	287	1,191	8,140	612	13.3
1989	5,739	1,874	7,613	6,486	855	272	1,127	7,613	603	12.6
1990	5,582	1,773	7,355	6,273	821	261	1,082	7,355	602	12.2
1991	5,618	1,798	7,417	6,245	886	286	1,172	7,417	614	12.1
1992	5,457	1,714	7,171	5,953	938	280	1,218	7,171	594	12.1
1993	5,264	1,582	6,847	<sup>R</sup> 5,596	964	287	<sup>R</sup> 1,250	6,847	584	11.7
1994	5,103	1,559	6,662	5,291	1,017	353	1,370	6,662	582	11.4
1995	5,076	1,484	6,560	5,035	1,140	385	1,525	6,560	574	11.4
1996	5,071	1,393	6,465	4,902	1,197	365	1,562	6,465	574	11.3
1997	5,156	1,296	6,452	4,803	1,278	371	1,648	6,452	573	11.3
1998	5,077	1,175	6,252	4,560	1,355	337	1,692	6,252	562	11.1
1999	4,832	1,050	5,881	4,132	1,462	288	1,750	5,881	546	10.8
2000	4,851	970	5,822	4,049	1,525	248	1,773	5,822	534	10.9
2001	4,839	963	5,801	3,879	1,621	302	1,923	5,801	530	10.9
2002	4,761	984	5,746	3,743	1,637	365	2,003	5,746	529	10.9
2003	4,706	974	5,681	3,668	1,641	371	2,012	5,681	513	11.1
2004	4,510	908	5,419	3,536	1,527	356	1,883	5,419	510	10.6
2005	4,314	864	5,178	3,466	1,354	358	1,712	5,178	498	10.4
2006	4,361	741	5,102	3,401	1,370	331	1,701	5,102	497	10.3
2007	4,342	722	5,064	3,407	1,344	312	1,657	5,064	500	10.1
2008	4,268	683	4,950	3,452	1,218	280	1,498	4,950	526	9.4
2009	4,715	645	5,361	3,622	1,619	119	1,738	5,361	526	10.2
2010	<sup>R</sup> 4,874	<sup>R</sup> 601	<sup>R</sup> 5,476	<sup>RE</sup> 3,744	<sup>E</sup> 1,609	<sup>E</sup> 122	<sup>RE</sup> 1,732	<sup>R</sup> 5,476	<sup>R</sup> 520	<sup>R</sup> 10.5
2011	<sup>E</sup> 5,090	<sup>E</sup> 572	<sup>E</sup> 5,662	<sup>E</sup> 4,178	<sup>E</sup> 1,373	<sup>E</sup> 111	<sup>E</sup> 1,484	<sup>E</sup> 5,662	<sup>P</sup> 536	<sup>E</sup> 10.6

<sup>1</sup> See "Crude Oil Well" in Glossary.

<sup>2</sup> United States excluding Alaska and Hawaii. Includes State onshore, State offshore, and Federal offshore production.

<sup>3</sup> Includes State onshore and State offshore production.

<sup>4</sup> As of December 31.

<sup>5</sup> Through 1976, average productivity is based on the average number of producing wells. Beginning in 1977, average productivity is based on the number of wells producing at end of year.

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

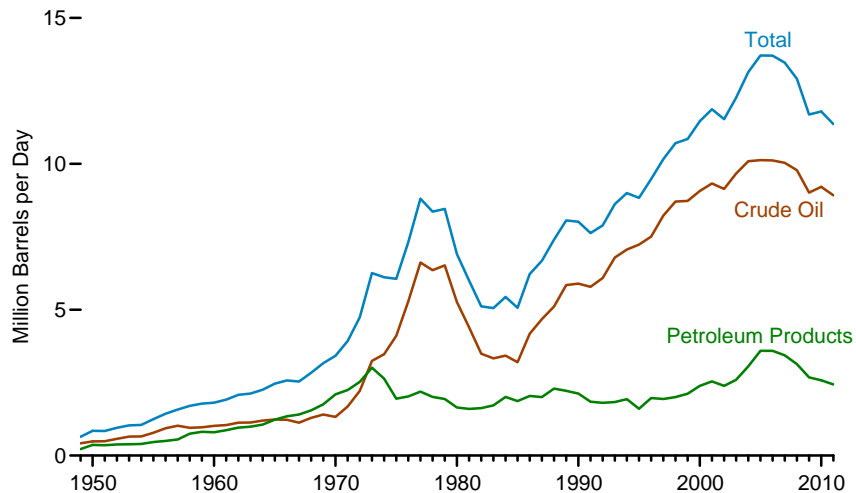
Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all data beginning in 1954. • For related information, see <http://www.eia.gov/petroleum/>.

Sources: **Crude Oil Production:** • 1954-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum*

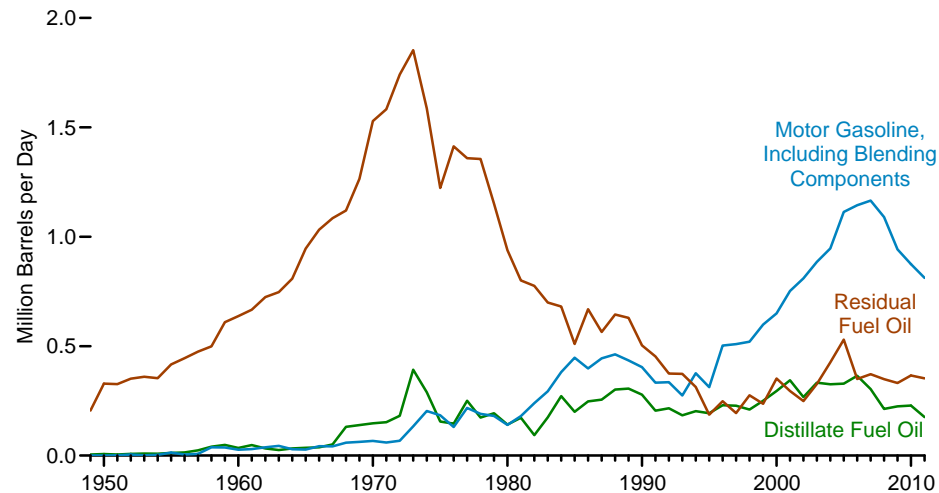
*Statement, Annual*, annual reports; and U.S. Geological Survey, *Outer Continental Shelf Statistics* (June 1979). • 1976-1980—U.S. Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual*, annual reports. • 1981-2009—EIA, *Petroleum Supply Annual*, annual reports. • 2010 and 2011—EIA, *Monthly Energy Review* (May 2012), Table 3.1; and crude oil production data from: State government agencies; U.S. Department of the Interior, Bureau of Safety and Environmental Enforcement, and predecessor agencies; and Form EIA-182, "Domestic Crude Oil First Purchase Report." **Producing Wells:** • 1954-1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual*, annual reports. • 1981-1994—Independent Petroleum Association of America, *The Oil Producing Industry in Your State*. • 1995 forward—Gulf Publishing Co., *World Oil*, February issues. **Average Productivity:** Calculated as total production divided by producing wells.

**Figure 5.3 Petroleum Imports by Type**

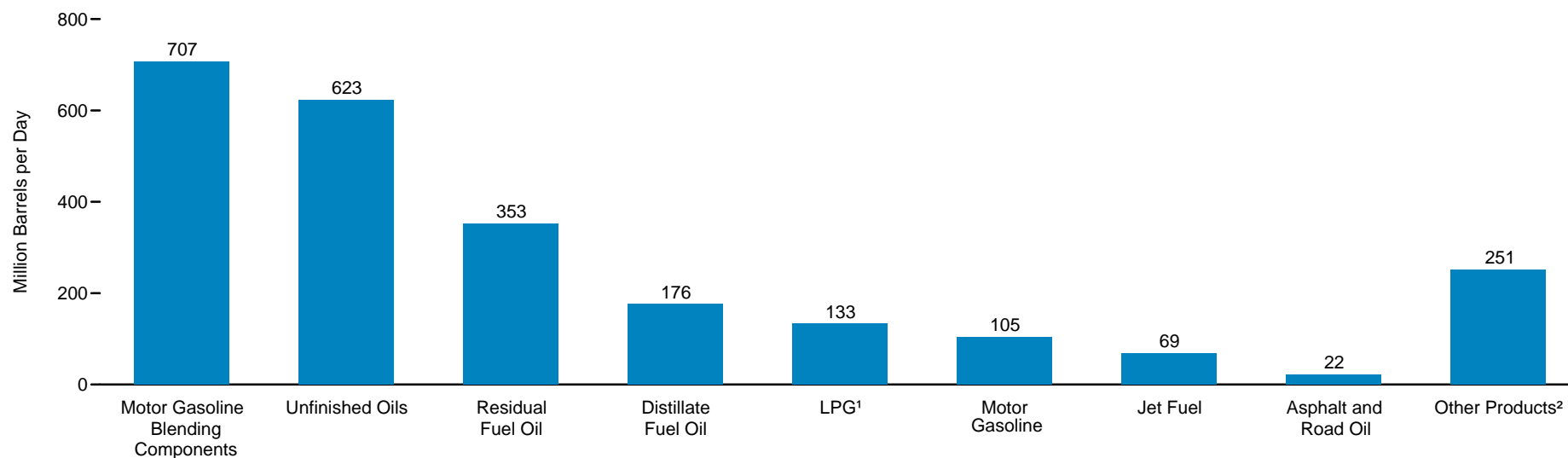
**Total, 1949-2011**



**By Selected Product, 1949-2011**



**By Product, 2011**



<sup>1</sup> Liquefied petroleum gases.

Source: Table 5.3.

<sup>2</sup> Aviation gasoline and blending components, kerosene, lubricants, naphtha-type jet fuel, pentanes plus, petrochemical feedstocks, petroleum coke, special naphthas, waxes, other hydrocarbons and oxygenates, and miscellaneous products.



**Table 5.3 Petroleum Imports by Type, Selected Years, 1949-2011**  
(Thousand Barrels per Day)

Year	Crude Oil <sup>1,2</sup>	Petroleum Products											Total Petroleum
		Asphalt and Road Oil	Distillate Fuel Oil	Jet Fuel <sup>3</sup>	Liquefied Petroleum Gases		Motor Gasoline <sup>5</sup>	Motor Gasoline Blending Components	Residual Fuel Oil	Unfinished Oils	Other Products <sup>6</sup>	Total	
					Propane <sup>4</sup>	Total							
1949	421	3	5	( <sup>3</sup> )	0	0	0	0	206	10	0	224	645
1950	487	5	7	( <sup>3</sup> )	0	0	(s)	( <sup>7</sup> )	329	21	1	363	850
1955	782	9	12	( <sup>3</sup> )	0	0	13	( <sup>7</sup> )	417	15	0	466	1,248
1960	1,015	17	35	34	NA	4	27	( <sup>7</sup> )	637	45	(s)	799	1,815
1965	1,238	17	36	81	NA	21	28	( <sup>7</sup> )	946	92	10	1,229	2,468
1970	1,324	17	147	144	26	52	67	( <sup>7</sup> )	1,528	108	32	2,095	3,419
1975	4,105	14	155	133	60	112	184	( <sup>7</sup> )	1,223	36	95	1,951	6,056
1976	5,287	11	146	76	68	130	131	( <sup>7</sup> )	1,413	32	87	2,026	7,313
1977	6,615	4	250	75	86	161	217	( <sup>7</sup> )	1,359	31	95	2,193	8,807
1978	6,356	2	173	86	57	123	190	( <sup>7</sup> )	1,355	27	50	2,008	8,363
1979	6,519	4	193	78	88	217	181	( <sup>7</sup> )	1,151	59	54	1,937	8,456
1980	5,263	4	142	80	69	216	140	( <sup>7</sup> )	939	55	72	1,646	6,909
1981	4,396	4	173	38	70	244	157	24	800	112	48	1,599	5,996
1982	3,488	5	93	29	63	226	197	42	776	174	84	1,625	5,113
1983	3,329	7	174	29	44	190	247	47	699	234	94	1,722	5,051
1984	3,426	18	272	62	67	195	299	83	681	231	171	2,011	5,437
1985	3,201	35	200	39	67	187	381	67	510	318	130	1,866	5,067
1986	4,178	29	247	57	110	242	326	72	669	250	153	2,045	6,224
1987	4,674	36	255	67	88	190	384	60	565	299	146	2,004	6,678
1988	5,107	31	302	90	106	209	405	57	644	360	196	2,295	7,402
1989	5,843	31	306	106	111	181	369	66	629	348	183	2,217	8,061
1990	5,894	32	278	108	115	188	342	62	504	413	198	2,123	8,018
1991	5,782	28	205	67	91	147	297	36	453	413	198	1,844	7,627
1992	6,083	27	216	82	85	131	294	41	375	443	195	1,805	7,888
1993	6,787	32	184	100	103	160	247	27	373	491	219	1,833	8,620
1994	7,063	37	203	117	124	183	356	20	314	413	291	1,933	8,996
1995	7,230	36	193	106	102	146	265	48	187	349	276	1,605	8,835
1996	7,508	27	230	111	119	166	336	166	248	367	319	1,971	9,478
1997	8,225	32	228	91	113	169	309	200	194	353	360	1,936	10,162
1998	8,706	28	210	124	137	194	311	209	275	302	350	2,002	10,708
1999	8,731	34	250	128	122	182	382	217	237	317	375	2,122	10,852
2000	9,071	28	295	162	161	215	427	223	352	274	414	2,389	11,459
2001	9,328	26	344	148	140	206	454	298	295	378	393	2,543	11,871
2002	9,140	27	267	107	145	183	498	311	249	410	337	2,390	11,530
2003	9,665	12	333	109	168	225	518	367	327	335	373	2,599	12,264
2004	10,088	43	325	127	209	263	496	451	426	490	436	3,057	13,145
2005	10,126	43	329	190	233	328	603	510	530	582	473	3,588	13,714
2006	10,118	50	365	186	228	332	475	669	350	689	473	3,589	13,707
2007	10,031	40	304	217	182	247	413	753	372	717	375	3,437	13,468
2008	9,783	25	213	103	185	253	302	789	349	763	337	3,132	12,915
2009	9,013	22	225	81	147	182	223	719	331	677	217	2,678	11,691
2010	<sup>R</sup> 9,213	20	<sup>R</sup> 228	<sup>R</sup> 98	<sup>R</sup> 121	<sup>R</sup> 153	<sup>R</sup> 134	<sup>R</sup> 741	<sup>R</sup> 366	<sup>R</sup> 606	<sup>R</sup> 234	<sup>R</sup> 2,580	<sup>R</sup> 11,793
2011 <sup>P</sup>	8,921	22	176	69	108	133	105	707	353	623	251	2,438	11,360

<sup>1</sup> Includes lease condensate.

<sup>2</sup> Includes imports for the Strategic Petroleum Reserve, which began in 1977. See Table 5.17.

<sup>3</sup> Through 1955, naphtha-type jet fuel is included in "Motor Gasoline." Through 1964, kerosene-type jet fuel is included with kerosene in "Other Products." Beginning in 2005, naphtha-type jet fuel is included in "Other Products."

<sup>4</sup> Includes propylene.

<sup>5</sup> Finished motor gasoline. Through 1955, also includes naphtha-type jet fuel. Through 1963, also includes aviation gasoline and special naphthas. Through 1980, also includes motor gasoline blending components.

<sup>6</sup> Aviation gasoline blending components, kerosene, lubricants, pentanes plus, petrochemical feedstocks, petroleum coke, waxes, other hydrocarbons and oxygenates, and miscellaneous products. Through 1964, also includes kerosene-type jet fuel. Beginning in 1964, also includes aviation gasoline and

special naphthas. Beginning in 2005, also includes naphtha-type jet fuel.

<sup>7</sup> Included in "Motor Gasoline."

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 500 barrels per day.

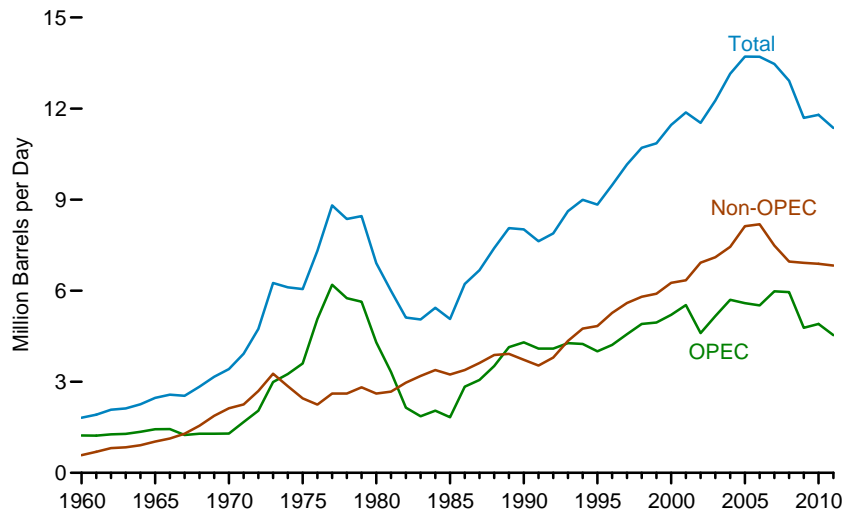
Notes: • Includes imports from U.S. possessions and territories. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> for related information.

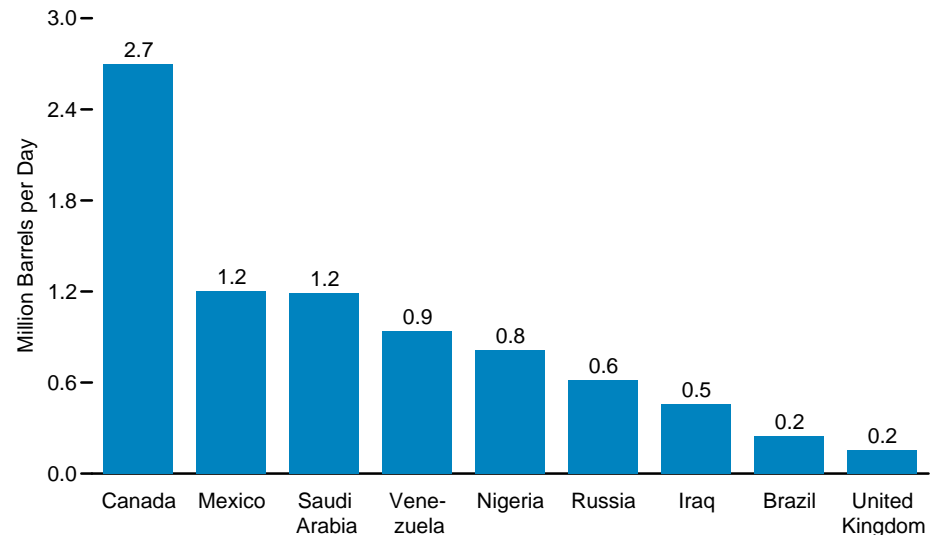
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. • 1976-1980—U.S. Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual*, annual reports. • 1981-2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.4 Petroleum Imports by Country of Origin**

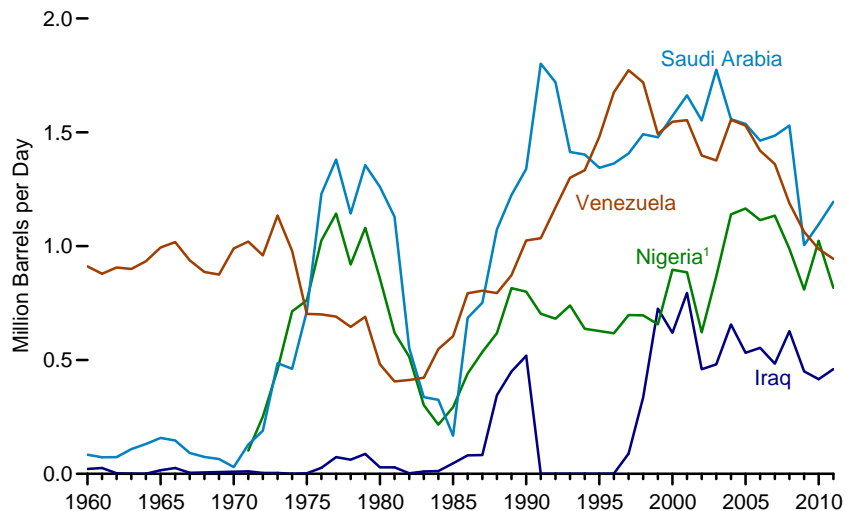
**Total, OPEC, and Non-OPEC, 1960-2011**



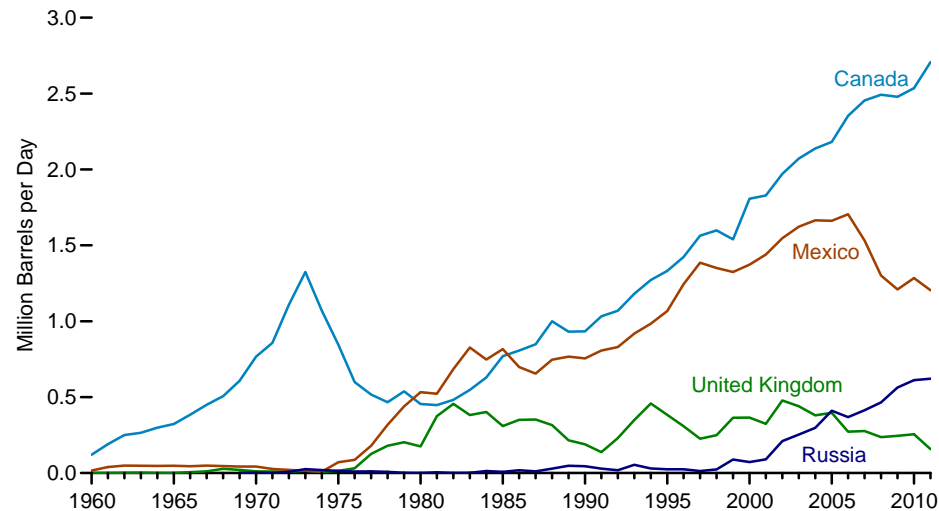
**Selected Countries, 2011**



**Selected OPEC Countries, 1960-2011**



**Selected Non-OPEC Countries, 1960-2011**



<sup>1</sup> On this graph, imports from Nigeria are shown beginning in 1971, when Nigeria joined OPEC.

Note: OPEC=Organization of the Petroleum Exporting Countries.  
Source: Table 5.4.

**Table 5.4 Petroleum Imports by Country of Origin, Selected Years, 1960-2011**

Year	Persian Gulf <sup>2</sup>	Selected OPEC <sup>1</sup> Countries					Selected Non-OPEC <sup>1</sup> Countries						Total Imports	Imports From Persian Gulf <sup>2</sup> as Share of Total Imports	Imports From OPEC <sup>1</sup> as Share of Total Imports
		Iraq	Nigeria	Saudi Arabia <sup>3</sup>	Venezuela	Total OPEC <sup>4</sup>	Brazil	Canada	Mexico	Russia <sup>5</sup>	United Kingdom	Total Non-OPEC <sup>4</sup>			
Thousand Barrels per Day													Percent		
1960	RE326	22	(6)	84	911	1,233	1	120	16	0	(s)	581	1,815	RE17.9	68.0
1965	R359	16	(6)	158	994	1,439	0	323	48	0	(s)	1,029	2,468	R14.5	58.3
1966	R319	26	(6)	147	1,018	1,444	0	384	45	0	6	1,129	2,573	R12.4	56.1
1967	R203	5	(6)	92	938	1,247	2	450	49	0	11	1,290	2,537	R8.0	49.2
1968	R218	0	(6)	74	886	1,287	(s)	506	45	0	28	1,553	2,840	R7.7	45.3
1969	R193	0	(6)	65	875	1,286	0	608	43	2	20	1,879	3,166	R6.1	40.6
1970	R184	0	(6)	30	989	1,294	2	766	42	3	11	2,126	3,419	R5.4	37.8
1971	R379	11	102	128	1,020	1,673	3	857	27	0	10	2,253	3,926	R9.7	42.6
1972	471	4	251	190	959	2,046	5	1,108	21	8	9	2,695	4,741	9.9	43.2
1973	848	4	459	486	1,135	2,993	9	1,325	16	26	15	3,263	6,256	13.6	47.8
1974	1,039	0	713	461	979	3,256	2	1,070	8	20	8	2,856	6,112	17.0	53.3
1975	1,165	2	762	715	702	3,601	5	846	71	14	14	2,454	6,056	19.2	59.5
1976	1,840	26	1,025	1,230	700	5,066	0	599	87	11	31	2,247	7,313	25.2	69.3
1977	2,448	74	1,143	1,380	690	6,193	0	517	179	12	126	2,614	8,807	27.8	70.3
1978	2,219	62	919	1,144	646	5,751	0	467	318	8	180	2,612	8,363	26.5	68.8
1979	2,069	88	1,080	1,356	690	5,637	1	538	439	1	202	2,819	8,456	24.5	66.7
1980	1,519	28	857	1,261	481	4,300	3	455	533	1	176	2,609	6,909	22.0	62.2
1981	1,219	(s)	620	1,129	406	3,323	23	447	522	5	375	2,672	5,996	20.3	55.4
1982	696	3	514	552	412	2,146	47	482	685	1	456	2,968	5,113	13.6	42.0
1983	442	10	302	337	422	1,862	41	547	826	1	382	3,189	5,051	8.8	36.9
1984	506	12	216	325	548	2,049	60	630	748	13	402	3,388	5,437	9.3	37.7
1985	311	46	293	168	605	1,830	61	770	816	8	310	3,237	5,067	6.1	36.1
1986	912	81	440	685	793	2,837	50	807	699	18	350	3,387	6,224	14.7	45.6
1987	1,077	83	535	751	804	3,060	84	848	655	11	352	3,617	6,678	16.1	45.8
1988	1,541	345	618	1,073	794	3,520	98	999	747	29	315	3,882	7,402	20.8	47.6
1989	1,861	449	815	1,224	873	4,140	82	931	767	48	215	3,921	8,061	23.1	51.4
1990	1,966	518	800	1,339	1,025	4,296	49	934	755	45	189	3,721	8,018	24.5	53.6
1991	1,845	0	703	1,802	1,035	4,092	22	1,033	807	29	138	3,535	7,627	24.2	53.7
1992	1,778	0	681	1,720	1,170	4,092	20	1,069	830	18	230	3,796	7,888	22.5	51.9
1993	1,782	0	740	1,414	1,300	4,273	33	1,181	919	55	350	4,347	8,620	20.7	49.6
1994	1,728	0	637	1,402	1,334	4,247	31	1,272	984	30	458	4,749	8,996	19.2	47.2
1995	1,573	0	627	1,344	1,480	4,002	8	1,332	1,068	25	383	4,833	8,835	17.8	45.3
1996	1,604	1	617	1,363	1,676	4,211	9	1,424	1,244	25	308	5,267	9,478	16.9	44.4
1997	1,755	89	698	1,407	1,773	4,569	5	1,563	1,385	13	226	5,593	10,162	17.3	45.0
1998	2,136	336	696	1,491	1,719	4,905	26	1,598	1,351	24	250	5,803	10,708	19.9	45.8
1999	2,464	725	657	1,478	1,493	4,953	26	1,539	1,324	89	365	5,899	10,852	22.7	45.6
2000	2,488	620	896	1,572	1,546	5,203	51	1,807	1,373	72	366	6,257	11,459	21.7	45.4
2001	2,761	795	885	1,662	1,553	5,528	82	1,828	1,440	90	324	6,343	11,871	23.3	46.6
2002	2,269	459	621	1,552	1,398	4,605	116	1,971	1,547	210	478	6,925	11,530	19.7	39.9
2003	2,501	481	867	1,774	1,376	5,162	108	2,072	1,623	254	440	7,103	12,264	20.4	42.1
2004	2,493	656	1,140	1,558	1,554	5,701	104	2,138	1,665	298	380	7,444	13,145	19.0	43.4
2005	2,334	531	1,166	1,537	1,529	5,587	156	2,181	1,662	410	396	8,127	13,714	17.0	40.7
2006	2,211	553	1,114	1,463	1,419	5,517	193	2,353	1,705	369	272	8,190	13,707	16.1	40.2
2007	2,163	484	1,134	1,485	1,361	5,980	200	2,455	1,532	414	277	7,489	13,468	16.1	44.4
2008	2,370	627	988	1,529	1,189	5,954	258	2,493	1,302	465	236	6,961	12,915	18.4	46.1
2009	1,689	450	809	1,004	1,063	4,776	309	2,479	1,210	563	245	6,915	11,691	14.4	40.9
2010	R1,711	R415	R1,023	R1,096	R988	R4,906	R272	R2,535	R1,284	R612	256	R6,887	R11,793	14.5	41.6
2011 <sup>P</sup>	1,862	460	817	1,195	944	4,534	249	2,706	1,205	621	158	6,825	11,360	16.4	39.9

<sup>1</sup> See "Organization of the Petroleum Exporting Countries (OPEC)" in Glossary.

<sup>2</sup> Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, United Arab Emirates, and the Neutral Zone (between Kuwait and Saudi Arabia).

<sup>3</sup> Through 1970, includes half the imports from the Neutral Zone. Beginning in 1971, includes imports from the Neutral Zone that are reported to U.S. Customs as originating in Saudi Arabia.

<sup>4</sup> On this table, "Total OPEC" for all years includes Iran, Iraq, Kuwait, Saudi Arabia, Venezuela, and the Neutral Zone (between Kuwait and Saudi Arabia); beginning in 1961, also includes Qatar; beginning in 1962, also includes Libya; for 1962–2008, also includes Indonesia; beginning in 1967, also includes United Arab Emirates; beginning in 1969, also includes Algeria; beginning in 1971, also includes Nigeria; for 1973–1992 and beginning in 2008, also includes Ecuador (although Ecuador rejoined OPEC in November 2007, on this table Ecuador is included in "Total Non-OPEC" for 2007); for 1975–1994, also includes Gabon; and beginning in 2007, also includes Angola. Data for all countries not included in "Total OPEC" are included in "Total Non-OPEC."

<sup>5</sup> Through 1992, may include imports from republics other than Russia in the former U.S.S.R. See "U.S.S.R." in Glossary.

<sup>6</sup> Nigeria joined OPEC in 1971. For 1960–1970, Nigeria is included in "Total Non-OPEC."

R=Revised, P=Preliminary, E=Estimate, (s)=Less than 500 barrels per day.

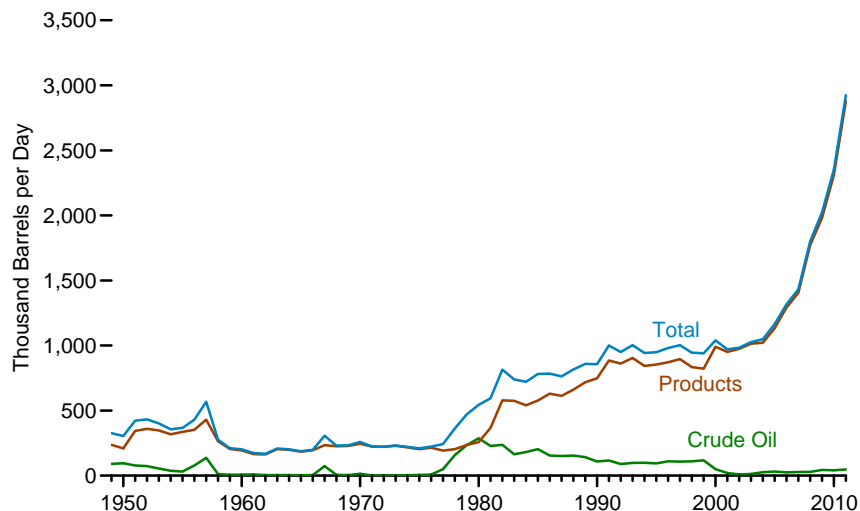
Notes: • The country of origin for refined petroleum products may not be the country of origin for the crude oil from which the refined products were produced. For example, refined products imported from refineries in the Caribbean may have been produced from Middle East crude oil. • Data include any imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1960. • See <http://www.eia.gov/petroleum/> for related information.

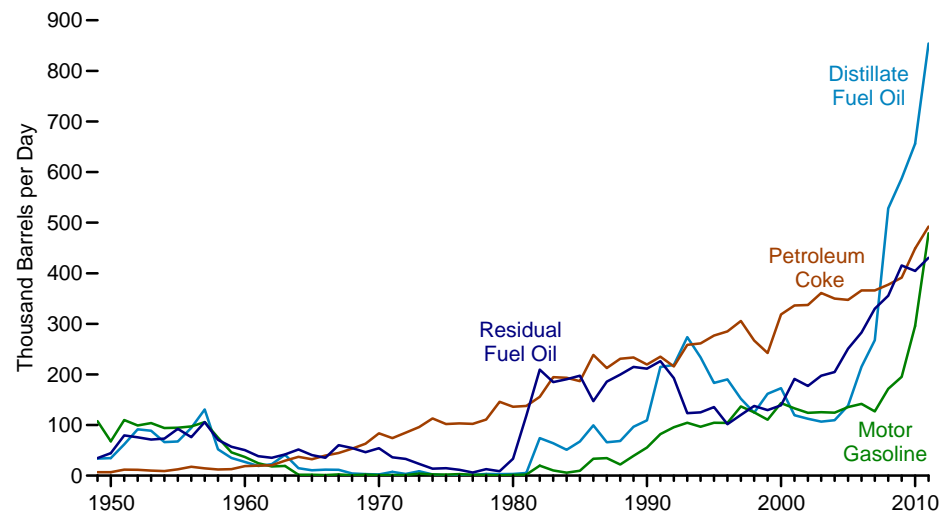
Sources: • 1960–1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1976–1980—U.S. Energy Information Administration (EIA), Energy Data Reports, *P.A.D. Districts Supply/Demand, Annual*, annual reports. • 1981–2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.5 Petroleum Exports by Type**

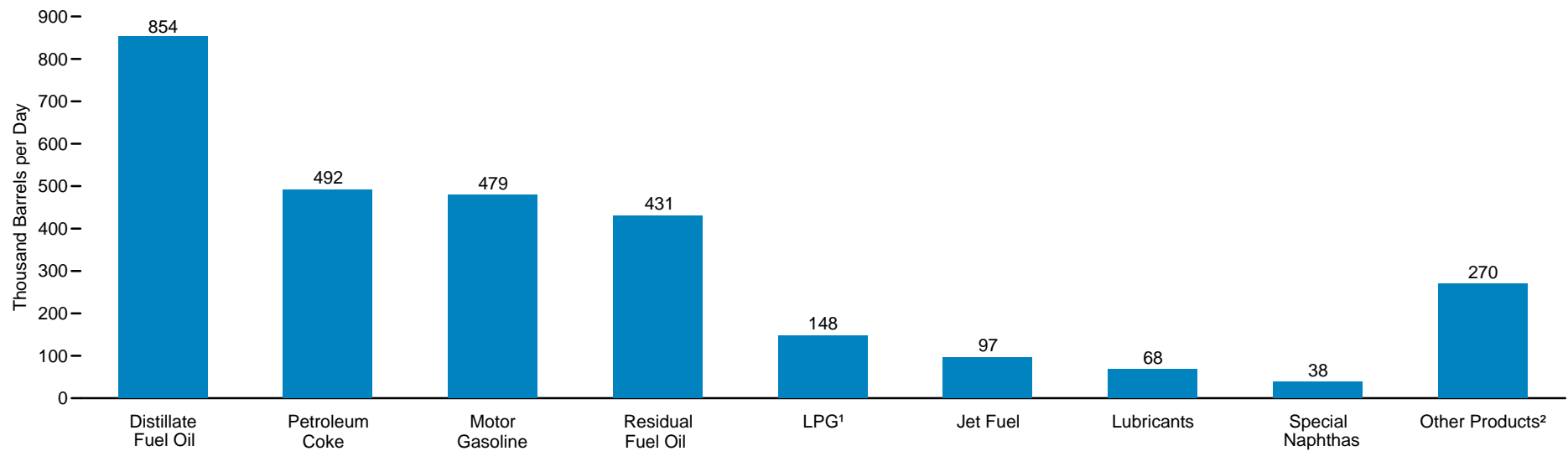
**Total, 1949-2011**



**By Selected Product, 1949-2011**



**By Product, 2011**



<sup>1</sup> Liquefied petroleum gases.

Source: Table 5.5.

<sup>2</sup> Asphalt and road oil, aviation gasoline, kerosene, motor gasoline blending components, naphtha-type jet fuel, pentanes plus, waxes, other hydrocarbons and oxygenates, and miscellaneous products.

**Table 5.5 Petroleum Exports by Type, Selected Years, 1949-2011**  
(Thousand Barrels per Day)

Year	Crude Oil <sup>1</sup>	Petroleum Products												Total Petroleum
		Distillate Fuel Oil	Jet Fuel <sup>2</sup>	Liquefied Petroleum Gases		Lubricants	Motor Gasoline <sup>4</sup>	Petroleum Coke	Petrochemical Feedstocks	Residual Fuel Oil	Special Naphthas	Other Products <sup>5</sup>	Total	
				Propane <sup>3</sup>	Total									
1949	91	34	( <sup>2</sup> )	NA	4	35	108	7	0	35	NA	15	236	327
1950	95	35	( <sup>2</sup> )	NA	4	39	68	7	0	44	NA	12	210	305
1955	32	67	(s)	NA	12	39	95	12	0	93	NA	18	336	368
1960	8	27	(s)	NA	8	43	37	19	0	51	NA	9	193	202
1965	3	10	3	NA	21	45	2	32	5	41	4	20	184	187
1970	14	2	6	6	27	44	1	84	10	54	4	12	245	259
1975	6	1	2	13	26	25	2	102	22	15	3	6	204	209
1976	8	1	2	13	25	26	3	103	30	12	7	6	215	223
1977	50	1	2	10	18	26	2	102	24	6	4	7	193	243
1978	158	3	1	9	20	27	1	111	23	13	2	2	204	362
1979	235	3	1	8	15	23	(s)	146	31	9	5	3	236	471
1980	287	3	1	10	21	23	1	136	29	33	5	4	258	544
1981	228	5	2	18	42	19	2	138	26	118	11	4	367	595
1982	236	74	6	31	65	16	20	156	24	209	5	4	579	815
1983	164	64	6	43	73	16	10	195	20	185	3	3	575	739
1984	181	51	9	30	48	15	6	193	21	190	2	6	541	722
1985	204	67	13	48	62	15	10	187	19	197	1	4	577	781
1986	154	100	18	28	42	23	33	238	22	147	1	8	631	785
1987	151	66	24	24	38	23	35	213	20	186	2	7	613	764
1988	155	69	28	31	49	26	22	231	23	200	7	6	661	815
1989	142	97	27	24	35	19	39	233	26	215	12	15	717	859
1990	109	109	43	28	40	20	55	220	26	211	11	13	748	857
1991	116	215	43	28	41	18	82	235	0	226	15	9	885	1,001
1992	89	219	43	33	49	16	96	216	0	193	14	16	861	950
1993	98	274	59	26	43	19	105	258	0	123	4	20	904	1,003
1994	99	234	20	24	38	22	97	261	0	125	20	26	843	942
1995	95	183	26	38	58	25	104	277	0	136	21	25	855	949
1996	110	190	48	28	51	34	104	285	0	102	21	36	871	981
1997	108	152	35	32	50	31	137	306	0	120	22	44	896	1,003
1998	110	124	26	25	42	25	125	267	0	138	18	70	835	945
1999	118	162	32	33	50	28	111	242	0	129	16	52	822	940
2000	50	173	32	53	74	26	144	319	0	139	20	64	990	1,040
2001	20	119	29	31	44	26	133	336	0	191	23	50	951	971
2002	9	112	15	55	67	33	124	337	0	177	15	94	975	984
2003	12	107	20	37	56	37	125	361	0	197	22	89	1,014	1,027
2004	27	110	40	28	43	41	124	350	0	205	27	82	1,021	1,048
2005	32	138	53	37	53	40	136	347	0	251	21	94	1,133	1,165
2006	25	215	41	45	56	55	142	366	0	283	14	121	1,292	1,317
2007	27	268	41	42	57	59	127	366	0	330	18	140	1,405	1,433
2008	29	528	61	53	67	60	172	377	0	355	13	139	1,773	1,802
2009	44	587	69	85	100	57	195	391	0	415	22	143	1,980	2,024
2010	42	656	84	109	132	62	296	449	0	405	36	<sup>R</sup> 192	<sup>R</sup> 2,311	<sup>R</sup> 2,353
2011 <sup>P</sup>	47	854	97	124	148	68	479	492	0	431	38	270	2,877	2,924

<sup>1</sup> Includes lease condensate.

<sup>2</sup> Through 1952, naphtha-type jet fuel is included in the products from which it was blended: gasoline, kerosene, and distillate fuel oil. Through 1964, kerosene-type jet fuel is included with kerosene in "Other Products." Beginning in 2005, naphtha-type jet fuel is included in "Other Products."

<sup>3</sup> Includes propylene.

<sup>4</sup> Finished motor gasoline. Through 1963, also includes aviation gasoline.

<sup>5</sup> Asphalt and road oil, kerosene, motor gasoline blending components, pentanes plus, waxes, other hydrocarbons and oxygenates, and miscellaneous products. Through 1964, also includes kerosene-type jet fuel. Beginning in 1964, also includes aviation gasoline. Beginning in 2005, also includes naphtha-type jet fuel.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 500 barrels per day.

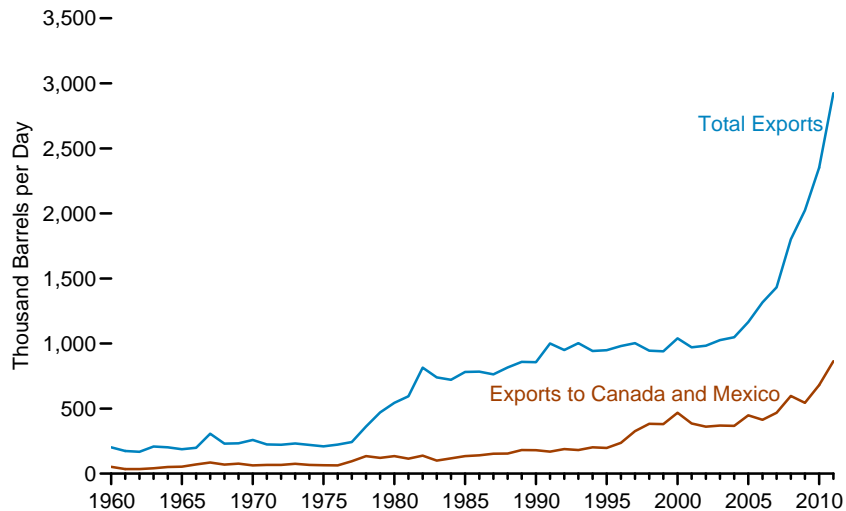
Notes: • Includes exports to U.S. possessions and territories. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> for related information.

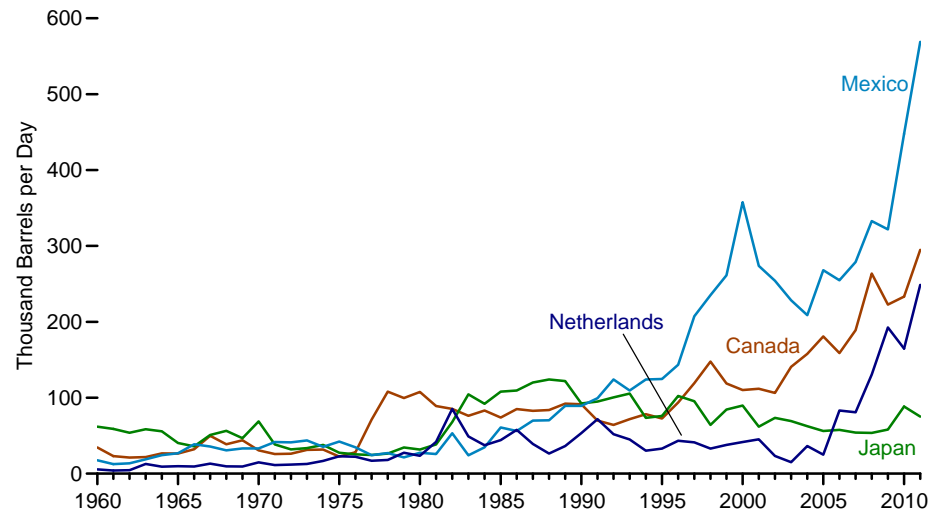
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. • 1976-1980—U.S. Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual*, annual reports. • 1981-2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.6 Petroleum Exports by Country of Destination**

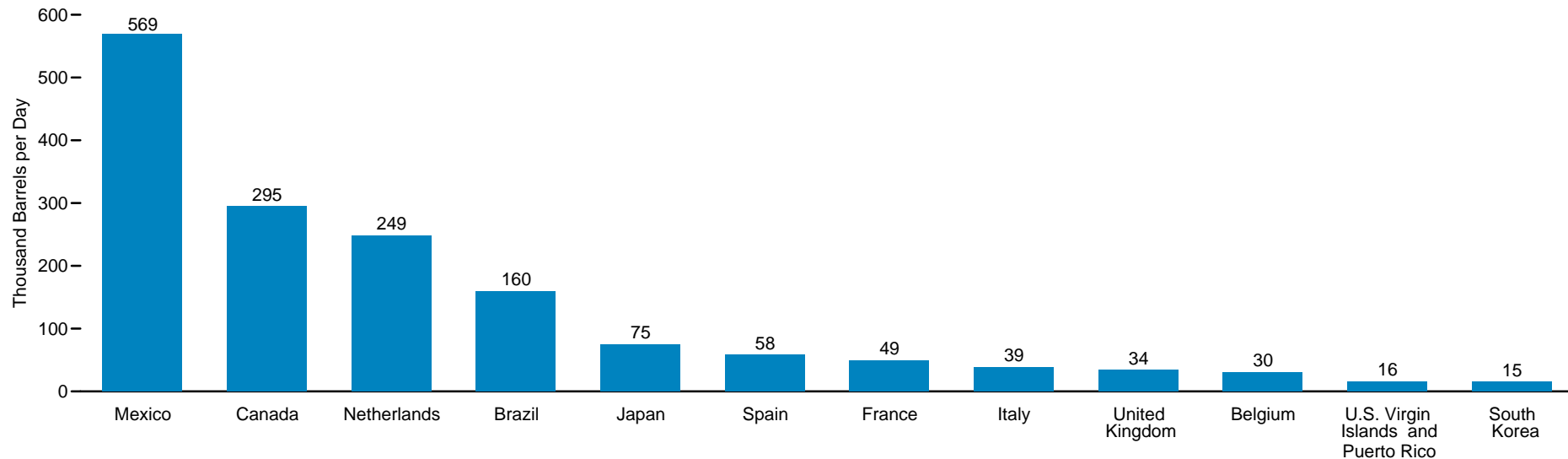
**Total Exports and Exports to Canada and Mexico, 1960-2011**



**By Selected Country, 1960-2011**



**By Selected Country, 2011**



Source: Table 5.6.

**Table 5.6 Petroleum Exports by Country of Destination, Selected Years, 1960-2011**  
(Thousand Barrels per Day)

Year	Belgium <sup>1</sup>	Brazil	Canada	France	Italy	Japan	Mexico	Nether-lands	South Korea	Spain	United Kingdom	U.S. Virgin Islands and Puerto Rico	Other	Total
1960	3	4	34	4	6	62	18	6	NA	NA	12	1	52	202
1965	3	3	26	3	7	40	27	10	NA	NA	12	1	54	187
1966	3	4	32	4	7	36	39	9	NA	NA	12	3	49	198
1967	5	6	50	3	9	51	36	13	NA	NA	62	7	65	307
1968	4	8	39	4	8	56	31	10	NA	NA	14	2	55	231
1969	4	7	44	4	9	47	33	9	NA	NA	13	2	59	233
1970	5	7	31	5	10	69	33	15	NA	NA	12	2	71	259
1971	7	9	26	5	8	39	42	11	NA	NA	9	3	67	224
1972	13	9	26	5	9	32	41	12	NA	4	10	4	59	222
1973	15	8	31	5	9	34	44	13	NA	4	9	3	56	231
1974	13	9	32	4	9	38	35	17	NA	4	6	6	48	221
1975	9	6	22	6	10	27	42	23	NA	4	7	12	40	209
1976	12	7	28	6	10	25	35	22	NA	4	13	22	39	223
1977	16	6	71	9	10	25	24	17	NA	5	9	11	39	243
1978	15	8	108	9	10	26	27	18	NA	5	7	86	42	362
1979	19	7	100	13	15	34	21	28	2	9	7	170	45	471
1980	20	4	108	11	14	32	28	23	2	8	7	220	70	544
1981	12	1	89	15	22	38	26	42	10	18	5	220	97	595
1982	17	8	85	24	32	68	53	85	28	24	14	212	165	815
1983	22	2	76	23	35	104	24	49	15	34	8	144	202	739
1984	21	1	83	18	39	92	35	37	17	29	14	152	182	722
1985	26	3	74	11	30	108	61	44	27	28	14	162	193	781
1986	30	3	85	11	39	110	56	58	12	39	8	113	222	785
1987	17	2	83	12	42	120	70	39	25	31	6	136	179	764
1988	25	3	84	12	29	124	70	26	24	36	9	147	226	815
1989	23	5	92	11	37	122	89	36	17	28	9	141	249	859
1990	20	2	91	17	48	92	89	54	60	33	11	101	240	857
1991	22	13	70	27	55	95	99	72	66	23	13	117	330	1,001
1992	22	20	64	9	38	100	124	52	80	21	12	95	315	950
1993	21	16	72	8	34	105	110	45	74	30	10	108	370	1,003
1994	26	15	78	11	35	74	124	30	66	30	10	104	338	942
1995	21	16	73	11	46	76	125	33	57	38	14	123	317	949
1996	27	29	94	18	32	102	143	43	60	34	9	72	318	981
1997	21	15	119	11	30	95	207	41	50	42	12	18	340	1,003
1998	14	18	148	8	30	64	235	33	33	30	11	4	317	945
1999	11	27	119	7	25	84	261	38	49	26	9	8	276	940
2000	14	28	110	10	34	90	358	42	20	40	10	10	277	1,040
2001	16	23	112	13	33	62	274	45	14	51	13	4	312	971
2002	19	26	106	12	29	74	254	23	11	54	12	9	354	984
2003	13	27	141	9	39	69	228	15	10	39	6	9	421	1,027
2004	20	27	158	18	32	63	209	36	12	42	14	10	408	1,048
2005	21	39	181	14	28	56	268	25	16	35	21	11	449	1,165
2006	23	42	159	13	39	58	255	83	21	42	28	10	543	1,317
2007	13	46	189	24	34	54	279	81	16	48	9	10	629	1,433
2008	18	54	264	27	41	54	333	131	18	54	17	13	777	1,802
2009	29	55	223	34	35	58	322	192	23	40	33	20	960	2,024
2010	19	<sup>R</sup> 123	<sup>R</sup> 233	36	37	88	<sup>R</sup> 448	<sup>R</sup> 165	<sup>R</sup> 13	36	<sup>R</sup> 19	17	<sup>R</sup> 1,117	<sup>R</sup> 2,353
2011 <sup>P</sup>	30	160	295	49	39	75	569	249	15	58	34	16	1,335	2,924

<sup>1</sup> Through 2004, includes Luxembourg.

R=Revised. P=Preliminary. NA=Not available.

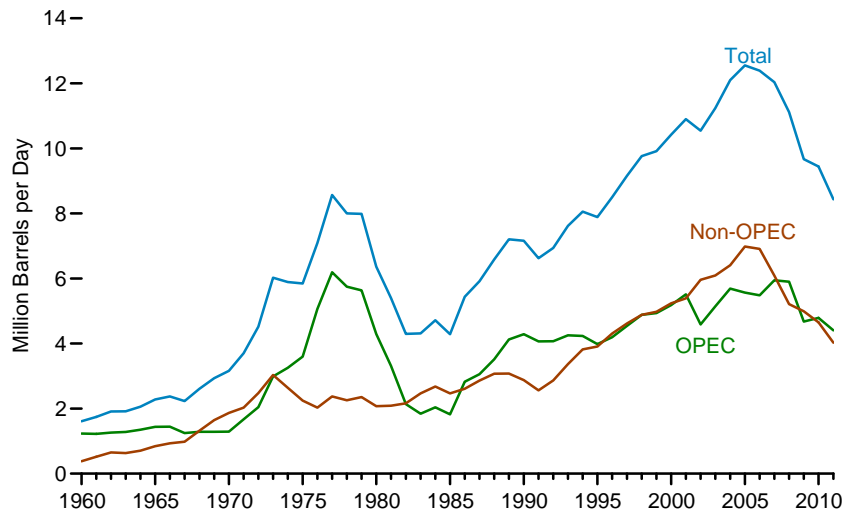
Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all data beginning in 1960. • For related information, see <http://www.eia.gov/petroleum/>.

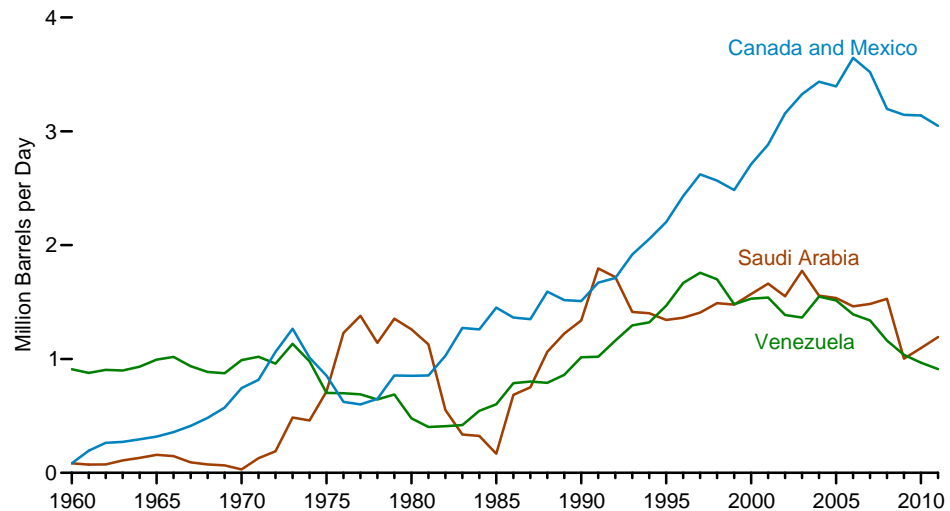
Sources: • 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. • 1976-1980—U.S. Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual*, annual reports. • 1981-2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.7 Petroleum Net Imports by Country of Origin, 1960-2011**

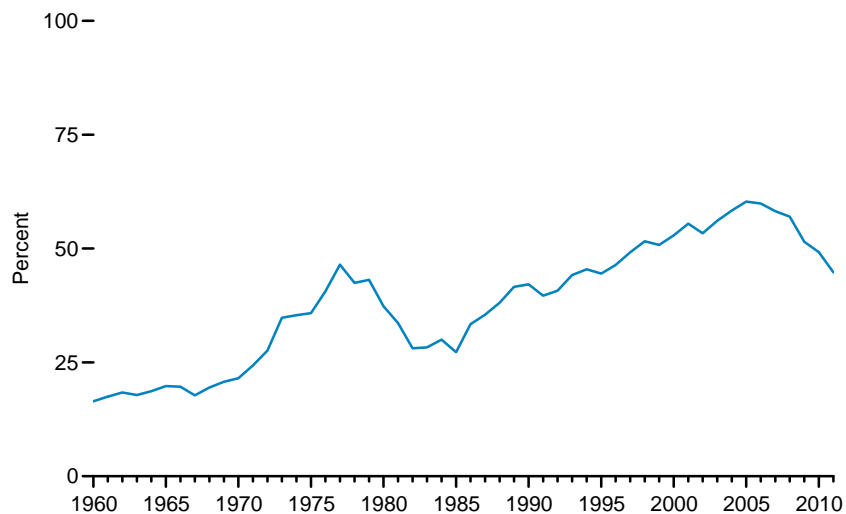
**Total, OPEC, and Non-OPEC**



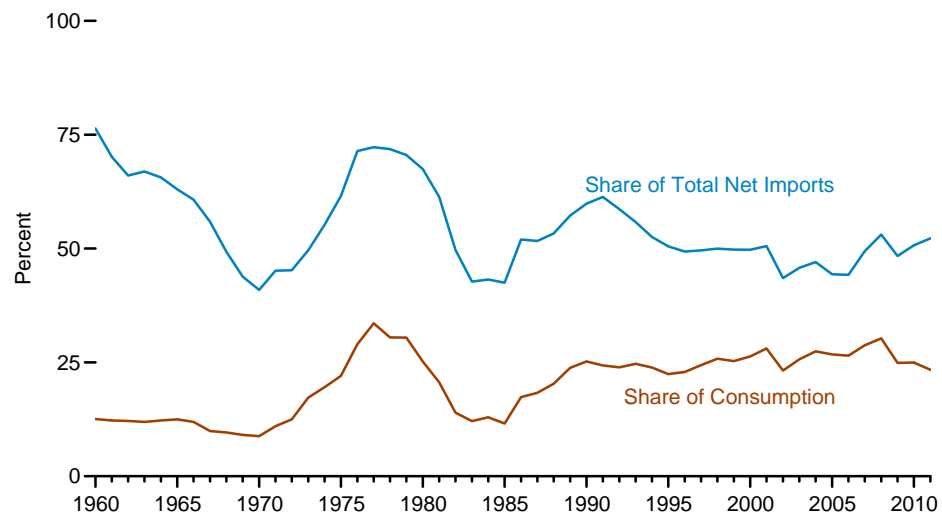
**By Selected Country**



**Total Net Imports as Share of Consumption**



**Net Imports From OPEC**



Note: OPEC=Organization of the Petroleum Exporting Countries.

Source: Table 5.7.



**Table 5.7 Petroleum Net Imports by Country of Origin, Selected Years, 1960-2011**

Year	Persian Gulf <sup>2</sup>	Selected OPEC <sup>1</sup> Countries					Selected Non-OPEC <sup>1</sup> Countries					Total Net Imports	Total Net Imports as Share of Consumption <sup>5</sup>	Net Imports From OPEC <sup>1</sup>	
		Algeria	Nigeria	Saudi Arabia <sup>3</sup>	Venezuela	Total OPEC <sup>4</sup>	Canada	Mexico	United Kingdom	U.S. Virgin Islands and Puerto Rico	Total Non-OPEC <sup>4</sup>			Share of Total Net Imports <sup>6</sup>	Share of Consumption <sup>7</sup>
1960	NA	( <sup>8</sup> )	( <sup>9</sup> )	84	910	1,232	86	-2	-12	34	381	1,613	16.5	76.4	12.6
1965	NA	( <sup>8</sup> )	( <sup>9</sup> )	158	994	1,438	297	21	-11	45	843	2,281	19.8	63.0	12.5
1970	NA	8	( <sup>9</sup> )	30	989	1,294	736	9	-1	270	1,867	3,161	21.5	40.9	8.8
1971	NA	15	102	128	1,019	1,671	831	-14	1	365	2,030	3,701	24.3	45.1	11.0
1972	NA	92	251	189	959	2,044	1,082	-20	-1	428	2,475	4,519	27.6	45.2	12.5
1973	NA	136	459	485	1,134	2,991	1,294	-28	6	426	3,034	6,025	34.8	49.6	17.3
1974	NA	190	713	461	978	3,254	1,038	-27	1	475	2,638	5,892	35.4	55.2	19.5
1975	NA	282	762	714	702	3,599	824	29	7	484	2,248	5,846	35.8	61.6	22.1
1976	NA	432	1,025	1,229	699	5,063	571	53	19	488	2,027	7,090	40.6	71.4	29.0
1977	NA	559	1,143	1,379	689	6,190	446	155	117	560	2,375	8,565	46.5	72.3	33.6
1978	NA	649	919	1,142	644	5,747	359	291	173	436	2,255	8,002	42.5	71.8	30.5
1979	NA	636	1,080	1,354	688	5,633	438	418	196	353	2,352	7,985	43.1	70.5	30.4
1980	NA	488	857	1,259	478	4,293	347	506	169	256	2,071	6,365	37.3	67.5	25.2
1981	1,215	311	620	1,128	403	3,315	358	497	370	169	2,086	5,401	33.6	61.4	20.6
1982	692	170	512	551	409	2,136	397	632	442	154	2,163	4,298	28.1	49.7	14.0
1983	439	240	299	336	420	1,843	471	802	374	178	2,469	4,312	28.3	42.7	12.1
1984	502	323	215	324	544	2,037	547	714	388	184	2,679	4,715	30.0	43.2	13.0
1985	309	187	293	167	602	1,821	696	755	295	114	2,465	4,286	27.3	42.5	11.6
1986	909	271	440	685	788	2,828	721	642	342	152	2,611	5,439	33.4	52.0	17.4
1987	1,074	295	535	751	801	3,055	765	585	346	158	2,859	5,914	35.5	51.7	18.3
1988	1,529	300	618	1,064	790	3,513	916	677	306	117	3,074	6,587	38.1	53.3	20.3
1989	1,858	269	815	1,224	861	4,124	839	678	206	212	3,078	7,202	41.6	57.3	23.8
1990	1,962	280	800	1,339	1,016	4,285	843	666	179	213	2,876	7,161	42.2	59.8	25.2
1991	1,833	253	703	1,796	1,020	4,065	963	707	125	153	2,561	6,626	39.6	61.3	24.3
1992	1,773	196	680	1,720	1,161	4,071	1,005	706	219	180	2,867	6,938	40.7	58.7	23.9
1993	1,774	219	736	1,413	1,296	4,253	1,109	809	340	175	3,365	7,618	44.2	55.8	24.7
1994	1,723	243	637	1,402	1,322	4,233	1,194	860	448	246	3,822	8,054	45.5	52.6	23.9
1995	1,563	234	626	1,343	1,468	3,980	1,260	943	369	170	3,906	7,886	44.5	50.5	22.5
1996	1,596	256	616	1,362	1,667	4,193	1,330	1,101	299	262	4,305	8,498	46.4	49.3	22.9
1997	1,747	285	693	1,407	1,758	4,542	1,444	1,178	214	298	4,616	9,158	49.2	49.6	24.4
1998	2,132	290	693	1,491	1,700	4,880	1,451	1,116	239	305	4,884	9,764	51.6	50.0	25.8
1999	2,459	259	655	1,478	1,480	4,934	1,421	1,063	356	284	4,978	9,912	50.8	49.8	25.3
2000	2,483	225	896	1,571	1,530	5,181	1,697	1,015	356	297	5,238	10,419	52.9	49.7	26.3
2001	2,758	278	884	1,662	1,540	5,510	1,717	1,166	311	268	5,390	10,900	55.5	50.5	28.0
2002	2,265	264	620	1,551	1,387	4,589	1,864	1,292	467	224	5,958	10,546	53.4	43.5	23.2
2003	2,497	381	866	1,774	1,364	5,144	1,932	1,395	434	279	6,094	11,238	56.1	45.8	25.7
2004	2,489	452	1,139	1,557	1,548	5,688	1,980	1,456	366	321	6,409	12,097	58.4	47.0	27.4
2005	2,330	478	1,165	1,536	1,515	5,567	2,001	1,394	375	317	6,982	12,549	60.3	44.4	26.8
2006	2,208	657	1,111	1,462	1,392	5,480	2,194	1,450	244	318	6,910	12,390	59.9	44.2	26.5
2007	2,159	663	1,133	1,483	1,339	5,946	2,266	1,254	268	336	6,090	12,036	58.2	49.4	28.8
2008	2,368	548	982	1,529	1,162	5,899	2,229	969	219	307	5,214	11,114	57.0	53.1	30.3
2009	1,678	490	798	1,003	1,037	4,675	2,257	888	212	257	4,991	9,667	51.5	48.4	24.9
2010	<sup>R</sup> 1,705	<sup>R</sup> 510	<sup>R</sup> 1,006	<sup>R</sup> 1,096	<sup>R</sup> 968	<sup>R</sup> 4,787	<sup>R</sup> 2,302	<sup>R</sup> 837	<sup>R</sup> 237	<sup>R</sup> 236	<sup>R</sup> 4,653	<sup>R</sup> 9,441	<sup>R</sup> 49.2	<sup>R</sup> 50.7	<sup>R</sup> 25.0
2011 <sup>P</sup>	1,843	354	802	1,193	912	4,408	2,411	636	124	171	4,028	8,436	44.8	52.2	23.4

<sup>1</sup> See "Organization of the Petroleum Exporting Countries (OPEC)" in Glossary.

<sup>2</sup> Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, United Arab Emirates, and the Neutral Zone (between Kuwait and Saudi Arabia).

<sup>3</sup> Through 1970, includes half the imports from the Neutral Zone. Beginning in 1971, includes imports from the Neutral Zone that are reported to U.S. Customs as originating in Saudi Arabia.

<sup>4</sup> On this table, "Total OPEC" for all years includes Iran, Iraq, Kuwait, Saudi Arabia, Venezuela, and the Neutral Zone (between Kuwait and Saudi Arabia); beginning in 1961, also includes Qatar; beginning in 1962, also includes Libya; for 1962–2008, also includes Indonesia; beginning in 1967, also includes United Arab Emirates; beginning in 1969, also includes Algeria; beginning in 1971, also includes Nigeria; for 1973–1992 and beginning in 2008, also includes Ecuador (although Ecuador rejoined OPEC in November 2007, on this table Ecuador is included in "Total Non-OPEC" for 2007); for 1975–1994, also includes Gabon; and beginning in 2007, also includes Angola. Data for all countries not included in "Total OPEC" are included in "Total Non-OPEC."

<sup>5</sup> Calculated by dividing total net petroleum imports by total U.S. petroleum products supplied (consumption).

<sup>6</sup> Calculated by dividing net petroleum imports from OPEC countries by total net petroleum imports.

<sup>7</sup> Calculated by dividing net petroleum imports from OPEC countries by total U.S. petroleum product

supplied (consumption).

<sup>8</sup> Algeria joined OPEC in 1969. For 1960–1968, Algeria is included in "Total Non-OPEC."

<sup>9</sup> Nigeria joined OPEC in 1971. For 1960–1970, Nigeria is included in "Total Non-OPEC."

R=Revised, P=Preliminary, NA=Not available.

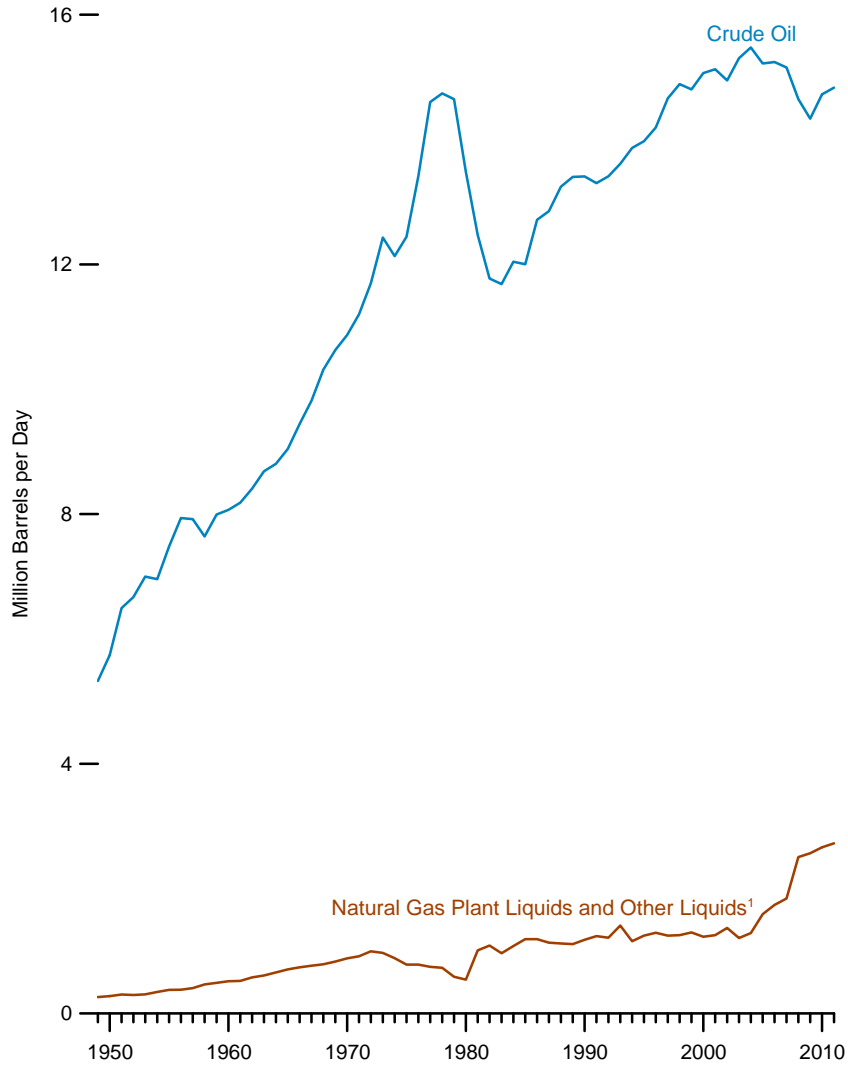
Notes: • The country of origin for refined petroleum products may not be the country of origin for the crude oil from which the refined products were produced. For example, refined products imported from refineries in the Caribbean may have been produced from Middle East crude oil. • Net imports equal imports minus exports. Minus sign indicates exports are greater than imports. • Data include any imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all data beginning in 1960. • For related information, see <http://www.eia.gov/petroleum/>.

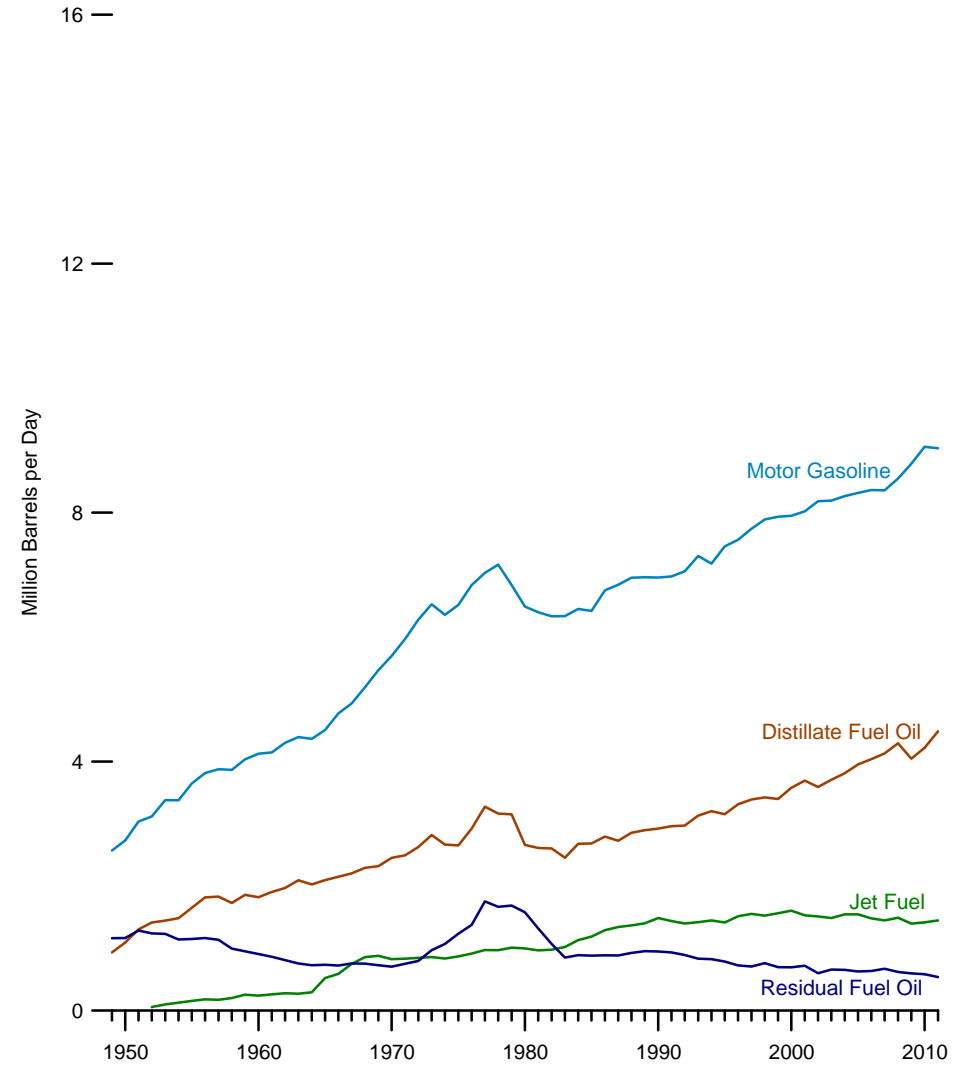
Sources: • 1960–1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1976–1980—U.S. Energy Information Administration (EIA), *Energy Data Reports, P.A.D. Districts Supply/Demand, Annual*, annual reports. • 1981–2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.8 Refinery and Blender Net Inputs and Net Production, 1949-2011**

**Refinery and Blender Net Inputs**



**Refinery and Blender Net Production of Selected Products**



<sup>1</sup> See Table 5.8, footnote 4.

Source: Table 5.8.

**Table 5.8 Refinery and Blender Net Inputs and Net Production, Selected Years, 1949-2011**

(Thousand Barrels per Day)

Year	Refinery and Blender Net Inputs <sup>1</sup>				Refinery and Blender Net Production <sup>2</sup>										Processing Gain
	Crude Oil <sup>3</sup>	Natural Gas Plant Liquids	Other Liquids <sup>4</sup>	Total	Asphalt and Road Oil	Distillate Fuel Oil	Jet Fuel <sup>5</sup>	Liquefied Petroleum Gases	Motor Gasoline <sup>6</sup>	Petroleum Coke	Residual Fuel Oil	Still Gas	Other Products <sup>7</sup>	Total	
1949	5,327	234	28	5,588	155	934	( <sup>5</sup> )	64	2,572	46	1,164	226	425	5,587	-2
1950	5,739	259	19	6,018	179	1,093	( <sup>5</sup> )	80	2,735	47	1,165	229	492	6,019	2
1955	7,480	345	32	7,857	251	1,651	155	119	3,648	78	1,152	319	518	7,891	34
1960	8,067	455	61	8,583	286	1,823	241	212	4,126	164	908	354	616	8,729	146
1965	9,043	618	88	9,750	357	2,096	523	293	4,507	236	736	395	827	9,970	220
1970	10,870	763	121	11,754	428	2,454	827	345	5,699	296	706	483	876	12,113	359
1975	12,442	710	72	13,225	408	2,653	871	311	6,518	354	1,235	523	811	13,685	460
1976	13,416	725	59	14,200	391	2,924	918	340	6,838	356	1,377	541	993	14,677	477
1977	14,602	673	74	15,349	431	3,277	973	352	7,031	369	1,754	572	1,114	15,874	524
1978	14,739	639	92	15,470	482	3,167	970	355	7,167	369	1,667	603	1,186	15,966	496
1979	14,648	510	78	15,236	467	3,152	1,012	340	6,837	376	1,687	598	1,296	15,763	527
1980	13,481	462	81	14,025	393	2,661	999	330	6,492	370	1,580	581	1,215	14,622	597
1981	12,470	524	488	13,482	340	2,613	968	315	6,400	390	1,321	565	1,078	13,990	508
1982	11,774	515	572	12,861	329	2,606	978	270	6,336	410	1,070	554	839	13,391	531
1983	11,685	460	505	12,650	372	2,456	1,022	328	6,338	420	852	550	801	13,138	488
1984	12,044	500	581	13,126	386	2,680	1,132	363	6,453	439	891	559	776	13,679	553
1985	12,002	509	681	13,192	401	2,686	1,189	391	6,419	455	882	584	743	13,750	557
1986	12,716	479	711	13,906	410	2,796	1,293	417	6,752	506	889	641	818	14,522	616
1987	12,854	466	667	13,987	434	2,729	1,343	449	6,841	512	885	643	791	14,626	639
1988	13,246	511	610	14,367	443	2,857	1,370	499	6,956	544	926	670	758	15,022	655
1989	13,401	499	613	14,513	424	2,899	1,403	554	6,963	542	954	681	755	15,175	661
1990	13,409	467	713	14,589	449	2,925	1,488	499	6,959	552	950	673	778	15,272	683
1991	13,301	472	768	14,541	430	2,962	1,438	536	6,975	568	934	651	761	15,256	715
1992	13,411	469	745	14,626	419	2,974	1,399	607	7,058	596	892	659	796	15,398	772
1993	13,613	491	917	15,021	451	3,132	1,422	592	7,304	619	835	653	780	15,787	766
1994	13,866	465	691	15,023	451	3,205	1,448	611	7,181	622	826	657	790	15,791	768
1995	13,973	471	775	15,220	467	3,155	1,416	654	7,459	630	788	647	778	15,994	774
1996	14,195	450	843	15,487	459	3,316	1,515	662	7,565	664	726	654	764	16,324	837
1997	14,662	416	832	15,909	485	3,392	1,554	691	7,743	689	708	661	836	16,759	850
1998	14,889	403	853	16,144	498	3,424	1,526	674	7,892	712	762	656	886	17,030	886
1999	14,804	372	927	16,103	505	3,399	1,565	684	7,934	713	698	656	835	16,989	886
2000	15,067	380	849	16,295	525	3,580	1,606	705	7,951	727	696	659	793	17,243	948
2001	15,128	429	825	16,382	485	3,695	1,530	667	8,022	767	721	670	729	17,285	903
2002	14,947	429	941	16,316	492	3,592	1,514	671	8,183	781	601	667	771	17,273	957
2003	15,304	419	791	16,513	496	3,707	1,488	658	8,194	798	660	702	784	17,487	974
2004	15,475	422	866	16,762	508	3,814	1,547	645	8,265	836	655	704	838	17,814	1,051
2005	15,220	441	1,149	16,811	512	3,954	1,546	573	8,318	835	628	684	752	17,800	989
2006	15,242	501	1,238	16,981	506	4,040	1,481	627	8,364	848	635	709	764	17,975	994
2007	15,156	505	1,337	16,999	456	4,133	1,448	655	8,358	823	673	697	752	17,994	996
2008	14,648	485	2,019	17,153	410	4,294	1,493	630	8,548	818	620	670	664	18,146	993
2009	14,336	485	2,082	16,904	359	4,048	1,396	623	8,786	799	598	664	608	17,882	979
2010	<sup>R</sup> 14,724	<sup>R</sup> 442	<sup>R</sup> 2,219	<sup>R</sup> 17,385	378	<sup>R</sup> 4,223	1,418	<sup>R</sup> 659	<sup>R</sup> 9,059	812	<sup>R</sup> 585	<sup>R</sup> 672	647	<sup>R</sup> 18,452	<sup>R</sup> 1,068
2011 <sup>P</sup>	14,833	489	2,237	17,559	364	4,487	1,449	620	9,035	842	538	678	631	18,643	1,085

<sup>1</sup> See "Refinery and Blender Net Inputs" in Glossary.

<sup>2</sup> See "Refinery and Blender Net Production" in Glossary.

<sup>3</sup> Includes lease condensate.

<sup>4</sup> Unfinished oils (net), other hydrocarbons, and hydrogen. Beginning in 1981, also includes aviation and motor gasoline blending components (net). Beginning in 1993, also includes oxygenates (net).

<sup>5</sup> Through 1951, naphtha-type jet fuel is included in the products from which it was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel oil. Through 1964, kerosene-type jet fuel is included with kerosene in "Other Products." Beginning in 2005, naphtha-type jet fuel is included in "Other Products."

<sup>6</sup> Finished motor gasoline. Through 1963, also includes aviation gasoline and special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.

<sup>7</sup> Kerosene, lubricants, petrochemical feedstocks, waxes, and miscellaneous products. Through 1964,

also includes kerosene-type jet fuel. Beginning in 1964, also includes aviation gasoline and special naphthas. Beginning in 2005, also includes naphtha-type jet fuel.

<sup>R</sup>=Revised. <sup>P</sup>=Preliminary.

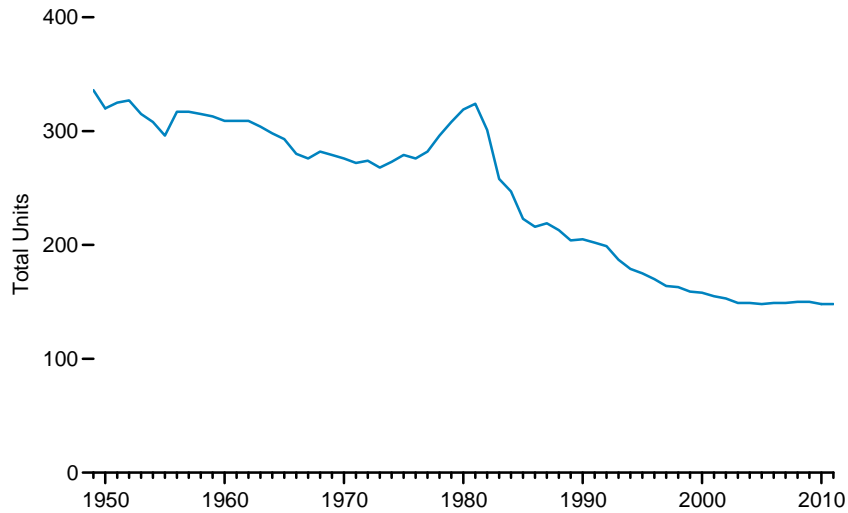
Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> for related information.

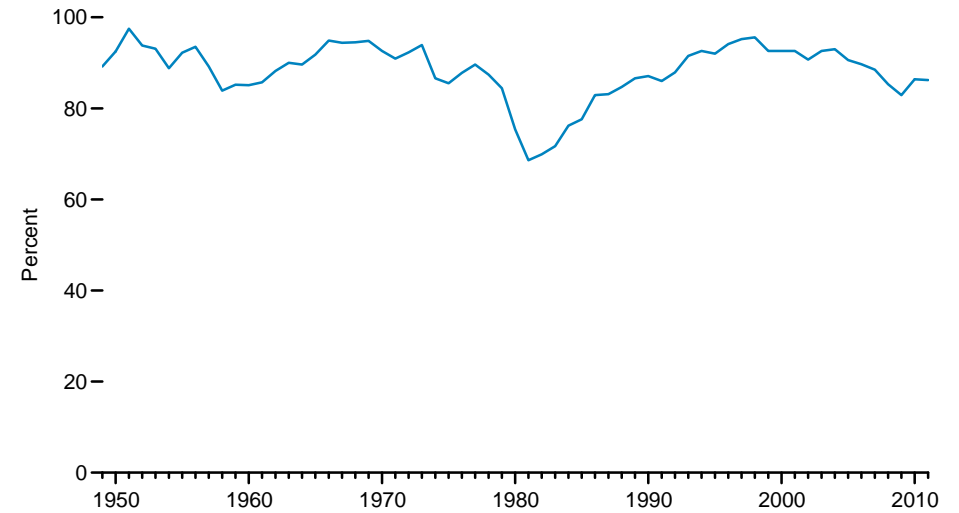
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual, annual reports*. • 1976-1980—U.S. Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual, annual reports*. • 1981-2010—EIA, *Petroleum Supply Annual, annual reports*. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.9 Refinery Capacity and Utilization, 1949-2011**

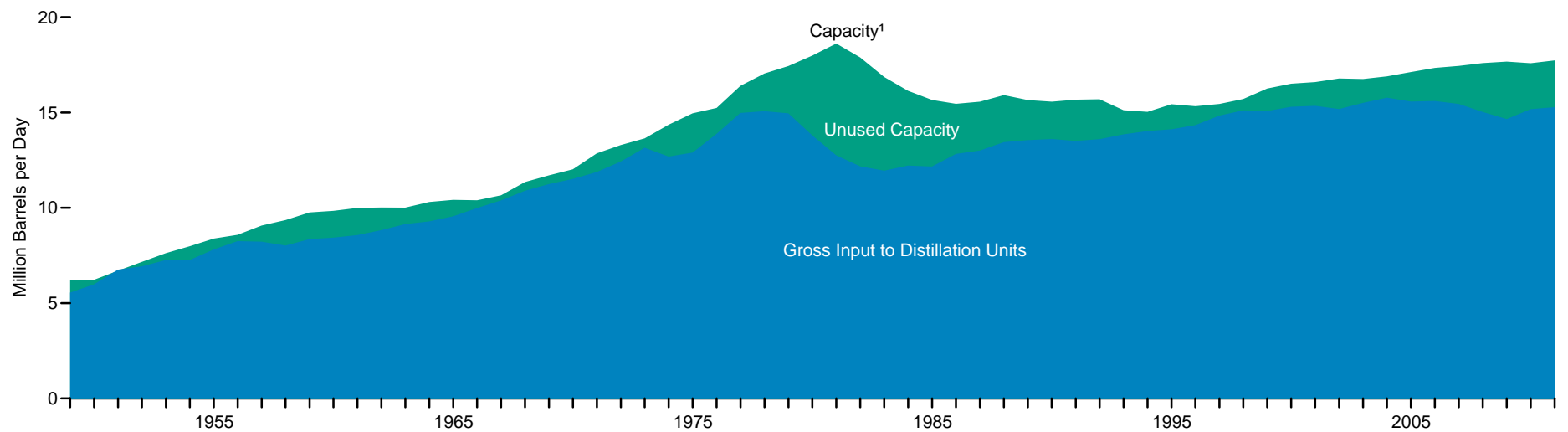
**Number of Operable Refineries**



**Utilization**



**Capacity**



<sup>1</sup> Operable refineries capacity on January 1.

Source: Table 5.9.

**Table 5.9 Refinery Capacity and Utilization, Selected Years, 1949-2011**

Year	Operable Refineries <sup>1</sup>	Operable Refineries Capacity		Gross Input to Distillation Units <sup>3</sup>	Utilization <sup>4</sup>
		On January 1	Annual Average <sup>2</sup>		
	Number	Thousand Barrels per Calendar Day		Thousand Barrels per Day	Percent
1949	336	6,231	NA	5,556	89.2
1950	320	6,223	NA	5,980	92.5
1955	296	8,386	NA	7,820	92.2
1960	309	9,843	NA	8,439	85.1
1965	293	10,420	NA	9,557	91.8
1970	276	12,021	NA	11,517	92.6
1975	279	14,961	NA	12,902	85.5
1976	276	15,237	NA	13,884	87.8
1977	282	16,398	NA	14,982	89.6
1978	296	17,048	NA	15,071	87.4
1979	308	17,441	NA	14,955	84.4
1980	319	17,988	NA	13,796	75.4
1981	324	18,621	18,603	12,752	68.6
1982	301	17,890	17,432	12,172	69.9
1983	258	16,859	16,668	11,947	71.7
1984	247	16,137	16,035	12,216	76.2
1985	223	15,659	15,671	12,165	77.6
1986	216	15,459	15,459	12,826	82.9
1987	219	15,566	15,642	13,003	83.1
1988	213	15,915	15,927	13,447	<sup>R</sup> 84.4
1989	204	15,655	15,701	13,551	<sup>R</sup> 86.3
1990	205	15,572	15,623	13,610	87.1
1991	202	15,676	15,707	13,508	86.0
1992	199	15,696	15,460	13,600	87.9
1993	187	15,121	15,143	13,851	91.5
1994	179	15,034	15,150	14,032	92.6
1995	175	15,434	15,346	14,119	92.0
1996	170	15,333	15,239	14,337	94.1
1997	164	15,452	15,594	14,838	95.2
1998	163	15,711	15,802	15,113	95.6
1999	159	16,261	16,282	15,080	92.6
2000	158	16,512	16,525	15,299	92.6
2001	155	16,595	16,582	15,352	92.6
2002	153	16,785	16,744	15,180	90.7
2003	149	16,757	16,748	15,508	92.6
2004	149	16,894	16,974	15,783	93.0
2005	148	17,125	17,196	15,578	90.6
2006	149	17,339	17,385	15,602	89.7
2007	149	17,443	17,450	15,450	88.5
2008	150	17,594	17,607	15,027	85.3
2009	150	17,672	17,678	14,659	82.9
2010	148	17,584	<sup>R</sup> 17,575	<sup>R</sup> 15,177	<sup>R</sup> 86.4
2011 <sup>P</sup>	148	17,736	17,726	15,283	86.2

<sup>1</sup> Through 1956, includes only those refineries in operation on January 1; beginning in 1957, includes all "operable" refineries on January 1. See "Operable Refineries" in Glossary.

<sup>2</sup> Average of monthly capacity data.

<sup>3</sup> See Note 3, "Gross Input to Distillation Units," at end of section.

<sup>4</sup> Through 1980, utilization is calculated by dividing gross input to distillation units by one-half of the sum of the current year's January 1 capacity and the following year's January 1 capacity. Beginning in 1981, utilization is calculated by dividing gross input to distillation units by the annual average capacity.

R=Revised. P=Preliminary. NA=Not available.

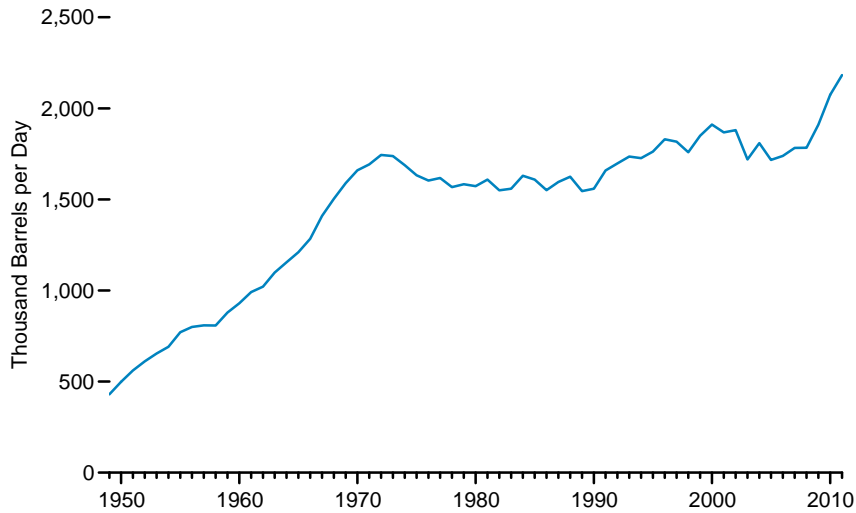
Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all data beginning in

1949. • For related information, see <http://www.eia.gov/petroleum/>.

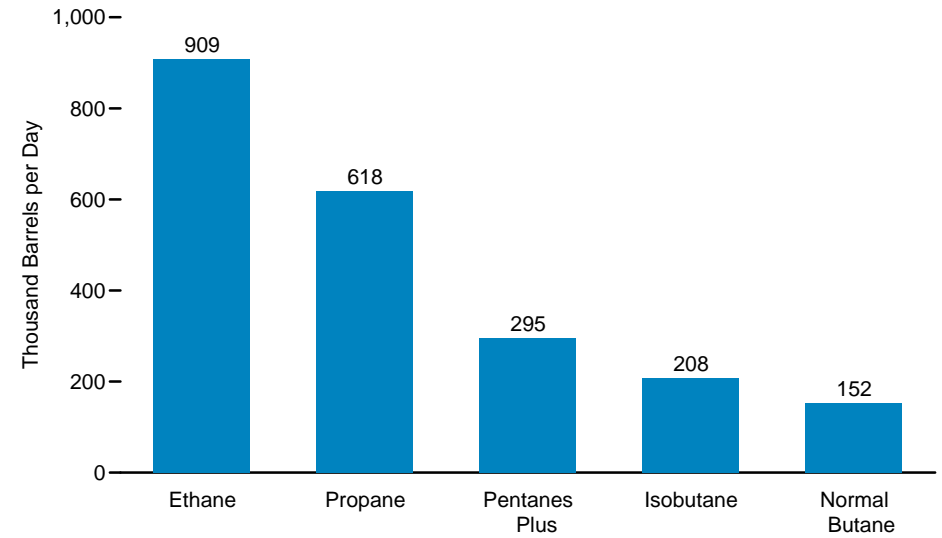
Sources: • 1949-1977—Bureau of Mines, Information Circular, "Petroleum Refineries, Including Cracking Plants in the United States"; *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" and "Natural Gas Liquids" chapters; and Mineral Industry Surveys, *Petroleum Refineries, Annual*, annual reports. • 1978-1980—U.S. Energy Information Administration (EIA), Energy Data Reports, *Petroleum Refineries in the United States*, annual reports. • 1981-2005—EIA, *Petroleum Supply Annual (PSA)*, annual reports; and Form EIA-810, "Monthly Refinery Report." • 2006-2010—EIA, PSA, annual reports; and *Refinery Capacity Report*, annual reports. • 2011—EIA, *Refinery Capacity Report* (June 2011), Table 1; and *Petroleum Supply Monthly* (January-December 2011 issues), Table 30.

**Figure 5.10 Natural Gas Plant Liquids Production**

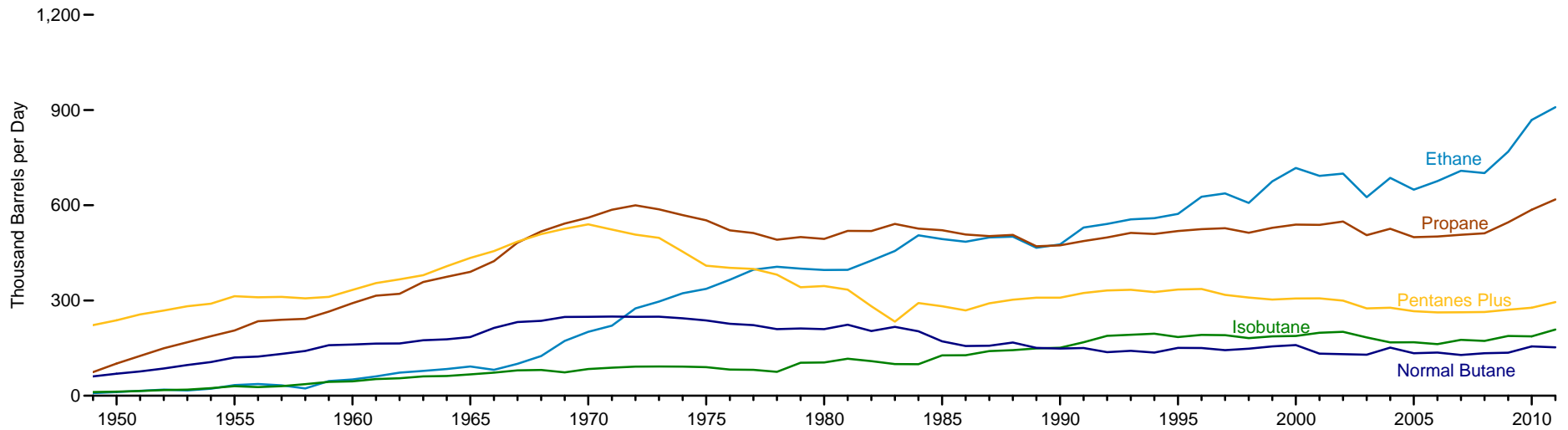
**Total, 1949-2011**



**By Product, 2011**



**By Selected Product, 1949-2011**



Source: Table 5.10.

**Table 5.10 Natural Gas Plant Liquids Production, Selected Years, 1949-2011**  
(Thousand Barrels per Day)

Year	Finished Petroleum Products <sup>1</sup>	Liquefied Petroleum Gases					Pentanes Plus <sup>4</sup>	Total
		Ethane <sup>2</sup>	Isobutane	Normal Butane <sup>3</sup>	Propane <sup>2,3</sup>	Total		
1949	53	8	11	61	74	155	223	430
1950	66	12	13	69	101	195	238	499
1955	68	34	30	120	205	390	313	771
1960	47	51	45	161	291	549	333	929
1965	41	92	67	185	390	734	434	1,210
1970	25	201	84	248	561	1,095	540	1,660
1975	7	337	90	237	552	1,217	409	1,633
1976	6	365	82	227	521	1,195	403	1,604
1977	5	397	81	223	513	1,214	399	1,618
1978	3	406	75	210	491	1,182	382	1,567
1979	26	400	104	212	500	1,216	342	1,584
1980	23	396	105	210	494	1,205	345	1,573
1981	18	397	117	224	519	1,256	334	1,609
1982	11	426	109	204	519	1,258	282	1,550
1983	12	456	100	217	541	1,314	233	1,559
1984	4	505	99	203	527	1,334	292	1,630
1985	14	493	127	171	521	1,313	282	1,609
1986	4	485	128	157	508	1,277	269	1,551
1987	4	499	141	157	503	1,300	291	1,595
1988	4	501	144	167	506	1,319	302	1,625
1989	NA	466	149	151	471	1,237	309	1,546
1990	NA	477	151	149	474	1,250	309	1,559
1991	NA	530	169	150	487	1,336	324	1,659
1992	NA	541	189	137	499	1,365	332	1,697
1993	NA	556	192	142	513	1,402	334	1,736
1994	NA	559	195	136	510	1,400	326	1,727
1995	NA	573	185	151	519	1,428	335	1,762
1996	NA	627	192	150	525	1,494	336	1,830
1997	NA	637	191	144	528	1,499	318	1,817
1998	NA	607	181	148	513	1,450	309	1,759
1999	NA	675	187	155	529	1,547	303	1,850
2000	NA	717	188	160	539	1,605	306	1,911
2001	NA	692	198	133	538	1,562	307	1,868
2002	NA	700	201	131	549	1,581	300	1,880
2003	NA	625	183	129	506	1,444	275	1,719
2004	NA	686	168	152	526	1,532	277	1,809
2005	NA	649	168	134	499	1,451	266	1,717
2006	NA	676	163	136	501	1,476	263	1,739
2007	NA	709	176	128	507	1,520	263	1,783
2008	NA	701	173	134	512	1,520	264	1,784
2009	NA	769	188	136	546	1,639	271	1,910
2010	NA	<sup>R</sup> 869	<sup>R</sup> 187	<sup>R</sup> 155	<sup>R</sup> 586	<sup>R</sup> 1,797	<sup>R</sup> 277	<sup>R</sup> 2,074
2011 <sup>P</sup>	NA	909	208	152	618	1,888	295	2,183

<sup>1</sup> Motor gasoline, aviation gasoline, special naphthas, distillate fuel oil, and miscellaneous products.

<sup>2</sup> Reported production of ethane-propane mixtures has been allocated 70 percent ethane and 30 percent propane.

<sup>3</sup> Reported production of butane-propane mixtures has been allocated 60 percent butane and 40 percent propane.

<sup>4</sup> Through 1983, "Pentanes Plus" was reported separately as natural gasoline, isopentane, and plant condensate.

R=Revised. P=Preliminary. NA=Not available.

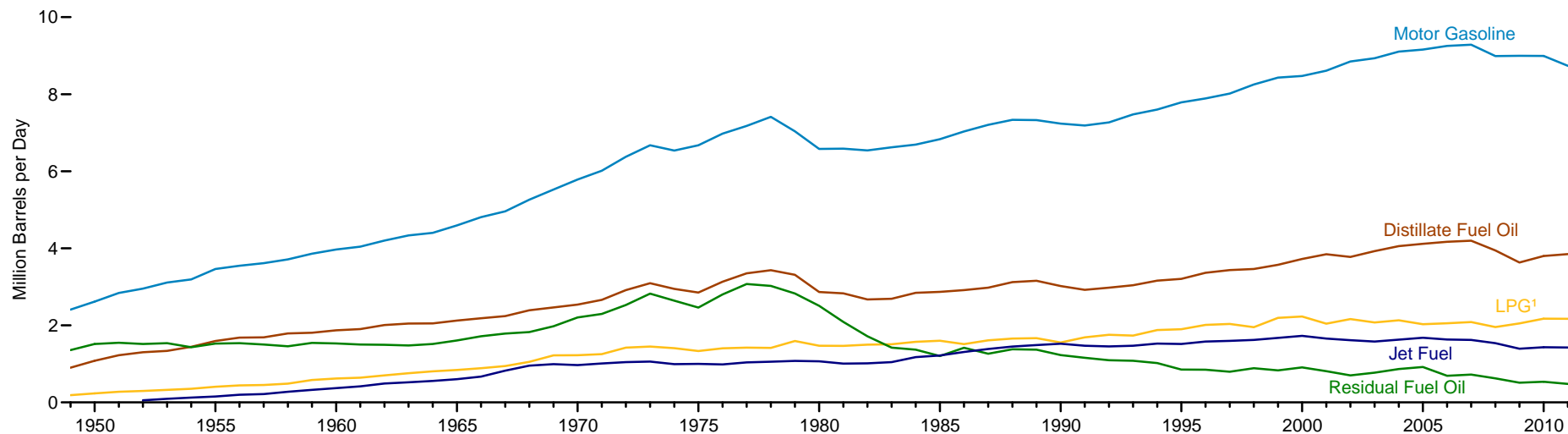
Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all data beginning in 1949. • For related information, see <http://www.eia.gov/petroleum/>.

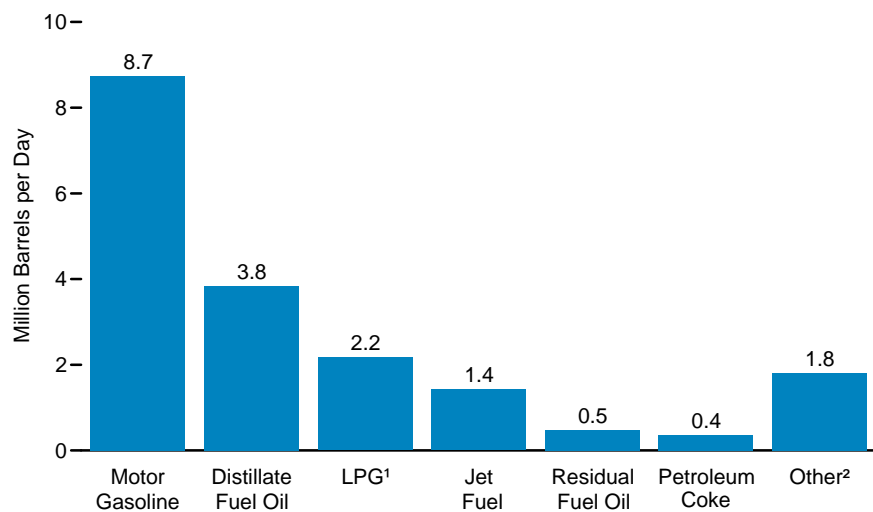
Sources: • 1949-1968—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1969-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. • 1976-1980—U.S. Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual*, annual reports. • 1981-2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.11 Petroleum Products Supplied by Type**

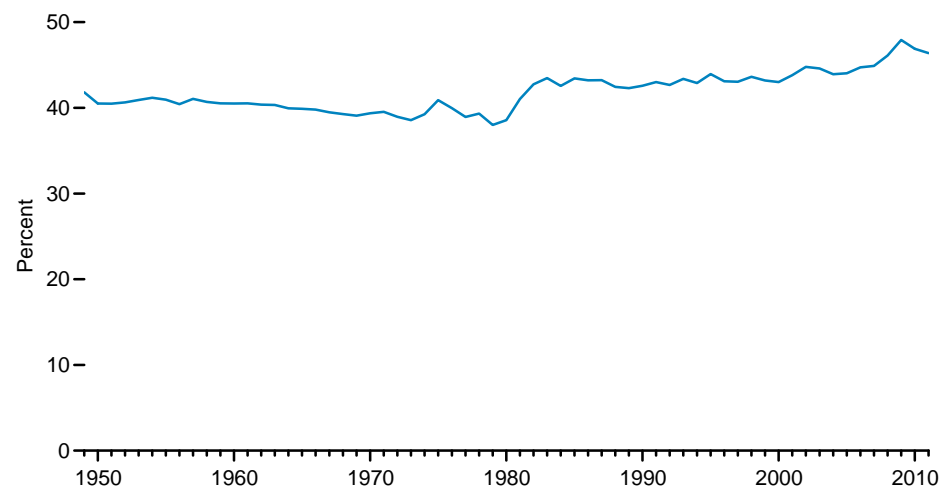
**By Selected Product, 1949-2011**



**By Product, 2011**



**Motor Gasoline's Share of Total Petroleum Products Supplied, 1949-2011**



<sup>1</sup> Liquefied petroleum gases.

<sup>2</sup> Asphalt and road oil, aviation gasoline, kerosene, lubricants, naphtha-type jet fuel, pentanes plus, petrochemical feedstocks, special naphthas, still gas (refinery gas), waxes, miscellaneous products, and crude oil burned as fuel.

Source: 5.11.



**Table 5.11 Petroleum Products Supplied by Type, Selected Years, 1949-2011**  
(Thousand Barrels per Day)

Year	Asphalt and Road Oil	Aviation Gasoline	Distillate Fuel Oil <sup>1</sup>	Jet Fuel <sup>2</sup>	Kerosene	Liquefied Petroleum Gases		Lubricants	Motor Gasoline <sup>4</sup>	Petroleum Coke	Residual Fuel Oil	Other <sup>5</sup>	Total	Percentage Change From Previous Year <sup>6</sup>
						Propane <sup>3</sup>	Total							
1949	157	93	902	( <sup>2</sup> )	281	NA	187	91	2,410	40	1,359	243	5,763	--
1950	180	108	1,082	( <sup>2</sup> )	323	NA	234	106	2,616	41	1,517	250	6,458	12.1
1955	254	192	1,592	154	320	NA	404	116	3,463	67	1,526	366	8,455	9.0
1960	302	161	1,872	371	271	NA	621	117	3,969	149	1,529	435	9,797	3.1
1965	368	120	2,126	602	267	NA	841	129	4,593	202	1,608	657	11,512	4.2
1970	447	55	2,540	967	263	776	1,224	136	5,785	212	2,204	866	14,697	4.0
1975	419	39	2,851	1,001	159	783	1,333	137	6,675	247	2,462	1,001	16,322	-2.0
1976	411	37	3,133	987	169	830	1,404	152	6,978	243	2,801	1,145	17,461	7.3
1977	436	38	3,352	1,039	175	821	1,422	160	7,177	268	3,071	1,294	18,431	5.3
1978	479	39	3,432	1,057	175	778	1,413	172	7,412	256	3,023	1,391	18,847	2.3
1979	476	38	3,311	1,076	188	849	1,592	180	7,034	246	2,826	1,546	18,513	-1.8
1980	396	35	2,866	1,068	158	754	1,469	159	6,579	237	2,508	1,581	17,056	-7.6
1981	342	31	2,829	1,007	127	773	1,466	153	6,588	252	2,088	1,176	16,058	-6.1
1982	342	25	2,671	1,013	129	798	1,499	140	6,539	248	1,716	973	15,296	-4.7
1983	373	26	2,690	1,046	127	751	1,509	146	6,622	229	1,421	1,042	15,231	-4
1984	408	24	2,845	1,175	115	833	1,572	156	6,693	247	1,369	1,120	15,726	3.5
1985	425	27	2,868	1,218	114	883	1,599	145	6,831	264	1,202	1,032	15,726	-3
1986	448	32	2,914	1,307	98	831	1,512	142	7,034	268	1,418	1,105	16,281	3.5
1987	467	25	2,976	1,385	95	924	1,612	161	7,206	299	1,264	1,176	16,665	2.4
1988	468	27	3,122	1,449	96	923	1,656	155	7,336	312	1,378	1,286	17,283	4.0
1989	453	26	3,157	1,489	84	990	1,668	159	7,328	307	1,370	1,284	17,325	(s)
1990	483	24	3,021	1,522	43	917	1,556	164	7,235	339	1,229	1,373	16,988	-1.9
1991	444	23	2,921	1,471	46	982	1,689	146	7,188	328	1,158	1,299	16,714	-1.6
1992	454	22	2,979	1,454	41	1,032	1,755	149	7,268	382	1,094	1,434	17,033	2.2
1993	474	21	3,041	1,469	50	1,006	1,734	152	7,476	366	1,080	1,373	17,237	.9
1994	484	21	3,162	1,527	49	1,082	1,880	159	7,601	361	1,021	1,454	17,718	2.8
1995	486	21	3,207	1,514	54	1,096	1,899	156	7,789	365	852	1,381	17,725	(s)
1996	484	20	3,365	1,578	62	1,136	2,012	151	7,891	379	848	1,518	18,309	3.6
1997	505	22	3,435	1,599	66	1,170	2,038	160	8,017	377	797	1,605	18,620	1.4
1998	521	19	3,461	1,622	78	1,120	1,952	168	8,253	447	887	1,508	18,917	1.6
1999	547	21	3,572	1,673	73	1,246	2,195	169	8,431	477	830	1,532	19,519	3.2
2000	525	20	3,722	1,725	67	1,235	2,231	166	8,472	406	909	1,458	19,701	1.2
2001	519	19	3,847	1,655	72	1,142	2,044	153	8,610	437	811	1,481	19,649	-.5
2002	512	18	3,776	1,614	43	1,248	2,163	151	8,848	463	700	1,474	19,761	.6
2003	503	16	3,927	1,578	55	1,215	2,074	140	8,935	455	772	1,579	20,034	1.4
2004	537	17	4,058	1,630	64	1,276	2,132	141	9,105	524	865	1,657	20,731	3.8
2005	546	19	4,118	1,679	70	1,229	2,030	141	9,159	515	920	1,605	20,802	.1
2006	521	18	4,169	1,633	54	1,215	2,052	137	9,253	522	689	1,640	20,687	-.6
2007	494	17	4,196	1,622	32	1,235	2,085	142	9,286	490	723	1,593	20,680	(s)
2008	417	15	3,945	1,539	14	1,154	1,954	131	8,989	464	622	1,408	19,498	-5.5
2009	360	14	3,631	1,393	18	1,160	2,051	118	8,997	427	511	1,251	18,771	-4.0
2010	362	15	<sup>R</sup> 3,800	<sup>R</sup> 1,432	20	<sup>R</sup> 1,160	<sup>R</sup> 2,173	<sup>R</sup> 131	<sup>R</sup> 8,993	376	<sup>R</sup> 535	<sup>R</sup> 1,343	<sup>R</sup> 19,180	<sup>R</sup> 2.2
2011 <sup>P</sup>	355	15	3,849	1,425	12	1,138	2,171	124	8,736	367	480	1,300	18,835	-1.8

<sup>1</sup> Beginning in 2009, includes renewable diesel fuel (including biodiesel) blended into distillate fuel oil.

<sup>2</sup> Through 1951, naphtha-type jet fuel is included in the products from which it was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel oil. Beginning in 1952, includes naphtha-type jet fuel. Beginning in 1957, also includes kerosene-type jet fuel. Beginning in 2005, naphtha-type jet fuel is included in "Other."

<sup>3</sup> Includes propylene.

<sup>4</sup> Finished motor gasoline. Through 1963, also includes special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.

<sup>5</sup> Pentanes plus, petrochemical feedstocks, still gas (refinery gas), waxes, and miscellaneous products. Beginning in 1964, also includes special naphthas. Beginning in 1981, also includes negative barrels per day of distillate and residual fuel oil reclassified as unfinished oils, and other products (from both primary and secondary supply) reclassified as gasoline blending components. Beginning in 1983, also includes crude oil burned as fuel. Beginning in 2005, also includes naphtha-type jet fuel.

<sup>6</sup> Percent change from previous year calculated from data in thousand barrels per year.

R=Revised. P=Preliminary. NA=Not available. -- =Not applicable. (s)=Less than 0.05 percent and greater than -0.05 percent.

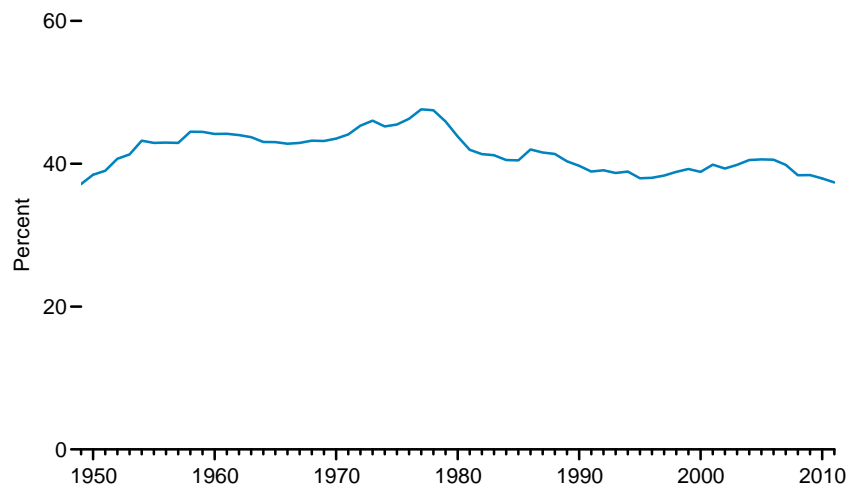
Notes: • For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of section. • See Note 2, "Changes Affecting Petroleum Production and Product Supplied Statistics," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> for related information.

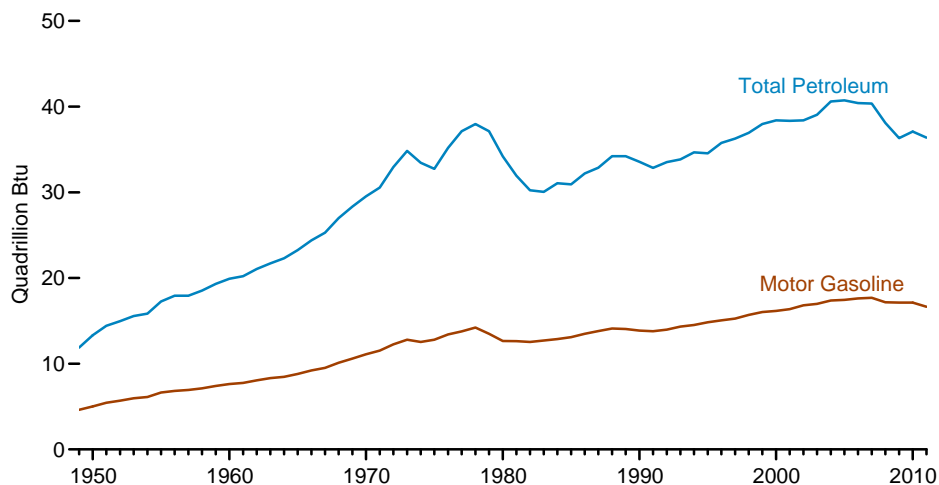
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports. • 1976-1980—U.S. Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual*, annual reports. • 1981-2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.12 Heat Content of Petroleum Products Supplied**

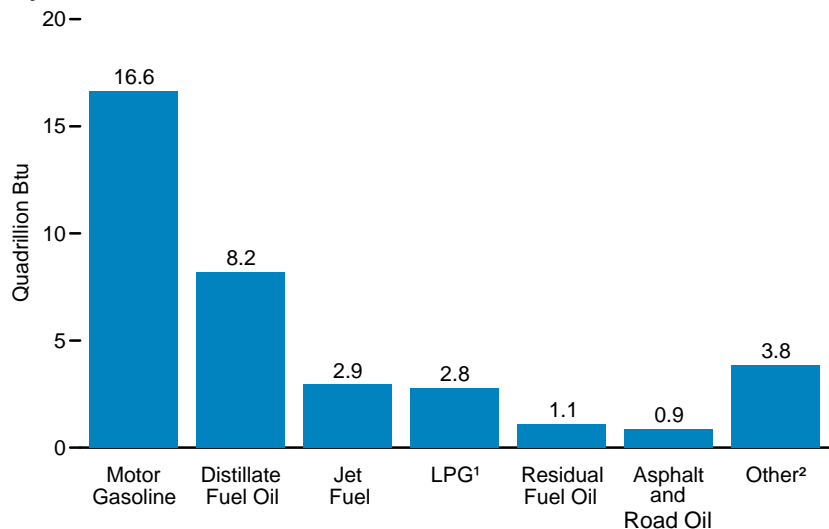
**Petroleum Products Supplied as Share of Total Energy Consumption, 1949-2011**



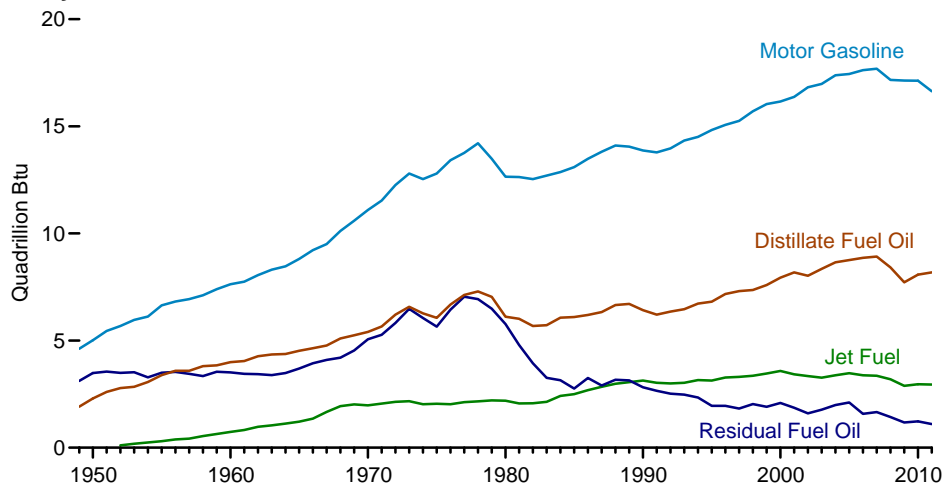
**Total Petroleum and Motor Gasoline Product Supplied, 1949-2011**



**By Product, 2011**



**By Selected Product, 1949-2011**



<sup>1</sup> Liquefied petroleum gases.

<sup>2</sup> Aviation gasoline, kerosene, lubricants, naphtha-type jet fuel, pentanes plus, petrochemical feedstocks, petroleum coke, special naphthas, still gas (refinery gas), waxes, miscellaneous products, and crude burned as fuel.

Sources: Tables 1.3 and 5.12.

**Table 5.12 Heat Content of Petroleum Products Supplied, Selected Years, 1949-2011**

(Trillion Btu)

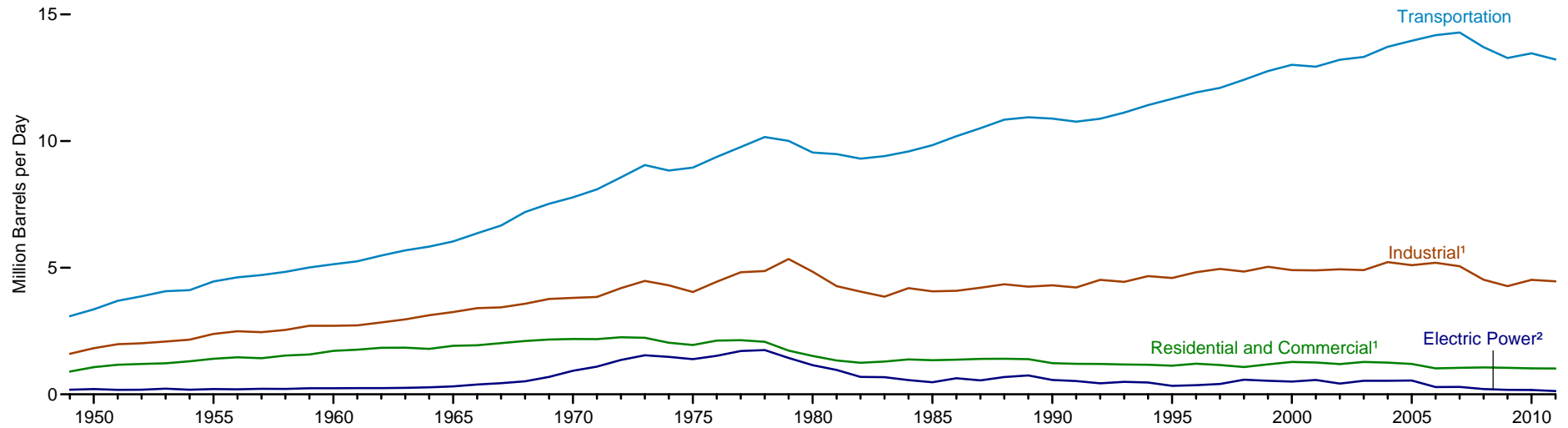
Year	Asphalt and Road Oil	Aviation Gasoline	Distillate Fuel Oil <sup>1</sup>	Jet Fuel <sup>2</sup>	Kerosene	Liquefied Petroleum Gases		Lubricants	Motor Gasoline <sup>4</sup>	Petroleum Coke	Residual Fuel Oil	Other <sup>5</sup>	Total	Percentage Change From Previous Year
						Propane <sup>3</sup>	Total							
1949	380	172	1,918	( <sup>2</sup> )	582	NA	274	201	4,621	87	3,118	530	11,883	--
1950	435	199	2,300	( <sup>2</sup> )	668	NA	343	236	5,015	90	3,482	546	13,315	12.1
1955	615	354	3,385	301	662	NA	592	258	6,640	147	3,502	798	17,255	8.9
1960	734	298	3,992	739	563	NA	912	259	7,631	328	3,517	947	19,919	3.1
1965	890	222	4,519	1,215	553	NA	1,232	286	8,806	444	3,691	1,390	23,246	4.2
1970	1,082	100	5,401	1,973	544	1,086	1,689	301	11,091	465	5,057	1,817	29,521	4.2
1975	1,014	71	6,061	2,047	329	1,097	1,807	304	12,798	542	5,649	2,109	32,732	-2.2
1976	998	67	6,679	2,026	351	1,166	1,907	338	13,415	537	6,445	2,413	35,178	7.5
1977	1,056	70	7,126	2,126	363	1,150	1,908	354	13,760	589	7,047	2,724	37,124	5.5
1978	1,160	71	7,296	2,164	363	1,089	1,892	380	14,211	562	6,936	2,928	37,963	2.3
1979	1,153	70	7,039	2,204	389	1,189	2,138	397	13,487	541	6,485	3,217	37,122	-2.2
1980	962	64	6,110	2,190	329	1,059	1,976	354	12,648	522	5,772	3,278	34,205	-7.9
1981	828	56	6,014	2,062	263	1,082	1,949	339	12,631	553	4,791	2,446	31,932	-6.6
1982	829	47	5,679	2,072	266	1,117	1,978	309	12,538	545	3,939	2,030	30,232	-5.3
1983	904	48	5,720	2,141	263	1,051	1,990	324	12,697	503	3,260	2,202	30,052	-6
1984	992	44	6,065	2,414	239	1,170	2,071	346	12,867	545	3,151	2,319	31,053	3.3
1985	1,029	50	6,098	2,497	236	1,236	2,103	322	13,098	582	2,759	2,152	30,925	-4
1986	1,086	59	6,196	2,682	203	1,163	2,010	315	13,487	590	3,255	2,315	32,198	4.1
1987	1,130	46	6,328	2,843	196	1,294	2,152	356	13,816	657	2,901	2,439	32,864	2.1
1988	1,136	49	6,655	2,982	200	1,296	2,213	343	14,105	687	3,170	2,682	34,223	4.1
1989	1,096	48	6,712	3,059	174	1,387	2,243	352	14,050	676	3,144	2,656	34,209	(s)
1990	1,170	45	6,422	3,129	88	1,284	2,059	362	13,872	745	2,820	2,839	33,552	-1.9
1991	1,077	42	6,210	3,025	96	1,374	2,228	324	13,781	722	2,657	2,685	32,846	-2.1
1992	1,102	41	6,351	3,001	86	1,449	2,328	330	13,973	843	2,518	2,951	33,525	2.1
1993	1,149	38	6,466	3,028	103	1,409	2,282	337	14,335	804	2,479	2,822	33,842	.9
1994	1,173	38	6,723	3,154	101	1,515	2,494	352	14,511	793	2,342	2,988	34,670	2.4
1995	1,178	40	6,818	3,132	112	1,534	2,512	346	14,825	802	1,955	2,837	34,556	-3
1996	1,176	37	7,175	3,274	128	1,594	2,660	335	15,064	837	1,952	3,121	35,759	3.5
1997	1,224	40	7,304	3,308	136	1,638	2,690	354	15,254	829	1,828	3,298	36,265	1.4
1998	1,263	35	7,359	3,357	162	1,568	2,575	371	15,701	982	2,036	3,093	36,934	1.8
1999	1,324	39	7,595	3,462	151	1,745	2,897	375	16,036	1,048	1,905	3,129	37,960	2.8
2000	1,276	36	7,935	3,580	140	1,734	2,945	369	16,155	895	2,091	2,979	38,402	1.2
2001	1,257	35	8,179	3,426	150	1,598	2,697	338	16,373	961	1,861	3,056	38,333	-2
2002	1,240	34	8,028	3,340	90	1,747	2,852	334	16,819	1,018	1,605	3,040	38,400	.2
2003	1,220	30	8,349	3,265	113	1,701	2,748	309	16,981	1,000	1,772	3,264	39,051	1.7
2004	1,304	31	8,652	3,383	133	1,791	2,824	313	17,379	1,156	1,990	3,428	40,593	3.9
2005	1,323	35	8,755	3,475	144	1,721	2,682	312	17,444	1,133	2,111	3,318	40,732	.3
2006	1,261	33	8,864	3,379	111	1,701	2,700	303	17,622	1,148	1,581	3,416	40,420	-8
2007	1,197	32	8,921	3,358	67	1,729	2,733	313	17,689	1,077	1,659	3,313	40,358	-2
2008	1,012	28	8,411	3,193	30	1,620	2,574	291	17,168	1,022	1,432	2,941	38,101	-5.6
2009	873	27	7,720	2,883	36	1,624	2,664	262	17,135	938	1,173	2,611	36,321	-4.7
2010	<sup>R</sup> 878	27	<sup>R</sup> 8,080	<sup>R</sup> 2,963	41	<sup>R</sup> 1,624	<sup>R</sup> 2,821	<sup>R</sup> 291	<sup>R</sup> 17,127	826	<sup>R</sup> 1,228	<sup>R</sup> 2,800	<sup>R</sup> 37,082	2.1
2011 <sup>P</sup>	860	27	8,184	2,950	25	1,594	2,796	275	16,639	807	1,102	2,712	36,376	-1.9

<sup>1</sup> Beginning in 2009, includes renewable diesel fuel (including biodiesel) blended into distillate fuel oil.  
<sup>2</sup> Through 1951, naphtha-type jet fuel is included in the products from which it was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel oil. Beginning in 1952, includes naphtha-type jet fuel. Beginning in 1957, also includes kerosene-type jet fuel. Beginning in 2005, naphtha-type jet fuel is included in "Other."  
<sup>3</sup> Includes propylene.  
<sup>4</sup> Finished motor gasoline. Through 1963, also includes special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.  
<sup>5</sup> Pentanes plus, petrochemical feedstocks, still gas (refinery gas), waxes, and miscellaneous products. Beginning in 1964, also includes special naphthas. Beginning in 1981, also includes negative barrels per day of distillate and residual fuel oil reclassified as unfinished oils, and other products (from both primary and secondary supply) reclassified as gasoline blending components. Beginning in 1983, also includes

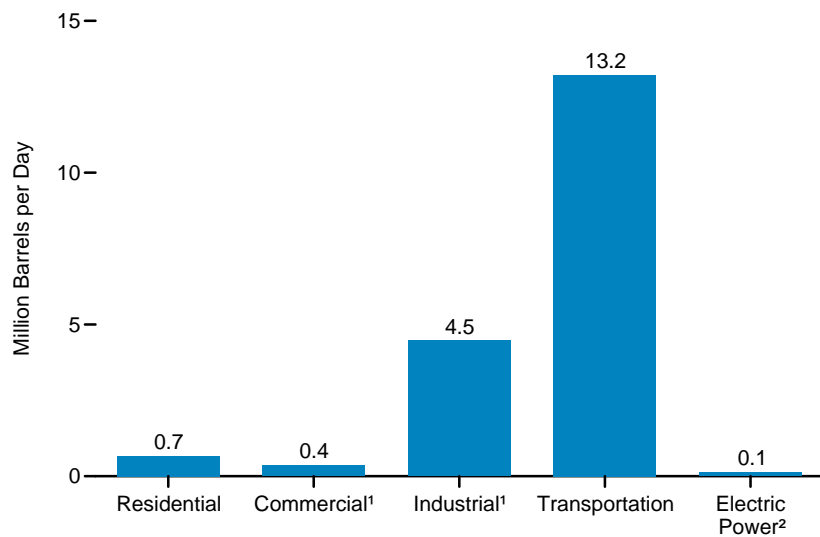
crude oil burned as fuel. Beginning in 2005, also includes naphtha-type jet fuel.  
R=Revised. P=Preliminary. NA=Not available. -- =Not applicable. (s)=Less than 0.05 percent and greater than -0.05 percent.  
Notes: • For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of section. • See Note 2, "Changes Affecting Petroleum Production and Product Supplied Statistics," at end of section. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> for related information.  
Sources: Tables 5.11, A1, and A3.

**Figure 5.13a Petroleum Consumption Estimates by Sector**

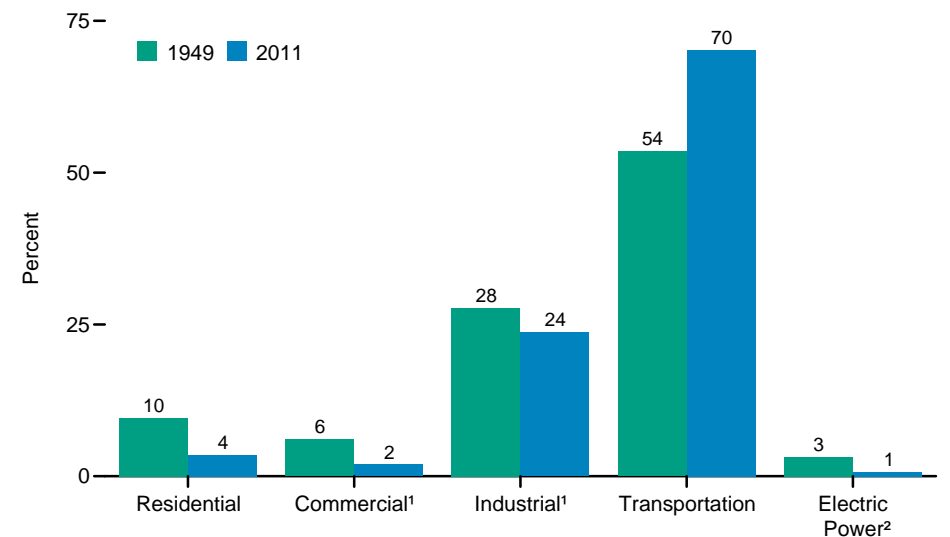
**By Sector, 1949-2011**



**By Sector, 2011**



**Sector Shares, 1949 and 2011**



<sup>1</sup> Includes combined-heat-and-power plants and a small number of electricity-only plants.

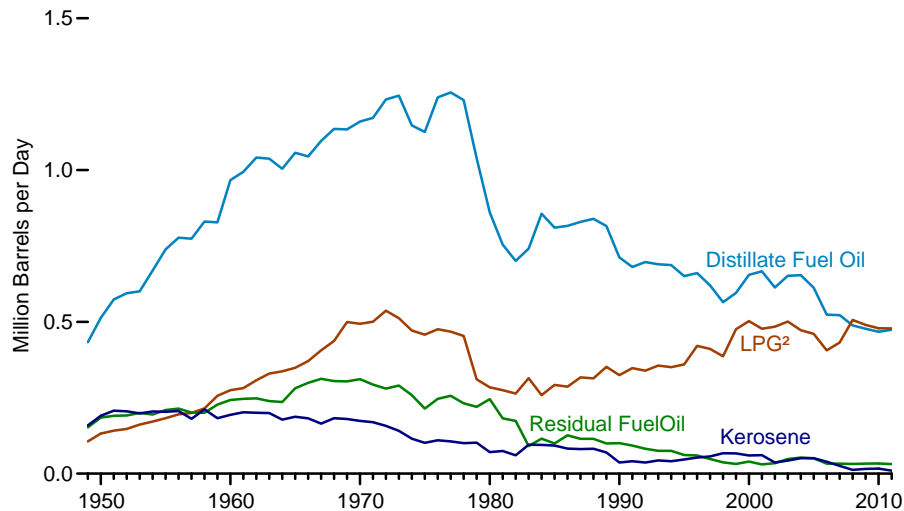
<sup>2</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

Note: See related Figure 5.13b.

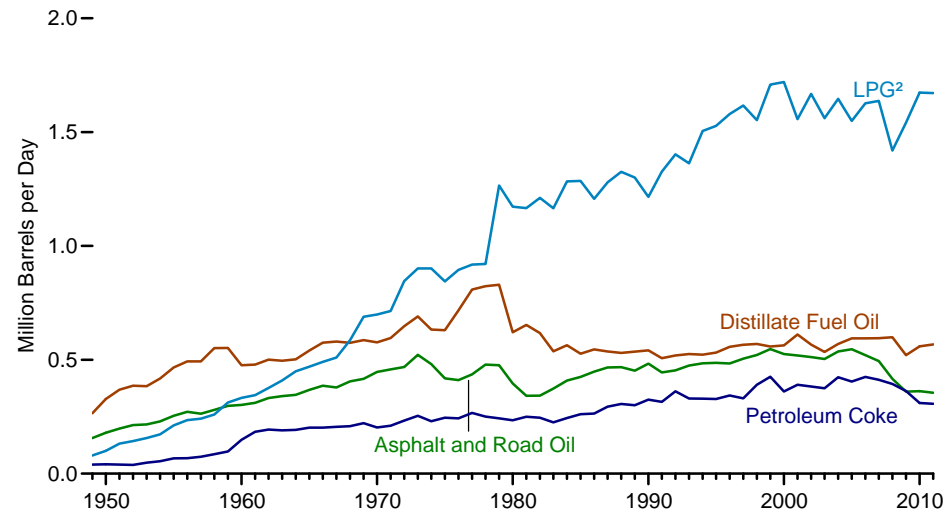
Sources: Tables 5.13a–5.13d.

**Figure 5.13b Petroleum Consumption Estimates by Product by Sector, 1949-2011**

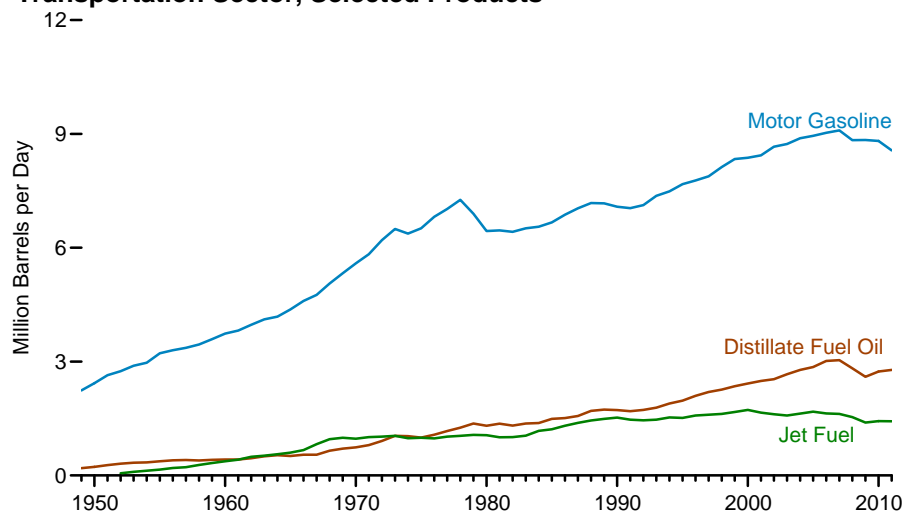
**Residential and Commercial<sup>1</sup> Sectors, Selected Products**



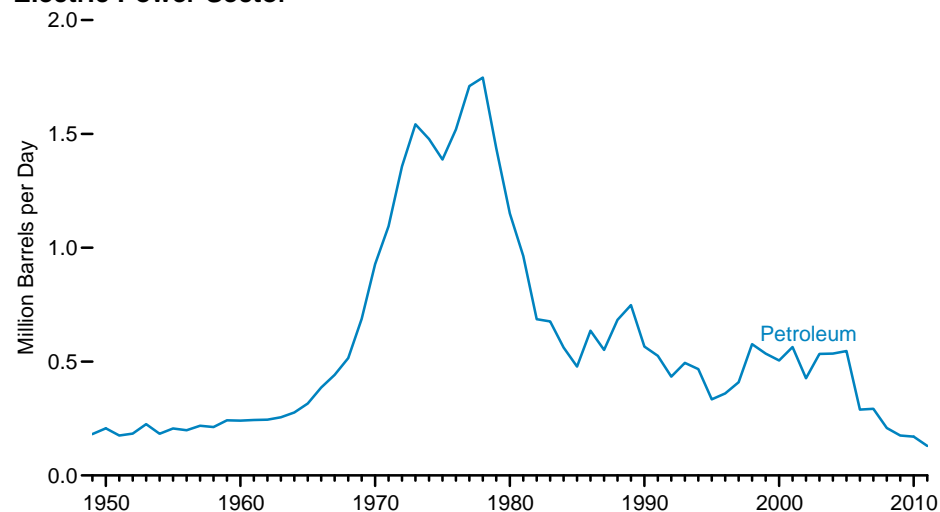
**Industrial<sup>1</sup> Sector, Selected Products**



**Transportation Sector, Selected Products**



**Electric Power Sector<sup>3</sup>**



<sup>1</sup> Includes combined-heat-and-power plants and a small number of electricity-only plants.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

Note: See related Figure 5.13a.

Sources: Tables 5.13a–5.13d.

**Table 5.13a Petroleum Consumption Estimates: Residential and Commercial Sectors, Selected Years, 1949-2011**  
(Thousand Barrels per Day)

Year	Residential Sector				Commercial Sector										
	Distillate Fuel Oil	Kerosene	Liquefied Petroleum Gases	Total	Distillate Fuel Oil			Kerosene	Liquefied Petroleum Gases	Motor Gasoline <sup>3</sup>	Petroleum Coke	Residual Fuel Oil			Total
					CHP <sup>1</sup>	Other <sup>2</sup>	Total					CHP <sup>1</sup>	Other <sup>2</sup>	Total	
1949	329	140	84	553	( <sup>4</sup> )	104	104	19	22	48	NA	( <sup>4</sup> )	153	153	346
1950	390	168	104	662	( <sup>4</sup> )	123	123	23	28	52	NA	( <sup>4</sup> )	185	185	411
1955	562	179	144	885	( <sup>4</sup> )	177	177	24	38	69	NA	( <sup>4</sup> )	209	209	519
1960	736	171	217	1,123	( <sup>4</sup> )	232	232	23	58	35	NA	( <sup>4</sup> )	243	243	590
1965	805	161	275	1,242	( <sup>4</sup> )	251	251	26	74	40	NA	( <sup>4</sup> )	281	281	672
1970	883	144	392	1,419	( <sup>4</sup> )	276	276	30	102	45	NA	( <sup>4</sup> )	311	311	764
1975	850	78	365	1,293	( <sup>4</sup> )	276	276	24	92	46	NA	( <sup>4</sup> )	214	214	653
1976	932	89	379	1,400	( <sup>4</sup> )	308	308	21	97	50	NA	( <sup>4</sup> )	247	247	722
1977	938	81	371	1,390	( <sup>4</sup> )	318	318	25	96	52	NA	( <sup>4</sup> )	256	256	748
1978	917	74	360	1,351	( <sup>4</sup> )	313	313	26	94	56	NA	( <sup>4</sup> )	232	232	721
1979	765	64	243	1,072	( <sup>4</sup> )	274	274	38	68	54	NA	( <sup>4</sup> )	220	220	655
1980	617	51	222	890	( <sup>4</sup> )	243	243	20	63	56	NA	( <sup>4</sup> )	245	245	626
1981	540	41	213	794	( <sup>4</sup> )	215	215	34	62	48	NA	( <sup>4</sup> )	182	182	540
1982	494	46	206	746	( <sup>4</sup> )	207	207	15	58	46	NA	( <sup>4</sup> )	174	174	499
1983	435	41	245	721	( <sup>4</sup> )	306	306	54	69	53	NA	( <sup>4</sup> )	91	91	573
1984	512	77	199	788	( <sup>4</sup> )	345	345	17	59	56	NA	( <sup>4</sup> )	115	115	593
1985	514	77	224	815	( <sup>4</sup> )	297	297	16	68	50	NA	( <sup>4</sup> )	99	99	530
1986	523	59	220	801	( <sup>4</sup> )	293	293	24	66	55	NA	( <sup>4</sup> )	126	126	566
1987	544	57	244	845	( <sup>4</sup> )	286	286	24	72	58	NA	( <sup>4</sup> )	114	114	554
1988	558	69	243	870	( <sup>4</sup> )	281	281	13	71	57	NA	( <sup>4</sup> )	115	115	537
1989	546	57	273	876	3	267	270	13	78	53	0	2	97	99	514
1990	460	31	252	742	3	249	252	6	73	58	0	3	97	100	489
1991	438	35	270	743	2	241	243	6	77	44	0	2	91	92	463
1992	460	31	263	754	1	236	238	5	76	41	(s)	2	80	82	443
1993	458	37	278	773	2	230	232	7	78	15	(s)	2	73	75	407
1994	451	31	274	757	3	233	236	9	77	13	(s)	2	73	75	410
1995	426	36	282	743	2	223	225	11	78	10	(s)	1	61	62	385
1996	434	43	334	811	2	225	227	10	87	14	(s)	1	58	60	397
1997	411	45	325	781	3	206	209	12	86	22	(s)	1	47	48	378
1998	363	52	303	718	2	199	202	15	84	20	(s)	3	35	37	358
1999	389	54	376	819	2	204	206	13	100	15	(s)	2	30	32	366
2000	424	46	395	865	2	228	230	14	107	23	(s)	2	38	40	415
2001	427	46	375	849	3	236	239	15	102	20	(s)	2	28	30	406
2002	404	29	384	817	2	207	209	8	101	24	(s)	1	34	35	376
2003	425	34	389	848	2	225	226	9	112	32	(s)	2	46	48	428
2004	433	41	364	839	3	218	221	10	108	23	(s)	2	51	53	416
2005	402	40	366	809	2	208	210	10	94	24	(s)	2	48	50	389
2006	335	32	318	685	1	188	189	7	88	26	(s)	1	31	33	343
2007	342	21	345	708	1	180	181	4	87	32	(s)	1	32	33	337
2008	314	10	394	718	1	173	174	2	113	24	(s)	1	31	32	345
2009	283	13	391	687	1	194	194	2	99	28	(s)	1	32	33	357
2010	R274	R14	R379	R667	1	R192	R193	2	R100	R29	(s)	(s)	R33	R34	R358
2011 <sup>P</sup>	278	9	378	665	(s)	196	196	1	100	28	(s)	(s)	31	32	357

<sup>1</sup> Commercial combined-heat-and-power (CHP) and a small number of commercial electricity-only plants. See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8.

<sup>2</sup> All commercial sector fuel use other than that in "CHP."

<sup>3</sup> Finished motor gasoline. Through 1963, also includes special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.

<sup>4</sup> Included in "Other."

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 500 barrels per day.

Notes: • For total petroleum consumption by all sectors, see petroleum products supplied data in Table 5.11. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1,

"Petroleum Products Supplied and Petroleum Consumption," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See [http://www.eia.gov/states/\\_seds.html](http://www.eia.gov/states/_seds.html) for related information.

Sources: **CHP and Petroleum Coke:** Table 8.7c. **All Other Data:** • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports, and U.S. Energy Information Administration (EIA) estimates. • 1960-1972—EIA, "State Energy Data 2010: Consumption" (June 2012), U.S. Tables CT4 and CT5. • 1973 forward—EIA, *Monthly Energy Review* (April 2012), Table 3.7a.

**Table 5.13b Petroleum Consumption Estimates: Industrial Sector, Selected Years, 1949-2011**

(Thousand Barrels per Day)

Year	Industrial Sector															
	Asphalt and Road Oil	Distillate Fuel Oil			Kerosene	Liquefied Petroleum Gases	Lubricants	Motor Gasoline <sup>3</sup>	Petroleum Coke			Residual Fuel Oil			Other Petroleum <sup>4</sup>	Total
		CHP <sup>1</sup>	Other <sup>2</sup>	Total					CHP <sup>1</sup>	Other <sup>2</sup>	Total	CHP <sup>1</sup>	Other <sup>2</sup>	Total		
1949	157	( <sup>5</sup> )	265	265	123	80	36	121	( <sup>5</sup> )	40	40	( <sup>5</sup> )	534	534	243	1,598
1950	180	( <sup>5</sup> )	328	328	132	100	43	131	( <sup>5</sup> )	41	41	( <sup>5</sup> )	617	617	250	1,822
1955	254	( <sup>5</sup> )	466	466	116	212	47	173	( <sup>5</sup> )	67	67	( <sup>5</sup> )	686	686	366	2,387
1960	302	( <sup>5</sup> )	476	476	78	333	48	198	( <sup>5</sup> )	149	149	( <sup>5</sup> )	689	689	435	2,708
1965	368	( <sup>5</sup> )	541	541	80	470	62	179	( <sup>5</sup> )	202	202	( <sup>5</sup> )	689	689	657	3,247
1970	447	( <sup>5</sup> )	577	577	89	699	70	150	( <sup>5</sup> )	203	203	( <sup>5</sup> )	708	708	866	3,808
1975	419	( <sup>5</sup> )	630	630	58	844	68	116	( <sup>5</sup> )	246	246	( <sup>5</sup> )	658	658	1,001	4,038
1976	411	( <sup>5</sup> )	717	717	59	895	75	110	( <sup>5</sup> )	242	242	( <sup>5</sup> )	792	792	1,145	4,447
1977	436	( <sup>5</sup> )	809	809	69	918	82	102	( <sup>5</sup> )	266	266	( <sup>5</sup> )	844	844	1,294	4,821
1978	479	( <sup>5</sup> )	823	823	75	921	88	93	( <sup>5</sup> )	250	250	( <sup>5</sup> )	748	748	1,391	4,867
1979	476	( <sup>5</sup> )	830	830	86	1,266	92	84	( <sup>5</sup> )	243	243	( <sup>5</sup> )	721	721	1,546	5,343
1980	396	( <sup>5</sup> )	621	621	87	1,172	82	82	( <sup>5</sup> )	234	234	( <sup>5</sup> )	586	586	1,581	4,842
1981	342	( <sup>5</sup> )	653	653	52	1,166	79	83	( <sup>5</sup> )	250	250	( <sup>5</sup> )	471	471	1,176	4,273
1982	342	( <sup>5</sup> )	617	617	68	1,211	72	72	( <sup>5</sup> )	246	246	( <sup>5</sup> )	456	456	973	4,058
1983	373	( <sup>5</sup> )	537	537	32	1,166	75	59	( <sup>5</sup> )	225	225	( <sup>5</sup> )	345	345	1,042	3,854
1984	408	( <sup>5</sup> )	564	564	21	1,283	80	83	( <sup>5</sup> )	244	244	( <sup>5</sup> )	386	386	1,120	4,191
1985	425	( <sup>5</sup> )	526	526	21	1,285	75	114	( <sup>5</sup> )	261	261	( <sup>5</sup> )	326	326	1,032	4,065
1986	448	( <sup>5</sup> )	546	546	16	1,207	73	108	( <sup>5</sup> )	264	264	( <sup>5</sup> )	321	321	1,105	4,087
1987	467	( <sup>5</sup> )	537	537	14	1,279	83	107	( <sup>5</sup> )	294	294	( <sup>5</sup> )	253	253	1,176	4,210
1988	468	( <sup>5</sup> )	530	530	14	1,326	80	100	( <sup>5</sup> )	306	306	( <sup>5</sup> )	237	237	1,286	4,347
1989	453	5	531	536	14	1,300	82	104	5	295	300	57	121	178	1,284	4,251
1990	483	7	534	541	6	1,215	84	97	25	300	325	63	116	179	1,373	4,304
1991	444	12	495	507	5	1,326	75	101	22	293	315	55	91	146	1,299	4,219
1992	454	10	509	519	5	1,402	77	101	26	336	362	59	109	168	1,434	4,522
1993	474	10	515	525	6	1,363	78	94	22	308	330	65	129	194	1,373	4,438
1994	484	10	513	522	8	1,505	82	101	25	304	329	69	113	183	1,454	4,667
1995	486	6	526	532	7	1,527	80	105	26	302	328	60	87	147	1,381	4,594
1996	484	8	549	557	9	1,580	78	105	27	317	343	66	80	146	1,518	4,819
1997	505	8	558	566	9	1,617	82	111	37	294	331	56	71	127	1,605	4,953
1998	521	16	554	570	11	1,553	86	105	29	362	390	60	40	100	1,508	4,844
1999	547	16	542	558	6	1,709	87	80	31	395	426	52	38	90	1,532	5,035
2000	525	10	553	563	8	1,720	86	79	19	342	361	48	57	105	1,458	4,903
2001	519	9	602	611	11	1,557	79	155	15	375	390	46	42	89	1,481	4,892
2002	512	6	561	566	7	1,668	78	163	21	362	383	37	46	83	1,474	4,934
2003	503	10	525	534	12	1,561	72	171	17	358	375	38	58	96	1,579	4,903
2004	537	9	561	570	14	1,646	73	195	18	405	423	46	62	108	1,657	5,222
2005	546	11	583	594	19	1,549	72	187	14	390	404	46	77	123	1,605	5,100
2006	521	5	589	594	14	1,627	71	198	21	404	425	33	71	104	1,640	5,193
2007	494	4	591	595	6	1,637	73	161	22	390	412	30	54	84	1,593	5,056
2008	417	3	596	599	2	1,419	67	131	16	377	394	14	73	86	1,408	4,523
2009	360	7	514	521	2	1,541	61	128	17	347	363	13	33	46	1,251	4,274
2010	362	R3	R556	R559	R4	R1,673	R68	R148	R17	R293	310	R6	R46	52	R1,343	R4,519
2011 <sup>P</sup>	355	2	566	568	2	1,672	64	143	17	289	307	5	44	49	1,300	4,460

<sup>1</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants. See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8.

<sup>2</sup> All industrial sector fuel use other than that in "CHP."

<sup>3</sup> Finished motor gasoline. Through 1963, also includes special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.

<sup>4</sup> Pentanes plus, petrochemical feedstocks, still gas (refinery gas), waxes, and miscellaneous products. Beginning in 1964, also includes special naphthas. Beginning in 1981, also includes negative barrels per day of distillate and residual fuel oil reclassified as unfinished oils, and other products (from both primary and secondary supply) reclassified as gasoline blending components. Beginning in 1983, also includes crude oil burned as fuel. Beginning in 2005, also includes naphtha-type jet fuel.

<sup>5</sup> Included in "Other."

R=Revised. P=Preliminary.

Notes: • For total petroleum consumption by all sectors, see petroleum products supplied data in Table 5.11. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See [http://www.eia.gov/states/\\_seds.html](http://www.eia.gov/states/_seds.html) for related information.

Sources: **CHP:** Table 8.7c. **All Other Data:** • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports, and U.S. Energy Information Administration (EIA) estimates. • 1960-1972—EIA, "State Energy Data 2010: Consumption" (June 2012), U.S. Table CT6. • 1973 forward—EIA, *Monthly Energy Review* (April 2012), Table 3.7b.

**Table 5.13c Petroleum Consumption Estimates: Transportation Sector, Selected Years, 1949-2011**  
(Thousand Barrels per Day)

Year	Transportation Sector								
	Aviation Gasoline	Distillate Fuel Oil <sup>1</sup>	Jet Fuel		Liquefied Petroleum Gases	Lubricants	Motor Gasoline <sup>3</sup>	Residual Fuel Oil	Total
			Kerosene Type	Total <sup>2</sup>					
1949	93	190	0	( <sup>2</sup> )	1	54	2,241	504	3,084
1950	108	226	0	( <sup>2</sup> )	2	64	2,433	524	3,356
1955	192	372	0	154	9	70	3,221	440	4,458
1960	161	418	91	371	13	68	3,736	367	5,135
1965	120	514	334	602	23	67	4,374	336	6,036
1970	55	738	718	967	32	66	5,589	332	7,778
1975	39	998	782	992	31	70	6,512	310	8,951
1976	37	1,073	777	976	33	77	6,817	358	9,372
1977	38	1,171	814	1,022	36	78	7,022	396	9,761
1978	39	1,260	845	1,044	38	83	7,264	431	10,160
1979	38	1,366	867	1,067	16	87	6,896	535	10,005
1980	35	1,311	845	1,062	13	77	6,441	608	9,546
1981	31	1,365	808	1,006	24	74	6,456	531	9,487
1982	25	1,312	803	1,011	24	68	6,421	444	9,307
1983	26	1,367	839	1,046	29	71	6,510	358	9,406
1984	24	1,383	953	1,175	30	76	6,554	351	9,592
1985	27	1,491	1,005	1,218	21	71	6,667	342	9,838
1986	32	1,514	1,105	1,307	19	69	6,871	379	10,191
1987	25	1,568	1,181	1,385	15	78	7,041	392	10,505
1988	27	1,701	1,236	1,449	17	75	7,179	399	10,846
1989	26	1,734	1,284	1,489	16	77	7,171	423	10,937
1990	24	1,722	1,340	1,522	16	80	7,080	443	10,888
1991	23	1,694	1,296	1,471	15	71	7,042	447	10,763
1992	22	1,728	1,310	1,454	14	72	7,125	465	10,881
1993	21	1,785	1,357	1,469	14	74	7,367	393	11,124
1994	21	1,896	1,480	1,527	24	77	7,487	385	11,417
1995	21	1,973	1,497	1,514	13	76	7,674	397	11,668
1996	20	2,096	1,575	1,578	11	73	7,772	370	11,921
1997	22	2,198	1,598	1,599	10	78	7,883	310	12,099
1998	19	2,263	1,623	1,622	13	81	8,128	294	12,420
1999	21	2,352	1,675	1,673	10	82	8,336	290	12,765
2000	20	2,422	1,725	1,725	8	81	8,370	386	13,012
2001	19	2,489	1,656	1,655	10	74	8,435	255	12,938
2002	18	2,536	1,621	1,614	10	73	8,662	295	13,208
2003	16	2,665	1,578	1,578	12	68	8,733	249	13,321
2004	17	2,783	1,630	1,630	14	69	8,887	321	13,720
2005	19	2,858	1,679	1,679	20	68	8,948	365	13,957
2006	18	3,017	1,633	1,633	20	67	9,029	395	14,178
2007	17	3,037	1,622	1,622	16	69	9,093	433	14,287
2008	15	2,824	1,539	1,539	29	64	8,834	400	13,704
2009	14	2,600	1,393	1,393	20	57	8,840	353	13,279
2010	15	<sup>R</sup> 2,737	<sup>R</sup> 1,432	<sup>R</sup> 1,432	21	<sup>R</sup> 64	<sup>R</sup> 8,816	<sup>R</sup> 382	<sup>R</sup> 13,466
2011 <sup>P</sup>	15	2,779	1,425	1,425	21	60	8,565	359	13,223

<sup>1</sup> Beginning in 2009, includes renewable diesel fuel (including biodiesel) blended into distillate fuel oil.

<sup>2</sup> Through 1951, naphtha-type jet fuel is included in the products from which jet fuel was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel oil. Beginning in 1952, includes naphtha-type jet fuel. Beginning in 1957, also includes kerosene-type jet fuel. Beginning in 2005, includes kerosene-type jet fuel only.

<sup>3</sup> Finished motor gasoline. Through 1963, also includes special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.

R=Revised. P=Preliminary.

Notes: • For total petroleum consumption by all sectors, see petroleum products supplied data in Table 5.11. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1,

"Petroleum Products Supplied and Petroleum Consumption," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See [http://www.eia.gov/states/\\_seds.html](http://www.eia.gov/states/_seds.html) for related information.

Sources: • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, annual reports, and U.S. Energy Information Administration (EIA) estimates. • 1960-1972—EIA, "State Energy Data 2010: Consumption" (June 2012), U.S. Table CT7. • 1973 forward—EIA, *Monthly Energy Review* (April 2012), Table 3.7c.



**Table 5.13d Petroleum Consumption Estimates: Electric Power Sector, Selected Years, 1949-2011**  
(Thousand Barrels per Day)

Year	Electric Power Sector <sup>1</sup>											
	Electricity Only				Combined Heat and Power (CHP)				Total			
	Distillate Fuel Oil <sup>2</sup>	Petroleum Coke	Residual Fuel Oil <sup>3</sup>	Total	Distillate Fuel Oil <sup>2</sup>	Petroleum Coke	Residual Fuel Oil <sup>3</sup>	Total	Distillate Fuel Oil <sup>2</sup>	Petroleum Coke	Residual Fuel Oil <sup>3</sup>	Total
1949	13	NA	169	182	NA	NA	NA	NA	13	NA	169	182
1950	15	NA	192	207	NA	NA	NA	NA	15	NA	192	207
1955	15	NA	191	206	NA	NA	NA	NA	15	NA	191	206
1960	10	NA	231	241	NA	NA	NA	NA	10	NA	231	241
1965	14	NA	302	316	NA	NA	NA	NA	14	NA	302	316
1970	66	9	853	928	NA	NA	NA	NA	66	9	853	928
1975	107	1	1,280	1,388	NA	NA	NA	NA	107	1	1,280	1,388
1976	114	1	1,405	1,520	NA	NA	NA	NA	114	1	1,405	1,520
1977	134	1	1,575	1,710	NA	NA	NA	NA	134	1	1,575	1,710
1978	130	5	1,612	1,747	NA	NA	NA	NA	130	5	1,612	1,747
1979	84	4	1,350	1,437	NA	NA	NA	NA	84	4	1,350	1,437
1980	79	2	1,069	1,151	NA	NA	NA	NA	79	2	1,069	1,151
1981	58	2	904	964	NA	NA	NA	NA	58	2	904	964
1982	42	2	642	686	NA	NA	NA	NA	42	2	642	686
1983	45	4	627	676	NA	NA	NA	NA	45	4	627	676
1984	42	3	517	562	NA	NA	NA	NA	42	3	517	562
1985	40	3	435	478	NA	NA	NA	NA	40	3	435	478
1986	39	4	592	636	NA	NA	NA	NA	39	4	592	636
1987	42	5	504	551	NA	NA	NA	NA	42	5	504	551
1988	51	6	627	683	NA	NA	NA	NA	51	6	627	683
1989 <sup>4</sup>	70	7	663	740	2	0	6	8	72	7	669	748
1990	41	14	497	551	4	0	10	15	45	14	507	566
1991	38	13	469	520	1	0	4	5	39	13	473	526
1992	33	18	371	422	2	2	8	12	34	20	379	434
1993	37	21	409	467	4	15	9	27	41	36	418	494
1994	46	16	369	431	11	15	10	36	56	32	379	467
1995	44	15	237	296	7	22	9	38	51	37	247	334
1996	47	14	263	325	4	22	10	36	51	36	273	360
1997	48	23	301	373	4	23	10	37	52	46	311	410
1998	61	30	448	539	3	26	8	37	64	56	456	576
1999	63	26	409	497	3	25	9	38	66	51	418	535
2000	77	20	370	466	6	25	8	39	82	45	378	505
2001	76	25	430	531	4	22	7	33	80	47	437	564
2002	59	54	281	394	1	26	6	33	60	80	287	427
2003	71	66	373	510	5	14	6	24	76	79	379	534
2004	49	83	376	509	3	17	6	26	52	101	382	535
2005	51	94	376	521	3	17	6	26	54	111	382	547
2006	34	82	151	267	1	15	6	22	35	97	157	289
2007	40	65	167	272	2	13	6	21	42	78	173	293
2008	33	58	99	189	2	12	6	19	34	70	104	209
2009	32	50	73	154	1	13	6	21	33	63	79	175
2010	<sup>R</sup> 37	<sup>R</sup> 61	62	<sup>R</sup> 159	1	<sup>R</sup> 4	6	<sup>R</sup> 11	<sup>R</sup> 38	65	<sup>R</sup> 67	170
2011 <sup>P</sup>	28	56	35	119	1	5	6	11	29	60	41	130

<sup>1</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Electric utility CHP plants are included in "Electricity Only."

<sup>2</sup> Fuel oil nos. 1, 2, and 4. For 1949–1979, data are for gas turbine and internal combustion plant use of petroleum. For 1980–2000, electric utility data also include small amounts of kerosene and jet fuel.

<sup>3</sup> Fuel oil nos. 5 and 6. For 1949–1979, data are for steam plant use of petroleum. For 1980–2000, electric utility data also include a small amount of fuel oil no. 4.

<sup>4</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities and independent power producers.

R=Revised. P=Preliminary. NA=Not available.

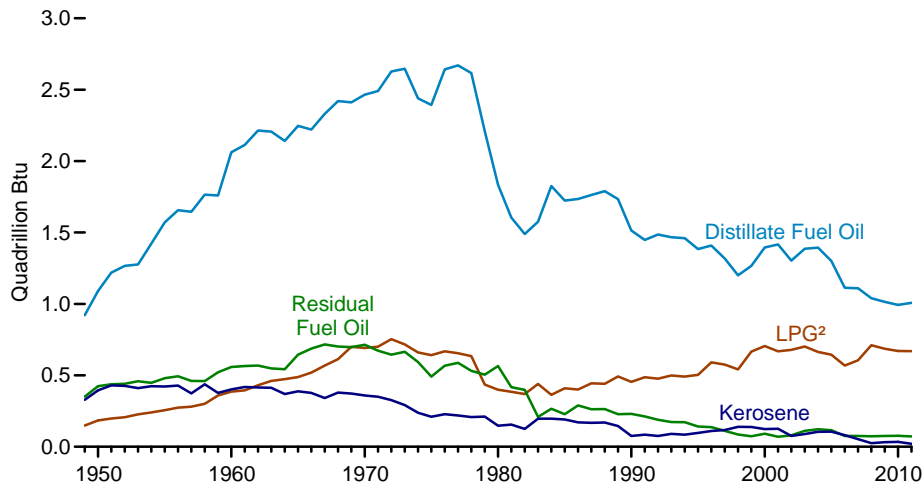
Notes: • For total petroleum consumption by all sectors, see petroleum products supplied data in Table 5.11. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of section. • See Tables 8.5a–8.5d for the amount of petroleum used to produce electricity and Tables 8.6a–8.6c for the amount of petroleum used to produce useful thermal output. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/electricity/> for related information.

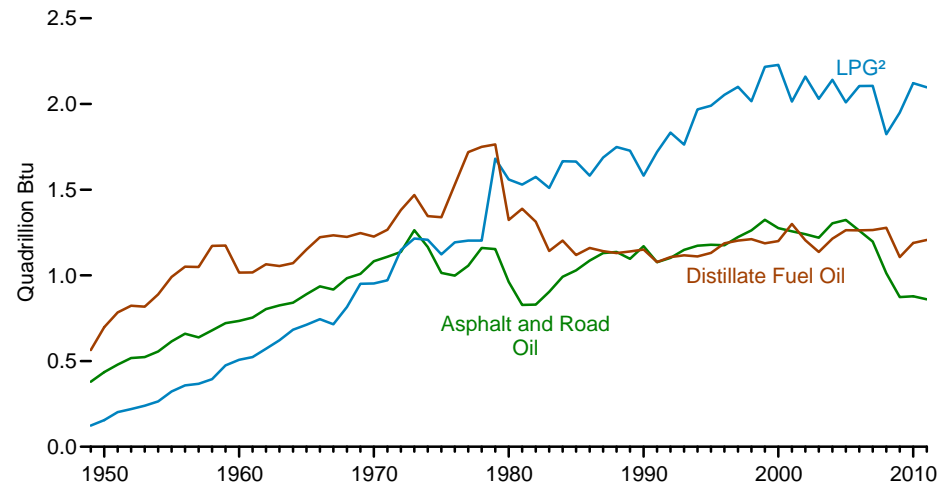
Sources: Tables 8.5b, 8.5c, 8.6b, and 8.7b.

**Figure 5.14 Heat Content of Petroleum Consumption Estimates by Product by Sector, 1949-2011**

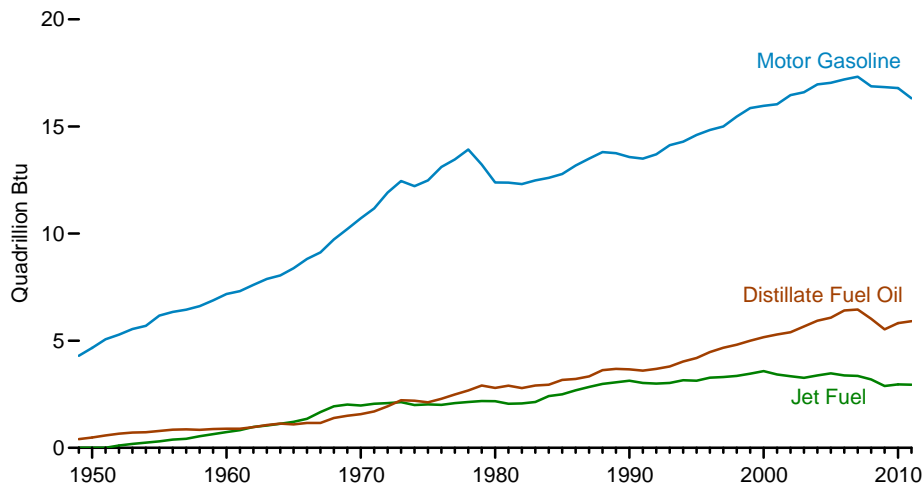
**Residential and Commercial<sup>1</sup> Sectors, Selected Products**



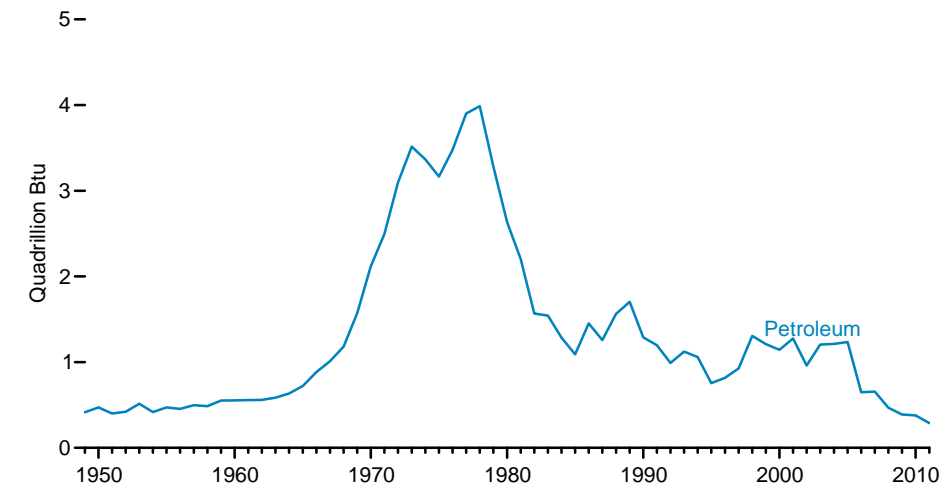
**Industrial<sup>1</sup> Sector, Selected Products**



**Transportation Sector, Selected Products**



**Electric Power Sector<sup>3</sup>**



<sup>1</sup> Includes combined-heat-and-power plants and a small number of electricity-only plants.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

Sources: Tables 5.14a–5.14c.

**Table 5.14a Heat Content of Petroleum Consumption Estimates: Residential and Commercial Sectors, Selected Years, 1949-2011 (Trillion Btu)**

Year	Residential Sector				Commercial Sector						
	Distillate Fuel Oil	Kerosene	Liquefied Petroleum Gases	Total	Distillate Fuel Oil	Kerosene	Liquefied Petroleum Gases	Motor Gasoline <sup>1</sup>	Petroleum Coke	Residual Fuel Oil	Total
1949	700	289	117	1,106	221	39	31	92	NA	351	735
1950	829	347	146	1,322	262	47	39	100	NA	424	872
1955	1,194	371	202	1,767	377	51	54	133	NA	480	1,095
1960	1,568	354	305	2,227	494	48	81	67	NA	559	1,248
1965	1,713	334	385	2,432	534	54	103	77	NA	645	1,413
1970	1,878	298	549	2,725	587	61	143	86	NA	714	1,592
1975	1,807	161	512	2,479	587	49	129	89	NA	492	1,346
1976	1,987	184	532	2,703	656	44	136	97	NA	567	1,500
1977	1,994	167	520	2,681	676	52	135	101	NA	588	1,552
1978	1,951	153	504	2,607	666	55	131	107	NA	532	1,490
1979	1,626	133	340	2,099	584	78	95	104	NA	505	1,367
1980	1,316	107	311	1,734	518	41	88	107	NA	565	1,318
1981	1,147	85	299	1,531	457	69	87	92	NA	417	1,122
1982	1,050	95	289	1,434	440	30	81	88	NA	399	1,037
1983	924	85	344	1,353	651	111	96	102	NA	208	1,170
1984	1,091	160	280	1,531	735	36	83	107	NA	266	1,227
1985	1,092	159	314	1,565	631	33	95	96	NA	228	1,083
1986	1,111	121	308	1,541	623	50	93	106	NA	290	1,162
1987	1,156	119	342	1,617	607	49	102	111	NA	263	1,131
1988	1,190	144	341	1,675	600	26	99	110	NA	264	1,099
1989	1,160	117	383	1,660	574	28	109	102	0	228	1,041
1990	978	64	352	1,394	536	12	102	111	0	230	991
1991	930	72	378	1,381	517	12	108	85	0	212	935
1992	980	65	369	1,414	507	11	107	80	(s)	189	893
1993	974	76	390	1,439	493	14	109	30	(s)	173	819
1994	960	65	384	1,408	501	19	107	25	(s)	172	825
1995	905	74	395	1,374	479	22	109	18	(s)	141	769
1996	926	89	469	1,484	483	21	122	27	(s)	137	790
1997	874	93	455	1,422	444	25	120	43	(s)	111	743
1998	772	108	424	1,304	429	31	118	39	(s)	85	702
1999	828	111	526	1,465	438	27	140	28	(s)	73	707
2000	905	95	555	1,554	491	30	150	45	(s)	92	807
2001	908	95	526	1,529	508	31	143	37	(s)	70	790
2002	860	60	537	1,457	444	16	141	45	(s)	80	726
2003	905	70	544	1,519	481	19	157	60	(s)	111	828
2004	924	85	512	1,520	470	20	152	45	(s)	122	810
2005	854	84	513	1,451	447	22	131	46	(s)	116	762
2006	712	66	446	1,224	401	15	123	49	(s)	75	664
2007	726	44	484	1,254	384	9	121	61	(s)	75	651
2008	669	21	553	1,243	372	4	158	46	(s)	73	653
2009	602	28	547	1,176	413	4	139	53	(s)	76	685
2010	<sup>R</sup> 583	<sup>R</sup> 29	<sup>R</sup> 530	<sup>R</sup> 1,142	<sup>R</sup> 410	5	<sup>R</sup> 140	<sup>R</sup> 55	(s)	<sup>R</sup> 77	<sup>R</sup> 688
2011 <sup>P</sup>	592	18	530	1,139	417	3	140	54	(s)	73	686

<sup>1</sup> Finished motor gasoline. Through 1963, also includes special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

Notes: • Data are estimates. • For total heat content of petroleum consumption by all sectors, see data for heat content of petroleum products supplied in Table 5.12. For petroleum, product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum

Consumption," at end of Section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See [http://www.eia.gov/states/\\_seds.html](http://www.eia.gov/states/_seds.html) for related information.

Sources: Tables 5.13a, A1, and A3.

**Table 5.14b Heat Content of Petroleum Consumption Estimates: Industrial Sector, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Industrial Sector									Total
	Asphalt and Road Oil	Distillate Fuel Oil	Kerosene	Liquefied Petroleum Gases	Lubricants	Motor Gasoline <sup>1</sup>	Petroleum Coke	Residual Fuel Oil	Other Petroleum <sup>2</sup>	
1949	380	564	254	123	80	231	87	1,225	530	3,475
1950	435	698	274	156	94	251	90	1,416	546	3,960
1955	615	991	241	323	103	332	147	1,573	798	5,123
1960	734	1,016	161	507	107	381	328	1,584	947	5,766
1965	890	1,150	165	712	137	342	444	1,582	1,390	6,813
1970	1,082	1,226	185	953	155	288	446	1,624	1,817	7,776
1975	1,014	1,339	119	1,123	149	223	540	1,509	2,109	8,127
1976	998	1,530	123	1,192	166	211	535	1,822	2,413	8,990
1977	1,056	1,719	143	1,203	182	196	586	1,937	2,724	9,747
1978	1,160	1,750	156	1,203	195	178	550	1,716	2,928	9,835
1979	1,153	1,764	177	1,681	204	162	533	1,655	3,217	10,548
1980	962	1,324	181	1,559	182	158	516	1,349	3,278	9,509
1981	828	1,389	108	1,530	175	160	549	1,081	2,446	8,265
1982	829	1,313	141	1,575	159	138	451	1,047	2,030	7,772
1983	904	1,142	66	1,510	167	112	495	791	2,202	7,390
1984	992	1,203	43	1,666	178	160	538	889	2,319	7,987
1985	1,029	1,119	44	1,664	166	218	575	748	2,152	7,714
1986	1,086	1,160	32	1,582	162	206	581	736	2,315	7,860
1987	1,130	1,141	28	1,687	183	206	646	582	2,439	8,042
1988	1,136	1,130	30	1,749	177	193	675	546	2,682	8,317
1989	1,096	1,139	30	1,728	181	199	660	410	2,656	8,098
1990	1,170	1,150	12	1,582	186	185	714	411	2,839	8,251
1991	1,077	1,078	11	1,720	167	193	693	334	2,685	7,958
1992	1,102	1,107	10	1,833	170	194	798	387	2,951	8,552
1993	1,149	1,117	13	1,763	173	180	725	446	2,822	8,388
1994	1,173	1,111	17	1,969	181	192	723	419	2,988	8,773
1995	1,178	1,131	15	1,990	178	200	721	337	2,837	8,588
1996	1,176	1,187	18	2,054	173	200	757	335	3,121	9,020
1997	1,224	1,203	19	2,100	182	212	727	291	3,298	9,256
1998	1,263	1,211	22	2,016	191	199	858	230	3,093	9,083
1999	1,324	1,187	13	2,217	193	152	936	207	3,129	9,357
2000	1,276	1,200	16	2,228	190	150	796	241	2,979	9,076
2001	1,257	1,300	23	2,014	174	295	858	203	3,056	9,181
2002	1,240	1,204	14	2,160	172	309	842	190	3,040	9,171
2003	1,220	1,136	24	2,030	159	324	825	220	3,264	9,202
2004	1,304	1,214	28	2,141	161	372	934	249	3,428	9,831
2005	1,323	1,264	39	2,009	160	356	889	281	3,318	9,640
2006	1,261	1,263	30	2,104	156	376	934	239	3,416	9,780
2007	1,197	1,265	13	2,106	161	306	906	193	3,313	9,461
2008	1,012	1,277	4	1,823	150	250	868	199	2,941	8,523
2009	873	1,107	4	1,950	135	244	799	106	2,611	7,829
2010	<sup>R</sup> 878	<sup>R</sup> 1,188	<sup>R</sup> 7	<sup>R</sup> 2,121	149	<sup>R</sup> 281	682	<sup>R</sup> 120	<sup>R</sup> 2,800	<sup>R</sup> 8,227
2011 <sup>P</sup>	860	1,207	4	2,097	141	273	674	113	2,712	8,081

<sup>1</sup> Finished motor gasoline. Through 1963, also includes special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.

<sup>2</sup> Pentanes plus, petrochemical feedstocks, still gas (refinery gas), waxes, and miscellaneous products. Beginning in 1964, also includes special naphthas. Beginning in 1983, also includes crude oil burned as fuel.

R=Revised. P=Preliminary.

Notes: • Data are estimates. • For total heat content of petroleum consumption by all sectors, see data for heat content of petroleum products supplied in Table 5.12. For petroleum, product supplied is used as

an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of Section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See [http://www.eia.gov/states/\\_seds.html](http://www.eia.gov/states/_seds.html) for related information.

Sources: Tables 5.12, 5.13b, A1, and A3.

**Table 5.14c Heat Content of Petroleum Consumption Estimates: Transportation and Electric Power Sectors, Selected Years, 1949-2011 (Trillion Btu)**

Year	Transportation Sector									Electric Power Sector <sup>1</sup>			
	Aviation Gasoline	Distillate Fuel Oil <sup>2</sup>	Jet Fuel		Liquefied Petroleum Gases	Lubricants	Motor Gasoline <sup>4</sup>	Residual Fuel Oil	Total	Distillate Fuel Oil <sup>5</sup>	Petroleum Coke	Residual Fuel Oil <sup>6</sup>	Total
			Kerosene Type	Total <sup>3</sup>									
1949	172	405	0	0	2	120	4,298	1,156	6,152	28	NA	387	415
1950	199	480	0	0	3	141	4,664	1,201	6,690	32	NA	440	472
1955	354	791	0	301	13	155	6,175	1,009	8,799	32	NA	439	471
1960	298	892	188	739	19	152	7,183	844	10,125	22	NA	530	553
1965	222	1,093	691	1,215	32	149	8,386	770	11,866	29	NA	693	722
1970	100	1,569	1,486	1,973	44	147	10,716	761	15,310	141	19	1,958	2,117
1975	71	2,121	1,619	2,029	43	155	12,485	711	17,615	226	2	2,937	3,166
1976	67	2,288	1,613	2,002	47	172	13,107	824	18,508	243	2	3,232	3,477
1977	70	2,489	1,684	2,090	50	172	13,464	908	19,243	283	3	3,614	3,901
1978	71	2,679	1,750	2,138	54	184	13,927	990	20,044	276	12	3,699	3,987
1979	70	2,905	1,795	2,186	22	193	13,221	1,228	19,825	178	8	3,097	3,283
1980	64	2,795	1,754	2,179	18	172	12,383	1,398	19,009	169	5	2,459	2,634
1981	56	2,901	1,671	2,058	34	165	12,379	1,219	18,813	124	4	2,073	2,202
1982	47	2,790	1,661	2,069	34	150	12,312	1,020	18,422	89	4	1,474	1,568
1983	48	2,905	1,736	2,141	40	157	12,482	821	18,595	96	8	1,440	1,544
1984	44	2,948	1,977	2,414	43	168	12,600	807	19,023	88	8	1,190	1,286
1985	50	3,170	2,079	2,497	30	156	12,784	786	19,472	85	7	998	1,090
1986	59	3,218	2,287	2,682	27	153	13,174	870	20,183	83	9	1,359	1,452
1987	46	3,335	2,444	2,843	22	173	13,499	900	20,817	90	10	1,157	1,257
1988	49	3,626	2,565	2,982	23	167	13,802	919	21,568	109	12	1,442	1,563
1989	48	3,687	2,658	3,059	23	171	13,749	971	21,707	152	16	1,535	1,703
1990	45	3,661	2,774	3,129	23	176	13,575	1,016	21,626	97	30	1,163	1,289
1991	42	3,601	2,681	3,025	21	157	13,503	1,026	21,374	84	29	1,085	1,198
1992	41	3,684	2,718	3,001	19	161	13,699	1,070	21,675	74	45	872	991
1993	38	3,796	2,809	3,028	20	163	14,126	901	22,073	86	79	959	1,124
1994	38	4,032	3,063	3,154	34	171	14,293	883	22,605	120	70	869	1,059
1995	40	4,195	3,099	3,132	18	168	14,607	911	23,070	108	81	566	755
1996	37	4,469	3,268	3,274	16	163	14,837	851	23,648	109	80	628	817
1997	40	4,672	3,307	3,308	14	172	14,999	712	23,918	111	102	715	927
1998	35	4,812	3,359	3,357	18	180	15,463	674	24,538	136	124	1,047	1,306
1999	39	5,001	3,466	3,462	14	182	15,855	665	25,219	140	112	959	1,211
2000	36	5,165	3,580	3,580	12	179	15,960	888	25,820	175	99	871	1,144
2001	35	5,292	3,427	3,426	14	164	16,041	586	25,557	171	103	1,003	1,277
2002	34	5,392	3,354	3,340	14	162	16,465	677	26,085	127	175	659	961
2003	30	5,666	3,266	3,265	17	150	16,597	571	26,297	161	175	869	1,205
2004	31	5,932	3,382	3,383	19	152	16,962	740	27,219	111	222	879	1,212
2005	35	6,076	3,475	3,475	28	151	17,043	837	27,645	115	243	876	1,235
2006	33	6,414	3,379	3,379	27	147	17,197	906	28,105	74	214	361	648
2007	32	6,457	3,358	3,358	22	152	17,321	994	28,335	89	171	397	657
2008	28	6,020	3,193	3,193	40	141	16,872	920	27,214	73	154	240	468
2009	27	5,528	2,883	2,883	28	127	16,837	810	26,240	70	139	181	390
2010	27	<sup>R</sup> 5,818	<sup>R</sup> 2,963	<sup>R</sup> 2,963	29	<sup>R</sup> 141	<sup>R</sup> 16,791	<sup>R</sup> 877	<sup>R</sup> 26,646	80	<sup>R</sup> 144	<sup>R</sup> 154	378
2011 <sup>P</sup>	27	5,908	2,950	2,950	29	133	16,312	823	26,182	62	132	94	288

<sup>1</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

<sup>2</sup> Beginning in 2009, includes renewable diesel fuel (including biodiesel) blended into distillate fuel oil.

<sup>3</sup> Through 1951, naphtha-type jet fuel is included in the products from which jet fuel was blended; in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel oil. Beginning in 1952, includes naphtha-type jet fuel. Beginning in 1957, also includes kerosene-type jet fuel. Beginning in 2005, includes kerosene-type jet fuel only.

<sup>4</sup> Finished motor gasoline. Through 1963, also includes special naphthas. Beginning in 1993, also includes ethanol blended into motor gasoline.

<sup>5</sup> Fuel oil nos. 1, 2, and 4. For 1949-1979, data are for gas turbine and internal combustion plant use of petroleum. For 1980-2000, electric utility data also include small amounts of kerosene and jet fuel.

<sup>6</sup> Fuel oil nos. 5 and 6. For 1949-1979, data are for steam plant use of petroleum. For 1980-2000, electric utility data also include a small amount of fuel oil no. 4.

R=Revised. P=Preliminary. NA=Not available.

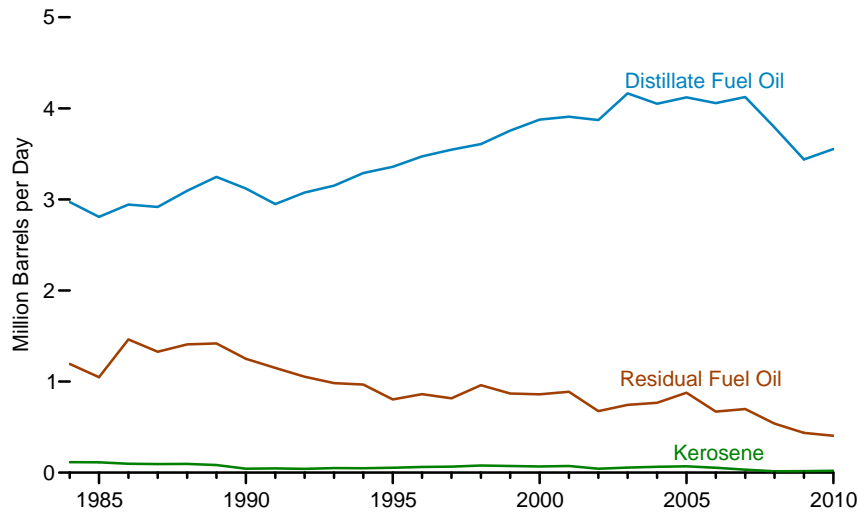
Notes: • Data for "Transportation Sector" are estimates. • For total heat content of petroleum consumption by all sectors, see data for heat content of petroleum products supplied in Table 5.12. For the transportation sector, petroleum product supplied is used as an approximation of petroleum consumption. See Note 1, "Petroleum Products Supplied and Petroleum Consumption," at end of Section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See [http://www.eia.gov/states/\\_seds.html](http://www.eia.gov/states/_seds.html) for related information.

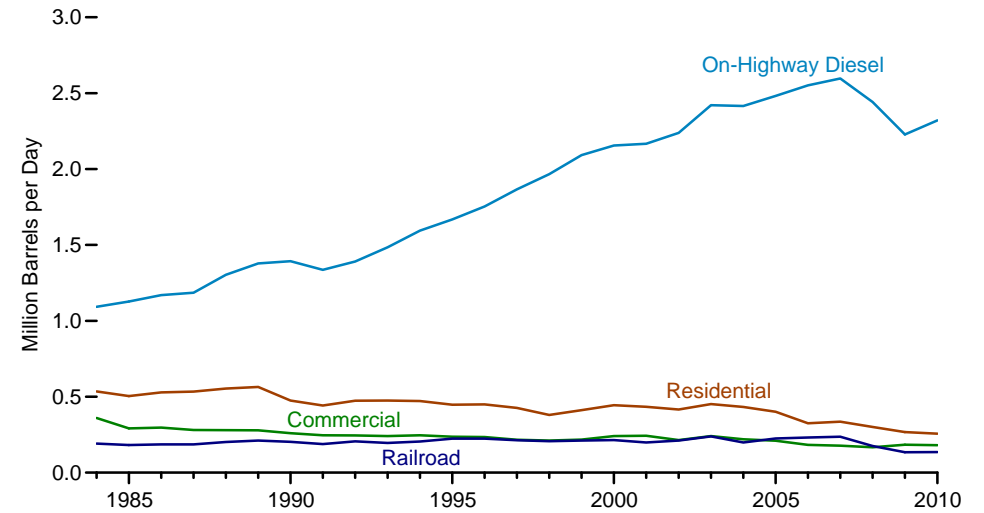
Sources: Tables 5.13c, 5.13d, A1, and A3.

**Figure 5.15 Fuel Oil and Kerosene Sales, 1984-2010**

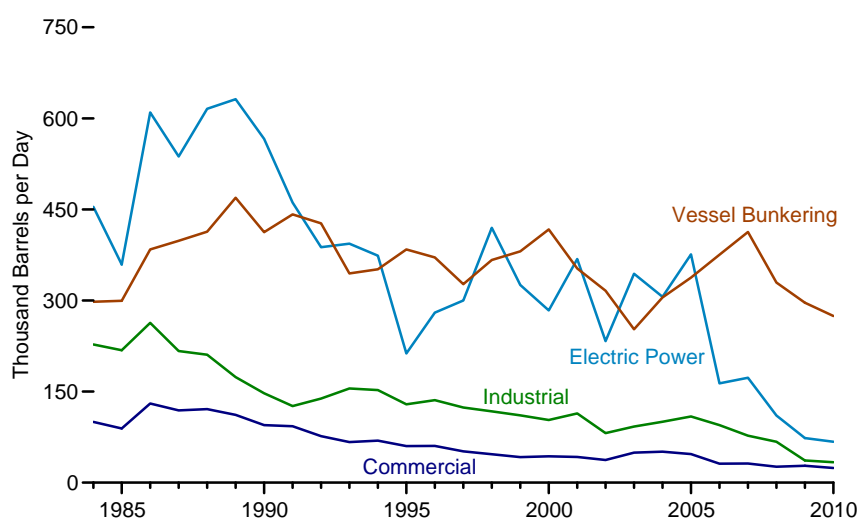
**Total by Fuel**



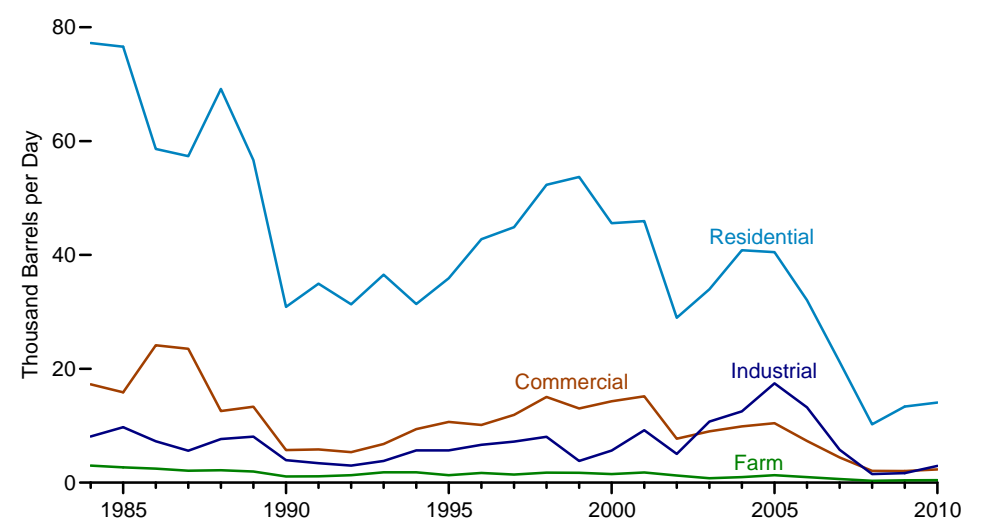
**Distillate Fuel Oil by Selected End Use**



**Residual Fuel Oil by Major End Use**



**Kerosene by Major End Use**



Source: Table 5.15.

**Table 5.15 Fuel Oil and Kerosene Sales, Selected Years, 1984-2010**  
(Thousand Barrels per Day)

Year	Distillate Fuel Oil													Total
	Residential	Commercial	Industrial	Oil Company	Farm	Electric Power <sup>1</sup>	Railroad	Vessel Bunkering	On-Highway Diesel	Military	Off-Highway Diesel	Other		
1984	534	360	166	55	208	42	192	115	1,093	46	114	46	2,971	
1985	504	291	159	45	202	34	182	111	1,127	43	99	11	2,809	
1990	475	260	169	49	222	50	203	135	1,393	46	118	(s)	3,120	
1991	442	246	151	48	206	39	188	133	1,336	53	107	(s)	2,949	
1992	474	245	150	43	228	35	206	144	1,391	42	114	(s)	3,075	
1993	475	241	139	46	222	36	196	141	1,485	32	137	(s)	3,150	
1994	472	246	148	44	213	43	205	143	1,594	40	140	(s)	3,289	
1995	447	237	146	45	227	39	224	153	1,668	30	142	--	3,357	
1996	450	234	149	48	234	43	224	162	1,754	30	146	--	3,472	
1997	426	216	151	56	231	41	214	168	1,867	28	149	--	3,546	
1998	380	211	161	51	222	55	207	169	1,967	23	162	--	3,608	
1999	411	218	162	43	223	53	211	158	2,091	23	162	--	3,756	
2000	444	241	152	45	225	66	214	147	2,155	20	168	--	3,877	
2001	433	243	161	49	234	88	198	133	2,167	26	177	--	3,908	
2002	416	215	156	50	223	49	212	136	2,238	23	154	--	3,871	
2003	452	240	156	33	209	75	239	145	2,420	27	169	--	4,165	
2004	432	220	151	31	207	54	198	139	2,415	23	179	--	4,050	
2005	401	210	160	31	210	59	225	131	2,482	18	193	--	4,120	
2006	325	183	161	42	213	43	232	124	2,552	21	162	--	4,057	
2007	335	177	161	51	209	44	237	126	2,596	24	164	--	4,123	
2008	301	167	154	64	209	35	175	77	2,441	17	148	--	3,790	
2009	268	184	143	48	173	35	135	83	2,228	15	128	--	3,440	
2010	256	181	133	61	190	32	136	88	2,321	16	139	--	3,552	

Year	Residual Fuel Oil							Kerosene						
	Commercial	Industrial	Oil Company	Electric Power <sup>1</sup>	Vessel Bunkering	Military	Other <sup>2</sup>	Total	Residential	Commercial	Industrial	Farm	Other	Total
1984	100	228	81	454	298	6	26	1,194	77	17	8	3	10	115
1985	89	218	62	359	299	8	13	1,048	77	16	10	3	9	114
1990	<sup>3</sup> 95	147	21	566	413	7	2	<sup>3</sup> 1,250	31	6	4	1	1	43
1991	93	126	20	461	442	8	1	1,150	35	6	3	1	1	46
1992	77	138	18	388	427	6	1	1,054	31	5	3	1	(s)	41
1993	67	155	17	394	345	5	(s)	983	37	7	4	2	1	50
1994	69	152	16	374	351	4	(s)	967	31	9	6	2	1	49
1995	60	129	14	213	384	3	(s)	804	36	11	6	1	(s)	54
1996	60	136	11	280	371	4	1	862	43	10	7	2	(s)	62
1997	52	124	10	300	327	3	(s)	816	45	12	7	1	(s)	66
1998	47	117	8	420	367	2	(s)	961	52	15	8	2	1	78
1999	42	111	8	326	381	2	(s)	869	54	13	4	2	1	73
2000	43	103	10	284	417	2	(s)	859	46	14	6	2	(s)	67
2001	42	114	9	368	353	1	(s)	888	46	15	9	2	(s)	72
2002	37	82	7	233	316	(s)	(s)	676	29	8	5	1	(s)	43
2003	49	92	5	344	253	1	(s)	744	34	9	11	1	(s)	55
2004	51	100	3	306	305	2	(s)	767	41	10	13	1	(s)	64
2005	47	109	5	376	338	2	(s)	877	40	10	17	1	(s)	70
2006	31	95	4	163	375	1	(s)	670	32	7	13	1	(s)	54
2007	31	77	3	173	413	1	(s)	698	21	4	6	1	(s)	32
2008	26	67	4	111	330	1	(s)	538	10	2	2	(s)	(s)	14
2009	28	37	2	73	296	1	1	437	13	2	2	(s)	(s)	<sup>R</sup> 18
2010	24	34	4	67	274	1	(s)	404	14	2	3	(s)	(s)	20

<sup>1</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

<sup>2</sup> Sales to railroads are included in "Other."

<sup>3</sup> Value has been revised since publication in the reports cited after "Sources."

--=Not applicable. (s)=Less than 0.5 thousand barrels per day.

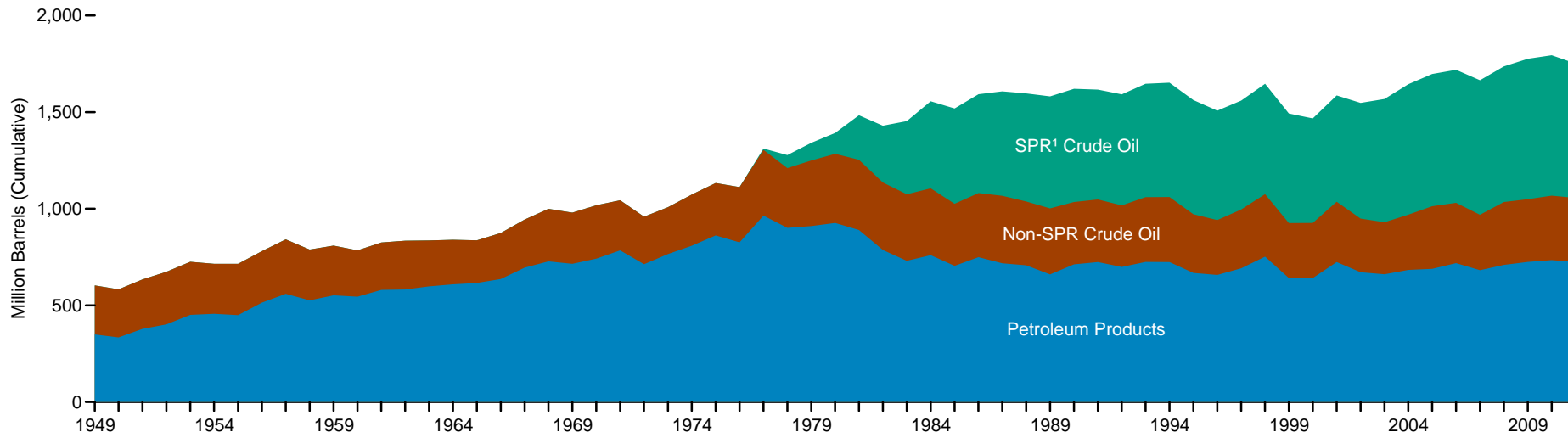
Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all data beginning in

1984. • For related information, see <http://www.eia.gov/petroleum/fueloilkerosene/>.

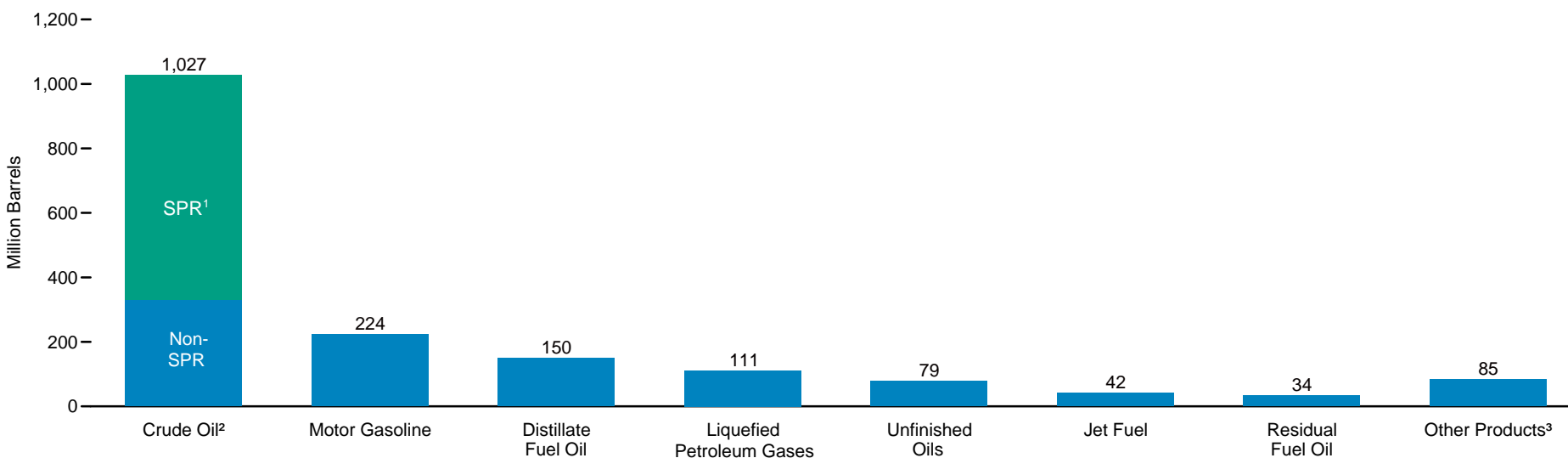
Sources: • 1984—U.S. Energy Information Administration (EIA), *Petroleum Marketing Annual 1988* (October 1989), Tables A1–A3, and unpublished revision. • 1985–2004—EIA, *Fuel Oil and Kerosene Sales*, annual reports, Tables 1–3, and unpublished revisions. • 2005 forward—EIA, *Fuel Oil and Kerosene Sales 2010* (February 2012).

**Figure 5.16 Petroleum Primary Stocks by Type, End of Year**

**Total Stocks and Strategic Petroleum Reserve (SPR) Stocks, 1949-2011**



**By Type, 2011**



<sup>1</sup> Crude oil stocks in the SPR include non-U.S. stocks held under foreign or commercial storage agreements. See Figure 5.17 for additional information about the SPR.

<sup>2</sup> Includes lease condensate and crude oil stored in the Strategic Petroleum Reserve (SPR).

<sup>3</sup> Asphalt and road oil, aviation gasoline and blending components, kerosene, lubricants, naphtha-type jet fuel, pentanes plus, petrochemical feedstocks, petroleum coke, special naphthas, waxes, other hydrocarbons and oxygenates, and miscellaneous products.

Source: Table 5.16.



**Table 5.16 Petroleum Primary Stocks by Type, Selected Years, End of Year 1949-2011**  
(Million Barrels)

Year	Crude Oil and Lease Condensate			Petroleum Products								Total Petroleum	
	SPR <sup>1</sup>	Non-SPR <sup>2,3</sup>	Total <sup>3</sup>	Distillate Fuel Oil <sup>4</sup>	Jet Fuel <sup>5</sup>	Liquefied Petroleum Gases		Motor Gasoline <sup>7</sup>	Residual Fuel Oil	Unfinished Oils	Other Products <sup>8</sup>		Total Products
						Propane <sup>6</sup>	Total						
1949	0	253	253	75	( <sup>5</sup> )	( <sup>9</sup> )	1	110	60	66	37	350	603
1950	0	248	248	72	( <sup>5</sup> )	( <sup>9</sup> )	2	116	41	70	34	334	583
1955	0	266	266	111	3	( <sup>9</sup> )	7	165	39	68	55	449	715
1960	0	240	240	138	7	( <sup>9</sup> )	23	195	45	62	76	545	785
1965	0	220	220	155	19	( <sup>9</sup> )	30	175	56	89	92	616	836
1970	0	276	276	195	28	( <sup>9</sup> )	67	209	54	99	89	741	1,018
1975	0	271	271	209	30	82	125	235	74	106	82	862	1,133
1976	0	285	285	186	32	74	116	231	72	110	78	826	1,112
1977	7	340	348	250	35	81	136	258	90	113	82	964	1,312
1978	67	309	376	216	34	87	132	238	90	109	82	901	1,278
1979	91	339	430	229	39	64	111	237	96	118	82	911	1,341
1980	108	358	466	205	42	65	120	261	92	124	82	926	1,392
1981	230	363	594	192	41	76	135	253	78	111	80	890	1,484
1982	294	350	644	179	37	54	94	235	66	105	70	786	1,430
1983	379	344	723	140	39	48	101	222	49	108	72	731	1,454
1984	451	345	796	161	42	58	101	243	53	94	67	760	1,556
1985	493	321	814	144	40	39	74	223	50	107	67	705	1,519
1986	512	331	843	155	50	63	103	233	47	94	68	750	1,593
1987	541	349	890	134	50	48	97	226	47	93	70	718	1,607
1988	560	330	890	124	44	50	97	228	45	100	70	707	1,597
1989	580	341	921	106	41	32	80	213	44	106	70	660	1,581
1990	586	323	908	132	52	49	98	220	49	99	63	712	1,621
1991	569	325	893	144	49	48	92	219	50	98	72	724	1,617
1992	575	318	893	141	43	39	89	216	43	95	73	699	1,592
1993	587	335	922	141	40	51	106	226	44	88	78	725	1,647
1994	592	337	929	145	47	46	99	215	42	91	84	724	1,653
1995	592	303	895	130	40	43	93	202	37	86	79	668	1,563
1996	566	284	850	127	40	43	86	195	46	88	76	658	1,507
1997	563	305	868	138	44	44	89	210	40	89	81	692	1,560
1998	571	324	895	156	45	65	115	216	45	91	85	752	1,647
1999	567	284	852	125	41	43	89	193	36	86	70	641	1,493
2000	541	286	826	118	45	41	83	196	36	87	77	641	1,468
2001	550	312	862	145	42	66	121	210	41	88	78	724	1,586
2002	599	278	877	134	39	53	106	209	31	76	76	671	1,548
2003	638	269	907	137	39	50	94	207	38	76	71	661	1,568
2004	676	286	961	126	40	55	104	218	42	81	72	683	1,645
2005	685	324	1,008	136	42	57	109	208	37	86	71	689	1,698
2006	689	312	1,001	144	39	62	113	212	42	84	85	719	1,720
2007	697	286	983	134	39	52	96	218	39	81	75	682	1,665
2008	702	326	1,028	146	38	55	113	214	36	83	79	709	1,737
2009	727	325	1,052	166	43	50	102	223	37	80	73	725	1,776
2010	727	<sup>R</sup> 333	<sup>R</sup> 1,060	164	43	49	<sup>R</sup> 108	219	41	81	77	<sup>R</sup> 734	1,794
2011 <sup>P</sup>	696	331	1,027	150	42	55	111	224	34	79	85	725	1,751

<sup>1</sup> "SPR" is the Strategic Petroleum Reserve, which began in 1977. Crude oil stocks in the SPR include non-U.S. stocks held under foreign or commercial storage agreements.

<sup>2</sup> All crude oil and lease condensate stocks other than those in "SPR."

<sup>3</sup> Beginning in 1981, includes stocks of Alaskan crude oil in transit.

<sup>4</sup> Does not include stocks that are held in the Northeast Heating Oil Reserve.

<sup>5</sup> Through 1951, naphtha-type jet fuel is included in the products from which it was blended: in 1952, 71 percent gasoline, 17 percent kerosene, and 12 percent distillate fuel oil. Through 1964, kerosene-type jet fuel is included with kerosene in "Other Products." Beginning in 2005, naphtha-type jet fuel is included in "Other Products."

<sup>6</sup> Includes propylene.

<sup>7</sup> Finished motor gasoline, motor gasoline blending components, and gasohol. Through 1963, also includes aviation gasoline and special naphthas.

<sup>8</sup> Asphalt and road oil, aviation gasoline blending components, kerosene, lubricants, pentanes plus,

petrochemical feedstocks, petroleum coke, waxes, other hydrocarbons and oxygenates, and miscellaneous products. Through 1964, also includes kerosene-type jet fuel. Beginning in 1964, also includes aviation gasoline and special naphthas. Beginning in 2005, also includes naphtha-type jet fuel.

<sup>9</sup> Included in "Liquefied Petroleum Gases Total."

R=Revised. P=Preliminary.

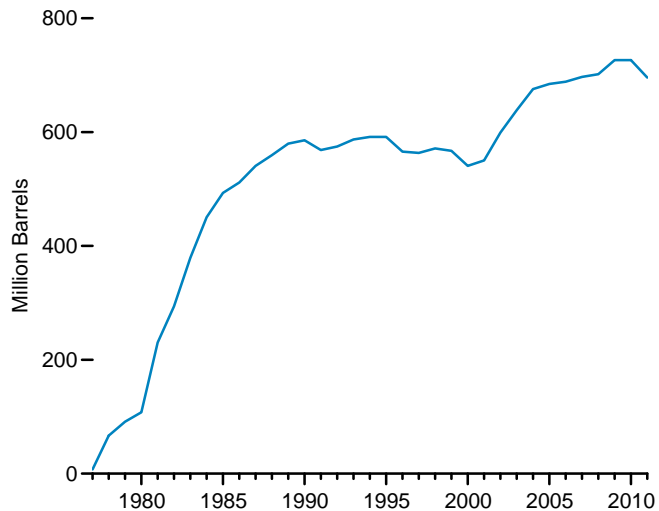
Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#petroleum> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> for related information.

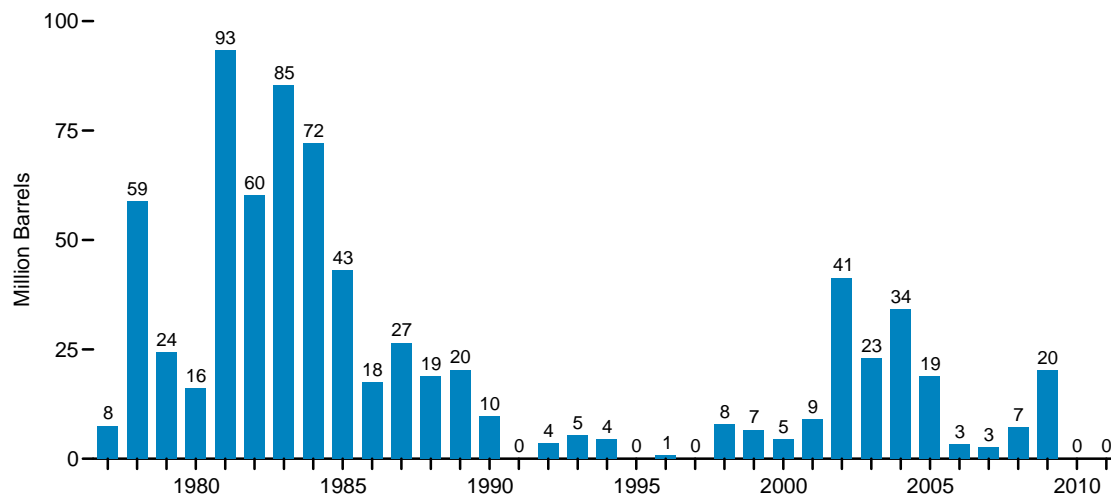
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual, annual reports*. • 1976-1980—U.S. Energy Information Administration (EIA), *Energy Data Reports, Petroleum Statement, Annual, annual reports*. • 1981-2010—EIA, *Petroleum Supply Annual, annual reports*. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.17 Strategic Petroleum Reserve, 1977-2011**

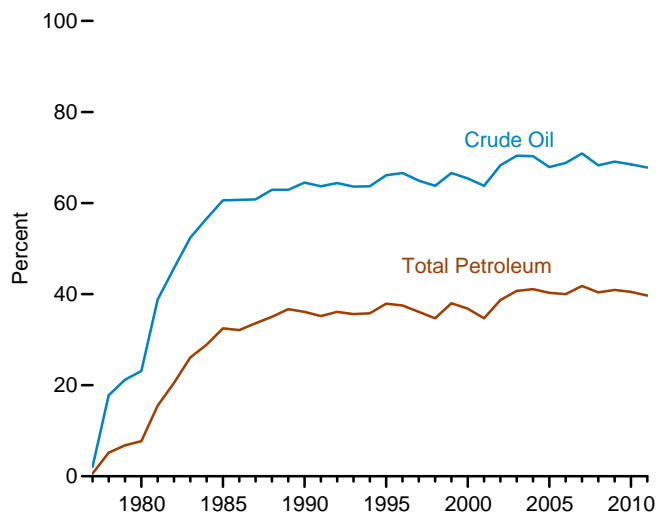
**End-of-Year Stocks in SPR**



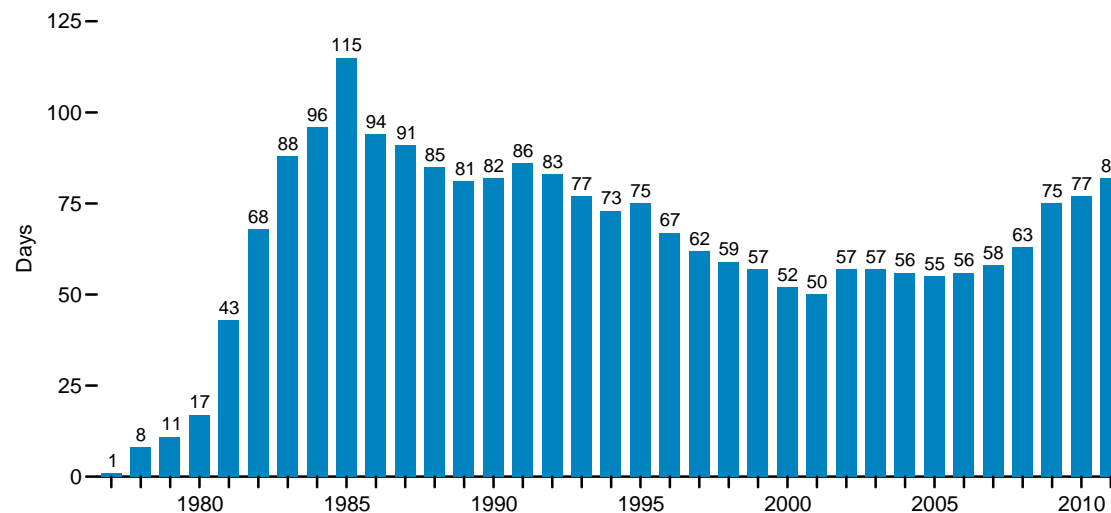
**Crude Oil Imports for SPR<sup>1</sup>**



**SPR as Share of Domestic Stocks**



**SPR Stocks as Days of Petroleum Net Imports<sup>2</sup>**



<sup>1</sup> Imported by SPR and imported by others for SPR.

<sup>2</sup> Derived by dividing end-of-year SPR stocks by annual average daily net imports of all petroleum.

Note: SPR=Strategic Petroleum Reserve.

Source: Table 5.17.

**Table 5.17 Strategic Petroleum Reserve, 1977-2011**

(Million Barrels, Except as Noted)

Year	Foreign Crude Oil Receipts		Domestic Crude Oil Receipts		Withdrawals		End-of-Year Stocks			Days of Petroleum Net Imports <sup>4</sup>
	Imported by SPR	Imported by Others <sup>1,2</sup>	Purchases	Exchanges <sup>2</sup>	Sales	Exchanges	Quantity	Percent of Crude Oil <sup>3</sup> Stocks	Percent of Total Petroleum Stocks	
1977	7.54	0.00	<sup>5</sup> 0.37	0.00	0.00	0.00	7.46	2.1	0.6	1
1978	58.80	.00	.00	.00	.00	.00	66.86	17.8	5.2	8
1979	24.43	.00	(s)	.00	.00	.00	91.19	21.2	6.8	11
1980	16.07	.00	1.30	.00	.00	.00	107.80	23.1	7.7	17
1981	93.30	.00	28.79	.00	.00	.00	230.34	38.8	15.5	43
1982	60.19	.00	3.79	.00	.00	.00	293.83	45.7	20.5	68
1983	85.29	.00	.42	.00	.00	.00	379.09	52.4	26.1	88
1984	72.04	.00	.05	.00	.00	.00	450.51	56.6	28.9	96
1985	43.12	.00	.17	.00	.00	.00	493.32	60.6	32.5	115
1986	17.56	.00	1.21	.00	.00	.00	511.57	60.7	32.1	94
1987	26.52	.00	2.69	.00	.00	.00	540.65	60.8	33.6	91
1988	18.76	.00	.01	.00	.00	.00	559.52	62.9	35.0	85
1989	20.35	.00	.00	.00	.00	.00	579.86	62.9	36.7	81
1990	9.77	.00	.00	.00	3.91	.00	585.69	64.5	36.1	82
1991	.00	.00	.00	.00	17.22	.00	568.51	63.7	35.2	86
1992	3.59	.00	2.60	.00	.00	.00	574.72	64.4	36.1	83
1993	5.37	.00	6.96	.00	.00	.00	587.08	63.6	35.6	77
1994	4.49	.00	.11	.00	.00	.00	591.67	63.7	35.8	73
1995	.00	.00	.00	.00	.00	.00	591.64	66.1	37.9	75
1996	.00	.90	.00	.00	25.82	.90	565.82	66.6	37.5	67
1997	.00	.00	.00	.00	2.33	.00	563.43	64.9	36.1	62
1998	.00	7.98	.00	.00	.00	.00	571.41	63.8	34.7	59
1999	3.04	3.60	.00	1.42	.00	10.75	567.24	66.6	38.0	57
2000	3.01	1.50	.00	2.29	.00	<sup>6</sup> 33.35	540.68	65.4	36.8	52
2001	3.91	5.07	.58	.00	.00	.00	550.24	63.8	34.7	50
2002	5.77	35.59	.00	7.64	.00	.00	599.09	68.3	38.7	57
2003	.00	22.94	.00	16.40	.00	.00	638.39	70.4	40.7	57
2004	.00	34.24	.00	8.47	.00	5.44	675.60	70.3	41.1	56
2005	.00	18.88	.00	8.41	11.03	9.82	684.54	67.9	40.3	55
2006	.00	3.31	.00	2.44	.00	1.57	688.61	68.8	40.0	56
2007	.00	2.70	.00	1.68	.00	.00	696.94	70.9	41.8	58
2008	.00	7.11	.00	3.20	.00	5.40	701.82	68.3	40.4	63
2009	.00	20.29	.00	4.47	.00	.00	726.62	69.1	40.9	75
2010	.00	.00	.00	.38	.00	.40	726.55	<sup>R</sup> 68.5	40.5	77
2011	.00	.00	.00	.00	30.59	.00	695.95	67.8	39.7	82

<sup>1</sup> Imported crude oil received represents volumes of imported crude oil received at SPR storage facilities for which the costs associated with the importation and delivery of crude oil are the responsibility of the commercial importer under contract to supply the SPR.

<sup>2</sup> The values shown for 1998 and 1999 represent an exchange agreement in which SPR received approximately 8.5 million barrels of high quality oil in exchange for approximately 11 million barrels of lower quality crude oil shipped from SPR during 1999 and 2000. Also, beginning in 1999, a portion of the crude oil in-kind royalties from Federal leases in the Gulf of Mexico was transferred to the U.S. Department of Energy and exchanged with commercial entities for crude oil to fill the SPR. Crude oil exchange barrels delivered to SPR could be either domestic or imported as long as the crude oil met the specification requirements of SPR. All exchange barrels of imported crude oil are included in "Foreign Crude Oil Receipts, Imported by Others," while exchange barrels of domestic crude oil are included in "Domestic Crude Oil Receipts, Exchanges."

<sup>3</sup> Includes lease condensate stocks.

<sup>4</sup> Derived by dividing end-of-year SPR stocks by annual average daily net imports of all petroleum. Calculated prior to rounding.

<sup>5</sup> The quantity of domestic fuel oil which was in storage prior to injection of foreign crude oil.

<sup>6</sup> Includes 30 million barrels released to increase heating oil stocks in exchange for a like quantity plus a bonus percentage to be returned in 2001 and 2002, as well as additional barrels to create a Northeast Home Heating Oil Reserve.

R=Revised. (s)=Less than 0.005 million barrels.

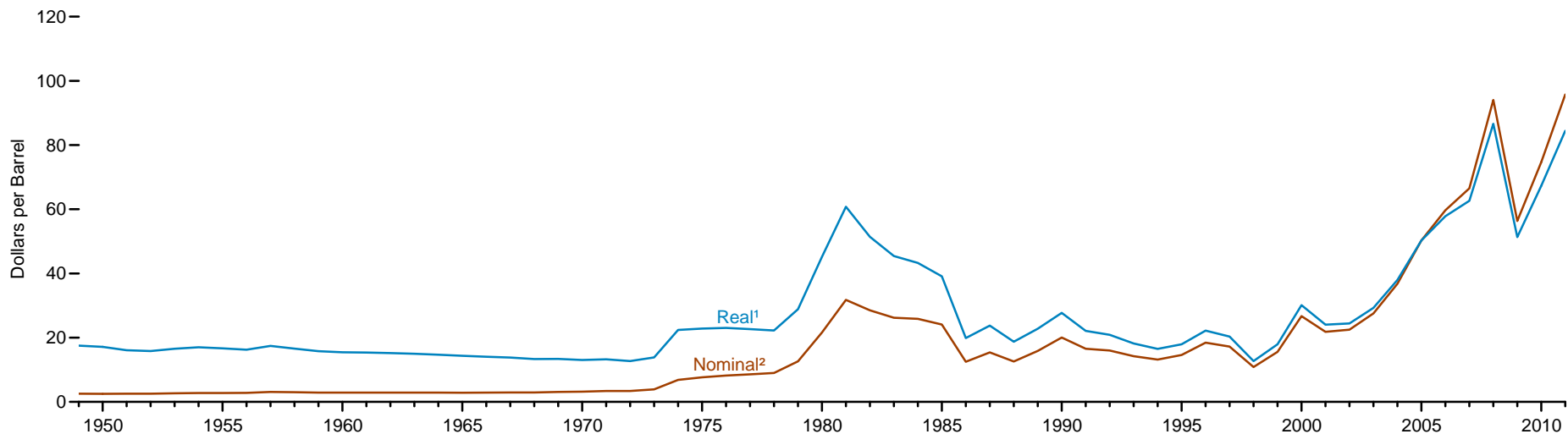
Note: "SPR" is the Strategic Petroleum Reserve—petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.

Web Page: For related information, see <http://www.eia.gov/petroleum/>.

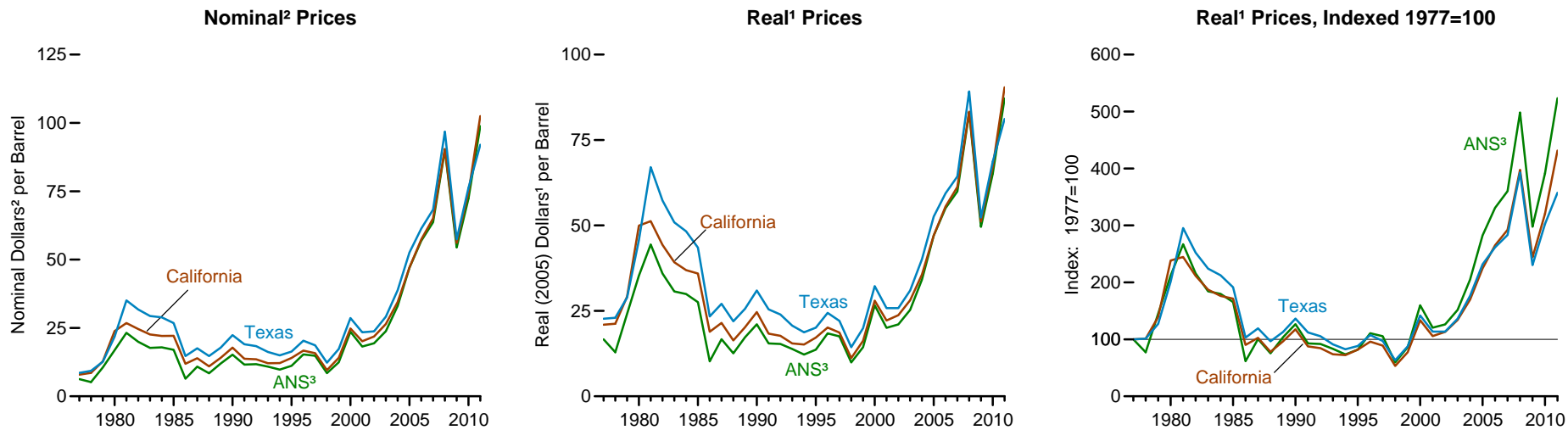
Sources: **Imported by SPR and End-of-Year Stocks, Quantity:** • 1977-1980—U.S. Energy Information Administration (EIA), Energy Data Report, *Petroleum Statement, Annual*, annual reports. • 1981-2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012). **Imported by Others, Domestic Crude Oil Receipts, and Withdrawals:** U.S. Department of Energy, Assistant Secretary for Fossil Energy, unpublished data. **All Other Data:** Calculated.

**Figure 5.18 Crude Oil Domestic First Purchase Prices**

**U.S. Average Prices, 1949-2011**



**Alaska North Slope, California, and Texas 1977-2011**



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>3</sup> Alaska North Slope. Source: Table 5.18.

<sup>2</sup> See "Nominal Dollars" in Glossary.

**Table 5.18 Crude Oil Domestic First Purchase Prices, Selected Years, 1949-2011**

(Dollars per Barrel)

Year	Alaska North Slope		California		Texas		U.S. Average	
	Nominal <sup>1</sup>	Real <sup>2</sup>	Nominal <sup>1</sup>	Real <sup>2</sup>	Nominal <sup>1</sup>	Real <sup>2</sup>	Nominal <sup>1</sup>	Real <sup>2</sup>
1949	--	--	NA	NA	NA	NA	2.54	R17.52
1950	--	--	NA	NA	NA	NA	2.51	R17.13
1955	--	--	NA	NA	NA	NA	2.77	R16.69
1960	NA	NA	NA	NA	NA	NA	2.88	R15.47
1965	NA	NA	NA	NA	NA	NA	2.86	R14.35
1970	NA	NA	NA	NA	NA	NA	3.18	R13.07
1975	NA	NA	NA	NA	NA	NA	7.67	R22.83
1976	NA	NA	NA	NA	NA	NA	8.19	R23.06
1977	<sup>3</sup> R16.29	<sup>3</sup> R16.65	7.92	R20.96	8.58	R22.71	8.57	R22.68
1978	5.21	R12.88	8.58	R21.22	9.29	R22.98	9.00	R22.26
1979	10.57	R24.13	12.78	R29.18	12.65	R28.88	12.64	R28.86
1980	16.87	R35.30	23.87	R49.95	21.84	R45.70	21.59	R45.18
1981	23.23	R44.44	26.80	R51.27	35.06	R67.07	31.77	R60.78
1982	19.92	R35.92	24.58	R44.32	31.77	R57.29	28.52	R51.43
1983	17.69	R30.68	22.61	R39.22	29.35	R50.91	26.19	R45.43
1984	17.91	R29.94	22.09	R36.93	28.87	R48.26	25.88	R43.27
1985	16.98	R27.55	22.14	R35.93	26.80	R43.49	24.09	R39.09
1986	6.45	R10.24	11.90	R18.89	14.73	R23.38	12.51	R19.86
1987	10.83	R16.71	13.92	R21.48	17.55	R27.08	15.40	R23.76
1988	8.43	R12.57	10.97	R16.36	14.71	R21.94	12.58	R18.76
1989	12.00	R17.25	14.06	R20.21	17.81	R25.60	15.86	R22.79
1990	15.23	R21.08	17.81	R24.65	22.37	R30.96	20.03	R27.72
1991	11.57	R15.46	13.72	R18.34	19.04	R25.45	16.54	R22.11
1992	11.73	R15.31	13.55	R17.69	18.32	R23.92	15.99	R20.88
1993	10.84	R13.85	12.11	R15.47	16.19	R20.68	14.25	R18.20
1994	9.77	R12.22	12.12	R15.16	14.98	R18.74	13.19	R16.50
1995	11.12	R13.63	14.00	R17.16	16.38	R20.07	14.62	R17.92
1996	15.32	R18.42	16.72	R20.11	20.31	R24.42	18.46	R22.20
1997	14.84	R17.54	15.78	R18.65	18.66	R22.05	17.23	R20.36
1998	8.47	R9.90	9.55	R11.16	12.28	R14.35	10.87	R12.70
1999	12.46	R14.35	14.08	R16.21	17.29	R19.91	15.56	R17.92
2000	23.62	R26.62	24.82	R27.97	28.60	R32.24	26.72	R30.12
2001	18.18	R20.04	20.11	R22.17	23.41	R25.80	21.84	R24.07
2002	19.37	R21.01	21.87	R23.72	23.77	R25.78	22.51	R24.42
2003	23.78	R25.26	26.43	R28.08	29.13	R30.94	27.56	R29.28
2004	33.03	R34.13	34.47	R35.61	38.79	R40.08	36.77	R37.99
2005	47.05	47.05	47.08	47.08	52.61	52.61	50.28	50.28
2006	56.86	R55.08	57.34	R55.55	61.31	R59.39	59.69	R57.82
2007	63.69	R59.96	65.07	R61.26	68.30	R64.30	66.52	R62.62
2008	90.10	R82.98	90.47	R83.32	96.85	R89.20	94.04	R86.61
2009	54.41	R49.59	56.11	R51.14	57.40	R52.31	56.35	R51.35
2010	72.33	R65.17	74.51	R67.13	76.23	R68.68	74.71	R67.31
2011	98.79	87.15	102.50	90.42	91.99	81.15	95.73	84.45

<sup>1</sup> See "Nominal Dollars" in Glossary.

<sup>2</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>3</sup> Average for July through December only.

R=Revised. NA=Not available. -- =Not applicable.

Note: Prices are for the marketed first sales price of domestic crude oil. See Note 4, "Crude Oil Domestic First Purchase Prices," at end of section.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#prices> for updated monthly and annual

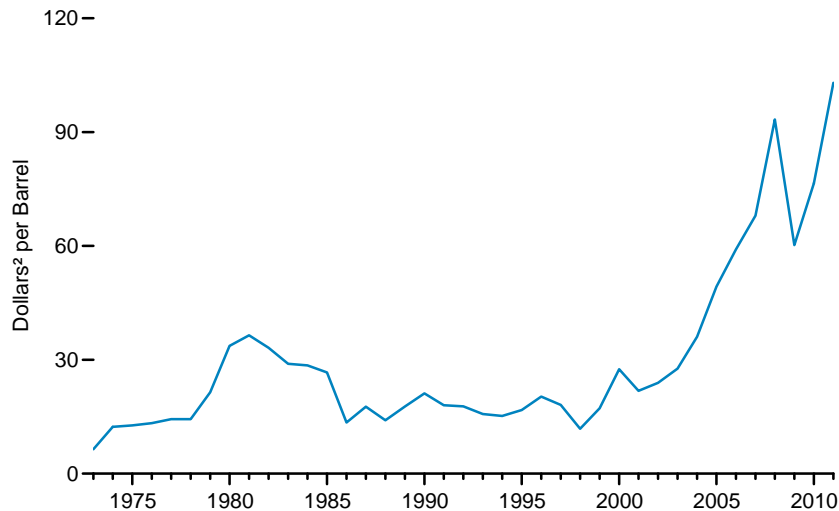
data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949.

• See <http://www.eia.gov/petroleum/> for related information.

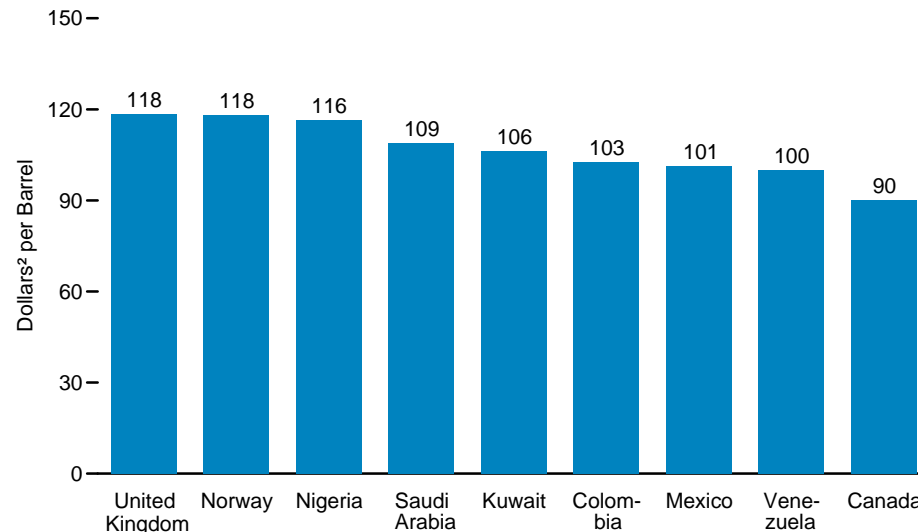
Sources: • 1949-1973—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1974-January 1976—Federal Energy Administration (FEA), Form FEA-90, "Crude Petroleum Production Monthly Report." • February 1976-1977—FEA, Form FEA-P-124, "Domestic Crude Oil Purchaser's Monthly Report." • 1978-1984—U.S. Energy Information Administration (EIA), *Petroleum Marketing Annual*, annual reports. • 1985 forward—EIA, *Petroleum Marketing Monthly* (April 2012), Table 18.

**Figure 5.19 Landed Costs of Crude Oil Imports From Selected Countries**

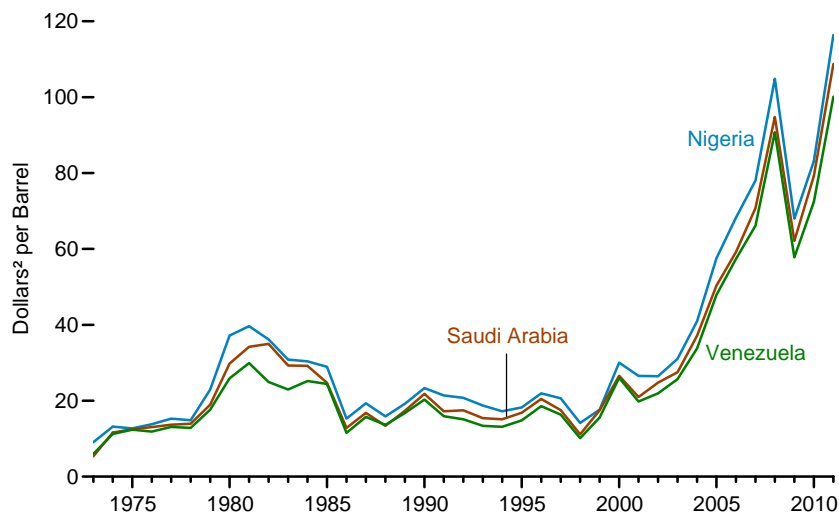
**Total, 1973<sup>1</sup>-2011**



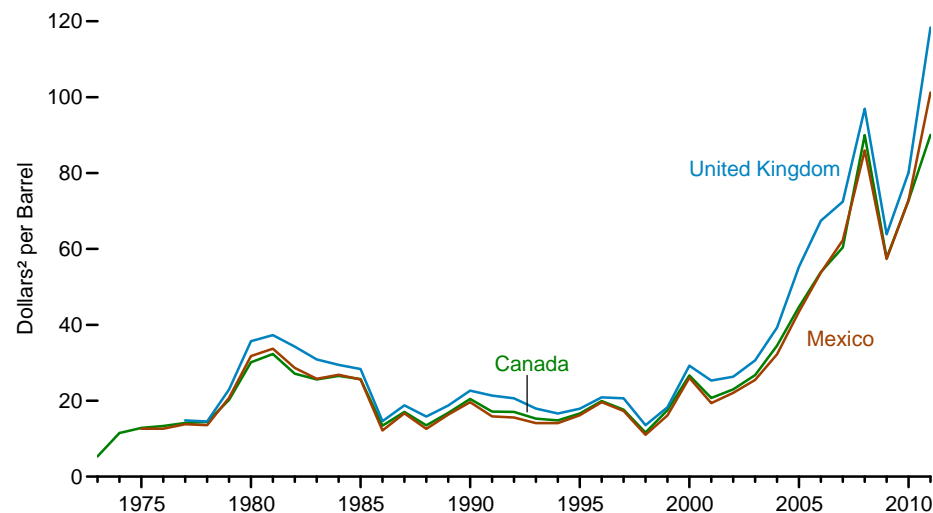
**By Selected Country, 2011**



**By Selected OPEC Country, 1973<sup>1</sup>-2011**



**By Selected Non-OPEC Country, 1973<sup>1</sup>-2011**



<sup>1</sup> 1973 cost is based on October, November, and December data only.

<sup>2</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

Note: OPEC=Organization of the Petroleum Exporting Countries.  
Source: Table 5.19.

**Table 5.19 Landed Costs of Crude Oil Imports From Selected Countries, 1973-2011**

 (Dollars <sup>1</sup> per Barrel)

Year	Persian Gulf <sup>3</sup>	Selected OPEC <sup>2</sup> Countries					Selected Non-OPEC <sup>2</sup> Countries						Total
		Kuwait	Nigeria	Saudi Arabia	Venezuela	Total OPEC <sup>4</sup>	Canada	Colombia	Mexico	Norway	United Kingdom	Total Non-OPEC <sup>4</sup>	
1973 <sup>5</sup>	5.91	W	9.08	5.37	5.99	6.85	5.33	W	–	–	–	5.64	6.41
1974	12.21	W	13.16	11.63	11.25	12.49	11.48	W	W	–	–	11.81	12.32
1975	12.64	W	12.70	12.50	12.36	12.70	12.84	–	–	–	–	12.70	12.70
1976	13.03	W	13.81	13.06	11.89	13.32	13.36	–	–	–	–	13.35	13.32
1977	13.85	W	15.29	13.69	13.11	14.35	14.13	–	–	–	–	14.42	14.36
1978	14.01	W	14.88	13.94	12.84	14.34	14.41	–	–	–	–	14.38	14.35
1979	20.42	W	22.97	18.95	17.65	21.29	20.22	–	–	–	–	22.10	21.45
1980	30.59	W	37.15	29.80	25.92	33.56	30.11	W	–	–	–	33.99	33.67
1981	34.61	–	39.66	34.20	29.91	36.60	32.32	–	–	–	–	36.14	36.47
1982	34.94	–	36.16	34.99	24.93	34.81	27.15	–	–	–	–	31.47	33.18
1983	29.37	–	30.85	29.27	22.94	29.84	25.63	–	–	–	–	28.08	28.93
1984	29.07	W	30.36	29.20	25.19	29.06	26.56	–	–	–	–	28.14	28.54
1985	25.50	–	28.96	24.72	24.43	26.86	25.71	–	–	–	–	26.53	26.67
1986	12.92	11.70	15.29	12.84	11.52	13.46	13.43	12.85	–	–	–	13.52	13.49
1987	17.47	18.14	19.32	16.81	15.76	17.64	17.04	18.43	–	–	–	17.66	17.65
1988	13.51	12.84	15.88	13.37	13.66	14.18	13.50	14.47	–	–	–	13.96	14.08
1989	17.37	16.90	19.19	17.34	16.78	17.78	16.81	18.10	–	–	–	17.54	17.68
1990	20.55	17.01	23.33	21.82	20.31	21.23	20.48	22.34	–	–	–	20.98	21.13
1991	17.34	18.48	21.39	17.22	15.92	18.08	17.16	19.55	–	–	–	17.93	18.02
1992	17.58	16.99	20.78	17.48	15.13	17.81	17.04	18.46	–	–	–	17.67	17.75
1993	15.26	14.23	18.73	15.40	13.39	15.68	15.27	16.54	–	–	–	15.78	15.72
1994	15.00	14.49	17.21	15.11	13.12	15.08	14.83	15.80	–	–	–	15.29	15.18
1995	16.78	16.47	18.25	16.84	14.81	16.61	16.65	17.45	–	–	–	16.95	16.78
1996	20.45	20.32	21.95	20.49	18.59	20.14	19.94	22.02	–	–	–	20.47	20.31
1997	17.44	17.03	20.64	17.52	16.35	17.73	17.63	19.71	–	–	–	18.45	18.11
1998	11.18	11.00	14.14	11.16	10.16	11.46	11.62	13.26	–	–	–	12.22	11.84
1999	17.37	16.77	17.63	17.48	15.58	16.94	17.54	18.09	–	–	–	17.51	17.23
2000	26.77	26.28	30.04	26.58	26.05	27.29	26.69	29.68	–	–	–	27.80	27.53
2001	20.73	19.66	26.55	20.98	19.81	21.52	20.72	25.88	–	–	–	22.17	21.82
2002	24.13	23.04	26.45	24.77	21.93	23.83	22.98	25.28	–	–	–	23.97	23.91
2003	27.54	26.82	31.07	27.50	25.70	27.70	26.76	30.55	–	–	–	27.68	27.69
2004	36.53	35.89	40.95	37.11	33.79	36.84	34.51	39.03	–	–	–	35.29	36.07
2005	49.68	48.36	57.55	50.31	47.87	51.36	44.73	53.42	–	–	–	47.31	49.29
2006	58.92	57.64	68.26	59.19	57.37	61.21	53.90	62.13	–	–	–	57.14	59.11
2007	69.83	66.01	78.01	70.78	66.13	71.14	60.38	70.91	–	–	–	63.96	67.97
2008	93.59	86.35	104.83	94.75	90.76	95.49	90.00	93.43	–	–	–	90.59	93.33
2009	62.15	61.12	68.01	62.14	57.78	61.90	57.60	58.50	–	–	–	58.58	60.23
2010	<sup>R</sup> 78.58	<sup>R</sup> 75.91	<sup>R</sup> 83.15	<sup>R</sup> 79.25	<sup>R</sup> 72.43	<sup>R</sup> 78.27	<sup>R</sup> 72.80	<sup>R</sup> 74.25	–	–	–	<sup>R</sup> 74.67	<sup>R</sup> 76.49
2011 <sup>P</sup>	108.01	106.33	116.40	108.74	100.14	107.83	90.03	102.53	–	–	–	98.76	102.98

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> See "Organization of the Petroleum Exporting Countries (OPEC)" in Glossary.

<sup>3</sup> Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, United Arab Emirates, and the Neutral Zone (between Kuwait and Saudi Arabia).

<sup>4</sup> On this table, "Total OPEC" for all years includes Algeria, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela; for 1973–2008, also includes Indonesia; for 1973–1992 and beginning in 2008, also includes Ecuador (although Ecuador rejoined OPEC in November 2007, on this table Ecuador is included in "Total Non-OPEC" for 2007); for 1974–1995, also includes Gabon (although Gabon was a member of OPEC for only 1975–1994); and beginning in 2007, also includes Angola. Data for all countries not included in "Total OPEC" are included in "Total Non-OPEC."

<sup>5</sup> Based on October, November, and December data only.

R=Revised. P=Preliminary. –=No data reported. W=Value withheld to avoid disclosure of individual

company data.

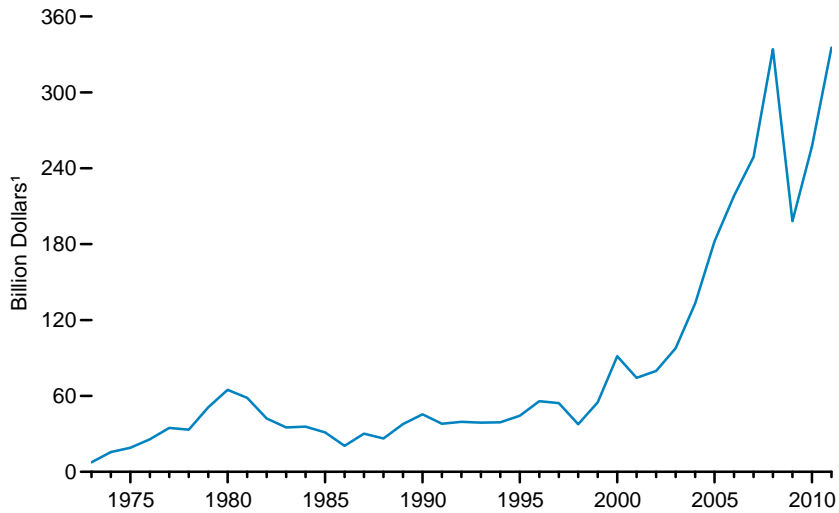
Notes: • Data are for landed costs of crude oil imports only; they do not account for refined petroleum products imported into the United States. • See "Crude Oil Landed Cost" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#prices> for updated monthly and annual data. • See <http://www.eia.gov/petroleum/> for related information.

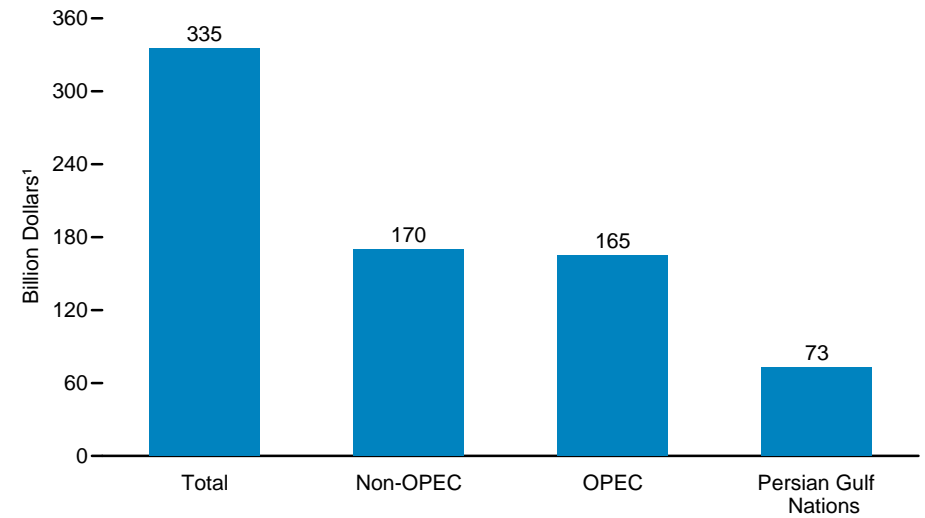
Sources: • 1973–September 1977—Federal Energy Administration, Form FEA-F701-M-0, "Transfer Pricing Report." • October 1977–December 1978—U.S. Energy Information Administration (EIA), Form FEA-F701-M-0, "Transfer Pricing Report." • January 1979–September 1982—EIA, Form ERA-51, "Transfer Pricing Report." • October 1982–June 1984—EIA, Form EP-51, "Monthly Foreign Crude Oil Transaction Report." • July 1984 forward—EIA, *Petroleum Marketing Monthly* (April 2012), Table 22; and EIA, Form EIA-856, "Monthly Foreign Crude Oil Acquisition Report."

**Figure 5.20 Value of Crude Oil Imports**

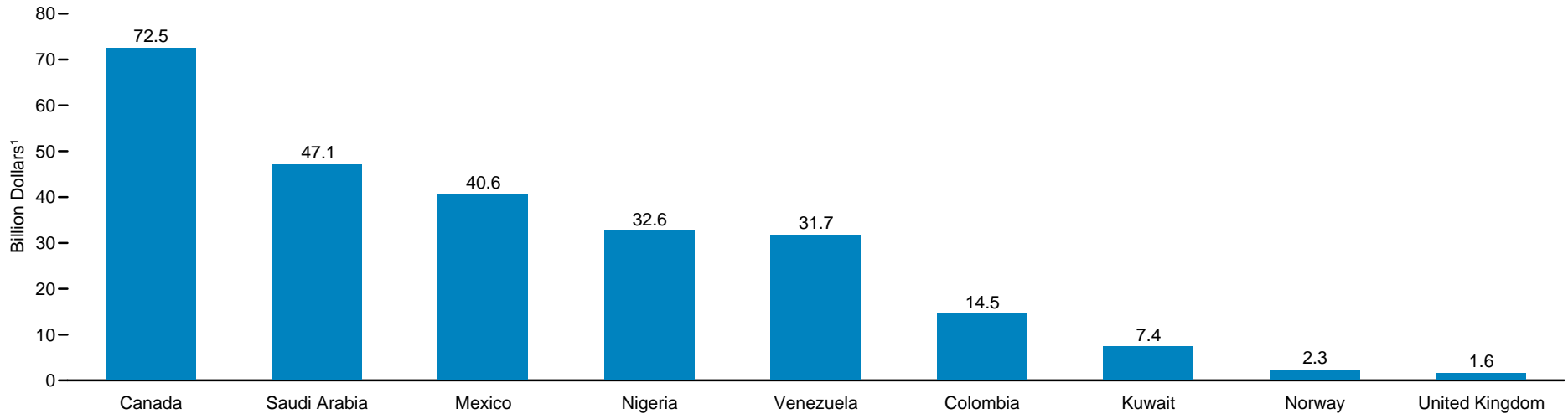
**Total, 1973-2011**



**Totals, 2011**



**By Selected Country, 2011**



<sup>1</sup>Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.  
Note: OPEC=Organization of the Petroleum Exporting Countries.

Source: Table 5.20.



**Table 5.20 Value of Crude Oil Imports From Selected Countries, 1973-2011**

 (Billion Dollars <sup>1</sup>)

Year	Persian Gulf <sup>3</sup>	Selected OPEC <sup>2</sup> Countries					Selected Non-OPEC <sup>2</sup> Countries					Total <sup>5</sup>	
		Kuwait	Nigeria	Saudi Arabia	Venezuela	Total OPEC <sup>4</sup>	Canada	Colombia	Mexico	Norway	United Kingdom		Total Non-OPEC <sup>4</sup>
1973	1.7	W	1.5	0.9	0.8	5.2	1.9	W	—	0.0	0.0	2.4	7.6
1974	4.4	W	3.3	1.9	1.3	11.6	3.3	.0	W	—	.0	4.1	15.6
1975	5.2	W	3.5	3.2	1.8	14.9	2.8	.0	.3	.1	—	4.1	19.0
1976	8.7	W	5.1	5.8	1.0	22.2	1.8	—	.4	.2	W	3.6	25.8
1977	12.2	W	6.3	6.9	1.2	29.6	1.4	.0	.9	.3	.5	5.1	34.7
1978	11.3	W	4.9	5.8	.8	27.1	1.3	.0	1.6	.6	.9	6.2	33.3
1979	15.3	W	9.0	9.3	1.9	39.7	2.0	.0	3.3	.6	1.7	11.3	51.0
1980	16.9	W	11.4	13.6	1.5	47.5	2.2	.0	5.9	1.9	2.3	17.4	64.9
1981	15.1	.0	8.8	13.9	1.6	39.0	1.9	.0	5.8	1.6	5.0	19.5	58.5
1982	8.4	—	6.7	6.8	1.4	22.0	2.1	.0	6.7	1.3	5.5	20.2	42.2
1983	4.3	—	3.4	3.4	1.4	16.1	2.6	.0	7.2	.7	4.1	19.1	35.2
1984	4.8	W	2.3	3.3	2.3	16.1	3.3	.0	6.5	1.2	4.1	19.7	35.8
1985	2.3	—	3.0	1.2	2.7	12.9	4.4	.0	6.7	.3	2.9	18.3	31.2
1986	3.8	.1	2.4	2.9	1.8	10.4	2.8	.3	2.8	.3	1.7	10.2	20.6
1987	6.0	.5	3.7	3.9	2.8	15.5	3.8	.8	3.7	.5	2.1	14.7	30.1
1988	6.7	.4	3.5	4.4	2.2	14.0	3.4	.6	3.1	.3	1.5	12.3	26.3
1989	11.0	1.0	5.6	7.1	3.0	21.9	3.9	.9	4.3	.9	1.1	15.8	37.7
1990	13.5	.5	6.7	9.5	4.9	27.2	4.8	1.1	4.9	.7	1.3	18.2	45.5
1991	11.0	(s)	5.3	10.7	3.9	22.3	4.7	.9	4.4	.6	.8	15.7	38.0
1992	10.5	.2	5.1	10.2	4.6	22.2	5.0	.7	4.5	.9	1.5	17.3	39.5
1993	9.1	1.8	4.9	7.2	4.9	20.7	5.0	.9	4.4	.9	2.0	18.3	38.9
1994	8.8	1.6	3.9	7.2	5.0	19.7	5.3	.8	4.8	1.2	2.4	19.4	39.1
1995	9.1	1.3	4.1	7.7	6.2	21.6	6.3	1.3	6.1	1.7	2.2	22.6	44.3
1996	11.1	1.8	4.8	9.4	8.9	25.3	7.8	1.8	8.7	2.3	1.6	30.5	55.8
1997	10.4	1.6	5.2	8.3	8.3	24.4	7.7	1.9	8.6	2.1	1.3	29.9	54.4
1998	8.3	1.2	3.6	5.7	5.1	17.4	5.4	1.7	5.3	1.1	.8	20.2	37.6
1999	15.0	1.5	4.0	8.8	6.5	26.1	7.5	3.0	7.4	1.8	1.9	28.8	54.9
2000	23.6	2.5	9.6	14.8	11.7	45.4	13.2	3.5	12.5	3.3	3.1	46.0	91.4
2001	20.2	1.7	8.2	12.3	9.3	38.1	10.3	2.5	9.9	2.6	2.3	36.2	74.3
2002	19.5	1.8	5.7	13.7	9.6	35.5	12.1	2.2	12.1	3.4	3.9	44.3	79.8
2003	24.4	2.0	9.4	17.3	11.1	46.3	15.1	1.8	14.6	2.0	4.0	51.4	97.7
2004	32.1	3.2	16.2	20.3	16.0	68.0	20.4	2.0	18.9	2.1	3.4	65.2	133.2
2005	40.0	4.0	22.6	26.5	21.7	90.3	26.7	3.0	24.7	2.4	4.5	91.9	182.2
2006	46.5	3.8	25.8	30.7	23.9	106.9	35.5	3.2	30.9	2.3	3.2	111.4	218.3
2007	53.9	4.2	30.9	37.4	27.7	139.9	41.6	3.6	32.0	1.5	2.7	109.0	248.9
2008	80.1	6.5	35.4	52.1	34.5	189.2	64.4	6.1	37.3	1.1	2.8	145.0	334.2
2009	37.6	4.0	19.3	22.2	20.1	98.4	40.8	5.4	22.9	1.3	2.4	99.7	198.1
2010	R48.6	5.4	R29.8	R31.3	24.1	R130.1	52.4	9.2	R30.6	.8	3.5	R127.2	R257.2
2011 <sup>P</sup>	72.9	7.4	32.6	47.1	31.7	165.1	72.5	14.5	40.6	2.3	1.6	170.2	335.3

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> See "Organization of the Petroleum Exporting Countries (OPEC)" in Glossary.

<sup>3</sup> Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, United Arab Emirates, and the Neutral Zone (between Kuwait and Saudi Arabia).

<sup>4</sup> On this table, "Total OPEC" for all years includes Algeria, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela; for 1973–2008, also includes Indonesia; for 1973–1992 and beginning in 2008, also includes Ecuador (although Ecuador rejoined OPEC in November 2007, on this table Ecuador is included in "Total Non-OPEC" for 2007); for 1974–1995, also includes Gabon (although Gabon was a member of OPEC for only 1975–1994); and beginning in 2007, also includes Angola. Data for all countries not included in "Total OPEC" are included in "Total Non-OPEC."

<sup>5</sup> Data shown here represent landed value; they differ from data in Table 3.7, which are data from U.S.

Customs that represent crude oil value at the port of loading.

R=Revised. P=Preliminary. — = No data reported. (s)=Less than \$0.05 billion. W=Value withheld to avoid disclosure of individual company data.

Notes: • Crude oil import volumes used to calculate values in this table are for the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

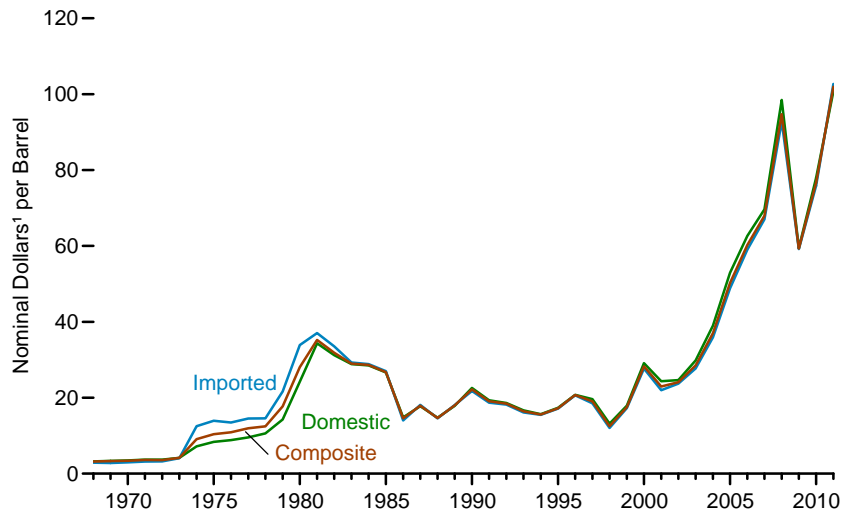
Web Page: For related information, see <http://www.eia.gov/petroleum/>.

Sources: Calculated by using prices on Table 5.19 and volume data from the following sources:

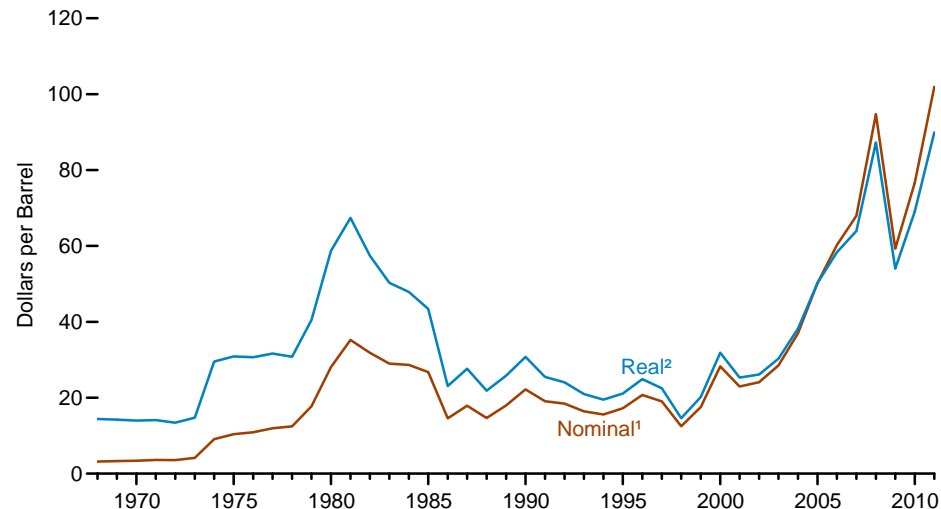
• 1973-1975—U.S. Department of the Interior, Bureau of Mines, *Petroleum Statement, Annual*, annual reports. • 1976-1980—U.S. Energy Information Administration (EIA), *Petroleum Statement, Annual*, annual reports. • 1981-2010—EIA, *Petroleum Supply Annual*, annual reports. • 2011—EIA, *Petroleum Supply Monthly* (February 2012).

**Figure 5.21 Crude Oil Refiner Acquisition Costs, 1968-2011**

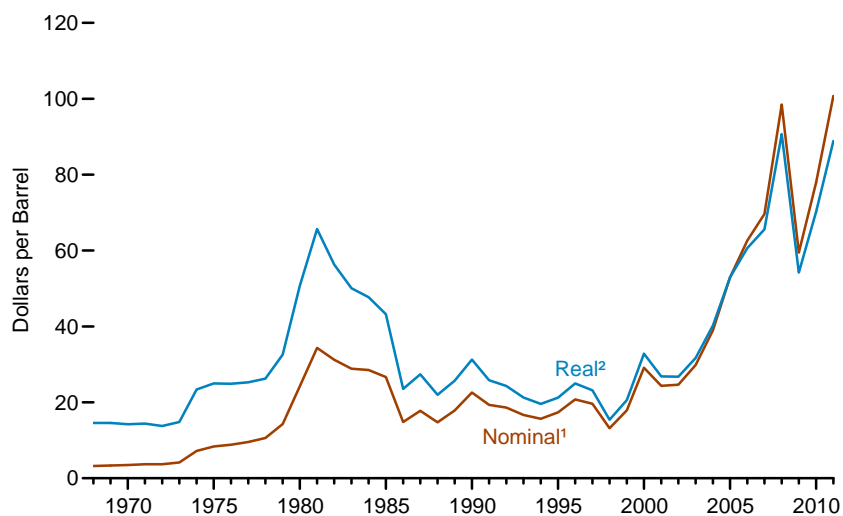
**Summary**



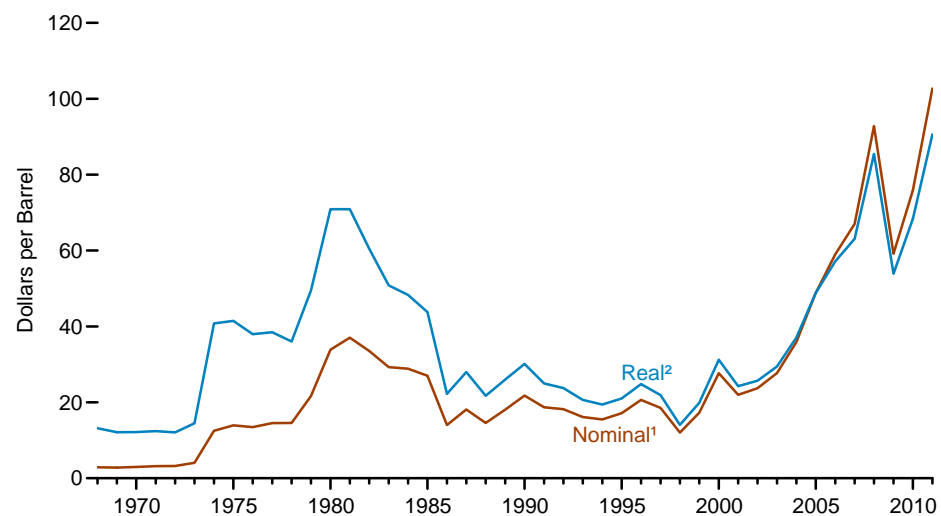
**Composite Costs**



**Domestic Costs**



**Imported Costs**



<sup>1</sup> See "Nominal Dollars" in Glossary.

<sup>2</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

Source: Table 5.21.

**Table 5.21 Crude Oil Refiner Acquisition Costs, 1968-2011**  
(Dollars per Barrel)

Year	Domestic		Imported		Composite	
	Nominal <sup>1</sup>	Real <sup>2</sup>	Nominal <sup>1</sup>	Real <sup>2</sup>	Nominal <sup>1</sup>	Real <sup>2</sup>
1968 <sup>E</sup>	3.21	R14.57	2.90	R13.16	3.17	R14.39
1969 <sup>E</sup>	3.37	R14.58	2.80	R12.11	3.29	R14.23
1970 <sup>E</sup>	3.46	R14.22	2.96	R12.16	3.40	R13.97
1971 <sup>E</sup>	3.68	R14.40	3.17	R12.41	3.60	R14.09
1972 <sup>E</sup>	3.67	R13.77	3.22	R12.08	3.58	R13.43
1973 <sup>E</sup>	4.17	R14.82	4.08	R14.50	4.15	R14.75
1974	7.18	R23.40	12.52	R40.80	9.07	R29.55
1975	8.39	R24.98	13.93	R41.47	10.38	R30.90
1976	8.84	R24.89	13.48	R37.95	10.89	R30.66
1977	9.55	R25.28	14.53	R38.46	11.96	R31.65
1978	10.61	R26.24	14.57	R36.03	12.46	R30.81
1979	14.27	R32.58	21.67	R49.48	17.72	R40.46
1980	24.23	R50.70	33.89	R70.91	28.07	R58.73
1981	34.33	R65.68	37.05	R70.88	35.24	R67.42
1982	31.22	R56.29	33.55	R60.50	31.87	R57.47
1983	28.87	R50.08	29.30	R50.82	28.99	R50.28
1984	28.53	R47.70	28.88	R48.28	28.63	R47.86
1985	26.66	R43.26	26.99	R43.80	26.75	R43.41
1986	14.82	R23.53	14.00	R22.23	14.55	R23.10
1987	17.76	R27.40	18.13	R27.97	17.90	R27.62
1988	14.74	R21.98	14.56	R21.72	14.67	R21.88
1989	17.87	R25.68	18.08	R25.99	17.97	R25.83
1990	22.59	R31.26	21.76	R30.11	22.22	R30.75
1991	19.33	R25.83	18.70	R24.99	19.06	R25.47
1992	18.63	R24.32	18.20	R23.76	18.43	R24.06
1993	16.67	R21.29	16.14	R20.62	16.41	R20.96
1994	15.67	R19.60	15.51	R19.40	15.59	R19.50
1995	17.33	R21.24	17.14	R21.00	17.23	R21.11
1996	20.77	R24.98	20.64	R24.82	20.71	R24.90
1997	19.61	R23.17	18.53	R21.90	19.04	R22.50
1998	13.18	R15.40	12.04	R14.07	12.52	R14.63
1999	17.90	R20.61	17.26	R19.88	17.51	R20.16
2000	29.11	R32.81	27.70	R31.22	28.26	R31.85
2001	24.33	R26.82	22.00	R24.25	22.95	R25.30
2002	24.65	R26.74	23.71	R25.72	24.10	R26.14
2003	29.82	R31.68	27.71	R29.44	28.53	R30.31
2004	38.97	R40.26	35.90	R37.09	36.98	38.21
2005	52.94	52.94	48.86	48.86	50.24	50.24
2006	62.62	R60.66	59.02	R57.17	60.24	R58.35
2007	69.65	R65.57	67.04	R63.11	67.94	R63.96
2008	98.47	R90.69	92.77	R85.44	94.74	R87.25
2009	59.49	R54.22	59.17	R53.92	59.29	R54.03
2010	77.96	R70.24	75.88	R68.37	76.69	R69.10
2011	100.74	88.87	102.70	90.60	101.93	89.92

<sup>1</sup> See "Nominal Dollars" in Glossary.

<sup>2</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.  
R=Revised. E=Estimate.

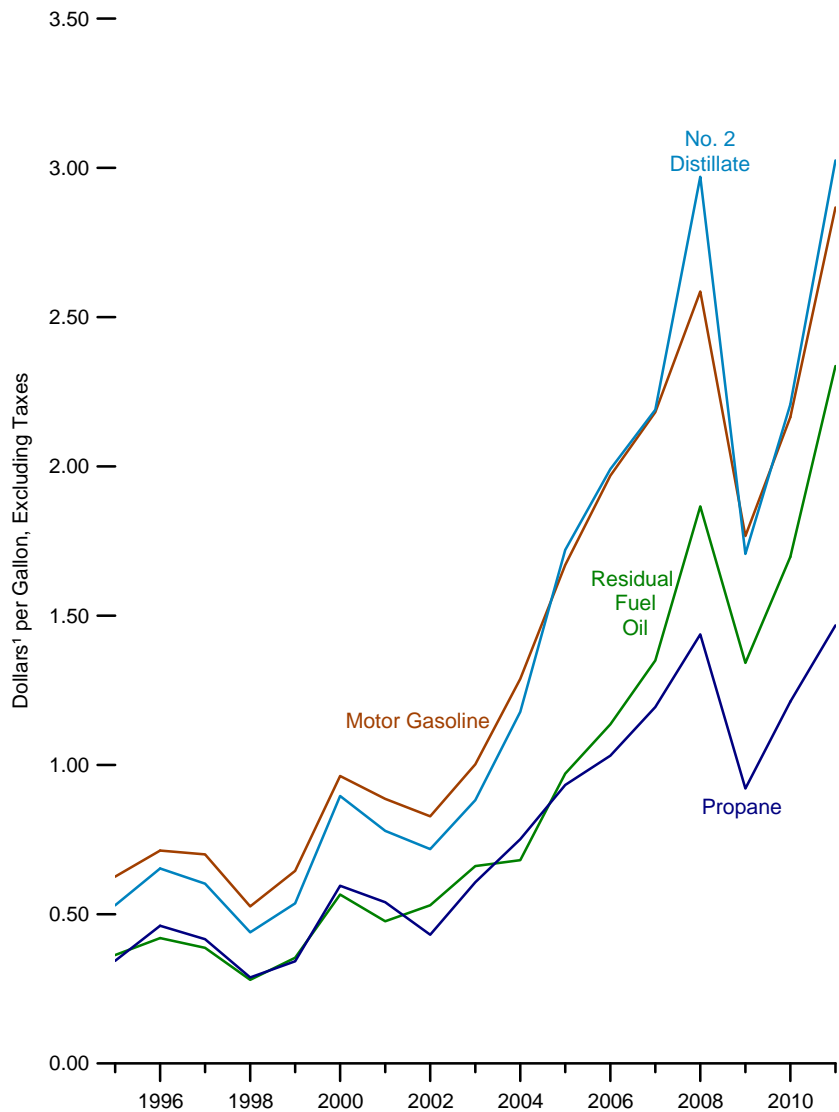
Note: Costs are for crude oil to refiners, including transportation and other fees; they do not include crude oil purchased for the Strategic Petroleum Reserve. The cost for each category and for the composite is derived by dividing the sum of the total purchasing (acquisition) costs of all refiners by the total volume of all refiners' purchases.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#prices> for updated monthly and annual data. • See <http://www.eia.gov/petroleum/> for related information.

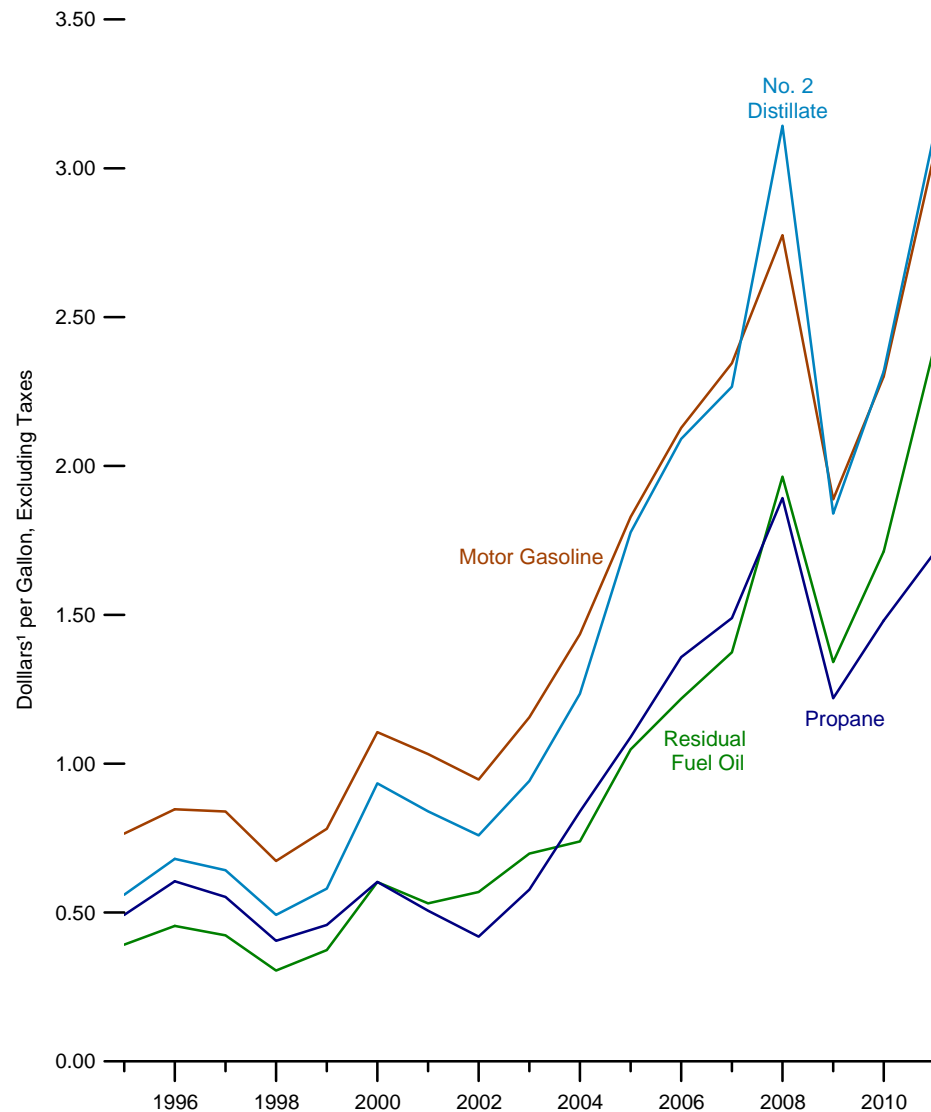
Sources: • 1968-1973—U.S. Energy Information Administration (EIA) estimates. The cost of domestic crude oil was derived by adding estimated transportation costs to the reported average domestic first purchase value. The cost of imported crude oil was derived by adding an estimated ocean transport cost based on the published "Average Freight Rate Assessment" to the average "Free Alongside Ship" value published by the U.S. Bureau of the Census. The composite cost was derived by weighting domestic costs and imported costs on the basis of quantities produced and imported. • 1974-January 1976—Federal Energy Administration (FEA), Form FEA-96, "Monthly Cost Allocation Report." • February 1976-1977—FEA, Form FEA-P110-M-1, "Refiners' Monthly Cost Allocation Report." • 1978-1984—U.S. Energy Information Administration (EIA), *Petroleum Marketing Annual*, annual reports. • 1985 forward—EIA, *Petroleum Marketing Monthly* (April 2012), Table 1.

**Figure 5.22 Refiner Sales Prices for Selected Petroleum Products, 1995-2011**

**To Resellers**



**To End Users**



<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

Source: Table 5.22.

**Table 5.22 Refiner Sales Prices and Refiner Margins for Selected Petroleum Products, 1995-2011**

(Dollars <sup>1</sup> per Gallon, Excluding Taxes)

Product	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Sales Prices to Resellers: <sup>2</sup></b>																	
Aviation Gasoline .....	0.975	1.055	1.065	0.912	1.007	1.330	1.256	1.146	1.288	1.627	2.076	2.490	2.758	3.342	2.480	2.874	3.739
Motor Gasoline .....	.626	.713	.700	.526	.645	.963	.886	.828	1.002	1.288	1.670	1.969	2.182	2.586	1.767	2.165	2.867
Unleaded Regular .....	.593	.685	.673	.499	.620	.942	.865	.806	.981	1.269	1.654	1.950	2.161	2.570	1.747	2.146	2.847
Unleaded Midgrade .....	.670	.759	.749	.576	.696	1.013	.945	.885	1.061	1.340	1.708	2.016	2.245	2.610	1.784	2.185	2.893
Unleaded Premium .....	.722	.803	.792	.617	.726	1.055	.980	.928	1.113	1.408	1.789	2.117	2.357	2.746	1.958	2.346	3.049
Kerosene .....	.580	.714	.653	.465	.550	.969	.821	.752	.955	1.271	1.757	2.007	2.249	2.851	1.844	2.299	3.065
Jet Fuel, Kerosene-Type .....	.539	.646	.613	.450	.533	.880	.763	.716	.871	1.208	1.723	1.961	2.171	3.020	1.719	2.185	3.014
No. 1 Distillate .....	.625	.751	.723	.513	.634	1.019	.883	.805	1.033	1.289	1.801	2.044	2.430	2.712	2.050	2.573	3.223
No. 2 Distillate .....	.530	.653	.602	.439	.536	.896	.779	.718	.882	1.178	1.720	1.991	2.190	2.970	1.707	2.208	3.025
No. 2 Fuel Oil .....	.511	.639	.590	.422	.493	.886	.756	.694	.881	1.125	1.623	1.834	2.072	2.745	1.657	2.147	2.907
No. 2 Diesel Fuel .....	.538	.659	.606	.444	.546	.898	.775	.724	.883	1.187	1.737	2.012	2.203	2.994	1.713	2.214	3.034
No. 4 Fuel <sup>3</sup> .....	.463	.603	.551	.383	.430	.778	.697	.663	.793	1.033	1.377	1.395	1.551	2.157	1.561	W	2.801
Residual Fuel Oil .....	.363	.420	.387	.280	.354	.566	.476	.530	.661	.681	.971	1.136	1.350	1.866	1.342	1.697	2.336
Sulfur <= 1% <sup>4</sup> .....	.383	.456	.415	.299	.382	.627	.523	.546	.728	.764	1.115	1.202	1.406	1.918	1.337	1.756	2.389
Sulfur > 1% <sup>4</sup> .....	.338	.389	.366	.269	.329	.512	.428	.508	.588	.601	.842	1.085	1.314	1.843	1.344	1.679	2.316
Propane (Consumer Grade) .....	.344	.461	.416	.288	.342	.595	.540	.431	.607	.751	.933	1.031	1.194	1.437	.921	1.212	1.467
<b>Sales Prices to End Users: <sup>2</sup></b>																	
Aviation Gasoline .....	1.005	1.116	1.128	.975	1.059	1.306	1.323	1.288	1.493	1.819	2.231	2.682	2.849	3.273	2.442	3.028	3.803
Motor Gasoline .....	.765	.847	.839	.673	.781	1.106	1.032	.947	1.156	1.435	1.829	2.128	2.345	2.775	1.888	2.301	3.050
Unleaded Regular .....	.717	.807	.798	.630	.742	1.073	.997	.912	1.123	1.404	1.802	2.099	2.315	2.748	1.856	2.270	3.021
Unleaded Midgrade .....	.808	.896	.895	.728	.835	1.168	1.100	1.010	1.218	1.499	1.893	2.213	2.438	2.879	1.997	2.416	3.165
Unleaded Premium .....	.890	.972	.973	.805	.906	1.242	1.175	1.088	1.305	1.596	1.992	2.320	2.552	2.965	2.122	2.536	3.283
Kerosene .....	.589	.740	.745	.501	.605	1.123	1.045	.990	1.224	1.160	1.957	2.244	2.263	3.283	2.675	3.063	3.616
Jet Fuel, Kerosene-Type .....	.540	.651	.613	.452	.543	.899	.775	.721	.872	1.207	1.735	1.998	2.165	3.052	1.704	2.201	3.054
No. 1 Distillate .....	.620	.726	.689	.551	.621	.988	.902	.828	1.017	1.262	1.832	2.137	2.286	2.983	2.141	2.705	3.467
No. 2 Distillate .....	.560	.680	.642	.492	.580	.934	.840	.759	.942	1.235	1.777	2.091	2.266	3.143	1.840	2.318	3.119
No. 2 Fuel Oil .....	.562	.673	.636	.482	.558	.927	.829	.737	.933	1.173	1.705	1.982	2.241	2.986	1.962	2.462	3.193
No. 2 Diesel Fuel .....	.560	.681	.642	.494	.584	.935	.842	.762	.944	1.243	1.786	2.096	2.267	3.150	1.834	2.314	3.117
No. 4 Fuel <sup>3</sup> .....	.505	.603	.565	.428	.474	.769	.679	.657	.856	1.017	W	W	W	W	W	W	W
Residual Fuel Oil .....	.392	.455	.423	.305	.374	.602	.531	.569	.698	.739	1.048	1.218	1.374	1.964	1.341	1.713	2.401
Sulfur <= 1% <sup>4</sup> .....	.436	.526	.488	.354	.405	.708	.642	.640	.804	.835	1.168	1.342	1.436	2.144	1.413	1.920	2.736
Sulfur > 1% <sup>4</sup> .....	.377	.433	.403	.287	.362	.566	.492	.544	.651	.692	.974	1.173	1.350	1.889	1.306	1.619	2.257
Propane (Consumer Grade) .....	.492	.605	.552	.405	.458	.603	.506	.419	.577	.839	1.089	1.358	1.489	1.892	1.220	1.481	1.709
<b>Refiner Margins <sup>5</sup></b>																	
Motor Gasoline .....	.216	.220	.247	.228	.228	.290	.340	.254	.323	.408	.474	.535	.564	.330	.355	.339	.440
Jet Fuel, Kerosene-Type .....	.129	.153	.160	.152	.116	.207	.217	.142	.192	.328	.527	.527	.553	.764	.307	.359	.587
No. 2 Distillate .....	.120	.160	.149	.141	.119	.223	.233	.144	.203	.298	.524	.557	.572	.714	.295	.382	.598
Residual Fuel Oil .....	-.048	-.072	-.066	-.018	-.063	-.107	-.070	-.044	-.018	-.199	-.225	-.298	-.268	-.390	-.070	-.129	-.091
Composite <sup>6</sup> .....	.181	.194	.200	.195	.189	.261	.297	.216	.281	.367	.484	.530	.553	.453	.328	.344	.481

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Sales for resale (wholesale sales) are those made to purchasers who are other than ultimate consumers. Sales to end users are those made directly to the ultimate consumer, including bulk customers, such as agriculture, industry, and utilities, as well as residential and commercial customers.

<sup>3</sup> Includes No. 4 fuel oil and No. 4 diesel fuel.

<sup>4</sup> Sulfur content by weight.

<sup>5</sup> In this table, refiner margin is the difference between the composite refiner acquisition price of crude oil (see Table 5.21) and the price to resellers.

<sup>6</sup> A volume weighted average of the refiner prices to resellers for aviation gasoline, kerosene-type jet fuel, kerosene, motor gasoline, distillate fuel nos. 1, 2, and 4, and residual fuel oil.

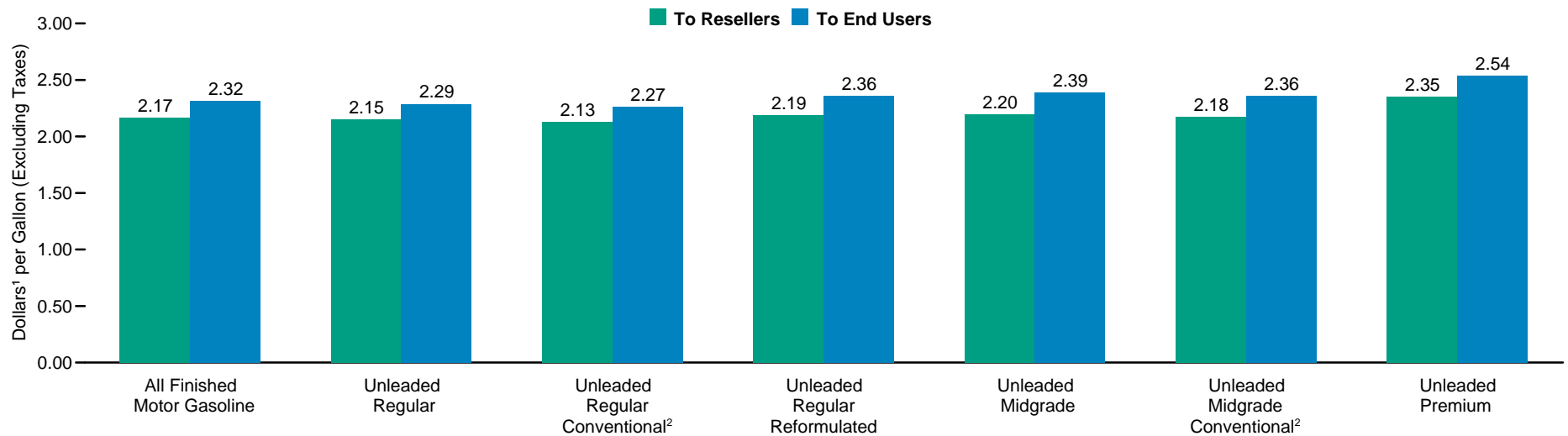
W=Value withheld to avoid disclosure of individual company data.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#prices> for updated monthly and annual data. • See <http://www.eia.gov/petroleum/> for related information.

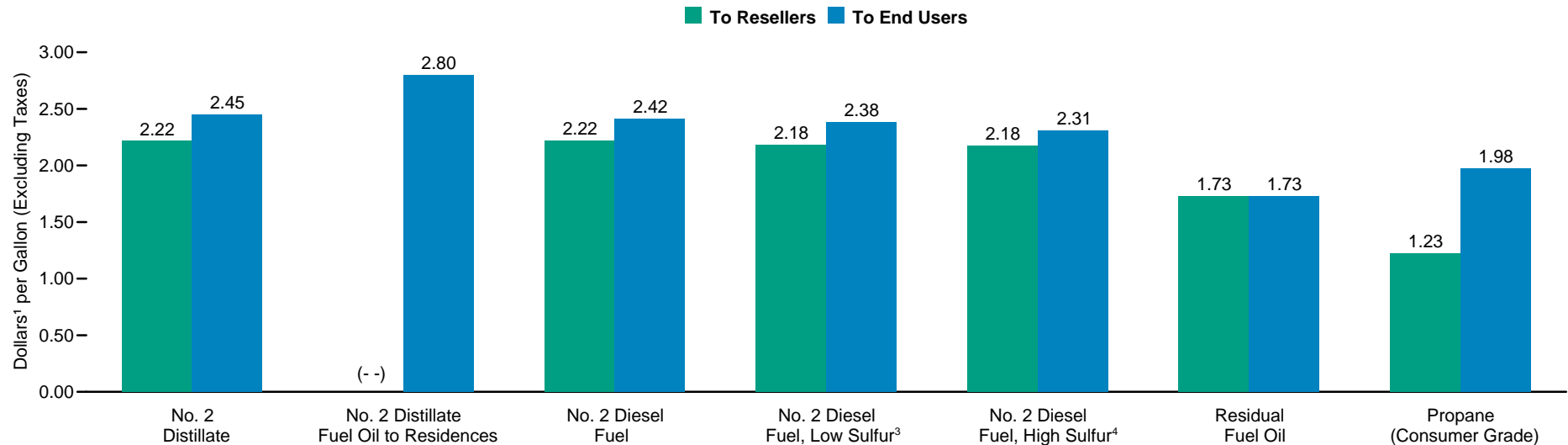
Source: U.S. Energy Information Administration, *Petroleum Marketing Monthly* (April 2012), Tables 1, 2, 4, 6, and 16.

**Figure 5.23 All Sellers Sales Prices for Selected Petroleum Products, 2010**

**Motor Gasoline, Selected Grades**



**Distillate Fuel Oil, Residual Fuel Oil, and Propane**



<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Includes oxygenated motor gasoline.

<sup>3</sup> > 15 and <= 500 parts per million.

<sup>4</sup> > 500 parts per million.

- - = Not applicable.

Note: Data are preliminary.

Source: Table 5.23.

**Table 5.23 All Sellers Sales Prices for Selected Petroleum Products, 1994-2010**

(Dollars <sup>1</sup> per Gallon, Excluding Taxes)

Product	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Sales Prices to Resellers <sup>2</sup></b>																	
Motor Gasoline .....	0.602	0.630	0.715	0.703	0.530	0.645	0.966	0.888	0.832	1.001	1.288	1.675	1.973	2.186	2.587	1.773	2.169
Unleaded Regular .....	.571	.599	.689	.677	.504	.621	.946	.868	.813	.982	1.271	1.659	1.956	2.165	2.570	1.753	2.151
Conventional <sup>3</sup> .....	.565	.583	.672	.658	.484	.596	.918	.838	.794	.950	1.241	1.639	1.930	<sup>3</sup> 2.145	<sup>3</sup> 2.564	<sup>3</sup> 1.732	<sup>3</sup> 2.133
Oxygenated <sup>3</sup> .....	.627	.662	.745	.754	.575	.690	1.016	.947	.858	1.031	1.289	1.667	1.951	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Reformulated .....	.632	.646	.733	.725	.551	.676	1.006	.930	.856	1.058	1.339	1.708	2.022	2.215	2.583	1.799	2.187
Unleaded Midgrade .....	.641	.673	.760	.751	.579	.694	1.014	.945	.886	1.056	1.338	1.719	2.024	2.252	2.636	1.803	2.196
Conventional <sup>3</sup> .....	.633	.651	.737	.723	.550	.658	.977	.901	.852	1.015	1.304	1.697	1.992	<sup>3</sup> 2.235	<sup>3</sup> 2.611	<sup>3</sup> 1.777	<sup>3</sup> 2.176
Oxygenated <sup>3</sup> .....	.689	.711	.789	.791	.599	.695	1.021	.965	.885	1.043	1.305	1.682	1.999	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Reformulated .....	.722	.719	.802	.801	.632	.758	1.080	1.022	.952	1.150	1.410	1.790	2.127	2.311	2.730	1.903	2.275
Unleaded Premium .....	.696	.724	.804	.794	.618	.724	1.055	.980	.929	1.105	1.400	1.792	2.122	2.362	2.749	1.959	2.350
Conventional <sup>3</sup> .....	.686	.695	.777	.764	.587	.688	1.013	.933	.897	1.055	1.351	1.756	2.083	<sup>3</sup> 2.330	<sup>3</sup> 2.743	<sup>3</sup> 1.932	<sup>3</sup> 2.327
Oxygenated <sup>3</sup> .....	.757	.787	.851	.856	.674	.779	1.119	1.020	.952	1.131	1.390	1.761	2.049	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Reformulated .....	.769	.779	.851	.845	.671	.787	1.117	1.054	.986	1.189	1.467	1.844	2.181	2.407	2.757	1.994	2.376
No. 2 Distillate .....	.529	.536	.660	.611	.450	.538	.901	.785	.728	.891	1.178	1.727	1.999	2.208	2.975	1.727	2.216
No. 2 Diesel Fuel .....	.538	.546	.667	.616	.454	.552	.904	.791	.735	.891	1.191	1.754	2.029	2.230	3.013	1.730	2.219
Ultra-Low Sulfur (<= 15 ppm <sup>4</sup> ) .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.258	3.022	1.742	2.222
Low Sulfur (> 15 and <= 500 ppm <sup>4</sup> ) .....	.542	.551	.673	.619	.457	.557	.909	.794	.738	.895	1.197	1.761	2.045	2.211	2.983	1.648	2.180
High Sulfur (> 500 ppm <sup>4</sup> ) .....	.519	.524	.639	.602	.437	.519	.875	.771	.712	.870	1.146	1.704	1.915	1.959	2.887	1.724	2.177
Residual Fuel Oil .....	.322	.366	.427	.396	.284	.355	.579	.496	.526	.675	.682	1.006	1.141	1.342	1.851	1.341	1.727
Sulfur <= 1% <sup>5</sup> .....	.350	.383	.461	.424	.305	.382	.638	.542	.548	.732	.740	1.107	1.205	1.377	1.898	1.349	1.812
Sulfur > 1% <sup>5</sup> .....	.298	.344	.397	.375	.271	.333	.523	.438	.502	.621	.638	.899	1.087	1.314	1.821	1.337	1.694
Propane (Consumer Grade) .....	.336	.354	.471	.426	.297	.354	.603	.556	.440	.615	.761	.939	1.041	1.206	1.455	.955	1.226
<b>Sales Prices to End Users <sup>2</sup></b>																	
Motor Gasoline .....	.729	.761	.843	.831	.660	.762	1.091	1.022	.943	1.135	1.423	1.828	2.121	2.338	2.772	1.893	2.316
Unleaded Regular .....	.690	.721	.809	.797	.623	.728	1.063	.993	.915	1.108	1.399	1.807	2.098	2.313	2.750	1.867	2.290
Conventional <sup>3</sup> .....	.685	.714	.801	.785	.610	.708	1.044	.968	.901	1.082	1.373	1.789	2.073	<sup>3</sup> 2.297	<sup>3</sup> 2.731	<sup>3</sup> 1.842	<sup>3</sup> 2.267
Oxygenated <sup>3</sup> .....	.737	.773	.861	.887	.694	.782	1.118	1.059	.964	1.142	1.414	1.768	2.076	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Reformulated .....	.743	.741	.833	.822	.651	.777	1.109	1.051	.949	1.183	1.478	1.861	2.168	2.357	2.807	1.944	2.358
Unleaded Midgrade .....	.770	.802	.885	.880	.711	.812	1.146	1.086	1.002	1.195	1.482	1.877	2.183	2.412	2.846	1.969	2.390
Conventional <sup>3</sup> .....	.766	.793	.874	.865	.695	.787	1.122	1.052	.985	1.166	1.453	1.855	2.151	<sup>3</sup> 2.389	<sup>3</sup> 2.816	<sup>3</sup> 1.934	<sup>3</sup> 2.357
Oxygenated <sup>3</sup> .....	.821	.838	.929	.964	.763	.853	1.185	1.120	1.031	1.193	1.459	1.824	2.138	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Reformulated .....	.851	.829	.916	.915	.748	.869	1.197	1.156	1.042	1.277	1.569	1.945	2.273	2.476	2.936	2.077	2.494
Unleaded Premium .....	.852	.883	.962	.955	.786	.880	1.218	1.154	1.081	1.282	1.580	1.988	2.303	2.529	2.961	2.124	2.542
Conventional <sup>3</sup> .....	.846	.871	.950	.939	.769	.856	1.192	1.119	1.063	1.245	1.538	1.958	2.263	<sup>3</sup> 2.497	<sup>3</sup> 2.935	<sup>3</sup> 2.082	<sup>3</sup> 2.504
Oxygenated <sup>3</sup> .....	.908	.938	1.019	1.054	.845	.940	1.279	1.218	1.128	1.307	1.568	1.915	2.236	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )
Reformulated .....	.937	.914	.991	.988	.822	.931	1.267	1.217	1.116	1.355	1.660	2.043	2.373	2.584	3.004	2.196	2.607
No. 2 Distillate .....	.675	.673	.793	.753	.599	.678	1.044	.948	.874	1.058	1.339	1.895	2.176	2.365	3.222	1.964	2.449
No. 2 Distillate to Residences <sup>6</sup> .....	.884	.867	.989	.984	.852	.876	1.311	1.250	1.129	1.355	1.548	2.052	2.365	2.592	3.219	2.386	2.798
No. 2 Diesel Fuel .....	.628	.636	.757	.714	.562	.654	1.006	.912	.837	1.008	1.316	1.886	2.165	2.348	3.230	1.918	2.415
Ultra-Low Sulfur (<= 15 ppm <sup>4</sup> ) .....	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.386	3.233	1.922	2.423
Low Sulfur (> 15 and <= 500 ppm <sup>4</sup> ) .....	.642	.645	.767	.719	.565	.663	1.014	.917	.841	1.014	1.325	1.899	2.183	2.317	3.232	1.913	2.381
High Sulfur (> 500 ppm <sup>4</sup> ) .....	.598	.614	.732	.698	.555	.620	.981	.892	.822	.986	1.281	1.833	2.084	2.187	3.187	1.865	2.308
Residual Fuel Oil .....	.358	.397	.464	.429	.311	.378	.609	.533	.561	.696	.725	1.041	1.212	1.376	1.944	1.340	1.729
Sulfur <= 1% <sup>5</sup> .....	.403	.433	.529	.472	.356	.406	.683	.620	.612	.785	.794	1.148	1.322	1.445	2.098	1.422	1.953
Sulfur > 1% <sup>5</sup> .....	.327	.376	.430	.407	.292	.366	.576	.498	.540	.651	.687	.985	1.175	1.354	1.896	1.312	1.662
Propane (Consumer Grade) .....	.776	.766	.886	.878	.774	.781	1.048	1.094	.958	1.150	1.307	1.530	1.727	1.888	2.245	1.777	1.976

<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Sales for resale (wholesale sales) are those made to purchasers who are other than ultimate consumers. Sales to end users are those made directly to the ultimate consumer, including bulk customers, such as agriculture, industry, and utilities, as well as residential and commercial customers.

<sup>3</sup> Beginning in 2007, oxygenated motor gasoline is included with conventional motor gasoline.

<sup>4</sup> Parts per million.

<sup>5</sup> Sulfur content by weight.

<sup>6</sup> See Note 5, "Historical Residential Heating Oil Prices," at end of section for historical data.

NA=Not available.

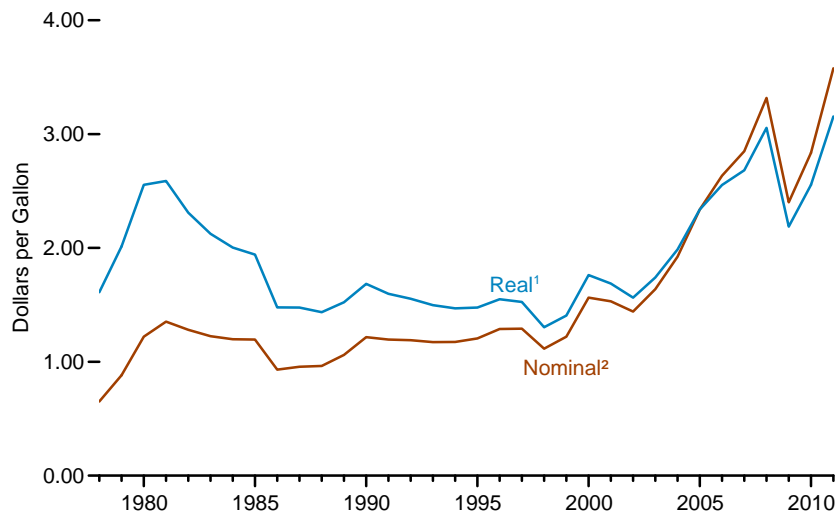
Note: Data for this table are not available for 2011.

Web Page: For related information, see <http://www.eia.gov/petroleum/>.

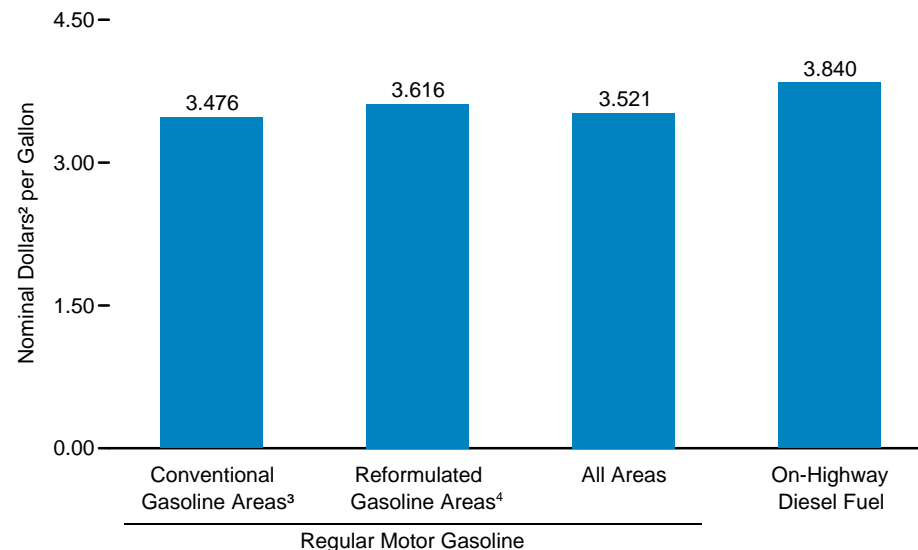
Sources: • 1994-2009—U.S. Energy Information Administration (EIA), *Petroleum Marketing Annual*, annual reports. • 2010—EIA, *Petroleum Marketing Monthly* (April 2011); EIA, Form EIA-782A, "Refiners/Gas Plant Operators' Monthly Petroleum Product Sales Report"; and EIA, Form EIA-782B, "Resellers/Retailers' Monthly Petroleum Product Sales Report."

**Figure 5.24 Retail Motor Gasoline and On-Highway Diesel Fuel Prices**

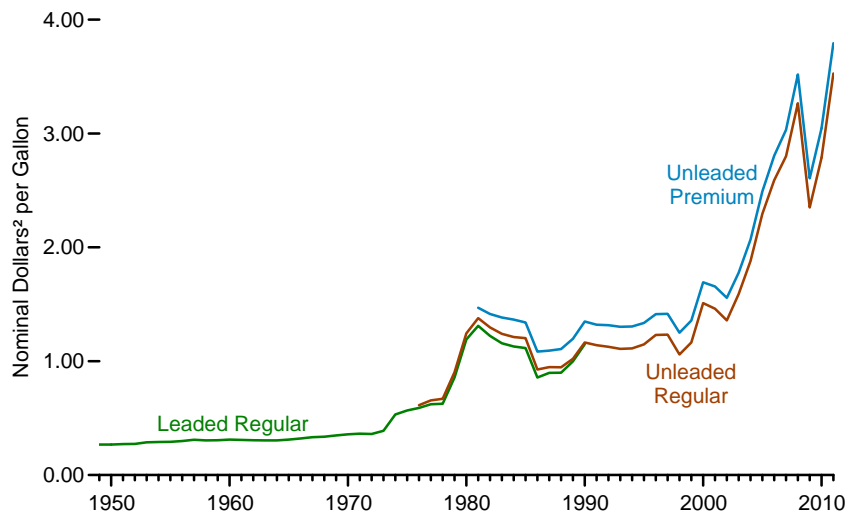
**Motor Gasoline, All Grades, 1978-2011**



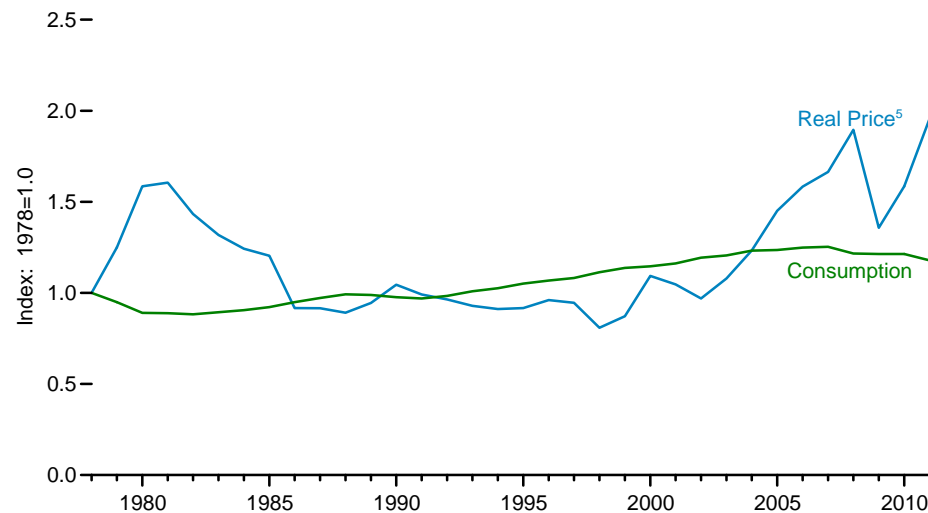
**Regular Motor Gasoline by Area Type and On-Highway Diesel Fuel, 2011**



**Motor Gasoline by Grade, 1949-2011**



**Motor Gasoline Price and Consumption, 1978-2011, Indexed to 1978**



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>2</sup> See "Nominal Dollars" in Glossary.

<sup>3</sup> Any area that does not require the sale of reformulated gasoline.

<sup>4</sup> "Reformulated Gasoline Areas" are ozone nonattainment areas designated by the Environmental Protection Agency that require the use of reformulated gasoline.

<sup>5</sup> All grades, in chained (2005) dollars.

Sources: Tables 5.11 and 5.24.



**Table 5.24 Retail Motor Gasoline and On-Highway Diesel Fuel Prices, Selected Years, 1949-2011**

(Dollars per Gallon)

Year	Motor Gasoline by Grade								Regular Motor Gasoline by Area Type			On-Highway Diesel Fuel
	Leaded Regular		Unleaded Regular		Unleaded Premium		All Grades		Conventional Gasoline Areas <sup>1,2</sup>	Reformulated Gasoline Areas <sup>3,4</sup>	All Areas	
	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Nominal <sup>5</sup>	Nominal <sup>5</sup>	
1949	0.268	R1.848	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1950	.268	R1.829	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1955	.291	R1.753	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1960	.311	R1.671	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1965	.312	R1.565	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1970	.357	R1.467	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1975	.567	R1.688	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1976	.590	R1.661	.614	R1.729	NA	NA	NA	NA	NA	NA	NA	NA
1977	.622	R1.646	.656	R1.736	NA	NA	NA	NA	NA	NA	NA	NA
1978	R.627	R1.551	.670	R1.657	NA	NA	.652	R1.612	NA	NA	NA	NA
1979	R.857	R1.957	.903	R2.062	NA	NA	.882	R2.014	NA	NA	NA	NA
1980	1.191	R2.492	1.245	R2.605	NA	NA	1.221	R2.555	NA	NA	NA	NA
1981	1.311	R2.508	1.378	R2.636	71.470	7R2.812	1.353	R2.588	NA	NA	NA	NA
1982	1.222	R2.203	1.296	R2.337	1.415	R2.551	1.281	R2.310	NA	NA	NA	NA
1983	R1.158	2.009	1.241	R2.153	1.383	R2.399	1.225	R2.125	NA	NA	NA	NA
1984	1.129	R1.887	1.212	R2.026	1.366	R2.284	1.198	R2.003	NA	NA	NA	NA
1985	1.115	R1.809	1.202	R1.950	1.340	R2.174	1.196	R1.941	NA	NA	NA	NA
1986	.857	R1.361	.927	R1.472	1.085	R1.722	.931	R1.478	NA	NA	NA	NA
1987	.897	R1.384	.948	R1.463	1.093	R1.686	.957	R1.476	NA	NA	NA	NA
1988	R.900	1.342	.946	R1.411	1.107	R1.651	R.964	1.438	NA	NA	NA	NA
1989	R.997	R1.433	R1.022	1.469	1.197	R1.720	1.060	R1.523	NA	NA	NA	NA
1990	1.149	R1.590	1.164	R1.611	1.349	R1.867	1.217	R1.684	NA	NA	NA	NA
1991	NA	NA	1.140	R1.524	1.321	R1.765	1.196	R1.598	1.098	NA	1.098	NA
1992	NA	NA	1.127	R1.471	1.316	R1.718	1.190	R1.554	1.087	NA	1.087	NA
1993	NA	NA	1.108	R1.415	1.302	R1.663	1.173	R1.498	21.067	NA	1.067	NA
1994	NA	NA	1.112	R1.391	1.305	R1.632	1.174	R1.469	21.072	NA	1.075	NA
1995	NA	NA	1.147	R1.406	1.336	R1.637	1.205	R1.477	21.103	41.163	1.111	1.109
1996	NA	NA	1.231	R1.480	1.413	R1.699	1.288	R1.549	21.192	41.242	1.199	1.235
1997	NA	NA	1.234	R1.458	1.416	R1.673	1.291	R1.525	21.189	41.252	1.199	1.198
1998	NA	NA	1.059	R1.237	1.250	R1.461	1.115	R1.303	21.017	41.078	1.030	1.044
1999	NA	NA	1.165	R1.342	1.357	R1.563	1.221	R1.406	21.116	41.195	1.136	1.121
2000	NA	NA	1.510	R1.702	1.693	R1.908	1.563	R1.762	21.462	41.543	1.484	1.491
2001	NA	NA	1.461	R1.610	1.657	R1.826	1.531	R1.687	1.384	1.498	1.420	1.401
2002	NA	NA	1.358	R1.473	1.556	R1.688	1.441	R1.563	1.313	1.408	1.345	1.319
2003	NA	NA	1.591	R1.690	1.777	1.888	1.638	R1.740	1.516	1.655	1.561	1.509
2004	NA	NA	1.880	R1.942	2.068	2.137	1.923	1.987	1.812	1.937	1.852	1.810
2005	NA	NA	2.295	2.295	2.491	2.491	2.338	2.338	2.240	2.335	2.270	2.402
2006	NA	NA	2.589	R2.508	2.805	2.717	2.635	R2.553	2.533	2.654	2.572	2.705
2007	NA	NA	2.801	R2.637	3.033	R2.855	2.849	R2.682	2.767	2.857	2.796	2.885
2008	NA	NA	3.266	R3.008	3.519	R3.241	3.317	R3.055	3.213	3.314	3.246	3.803
2009	NA	NA	2.350	R2.142	2.607	R2.376	2.401	R2.188	2.315	2.433	2.353	2.467
2010	NA	NA	2.788	R2.512	3.047	R2.745	2.836	R2.555	2.742	2.864	2.782	2.992
2011	NA	NA	3.527	3.111	3.792	3.345	3.577	3.155	3.476	3.616	3.521	3.840

<sup>1</sup> Any area that does not require the sale of reformulated gasoline.

<sup>2</sup> For 1993–2000, data collected for oxygenated areas are included in "Conventional Gasoline Areas."

<sup>3</sup> "Reformulated Gasoline Areas" are ozone nonattainment areas designated by the Environmental Protection Agency that require the use of reformulated gasoline.

<sup>4</sup> For 1995–2000, data collected for combined oxygenated and reformulated areas are included in "Reformulated Gasoline Areas."

<sup>5</sup> See "Nominal Dollars" in Glossary.

<sup>6</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>7</sup> The 1981 average price is based on September through December data only.

R=Revised. NA=Not available.

Note: See "Motor Gasoline Grades," "Motor Gasoline, Conventional," "Motor Gasoline, Oxygenated," and "Motor Gasoline, Reformulated" in Glossary.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#prices> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#petroleum> for all annual data beginning in 1949. • See <http://www.eia.gov/petroleum/> for related information.

Sources: **Motor Gasoline by Grade:** • 1949-1973—*Platt's Oil Price Handbook and Oilmanac, 1974*, 51st Edition. • 1974 forward—U.S. Energy Information Administration (EIA), annual averages of monthly data from the U.S. Department of Labor, Bureau of Labor Statistics, *U.S. City Average Gasoline Prices*. **Regular Motor Gasoline by Area Type:** EIA, weighted annual averages of data from "Weekly U.S. Retail Gasoline Prices, Regular Grade." **On-Highway Diesel Fuel:** EIA, weighted annual averages of data from "Weekly Retail On-Highway Diesel Prices."

## Petroleum

**Note 1. Petroleum Products Supplied and Petroleum Consumption.** Petroleum product supplied (see Table 5.11) is used as an approximation of petroleum consumption. Petroleum products supplied is calculated as field production plus renewable fuels and oxygenates production plus processing gain plus net imports minus stock change plus adjustments. Total products supplied include natural gas plant liquids, unfinished oils, aviation gasoline blending components, and finished petroleum products. Crude oil burned on leases and at pipeline stations was reported as product supplied for either distillate fuel oil or residual fuel oil until January 1983. From January 1983 through December 2010, crude oil product supplied was reported based on quantities reported on Form EIA-813 “Monthly Crude Oil Report.” Beginning with data for January 2010, reporting crude oil used directly on Form EIA-813 was discontinued, and crude oil product supplied was assumed equal to zero. The sector allocation of product supplied in Tables 5.13a-5.13d for products used in more than one sector is derived from sales to ultimate consumers by refiners, marketers, distributors, and dealers (see U.S. Energy Information Administration (EIA) report Fuel Oil and Kerosene Sales) and from EIA electric power sector petroleum consumption data (see Tables 8.7b and 8.7c).

**Note 2. Changes Affecting Petroleum Production and Product Supplied Statistics.** Beginning in January 1981, several U.S. Energy Information Administration survey forms and calculation methodologies were changed to reflect new developments in refinery and blending plant practices and to improve data integrity. Those changes affect production and product supplied statistics for motor gasoline, distillate fuel oil, and residual fuel oil, and stocks of motor gasoline. On the basis of those changes, motor gasoline production during the last half of 1980 would have averaged 289 thousand barrels per day higher than that which was published on the old basis. Distillate and residual fuel oil production and product supplied for all of 1980 would have averaged, respectively, 105 thousand and 54 thousand barrels per day higher than the numbers that were published. A new adjustment was introduced for calculating finished motor gasoline product supplied beginning with data for January 1993. The new adjustment transferred product supplied for motor gasoline blending components and fuel ethanol to supply of finished motor gasoline. Applying the new

gasoline adjustment method to gasoline product supplied data for 1992 increased the reported quantity 108 thousand barrels per day at the U.S. level from 7,268 thousand barrels per day to 7,376 thousand barrels per day.

**Note 3. Gross Input to Distillation Units.** The methods of deriving Gross Input to Distillation Units (GIDU) in this report are as follows: for 1949-1966, GIDU is estimated by summing annual crude oil runs to stills, net unfinished oil reruns at refineries, and shipments of natural gasoline and plant condensate from natural gas processing plants to refineries; for 1967-1973, GIDU is estimated by summing annual crude oil runs to stills, net unfinished oil reruns, and refinery input of natural gasoline and plant condensate; for 1974-1980, GIDU is published annual data; and for 1981 forward, GIDU is the sum of reported monthly data.

**Note 4. Crude Oil Domestic First Purchase Prices.** Crude oil domestic first purchase prices were derived as follows: for 1949-1973, weighted average domestic first purchase values as reported by State agencies and calculated by the Bureau of Mines; for 1974 and 1975, weighted averages of a sample survey of major first purchasers’ purchases; for 1976 forward, weighted averages of all first purchasers’ purchases.

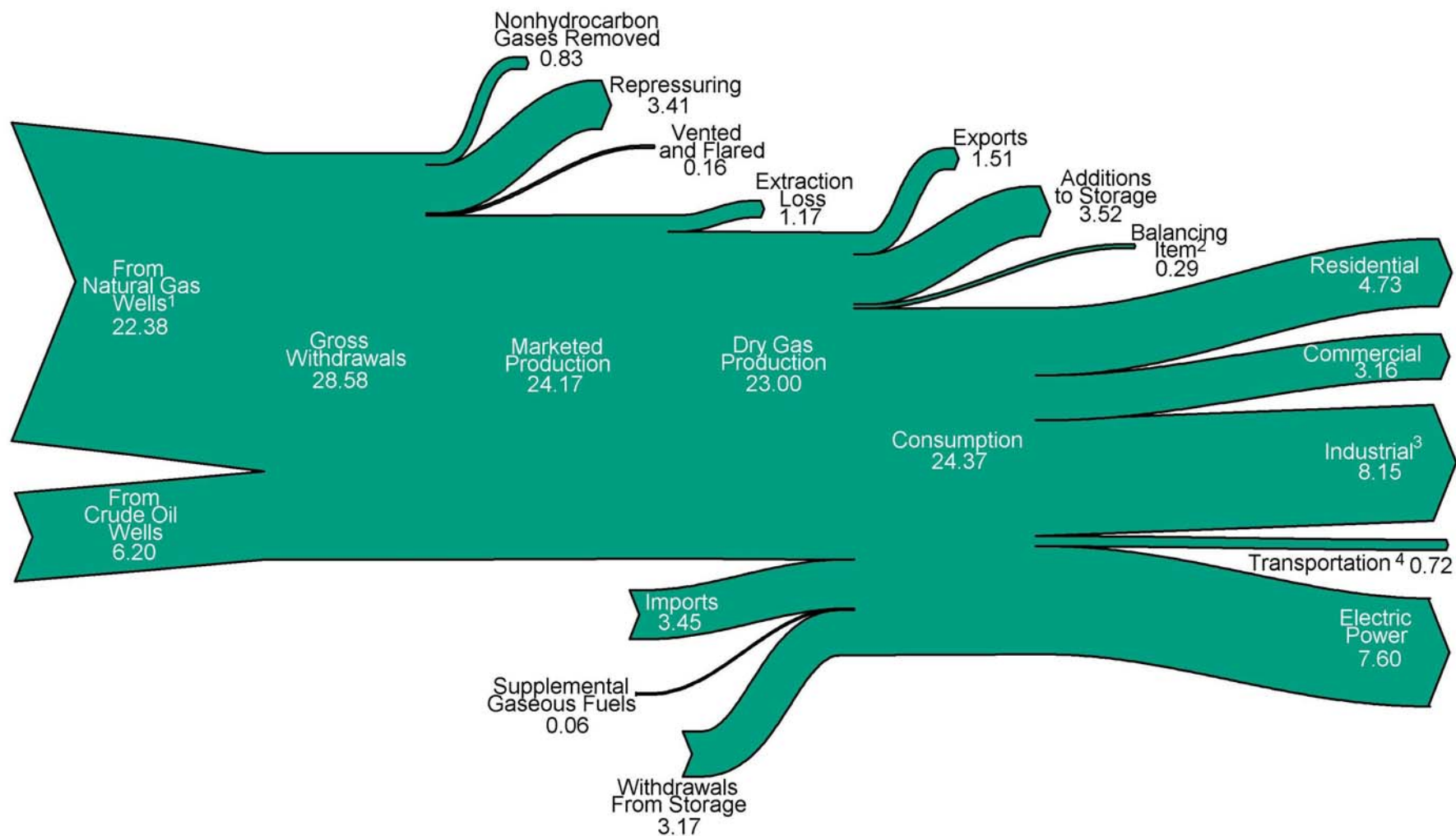
**Note 5. Historical Residential Heating Oil Prices.** Residential heating oil prices for 1956 through 1987 were formerly published in the *Annual Energy Review*. Those data, in cents per gallon, are: 1956—15.2; 1957—16.0; 1958—15.1; 1959—15.3; 1960—15.0; 1961—15.6; 1962—15.6; 1963—16.0; 1964—16.1; 1965—16.0; 1966—16.4; 1967—16.9; 1968—17.4; 1969—17.8; 1970—18.5; 1971—19.6; 1972—19.7; 1973—22.8; 1974—36.0; 1975—37.7; 1976—40.6; 1977—46.0; 1978—49.0; 1979—70.4; 1980—97.4; 1981—119.4; 1982—116.0; 1983—107.8; 1984—109.1; 1985—105.3; 1986—83.6; and 1987—80.3. The sources of these data are: 1956-1974—Bureau of Labor Statistics, “Retail Prices and Indexes of Fuels and Utilities for Residential Usage,” monthly; January 1975–September 1977—Federal Energy Administration, Form FEA-P112-M-1, “No. 2 Heating Oil Supply/Price Monitoring Report”; October 1977–December 1977—U.S. Energy Information Administration (EIA), Form EIA-9, “No. 2 Heating Oil Supply/Price Monitoring Report”; 1978 forward—EIA, *Petroleum Marketing Annual*, Table 15.

## **6. Natural Gas**

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**Figure 6.0 Natural Gas Flow, 2011**  
(Trillion Cubic Feet)



<sup>1</sup> Includes natural gas gross withdrawals from coalbed wells and shale gas wells.

<sup>2</sup> Quantities lost and imbalances in data due to differences among data sources.

<sup>3</sup> Lease and plant fuel, and other industrial.

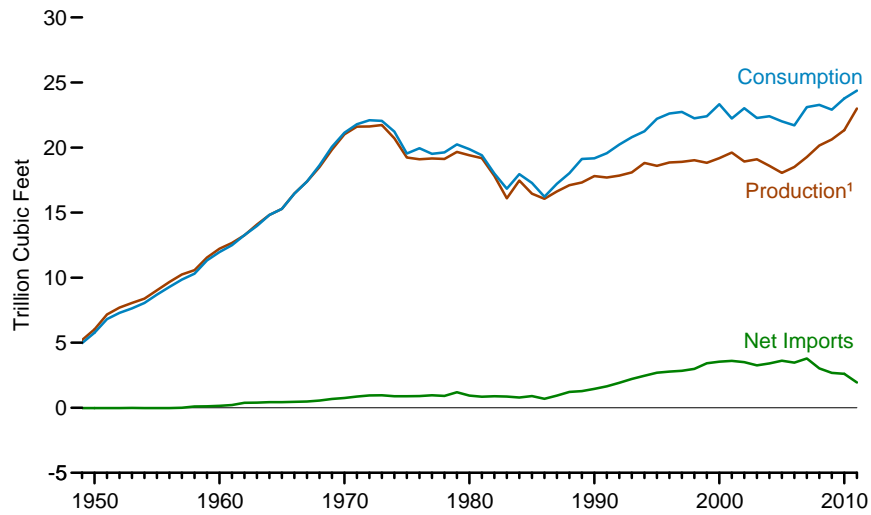
<sup>4</sup> Natural gas consumed in the operation of pipelines (primarily in compressors), and as fuel in the delivery of natural gas to consumers; plus a small quantity used as vehicle fuel.

Notes: • Data are preliminary. • Values are derived from source data prior to rounding for publication. • Totals may not equal sum of components due to independent rounding.

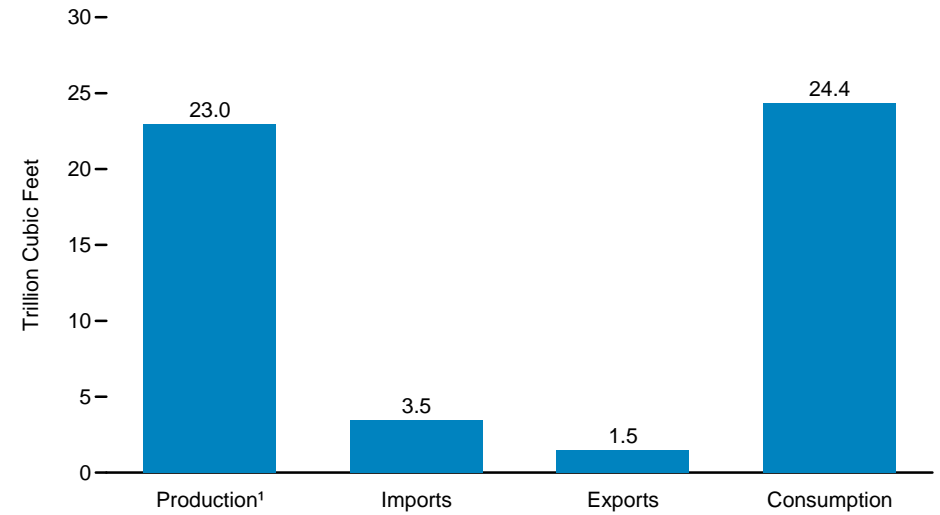
Sources: Tables 6.1, 6.2, and 6.5.

## Figure 6.1 Natural Gas Overview

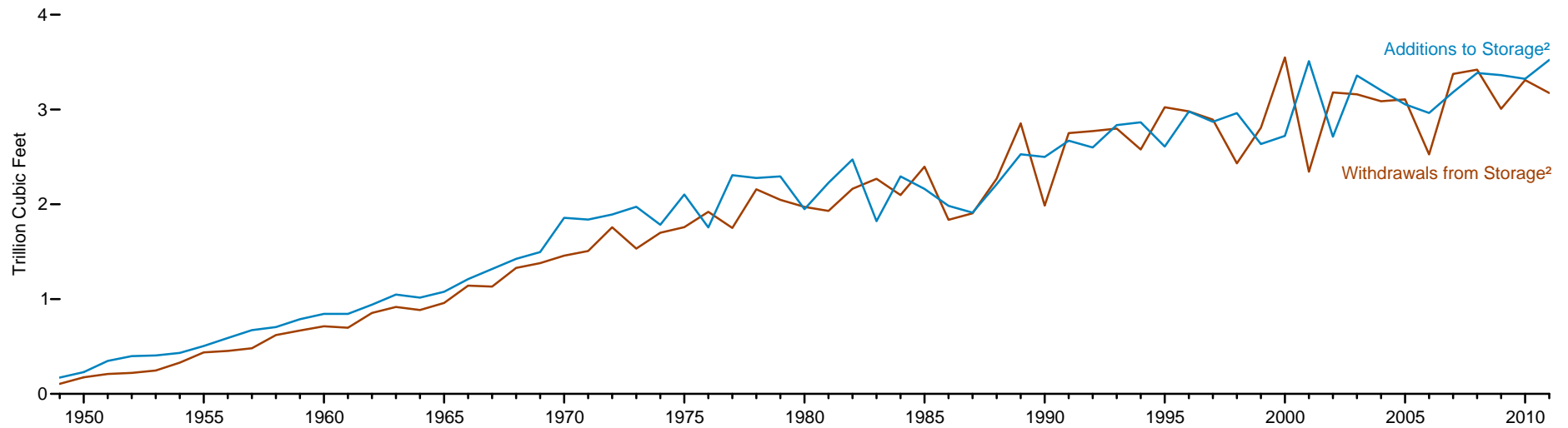
### Overview, 1949-2011



### Overview, 2011



### Storage Additions and Withdrawals, 1949-2011



<sup>1</sup> Dry gas.

<sup>2</sup> Underground storage. For 1980-2010, also includes liquefied natural gas in above-ground tanks.

Source: Table 6.1.

**Table 6.1 Natural Gas Overview, Selected Years, 1949-2011**

(Billion Cubic Feet)

Year	Dry Gas Production	Supplemental Gaseous Fuels <sup>2</sup>	Trade			Storage <sup>1</sup> Activity			Balancing Item <sup>5</sup>	Consumption <sup>6</sup>
			Imports	Exports	Net Imports <sup>3</sup>	Withdrawals	Additions	Net Withdrawals <sup>4</sup>		
1949	5,195	NA	0	20	-20	106	172	-66	-139	4,971
1950	6,022	NA	0	26	-26	175	230	-54	-175	5,767
1955	9,029	NA	11	31	-20	437	505	-68	-247	8,694
1960	12,228	NA	156	11	144	713	844	-132	-274	11,967
1965	15,286	NA	456	26	430	960	1,078	-118	-319	15,280
1970	21,014	NA	821	70	751	1,459	1,857	-398	-228	21,139
1975	19,236	NA	953	73	880	1,760	2,104	-344	-235	19,538
1976	19,098	NA	964	65	899	1,921	1,756	165	-216	19,946
1977	19,163	NA	1,011	56	955	1,750	2,307	-557	-41	19,521
1978	19,122	NA	966	53	913	2,158	2,278	-120	-287	19,627
1979	19,663	NA	1,253	56	1,198	2,047	2,295	-248	-372	20,241
1980	19,403	155	985	49	936	1,972	1,949	23	-640	19,877
1981	19,181	176	904	59	845	1,930	2,228	-297	-500	19,404
1982	17,820	145	933	52	882	2,164	2,472	-308	-537	18,001
1983	16,094	132	918	55	864	2,270	1,822	447	-703	16,835
1984	17,466	110	843	55	788	2,098	2,295	-197	-217	17,951
1985	16,454	126	950	55	894	2,397	2,163	235	-428	17,281
1986	16,059	113	750	61	689	1,837	1,984	-147	-493	16,221
1987	16,621	101	993	54	939	1,905	1,911	-6	-444	17,211
1988	17,103	101	1,294	74	1,220	2,270	2,211	59	-453	18,030
1989	17,311	107	1,382	107	1,275	2,854	2,528	326	101	<sup>7</sup> 19,119
1990	17,810	123	1,532	86	1,447	1,986	2,499	-513	307	<sup>7</sup> 19,174
1991	17,698	113	1,773	129	1,644	2,752	2,672	80	27	<sup>7</sup> 19,562
1992	17,840	118	2,138	216	1,921	2,772	2,599	173	176	<sup>7</sup> 20,228
1993	18,095	119	2,350	140	2,210	2,799	2,835	-36	401	20,790
1994	18,821	111	2,624	162	2,462	2,579	2,865	-286	139	21,247
1995	18,599	110	2,841	154	2,687	3,025	2,610	415	396	22,207
1996	18,854	109	2,937	153	2,784	2,981	2,979	2	860	22,609
1997	18,902	103	2,994	157	2,837	2,894	2,870	24	871	22,737
1998	19,024	102	3,152	159	2,993	2,432	2,961	-530	657	22,246
1999	18,832	98	3,586	163	3,422	2,808	2,636	172	-119	22,405
2000	19,182	90	3,782	244	3,538	3,550	2,721	829	<sup>R</sup> -306	23,333
2001	19,616	86	3,977	373	3,604	2,344	3,510	-1,166	99	22,239
2002	18,928	68	4,015	516	3,499	3,180	2,713	467	<sup>R</sup> 65	<sup>R</sup> 23,027
2003	19,099	68	3,944	680	3,264	3,161	3,358	-197	44	22,277
2004	18,591	60	4,259	854	3,404	3,088	3,202	-114	<sup>R</sup> 461	<sup>R</sup> 22,403
2005	18,051	64	4,341	729	3,612	3,107	3,055	52	<sup>R</sup> 236	<sup>R</sup> 22,014
2006	18,504	66	4,186	724	3,462	2,527	2,963	-436	<sup>R</sup> 103	<sup>R</sup> 21,699
2007	19,266	63	4,608	822	3,785	3,375	3,183	192	<sup>R</sup> -203	<sup>R</sup> 23,104
2008	20,159	61	3,984	963	3,021	3,420	3,385	34	<sup>R</sup> 2	<sup>R</sup> 23,277
2009	<sup>R</sup> 20,624	65	3,751	1,072	2,679	3,007	3,362	-355	<sup>R</sup> -103	<sup>R</sup> 22,910
2010	<sup>R</sup> 21,332	<sup>R</sup> 65	<sup>R</sup> 3,741	<sup>R</sup> 1,137	<sup>R</sup> 2,604	<sup>R</sup> 3,311	<sup>R</sup> 3,324	<sup>R</sup> -13	<sup>R</sup> -213	<sup>R</sup> 23,775
2011	<sup>E</sup> 23,000	<sup>P</sup> 61	<sup>P</sup> 3,453	<sup>P</sup> 1,507	<sup>P</sup> 1,946	<sup>P</sup> 3,175	<sup>P</sup> 3,523	<sup>P</sup> -348	<sup>P</sup> -290	<sup>P</sup> 24,369

<sup>1</sup> Underground storage. For 1980–2010, also includes liquefied natural gas in above-ground tanks.

<sup>2</sup> See Note 1, "Supplemental Gaseous Fuels," at end of section.

<sup>3</sup> Net imports equal imports minus exports. Minus sign indicates exports are greater than imports.

<sup>4</sup> Net withdrawals equal withdrawals minus additions. Minus sign indicates additions are greater than withdrawals.

<sup>5</sup> Quantities lost and imbalances in data due to differences among data sources. Since 1980, excludes intransit shipments that cross the U.S.-Canada border (i.e., natural gas delivered to its destination via the other country).

<sup>6</sup> See Note 2, "Natural Gas Consumption," at end of section.

<sup>7</sup> For 1989–1992, a small amount of consumption at independent power producers may be counted in both "Other Industrial" and "Electric Power Sector" on Table 6.5. See Note 3, "Natural Gas Consumption, 1989–1992," at end of section.

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

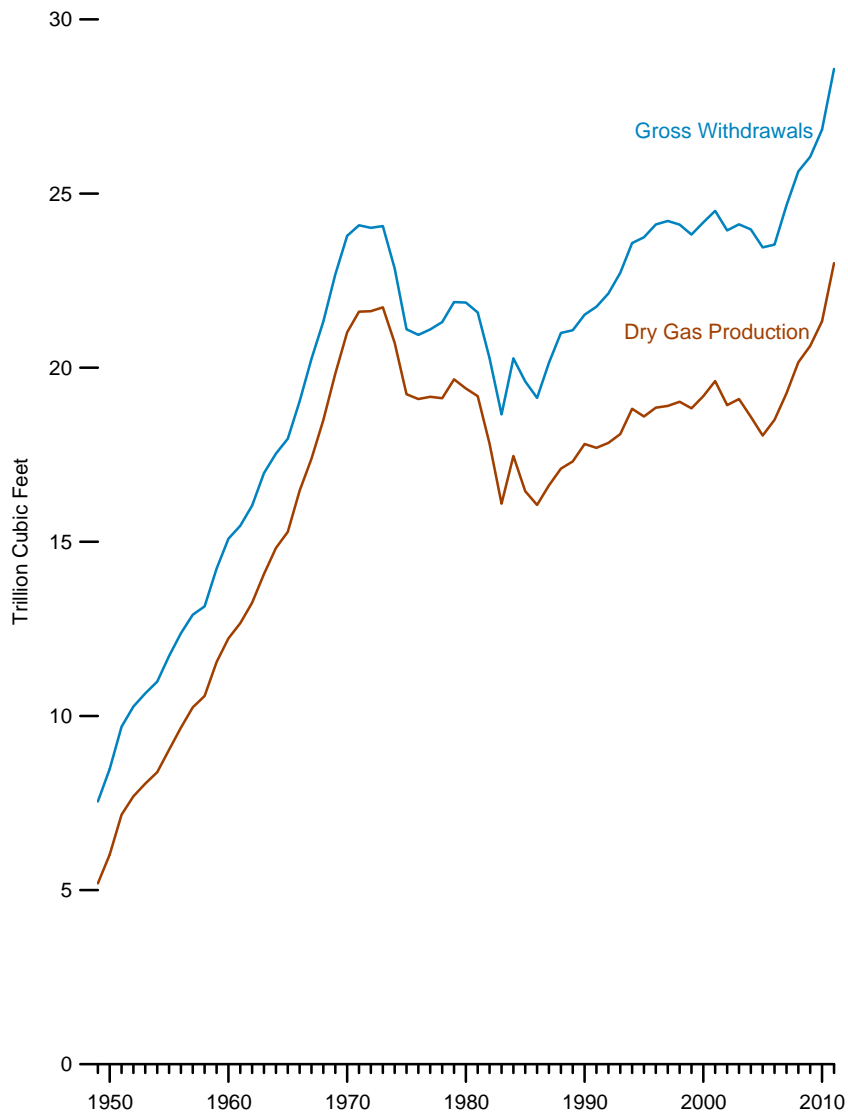
Notes: • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#naturalgas> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#naturalgas> for all annual data beginning in 1949. • See <http://www.eia.gov/naturalgas/> for related information.

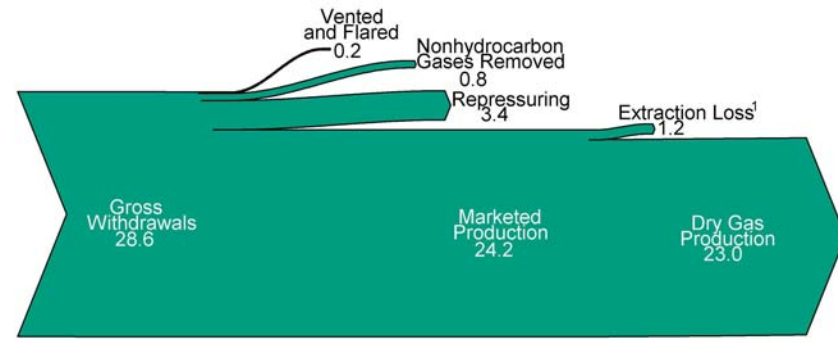
Sources: **Dry Gas Production:** Table 6.2. **Supplemental Gaseous Fuels:** • 1980-2006—U.S. Energy Information Administration (EIA), *Natural Gas Annual (NGA)*, annual reports. • 2007 forward—EIA, *Natural Gas Monthly (NGM)* (March 2012), Table 1. **Trade:** Table 6.3. **Storage Activity:** • 1949-2010—EIA, NGA, annual reports. • 2011—EIA, NGM (March 2012), Table 8. **Balancing Item:** Calculated as consumption minus dry gas production, supplemental gaseous fuels, net imports, and net withdrawals. **Consumption:** Table 6.5.

## Figure 6.2 Natural Gas Production

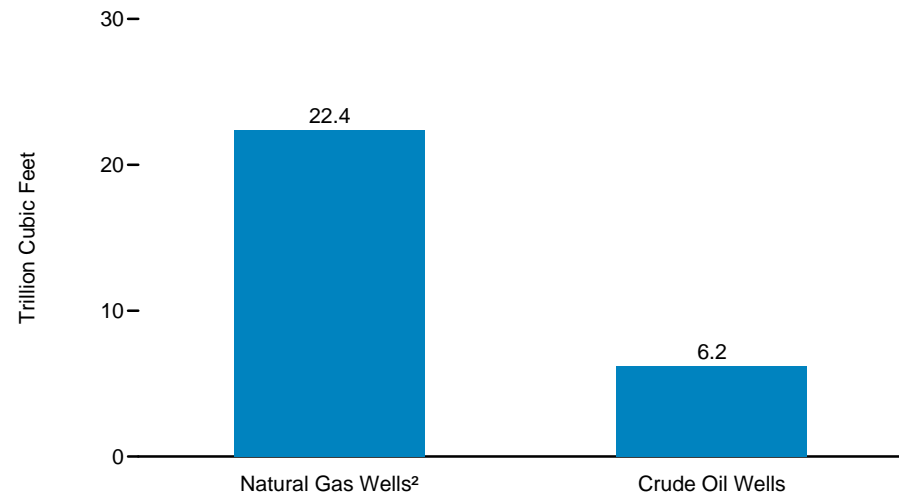
### Gross Withdrawals and Dry Gas Production, 1949-2011



### Production Flow, 2011 (Trillion Cubic Feet)



### Gross Withdrawals by Well Type, 2011



<sup>1</sup> Volume reduction resulting from the removal of natural gas plant liquids, which are transferred to petroleum supply.

<sup>2</sup> Includes natural gas gross withdrawals from coalbed wells and shale gas wells. Source: Table 6.2.



**Table 6.2 Natural Gas Production, Selected Years, 1949-2011**  
(Billion Cubic Feet)

Year	Natural Gas Gross Withdrawals					Repressuring	Nonhydrocarbon Gases Removed	Vented and Flared	Marketed Production	Extraction Loss <sup>1</sup>	Dry Gas Production
	Natural Gas Wells	Crude Oil Wells	Coalbed Wells	Shale Gas Wells	Total						
1949	4,986	2,561	NA	NA	7,547	1,273	NA	854	5,420	224	5,195
1950	5,603	2,876	NA	NA	8,480	1,397	NA	801	6,282	260	6,022
1955	7,842	3,878	NA	NA	11,720	1,541	NA	774	9,405	377	9,029
1960	10,853	4,234	NA	NA	15,088	1,754	NA	563	12,771	543	12,228
1965	13,524	4,440	NA	NA	17,963	1,604	NA	319	16,040	753	15,286
1970	18,595	5,192	NA	NA	23,786	1,376	NA	489	21,921	906	21,014
1975	17,380	3,723	NA	NA	21,104	861	NA	134	20,109	872	19,236
1976	17,191	3,753	NA	NA	20,944	859	NA	132	19,952	854	19,098
1977	17,416	3,681	NA	NA	21,097	935	NA	137	20,025	863	19,163
1978	17,394	3,915	NA	NA	21,309	1,181	NA	153	19,974	852	19,122
1979	18,034	3,849	NA	NA	21,883	1,245	NA	167	20,471	808	19,663
1980	17,573	4,297	NA	NA	21,870	1,365	199	125	20,180	777	19,403
1981	17,337	4,251	NA	NA	21,587	1,312	222	98	19,956	775	19,181
1982	15,809	4,463	NA	NA	20,272	1,388	208	93	18,582	762	17,820
1983	14,153	4,506	NA	NA	18,659	1,458	222	95	16,884	790	16,094
1984	15,513	4,754	NA	NA	20,267	1,630	224	108	18,304	838	17,466
1985	14,535	5,071	NA	NA	19,607	1,915	326	95	17,270	816	16,454
1986	14,154	4,977	NA	NA	19,131	1,838	337	98	16,859	800	16,059
1987	14,807	5,333	NA	NA	20,140	2,208	376	124	17,433	812	16,621
1988	15,467	5,532	NA	NA	20,999	2,478	460	143	17,918	816	17,103
1989	15,709	5,366	NA	NA	21,074	2,475	362	142	18,095	785	17,311
1990	16,054	5,469	NA	NA	21,523	2,489	289	150	18,594	784	17,810
1991	16,018	5,732	NA	NA	21,750	2,772	276	170	18,532	835	17,698
1992	16,165	5,967	NA	NA	22,132	2,973	280	168	18,712	872	17,840
1993	16,691	6,035	NA	NA	22,726	3,103	414	227	18,982	886	18,095
1994	17,351	6,230	NA	NA	23,581	3,231	412	228	19,710	889	18,821
1995	17,282	6,462	NA	NA	23,744	3,565	388	284	19,506	908	18,599
1996	17,737	6,376	NA	NA	24,114	3,511	518	272	19,812	958	18,854
1997	17,844	6,369	NA	NA	24,213	3,492	599	256	19,866	964	18,902
1998	17,729	6,380	NA	NA	24,108	3,427	617	103	19,961	938	19,024
1999	17,590	6,233	NA	NA	23,823	3,293	615	110	19,805	973	18,832
2000	17,726	6,448	NA	NA	24,174	3,380	505	91	20,198	1,016	19,182
2001	18,129	6,371	NA	NA	24,501	3,371	463	97	20,570	954	19,616
2002	17,795	6,146	NA	NA	23,941	3,455	502	99	19,885	957	18,928
2003	17,882	6,237	NA	NA	24,119	3,548	499	98	19,974	876	19,099
2004	17,885	6,084	NA	NA	23,970	3,702	654	96	19,517	927	18,591
2005	17,472	5,985	NA	NA	23,457	3,700	711	119	18,927	876	18,051
2006	17,996	5,539	NA	NA	23,535	3,265	731	129	19,410	906	18,504
2007	17,065	5,818	1,780	NA	24,664	3,663	661	143	20,196	930	19,266
2008	15,618	5,747	1,986	2,284	25,636	3,639	719	167	21,112	953	20,159
2009	<sup>R</sup> 14,885	<sup>R</sup> 5,812	1,977	3,384	<sup>R</sup> 26,057	3,522	722	165	<sup>R</sup> 21,648	1,024	<sup>R</sup> 20,624
2010	<sup>2</sup> <sup>R</sup> 20,841	<sup>R</sup> 5,995	( <sup>2</sup> )	( <sup>2</sup> )	<sup>R</sup> 26,836	<sup>R</sup> 3,432	<sup>R</sup> 837	<sup>R</sup> 166	<sup>R</sup> 22,402	<sup>R</sup> 1,070	<sup>R</sup> 21,332
2011	<sup>E</sup> 22,378	<sup>E</sup> 6,199	( <sup>2</sup> )	( <sup>2</sup> )	<sup>P</sup> 28,576	<sup>E</sup> 3,410	<sup>E</sup> 831	<sup>E</sup> 165	<sup>E</sup> 24,170	<sup>P</sup> 1,169	<sup>E</sup> 23,000

<sup>1</sup> Volume reduction resulting from the removal of natural gas plant liquids, which are transferred to petroleum supply (see Tables 5.1b and 5.10).

<sup>2</sup> Beginning in 2010, natural gas gross withdrawals from coalbed wells and shale gas wells are included in "Natural Gas Wells."

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

Notes: • Beginning with 1965 data, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.

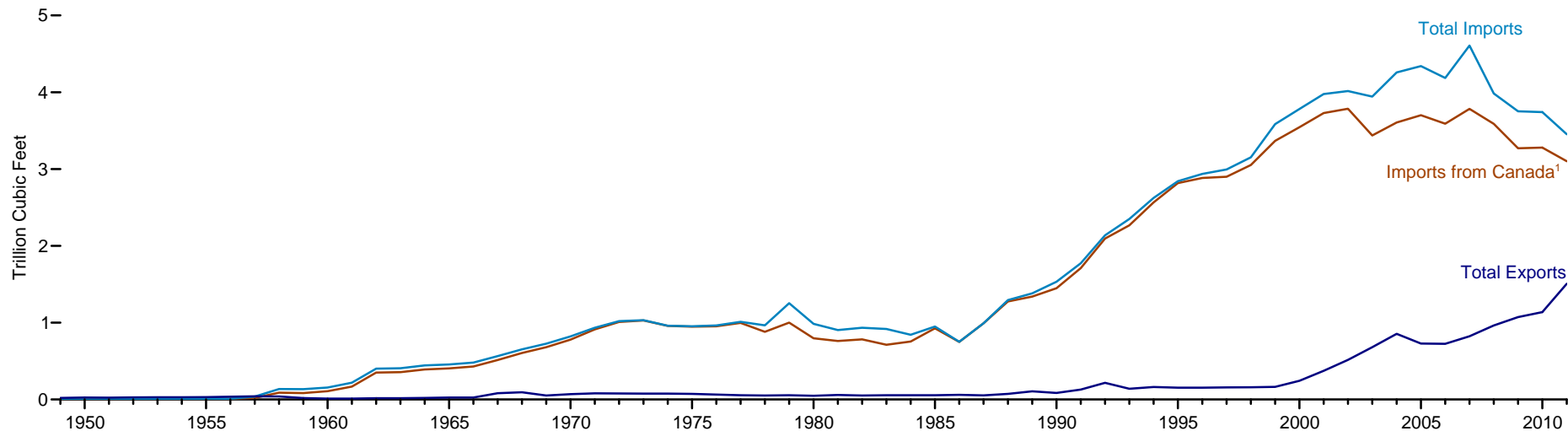
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#naturalgas> for updated monthly and

annual data. • See <http://www.eia.gov/totalenergy/data/annual/#naturalgas> for all annual data beginning in 1949. • See <http://www.eia.gov/naturalgas/> for related information.

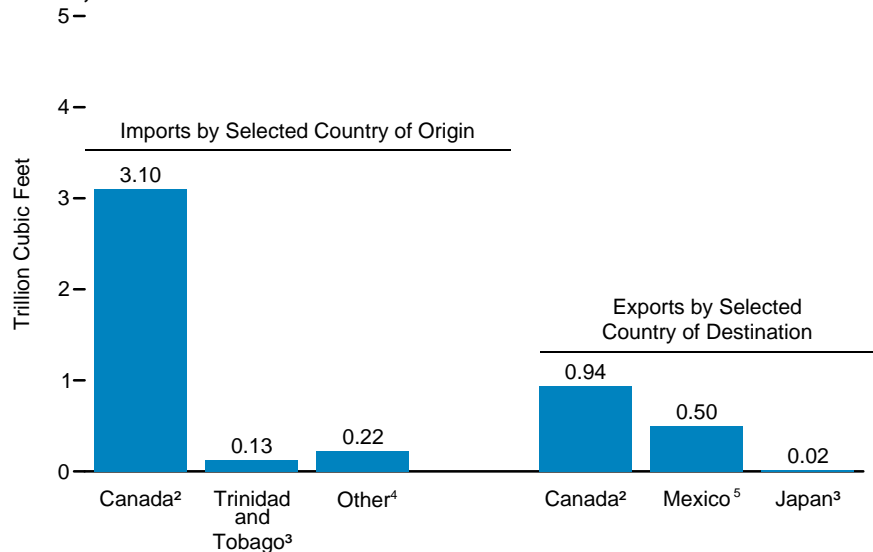
Sources: **Natural Gas Wells, Crude Oil Wells, Coalbed Wells, and Shale Gas Wells:** • 1949-1966—Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. • 1967-2010—U.S. Energy Information Administration (EIA), *Natural Gas Annual (NGA)*, annual reports. • 2011—EIA estimates based on previous year's data. **Total Gross Withdrawals, Marketed Production, Extraction Loss, and Dry Gas Production:** • 1949-2006—EIA, NGA, annual reports. • 2007 forward—EIA, *Natural Gas Monthly* (March 2012), Table 1. **All Other Data:** • 1949-2010—EIA, NGA, annual reports. • 2011—EIA estimates based on previous year's data.

**Figure 6.3 Natural Gas Imports, Exports, and Net Imports**

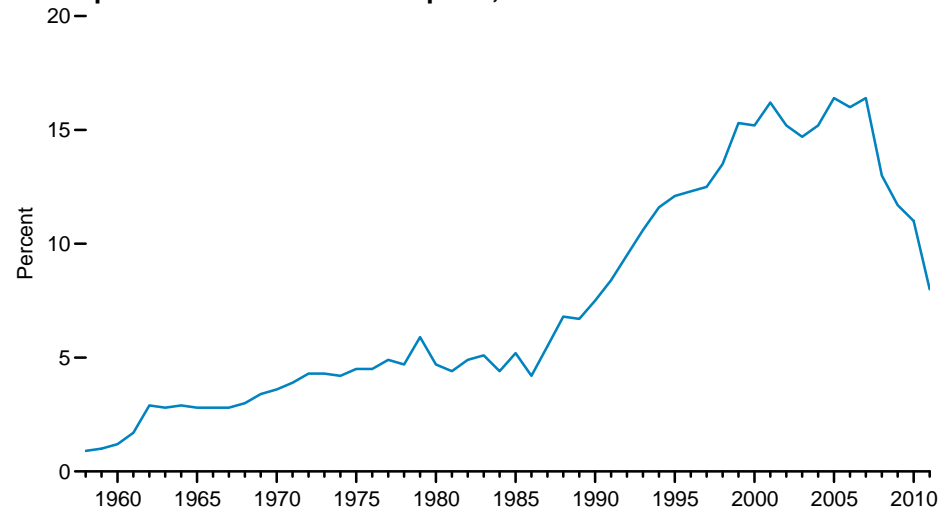
**Trade Overview, 1949-2011**



**Trade, 2011**



**Net Imports as Share of Consumption, 1958-2011**



<sup>1</sup> By pipeline, except for very small amounts of liquefied natural gas in 1973, 1977, and 1981.

<sup>2</sup> By pipeline.

<sup>3</sup> As liquefied natural gas.

<sup>4</sup> By pipeline from Mexico, and as liquefied natural gas from Egypt, Nigeria, Norway, Qatar, Peru, and Yemen.

<sup>5</sup> By pipeline, except for very small amounts of liquefied natural gas.

Source: Table 6.3.

**Table 6.3 Natural Gas Imports, Exports, and Net Imports, Selected Years, 1949-2011**

(Billion Cubic Feet, Except as Noted)

Year	Imports by Country of Origin									Exports by Country of Destination					Net Imports <sup>1</sup>	
	Algeria <sup>2</sup>	Canada <sup>3</sup>	Egypt <sup>2</sup>	Mexico <sup>3</sup>	Nigeria <sup>2</sup>	Qatar <sup>2</sup>	Trinidad and Tobago <sup>2</sup>	Other <sup>2,4</sup>	Total	Canada <sup>3</sup>	Japan <sup>2</sup>	Mexico <sup>3</sup>	Other <sup>2,5</sup>	Total	Total	Percent of U.S. Consumption
1949	0	0	0	0	0	0	0	0	0	(s)	0	20	0	20	-20	( <sup>6</sup> )
1950	0	0	0	0	0	0	0	0	0	3	0	23	0	26	-26	( <sup>6</sup> )
1955	0	11	0	(s)	0	0	0	0	11	11	0	20	0	31	-20	( <sup>6</sup> )
1960	0	109	0	47	0	0	0	0	156	6	0	6	0	11	144	1.2
1965	0	405	0	52	0	0	0	0	456	18	0	8	0	26	430	2.8
1970	1	779	0	41	0	0	0	0	821	11	44	15	0	70	751	3.6
1975	5	948	0	0	0	0	0	0	953	10	53	9	0	73	880	4.5
1976	10	954	0	0	0	0	0	0	964	8	50	7	0	65	899	4.5
1977	11	997	0	2	0	0	0	0	1,011	(s)	52	4	0	56	955	4.9
1978	84	881	0	0	0	0	0	0	966	(s)	48	4	0	53	913	4.7
1979	253	1,001	0	0	0	0	0	0	1,253	(s)	51	4	0	56	1,198	5.9
1980	86	797	0	102	0	0	0	0	985	(s)	45	4	0	49	936	4.7
1981	37	762	0	105	0	0	0	0	904	(s)	56	3	0	59	845	4.4
1982	55	783	0	95	0	0	0	0	933	(s)	50	2	0	52	882	4.9
1983	131	712	0	75	0	0	0	0	918	(s)	53	2	0	55	864	5.1
1984	36	755	0	52	0	0	0	0	843	(s)	53	2	0	55	788	4.4
1985	24	926	0	0	0	0	0	0	950	(s)	53	2	0	55	894	5.2
1986	0	749	0	0	0	0	0	2	750	9	50	2	0	61	689	4.2
1987	0	993	0	0	0	0	0	0	993	3	49	2	0	54	939	5.5
1988	17	1,276	0	0	0	0	0	0	1,294	20	52	2	0	74	1,220	6.8
1989	42	1,339	0	0	0	0	0	0	1,382	38	51	17	0	107	1,275	6.7
1990	84	1,448	0	0	0	0	0	0	1,532	17	53	16	0	86	1,447	7.5
1991	64	1,710	0	0	0	0	0	0	1,773	15	54	60	0	129	1,644	8.4
1992	43	2,094	0	0	0	0	0	0	2,138	68	53	96	0	216	1,921	9.5
1993	82	2,267	0	2	0	0	0	0	2,350	45	56	40	0	140	2,210	10.6
1994	51	2,566	0	7	0	0	0	0	2,624	53	63	47	0	162	2,462	11.6
1995	18	2,816	0	7	0	0	0	0	2,841	28	65	61	0	154	2,687	12.1
1996	35	2,883	0	14	0	0	0	5	2,937	52	68	34	0	153	2,784	12.3
1997	66	2,899	0	17	0	0	0	12	2,994	56	62	38	0	157	2,837	12.5
1998	69	3,052	0	15	0	0	0	17	3,152	40	66	53	0	159	2,993	13.5
1999	76	3,368	0	55	0	20	51	17	3,586	39	64	61	0	163	3,422	15.3
2000	47	3,544	0	12	13	46	99	21	3,782	73	66	106	0	244	3,538	15.2
2001	65	3,729	0	10	38	23	98	14	3,977	167	66	141	0	373	3,604	16.2
2002	27	3,785	0	2	8	35	151	8	4,015	189	63	263	0	516	3,499	15.2
2003	53	3,437	0	0	50	14	378	11	3,944	271	66	343	0	680	3,264	14.7
2004	120	3,607	0	0	12	12	462	46	4,259	395	62	397	0	854	3,404	15.2
2005	97	3,700	73	9	8	3	439	11	4,341	358	65	305	0	729	3,612	16.4
2006	17	3,590	120	13	57	0	389	0	4,186	341	61	322	0	724	3,462	16.0
2007	77	3,783	115	54	95	18	448	18	4,608	482	47	292	2	822	3,785	16.4
2008	0	3,589	55	43	12	3	267	15	3,984	559	39	365	0	963	3,021	13.0
2009	0	3,271	160	28	13	13	236	29	3,751	701	31	338	3	1,072	2,679	11.7
2010	0	R3,280	73	30	42	46	190	81	R3,741	R739	33	333	32	R1,137	R2,604	R11.0
2011 <sup>P</sup>	0	3,102	35	3	2	91	129	92	3,453	937	18	500	52	1,507	1,946	8.0

<sup>1</sup> Net imports equal imports minus exports.

<sup>2</sup> As liquefied natural gas.

<sup>3</sup> By pipeline, except for very small amounts of liquefied natural gas imported from Canada in 1973, 1977, and 1981, and exported to Mexico beginning in 1998.

<sup>4</sup> Australia in 1997–2001 and 2004; Brunei in 2002; Equatorial Guinea in 2007; Indonesia in 1986 and 2000; Malaysia in 1999 and 2002–2005; Norway in 2008 forward; Oman in 2000–2005; Peru in 2010 and 2011; United Arab Emirates in 1996–2000; Yemen in 2010 and 2011; and Other (unassigned) in 2004.

<sup>5</sup> Brazil in 2010 and 2011; Chile in 2011; China in 2011; India in 2010 and 2011; Russia in 2007; South Korea in 2009 forward; Spain in 2010 and 2011; and United Kingdom in 2010 and 2011.

<sup>6</sup> Not meaningful because there were net exports during this year.

R=Revised. P=Preliminary. (s)=Less than 0.5 billion cubic feet.

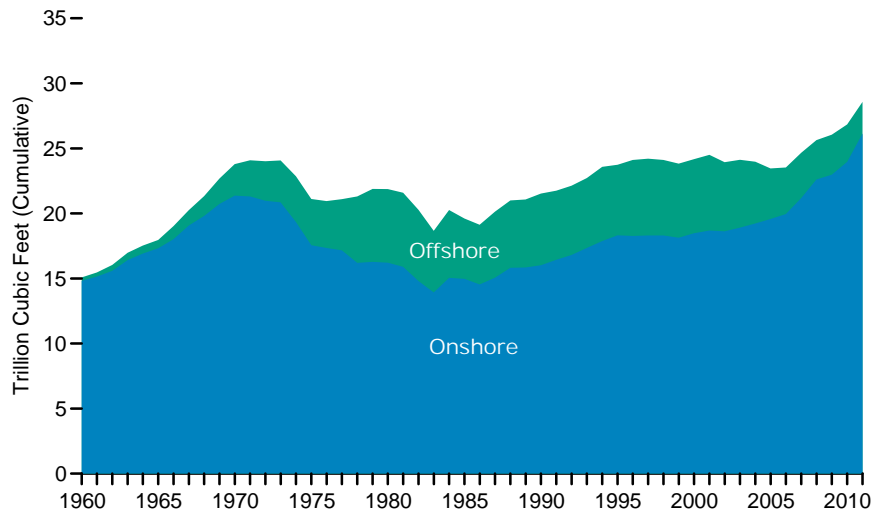
Note: Totals may not equal sum of components due to independent rounding.

 Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#naturalgas> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#naturalgas> for all annual data beginning in 1949. • See <http://www.eia.gov/naturalgas/> for related information.

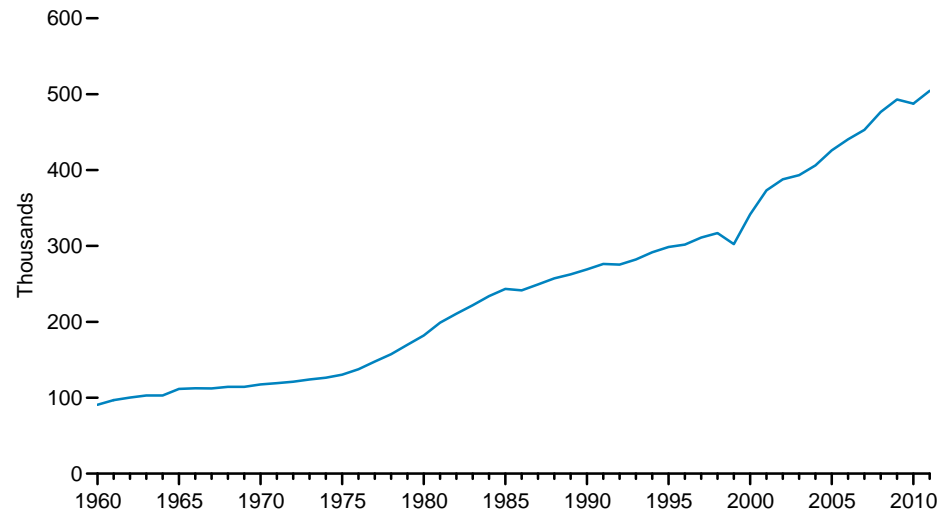
 Sources: **Percent of U.S. Consumption:** Calculated by dividing natural gas net imports by total natural gas consumption—see Table 6.1. **All Other Data:** • 1949–1954—U.S. Energy Information Administration (EIA) estimates based on Bureau of Mines, Minerals Yearbook, "Natural Gas" chapter. • 1955–1971—EIA, Federal Power Commission, by telephone. • 1972–1987—EIA, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." • 1988–2009—EIA, *Natural Gas Annual*, annual reports. • 2010 and 2011—EIA, *Natural Gas Monthly* (March 2012), Tables 4 and 5.

**Figure 6.4 Natural Gas Gross Withdrawals and Natural Gas Well Productivity, 1960-2011**

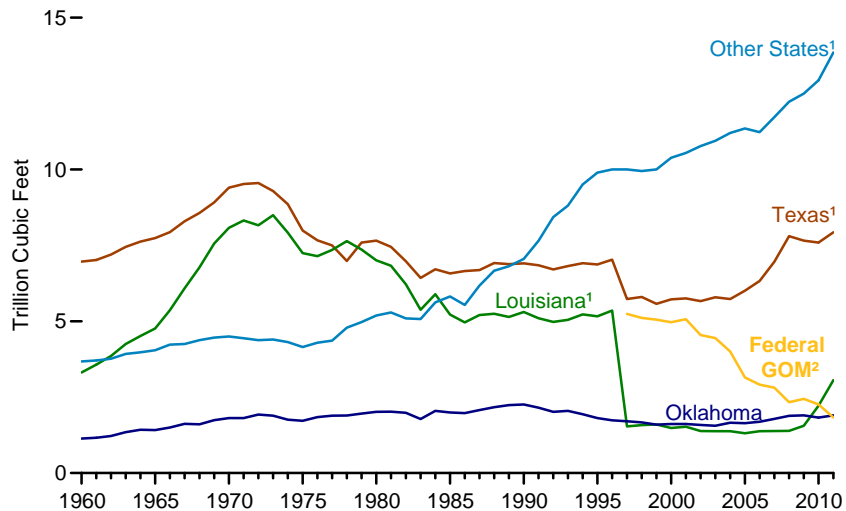
**Gross Withdrawals by Location**



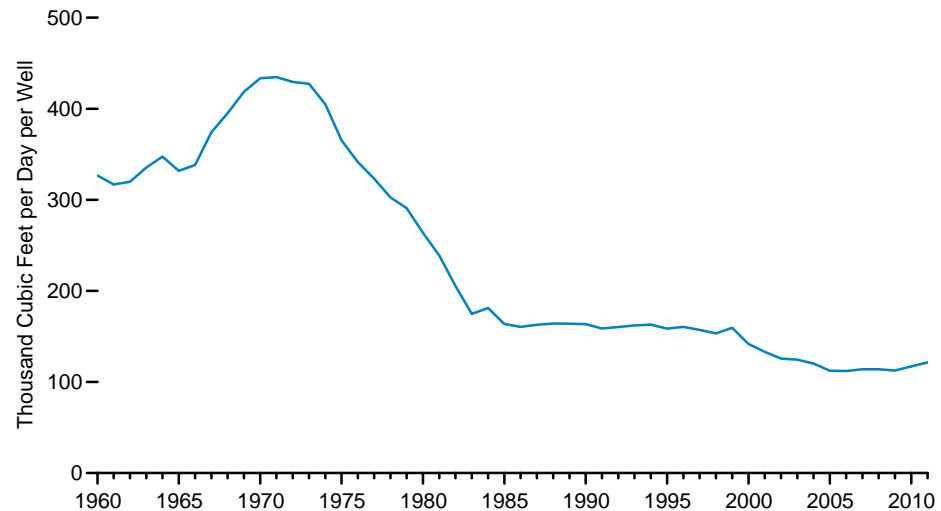
**Number of Producing Wells**



**Gross Withdrawals by State and Federal Gulf of Mexico**



**Natural Gas Well Average Productivity**



<sup>1</sup> Through 1996, includes gross withdrawals in Federal offshore areas of the Gulf of Mexico; beginning in 1997, these are included in "Federal Gulf of Mexico."

<sup>2</sup> Gulf of Mexico.  
Source: Table 6.4.

**Table 6.4 Natural Gas Gross Withdrawals and Natural Gas Well Productivity, Selected Years, 1960-2011**

Year	Natural Gas Gross Withdrawals From Crude Oil, Natural Gas, Coalbed, and Shale Gas Wells										Natural Gas Well Productivity			
	Texas <sup>1</sup>	Louisiana <sup>1</sup>	Oklahoma	Other States <sup>1</sup>	Federal Gulf of Mexico <sup>2</sup>	Total	Onshore	Offshore			Total	Gross Withdrawals From Natural Gas Wells <sup>3</sup>	Producing Wells <sup>4</sup>	Average Productivity
								Federal	State	Total				
	Billion Cubic Feet						Billion Cubic Feet				Billion Cubic Feet	Thousands	Thousand Cubic Feet Per Day Per Well	
1960	6,965	3,313	1,133	3,677	( <sup>2</sup> )	15,088	14,815	273	NA	273	15,088	10,853	91	326.7
1965	7,741	4,764	1,414	4,044	( <sup>2</sup> )	17,963	17,318	646	NA	646	17,963	13,524	112	331.8
1966	7,935	5,365	1,502	4,232	( <sup>2</sup> )	19,034	18,026	1,007	NA	1,007	19,034	13,894	112	338.4
1967	8,292	6,087	1,621	4,252	( <sup>2</sup> )	20,252	19,065	1,187	NA	1,187	20,252	15,345	112	374.3
1968	8,566	6,778	1,607	4,375	( <sup>2</sup> )	21,325	19,801	1,524	NA	1,524	21,325	16,540	114	395.1
1969	8,915	7,561	1,742	4,462	( <sup>2</sup> )	22,679	20,725	1,954	NA	1,954	22,679	17,489	114	418.6
1970	9,399	8,076	1,811	4,501	( <sup>2</sup> )	23,786	21,368	2,419	NA	2,419	23,786	18,595	117	433.6
1971	9,519	8,319	1,809	4,442	( <sup>2</sup> )	24,088	21,311	2,777	NA	2,777	24,088	18,925	119	434.8
1972	9,550	8,160	1,928	4,378	( <sup>2</sup> )	24,016	20,978	3,039	NA	3,039	24,016	19,043	121	429.4
1973	9,290	8,491	1,890	4,396	( <sup>2</sup> )	24,067	20,856	3,212	NA	3,212	24,067	19,372	124	427.4
1974	8,859	7,920	1,757	4,314	( <sup>2</sup> )	22,850	19,335	3,515	NA	3,515	22,850	18,669	126	404.9
1975	7,989	7,242	1,721	4,152	( <sup>2</sup> )	21,104	17,555	3,549	NA	3,549	21,104	17,380	130	365.3
1976	7,666	7,143	1,842	4,293	( <sup>2</sup> )	20,944	17,348	3,596	NA	3,596	20,944	17,191	138	341.5
1977	7,496	7,351	1,888	4,362	( <sup>2</sup> )	21,097	17,165	3,932	NA	3,932	21,097	17,416	148	323.1
1978	6,988	7,639	1,892	4,790	( <sup>2</sup> )	21,309	<sup>R</sup> 16,197	4,356	756	<sup>R</sup> 5,111	21,309	17,394	157	302.7
1979	7,594	7,359	1,958	4,973	( <sup>2</sup> )	21,883	<sup>R</sup> 16,280	4,822	781	<sup>R</sup> 5,603	21,883	18,034	170	290.8
1980	7,656	7,008	2,019	5,187	( <sup>2</sup> )	21,870	<sup>R</sup> 16,220	4,902	748	<sup>R</sup> 5,650	21,870	17,573	182	263.8
1981	7,452	6,830	2,019	5,287	( <sup>2</sup> )	21,587	<sup>R</sup> 15,894	4,991	703	<sup>R</sup> 5,693	21,587	17,337	199	238.9
1982	6,976	6,217	1,985	5,094	( <sup>2</sup> )	20,272	<sup>R</sup> 14,806	4,773	693	<sup>R</sup> 5,466	20,272	15,809	211	205.5
1983	6,429	5,379	1,780	5,071	( <sup>2</sup> )	18,659	<sup>R</sup> 13,924	4,182	553	<sup>R</sup> 4,735	18,659	14,153	222	174.7
1984	6,712	5,888	2,046	5,620	( <sup>2</sup> )	20,267	<sup>R</sup> 15,046	4,707	513	<sup>R</sup> 5,220	20,267	15,513	234	181.2
1985	6,577	5,218	1,993	5,818	( <sup>2</sup> )	19,607	<sup>R</sup> 14,975	4,186	446	<sup>R</sup> 4,632	19,607	14,535	243	163.6
1986	6,656	4,965	1,972	5,538	( <sup>2</sup> )	19,131	<sup>R</sup> 14,542	4,186	403	<sup>R</sup> 4,589	19,131	14,154	242	160.6
1987	6,688	5,205	2,073	6,174	( <sup>2</sup> )	20,140	<sup>R</sup> 15,062	4,672	406	<sup>R</sup> 5,078	20,140	14,807	249	162.8
1988	6,919	5,248	2,167	6,665	( <sup>2</sup> )	20,999	<sup>R</sup> 15,818	4,747	434	<sup>R</sup> 5,181	20,999	15,467	257	164.3
1989	6,881	5,143	2,237	6,813	( <sup>2</sup> )	21,074	<sup>R</sup> 15,843	4,771	460	<sup>R</sup> 5,231	21,074	15,709	262	164.0
1990	6,907	5,303	2,258	7,054	( <sup>2</sup> )	21,523	<sup>R</sup> 16,013	5,047	463	<sup>R</sup> 5,509	21,523	16,054	<sup>R</sup> 270	<sup>R</sup> 163.0
1991	6,846	5,100	2,154	7,651	( <sup>2</sup> )	21,750	<sup>R</sup> 16,442	4,850	459	<sup>R</sup> 5,308	21,750	16,018	<sup>R</sup> 277	<sup>R</sup> 158.4
1992	6,708	4,977	2,017	8,429	( <sup>2</sup> )	22,132	<sup>R</sup> 16,808	4,772	552	<sup>R</sup> 5,324	22,132	16,165	<sup>R</sup> 276	<sup>R</sup> 160.0
1993	6,817	5,047	2,050	8,812	( <sup>2</sup> )	22,726	<sup>R</sup> 17,352	4,766	607	<sup>R</sup> 5,373	22,726	16,691	282	162.1
1994	6,912	5,226	1,935	9,508	( <sup>2</sup> )	23,581	<sup>R</sup> 17,880	4,996	704	<sup>R</sup> 5,701	23,581	17,351	292	162.9
1995	6,873	5,163	1,812	9,896	( <sup>2</sup> )	23,744	<sup>R</sup> 18,312	4,942	490	<sup>R</sup> 5,432	23,744	17,282	299	158.6
1996	7,028	5,351	1,735	9,999	( <sup>2</sup> )	24,114	<sup>R</sup> 18,270	5,246	597	<sup>R</sup> 5,844	24,114	17,737	302	160.6
1997	<sup>15</sup> 7,300	<sup>1</sup> 5,538	1,704	<sup>19</sup> 9,999	5,242	24,213	<sup>R</sup> 18,306	5,316	591	<sup>R</sup> 5,906	24,213	17,844	311	157.2
1998	5,799	1,579	1,669	9,950	5,110	24,108	<sup>R</sup> 18,308	5,185	615	<sup>R</sup> 5,801	24,108	17,729	317	153.3
1999	5,575	1,599	1,594	10,002	5,053	23,823	<sup>R</sup> 18,133	5,131	559	<sup>R</sup> 5,689	23,823	17,590	302	159.4
2000	5,723	1,485	1,613	10,386	4,968	24,174	<sup>R</sup> 18,474	5,044	656	<sup>R</sup> 5,699	24,174	17,726	342	141.7
2001	5,752	1,525	1,615	10,542	5,066	24,501	<sup>R</sup> 18,685	5,137	679	<sup>R</sup> 5,816	24,501	18,129	373	133.1
2002	5,661	1,382	1,582	10,769	4,548	23,941	<sup>R</sup> 18,629	4,615	697	<sup>R</sup> 5,312	23,941	17,795	388	125.7
2003	5,791	1,378	1,558	10,944	4,447	24,119	<sup>R</sup> 18,903	4,505	710	<sup>R</sup> 5,216	24,119	17,882	393	124.6
2004	5,734	1,377	1,656	11,202	4,001	23,970	<sup>R</sup> 19,233	4,055	681	<sup>R</sup> 4,736	23,970	17,885	406	120.3
2005	6,007	1,310	1,639	11,350	3,151	23,457	<sup>R</sup> 19,567	3,205	685	<sup>R</sup> 3,890	23,457	17,472	426	112.4
2006	6,326	1,378	1,689	11,227	2,914	23,535	<sup>R</sup> 19,951	2,955	630	<sup>R</sup> 3,584	23,535	17,996	441	111.9
2007	6,961	1,383	1,784	11,723	2,813	24,664	<sup>R</sup> 21,187	2,859	618	<sup>R</sup> 3,477	24,664	<sup>3,R</sup> 18,845	453	<sup>R</sup> 114.0
2008	7,801	1,388	1,887	12,231	2,330	25,636	<sup>R</sup> 22,608	2,375	654	<sup>R</sup> 3,029	25,636	<sup>R</sup> 19,889	477	<sup>R</sup> 114.0
2009	7,654	1,559	<sup>R</sup> 1,902	12,499	2,444	<sup>R</sup> 26,057	<sup>R</sup> 22,985	2,485	587	<sup>R</sup> 3,072	<sup>R</sup> 26,057	<sup>R</sup> 20,245	493	<sup>R</sup> 112.5
2010	<sup>R</sup> 7,594	<sup>R</sup> 2,218	1,827	<sup>R</sup> 12,938	2,259	<sup>R</sup> 26,836	<sup>R</sup> 23,960	2,300	576	<sup>R</sup> 2,876	<sup>R</sup> 26,836	<sup>R</sup> 20,841	<sup>R</sup> 488	<sup>R</sup> 117.1
2011	<sup>P</sup> 7,931	<sup>P</sup> 3,060	<sup>P</sup> 1,899	<sup>P</sup> 13,855	<sup>P</sup> 1,830	<sup>P</sup> 28,576	<sup>E</sup> 26,152	<sup>E</sup> 1,868	<sup>E</sup> 556	<sup>E</sup> 2,424	<sup>P</sup> 28,576	<sup>E</sup> 22,378	<sup>E</sup> 504	<sup>E</sup> 121.5

<sup>1</sup> Through 1996, includes gross withdrawals in Federal offshore areas of the Gulf of Mexico; beginning in 1997, these are included in "Federal Gulf of Mexico."

<sup>2</sup> Gross withdrawals from Federal offshore areas of the Gulf of Mexico. Through 1996, these gross withdrawals are included in "Texas," "Louisiana," and "Other States."

<sup>3</sup> Beginning in 2007, includes natural gas gross withdrawals from coalbed wells, and beginning in 2008, from shale gas wells.

<sup>4</sup> As of December 31.

R=Revised, P=Preliminary, E=Estimate, NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

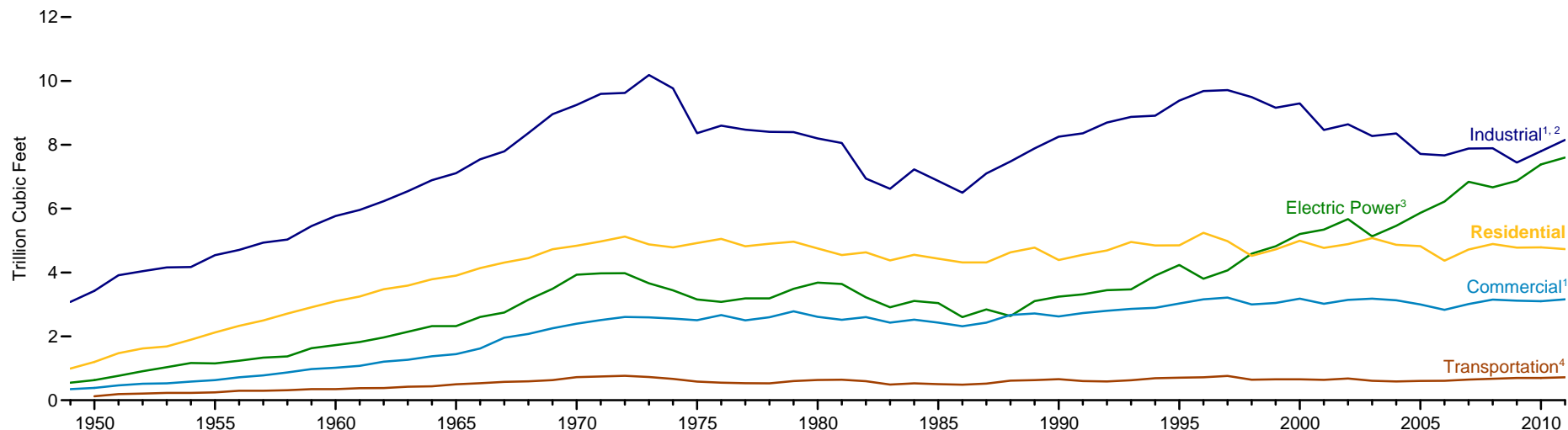
Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#naturalgas> for all data beginning in 1960. • For related information, see <http://www.eia.gov/naturalgas/>.

Sources: **Total (Gross Withdrawals):** • 1960-2006—U.S. Energy Information Administration (EIA),

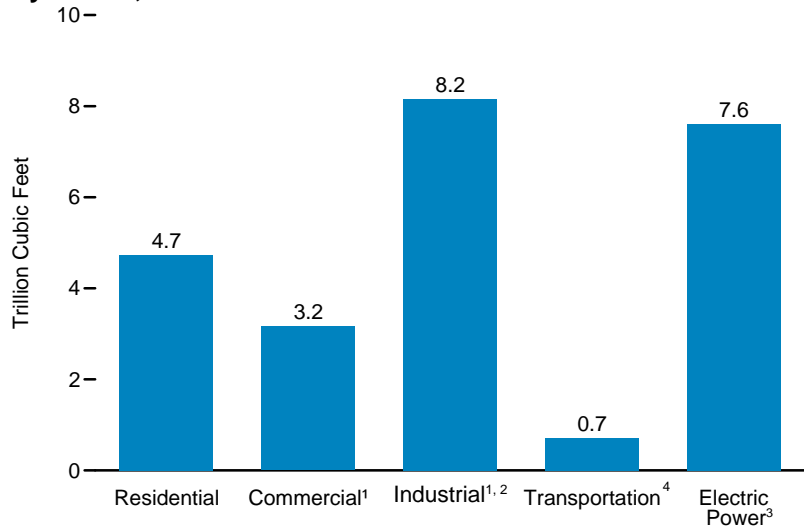
*Natural Gas Annual (NGA)*, annual reports. • 2007 forward—EIA, *Natural Gas Monthly* (March 2012), Table 1. **Total (Offshore):** • 1960-1981—U.S. Geological Survey. • 1982-1985—U.S. Minerals Management Service, *Mineral Revenues—The 1989 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports. • 1986-2010—EIA, NGA, annual reports • 2011—Calculated as total gross withdrawals minus onshore withdrawals. **State (Offshore) and Federal (Offshore):** • 1960-2010—EIA, NGA, annual reports. • 2011—EIA estimates based on Bureau of Safety and Environmental Enforcement and State reports and websites. **Average Productivity:** Calculated as gross withdrawals from natural gas wells divided by the number of producing wells, and then divided by the number of days in the year. **All Other Data:** • 1960-1966—Bureau of Mines, *Natural Gas Production and Consumption*. • 1967-2010—EIA, NGA, annual reports and unpublished revisions. • 2011—EIA estimates based on previous year's data.

**Figure 6.5 Natural Gas Consumption by Sector**

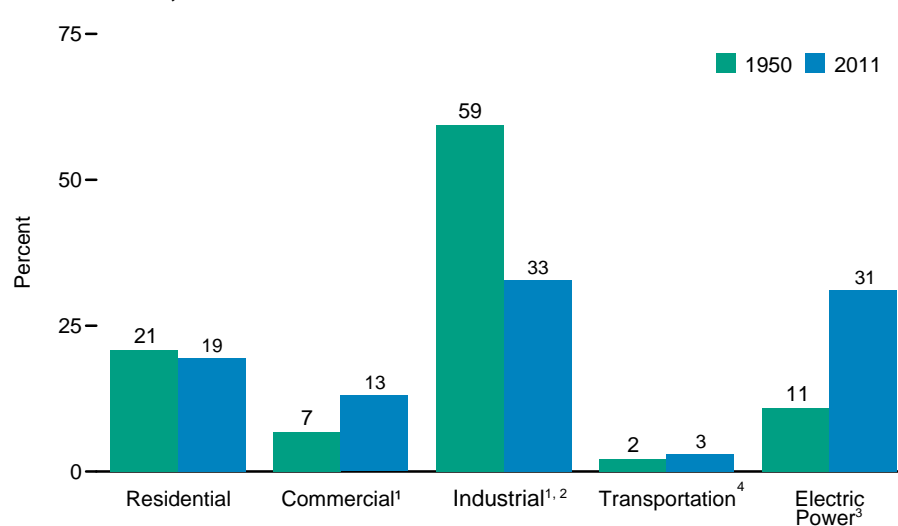
**By Sector, 1949-2011**



**By Sector, 2011**



**Sector Shares, 1950 and 2011**



<sup>1</sup> Includes combined-heat-and-power plants and a small number of electricity-only plants.

<sup>2</sup> Lease and plant fuel, and other industrial.

<sup>3</sup> Electricity-only and combined-heat-and-power plants whose primary business is to sell electricity, or electricity and heat, to the public.

<sup>4</sup> Natural gas consumed in the operation of pipelines (primarily in compressors), and as fuel in the delivery of natural gas to consumers; plus a small quantity used as vehicle fuel.

Source: Table 6.5.

**Table 6.5 Natural Gas Consumption by Sector, Selected Years, 1949-2011**  
(Billion Cubic Feet)

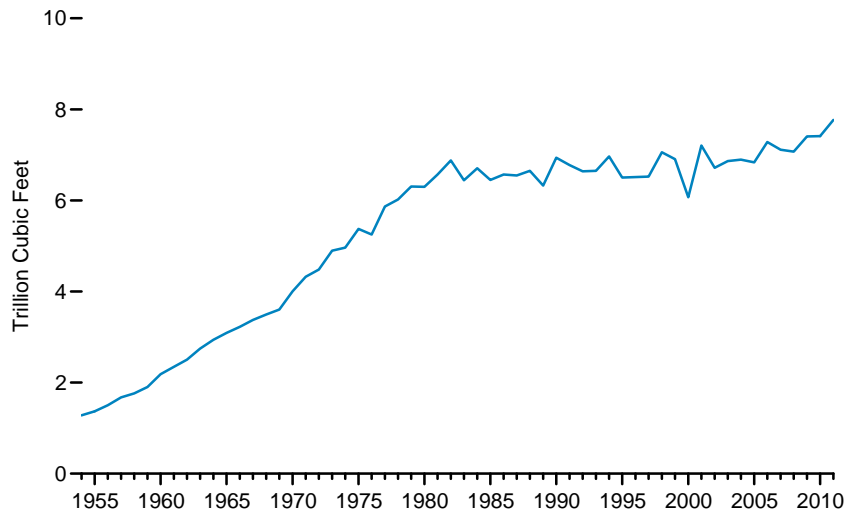
Year	Residential Sector	Commercial Sector			Industrial Sector				Transportation Sector			Electric Power Sector <sup>1</sup>			Total	
		CHP <sup>2</sup>	Other <sup>3</sup>	Total	Lease and Plant Fuel	Other Industrial			Total	Pipelines and Distribution <sup>6</sup>	Vehicle Fuel <sup>8</sup>	Total	Electricity Only	CHP		Total
						CHP <sup>4</sup>	Non-CHP <sup>5</sup>	Total								
1949	993	( <sup>9</sup> )	348	348	835	( <sup>10</sup> )	2,245	2,245	3,081	NA	NA	NA	550	NA	550	4,971
1950	1,198	( <sup>9</sup> )	388	388	928	( <sup>10</sup> )	2,498	2,498	3,426	126	NA	126	629	NA	629	5,767
1955	2,124	( <sup>9</sup> )	629	629	1,131	( <sup>10</sup> )	3,411	3,411	4,542	245	NA	245	1,153	NA	1,153	8,694
1960	3,103	( <sup>9</sup> )	1,020	1,020	1,237	( <sup>10</sup> )	4,535	4,535	5,771	347	NA	347	1,725	NA	1,725	11,967
1965	3,903	( <sup>9</sup> )	1,444	1,444	1,156	( <sup>10</sup> )	5,955	5,955	7,112	501	NA	501	2,321	NA	2,321	15,280
1970	4,837	( <sup>9</sup> )	2,399	2,399	1,399	( <sup>10</sup> )	7,851	7,851	9,249	722	NA	722	3,932	NA	3,932	21,139
1975	4,924	( <sup>9</sup> )	2,508	2,508	1,396	( <sup>10</sup> )	6,968	6,968	8,365	583	NA	583	3,158	NA	3,158	19,538
1976	5,051	( <sup>9</sup> )	2,668	2,668	1,634	( <sup>10</sup> )	6,964	6,964	8,598	548	NA	548	3,081	NA	3,081	19,946
1977	4,821	( <sup>9</sup> )	2,501	2,501	1,659	( <sup>10</sup> )	6,815	6,815	8,474	533	NA	533	3,191	NA	3,191	19,521
1978	4,903	( <sup>9</sup> )	2,601	2,601	1,648	( <sup>10</sup> )	6,757	6,757	8,405	530	NA	530	3,188	NA	3,188	19,627
1979	4,965	( <sup>9</sup> )	2,786	2,786	1,499	( <sup>10</sup> )	6,899	6,899	8,398	601	NA	601	3,491	NA	3,491	20,241
1980	4,752	( <sup>9</sup> )	2,611	2,611	1,026	( <sup>10</sup> )	7,172	7,172	8,198	635	NA	635	3,682	NA	3,682	19,877
1981	4,546	( <sup>9</sup> )	2,520	2,520	928	( <sup>10</sup> )	7,128	7,128	8,055	642	NA	642	3,640	NA	3,640	19,404
1982	4,633	( <sup>9</sup> )	2,606	2,606	1,109	( <sup>10</sup> )	5,831	5,831	6,941	596	NA	596	3,226	NA	3,226	18,001
1983	4,381	( <sup>9</sup> )	2,433	2,433	978	( <sup>10</sup> )	5,643	5,643	6,621	490	NA	490	2,911	NA	2,911	16,835
1984	4,555	( <sup>9</sup> )	2,524	2,524	1,077	( <sup>10</sup> )	6,154	6,154	7,231	529	NA	529	3,111	NA	3,111	17,951
1985	4,433	( <sup>9</sup> )	2,432	2,432	966	( <sup>10</sup> )	5,901	5,901	6,867	504	NA	504	3,044	NA	3,044	17,281
1986	4,314	( <sup>9</sup> )	2,318	2,318	923	( <sup>10</sup> )	5,579	5,579	6,502	485	NA	485	2,602	NA	2,602	16,221
1987	4,315	( <sup>9</sup> )	2,430	2,430	1,149	( <sup>10</sup> )	5,953	5,953	7,103	519	NA	519	2,844	NA	2,844	17,211
1988	4,630	( <sup>9</sup> )	2,670	2,670	1,096	( <sup>10</sup> )	6,383	6,383	7,479	614	NA	614	2,636	NA	2,636	18,030
1989	4,781	30	2,688	2,718	1,070	914	<sup>11</sup> 5,903	<sup>11</sup> 6,816	7,886	629	NA	629	<sup>11</sup> 2,791	<sup>11</sup> 315	<sup>11</sup> 3,105	<sup>11</sup> 19,119
1990	4,391	46	2,576	2,623	1,236	1,055	<sup>11</sup> 5,963	<sup>11</sup> 7,018	8,255	660	(s)	660	<sup>11</sup> 2,794	<sup>11</sup> 451	<sup>11</sup> 3,245	<sup>11</sup> 19,174
1991	4,556	52	2,676	2,729	1,129	1,061	<sup>11</sup> 6,170	<sup>11</sup> 7,231	8,360	601	(s)	602	<sup>11</sup> 2,822	<sup>11</sup> 494	<sup>11</sup> 3,316	<sup>11</sup> 19,562
1992	4,690	62	2,740	2,803	1,171	1,107	<sup>11</sup> 6,420	<sup>11</sup> 7,527	8,698	588	2	590	<sup>11</sup> 2,829	<sup>11</sup> 619	<sup>11</sup> 3,448	<sup>11</sup> 20,228
1993	4,956	65	2,796	2,862	1,172	1,124	6,576	7,700	8,872	624	3	627	2,755	718	3,473	20,790
1994	4,848	72	2,823	2,895	1,124	1,176	6,613	7,790	8,913	685	3	689	3,065	838	3,903	21,247
1995	4,850	78	2,953	3,031	1,220	1,258	6,906	8,164	9,384	700	5	705	3,288	949	4,237	22,207
1996	5,241	82	3,076	3,158	1,250	1,289	7,146	8,435	9,685	711	6	718	2,824	983	3,807	22,609
1997	4,984	87	3,128	3,215	1,203	1,282	7,229	8,511	9,714	751	8	760	3,039	1,026	4,065	22,737
1998	4,520	87	2,912	2,999	1,173	1,355	6,965	8,320	9,493	635	9	645	3,544	1,044	4,588	22,246
1999	4,726	84	2,961	3,045	1,079	1,401	6,678	8,079	9,158	645	12	657	3,729	1,090	4,820	22,405
2000	4,996	85	3,098	3,182	1,151	1,386	6,757	8,142	9,293	642	13	655	4,093	1,114	5,206	23,333
2001	4,771	79	2,944	3,023	1,119	1,310	6,035	7,344	8,463	625	15	640	4,164	1,178	5,342	22,239
2002	4,889	74	3,070	3,144	1,113	1,240	<sup>R</sup> 6,287	<sup>R</sup> 7,527	<sup>R</sup> 8,640	667	15	682	4,258	1,413	5,672	<sup>R</sup> 23,027
2003	5,079	58	3,121	3,179	1,122	1,144	6,007	7,150	8,273	591	18	610	3,780	1,355	5,135	22,277
2004	4,869	72	3,057	3,129	1,098	1,191	<sup>R</sup> 6,066	<sup>R</sup> 7,256	<sup>R</sup> 8,354	566	21	587	4,142	1,322	5,464	<sup>R</sup> 22,403
2005	4,827	68	2,931	2,999	1,112	1,084	<sup>R</sup> 5,518	<sup>R</sup> 6,601	<sup>R</sup> 7,713	584	23	607	4,592	1,277	5,869	<sup>R</sup> 22,014
2006	4,368	68	2,764	2,832	1,142	1,115	<sup>R</sup> 5,412	<sup>R</sup> 6,527	<sup>R</sup> 7,669	584	24	608	5,091	1,131	6,222	<sup>R</sup> 21,699
2007	4,722	70	2,943	3,013	1,226	1,050	<sup>R</sup> 5,604	<sup>R</sup> 6,655	<sup>R</sup> 7,881	621	25	646	5,612	1,230	6,841	<sup>R</sup> 23,104
2008	4,892	66	3,086	3,153	1,220	955	<sup>R</sup> 5,715	<sup>R</sup> 6,670	<sup>R</sup> 7,890	648	26	674	5,520	1,148	6,668	<sup>R</sup> 23,277
2009	<sup>R</sup> 4,779	76	3,043	3,119	1,275	990	<sup>R</sup> 5,178	6,167	<sup>R</sup> 7,443	<sup>R</sup> 670	<sup>R</sup> 27	<sup>R</sup> 697	5,751	1,122	6,873	<sup>R</sup> 22,910
2010	<sup>R</sup> 4,787	<sup>R</sup> 86	<sup>R</sup> 3,016	<sup>R</sup> 3,102	<sup>R</sup> 1,282	<sup>R</sup> 1,029	<sup>R</sup> 5,488	<sup>R</sup> 6,517	<sup>R</sup> 7,800	<sup>R</sup> 669	<sup>R</sup> 31	<sup>R</sup> 700	<sup>R</sup> 6,239	<sup>R</sup> 1,148	<sup>R</sup> 7,387	<sup>R</sup> 23,775
2011 <sup>P</sup>	4,735	81	3,080	3,161	1,383	1,024	5,746	6,769	8,153	686	33	718	6,440	1,162	7,602	24,369

<sup>1</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers. Electric utility CHP plants are included in "Electricity Only."  
<sup>2</sup> Commercial combined-heat-and-power (CHP) and a small number of commercial electricity-only plants.  
<sup>3</sup> All commercial sector fuel use other than that in "Commercial CHP."  
<sup>4</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants.  
<sup>5</sup> All industrial sector fuel use other than that in "Lease and Plant Fuel" and "Industrial CHP."  
<sup>6</sup> Natural gas consumed in the operation of pipelines, primarily in compressors.  
<sup>7</sup> Natural gas used as fuel in the delivery of natural gas to consumers.  
<sup>8</sup> Vehicle fuel data do not reflect revised data shown in Table 10.5. See Note 4, "Natural Gas Vehicle Fuel," at end of section.  
<sup>9</sup> Included in "Commercial Other."  
<sup>10</sup> Included in "Industrial Non-CHP."  
<sup>11</sup> For 1989–1992, a small amount of consumption at independent power producers may be counted in both "Other Industrial" and "Electric Power Sector." See Note 3, "Natural Gas Consumption, 1989–1992," at end of section.  
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 billion cubic feet.  
Notes: • Data are for natural gas, plus a small amount of supplemental gaseous fuels. See Note 1,

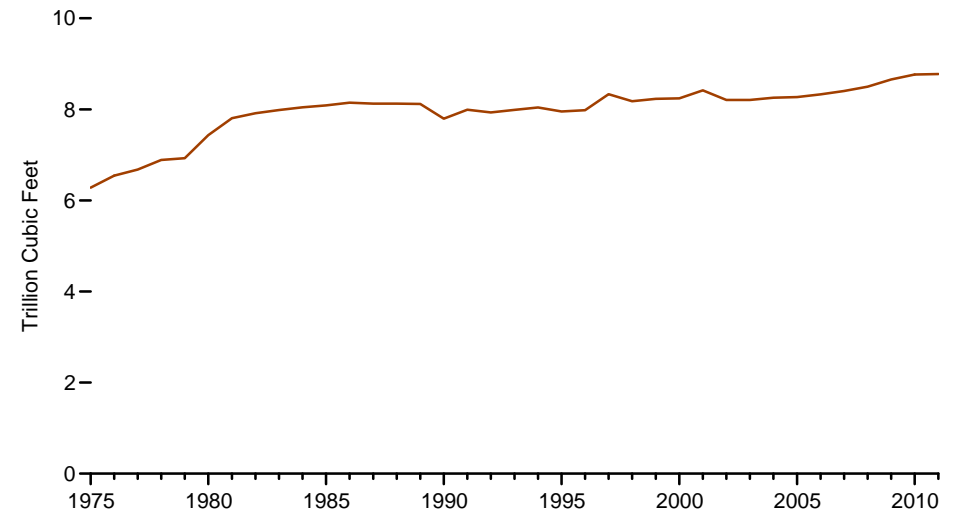
"Supplemental Gaseous Fuels," at end of section. • See Tables 8.5a–8.5d for the amount of natural gas used to produce electricity and Tables 8.6a–8.6c for the amount of natural gas used to produce useful thermal output. • See Note 2, "Natural Gas Consumption," at end of section. • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#naturalgas> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#naturalgas> for all annual data beginning in 1949. • See <http://www.eia.gov/naturalgas/> for related information.  
Sources: **Residential, Commercial Total, Lease and Plant Fuel, Other Industrial Total, and Pipelines and Distribution:** • 1949–2006—U.S. Energy Information Administration (EIA), *Natural Gas Annual (NGA)*, annual reports and unpublished revisions. • 2007 forward—EIA, *Natural Gas Monthly (NGM)* (March 2012), Table 2. **Commercial CHP and Industrial CHP:** Table 8.7c. **Vehicle Fuel:** • 1990 and 1991—EIA, NGA 2000 (November 2001), Table 95. • 1992–1998—EIA, "Alternatives to Traditional Transportation Fuels 1999" (October 1999), Table 10, and "Alternatives to Traditional Transportation Fuels 2003" (February 2004), Table 10. Data for compressed natural gas and liquefied natural gas in gasoline-equivalent gallons were converted to cubic feet by multiplying by the motor gasoline conversion factor (see Table A3) and dividing by the natural gas end-use sectors conversion factor (see Table A4). • 1999–2006—EIA, NGA, annual reports. • 2007 forward—EIA, NGM (March 2012), Table 2. **Electric Power Sector:** Tables 8.5b, 8.5c, 8.6b, and 8.7b. **All Other Data:** Calculated.

**Figure 6.6 Natural Gas Underground Storage, End of Year**

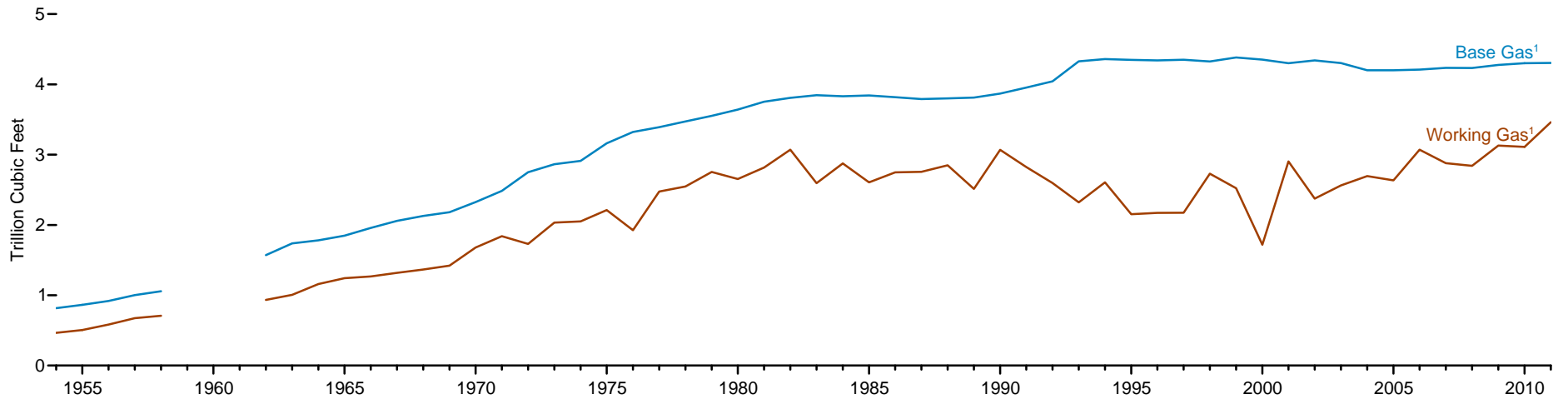
**Total (Base Gas and Working Gas) Underground Storage, 1954-2011**



**Underground Storage Capacity, 1975-2011**



**Base Gas and Working Gas in Underground Storage, 1954-2011**



<sup>1</sup> Working-gas and base-gas data were not collected in 1959, 1960, and 1961.

Source: Table 6.6.



**Table 6.6 Natural Gas Underground Storage, Selected Years, End of Year 1954-2011**  
(Billion Cubic Feet)

Year	Natural Gas in Underground Storage									Natural Gas Underground Storage Capacity <sup>3</sup>
	Base Gas <sup>1</sup>			Working Gas			Total			
	Salt Caverns	Other Than Salt Caverns <sup>2</sup>	Total	Salt Caverns	Other Than Salt Caverns <sup>2</sup>	Total	Salt Caverns	Other Than Salt Caverns <sup>2</sup>	Total	
1954	NA	NA	817	NA	NA	465	NA	NA	1,281	NA
1955	NA	NA	863	NA	NA	505	NA	NA	1,368	NA
1960	NA	NA	NA	NA	NA	NA	NA	NA	2,184	NA
1961	NA	NA	NA	NA	NA	NA	NA	NA	2,344	NA
1962	NA	NA	1,571	NA	NA	933	NA	NA	2,504	NA
1963	NA	NA	1,738	NA	NA	1,007	NA	NA	2,745	NA
1964	NA	NA	1,781	NA	NA	1,159	NA	NA	2,940	NA
1965	NA	NA	1,848	NA	NA	1,242	NA	NA	3,090	NA
1966	NA	NA	1,958	NA	NA	1,267	NA	NA	3,225	NA
1967	NA	NA	2,058	NA	NA	1,318	NA	NA	3,376	NA
1968	NA	NA	2,128	NA	NA	1,366	NA	NA	3,495	NA
1969	NA	NA	2,181	NA	NA	1,421	NA	NA	3,602	NA
1970	NA	NA	2,326	NA	NA	1,678	NA	NA	4,004	NA
1971	NA	NA	2,485	NA	NA	1,840	NA	NA	4,325	NA
1972	NA	NA	2,751	NA	NA	1,729	NA	NA	4,480	NA
1973	NA	NA	2,864	NA	NA	2,034	NA	NA	4,898	NA
1974	NA	NA	2,912	NA	NA	2,050	NA	NA	4,962	NA
1975	NA	NA	3,162	NA	NA	2,212	NA	NA	5,374	6,280
1976	NA	NA	3,323	NA	NA	1,926	NA	NA	5,250	6,544
1977	NA	NA	3,391	NA	NA	2,475	NA	NA	5,866	6,678
1978	NA	NA	3,473	NA	NA	2,547	NA	NA	6,020	6,890
1979	NA	NA	3,553	NA	NA	2,753	NA	NA	6,306	6,929
1980	NA	NA	3,642	NA	NA	2,655	NA	NA	6,297	7,434
1981	NA	NA	3,752	NA	NA	2,817	NA	NA	6,569	7,805
1982	NA	NA	3,808	NA	NA	3,071	NA	NA	6,879	7,915
1983	NA	NA	3,847	NA	NA	2,595	NA	NA	6,442	7,985
1984	NA	NA	3,830	NA	NA	2,876	NA	NA	6,706	8,043
1985	NA	NA	3,842	NA	NA	2,607	NA	NA	6,448	8,087
1986	NA	NA	3,819	NA	NA	2,749	NA	NA	6,567	8,145
1987	NA	NA	3,792	NA	NA	2,756	NA	NA	6,548	8,124
1988	NA	NA	3,800	NA	NA	2,850	NA	NA	6,650	8,124
1989	NA	NA	3,812	NA	NA	2,513	NA	NA	6,325	8,120
1990	NA	NA	3,868	NA	NA	3,068	NA	NA	6,936	7,794
1991	NA	NA	3,954	NA	NA	2,824	NA	NA	6,778	7,993
1992	NA	NA	4,044	NA	NA	2,597	NA	NA	6,641	7,932
1993	NA	NA	4,327	NA	NA	2,322	NA	NA	6,649	7,989
1994	44	4,317	4,360	70	2,536	2,606	113	6,853	6,966	8,043
1995	60	4,290	4,349	72	2,082	2,153	131	6,371	6,503	7,953
1996	64	4,277	4,341	85	2,087	2,173	149	6,364	6,513	7,980
1997	67	4,283	4,350	83	2,092	2,175	150	6,375	6,525	8,332
1998	67	4,259	4,326	104	2,626	2,730	171	6,884	7,056	8,179
1999	69	4,314	4,383	100	2,423	2,523	169	6,738	6,906	8,229
2000	70	4,282	4,352	72	1,647	1,719	142	5,929	6,071	8,241
2001	77	4,224	4,301	115	2,789	2,904	191	7,013	7,204	8,415
2002	75	4,265	4,340	102	2,273	2,375	177	6,539	6,715	8,207
2003	76	4,227	4,303	125	2,438	2,563	201	6,665	6,866	8,206
2004	72	4,129	4,201	98	2,598	2,696	170	6,727	6,897	8,255
2005	78	4,122	4,200	123	2,513	2,635	201	6,635	6,835	8,268
2006	77	4,134	4,211	144	2,926	3,070	222	7,059	7,281	8,330
2007	80	4,154	4,234	123	2,756	2,879	203	6,910	7,113	8,402
2008	86	4,146	4,232	154	2,686	2,840	240	6,832	7,073	8,499
2009	116	4,161	4,277	186	2,944	3,130	302	7,105	7,407	8,656
2010	135	R4,166	R4,301	R220	R2,891	R3,111	R355	R7,057	7,412	R8,764
2011 <sup>P</sup>	142	4,163	4,305	308	3,154	3,462	451	7,317	7,767	8,776

<sup>1</sup> Includes native gas.

<sup>2</sup> Depleted fields, aquifers, and other types of storage not using salt formations.

<sup>3</sup> Includes both active and inactive fields.

R=Revised, P=Preliminary, NA=Not available.

Notes: • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.

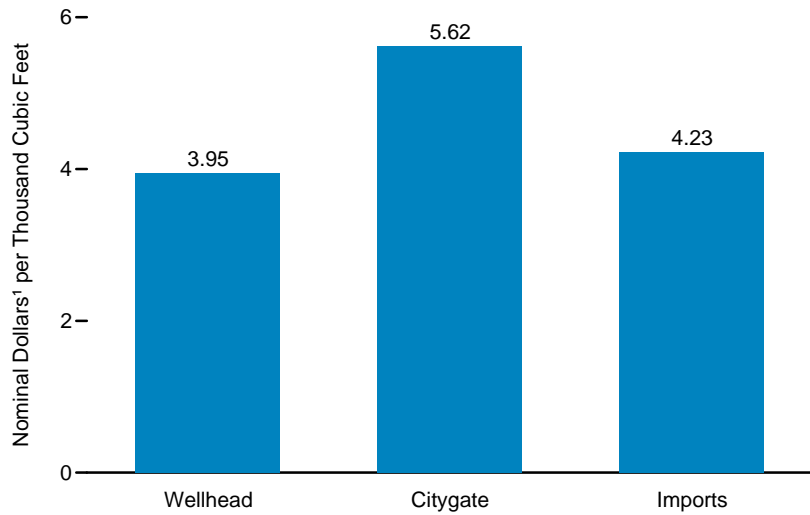
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#naturalgas> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#naturalgas> for all annual data beginning in

1954. • See <http://www.eia.gov/naturalgas/> for related information.

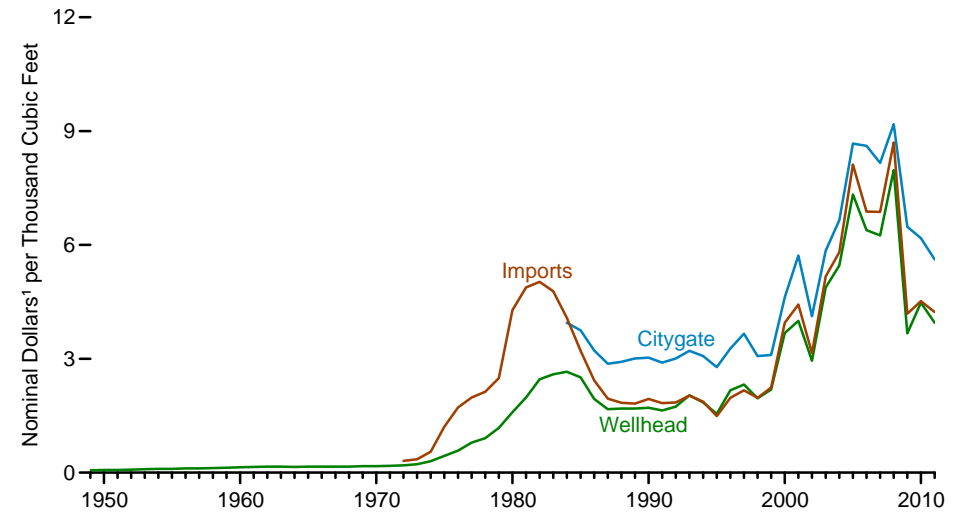
Sources: • 1954-1974—American Gas Association, *Gas Facts*. • 1975-1978—Federal Energy Administration, Form FEA-G318-M-O, "Underground Gas Storage Report," and Federal Power Commission, Form FPC-8, "Underground Gas Storage Report." • 1979-1984—U.S. Energy Information Administration (EIA), Form EIA-191, "Underground Gas Storage Report," and Federal Energy Regulatory Commission, Form FERC-8, "Underground Gas Storage Report." • 1985-2009—EIA, *Natural Gas Monthly (NGM)*, monthly reports, and *Natural Gas Annual*, annual reports. • 2010 and 2011—EIA, NGM (March 2012), Tables 8, 10, and 11, and Form EIA-191M, "Monthly Underground Gas Storage Report."

**Figure 6.7 Natural Gas Wellhead, Citygate, and Imports Prices**

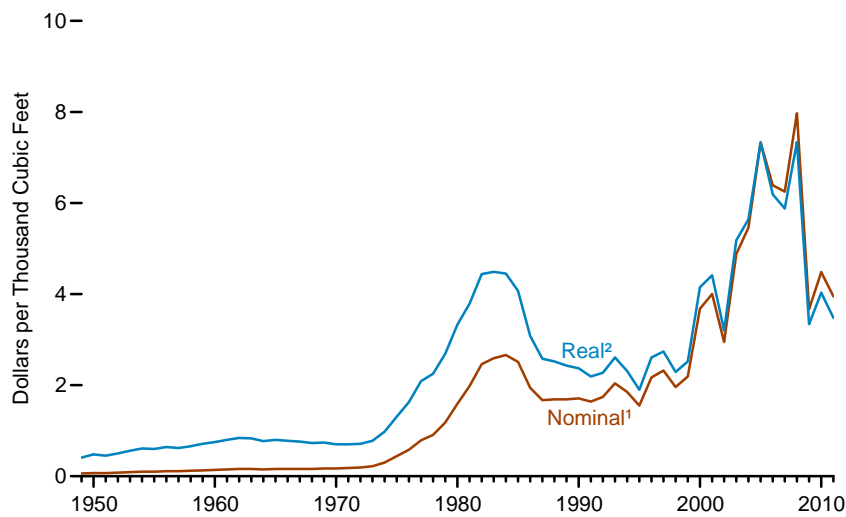
**Wellhead, Citygate, and Imports, 2011**



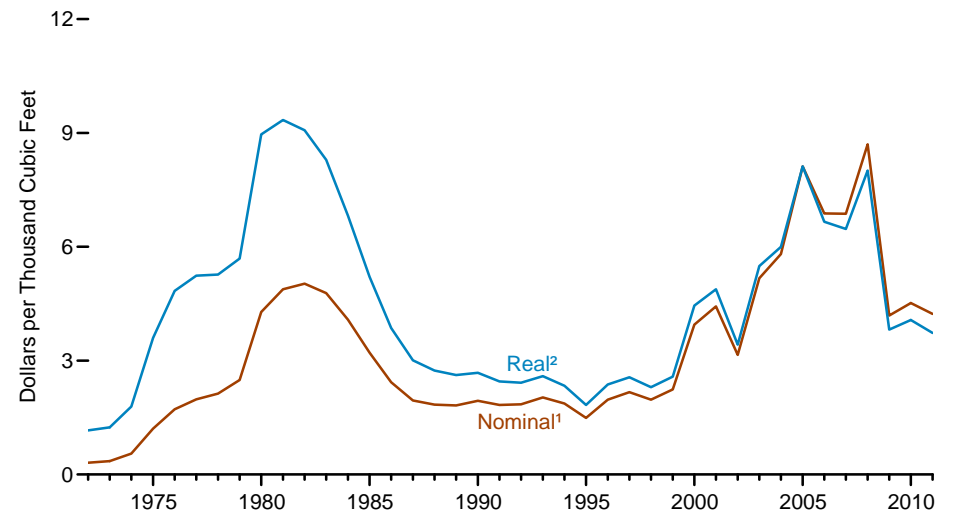
**Wellhead, Citygate, and Imports, 1949-2011**



**Wellhead, 1949-2011**



**Imports, 1972-2011**



<sup>1</sup> See "Nominal Dollars" in Glossary.

<sup>2</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

Source: Table 6.7.

**Table 6.7 Natural Gas Wellhead, Citygate, and Imports Prices, Selected Years, 1949-2011**  
(Dollars per Thousand Cubic Feet)

Year	Wellhead <sup>1</sup>		Citygate <sup>2</sup>		Imports	
	Nominal <sup>3</sup>	Real <sup>4</sup>	Nominal <sup>3</sup>	Real <sup>4</sup>	Nominal <sup>3</sup>	Real <sup>4</sup>
1949	0.06	0.41	NA	NA	NA	NA
1950	.07	.48	NA	NA	NA	NA
1955	.10	.60	NA	NA	NA	NA
1960	.14	.75	NA	NA	NA	NA
1965	.16	.80	NA	NA	NA	NA
1970	.17	.70	NA	NA	NA	NA
1975	.44	1.31	NA	NA	1.21	<sup>R</sup> 3.60
1976	.58	1.63	NA	NA	1.72	<sup>R</sup> 4.84
1977	.79	2.09	NA	NA	1.98	5.24
1978	.91	2.25	NA	NA	2.13	5.27
1979	1.18	<sup>R</sup> 2.69	NA	NA	2.49	5.69
1980	1.59	3.33	NA	NA	4.28	8.96
1981	1.98	3.79	NA	NA	4.88	9.34
1982	2.46	4.44	NA	NA	5.03	<sup>R</sup> 9.07
1983	2.59	<sup>R</sup> 4.49	NA	NA	4.78	<sup>R</sup> 8.29
1984	2.66	4.45	3.95	<sup>R</sup> 6.60	4.08	<sup>R</sup> 6.82
1985	2.51	<sup>R</sup> 4.07	3.75	<sup>R</sup> 6.08	3.21	5.21
1986	1.94	3.08	3.22	<sup>R</sup> 5.11	2.43	3.86
1987	1.67	2.58	2.87	4.43	1.95	3.01
1988	1.69	2.52	2.92	4.36	1.84	<sup>R</sup> 2.74
1989	1.69	2.43	3.01	4.33	1.82	2.62
1990	1.71	2.37	3.03	<sup>R</sup> 4.19	1.94	<sup>R</sup> 2.68
1991	1.64	2.19	2.90	3.88	1.83	2.45
1992	1.74	2.27	3.01	3.93	1.85	2.42
1993	2.04	2.61	3.21	4.10	2.03	<sup>R</sup> 2.59
1994	1.85	<sup>R</sup> 2.31	3.07	3.84	1.87	2.34
1995	1.55	1.90	2.78	3.41	1.49	1.83
1996	2.17	2.61	3.27	<sup>R</sup> 3.93	1.97	2.37
1997	2.32	2.74	3.66	<sup>R</sup> 4.32	2.17	<sup>R</sup> 2.56
1998	1.96	2.29	3.07	3.59	1.97	2.30
1999	2.19	2.52	3.10	3.57	2.24	2.58
2000	3.68	4.15	4.62	5.21	3.95	<sup>R</sup> 4.45
2001	4.00	4.41	5.72	<sup>R</sup> 6.30	4.43	<sup>R</sup> 4.88
2002	2.95	3.20	4.12	4.47	3.15	3.42
2003	4.88	<sup>R</sup> 5.18	5.85	<sup>R</sup> 6.21	5.17	5.49
2004	5.46	5.64	6.65	6.87	5.81	6.00
2005	7.33	7.33	8.67	8.67	8.12	8.12
2006	6.39	6.19	8.61	8.34	6.88	6.66
2007	6.25	5.88	8.16	7.68	6.87	<sup>R</sup> 6.47
2008	7.97	7.34	9.18	8.45	8.70	8.01
2009	3.67	3.34	<sup>R</sup> 6.48	<sup>R</sup> 5.91	4.19	3.82
2010	<sup>R</sup> 4.48	<sup>R</sup> 4.04	<sup>R</sup> 6.18	5.57	4.52	<sup>R</sup> 4.07
2011	<sup>E</sup> 3.95	<sup>E</sup> 3.48	<sup>P</sup> 5.62	<sup>P</sup> 4.96	<sup>P</sup> 4.23	<sup>P</sup> 3.73

<sup>1</sup> See "Natural Gas Wellhead Price" in Glossary.

<sup>2</sup> See "Citygate" in Glossary.

<sup>3</sup> See "Nominal Dollars" in Glossary.

<sup>4</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

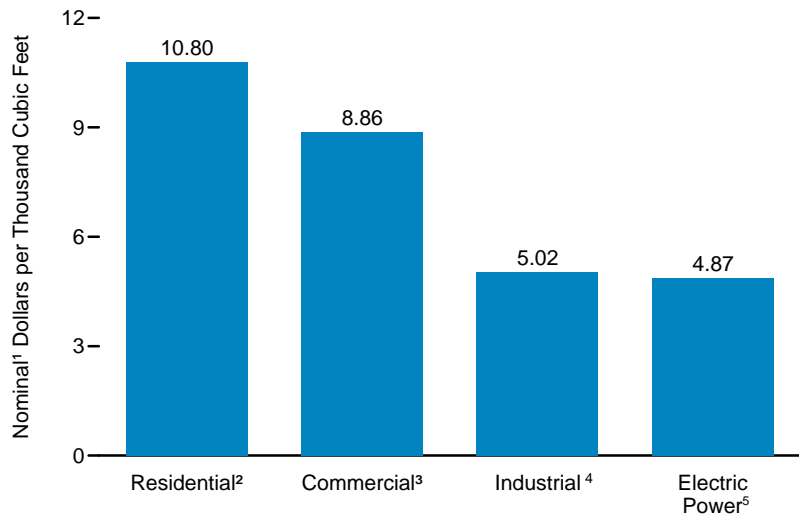
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#prices> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#naturalgas> for all annual data beginning in 1949.

• See <http://www.eia.gov/naturalgas/> for related information.

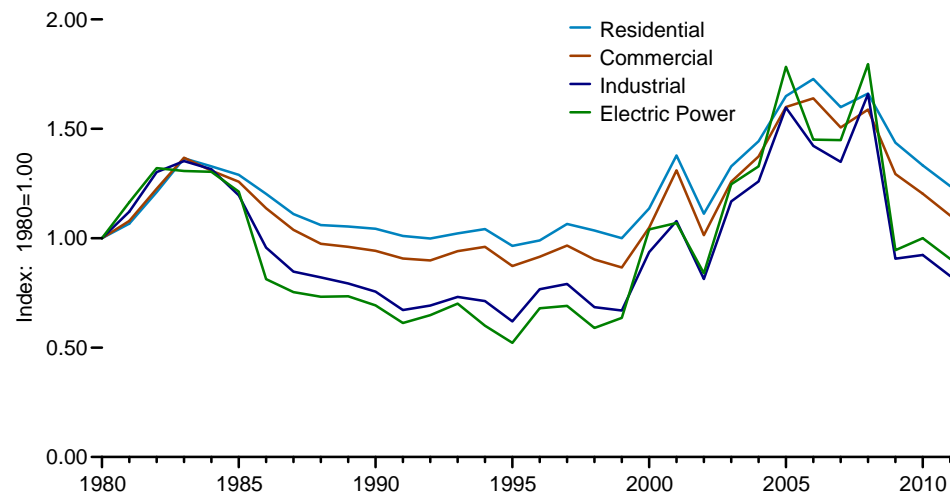
Sources: **Wellhead and Citygate:** • 1949-2006—U.S. Energy Information Administration (EIA), *Natural Gas Annual (NGA)*, annual reports. • 2007 forward—EIA, *Natural Gas Monthly (NGM)* (March 2012), Table 3. **Imports:** • 1972 and 1973—Federal Power Commission (FPC), *Pipeline Imports and Exports of Natural Gas—Imports and Exports of LNG*. • 1974-1976—FPC, *United States Imports and Exports of Natural Gas*, annual reports. • 1977-2009—EIA, NGA, annual reports. • 2010 and 2011—EIA, NGM (March 2012), Tables 3 and 4.

**Figure 6.8 Natural Gas Prices by Sector**

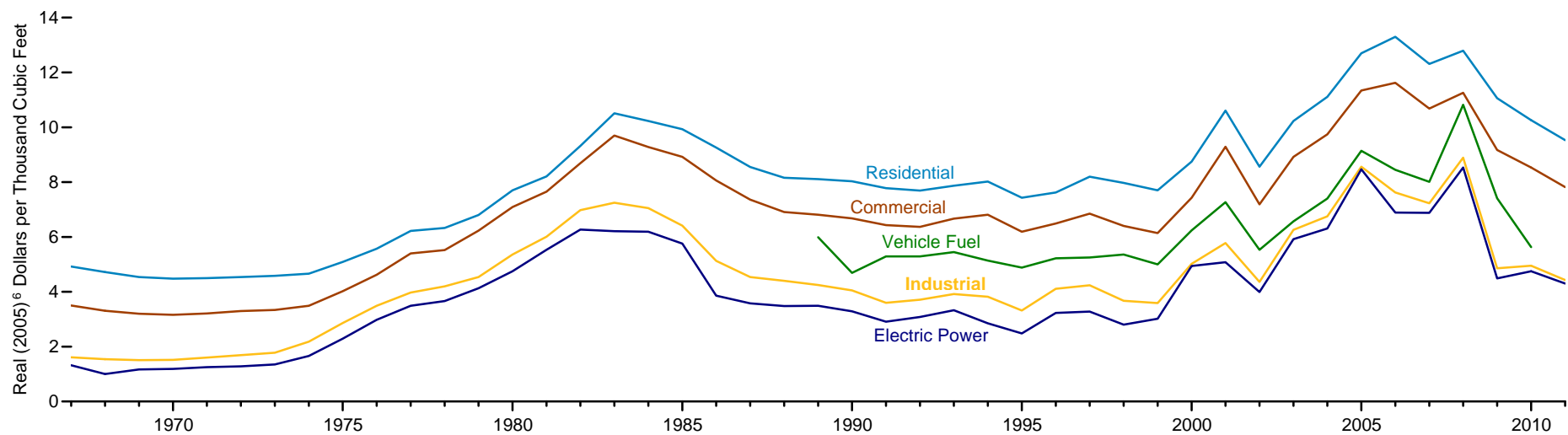
**Nominal<sup>1</sup> Prices, 2011**



**Real<sup>6</sup> Prices, Indexed, 1980-2011**



**Real<sup>6</sup> Prices, 1967-2011**



<sup>1</sup> See "Nominal Dollars" in Glossary.

<sup>2</sup> Based on 95.7 percent of volume delivered.

<sup>3</sup> Based on 62.3 percent of volume delivered.

<sup>4</sup> Based on 16.0 percent of volume delivered.

<sup>5</sup> Based on 101.2 percent of volume delivered. For an explanation of values over 100 percent, see Table 6.8, footnote 8.

<sup>6</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

Source: Table 6.8.

**Table 6.8 Natural Gas Prices by Sector, Selected Years, 1967-2011**  
(Dollars per Thousand Cubic Feet, Except as Noted)

Year	Residential Sector			Commercial Sector <sup>1</sup>			Industrial Sector <sup>2</sup>			Transportation Sector		Electric Power Sector <sup>3</sup>		
	Prices		Percentage of Sector <sup>7</sup>	Prices		Percentage of Sector <sup>7</sup>	Prices		Percentage of Sector <sup>7</sup>	Vehicle Fuel <sup>4</sup> Prices		Prices		Percentage of Sector <sup>7,8</sup>
	Nominal <sup>5</sup>	Real <sup>6</sup>		Nominal <sup>5</sup>	Real <sup>6</sup>		Nominal <sup>5</sup>	Real <sup>6</sup>		Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	
1967	1.04	R4.92	NA	0.74	3.50	NA	0.34	1.61	NA	NA	NA	0.28	R1.32	NA
1970	1.09	4.48	NA	.77	R3.16	NA	.37	1.52	NA	NA	NA	.29	1.19	NA
1975	1.71	5.09	NA	1.35	4.02	NA	.96	2.86	NA	NA	NA	.77	2.29	96.1
1976	1.98	R5.57	NA	1.64	4.62	NA	1.24	3.49	NA	NA	NA	1.06	R2.98	96.2
1977	2.35	R6.22	NA	2.04	5.40	NA	1.50	3.97	NA	NA	NA	1.32	R3.49	97.1
1978	2.56	R6.33	NA	2.23	5.52	NA	1.70	R4.20	NA	NA	NA	1.48	3.66	98.0
1979	2.98	R6.80	NA	2.73	R6.23	NA	1.99	R4.54	NA	NA	NA	1.81	R4.13	96.1
1980	3.68	R7.70	NA	3.39	R7.09	NA	2.56	5.36	NA	NA	NA	2.27	4.75	96.9
1981	4.29	8.21	NA	4.00	R7.65	NA	3.14	6.01	NA	NA	NA	2.89	5.53	97.6
1982	5.17	R9.32	NA	4.82	R8.69	NA	3.87	6.98	85.1	NA	NA	3.48	R6.27	92.6
1983	6.06	R10.51	NA	5.59	9.70	NA	4.18	R7.25	80.7	NA	NA	3.58	6.21	93.9
1984	6.12	R10.23	NA	5.55	R9.28	NA	4.22	R7.05	74.7	NA	NA	3.70	6.19	94.4
1985	6.12	R9.93	NA	5.50	R8.92	NA	3.95	6.41	68.8	NA	NA	3.55	R5.76	94.0
1986	5.83	9.26	NA	5.08	R8.06	NA	3.23	5.13	59.8	NA	NA	2.43	3.86	91.7
1987	5.54	8.55	NA	4.77	R7.36	93.1	2.94	4.54	47.4	NA	NA	2.32	3.58	91.6
1988	5.47	R8.16	NA	4.63	6.91	90.7	2.95	4.40	42.6	NA	NA	2.33	3.48	89.6
1989	5.64	8.11	99.9	4.74	R6.81	89.1	2.96	R4.25	36.9	4.17	R5.99	2.43	R3.49	79.6
1990	5.80	8.03	99.2	4.83	R6.68	86.6	2.93	R4.05	35.2	3.39	R4.69	2.38	R3.29	76.8
1991	5.82	7.78	99.2	4.81	6.43	85.1	2.69	3.60	32.7	3.96	R5.29	2.18	R2.91	79.3
1992	5.89	R7.69	99.1	4.88	R6.37	83.2	2.84	3.71	30.3	4.05	5.29	2.36	3.08	76.5
1993	6.16	7.87	99.1	5.22	6.67	83.9	3.07	3.92	29.7	4.27	R5.45	2.61	R3.33	74.1
1994	6.41	R8.02	99.1	5.44	6.81	79.3	3.05	3.82	25.5	4.11	R5.14	2.28	2.85	73.4
1995	6.06	7.43	99.0	5.05	6.19	76.7	2.71	3.32	24.5	3.98	4.88	2.02	2.48	71.4
1996	6.34	R7.62	99.0	5.40	R6.49	77.6	3.42	R4.11	19.4	4.34	5.22	2.69	R3.23	68.4
1997	6.94	R8.20	98.8	5.80	R6.85	70.8	3.59	R4.24	18.1	4.44	5.25	2.78	R3.28	68.0
1998	6.82	R7.97	97.7	5.48	R6.40	67.0	3.14	3.67	16.1	4.59	R5.36	2.40	R2.80	63.7
1999	6.69	R7.70	95.2	5.33	6.14	66.1	3.12	R3.59	18.8	4.34	5.00	2.62	3.02	58.3
2000	7.76	8.75	92.6	6.59	7.43	63.9	4.45	5.02	19.8	5.54	R6.24	4.38	4.94	50.5
2001	9.63	R10.61	92.4	8.43	R9.29	66.0	5.24	5.78	20.8	6.60	R7.27	4.61	R5.08	40.2
2002	7.89	R8.56	97.9	6.63	R7.19	77.4	4.02	4.36	22.7	5.10	R5.53	3.68	3.99	383.9
2003	9.63	10.23	97.5	8.40	R8.92	78.2	5.89	6.26	22.1	6.19	R6.57	5.57	5.92	91.2
2004	10.75	11.11	97.7	9.43	9.74	78.0	6.53	6.75	R23.6	7.16	7.40	6.11	6.31	89.8
2005	12.70	12.70	R98.1	11.34	11.34	82.1	8.56	8.56	R24.0	9.14	9.14	8.47	8.47	91.3
2006	13.73	13.30	98.1	12.00	11.62	80.8	7.87	7.62	23.4	8.72	8.45	7.11	6.89	93.4
2007	13.08	12.31	98.0	11.34	R10.68	80.4	7.68	7.23	22.2	8.50	R8.01	7.31	6.88	92.2
2008	13.89	12.79	97.5	12.23	11.26	79.9	9.65	R8.89	20.5	11.75	10.82	9.26	8.53	101.1
2009	12.14	R11.06	97.4	10.06	R9.17	77.8	5.33	4.86	18.8	8.13	7.41	4.93	R4.49	101.1
2010	R11.39	R10.26	R97.4	R9.47	R8.53	R77.5	R5.49	R4.95	R18.0	R6.25	R5.63	R5.27	4.75	R100.8
2011 <sup>P</sup>	10.80	9.53	95.7	8.86	7.82	62.3	5.02	4.43	16.0	NA	NA	4.87	4.30	101.2

<sup>1</sup> Commercial sector, including commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>2</sup> Industrial sector, including industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

<sup>3</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 2001, data are for electric utilities only; beginning in 2002, data are for electric utilities and independent power producers. See Note 5, "Coverage of Electric Power Sector Natural Gas Prices," at end of section.

<sup>4</sup> Much of the natural gas delivered for vehicle fuel represents deliveries to fueling stations that are used primarily or exclusively by fleet vehicles. Thus, the prices are often those associated with the cost of gas in the operation of fleet vehicles.

<sup>5</sup> See "Nominal Dollars" in Glossary.

<sup>6</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>7</sup> The percentage of the sector's consumption in Table 6.5 for which price data are available.

<sup>8</sup> Percentages exceed 100 percent when reported natural gas receipts are greater than reported natural gas consumption—this can occur when combined-heat-and-power (CHP) plants report fuel receipts related to non-electric generating activities.

R=Revised. P=Preliminary. NA=Not available.

Notes: • Prices are for natural gas, plus a small amount of supplemental gaseous fuels. • The average for each end-use sector is calculated by dividing the total value of the natural gas consumed by each sector

by the total quantity consumed. • Prices are intended to include all taxes. • See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#prices> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#naturalgas> for all annual data beginning in 1967. • See <http://www.eia.gov/naturalgas/> for related information.

Sources: **Residential Percentage of Sector:** • 1989-2006—U.S. Energy Information Administration (EIA), Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition." • 2007 forward—EIA, *Natural Gas Monthly (NGM)* (March 2012), Table 3. **Vehicle Fuel:** EIA, *Natural Gas Annual (NGA)*, annual reports. **Electric Power Percentage of Sector:** • 1973-2001—Calculated by EIA as the quantity of natural gas receipts by electric utilities reported on Form FERC-423, "Monthly Report of Cost and Quantity of Fuels for Electric Utility Plants" (and predecessor forms), divided by the quantity of natural gas consumed by the electric power sector (for 1973-1988, see Table 8.5b; for 1989-2001, see Table 8.7b). • 2002-2007—Calculated by EIA as the quantity of natural gas receipts by electric utilities and independent power producers reported on Forms FERC-423, "Monthly Report of Cost and Quantity of Fuels for Electric Utility Plants," and EIA-423, "Monthly Cost and Quality of Fuels for Electric Plants Report," divided by the quantity of natural gas consumed by the electric power sector (see Table 8.7b). • 2008 forward—Calculated by EIA as the quantity of natural gas receipts by electric utilities and independent power producers reported on Form EIA-923, "Power Plant Operations Report," divided by the quantity of natural gas consumed by the electric power sector (see Table 8.7b). **All Other Data:** • 1967-2006—EIA, NGA, annual reports. • 2007 forward—EIA, NGM (March 2012), Table 3.

## Natural Gas

**Note 1. Supplemental Gaseous Fuels.** Supplemental gaseous fuels are any substances that, introduced into or commingled with natural gas, increase the volume available for disposition. Such substances include, but are not limited to, propane-air, refinery gas, coke oven gas, still gas, manufactured gas, biomass gas, or air or inert gases added for British thermal unit (Btu) stabilization.

Annual data beginning with 1980 are from the U.S. Energy Information Administration (EIA), *Natural Gas Annual*. Unknown quantities of supplemental gaseous fuels are included in consumption data for 1979 and earlier years.

Although the total amount of supplemental gaseous fuels consumed is known for 1980 forward, the amount consumed by each energy-use sector is estimated by EIA. These estimates are used to create natural gas (without supplemental gaseous fuels) data for Tables 1.3, 2.1b, 2.1c, 2.1d, and 2.1f (note: to avoid double-counting in these tables, supplemental gaseous fuels are accounted for in their primary energy category: “Coal,” “Petroleum,” or “Biomass”). It is assumed that supplemental gaseous fuels are commingled with natural gas consumed by the residential, commercial, other industrial, and electric power sectors, but are not commingled with natural gas used for lease and plant fuel, pipelines and distribution, or vehicle fuel. The estimated consumption of supplemental gaseous fuels by each sector (residential, commercial, other industrial, and electric power) is calculated as that sector’s natural gas consumption (see Table 6.5) divided by the sum of natural gas consumption by the residential, commercial, other industrial, and electric power sectors (see Table 6.5), and then multiplied by total supplemental gaseous fuels consumption (see Table 6.1). For estimated sectoral consumption of supplemental gaseous fuels in Btu, the residential, commercial, and other industrial values in cubic feet are multiplied by the “End-Use Sectors” conversion factors (see Table A4), and the electric power values in cubic feet are multiplied by the “Electric Power Sector” conversion factors (see Table A4). Total supplemental gaseous fuels consumption in Btu is calculated as the sum of the Btu values for the sectors.

**Note 2. Natural Gas Consumption.** Natural gas consumption statistics are compiled from surveys of natural gas production, transmission, and distribution companies and from surveys of electric power generation. Consumption by sector from these surveys is compiled on a national and individual State basis and then balanced with national and individual State supply data. Included in the data are the following: **Residential Sector**—Consumption by private households for space heating, cooking, and other household uses; **Commercial Sector**—Consumption by nonmanufacturing establishments; government agencies; and, through 1995, those engaged in agriculture, forestry, and fishing. The commercial sector includes

generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercialestablishments; **Industrial Sector**—Consumption by establishments engaged primarily in processing unfinished materials into another form of product (including mining; petroleum refining; manufacturing; and, beginning in 1996, agriculture, forestry, and fishing), and natural gas industry use for lease and plant fuel. The industrial sector includes generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities; **Transportation Sector**—Natural gas transmission (pipeline) fuel, and natural gas delivered for use as vehicle fuel; and **Electric Power Sector (electric utilities and independent power producers)**—Consumption for electricity generation and useful thermal output at electricity-only and combined-heat-and-power (CHP) plants within the NAICS (North American Industry Classification System) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

**Note 3. Natural Gas Consumption, 1989-1992.** Prior to 1993, deliveries to nonutility generators were not separately collected from natural gas companies on Form EIA-176, “Annual Report of Natural and Supplemental Gas Supply and Disposition.” As a result, for 1989-1992, those volumes are probably included in both the industrial and electric power sectors and double-counted in total consumption. In 1993, 0.28 trillion cubic feet was reported as delivered to nonutility generators.

**Note 4. Natural Gas Vehicle Fuel.** In Table 6.5, for 1992 forward, natural gas vehicle fuel data do not reflect revised data shown in Table 10.5. These revisions, in million cubic feet, are: 1992–2,112; 1993–2,860; 1994–3,222; 1995–4,619; 1996–6,111; 1997–8,393; 1998–9,416; 1999–10,398; 2000–11,461; 2001–13,788; 2002–15,872; 2003–17,484; 2004–21,487; 2005–22,578; 2006–23,317; 2007–24,256; 2008–25,659; 2009–26,936; and 2010 –28,297.

**Note 5. Coverage of Electric Power Sector Natural Gas Prices.** For 1973-1982, data for electric power sector natural gas prices include all electric utility plants at which the generator nameplate capacity of all steam-electric units combined totaled 25 megawatts or greater. For 1974-1982, peaking units are also included and counted toward the 25-megawatt-or-greater total. For 1983-1990, data include all electric utility plants at which the generator nameplate capacity of all steam-electric units combined totaled 50 megawatts or greater. For 1991-2001, data include all electric utility plants at which the generator nameplate capacity of all steam-electric units and combined-cycle units together totaled 50 megawatts or greater. For 2002 forward, data include electric utility and independent power producer plants at which the total facility fossil-fueled nameplate generating capacity is 50 or more megawatts, regardless of unit type.

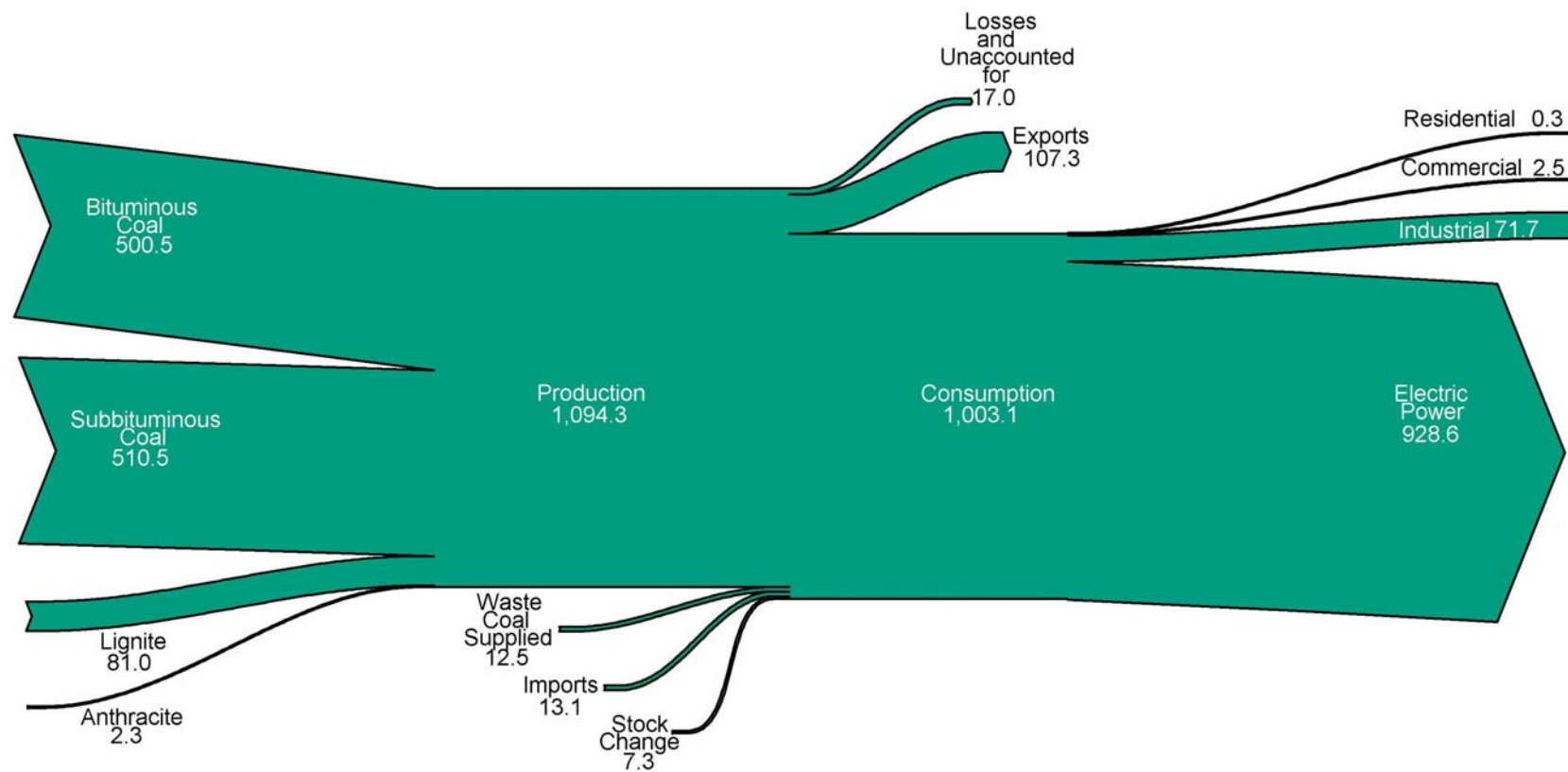
## **7. Coal**

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**Figure 7.0 Coal Flow, 2011**  
(Million Short Tons)

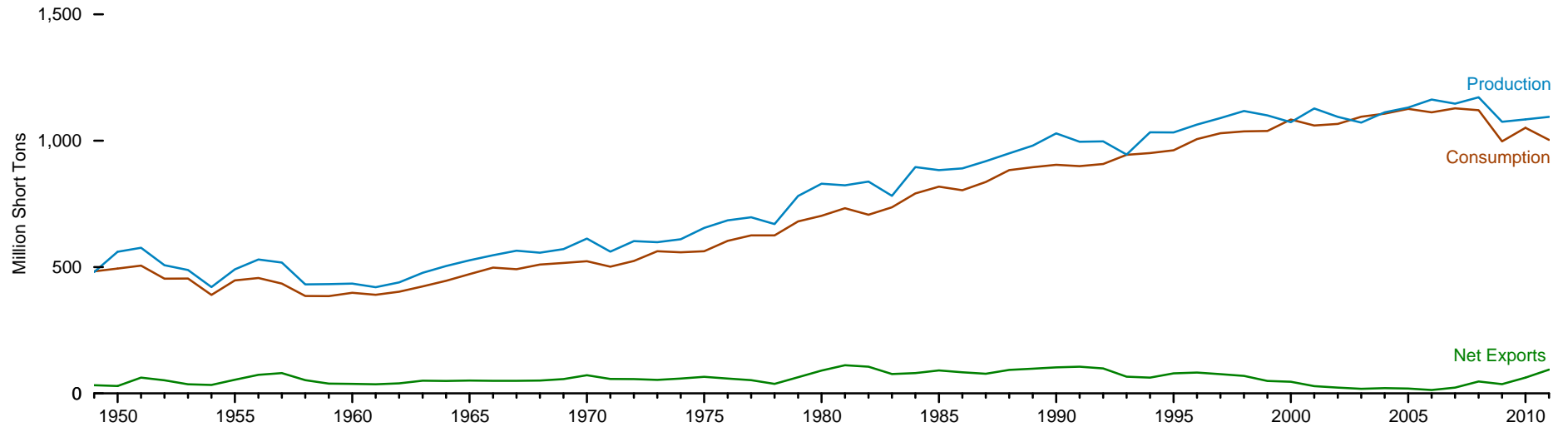


Notes: • Production categories are estimated; all data are preliminary. • Values are derived from source data prior to rounding for publication. • Totals may not equal sum of components due to independent rounding.

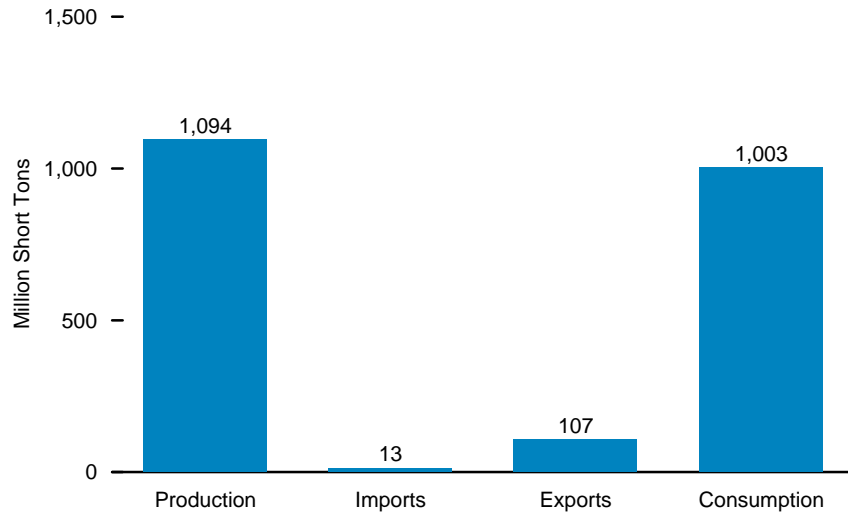
Sources: Tables 7.1, 7.2, and 7.3.

## Figure 7.1 Coal Overview

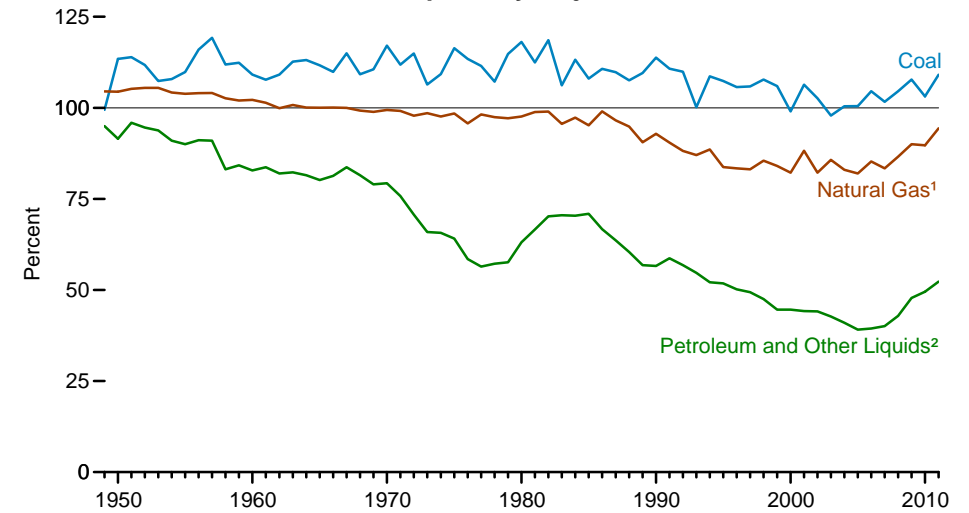
### Overview, 1949-2011



### Overview, 2011



### Production as Share of Consumption by Major Source, 1949-2011



<sup>1</sup> Dry natural gas production as share of natural gas consumption.

<sup>2</sup> Petroleum and other liquids production as share of petroleum and other liquids estimated consumption.

Sources: Tables 5.1a, 6.1, and 7.1.

**Table 7.1 Coal Overview, Selected Years, 1949-2011**  
(Million Short Tons)

Year	Production <sup>1</sup>	Waste Coal Supplied <sup>2</sup>	Trade			Stock Change <sup>4,5</sup>	Losses and Unaccounted for <sup>6</sup>	Consumption
			Imports	Exports	Net Imports <sup>3</sup>			
1949	480.6	NA	0.3	32.8	-32.5	( <sup>7</sup> )	<sup>7</sup> -35.1	483.2
1950	560.4	NA	.4	29.4	-29.0	<sup>R</sup> 27.8	<sup>R</sup> 9.5	494.1
1955	490.8	NA	.3	54.4	-54.1	<sup>R</sup> -4.0	<sup>R</sup> -6.3	447.0
1960	434.3	NA	.3	38.0	-37.7	<sup>R</sup> -3.2	<sup>R</sup> 1.7	398.1
1965	527.0	NA	.2	51.0	-50.8	<sup>R</sup> 1.9	<sup>R</sup> 2.2	472.0
1970	612.7	NA	(s)	71.7	-71.7	<sup>R</sup> 11.1	<sup>R</sup> 6.6	523.2
1975	654.6	NA	.9	66.3	-65.4	32.2	-5.5	562.6
1976	684.9	NA	1.2	60.0	-58.8	8.5	13.8	603.8
1977	697.2	NA	1.6	54.3	-52.7	22.6	-3.4	625.3
1978	670.2	NA	3.0	40.7	-37.8	-4.9	12.1	625.2
1979	781.1	NA	2.1	66.0	-64.0	36.2	.4	680.5
1980	829.7	NA	1.2	91.7	-90.5	25.6	10.8	702.7
1981	823.8	NA	1.0	112.5	-111.5	-19.0	-1.4	732.6
1982	838.1	NA	.7	106.3	-105.5	22.6	3.1	706.9
1983	782.1	NA	1.3	77.8	-76.5	-29.5	-1.6	736.7
1984	895.9	NA	1.3	81.5	-80.2	28.7	-4.3	791.3
1985	883.6	NA	2.0	92.7	-90.7	-27.9	2.8	818.0
1986	890.3	NA	2.2	85.5	-83.3	4.0	-1.2	804.2
1987	918.8	NA	1.7	79.6	-77.9	6.5	-2.5	836.9
1988	950.3	NA	2.1	95.0	-92.9	-24.9	-1.3	883.6
1989	980.7	1.4	2.9	100.8	-98.0	-13.7	2.9	895.0
1990	1,029.1	3.3	2.7	105.8	-103.1	26.5	-1.7	904.5
1991	996.0	4.0	3.4	109.0	-105.6	-9	-3.9	899.2
1992	997.5	6.3	3.8	102.5	-98.7	-3.0	.5	907.7
1993	945.4	8.1	8.2	74.5	-66.3	-51.9	-4.9	944.1
1994	1,033.5	8.2	8.9	71.4	-62.5	23.6	4.3	951.3
1995	1,033.0	8.6	9.5	88.5	-79.1	-3	.6	962.1
1996	1,063.9	8.8	8.1	90.5	-82.4	-17.5	1.4	1,006.3
1997	1,089.9	8.1	7.5	83.5	-76.1	-11.3	3.7	1,029.5
1998	1,117.5	8.7	8.7	78.0	-69.3	24.2	-4.4	1,037.1
1999	1,100.4	8.7	9.1	58.5	-49.4	24.0	-2.9	1,038.6
2000	1,073.6	9.1	12.5	58.5	-46.0	-48.3	.9	1,084.1
2001	<sup>R</sup> 1,127.7	10.1	19.8	48.7	-28.9	41.6	7.1	1,060.1
2002	1,094.3	9.1	16.9	39.6	-22.7	10.2	4.0	1,066.4
2003	1,071.8	10.0	25.0	43.0	-18.0	-26.7	-4.4	1,094.9
2004	1,112.1	11.3	27.3	48.0	-20.7	-11.5	6.9	1,107.3
2005	1,131.5	13.4	30.5	49.9	-19.5	-9.7	9.1	1,126.0
2006	1,162.7	14.4	36.2	49.6	-13.4	42.6	8.8	1,112.3
2007	1,146.6	14.1	36.3	59.2	-22.8	5.8	4.1	1,128.0
2008	1,171.8	14.1	34.2	81.5	-47.3	12.4	5.7	1,120.5
2009	1,074.9	13.7	22.6	59.1	-36.5	39.7	15.0	997.5
2010	<sup>R</sup> 1,084.4	<sup>R</sup> 13.7	19.4	81.7	-62.4	<sup>R</sup> -11.2	<sup>R</sup> -4.4	<sup>R</sup> 1,051.3
2011 <sup>P</sup>	1,094.3	12.5	13.1	107.3	-94.2	-7.3	17.0	1,003.1

<sup>1</sup> Beginning in 2001, includes a small amount of refuse recovery (coal recaptured from a refuse mine, and cleaned to reduce the concentration of noncombustible materials).

<sup>2</sup> Waste coal (including fine coal, coal obtained from a refuse bank or slurry dam, anthracite culm, bituminous gob, and lignite waste) consumed by the electric power and industrial sectors. Beginning in 1989, waste coal supplied is counted as a supply-side item to balance the same amount of waste coal included in "Consumption."

<sup>3</sup> Net imports equal imports minus exports. Minus sign indicates exports are greater than imports.

<sup>4</sup> Through 1972, excludes coal stocks at producers and distributors. For 1980-2007, excludes coal stocks in the residential and commercial sectors.

<sup>5</sup> A negative value indicates a decrease in stocks and a positive value indicates an increase.

<sup>6</sup> The difference between calculated coal supply and disposition, due to coal quantities lost or to data reporting problems.

<sup>7</sup> In 1949, stock change is included in "Losses and Unaccounted for."

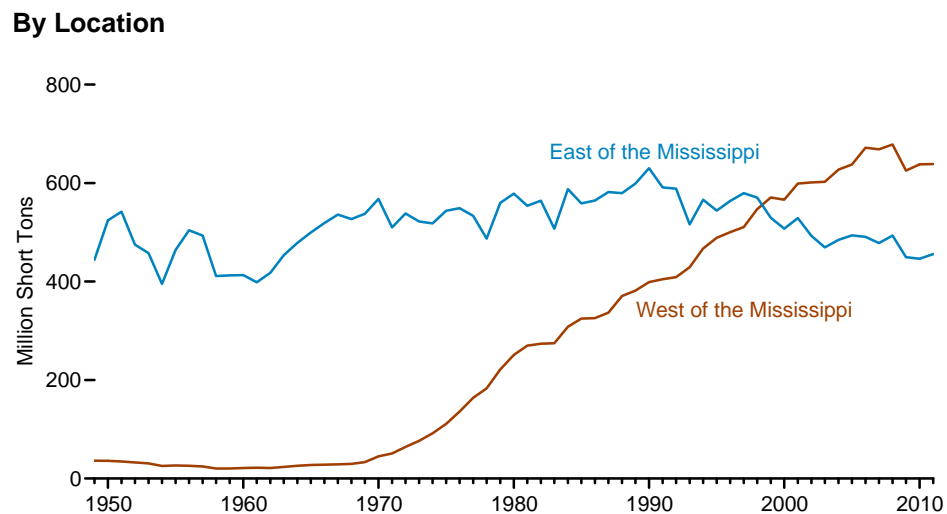
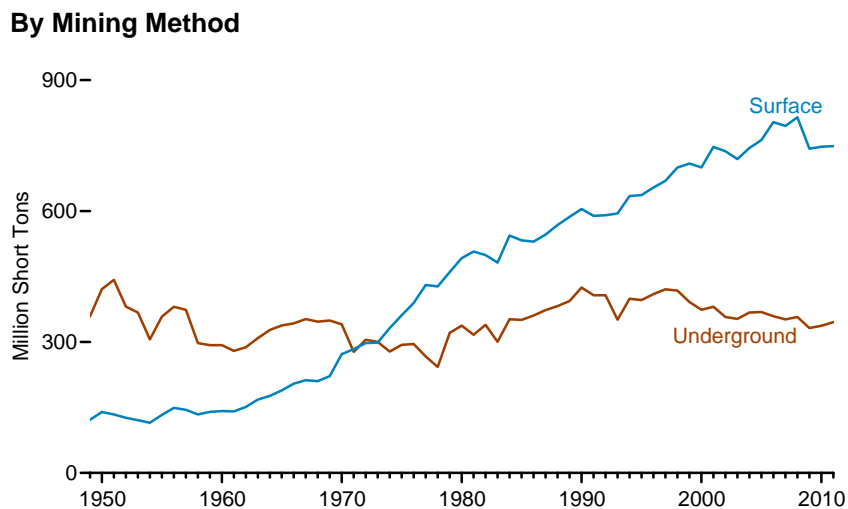
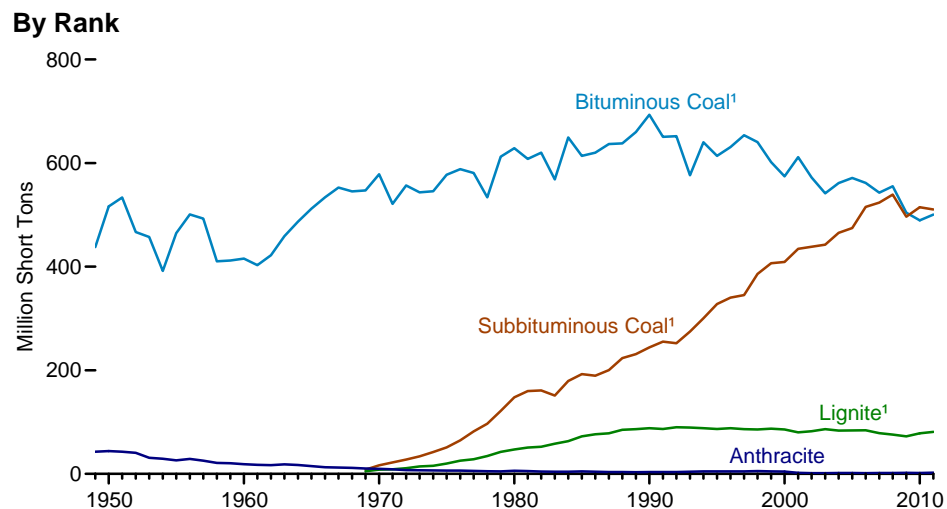
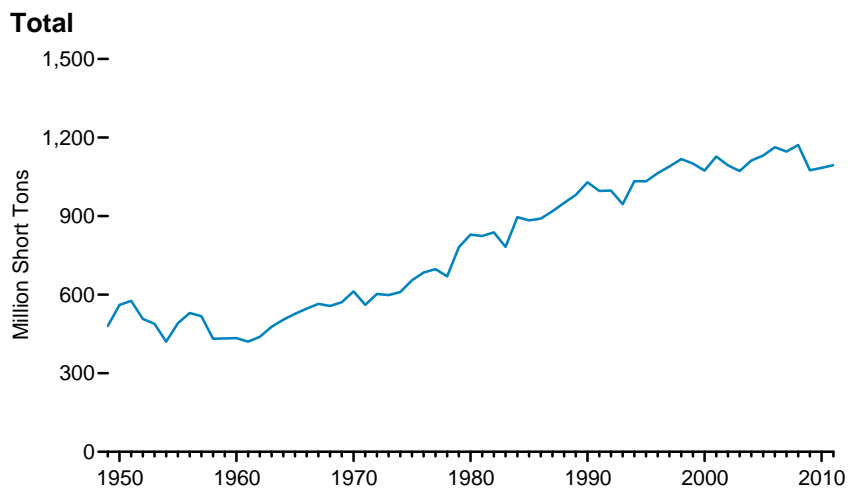
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.05 million short tons.

Notes: • See Note 1, "Coal Consumption," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#coal> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#coal> for all annual data beginning in 1949. • See <http://www.eia.gov/coal/> for related information.

Sources: **Production:** Table 7.2. **Waste Coal Supplied:** • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2004—EIA, Form EIA-906, "Power Plant Report," and Form EIA-3, "Quarterly Coal Consumption and Quality Report—Manufacturing Plants. • 2005 forward—EIA, *Quarterly Coal Report (QCR) October-December 2011* (April 2012), Table ES-1. **Imports:** • 1949-2000—U.S. Department of Commerce, Bureau of the Census, "Monthly Report IM 145." • 2001 forward—Table 7.4. **Exports:** Table 7.5. **Stock Change:** Table 7.6. **Losses and Unaccounted for:** Calculated as the sum of production, imports, and waste coal supplied, minus exports, stock change, and consumption. **Consumption:** Table 7.3.

**Figure 7.2 Coal Production, 1949-2011**



<sup>1</sup> Subbituminous coal and lignite are included in bituminous coal prior to 1969.

Source: Table 7.2.

**Table 7.2 Coal Production, Selected Years, 1949-2011**  
(Million Short Tons)

Year	Rank				Mining Method		Location		Total <sup>1</sup>
	Bituminous Coal <sup>1</sup>	Subbituminous Coal	Lignite	Anthracite <sup>1</sup>	Underground	Surface <sup>1</sup>	East of the Mississippi <sup>1</sup>	West of the Mississippi <sup>1</sup>	
1949	437.9	( <sup>2</sup> )	( <sup>2</sup> )	42.7	358.9	121.7	444.2	36.4	480.6
1950	516.3	( <sup>2</sup> )	( <sup>2</sup> )	44.1	421.0	139.4	524.4	36.0	560.4
1955	464.6	( <sup>2</sup> )	( <sup>2</sup> )	26.2	358.0	132.9	464.2	26.6	490.8
1960	415.5	( <sup>2</sup> )	( <sup>2</sup> )	18.8	292.6	141.7	413.0	21.3	434.3
1965	512.1	( <sup>2</sup> )	( <sup>2</sup> )	14.9	338.0	189.0	499.5	27.4	527.0
1970	578.5	16.4	8.0	9.7	340.5	272.1	567.8	44.9	612.7
1975	577.5	51.1	19.8	6.2	293.5	361.2	543.7	110.9	654.6
1976	588.4	64.8	25.5	6.2	295.5	389.4	548.8	136.1	684.9
1977	581.0	82.1	28.2	5.9	266.6	430.6	533.3	163.9	697.2
1978	534.0	96.8	34.4	5.0	242.8	427.4	487.2	183.0	670.2
1979	612.3	121.5	42.5	4.8	320.9	460.2	559.7	221.4	781.1
1980	628.8	147.7	47.2	6.1	337.5	492.2	578.7	251.0	829.7
1981	608.0	159.7	50.7	5.4	316.5	507.3	553.9	269.9	823.8
1982	620.2	160.9	52.4	4.6	339.2	499.0	564.3	273.9	838.1
1983	568.6	151.0	58.3	4.1	300.4	481.7	507.4	274.7	782.1
1984	649.5	179.2	63.1	4.2	352.1	543.9	587.6	308.3	895.9
1985	613.9	192.7	72.4	4.7	350.8	532.8	558.7	324.9	883.6
1986	620.1	189.6	76.4	4.3	360.4	529.9	564.4	325.9	890.3
1987	636.6	200.2	78.4	3.6	372.9	545.9	581.9	336.8	918.8
1988	638.1	223.5	85.1	3.6	382.2	568.1	579.6	370.7	950.3
1989	659.8	231.2	86.4	3.3	393.8	586.9	599.0	381.7	980.7
1990	693.2	244.3	88.1	3.5	424.5	604.5	630.2	398.9	1,029.1
1991	650.7	255.3	86.5	3.4	407.2	588.8	591.3	404.7	996.0
1992	651.8	252.2	90.1	3.5	407.2	590.3	588.6	409.0	997.5
1993	576.7	274.9	89.5	4.3	351.1	594.4	516.2	429.2	945.4
1994	640.3	300.5	88.1	4.6	399.1	634.4	566.3	467.2	1,033.5
1995	613.8	328.0	86.5	4.7	396.2	636.7	544.2	488.7	1,033.0
1996	630.7	340.3	88.1	4.8	409.8	654.0	563.7	500.2	1,063.9
1997	653.8	345.1	86.3	4.7	420.7	669.3	579.4	510.6	1,089.9
1998	640.6	385.9	85.8	5.3	417.7	698.8	570.6	547.0	1,117.5
1999	601.7	406.7	87.2	4.8	391.8	708.6	529.6	570.8	1,100.4
2000	574.3	409.2	85.6	4.6	373.7	700.0	507.5	566.1	1,073.6
2001	<sup>1</sup> 611.3	<sup>1</sup> 434.4	<sup>1</sup> 80.0	<sup>1</sup> 1.9	<sup>1</sup> 380.6	<sup>1</sup> 747.1	<sup>1</sup> 528.8	<sup>1</sup> 598.9	<sup>1</sup> 1,127.7
2002	572.1	438.4	82.5	1.4	357.4	736.9	492.9	601.4	1,094.3
2003	541.5	442.6	86.4	1.3	352.8	719.0	469.2	602.5	1,071.8
2004	561.5	465.4	83.5	1.7	367.6	744.5	484.8	627.3	1,112.1
2005	571.2	474.7	83.9	1.7	368.6	762.9	493.8	637.7	1,131.5
2006	561.6	515.3	84.2	1.5	359.0	803.7	490.8	672.0	1,162.7
2007	542.8	523.7	78.6	1.6	351.8	794.8	478.2	668.5	1,146.6
2008	555.3	539.1	75.7	1.7	357.1	814.7	493.3	678.5	1,171.8
2009	504.1	496.4	72.5	1.9	332.1	742.9	449.6	625.3	1,074.9
2010	<sup>R</sup> 489.5	<sup>R</sup> 514.8	<sup>R</sup> 78.2	<sup>R</sup> 1.8	<sup>R</sup> 337.2	<sup>R</sup> 747.2	<sup>R</sup> 446.2	<sup>R</sup> 638.2	<sup>R</sup> 1,084.4
2011	<sup>E</sup> 500.5	<sup>E</sup> 510.5	<sup>E</sup> 81.0	<sup>E</sup> 2.3	<sup>E</sup> 345.5	<sup>E</sup> 748.8	<sup>E</sup> 455.8	<sup>E</sup> 638.5	<sup>P</sup> 1,094.3

<sup>1</sup> Beginning in 2001, includes a small amount of refuse recovery.

<sup>2</sup> Included in "Bituminous Coal."

R=Revised. P=Preliminary. E=Estimate.

Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#coal>.

• For related information, see <http://www.eia.gov/coal/>.

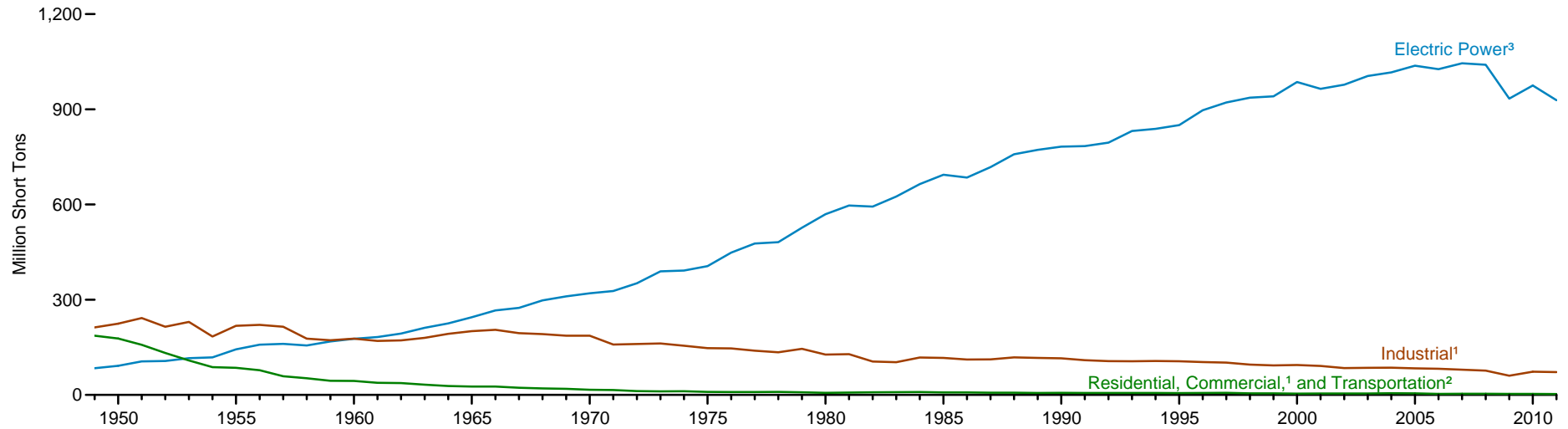
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal—Bituminous and Lignite" and "Coal—Pennsylvania Anthracite" chapters. • 1976—U.S. Energy Information Administration (EIA), *Energy Data Reports, Coal—Bituminous and Lignite in 1976* and *Coal—Pennsylvania Anthracite 1976*. • 1977

and 1978—EIA, *Energy Data Reports, Bituminous Coal and Lignite Production and Mine Operations—1977; 1978, Coal—Pennsylvania Anthracite 1977; 1978, and Coal Production*, annual reports.

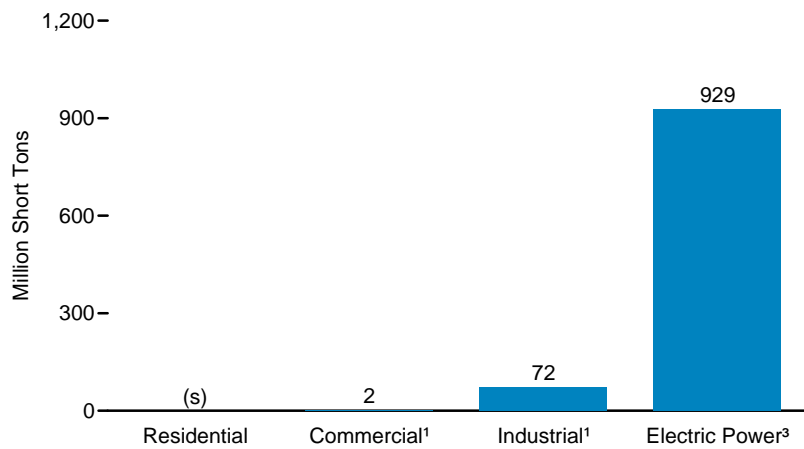
• 1979 and 1980—EIA, *Energy Data Reports, Weekly Coal Report and Coal Production*, annual reports. • 1981-1988—EIA, *Weekly Coal Production and Coal Production*, annual reports. • 1989-2000—EIA, *Coal Industry Annual*, annual reports. • 2001-2010—EIA, *Annual Coal Report*, annual reports. • 2011—EIA, *Quarterly Coal Report October-December 2011* (April 2012), Table 1; EIA, Form EIA-7A, "Coal Production Report"; and U.S. Department of Labor, Mine Safety and Health Administration, Form 7000-2, "Quarterly Mine Employment and Coal Production Report."

**Figure 7.3 Coal Consumption by Sector**

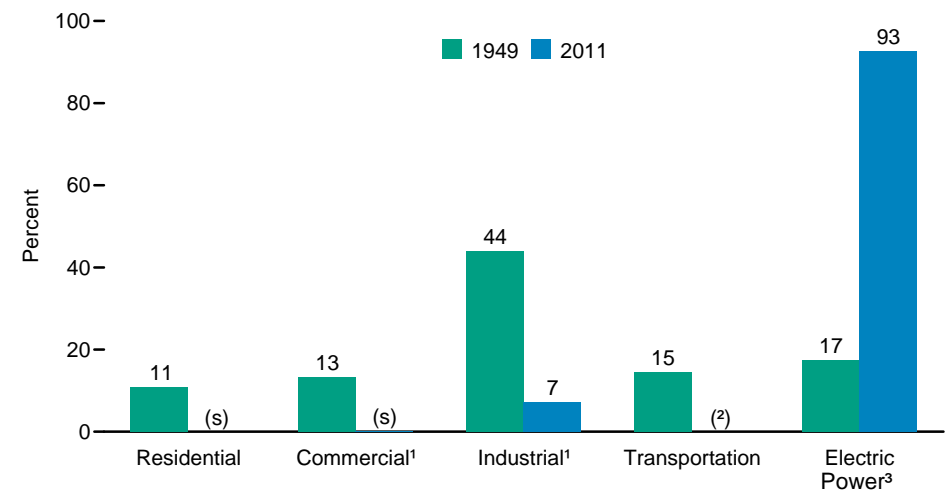
**By Sector, 1949-2011**



**By Sector, 2011**



**Sector Shares, 1949 and 2011**



<sup>1</sup> Includes combined-heat-and-power (CHP) plants and a small number of electricity-only plants.

<sup>2</sup> For 1978 forward, small amounts of transportation sector use are included in "Industrial."

<sup>3</sup> Electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.

(s)=Less than 0.5.

Source: Table 7.3.

**Table 7.3 Coal Consumption by Sector, Selected Years, 1949-2011**  
(Million Short Tons)

Year	Residential Sector <sup>1</sup>	Commercial Sector <sup>1</sup>			Industrial Sector					Transportation Sector	Electric Power Sector <sup>2</sup>			Total
		CHP <sup>3</sup>	Other <sup>4</sup>	Total	Coke Plants	Other Industrial		Total	Electricity Only		CHP	Total		
						CHP <sup>5</sup>	Non-CHP <sup>6</sup>							
1949	52.4	(7)	64.1	64.1	91.4	(8)	121.2	121.2	212.6	70.2	84.0	NA	84.0	483.2
1950	51.6	(7)	63.0	63.0	104.0	(8)	120.6	120.6	224.6	63.0	91.9	NA	91.9	494.1
1955	35.6	(7)	32.9	32.9	107.7	(8)	110.1	110.1	217.8	17.0	143.8	NA	143.8	447.0
1960	24.2	(7)	16.8	16.8	81.4	(8)	96.0	96.0	177.4	3.0	176.7	NA	176.7	398.1
1965	14.6	(7)	11.0	11.0	95.3	(8)	105.6	105.6	200.8	.7	244.8	NA	244.8	472.0
1970	9.0	(7)	7.1	7.1	96.5	(8)	90.2	90.2	186.6	.3	320.2	NA	320.2	523.2
1975	2.8	(7)	6.6	6.6	83.6	(8)	63.6	63.6	147.2	(s)	406.0	NA	406.0	562.6
1976	2.6	(7)	6.3	6.3	84.7	(8)	61.8	61.8	146.5	(s)	448.4	NA	448.4	603.8
1977	2.5	(7)	6.4	6.4	77.7	(8)	61.5	61.5	139.2	(s)	477.1	NA	477.1	625.3
1978	2.2	(7)	7.3	7.3	71.4	(8)	63.1	63.1	134.5	(8)	481.2	NA	481.2	625.2
1979	1.7	(7)	6.7	6.7	77.4	(8)	67.7	67.7	145.1	(8)	527.1	NA	527.1	680.5
1980	1.4	(7)	5.1	5.1	66.7	(8)	60.3	60.3	127.0	(8)	569.3	NA	569.3	702.7
1981	1.3	(7)	6.1	6.1	61.0	(8)	67.4	67.4	128.4	(8)	596.8	NA	596.8	732.6
1982	1.4	(7)	6.8	6.8	40.9	(8)	64.1	64.1	105.0	(8)	593.7	NA	593.7	706.9
1983	1.4	(7)	7.1	7.1	37.0	(8)	66.0	66.0	103.0	(8)	625.2	NA	625.2	736.7
1984	1.7	(7)	7.4	7.4	44.0	(8)	73.7	73.7	117.8	(8)	664.4	NA	664.4	791.3
1985	1.7	(7)	6.1	6.1	41.1	(8)	75.4	75.4	116.4	(8)	693.8	NA	693.8	818.0
1986	1.8	(7)	5.9	5.9	35.9	(8)	75.6	75.6	111.5	(8)	685.1	NA	685.1	804.2
1987	1.6	(7)	5.3	5.3	37.0	(8)	75.2	75.2	112.1	(8)	717.9	NA	717.9	836.9
1988	1.6	(7)	5.6	5.6	41.9	(8)	76.3	76.3	118.1	(8)	758.4	NA	758.4	885.0
1989	1.3	1.1	3.7	4.9	40.5	24.9	51.3	76.1	116.6	(8)	767.4	4.8	772.2	893.6
1990	1.3	1.2	4.2	5.4	38.9	27.8	48.5	76.3	115.2	(8)	774.2	8.4	782.6	904.5
1991	1.1	1.2	3.8	5.0	33.9	27.0	48.4	75.4	109.3	(8)	773.2	10.7	783.9	899.2
1992	1.1	1.2	3.9	5.0	32.4	28.2	45.8	74.0	106.4	(8)	781.2	13.9	795.1	907.7
1993	1.1	1.4	3.7	5.1	31.3	28.9	46.0	74.9	106.2	(8)	816.6	15.1	831.6	944.1
1994	.9	1.3	3.8	5.1	31.7	29.7	45.5	75.2	106.9	(8)	821.2	17.1	838.4	951.3
1995	.8	1.4	3.6	5.1	33.0	29.4	43.7	73.1	106.1	(8)	832.9	17.3	850.2	962.1
1996	.7	1.7	3.6	5.3	31.7	29.4	42.3	71.7	103.4	(8)	878.8	18.1	896.9	1,006.3
1997	.7	1.7	4.0	5.8	30.2	29.9	41.7	71.5	101.7	(8)	904.2	17.1	921.4	1,029.5
1998	.5	1.4	2.9	4.3	28.2	28.6	38.9	67.4	95.6	(8)	920.4	16.3	936.6	1,037.1
1999	.6	1.5	2.8	4.3	28.1	27.8	37.0	64.7	92.8	(8)	924.7	16.2	940.9	1,038.6
2000	.5	1.5	2.1	3.7	28.9	28.0	37.2	65.2	94.1	(8)	967.1	18.7	985.8	1,084.1
2001	.5	1.4	2.4	3.9	26.1	25.8	39.5	65.3	91.3	(8)	946.1	18.4	964.4	1,060.1
2002	.5	1.4	2.5	3.9	23.7	26.2	34.5	60.7	84.4	(8)	960.1	17.4	977.5	1,066.4
2003	.6	1.8	1.9	3.7	24.2	24.8	36.4	61.3	85.5	(8)	983.5	21.6	1,005.1	1,094.9
2004	.5	1.9	2.7	4.6	23.7	26.6	35.6	62.2	85.9	(8)	994.8	21.5	1,016.3	1,107.3
2005	.4	1.9	2.4	4.3	23.4	25.9	34.5	60.3	83.8	(8)	1,015.6	21.8	1,037.5	1,126.0
2006	.3	1.9	1.1	2.9	23.0	25.3	34.2	59.5	82.4	(8)	1,004.8	21.9	1,026.6	1,112.3
2007	.4	1.9	1.2	3.2	22.7	22.5	34.1	56.6	79.3	(8)	1,022.8	22.3	1,045.1	1,128.0
2008	.4	2.0	1.1	3.2	22.1	21.9	32.5	54.4	76.5	(8)	1,017.8	22.8	1,040.6	1,120.5
2009	.4	1.8	1.1	2.9	15.3	19.8	25.5	45.3	60.6	(8)	913.6	20.1	933.6	997.5
2010	.3	R1.7	1.0	2.7	21.1	R24.6	R27.4	R52.1	R73.2	(8)	R954.5	R20.5	R975.1	R1,051.3
2011 <sup>P</sup>	.3	1.6	.8	2.5	21.4	24.7	25.6	50.3	71.7	(8)	909.6	18.9	928.6	1,003.1

<sup>1</sup> See Note 2, "Residential and Commercial Coal Consumption Estimates," at end of section.

<sup>2</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

<sup>3</sup> Electric utility CHP plants are included in "Electricity Only."

<sup>4</sup> Commercial combined-heat-and-power (CHP) and a small number of commercial electricity-only plants, such as those at hospitals and universities.

<sup>5</sup> All commercial sector fuel use other than that in "Commercial CHP."

<sup>6</sup> Industrial combined-heat-and-power (CHP) and a small number of industrial electricity-only plants.

<sup>7</sup> All industrial sector fuel use other than that in "Coke Plants" and "Industrial CHP."

<sup>8</sup> Included in "Commercial Other."

<sup>9</sup> Included in "Industrial Non-CHP."

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.05 million short tons.

Notes: • See Tables 8.5a–8.5d for the amount of coal used to produce electricity and Tables 8.6a–8.6c

for the amount of coal used to produce useful thermal output. • See Note 1, "Coal Consumption," at end of section. • See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8.

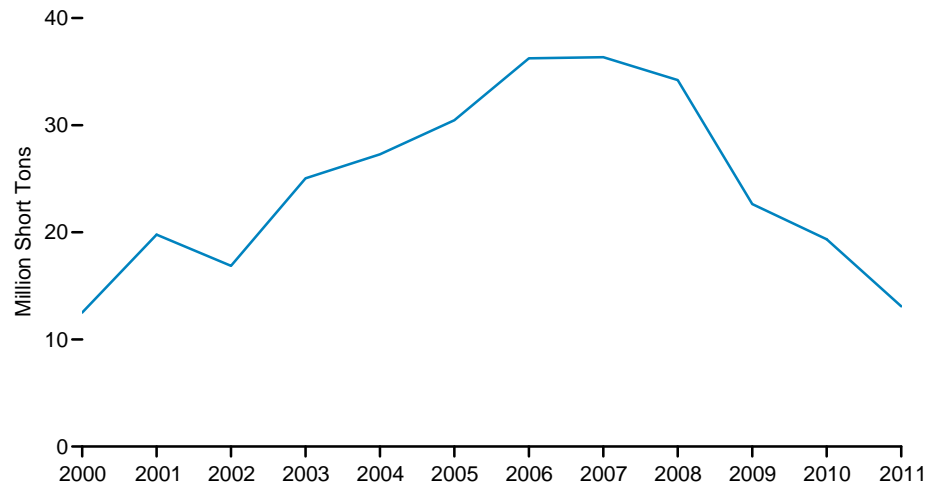
• Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#coal> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#coal> for all annual data beginning in 1949. • See <http://www.eia.gov/coal/> for related information.

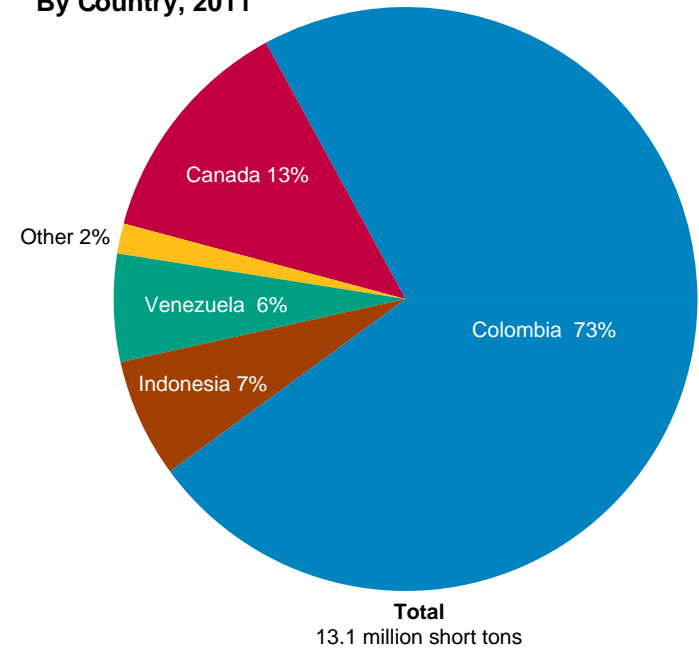
Sources: **Commercial CHP and Industrial CHP:** Table 8.7c. **Electric Power Sector:** Tables 8.5b, 8.5c, 8.6b, and 8.7b. **All Other Data:** • 1949-1975—Bureau of Mines (BOM), *Minerals Yearbook*, "Coal—Bituminous and Lignite" and "Coal—Pennsylvania Anthracite" chapters. • 1976—U.S. Energy Information Administration (EIA), Energy Data Reports, *Coal—Bituminous and Lignite in 1976 and Coal—Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, Energy Data Reports, *Coal—Pennsylvania Anthracite 1977; 1978, and Weekly Coal Report*. • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report*. • 1981-2004—EIA, *Quarterly Coal Report (QCR) October-December*, quarterly reports. • 2005 forward—EIA, QCR October-December 2011 (April 2012), Table 32.

**Figure 7.4 Coal Imports by Country of Origin**

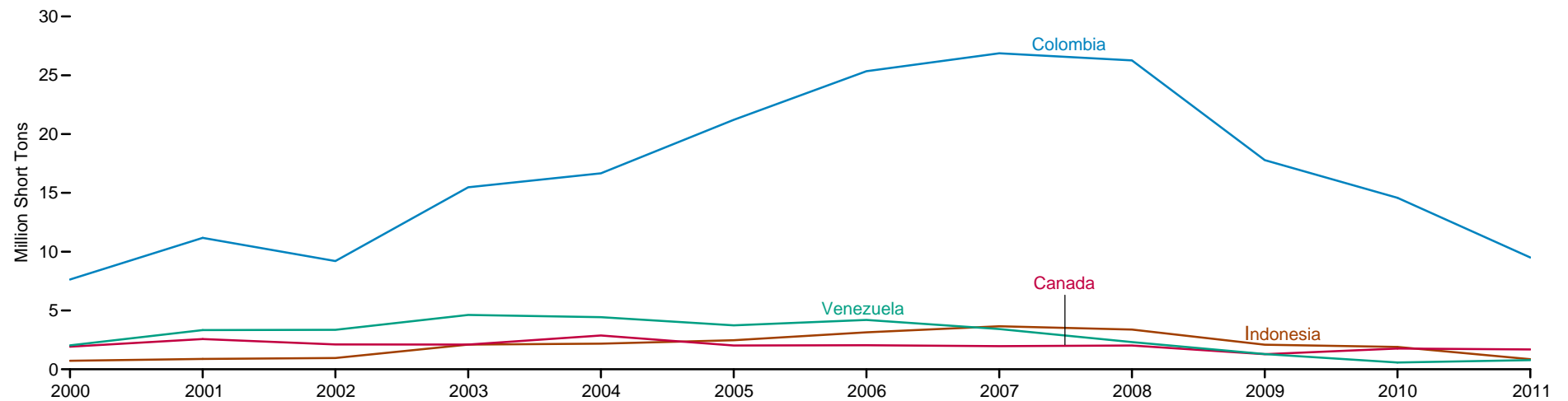
**Total, 2000-2011**



**By Country, 2011**



**By Selected Country, 2000-2011**



Note: Sum of components may not equal 100 percent due to independent rounding.

Source: Table 7.4.



**Table 7.4 Coal Imports by Country of Origin, 2000-2011**  
(Million Short Tons)

Year	Australia	New Zealand	Canada	Mexico	Colombia	Venezuela	China	India	Indonesia	Europe						South Africa	Other	Total	
										Norway	Poland	Russia	Ukraine	United Kingdom	Other				Total
2000	0.2	0.0	1.9	(s)	7.6	2.0	(s)	(s)	0.7	0.0	0.0	(s)	0.0	(s)	0.0	(s)	0.0	(s)	12.5
2001	.3	(s)	2.6	(s)	11.2	3.3	.1	(s)	.9	(s)	.5	.2	.0	.1	(s)	.8	.4	.1	19.8
2002	.8	.0	2.1	(s)	9.2	3.3	.1	(s)	1.0	.0	.1	.1	.0	(s)	(s)	.2	.1	(s)	16.9
2003	.3	.1	2.1	.0	15.5	4.6	.1	(s)	2.1	.0	.0	.1	.0	(s)	(s)	.1	.1	.1	25.0
2004	.3	.0	2.9	(s)	16.7	4.4	.1	(s)	2.2	.0	.1	.3	.1	(s)	.1	.6	(s)	(s)	27.3
2005	.2	(s)	2.0	(s)	21.2	3.7	(s)	.0	2.5	.0	.1	.4	(s)	(s)	.1	.6	.1	.1	30.5
2006	.2	.0	2.0	.0	25.3	4.2	(s)	.0	3.1	(s)	.0	.9	.0	(s)	.2	1.1	.1	(s)	36.2
2007	.1	.1	2.0	.0	26.9	3.4	.1	(s)	3.7	(s)	.0	.1	(s)	(s)	(s)	.2	.0	.1	36.3
2008	.1	.0	2.0	.0	26.3	2.3	(s)	.0	3.4	.0	.0	(s)	(s)	.0	(s)	(s)	(s)	(s)	34.2
2009	.2	.0	1.3	(s)	17.8	1.3	(s)	(s)	2.1	.0	.0	.0	(s)	(s)	(s)	(s)	.0	(s)	22.6
2010	.4	(s)	1.8	.0	14.6	.6	.1	(s)	1.9	.0	.0	.0	(s)	(s)	(s)	(s)	.0	(s)	19.4
2011 <sup>P</sup>	.1	.0	1.7	(s)	9.5	.8	(s)	(s)	.9	.0	(s)	(s)	.1	.0	(s)	.1	(s)	.1	13.1

P=Preliminary. (s)=Less than 0.05 million short tons.

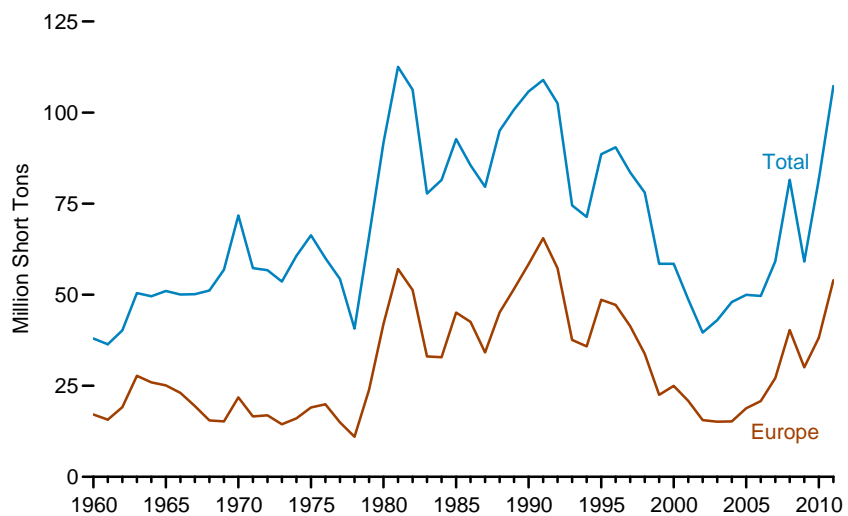
Note: Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/coal/>.

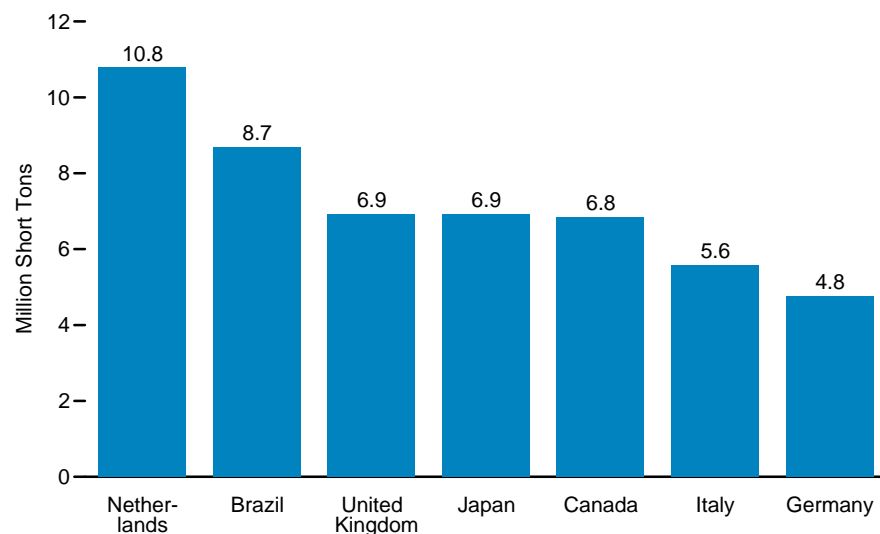
Sources: • 2000—U.S. Department of Commerce, Bureau of the Census, "Monthly Report IM 145."  
• 2001 forward—U.S. Energy Information Administration, *Quarterly Coal Report October-December*, quarterly reports.

**Figure 7.5 Coal Exports by Country of Destination**

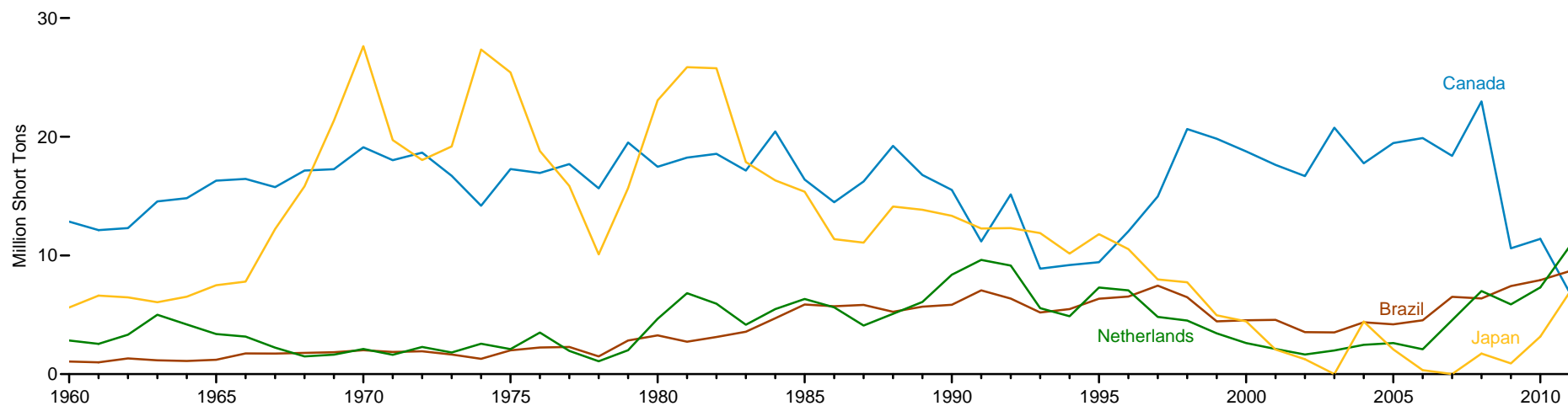
**Total and Europe, 1960-2011**



**By Selected Country, 2011**



**By Selected Country, 1960-2011**



Source: Table 7.5.

**Table 7.5 Coal Exports by Country of Destination, Selected Years, 1960-2011**

(Million Short Tons)

Year	Canada	Brazil	Europe											Japan	Other <sup>3</sup>	Total
			Belgium <sup>1</sup>	Denmark	France	Germany <sup>2</sup>	Italy	Netherlands	Spain	Turkey	United Kingdom	Other <sup>3</sup>	Total			
1960	12.8	1.1	1.1	0.1	0.8	4.6	4.9	2.8	0.3	NA	—	2.4	17.1	5.6	1.3	38.0
1965	16.3	1.2	2.2	(s)	2.1	4.7	9.0	3.4	1.4	NA	(s)	2.3	25.1	7.5	.9	51.0
1966	16.5	1.7	1.8	(s)	1.6	4.9	7.8	3.2	1.2	NA	(s)	2.5	23.1	7.8	1.0	50.1
1967	15.8	1.7	1.4	—	2.1	4.7	5.9	2.2	1.0	NA	—	2.1	19.4	12.2	1.0	50.1
1968	17.1	1.8	1.1	—	1.5	3.8	4.3	1.5	1.5	NA	—	1.9	15.5	15.8	.9	51.2
1969	17.3	1.8	.9	—	2.3	3.5	3.7	1.6	1.8	NA	—	1.3	15.2	21.4	1.2	56.9
1970	19.1	2.0	1.9	—	3.6	5.0	4.3	2.1	3.2	NA	(s)	1.8	21.8	27.6	1.2	71.7
1971	18.0	1.9	.8	—	3.2	2.9	2.7	1.6	2.6	NA	1.7	1.1	16.6	19.7	1.1	57.3
1972	18.7	1.9	1.1	—	1.7	2.4	3.7	2.3	2.1	NA	2.4	1.1	16.9	18.0	1.2	56.7
1973	16.7	1.6	1.2	—	2.0	1.6	3.3	1.8	2.2	NA	.9	1.3	14.4	19.2	1.6	53.6
1974	14.2	1.3	1.1	—	2.7	1.5	3.9	2.6	2.0	NA	1.4	.9	16.1	27.3	1.8	60.7
1975	17.3	2.0	.6	—	3.6	2.0	4.5	2.1	2.7	NA	1.9	1.6	19.0	25.4	2.6	66.3
1976	16.9	2.2	2.2	(s)	3.5	1.0	4.2	3.5	2.5	NA	.8	2.1	19.9	18.8	2.1	60.0
1977	17.7	2.3	1.5	.1	2.1	.9	4.1	2.0	1.6	NA	.6	2.1	15.0	15.9	3.5	54.3
1978	15.7	1.5	1.1	—	1.7	.6	3.2	1.1	.8	NA	.4	2.2	11.0	10.1	2.5	40.7
1979	19.5	2.8	3.2	.2	3.9	2.6	5.0	2.0	1.4	NA	1.4	4.4	23.9	15.7	4.1	66.0
1980	17.5	3.3	4.6	1.7	7.8	2.5	7.1	4.7	3.4	NA	4.1	6.0	41.9	23.1	6.0	91.7
1981	18.2	2.7	4.3	3.9	9.7	4.3	10.5	6.8	6.4	.6	2.3	8.2	57.0	25.9	8.7	112.5
1982	18.6	3.1	4.8	2.8	9.0	2.3	11.3	5.9	5.6	1.6	2.0	6.0	51.3	25.8	7.5	106.3
1983	17.2	3.6	2.5	1.7	4.2	1.5	8.1	4.2	3.3	1.6	1.2	4.7	33.1	17.9	6.1	77.8
1984	20.4	4.7	3.9	.6	3.8	.9	7.6	5.5	2.3	1.5	2.9	3.9	32.8	16.3	7.2	81.5
1985	16.4	5.9	4.4	2.2	4.5	1.1	10.3	6.3	3.5	2.2	2.7	8.1	45.1	15.4	9.9	92.7
1986	14.5	5.7	4.4	2.1	5.4	.8	10.4	5.6	2.6	2.4	2.9	5.9	42.6	11.4	11.4	85.5
1987	16.2	5.8	4.6	.9	2.9	.5	9.5	4.1	2.5	.8	2.6	5.8	34.2	11.1	12.3	79.6
1988	19.2	5.3	6.5	2.8	4.3	.7	11.1	5.1	2.5	2.0	3.7	6.4	45.1	14.1	11.3	95.0
1989	16.8	5.7	7.1	3.2	6.5	.7	11.2	6.1	3.3	1.7	4.5	7.2	51.6	13.8	12.9	100.8
1990	15.5	5.8	8.5	3.2	6.9	1.1	11.9	8.4	3.8	2.1	5.2	7.4	58.4	13.3	12.7	105.8
1991	11.2	7.1	7.5	4.7	9.5	1.7	11.3	9.6	4.7	2.2	6.2	8.2	65.5	12.3	13.0	109.0
1992	15.1	6.4	7.2	3.8	8.1	1.0	9.3	9.1	4.5	2.0	5.6	6.6	57.3	12.3	11.4	102.5
1993	8.9	5.2	5.2	.3	4.0	.5	6.9	5.6	4.1	1.6	4.1	5.3	37.6	11.9	11.0	74.5
1994	9.2	5.5	4.9	.5	2.9	.3	7.5	4.9	4.1	1.3	3.4	6.0	35.8	10.2	10.7	71.4
1995	9.4	6.4	4.5	2.1	3.7	2.0	9.1	7.3	4.7	2.0	4.7	8.7	48.6	11.8	12.4	88.5
1996	12.0	6.5	4.6	1.3	3.9	1.1	9.2	7.1	4.1	2.2	6.2	7.7	47.2	10.5	14.2	90.5
1997	15.0	7.5	4.3	.4	3.4	.9	7.0	4.8	4.1	2.1	7.2	7.1	41.3	8.0	11.8	83.5
1998	20.7	6.5	3.2	.3	3.2	1.2	5.3	4.5	3.2	1.6	5.9	5.3	33.8	7.7	9.4	78.0
1999	19.8	4.4	2.1	—	2.5	.6	4.0	3.4	2.5	.8	3.2	3.5	22.5	5.0	6.7	58.5
2000	18.8	4.5	2.9	.1	3.0	1.0	3.7	2.6	2.7	1.8	3.3	3.9	25.0	4.4	5.8	58.5
2001	17.6	4.6	2.8	—	2.2	.9	5.4	2.1	1.6	.9	2.5	2.4	20.8	2.1	3.6	48.7
2002	16.7	3.5	2.4	—	1.3	1.0	3.1	1.7	1.9	.6	1.9	1.8	15.6	1.3	2.6	39.6
2003	20.8	3.5	1.8	.3	1.3	.5	2.8	2.0	1.8	1.1	1.5	2.1	15.1	(s)	3.6	43.0
2004	17.8	4.4	1.7	.1	1.1	.6	2.1	2.5	1.5	1.3	2.0	2.3	15.2	4.4	6.2	48.0
2005	19.5	4.2	2.1	.1	1.3	.7	2.5	2.6	1.9	1.9	1.8	4.1	18.8	2.1	5.4	49.9
2006	19.9	4.5	2.2	.4	1.6	1.7	3.3	2.1	1.6	1.2	2.6	4.2	20.8	.3	4.1	49.6
2007	18.4	6.5	2.1	.1	2.4	2.3	3.5	4.6	1.5	1.4	3.4	5.8	27.1	(s)	7.1	59.2
2008	23.0	6.4	3.1	.4	3.5	2.5	3.2	7.0	2.4	1.9	5.8	10.6	40.3	1.7	10.1	81.5
2009	10.6	7.4	2.7	.3	3.4	2.5	2.3	5.9	1.7	1.4	4.6	5.3	30.1	.9	10.1	59.1
2010	11.4	7.9	2.3	.1	3.2	2.7	3.3	7.3	1.9	2.5	4.4	10.5	38.2	3.2	21.0	81.7
2011 <sup>P</sup>	6.8	8.7	3.1	.2	4.0	4.8	5.6	10.8	1.8	2.9	6.9	13.9	53.9	6.9	30.9	107.3

<sup>1</sup> Through 1999, includes Luxembourg.

<sup>2</sup> Through 1990, data for Germany are for the former West Germany only. Beginning in 1991, data for Germany are for the unified Germany, i.e., the former East Germany and West Germany.

<sup>3</sup> See source publications for data for countries included in "Other."

P=Preliminary. NA=Not Available. —=No data reported. (s)=Less than 0.05 million short tons.

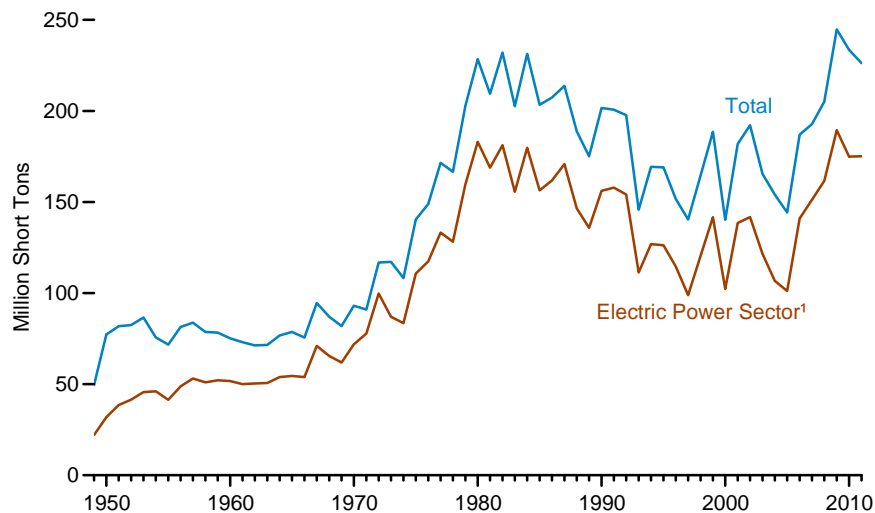
Note: Totals may not equal sum of components due to independent rounding.

Web Page: For all data beginning in 1960, see <http://www.eia.gov/totalenergy/data/annual/#coal>.

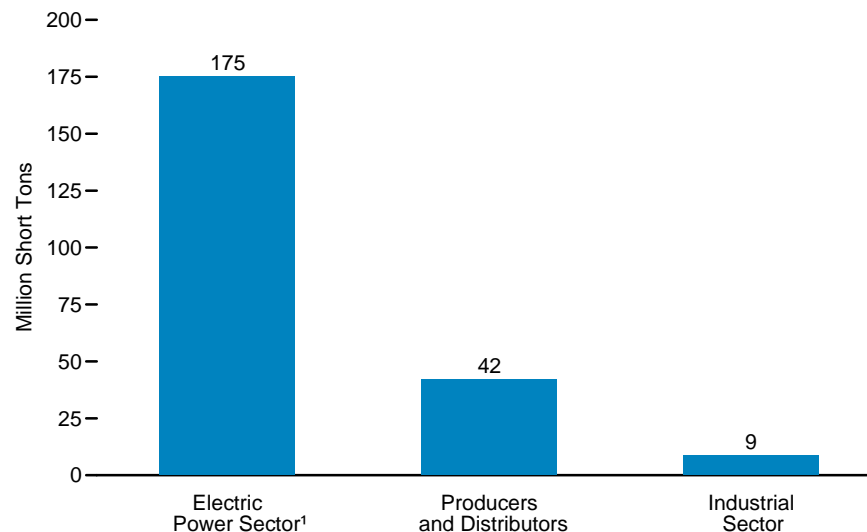
Sources: • 1960-1988—U.S. Department of Commerce, Bureau of the Census, *U.S. Exports by Schedule B Commodities, EM 522*. • 1989-2000—U.S. Energy Information Administration (EIA), *Coal Industry Annual*, annual reports. • 2001 forward—EIA, *Quarterly Coal Report October-December*, quarterly reports; and U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM 545."

**Figure 7.6 Coal Stocks, End of Year**

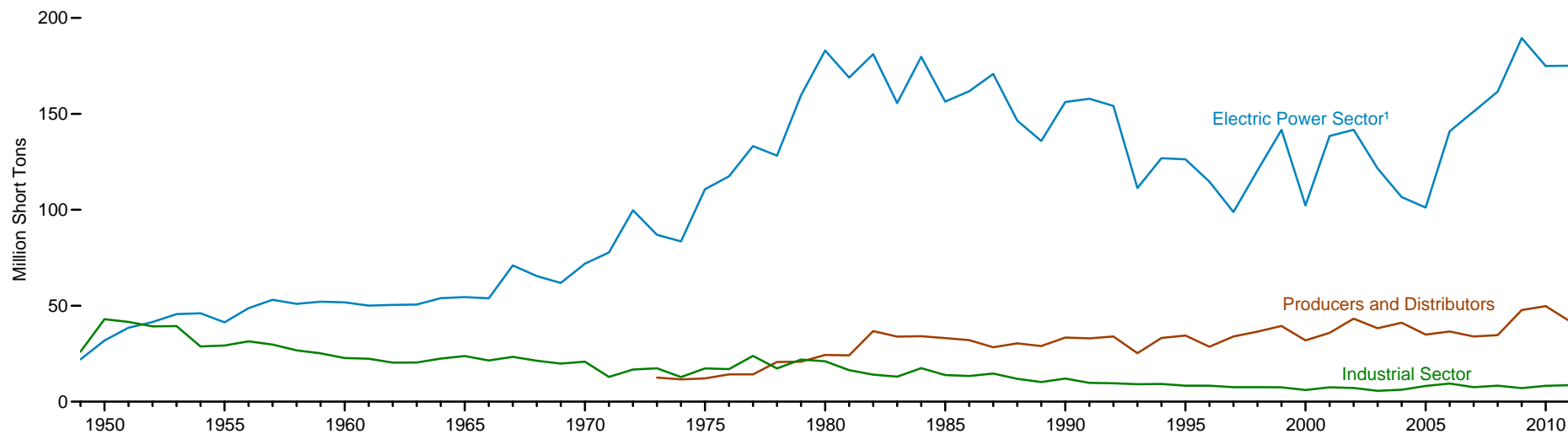
**Total and Electric Power Stocks, 1949-2011**



**Electric Power, Producer/Distributor, and Industrial Stocks, 2011**



**Electric Power, Producer/Distributor, and Industrial Stocks, 1949-2011**



<sup>1</sup> Electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.

Source: Table 7.6.

**Table 7.6 Coal Stocks by Sector, Selected Years, End of Year 1949-2011**  
(Million Short Tons)

Year	Producers and Distributors	Consumers						Total	
		Residential and Commercial Sectors	Industrial Sector			Transportation Sector	Electric Power Sector <sup>2</sup>		
			Coke Plants	Other <sup>1</sup>	Total				
1949	NA	1.4	10.0	16.1	26.0	( <sup>3</sup> )	22.1	49.5	49.5
1950	NA	2.5	16.8	26.2	43.0	( <sup>3</sup> )	31.8	77.3	77.3
1955	NA	1.0	13.4	15.9	29.3	( <sup>3</sup> )	41.4	71.7	71.7
1960	NA	.7	11.1	11.6	22.8	( <sup>3</sup> )	51.7	75.2	75.2
1965	NA	.4	10.6	13.1	23.8	( <sup>3</sup> )	54.5	78.6	78.6
1970	NA	.3	9.0	11.8	20.8	( <sup>3</sup> )	71.9	93.0	93.0
1975	12.1	.2	8.8	8.5	17.3	( <sup>3</sup> )	110.7	128.3	140.4
1976	14.2	.2	9.9	7.1	17.0	( <sup>3</sup> )	117.4	134.7	148.9
1977	14.2	.2	12.8	11.1	23.9	( <sup>3</sup> )	133.2	157.3	171.5
1978	20.7	.4	8.3	9.0	17.3	NA	128.2	145.9	166.6
1979	20.8	.3	10.2	11.8	21.9	NA	159.7	182.0	202.8
1980	24.4	NA	9.1	12.0	21.0	NA	183.0	204.0	228.4
1981	24.1	NA	6.5	9.9	16.4	NA	168.9	185.3	209.4
1982	36.8	NA	4.6	9.5	14.1	NA	181.1	195.3	232.0
1983	33.9	NA	4.3	8.7	13.1	NA	155.6	168.7	202.6
1984	34.1	NA	6.2	11.3	17.5	NA	179.7	197.2	231.3
1985	33.1	NA	3.4	10.4	13.9	NA	156.4	170.2	203.4
1986	32.1	NA	3.0	10.4	13.4	NA	161.8	175.2	207.3
1987	28.3	NA	3.9	10.8	14.7	NA	170.8	185.5	213.8
1988	30.4	NA	3.1	8.8	11.9	NA	146.5	158.4	188.8
1989	29.0	NA	2.9	7.4	10.2	NA	135.9	146.1	175.1
1990	33.4	NA	3.3	8.7	12.0	NA	156.2	168.2	201.6
1991	33.0	NA	2.8	7.1	9.8	NA	157.9	167.7	200.7
1992	34.0	NA	2.6	7.0	9.6	NA	154.1	163.7	197.7
1993	25.3	NA	2.4	6.7	9.1	NA	111.3	120.5	145.7
1994	33.2	NA	2.7	6.6	9.2	NA	126.9	136.1	169.4
1995	34.4	NA	2.6	5.7	8.3	NA	126.3	134.6	169.1
1996	28.6	NA	2.7	5.7	8.4	NA	114.6	123.0	151.6
1997	34.0	NA	2.0	5.6	7.6	NA	98.8	106.4	140.4
1998	36.5	NA	2.0	5.5	7.6	NA	120.5	128.1	164.6
1999	39.5	NA	1.9	5.6	7.5	NA	141.6	149.1	188.6
2000	31.9	NA	1.5	4.6	6.1	NA	102.3	108.4	140.3
2001	35.9	NA	1.5	6.0	7.5	NA	138.5	146.0	181.9
2002	43.3	NA	1.4	5.8	7.2	NA	141.7	148.9	192.1
2003	38.3	NA	.9	4.7	5.6	NA	121.6	127.2	165.5
2004	41.2	NA	1.3	4.8	6.2	NA	106.7	112.9	154.0
2005	35.0	NA	2.6	5.6	8.2	NA	101.1	109.3	144.3
2006	36.5	NA	2.9	6.5	9.4	NA	141.0	150.4	186.9
2007	34.0	NA	1.9	5.6	7.6	NA	151.2	158.8	192.8
2008	34.7	.5	2.3	6.0	8.3	NA	161.6	170.4	205.1
2009	47.7	.5	2.0	5.1	7.1	NA	189.5	197.1	244.8
2010	<sup>R</sup> 49.8	.6	1.9	<sup>R</sup> 6.3	<sup>R</sup> 8.3	NA	<sup>R</sup> 174.9	<sup>R</sup> 183.7	<sup>R</sup> 233.6
2011	<sup>E</sup> 41.9	<sup>P</sup> .6	<sup>P</sup> 2.6	<sup>P</sup> 6.0	<sup>P</sup> 8.6	NA	<sup>P</sup> 175.1	<sup>P</sup> 184.3	<sup>P</sup> 226.2

<sup>1</sup> Through 1977, data are for stocks held by the manufacturing and transportation sectors. Beginning in 1978, data are for stocks held at manufacturing plants only.

<sup>2</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1998, data are for electric utilities only; beginning in 1999, data are for electric utilities and independent power producers.

<sup>3</sup> Included in "Industrial Sector Other."

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

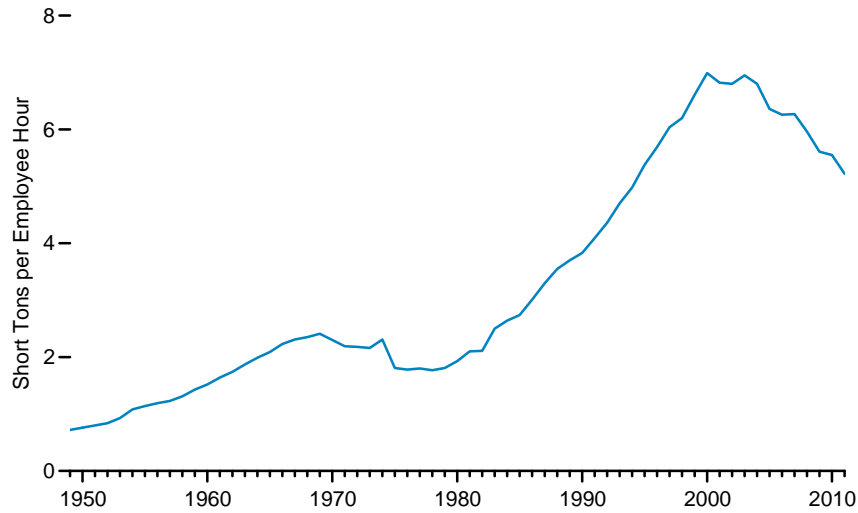
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#coal> for updated monthly and annual

data. • See <http://www.eia.gov/totalenergy/data/annual/#coal> for all annual data beginning in 1949. • See <http://www.eia.gov/coal/> for related information.

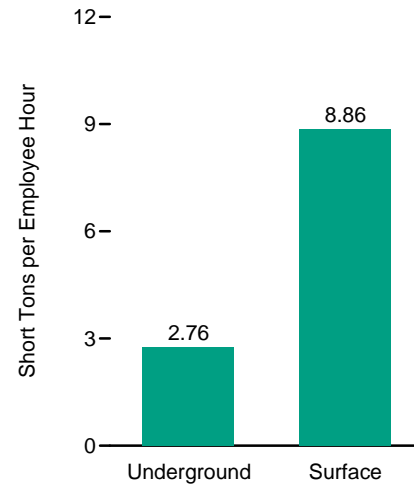
Sources: **Electric Power Sector:** Table 8.8. **All Other Data:** • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal—Bituminous and Lignite" and "Coal—Pennsylvania Anthracite" chapters. • 1976—U.S. Energy Information Administration (EIA), Energy Data Reports, *Coal—Bituminous and Lignite in 1976* and *Coal—Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, Energy Data Reports, *Coal—Pennsylvania Anthracite 1977; 1978*, and *Weekly Coal Report*. • 1979—EIA, Energy Data Report, *Weekly Coal Report*. • 1980-2004—EIA, *Quarterly Coal Report (QCR) October-December*, quarterly reports. • 2005 forward—EIA, QCR October-December 2011 (April 2012), Table 37.

**Figure 7.7 Coal Mining Productivity**

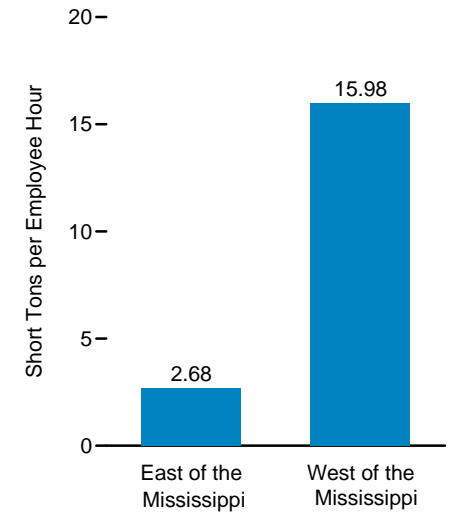
**Total, 1949-2011**



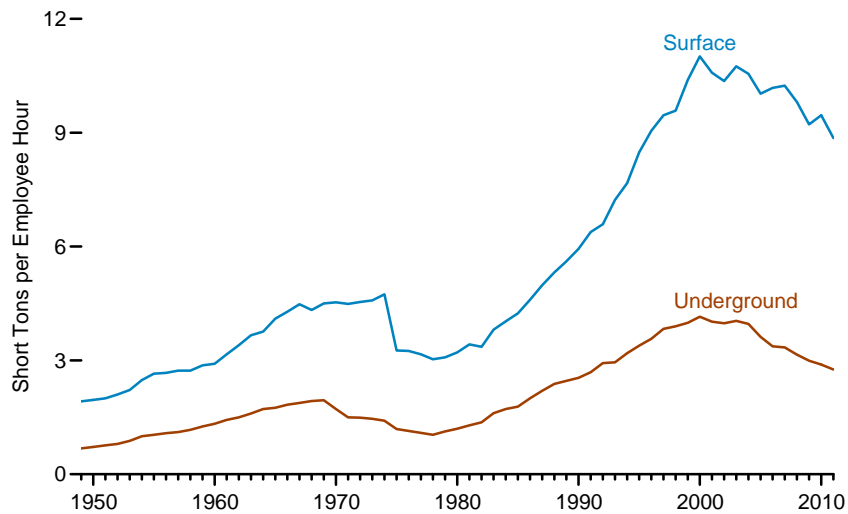
**By Mining Method, 2011**



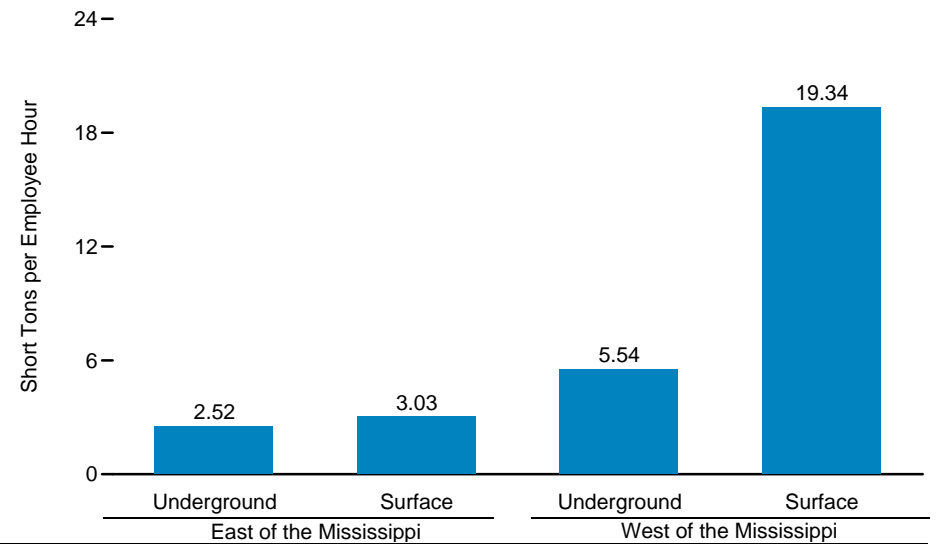
**By Location, 2011**



**By Mining Method,<sup>1</sup> 1949-2011**



**By Region and Mining Method, 2011**



<sup>1</sup> For 1979 forward, includes all coal; prior to 1979, excludes anthracite.  
 Note: Beginning in 2001, surface mining includes a small amount of refuse recovery.

Source: Table 7.7.

**Table 7.7 Coal Mining Productivity, Selected Years, 1949-2011**  
(Short Tons per Employee Hour<sup>1</sup>)

Year	Mining Method		Location						Total <sup>2</sup>
	Underground	Surface <sup>2</sup>	East of the Mississippi			West of the Mississippi			
			Underground	Surface <sup>2</sup>	Total <sup>2</sup>	Underground	Surface <sup>2</sup>	Total <sup>2</sup>	
1949	<sup>3</sup> 0.68	<sup>3</sup> 1.92	NA	NA	NA	NA	NA	NA	0.72
1950	<sup>3</sup> 0.72	<sup>3</sup> 1.96	NA	NA	NA	NA	NA	NA	.76
1955	<sup>3</sup> 1.04	<sup>3</sup> 2.65	NA	NA	NA	NA	NA	NA	1.14
1960	<sup>3</sup> 1.33	<sup>3</sup> 2.91	NA	NA	NA	NA	NA	NA	1.52
1965	<sup>3</sup> 1.75	<sup>3</sup> 4.10	NA	NA	NA	NA	NA	NA	2.09
1970	<sup>3</sup> 1.72	<sup>3</sup> 4.53	NA	NA	NA	NA	NA	NA	2.30
1975	<sup>3</sup> 1.19	<sup>3</sup> 3.26	NA	NA	NA	NA	NA	NA	1.81
1976	<sup>3</sup> 1.14	<sup>3</sup> 3.25	NA	NA	NA	NA	NA	NA	1.78
1977	<sup>3</sup> 1.09	<sup>3</sup> 3.16	NA	NA	NA	NA	NA	NA	1.80
1978	<sup>3</sup> 1.04	<sup>3</sup> 3.03	NA	NA	NA	NA	NA	NA	1.77
1979	1.13	3.08	NA	NA	NA	NA	NA	NA	1.81
1980	1.20	3.21	NA	NA	NA	NA	NA	NA	1.93
1981	1.29	3.42	NA	NA	NA	NA	NA	NA	2.10
1982	1.37	3.36	NA	NA	NA	NA	NA	NA	2.11
1983	1.61	3.81	NA	NA	NA	NA	NA	NA	2.50
1984	1.72	4.03	1.69	2.56	1.98	2.49	8.15	7.07	2.64
1985	1.78	4.24	1.75	2.52	2.00	2.45	8.61	7.40	2.74
1986	2.00	4.60	1.96	2.75	2.21	2.80	9.02	7.90	3.01
1987	2.20	4.98	2.16	2.97	2.42	3.39	9.86	8.73	3.30
1988	2.38	5.32	2.32	2.99	2.54	3.55	10.73	9.38	3.55
1989	2.46	5.61	2.39	3.13	2.63	3.92	11.86	10.21	3.70
1990	2.54	5.94	2.46	3.32	2.73	4.01	12.26	10.41	3.83
1991	2.69	6.38	2.59	3.49	2.86	4.53	12.36	10.79	4.09
1992	2.93	6.59	2.82	3.61	3.07	4.85	12.49	11.03	4.36
1993	2.95	7.23	2.81	3.74	3.11	5.18	13.94	12.14	4.70
1994	3.19	7.67	3.02	3.85	3.28	5.93	15.19	13.22	4.98
1995	3.39	8.48	3.19	4.03	3.45	6.32	16.23	14.18	5.38
1996	3.57	9.05	3.36	4.25	3.63	7.03	17.89	15.66	5.69
1997	3.83	9.46	3.63	4.49	3.89	6.82	18.63	16.04	6.04
1998	3.90	9.58	3.69	4.31	3.89	6.76	18.82	16.27	6.20
1999	3.99	10.39	3.74	4.48	3.97	7.45	19.57	17.18	6.61
2000	4.15	11.01	3.89	4.82	4.18	7.66	20.04	17.62	6.99
2001	4.02	<sup>2</sup> 10.58	3.71	<sup>2</sup> 4.53	<sup>2</sup> 3.98	8.39	<sup>2</sup> 20.63	<sup>2</sup> 18.32	<sup>2</sup> 6.82
2002	3.98	10.36	3.67	4.22	3.86	7.80	20.67	18.06	6.80
2003	4.04	10.75	3.68	4.18	3.85	8.33	21.42	18.67	6.95
2004	3.96	10.55	3.59	3.95	3.72	8.22	22.04	19.00	6.80
2005	3.62	10.03	3.28	3.75	3.44	7.48	21.98	18.50	6.36
2006	3.37	10.18	3.06	3.74	3.29	6.62	22.26	18.33	6.26
2007	3.34	10.24	3.03	3.74	3.27	6.52	22.35	18.23	6.27
2008	3.15	9.81	2.87	3.58	3.12	6.07	21.85	17.77	5.96
2009	2.99	9.22	2.74	3.33	2.94	5.51	19.85	16.15	5.61
2010	<sup>R</sup> 2.89	<sup>R</sup> 9.46	<sup>R</sup> 2.66	3.24	<sup>R</sup> 2.84	<sup>R</sup> 5.54	<sup>R</sup> 20.25	16.60	<sup>R</sup> 5.55
2011 <sup>P</sup>	2.76	8.86	2.52	3.03	2.68	5.54	19.34	15.98	5.22

<sup>1</sup> Data through 1973 for bituminous coal, subbituminous coal, and lignite, and data through 1978 for anthracite, were originally reported in short tons per employee day—these data were converted to short tons per employee hour by assuming an eight-hour day. Through 1997, other data were calculated by dividing total production by total labor hours worked by all mine employees except office workers; beginning in 1998, the calculation also includes office workers.

<sup>2</sup> Beginning in 2001, includes a small amount of refuse recovery.

<sup>3</sup> Through 1978, data for anthracite are not available by mining method, but are included in "Total."

R=Revised. P=Preliminary. NA=Not available.

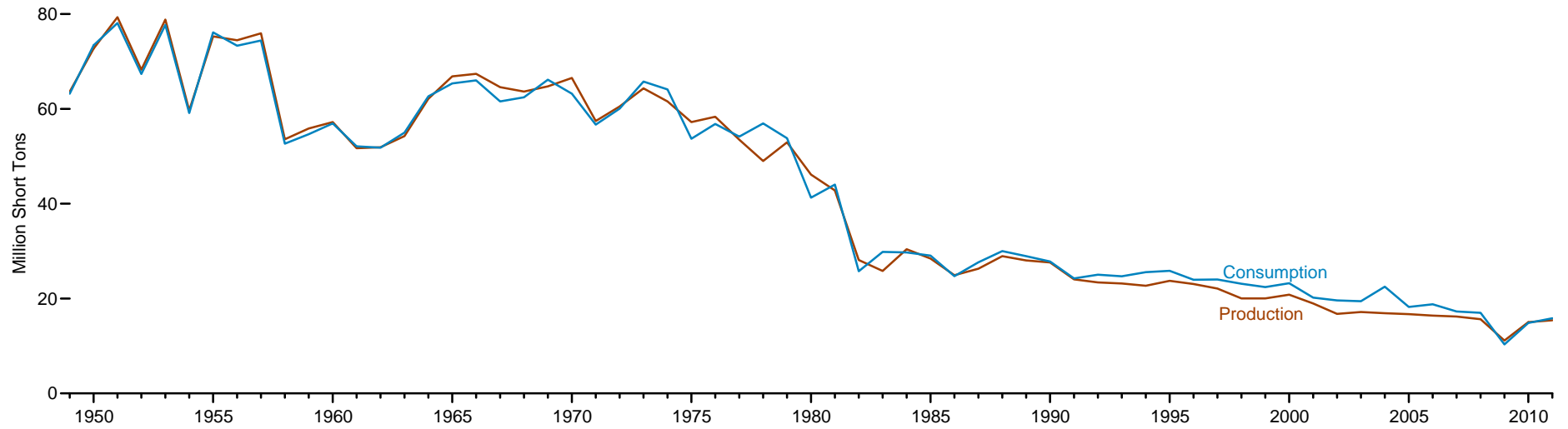
Web Pages: • For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#coal>.

• For related information, see <http://www.eia.gov/coal/>.

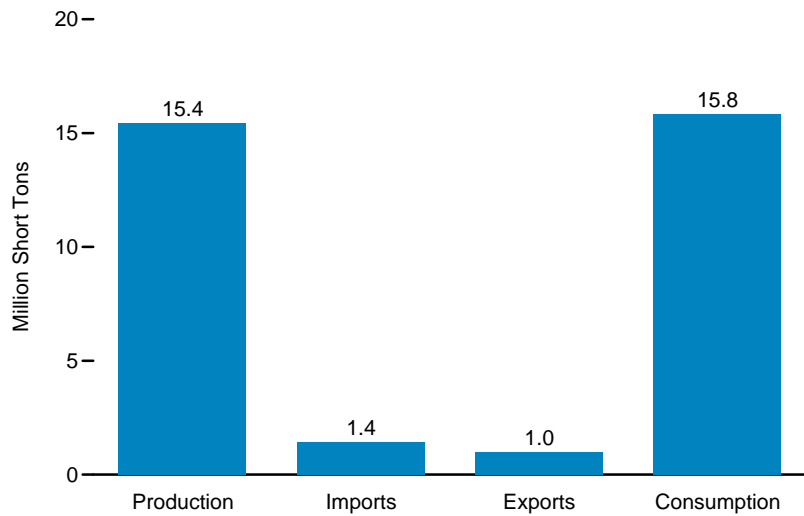
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal—Bituminous and Lignite" and "Coal—Pennsylvania Anthracite" chapters. • 1976—U.S. Energy Information Administration (EIA), Energy Data Reports, *Coal—Bituminous and Lignite in 1976* and *Coal—Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, Energy Data Reports, *Bituminous Coal and Lignite Production and Mine Operations—1977; 1978* and *Coal—Pennsylvania Anthracite 1977; 1978*. • 1979—EIA, Energy Data Report, *Coal Production—1979*. • 1980-1988—EIA, *Coal Production*, annual reports. • 1989-2000—EIA, *Coal Industry Annual*, annual reports. • 2001-2010—EIA, *Annual Coal Report*, annual reports. • 2011—EIA, Form EIA-7A, "Coal Production Report," and U.S. Department of Labor, Mine Safety and Health Administration, Form 7000-2, "Quarterly Mine Employment and Coal Production Report."

**Figure 7.8 Coke Overview**

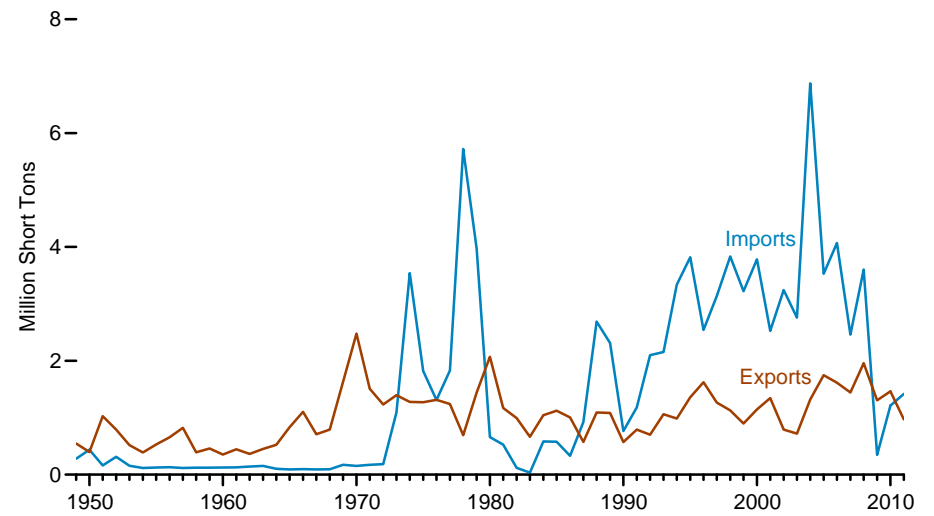
**Production and Consumption, 1949-2011**



**Overview, 2011**



**Trade**



Source: Table 7.8.



**Table 7.8 Coke Overview, Selected Years, 1949-2011**  
(Million Short Tons)

Year	Production	Trade			Stock Change <sup>2</sup>	Consumption <sup>3</sup>
		Imports	Exports	Net Imports <sup>1</sup>		
1949	63.6	0.3	0.5	-0.3	0.2	63.2
1950	72.7	.4	.4	(s)	-7	73.4
1955	75.3	.1	.5	-4	-1.2	76.1
1960	57.2	.1	.4	-2	.1	56.9
1965	66.9	.1	.8	-7	.7	65.4
1970	66.5	.2	2.5	-2.3	1.0	63.2
1975	57.2	1.8	1.3	.5	4.1	53.7
1976	58.3	1.3	1.3	(s)	1.5	56.8
1977	53.5	1.8	1.2	.6	(s)	54.1
1978	49.0	5.7	.7	5.0	-2.9	56.9
1979	52.9	4.0	1.4	2.5	1.7	53.8
1980	46.1	.7	2.1	-1.4	3.4	41.3
1981	42.8	.5	1.2	-6	-1.9	44.0
1982	28.1	.1	1.0	-9	1.5	25.8
1983	25.8	(s)	.7	-6	-4.7	29.9
1984	30.4	.6	1.0	-5	.2	29.7
1985	28.4	.6	1.1	-5	-1.2	29.1
1986	24.9	.3	1.0	-7	-5	24.7
1987	26.3	.9	.6	.3	-1.0	27.7
1988	28.9	2.7	1.1	1.6	.5	30.0
1989	28.0	2.3	1.1	1.2	.3	28.9
1990	27.6	.8	.6	.2	(s)	27.8
1991	24.0	1.2	.8	.4	.2	24.2
1992	23.4	2.1	.7	1.4	-2	25.0
1993	23.2	2.2	1.1	1.1	-4	24.7
1994	22.7	3.3	1.0	2.4	-5	25.6
1995	23.7	3.8	1.4	2.5	.4	25.8
1996	23.1	2.5	1.6	.9	(s)	24.0
1997	22.1	3.1	1.3	1.9	(s)	24.0
1998	20.0	3.8	1.1	2.7	-4	23.1
1999	20.0	3.2	.9	2.3	-1	22.4
2000	20.8	3.8	1.1	2.6	.2	23.2
2001	18.9	2.5	1.3	1.2	-1	20.2
2002	16.8	3.2	.8	2.5	-4	19.6
2003	17.2	2.8	.7	2.0	-2	19.4
2004	16.9	6.9	1.3	5.6	(s)	22.5
2005	16.7	3.5	1.7	1.8	.3	18.2
2006	16.4	4.1	1.6	2.5	.1	18.8
2007	16.2	2.5	1.4	1.0	-1	17.3
2008	15.6	3.6	2.0	1.6	.3	17.0
2009	11.1	.3	1.3	-1.0	-1	10.3
2010	15.0	1.2	1.5	-2	-1	14.8
2011 <sup>P</sup>	15.4	1.4	1.0	.4	(s)	15.8

<sup>1</sup> Net imports equal imports minus exports. Minus sign indicates exports are greater than imports.

<sup>2</sup> Producer and distributor stocks at end of year. A negative value indicates a decrease in stocks; a positive value indicates an increase.

<sup>3</sup> "Consumption" is calculated as the sum of production and imports minus exports and stock change.

P=Preliminary. (s)=Less than 0.05 million short tons.

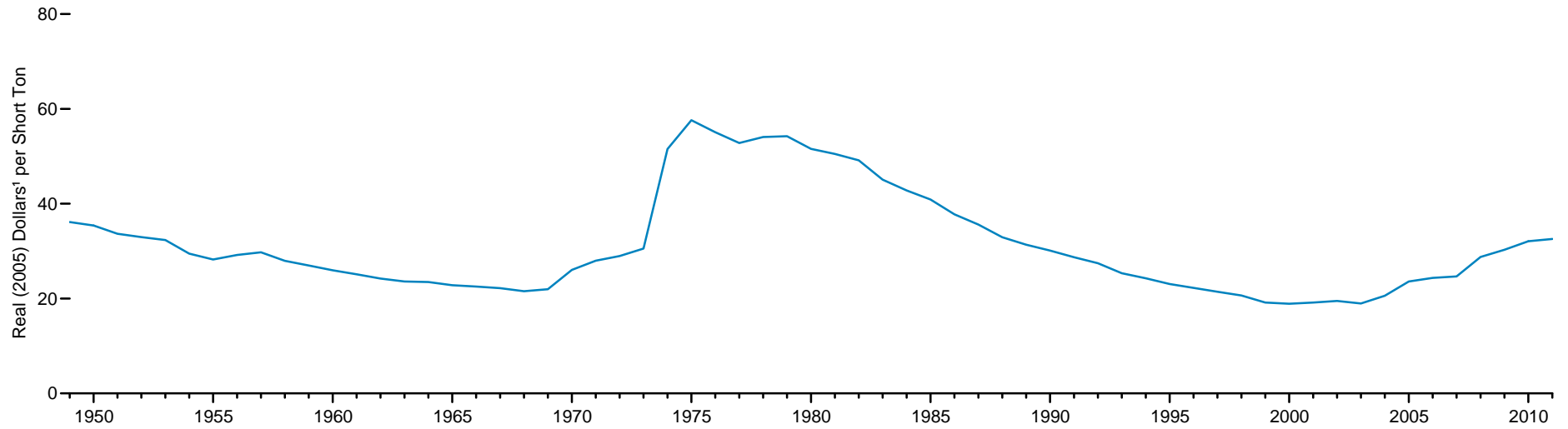
Note: Totals may not equal sum of components due to independent rounding.

Web Pages: • For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#coal>.  
• For related information, see <http://www.eia.gov/coal/>.

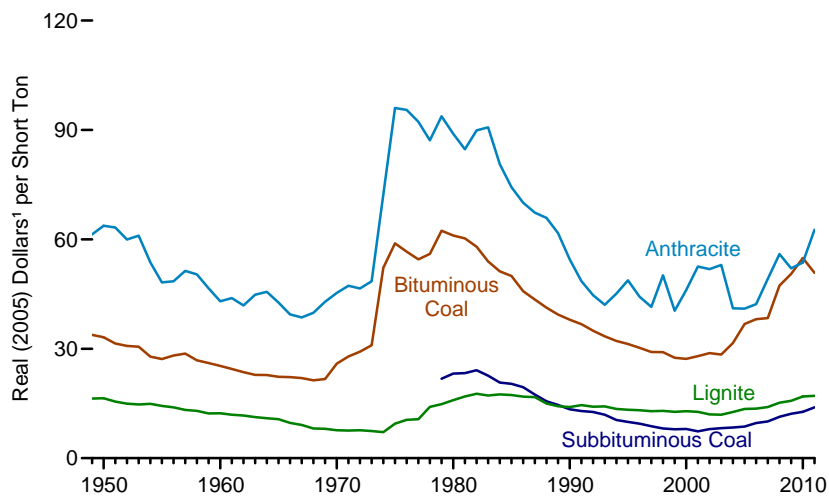
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coke and Coal Chemicals" chapter.  
• 1976-1980—U.S. Energy Information Administration (EIA), Energy Data Report, *Coke and Coal Chemicals*, annual reports. • 1981-2004—EIA, *Quarterly Coal Report (QCR) October-December*, quarterly reports. • 2005 forward—EIA, *QCR October-December 2011 (April 2012)*, Table ES-2.

**Figure 7.9 Coal Prices**

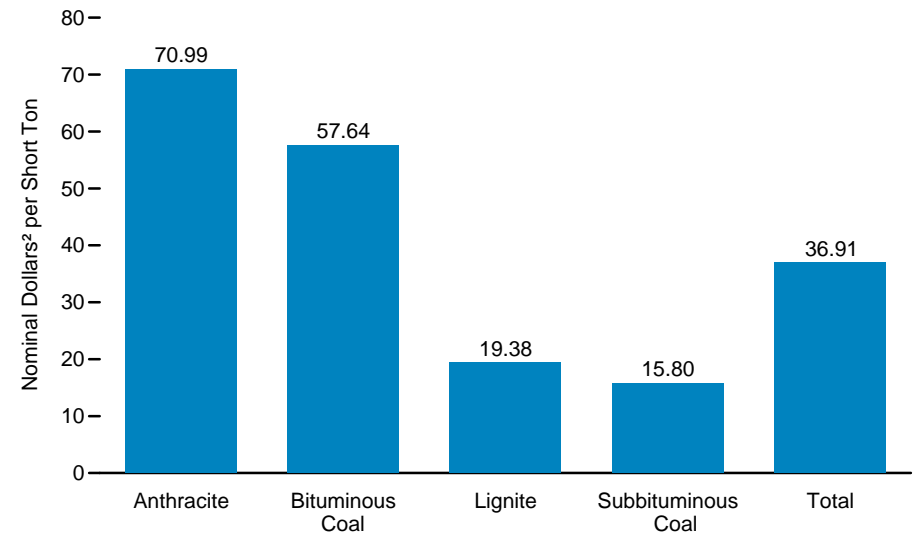
**Total, 1949-2011**



**By Type, 1949-2011**



**By Type, 2011**



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>2</sup> See "Nominal Dollars" in Glossary. Source: Table 7.9.

**Table 7.9 Coal Prices, Selected Years, 1949-2011**  
(Dollars per Short Ton)

Year	Bituminous Coal		Subbituminous Coal		Lignite <sup>1</sup>		Anthracite		Total	
	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>	Nominal <sup>2</sup>	Real <sup>3</sup>
1949	4.90	<sup>4</sup> R33.80	( <sup>4</sup> )	( <sup>4</sup> )	2.37	<sup>R</sup> 16.35	8.90	<sup>R</sup> 61.38	5.24	<sup>R</sup> 36.14
1950	4.86	<sup>4</sup> R33.16	( <sup>4</sup> )	( <sup>4</sup> )	2.41	<sup>R</sup> 16.44	9.34	<sup>R</sup> 63.73	5.19	<sup>R</sup> 35.41
1955	4.51	<sup>4</sup> R27.17	( <sup>4</sup> )	( <sup>4</sup> )	2.38	<sup>R</sup> 14.34	8.00	<sup>R</sup> 48.19	4.69	<sup>R</sup> 28.25
1960	4.71	<sup>4</sup> R25.31	( <sup>4</sup> )	( <sup>4</sup> )	2.29	<sup>R</sup> 12.30	8.01	<sup>R</sup> 43.04	4.83	<sup>R</sup> 25.95
1965	4.45	<sup>4</sup> R22.32	( <sup>4</sup> )	( <sup>4</sup> )	2.13	<sup>R</sup> 10.68	8.51	<sup>R</sup> 42.69	4.55	<sup>R</sup> 22.82
1970	4.63	<sup>4</sup> R25.89	( <sup>4</sup> )	( <sup>4</sup> )	1.86	<sup>R</sup> 7.64	11.03	<sup>R</sup> 45.32	6.34	<sup>R</sup> 26.05
1975	4.19	<sup>4</sup> R58.91	( <sup>4</sup> )	( <sup>4</sup> )	3.17	9.44	32.26	<sup>R</sup> 96.04	19.35	<sup>R</sup> 57.60
1976	4.20	<sup>4</sup> R56.62	( <sup>4</sup> )	( <sup>4</sup> )	3.74	<sup>R</sup> 10.53	33.92	<sup>R</sup> 95.50	19.56	<sup>R</sup> 55.07
1977	4.20	<sup>4</sup> R54.50	( <sup>4</sup> )	( <sup>4</sup> )	4.03	<sup>R</sup> 10.67	34.86	<sup>R</sup> 92.26	19.95	<sup>R</sup> 52.80
1978	4.22	<sup>4</sup> R55.99	( <sup>4</sup> )	( <sup>4</sup> )	5.68	<sup>R</sup> 14.05	35.25	<sup>R</sup> 87.18	21.86	<sup>R</sup> 54.06
1979	27.31	<sup>R</sup> 62.35	9.55	<sup>R</sup> 21.80	6.48	<sup>R</sup> 14.80	41.06	<sup>R</sup> 93.75	23.75	<sup>R</sup> 54.23
1980	29.17	<sup>R</sup> 61.04	11.08	<sup>R</sup> 23.18	7.60	<sup>R</sup> 15.90	42.51	<sup>R</sup> 88.95	24.65	<sup>R</sup> 51.58
1981	31.51	<sup>R</sup> 60.28	12.18	<sup>R</sup> 23.30	8.85	<sup>R</sup> 16.93	44.28	<sup>R</sup> 84.71	26.40	<sup>R</sup> 50.51
1982	32.15	<sup>R</sup> 57.97	13.37	<sup>R</sup> 24.11	9.79	<sup>R</sup> 17.65	49.85	<sup>R</sup> 89.89	27.25	<sup>R</sup> 49.14
1983	31.11	<sup>R</sup> 53.96	13.03	<sup>R</sup> 22.60	9.91	<sup>R</sup> 17.19	52.29	<sup>R</sup> 90.70	25.98	<sup>R</sup> 45.06
1984	30.63	<sup>R</sup> 51.21	12.41	<sup>R</sup> 20.75	10.45	<sup>R</sup> 17.47	48.22	<sup>R</sup> 80.61	25.61	<sup>R</sup> 42.81
1985	30.78	<sup>R</sup> 49.94	12.57	<sup>R</sup> 20.40	10.68	<sup>R</sup> 17.33	45.80	<sup>R</sup> 74.32	25.20	<sup>R</sup> 40.89
1986	28.84	<sup>R</sup> 45.78	12.26	<sup>R</sup> 19.46	10.64	<sup>R</sup> 16.89	44.12	<sup>R</sup> 70.04	23.79	<sup>R</sup> 37.77
1987	28.19	<sup>R</sup> 43.49	11.32	<sup>R</sup> 17.46	10.85	<sup>R</sup> 16.74	43.65	<sup>R</sup> 67.34	23.07	<sup>R</sup> 35.59
1988	27.66	<sup>R</sup> 41.26	10.45	<sup>R</sup> 15.59	10.06	<sup>R</sup> 15.00	44.16	<sup>R</sup> 65.87	22.07	<sup>R</sup> 32.92
1989	27.40	<sup>R</sup> 39.38	10.16	<sup>R</sup> 14.60	9.91	<sup>R</sup> 14.24	42.93	<sup>R</sup> 61.70	21.82	<sup>R</sup> 31.36
1990	27.43	<sup>R</sup> 37.96	9.70	<sup>R</sup> 13.42	10.13	<sup>R</sup> 14.02	39.40	<sup>R</sup> 54.52	21.76	<sup>R</sup> 30.11
1991	27.49	<sup>R</sup> 36.74	9.68	<sup>R</sup> 12.94	10.89	<sup>R</sup> 14.55	36.34	<sup>R</sup> 48.57	21.49	<sup>R</sup> 28.72
1992	26.78	<sup>R</sup> 34.96	9.68	<sup>R</sup> 12.64	10.81	<sup>R</sup> 14.11	34.24	<sup>R</sup> 44.70	21.03	<sup>R</sup> 27.46
1993	26.15	<sup>R</sup> 33.40	9.33	<sup>R</sup> 11.92	11.11	<sup>R</sup> 14.19	32.94	<sup>R</sup> 42.07	19.85	<sup>R</sup> 25.35
1994	25.68	<sup>R</sup> 32.12	8.37	<sup>R</sup> 10.47	10.77	<sup>R</sup> 13.47	36.07	<sup>R</sup> 45.12	19.41	<sup>R</sup> 24.28
1995	25.56	<sup>R</sup> 31.32	8.10	9.93	10.83	<sup>R</sup> 13.27	39.78	<sup>R</sup> 48.75	18.83	<sup>R</sup> 23.07
1996	25.17	<sup>R</sup> 30.27	7.87	<sup>R</sup> 9.46	10.92	<sup>R</sup> 13.13	36.78	<sup>R</sup> 44.23	18.50	<sup>R</sup> 22.25
1997	24.64	<sup>R</sup> 29.12	7.42	<sup>R</sup> 8.77	10.91	<sup>R</sup> 12.89	35.12	<sup>R</sup> 41.50	18.14	<sup>R</sup> 21.43
1998	24.87	<sup>R</sup> 29.06	6.96	<sup>R</sup> 8.13	11.08	<sup>R</sup> 12.95	42.91	<sup>R</sup> 50.14	17.67	<sup>R</sup> 20.65
1999	23.92	<sup>R</sup> 27.54	6.87	<sup>R</sup> 7.91	11.04	<sup>R</sup> 12.71	35.13	<sup>R</sup> 40.45	16.63	<sup>R</sup> 19.15
2000	24.15	<sup>R</sup> 27.22	7.12	<sup>R</sup> 8.02	11.41	<sup>R</sup> 12.86	40.90	<sup>R</sup> 46.10	16.78	<sup>R</sup> 18.91
2001	25.36	<sup>R</sup> 27.95	6.67	<sup>R</sup> 7.35	11.52	<sup>R</sup> 12.70	47.67	<sup>R</sup> 52.54	17.38	<sup>R</sup> 19.16
2002	26.57	<sup>R</sup> 28.82	7.34	<sup>R</sup> 7.96	11.07	<sup>R</sup> 12.01	47.78	<sup>R</sup> 51.82	17.98	<sup>R</sup> 19.50
2003	26.73	<sup>R</sup> 28.40	7.73	8.21	11.20	11.90	49.87	<sup>R</sup> 52.98	17.85	<sup>R</sup> 18.96
2004	30.56	<sup>R</sup> 31.57	8.12	8.39	12.27	12.68	39.77	<sup>R</sup> 41.09	19.93	<sup>R</sup> 20.59
2005	36.80	36.80	8.68	8.68	13.49	13.49	41.00	41.00	23.59	23.59
2006	39.32	<sup>R</sup> 38.09	9.95	9.64	14.00	13.56	43.61	<sup>R</sup> 42.25	25.16	24.37
2007	40.80	<sup>R</sup> 38.41	10.69	10.06	14.89	<sup>R</sup> 14.02	52.24	<sup>R</sup> 49.18	26.20	<sup>R</sup> 24.66
2008	51.39	<sup>R</sup> 47.33	12.31	<sup>R</sup> 11.34	16.50	<sup>R</sup> 15.20	60.76	<sup>R</sup> 55.96	31.25	<sup>R</sup> 28.78
2009	55.44	<sup>R</sup> 50.52	13.35	<sup>R</sup> 12.17	17.26	<sup>R</sup> 15.73	57.10	<sup>R</sup> 52.04	33.24	<sup>R</sup> 30.29
2010	<sup>R</sup> 60.88	<sup>R</sup> 54.85	<sup>R</sup> 14.11	<sup>R</sup> 12.71	<sup>R</sup> 18.76	<sup>R</sup> 16.90	<sup>R</sup> 59.51	<sup>R</sup> 53.62	<sup>R</sup> 35.61	<sup>R</sup> 32.08
2011 <sup>E</sup>	57.64	50.85	15.80	13.94	19.38	17.10	70.99	62.62	36.91	32.56

<sup>1</sup> Because of withholding to protect company confidentiality, lignite prices exclude Texas for 1955–1977 and Montana for 1974–1978. As a result, lignite prices for 1974–1977 are for North Dakota only.

<sup>2</sup> See "Nominal Dollars" in Glossary.

<sup>3</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>4</sup> Through 1978, subbituminous coal is included in "Bituminous Coal."

R=Revised. E=Estimate.

Note: Prices are free-on-board (F.O.B.) rail/barge prices, which are the F.O.B. prices of coal at the point of first sale, excluding freight or shipping and insurance costs. For 1949–2000, prices are for open market and captive coal sales; for 2001–2007, prices are for open market coal sales; for 2008 forward, prices are for open market and captive coal sales. See "Captive Coal," "Free on Board (F.O.B.)," and "Open Market Coal" in Glossary.

Web Pages: • For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#coal>.  
• For related information, see <http://www.eia.gov/coal/>.

Sources: • 1949-1975—Bureau of Mines (BOM), *Minerals Yearbook*. • 1976—U.S. Energy Information Administration (EIA), Energy Data Report, *Coal—Bituminous and Lignite in 1976*, and BOM, *Minerals Yearbook*. • 1977 and 1978—EIA, Energy Data Reports, *Bituminous Coal and Lignite Production and Mine Operations*, and *Coal—Pennsylvania Anthracite*. • 1979—EIA, *Coal Production*, and Energy Data Report, *Coal—Pennsylvania Anthracite*. • 1980-1992—EIA, *Coal Production*, annual reports. • 1993-2000—EIA, *Coal Industry Annual*, annual reports and unpublished revisions. • 2001-2010—EIA, *Annual Coal Report*, annual reports. • 2011—EIA, Form EIA-7A, "Coal Production Report," and U.S. Department of Labor, Mine Safety and Health Administration, Form 7000-2, "Quarterly Mine Employment and Coal Production Report."

## Coal

**Note 1. Coal Consumption.** Data in this report on the consumption of bituminous coal, sub-bituminous coal, lignite, anthracite, and waste coal are developed primarily from consumption data reported in surveys. Included are data reported by all electric power companies and coke plant companies. Data on coal consumption by all industrial and manufacturing establishments are based on consumption data obtained quarterly from coal users. Beginning in 2008, data on coal consumption by the residential and commercial sectors are based on data received on Form EIA-3, "Quarterly Coal Consumption and Quality Report—Manufacturing and Transformation/Processing Coal Plants and Commercial and Institutional Users." Prior to 2008, data on coal consumption by the residential and commercial sectors are based on distribution data obtained annually from coal distributors. Included in each sector's data are the following: Residential and Commercial Sectors—commercial and institutional establishments including military bases, universities, and various State facilities; Industrial Sector—consumption at manufacturing plants, coking plants, and coal preparation plants; Electric Power Sector (electric utilities and independent power producers)—consumption for electric generation and useful thermal output at electricity-only and CHP plants within the North American Industry Classification System (NAICS) 22 category, whose primary business is to sell electricity, or electricity and heat, to the public. There are no data for the Transportation Sector.

**Note 2. Residential and Commercial Coal Consumption Estimates.** Through 2007, coal consumption by the residential and commercial sectors was reported to the U.S. Energy Information Administration (EIA) for the two sectors combined; EIA estimates the amount consumed by the sectors individually. To create the estimates, it is first assumed that an occupied coal-heated housing unit consumes fuel at the same Btu rate as an oil-heated housing unit. Then, for the years in which data are available on the number of occupied housing units by heating source (1950, 1960, 1970, 1973–1981, and subsequent odd-numbered years; see Table 2.7), residential consumption of coal is estimated by the following steps: a ratio is created of the number of occupied housing units heated by coal to the number of housing units heated by oil; that ratio is then multiplied by the Btu quantity of oil consumed by the residential sector to derive an estimate of the Btu quantity of coal consumed by the residential sector; and, finally, the amount estimated as the residential sector consumption is subtracted from the residential and commercial sectors' combined consumption to derive the commercial sector's estimated consumption. The 1950 share is applied to 1949, and the other missing years' shares are interpolated.

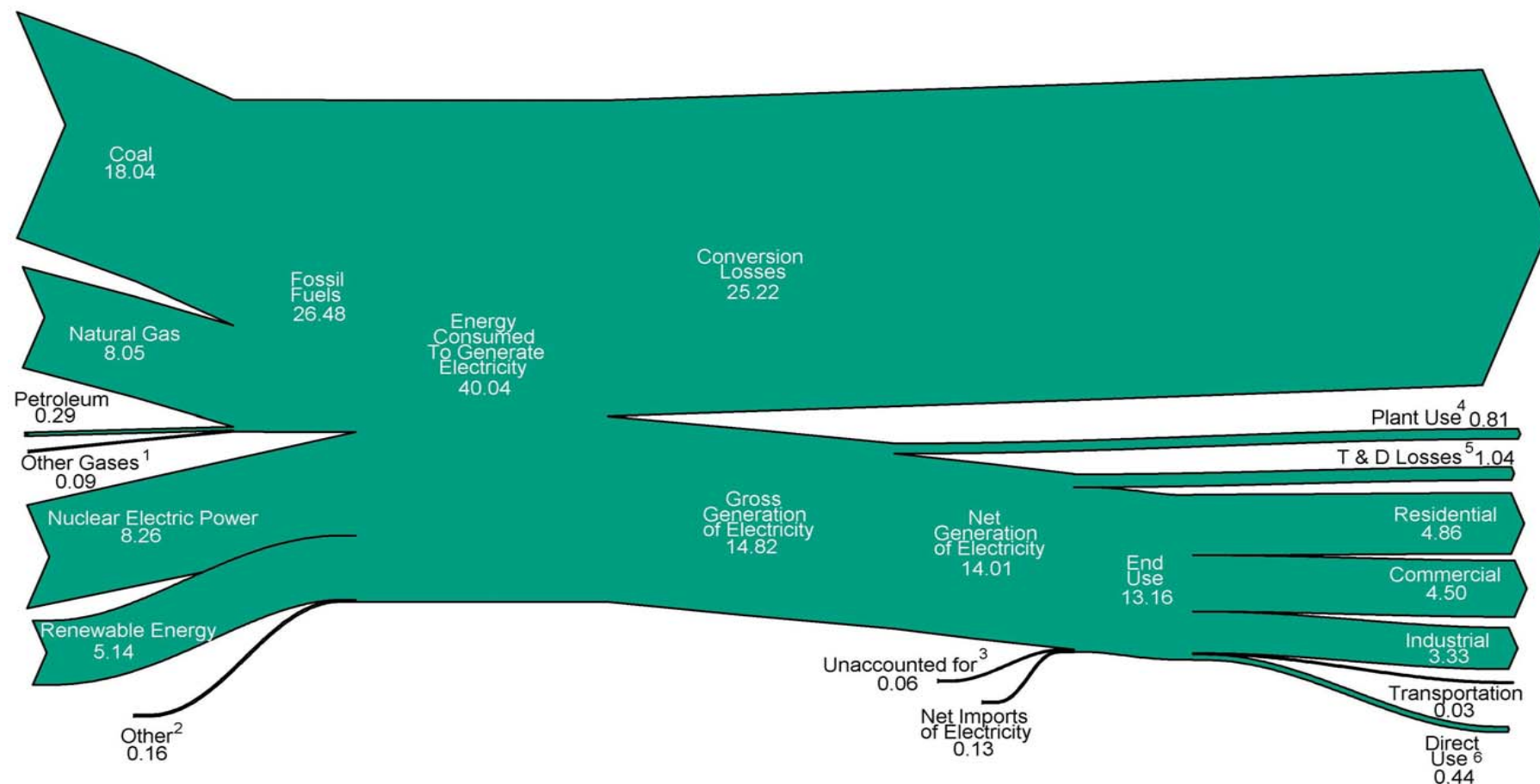
Beginning in 2008, coal consumption is reported to EIA for commercial and institutional users. However, EIA continues to allocate a small portion of that consumption to the residential sector using the above methodology.

# 8. Electricity

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**Figure 8.0 Electricity Flow, 2011**  
(Quadrillion Btu)



<sup>1</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>2</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>3</sup> Data collection frame differences and nonsampling error. Derived for the diagram by subtracting the "T & D Losses" estimate from "T & D Losses and Unaccounted for" derived from Table 8.1.

<sup>4</sup> Electric energy used in the operation of power plants.

<sup>5</sup> Transmission and distribution losses (electricity losses that occur between the point of

generation and delivery to the customer) are estimated as 7 percent of gross generation.

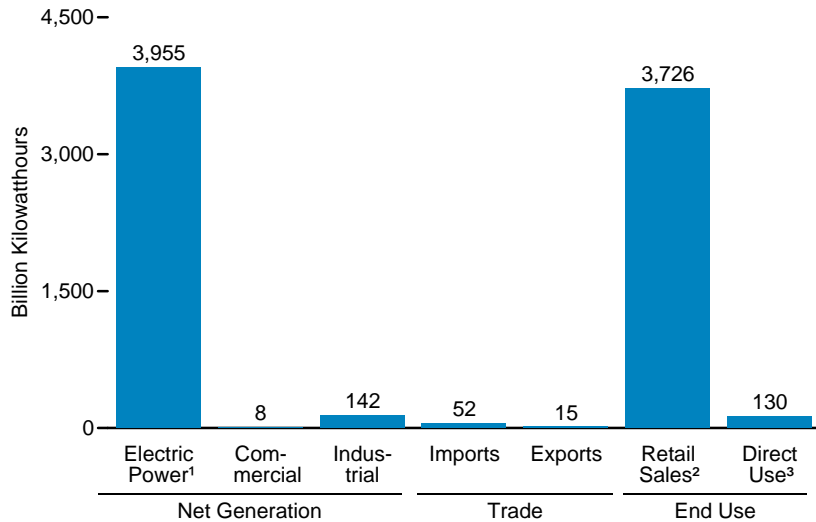
<sup>6</sup> Use of electricity that is 1) self-generated, 2) produced by either the same entity that consumes the power or an affiliate, and 3) used in direct support of a service or industrial process located within the same facility or group of facilities that house the generating equipment. Direct use is exclusive of station use.

Notes: • Data are preliminary. • See Note, "Electrical System Energy Losses," at the end of Section 2. • Net generation of electricity includes pumped storage facility production minus energy used for pumping. • Values are derived from source data prior to rounding for publication. • Totals may not equal sum of components due to independent rounding.

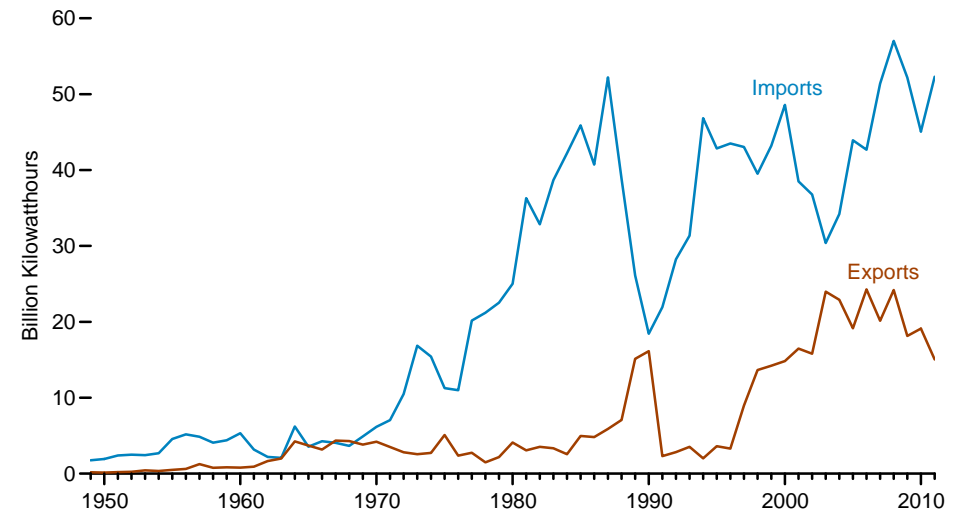
Sources: Tables 8.1, 8.4a, 8.9, A6 (column 7), and U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."

## Figure 8.1 Electricity Overview

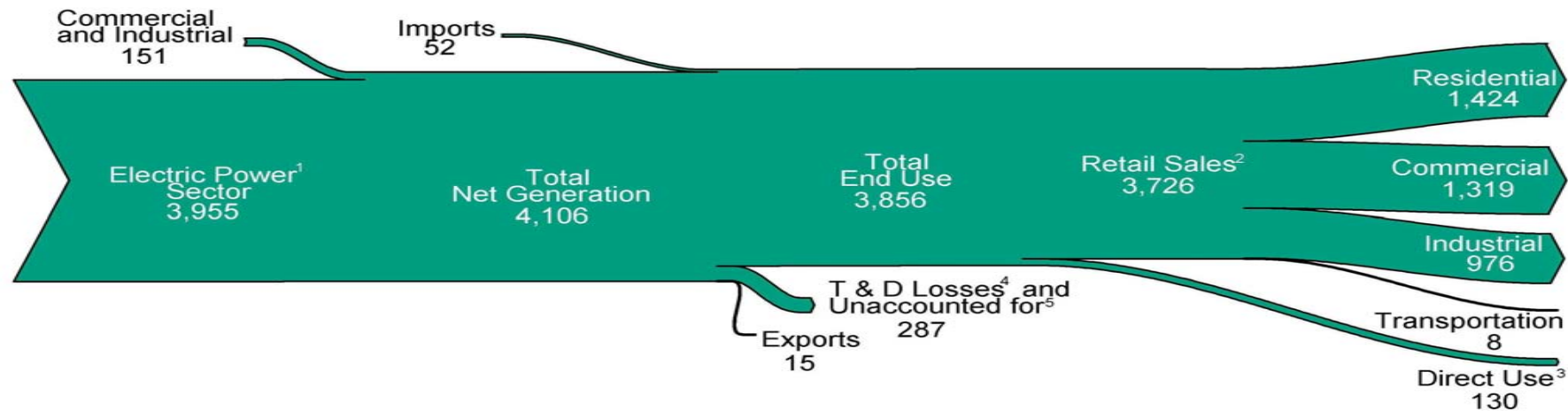
### Overview, 2011



### Electricity Trade, 1949-2011



### Net-Generation-to-End-Use Flow, 2011 (Billion Kilowatthours)



<sup>1</sup> Electricity-only and combined-heat-and-power plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

<sup>2</sup> Electricity retail sales to ultimate customers reported by electric utilities and other energy service providers.

<sup>3</sup> See Table 8.1, footnote 8.

<sup>4</sup> Transmission and distribution losses (electricity losses that occur between the point of generation and delivery to the customer). See Note, "Electrical System Energy Losses," at the end of Section 2.

<sup>5</sup> Data collection frame differences and nonsampling error.

Sources: Tables 8.1 and 8.9.



**Table 8.1 Electricity Overview, Selected Years, 1949-2011**  
(Billion Kilowatthours)

Year	Net Generation				Trade					T & D Losses <sup>5</sup> and Unaccounted for <sup>6</sup>	End Use		
	Electric Power Sector <sup>2</sup>	Commercial Sector <sup>3</sup>	Industrial Sector <sup>4</sup>	Total	Imports <sup>1</sup>		Exports <sup>1</sup>		Net Imports <sup>1</sup>		Retail Sales <sup>7</sup>	Direct Use <sup>8</sup>	Total
					From Canada	Total	To Canada	Total	Total				
1949	291	NA	5	296	NA	2	NA	(s)	2	43	255	NA	255
1950	329	NA	5	334	NA	2	NA	(s)	2	44	291	NA	291
1955	547	NA	3	550	NA	5	NA	(s)	4	58	497	NA	497
1960	756	NA	4	759	NA	5	NA	1	5	76	688	NA	688
1965	1,055	NA	3	1,058	NA	4	NA	4	(s)	104	954	NA	954
1970	1,532	NA	3	1,535	NA	6	NA	4	2	145	1,392	NA	1,392
1975	1,918	NA	3	1,921	NA	11	NA	5	6	180	1,747	NA	1,747
1976	2,038	NA	3	2,041	NA	11	NA	2	9	194	1,855	NA	1,855
1977	2,124	NA	3	2,127	NA	20	NA	3	17	197	1,948	NA	1,948
1978	2,206	NA	3	2,209	NA	21	NA	1	20	211	2,018	NA	2,018
1979	2,247	NA	3	2,251	NA	23	NA	2	20	200	2,071	NA	2,071
1980	2,286	NA	3	2,290	NA	25	NA	4	21	216	2,094	NA	2,094
1981	2,295	NA	3	2,298	NA	36	NA	3	33	184	2,147	NA	2,147
1982	2,241	NA	3	2,244	NA	33	NA	4	29	187	2,086	NA	2,086
1983	2,310	NA	3	2,313	NA	39	NA	3	35	198	2,151	NA	2,151
1984	2,416	NA	3	2,419	NA	42	NA	3	40	173	2,286	NA	2,286
1985	2,470	NA	3	2,473	NA	46	NA	5	41	190	2,324	NA	2,324
1986	2,487	NA	3	2,490	NA	41	NA	5	36	158	2,369	NA	2,369
1987	2,572	NA	3	2,575	NA	52	NA	6	46	164	2,457	NA	2,457
1988	2,704	NA	3	2,707	NA	39	NA	7	32	161	2,578	NA	2,578
1989	2,848	4	4115	2,967	NA	26	NA	15	11	222	2,647	109	2,756
1990	2,901	6	131	3,038	16	18	16	16	2	203	2,713	125	2,837
1991	2,936	6	133	3,074	20	22	2	2	20	207	2,762	124	2,886
1992	2,934	6	143	3,084	26	28	2	3	25	212	2,763	134	2,897
1993	3,044	7	146	3,197	29	31	3	4	28	224	2,861	139	3,001
1994	3,089	8	151	3,248	45	47	1	2	45	211	2,935	146	3,081
1995	3,194	8	151	3,353	41	43	2	4	39	229	3,013	151	3,164
1996	3,284	9	151	3,444	42	43	2	3	40	231	3,101	153	3,254
1997	3,329	9	154	3,492	43	43	7	9	34	224	3,146	156	3,302
1998	3,457	9	154	3,620	40	40	12	14	26	221	3,264	161	3,425
1999	3,530	9	156	3,695	43	43	13	14	29	240	3,312	172	3,484
2000	3,638	8	157	3,802	49	49	13	15	34	244	3,421	171	3,592
2001	3,580	7	149	3,737	38	39	16	16	22	202	3,394	163	3,557
2002	3,698	7	153	3,858	37	37	15	16	21	248	3,465	166	3,632
2003	3,721	7	155	3,883	29	30	24	24	6	228	3,494	168	3,662
2004	3,808	8	154	3,971	33	34	22	23	11	266	3,547	168	3,716
2005	3,902	8	145	4,055	42	44	19	19	25	269	3,661	150	3,811
2006	3,908	8	148	4,065	42	43	23	24	18	266	3,670	147	3,817
2007	4,005	8	143	4,157	50	51	20	20	31	298	3,765	126	3,890
2008	3,974	8	137	4,119	56	57	24	24	33	287	3,733	132	3,865
2009	3,810	8	132	3,950	51	52	18	18	34	261	3,597	127	3,724
2010	R3,972	R9	R144	R4,125	44	45	R18	19	26	R265	R3,754	R132	R3,886
2011	P3,955	P8	P142	P4,106	P51	P52	P14	P15	P37	P287	P3,726	E130	P3,856

<sup>1</sup> Electricity transmitted across U.S. borders. Net imports equal imports minus exports.

<sup>2</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

<sup>3</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>4</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants. Through 1988, data are for industrial hydroelectric power only.

<sup>5</sup> Transmission and distribution losses (electricity losses that occur between the point of generation and delivery to the customer). See Note, "Electrical System Energy Losses," at end of Section 2.

<sup>6</sup> Data collection frame differences and nonsampling error.

<sup>7</sup> Electricity retail sales to ultimate customers by electric utilities and, beginning in 1996, other energy service providers.

<sup>8</sup> Use of electricity that is 1) self-generated, 2) produced by either the same entity that consumes the power or an affiliate, and 3) used in direct support of a service or industrial process located within the same facility or group of facilities that house the generating equipment. Direct use is exclusive of station use.

R=Revised. P=Preliminary. E=Estimate. NA=Not available. (s)=Less than 0.5 billion kilowatthours.

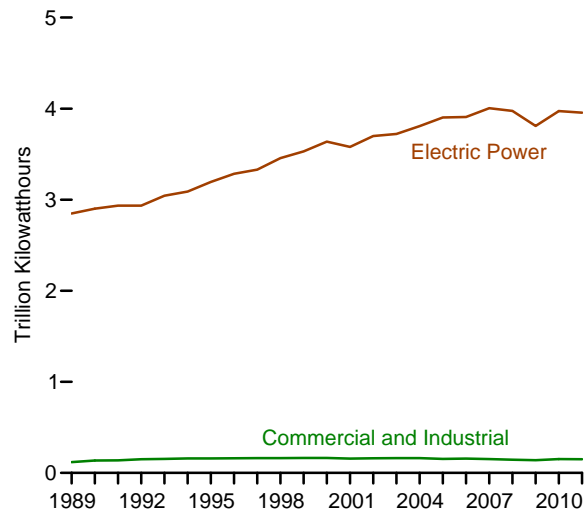
Notes: • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1949. • See <http://www.eia.gov/electricity/> for related information.

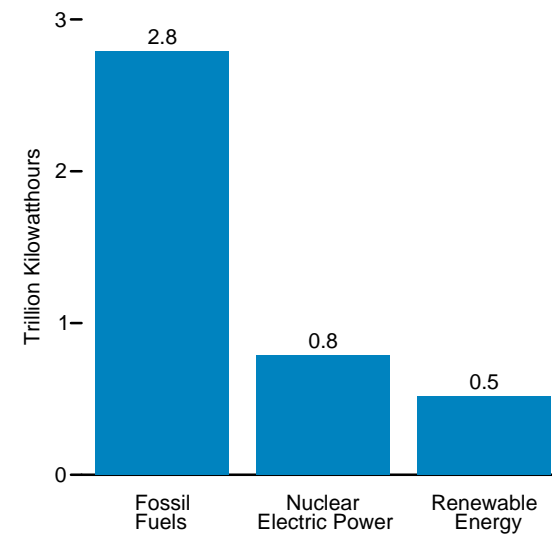
Sources: See end of section.

**Figure 8.2a Electricity Net Generation, Total (All Sectors)**

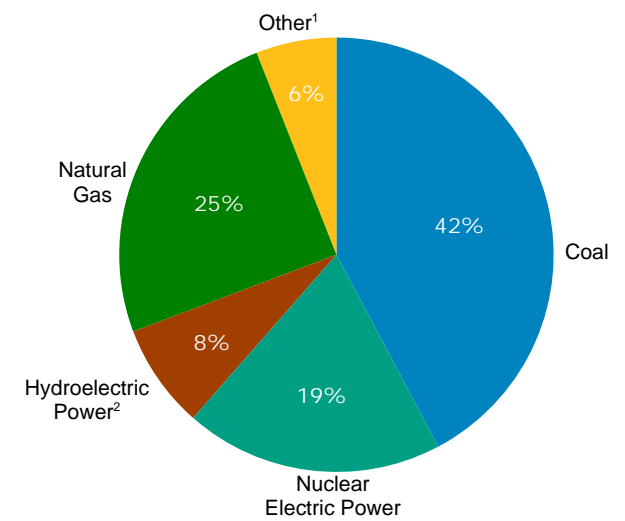
**By Sector, 1989-2011**



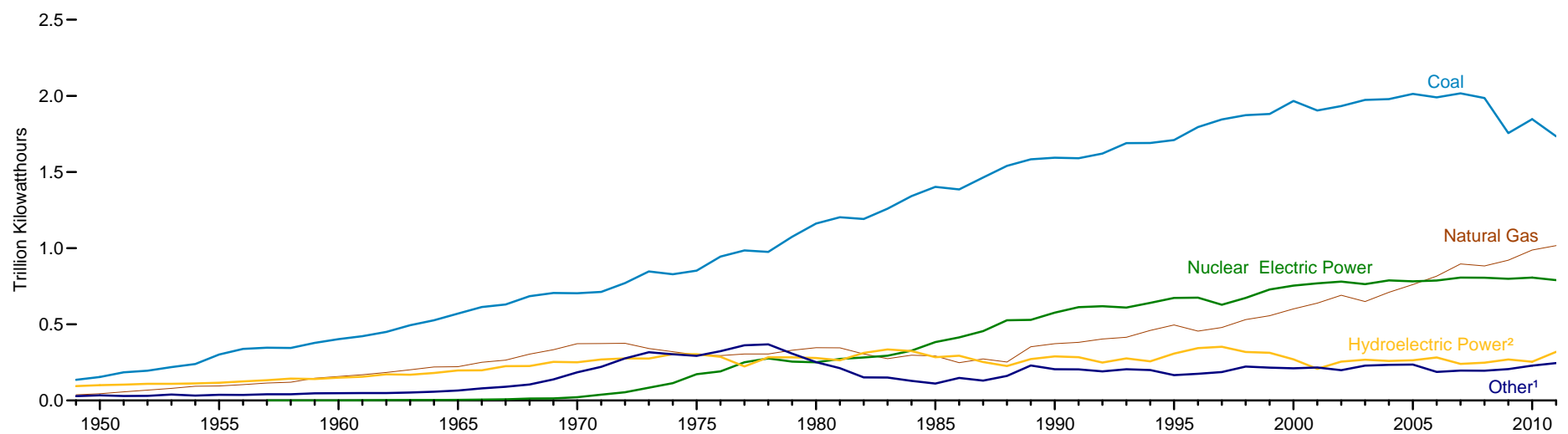
**By Source Category, 2011**



**By Source, 2011**



**By Source, 1949-2011**

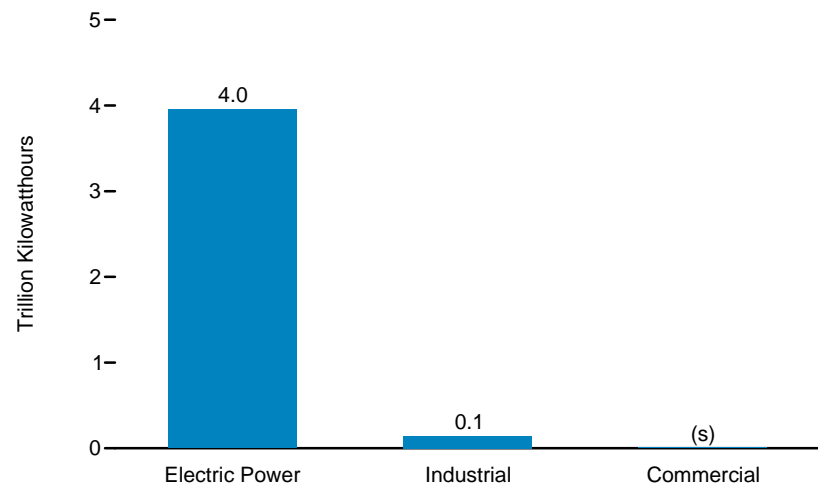


<sup>1</sup> Wind, petroleum, wood, waste, geothermal, other gases, solar thermal and photovoltaic, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

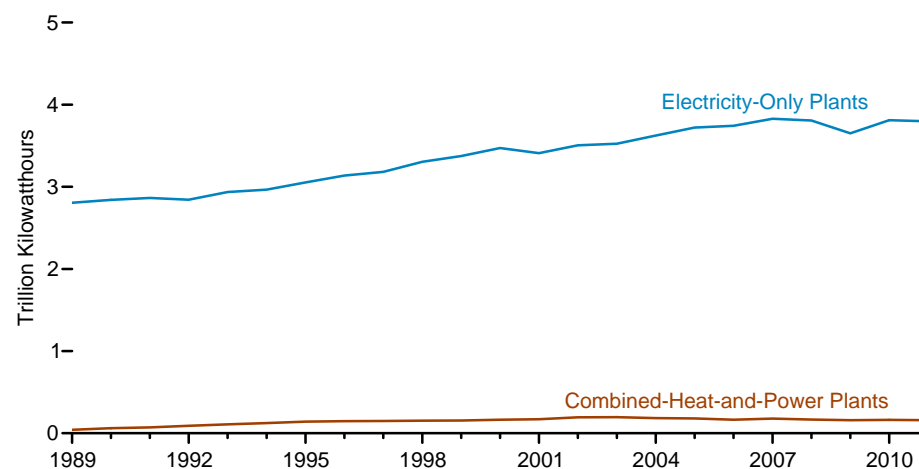
<sup>2</sup> Conventional hydroelectric power and pumped storage.  
Note: Sum of components may not equal 100 percent due to independent rounding.  
Sources: Tables 8.2a, 8.2b, and 8.2d.

**Figure 8.2b Electricity Net Generation by Sector**

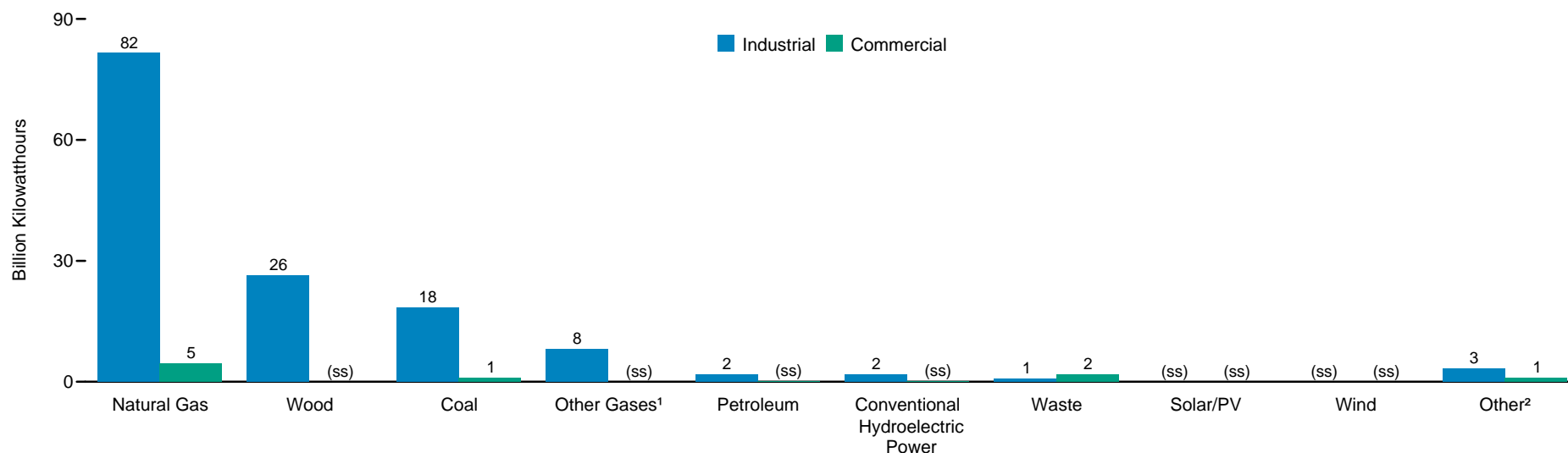
**By Sector, 2011**



**Electric Power Sector by Plant Type, 1989-2011**



**Industrial and Commercial Sectors, 2011**



<sup>1</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>2</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

(s) = Less than 0.05 trillion kilowatthours.

(ss) = Less than 0.5 billion kilowatthours.

Sources: Tables 8.2b-8.2d.

**Table 8.2a Electricity Net Generation: Total (All Sectors), Selected Years, 1949-2011**  
(Sum of Tables 8.2b and 8.2d; Billion Kilowatthours)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy							Other <sup>10</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power <sup>6</sup>	Biomass		Geo-thermal	Solar/PV <sup>9</sup>	Wind	Total		
									Wood <sup>7</sup>	Waste <sup>8</sup>						
1949	135.5	28.5	37.0	NA	201.0	0.0	( <sup>6</sup> )	94.8	0.4	NA	NA	NA	NA	95.2	NA	296.1
1950	154.5	33.7	44.6	NA	232.8	.0	( <sup>6</sup> )	100.9	.4	NA	NA	NA	NA	101.3	NA	334.1
1955	301.4	37.1	95.3	NA	433.8	.0	( <sup>6</sup> )	116.2	.3	NA	NA	NA	NA	116.5	NA	550.3
1960	403.1	48.0	158.0	NA	609.0	.5	( <sup>6</sup> )	149.4	.1	NA	(s)	NA	NA	149.6	NA	759.2
1965	570.9	64.8	221.6	NA	857.3	3.7	( <sup>6</sup> )	197.0	.3	NA	.2	NA	NA	197.4	NA	1,058.4
1970	704.4	184.2	372.9	NA	1,261.5	21.8	( <sup>6</sup> )	251.0	.1	.2	.5	NA	NA	251.8	NA	1,535.1
1975	852.8	289.1	299.8	NA	1,441.7	172.5	( <sup>6</sup> )	303.2	(s)	.2	3.2	NA	NA	306.6	NA	1,920.8
1976	944.4	320.0	294.6	NA	1,559.0	191.1	( <sup>6</sup> )	286.9	.1	.2	3.6	NA	NA	290.8	NA	2,040.9
1977	985.2	358.2	305.5	NA	1,648.9	250.9	( <sup>6</sup> )	223.6	.3	.2	3.6	NA	NA	227.7	NA	2,127.4
1978	975.7	365.1	305.4	NA	1,646.2	276.4	( <sup>6</sup> )	283.5	.2	.1	3.0	NA	NA	286.8	NA	2,209.4
1979	1,075.0	303.5	329.5	NA	1,708.0	255.2	( <sup>6</sup> )	283.1	.3	.2	3.9	NA	NA	287.5	NA	2,250.7
1980	1,161.6	246.0	346.2	NA	1,753.8	251.1	( <sup>6</sup> )	279.2	.3	.2	5.1	NA	NA	284.7	NA	2,289.6
1981	1,203.2	206.4	345.8	NA	1,755.4	272.7	( <sup>6</sup> )	263.8	.2	.1	5.7	NA	NA	269.9	NA	2,298.0
1982	1,192.0	146.8	305.3	NA	1,644.1	282.8	( <sup>6</sup> )	312.4	.2	.1	4.8	NA	NA	317.5	NA	2,244.4
1983	1,259.4	144.5	274.1	NA	1,678.0	293.7	( <sup>6</sup> )	335.3	.2	.2	6.1	NA	(s)	341.7	NA	2,313.4
1984	1,341.7	119.8	297.4	NA	1,758.9	327.6	( <sup>6</sup> )	324.3	.5	.4	7.7	(s)	(s)	332.9	NA	2,419.5
1985	1,402.1	100.2	291.9	NA	1,794.3	383.7	( <sup>6</sup> )	284.3	.7	.6	9.3	(s)	(s)	295.0	NA	2,473.0
1986	1,385.8	136.6	248.5	NA	1,770.9	414.0	( <sup>6</sup> )	294.0	.5	.7	10.3	(s)	(s)	305.5	NA	2,490.5
1987	1,463.8	118.5	272.6	NA	1,854.9	455.3	( <sup>6</sup> )	252.9	.8	.7	10.8	(s)	(s)	265.1	NA	2,575.3
1988	1,540.7	148.9	252.8	NA	1,942.4	527.0	( <sup>6</sup> )	226.1	.9	.7	10.3	(s)	(s)	238.1	NA	2,707.4
1989 <sup>11</sup>	1,583.8	164.4	352.6	7.9	2,108.6	529.4	( <sup>6</sup> )	272.0	27.2	9.2	14.6	.3	2.1	325.3	3.8	2,967.1
1990	1,594.0	126.5	372.8	10.4	2,103.6	576.9	-3.5	292.9	32.5	13.2	15.4	.4	2.8	357.2	3.6	3,037.8
1991	1,590.6	119.8	381.6	11.3	2,103.3	612.6	-4.5	289.0	33.7	15.7	16.0	.5	3.0	357.8	4.7	3,073.8
1992	1,621.2	100.2	404.1	13.3	2,138.7	618.8	-4.2	253.1	36.5	17.8	16.1	.4	2.9	326.9	3.7	3,083.9
1993	1,690.1	112.8	414.9	13.0	2,230.7	610.3	-4.0	280.5	37.6	18.3	16.8	.5	3.0	356.7	3.5	3,197.2
1994	1,690.7	105.9	460.2	13.3	2,270.1	640.4	-3.4	260.1	37.9	19.1	15.5	.5	3.4	336.7	3.7	3,247.5
1995	1,709.4	74.6	496.1	13.9	2,293.9	673.4	-2.7	310.8	36.5	20.4	13.4	.5	3.2	384.8	4.1	3,353.5
1996	1,795.2	81.4	455.1	14.4	2,346.0	674.7	-3.1	347.2	36.8	20.9	14.3	.5	3.2	423.0	3.6	3,444.2
1997	1,845.0	92.6	479.4	13.4	2,430.3	628.6	-4.0	356.5	36.9	21.7	14.7	.5	3.3	433.6	3.6	3,492.2
1998	1,873.5	128.8	531.3	13.5	2,547.1	673.7	-4.5	323.3	36.3	22.4	14.8	.5	3.0	400.4	3.6	3,620.3
1999	1,881.1	118.1	556.4	14.1	2,569.7	728.3	-6.1	319.5	37.0	22.6	14.8	.5	4.5	399.0	4.0	3,694.8
2000	1,966.3	111.2	601.0	14.0	2,692.5	753.9	-5.5	275.6	37.6	23.1	14.1	.5	5.6	356.5	4.8	3,802.1
2001	1,904.0	124.9	639.1	9.0	2,677.0	768.8	-8.8	217.0	35.2	14.5	13.7	.5	6.7	287.7	11.9	3,736.6
2002	1,933.1	94.6	691.0	11.5	2,730.2	780.1	-8.7	264.3	38.7	15.0	14.5	.6	10.4	343.4	13.5	3,858.5
2003	1,973.7	119.4	649.9	15.6	2,758.6	763.7	-8.5	275.8	37.5	15.8	14.4	.5	11.2	355.3	14.0	3,883.2
2004	1,978.3	121.1	710.1	15.3	2,824.8	788.5	-8.5	268.4	38.1	15.4	14.8	.6	14.1	351.5	14.2	3,970.6
2005	2,012.9	122.2	761.0	13.5	2,909.5	782.0	-6.6	270.3	38.9	15.4	14.7	.6	17.8	357.7	12.8	4,055.4
2006	1,990.5	64.2	816.4	14.2	2,885.3	787.2	-6.6	289.2	38.8	16.1	14.6	.5	26.6	385.8	13.0	4,064.7
2007	2,016.5	65.7	896.6	13.5	2,992.2	806.4	-6.9	247.5	39.0	16.5	14.6	.6	34.4	352.7	12.2	4,156.7
2008	1,985.8	46.2	883.0	11.7	2,926.7	806.2	-6.3	254.8	37.3	17.7	14.8	.9	55.4	380.9	11.8	4,119.4
2009	1,755.9	38.9	921.0	10.6	2,726.5	798.9	-4.6	273.4	36.1	18.4	15.0	.9	73.9	417.7	11.9	3,950.3
2010	R1,847.3	R37.1	R987.7	R11.3	R2,883.4	807.0	R-5.5	R260.2	R37.2	R18.9	R15.2	R1.2	R94.7	R427.4	R12.9	R4,125.1
2011 <sup>P</sup>	1,734.3	28.2	1,016.6	11.3	2,790.3	790.2	-5.9	325.1	36.9	19.8	16.7	1.8	119.7	520.1	11.1	4,105.7

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.  
<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.  
<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>5</sup> Pumped storage facility production minus energy used for pumping.  
<sup>6</sup> Through 1989, hydroelectric pumped storage is included in "Conventional Hydroelectric Power."  
<sup>7</sup> Wood and wood-derived fuels.  
<sup>8</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>9</sup> Solar thermal and photovoltaic (PV) energy.  
<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived

fuels).  
<sup>11</sup> Through 1988, all data except hydroelectric are for electric utilities only; hydroelectric data through 1988 include industrial plants as well as electric utilities. Beginning in 1989, data are for electric utilities, independent power producers, commercial plants, and industrial plants.  
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.05 billion kilowatthours.  
Notes: • See Note 1, "Coverage of Electricity Statistics," at end of section. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1949. • See <http://www.eia.gov/electricity/> for related information.  
Sources: • 1949-1988—Table 8.2b for electric power sector, and Table 8.1 for industrial sector. • 1989 forward—Tables 8.2b and 8.2d.

**Table 8.2b Electricity Net Generation: Electric Power Sector, Selected Years, 1949-2011**  
(Subset of Table 8.2a; Billion Kilowatthours)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy							Other <sup>10</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power <sup>6</sup>	Biomass		Geo-thermal	Solar/PV <sup>9</sup>	Wind	Total		
									Wood <sup>7</sup>	Waste <sup>8</sup>						
1949	135.5	28.5	37.0	NA	201.0	0.0	( <sup>6</sup> )	89.7	0.4	NA	NA	NA	NA	90.1	NA	291.1
1950	154.5	33.7	44.6	NA	232.8	.0	( <sup>6</sup> )	95.9	.4	NA	NA	NA	NA	96.3	NA	329.1
1955	301.4	37.1	95.3	NA	433.8	.0	( <sup>6</sup> )	113.0	.3	NA	NA	NA	NA	113.3	NA	547.0
1960	403.1	48.0	158.0	NA	609.0	.5	( <sup>6</sup> )	145.8	.1	NA	(s)	NA	NA	146.0	NA	755.5
1965	570.9	64.8	221.6	NA	857.3	3.7	( <sup>6</sup> )	193.9	.3	NA	.2	NA	NA	194.3	NA	1,055.3
1970	704.4	184.2	372.9	NA	1,261.5	21.8	( <sup>6</sup> )	247.7	.1	.2	.5	NA	NA	248.6	NA	1,531.9
1975	852.8	289.1	299.8	NA	1,441.7	172.5	( <sup>6</sup> )	300.0	(s)	.2	3.2	NA	NA	303.5	NA	1,917.6
1976	944.4	320.0	294.6	NA	1,559.0	191.1	( <sup>6</sup> )	283.7	.1	.2	3.6	NA	NA	287.6	NA	2,037.7
1977	985.2	358.2	305.5	NA	1,648.9	250.9	( <sup>6</sup> )	220.5	.3	.2	3.6	NA	NA	224.5	NA	2,124.3
1978	975.7	365.1	305.4	NA	1,646.2	276.4	( <sup>6</sup> )	280.4	.2	.1	3.0	NA	NA	283.7	NA	2,206.3
1979	1,075.0	303.5	329.5	NA	1,708.0	255.2	( <sup>6</sup> )	279.8	.3	.2	3.9	NA	NA	284.2	NA	2,247.4
1980	1,161.6	246.0	346.2	NA	1,753.8	251.1	( <sup>6</sup> )	276.0	.3	.2	5.1	NA	NA	281.5	NA	2,286.4
1981	1,203.2	206.4	345.8	NA	1,755.4	272.7	( <sup>6</sup> )	260.7	.2	.1	5.7	NA	NA	266.7	NA	2,294.8
1982	1,192.0	146.8	305.3	NA	1,644.1	282.8	( <sup>6</sup> )	309.2	.2	.1	4.8	NA	NA	314.4	NA	2,241.2
1983	1,259.4	144.5	274.1	NA	1,678.0	293.7	( <sup>6</sup> )	332.1	.2	.2	6.1	NA	(s)	338.6	NA	2,310.3
1984	1,341.7	119.8	297.4	NA	1,758.9	327.6	( <sup>6</sup> )	321.2	.5	.4	7.7	(s)	(s)	329.8	NA	2,416.3
1985	1,402.1	100.2	291.9	NA	1,794.3	383.7	( <sup>6</sup> )	281.1	.7	.6	9.3	(s)	(s)	291.9	NA	2,469.8
1986	1,385.8	136.6	248.5	NA	1,770.9	414.0	( <sup>6</sup> )	290.8	.5	.7	10.3	(s)	(s)	302.3	NA	2,487.3
1987	1,463.8	118.5	272.6	NA	1,854.9	455.3	( <sup>6</sup> )	249.7	.8	.7	10.8	(s)	(s)	262.0	NA	2,572.1
1988	1,540.7	148.9	252.8	NA	1,942.4	527.0	( <sup>6</sup> )	222.9	.9	.7	10.3	(s)	(s)	234.9	NA	2,704.3
1989 <sup>11</sup>	1,562.4	159.0	297.3	.5	2,019.1	529.4	( <sup>6</sup> )	269.2	5.6	7.7	14.6	.3	2.1	299.5	.3	2,848.2
1990	1,572.1	118.9	309.5	.6	2,001.1	576.9	-3.5	289.8	7.0	11.5	15.4	.4	2.8	326.9	(s)	2,901.3
1991	1,568.8	112.8	317.8	.7	2,000.1	612.6	-4.5	286.0	7.7	13.9	16.0	.5	3.0	327.0	.4	2,935.6
1992	1,597.7	92.2	334.3	1.2	2,025.4	618.8	-4.2	250.0	8.5	15.9	16.1	.4	2.9	293.9	.5	2,934.4
1993	1,665.5	105.4	342.2	1.0	2,114.1	610.3	-4.0	277.5	9.2	16.2	16.8	.5	3.0	323.2	.4	3,043.9
1994	1,666.3	98.7	385.7	1.1	2,151.7	640.4	-3.4	254.0	9.2	17.0	15.5	.5	3.4	299.7	.2	3,088.7
1995	1,686.1	68.1	419.2	1.9	2,175.3	673.4	-2.7	305.4	7.6	18.0	13.4	.5	3.2	348.0	.2	3,194.2
1996	1,772.0	74.8	378.8	1.3	2,226.9	674.7	-3.1	341.2	8.4	17.8	14.3	.5	3.2	385.4	.2	3,284.1
1997	1,820.8	86.5	399.6	1.5	2,308.4	628.6	-4.0	350.6	8.7	18.5	14.7	.5	3.3	396.3	.1	3,329.4
1998	1,850.2	122.2	449.3	2.3	2,424.0	673.7	-4.5	317.9	8.6	19.2	14.8	.5	3.0	364.0	.2	3,457.4
1999	1,858.6	111.5	473.0	1.6	2,444.8	728.3	-6.1	314.7	9.0	19.5	14.8	.5	4.5	362.9	.1	3,530.0
2000	1,943.1	105.2	518.0	2.0	2,568.3	753.9	-5.5	271.3	8.9	20.3	14.1	.5	5.6	320.7	.1	3,637.5
2001	1,882.8	119.1	554.9	.6	2,557.5	768.8	-8.8	213.7	8.3	12.9	13.7	.5	6.7	256.0	6.5	3,580.1
2002	1,910.6	89.7	607.7	2.0	2,610.0	780.1	-8.7	260.5	9.0	13.1	14.5	.6	10.4	308.0	9.1	3,698.5
2003	1,952.7	113.7	567.3	2.6	2,636.4	763.7	-8.5	271.5	9.5	13.8	14.4	.5	11.2	321.0	8.6	3,721.2
2004	1,957.2	114.7	627.2	3.6	2,702.6	788.5	-8.5	265.1	9.7	13.1	14.8	.6	14.1	317.4	8.3	3,808.4
2005	1,992.1	116.5	683.8	3.8	2,796.1	782.0	-6.6	267.0	10.6	13.0	14.7	.6	17.8	323.7	6.9	3,902.2
2006	1,969.7	59.7	734.4	4.3	2,768.1	787.2	-6.6	286.3	10.3	13.9	14.6	.5	26.6	352.2	7.1	3,908.1
2007	1,998.4	61.3	814.8	4.0	2,878.5	806.4	-6.9	245.8	10.7	14.3	14.6	.6	34.4	320.5	6.8	4,005.3
2008	1,968.8	42.9	802.4	3.2	2,817.3	806.2	-6.3	253.1	10.6	15.4	14.8	.9	55.4	350.2	7.0	3,974.3
2009	1,741.1	35.8	841.0	3.1	2,621.0	798.9	-4.6	271.5	10.7	16.0	15.0	.9	73.9	388.0	6.6	3,809.8
2010	<sup>R</sup> 1,827.7	<sup>R</sup> 34.7	<sup>R</sup> 901.4	<sup>R</sup> 3.0	<sup>R</sup> 2,766.8	807.0	<sup>R</sup> -5.5	<sup>R</sup> 258.5	<sup>R</sup> 11.4	<sup>R</sup> 16.4	<sup>R</sup> 15.2	<sup>R</sup> 1.2	94.6	<sup>R</sup> 397.3	<sup>R</sup> 6.8	<sup>R</sup> 3,972.4
2011 <sup>P</sup>	1,714.9	26.2	930.6	3.1	2,674.8	790.2	-5.9	323.1	10.5	17.2	16.7	1.8	119.7	489.0	6.9	3,955.1

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.  
<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.  
<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>5</sup> Pumped storage facility production minus energy used for pumping.  
<sup>6</sup> Through 1989, hydroelectric pumped storage is included in "Conventional Hydroelectric Power."  
<sup>7</sup> Wood and wood-derived fuels.  
<sup>8</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>9</sup> Solar thermal and photovoltaic (PV) energy.  
<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>11</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities and independent power producers.  
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.05 billion kilowatthours.

Notes: • The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. • See Table 8.2d for commercial and industrial CHP and electricity-only data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1949. • See <http://www.eia.gov/electricity/> for related information.  
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982-1988—U.S. Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." • 1989-1997—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Table 8.2c Electricity Net Generation: Electric Power Sector by Plant Type, Selected Years, 1989-2011**  
(Breakout of Table 8.2b; Billion Kilowatthours)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy							Other <sup>10</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power <sup>6</sup>	Biomass		Geo-thermal	Solar/PV <sup>9</sup>	Wind	Total		
									Wood <sup>7</sup>	Waste <sup>8</sup>						
<b>Electricity-Only Plants<sup>11</sup></b>																
1989	1,554.0	158.3	266.9	—	1,979.3	529.4	( <sup>6</sup> )	269.2	4.2	6.9	14.6	0.3	2.1	297.3	—	2,805.9
1990	1,560.2	117.6	264.7	(s)	1,942.4	576.9	-3.5	289.8	5.6	10.4	15.4	.4	2.8	324.3	—	2,840.0
1995	1,658.0	62.0	317.4	(s)	2,037.4	673.4	-2.7	305.4	5.9	16.3	13.4	.5	3.2	344.7	—	3,052.8
1996	1,742.8	68.5	272.8	(s)	2,084.1	674.7	-3.1	341.2	6.5	16.1	14.3	.5	3.2	381.8	—	3,137.6
1997	1,793.2	80.3	291.1	(s)	2,164.6	628.6	-4.0	350.6	6.5	16.4	14.7	.5	3.3	392.0	—	3,181.3
1998	1,823.0	115.7	335.9	.1	2,274.6	673.7	-4.5	317.9	6.6	17.0	14.8	.5	3.0	359.8	—	3,303.6
1999	1,832.1	104.8	356.6	(s)	2,293.6	728.3	-6.1	314.7	7.3	17.1	14.8	.5	4.5	358.8	—	3,374.6
2000	1,910.6	98.0	399.4	.2	2,408.2	753.9	-5.5	271.3	7.3	17.6	14.1	.5	5.6	316.4	—	3,472.9
2001	1,851.8	113.2	427.0	(s)	2,392.0	768.8	-8.8	213.7	6.6	11.3	13.7	.5	6.7	252.6	5.9	3,410.5
2002	1,881.2	83.3	456.8	.2	2,421.5	780.1	-8.7	260.5	7.3	11.2	14.5	.6	10.4	304.3	7.6	3,504.8
2003	1,915.8	108.5	421.2	.3	2,445.7	763.7	-8.5	271.5	7.4	11.9	14.4	.5	11.2	317.0	7.6	3,525.5
2004	1,921.1	109.4	491.2	.4	2,522.0	788.5	-8.5	265.1	8.1	11.8	14.8	.6	14.1	314.5	7.6	3,624.1
2005	1,955.5	111.2	553.2	(s)	2,619.9	782.0	-6.6	267.0	8.5	11.7	14.7	.6	17.8	320.3	6.2	3,721.8
2006	1,933.7	55.2	618.0	(s)	2,607.0	787.2	-6.6	286.2	8.3	12.5	14.6	.5	26.6	348.7	6.3	3,742.7
2007	1,962.0	56.9	686.3	.1	2,705.3	806.4	-6.9	245.8	8.7	12.9	14.6	.6	34.4	317.1	6.0	3,828.0
2008	1,932.0	39.3	683.3	(s)	2,654.6	806.2	-6.3	253.1	8.6	14.0	14.8	.9	55.4	346.8	6.2	3,807.4
2009	1,711.9	31.9	722.7	.1	2,466.6	798.9	-4.6	271.5	8.5	14.3	15.0	.9	73.9	384.0	5.8	3,650.7
2010	R <sup>1</sup> 1,797.5	R <sup>2</sup> 32.4	R <sup>3</sup> 779.4	.1	R <sup>4</sup> 2,609.3	807.0	R <sup>5</sup> -5.5	R <sup>6</sup> 258.5	R <sup>7</sup> 8.5	R <sup>8</sup> 14.7	R <sup>9</sup> 15.2	R <sup>10</sup> 1.2	R <sup>11</sup> 94.6	R <sup>12</sup> 393.6	6.0	R <sup>13</sup> 3,810.3
2011 <sup>P</sup>	1,687.9	24.1	809.2	(s)	2,521.2	790.2	-5.9	323.1	8.5	15.5	16.7	1.8	119.7	485.3	6.1	3,796.9
<b>Combined-Heat-and-Power Plants<sup>12</sup></b>																
1989	8.4	0.7	30.4	0.5	39.9	—	—	—	1.3	0.9	—	—	—	2.2	0.3	42.3
1990	11.9	1.3	44.8	.6	58.7	—	—	—	1.4	1.1	—	—	—	2.6	(s)	61.3
1995	28.1	6.1	101.7	1.9	137.9	—	—	—	1.7	1.7	—	—	—	3.4	.2	141.5
1996	29.2	6.3	105.9	1.3	142.7	—	—	—	1.9	1.7	—	—	—	3.6	.2	146.6
1997	27.6	6.2	108.5	1.5	143.7	—	—	—	2.2	2.1	—	—	—	4.3	.1	148.1
1998	27.2	6.6	113.4	2.3	149.4	—	—	—	2.0	2.3	—	—	—	4.2	.2	153.8
1999	26.6	6.7	116.4	1.6	151.2	—	—	—	1.7	2.4	—	—	—	4.1	.1	155.4
2000	32.5	7.2	118.6	1.8	160.2	—	—	—	1.6	2.7	—	—	—	4.3	.1	164.6
2001	31.0	6.0	128.0	.6	165.5	—	—	—	1.7	1.7	—	—	—	3.4	.6	169.5
2002	29.4	6.5	150.9	1.7	188.5	—	—	—	1.7	2.0	—	—	—	3.7	1.4	193.7
2003	36.9	5.2	146.1	2.4	190.6	—	—	—	2.1	1.9	—	—	—	4.0	1.1	195.7
2004	36.1	5.3	136.0	3.2	180.6	—	—	—	1.6	1.3	—	—	—	2.9	.7	184.3
2005	36.5	5.3	130.7	3.8	176.2	—	—	(s)	2.1	1.3	—	—	—	3.4	.7	180.4
2006	36.0	4.5	116.4	4.2	161.1	—	—	(s)	2.0	1.4	—	—	—	3.5	.8	165.4
2007	36.4	4.4	128.4	3.9	173.2	—	—	(s)	2.0	1.4	—	—	—	3.5	.7	177.4
2008	36.9	3.6	119.0	3.2	162.7	—	—	(s)	2.0	1.4	—	—	—	3.4	.8	166.9
2009	29.2	3.9	118.3	3.0	154.4	—	—	(s)	2.3	1.7	—	—	—	3.9	.8	159.1
2010	R <sup>1</sup> 30.3	R <sup>2</sup> 3.3	R <sup>3</sup> 122.0	R <sup>4</sup> 2.9	R <sup>5</sup> 157.5	—	—	R <sup>6</sup> —	R <sup>7</sup> 2.1	R <sup>8</sup> 1.6	—	—	—	R <sup>9</sup> 3.8	R <sup>10</sup> .8	R <sup>11</sup> 162.0
2011 <sup>P</sup>	26.9	2.1	121.4	3.1	153.6	—	—	—	2.0	1.7	—	—	—	3.7	.9	158.1

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Pumped storage facility production minus energy used for pumping.

<sup>6</sup> Through 1989, hydroelectric pumped storage is included in "Conventional Hydroelectric Power."

<sup>7</sup> Wood and wood-derived fuels.

<sup>8</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>9</sup> Solar thermal and photovoltaic (PV) energy.

<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>11</sup> Electricity-only plants within the NAICS 22 category whose primary business is to sell electricity to the public. Data also include a small number of electric utility combined-heat-and-power (CHP) plants.

<sup>12</sup> Combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity and heat to the public. Data do not include electric utility CHP plants—these are included under "Electricity-Only Plants."

R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.05 billion kilowatthours.

Notes: • See Table 8.2d for commercial and industrial CHP and electricity-only data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1989. • For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report," and Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Table 8.2d Electricity Net Generation: Commercial and Industrial Sectors, Selected Years, 1989-2011**

(Subset of Table 8.2a; Billion Kilowatthours)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage <sup>5</sup>	Renewable Energy						Other <sup>9</sup>	Total	
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power	Biomass		Geo-thermal	Solar/PV <sup>8</sup>	Wind			Total
									Wood <sup>6</sup>	Waste <sup>7</sup>						
<b>Commercial Sector<sup>10</sup></b>																
1989	0.7	0.6	2.2	0.1	3.6	—	—	0.1	0.1	0.5	—	—	—	0.7	—	4.3
1990	.8	.6	3.3	.1	4.8	—	—	.1	.1	.8	—	—	—	1.1	—	5.8
1995	1.0	.4	5.2	—	6.5	—	—	.1	.1	1.5	—	—	—	1.7	(s)	8.2
1996	1.1	.4	5.2	(s)	6.7	—	—	.1	.1	2.2	—	—	—	2.4	(s)	9.0
1997	1.0	.4	4.7	(s)	6.2	—	—	.1	(s)	2.3	—	—	—	2.5	(s)	8.7
1998	1.0	.4	4.9	(s)	6.3	—	—	.1	(s)	2.3	—	—	—	2.5	—	8.7
1999	1.0	.4	4.6	(s)	6.0	—	—	.1	(s)	2.4	—	—	—	2.5	(s)	8.6
2000	1.1	.4	4.3	(s)	5.8	—	—	.1	(s)	2.0	—	—	—	2.1	(s)	7.9
2001	1.0	.4	4.4	(s)	5.9	—	—	.1	(s)	1.0	—	—	—	1.1	.5	7.4
2002	1.0	.4	4.3	(s)	5.7	—	—	(s)	(s)	1.1	—	—	—	1.1	.6	7.4
2003	1.2	.4	3.9	—	5.5	—	—	.1	(s)	1.3	—	—	—	1.4	.6	7.5
2004	1.3	.5	4.0	—	5.8	—	—	.1	(s)	1.6	—	—	—	1.7	.8	8.3
2005	1.4	.4	4.2	—	6.0	—	—	.1	(s)	1.7	—	—	—	1.8	.8	8.5
2006	1.3	.2	4.4	(s)	5.9	—	—	.1	(s)	1.6	—	—	—	1.7	.8	8.4
2007	1.4	.2	4.3	—	5.8	—	—	.1	(s)	1.6	—	—	—	1.7	.8	8.3
2008	1.3	.1	4.2	—	5.6	—	—	.1	(s)	1.5	—	(s)	—	1.6	.7	7.9
2009	1.1	.2	4.2	—	5.5	—	—	.1	(s)	1.7	—	(s)	(s)	1.8	.8	8.2
2010	1.1	.1	R4.7	R(s)	R6.0	—	—	.1	(s)	1.7	—	(s)	(s)	1.8	.8	R8.6
2011 <sup>P</sup>	1.0	.1	4.5	(s)	5.6	—	—	.1	(s)	1.7	—	(s)	(s)	1.9	.9	8.4
<b>Industrial Sector<sup>11</sup></b>																
1989	20.7	4.8	53.2	7.3	85.9	—	—	2.7	21.6	0.9	—	—	—	25.2	3.5	114.7
1990	21.1	7.0	60.0	9.6	97.8	—	—	3.0	25.4	.9	—	—	—	29.3	3.6	130.7
1995	22.4	6.0	71.7	11.9	112.1	—	—	5.3	28.9	.9	—	—	—	35.1	3.9	151.0
1996	22.2	6.3	71.0	13.0	112.5	—	—	5.9	28.4	.9	—	—	—	35.2	3.4	151.0
1997	23.2	5.6	75.1	11.8	115.8	—	—	5.7	28.2	.9	—	—	—	34.8	3.5	154.1
1998	22.3	6.2	77.1	11.2	116.8	—	—	5.3	27.7	.9	—	—	—	33.9	3.4	154.1
1999	21.5	6.1	78.8	12.5	118.9	—	—	4.8	28.1	.7	—	—	—	33.5	3.9	156.3
2000	22.1	5.6	78.8	11.9	118.4	—	—	4.1	28.7	.8	—	—	—	33.6	4.7	156.7
2001	20.1	5.3	79.8	8.5	113.6	—	—	3.1	26.9	.6	—	—	—	30.6	4.9	149.2
2002	21.5	4.4	79.0	9.5	114.4	—	—	3.8	29.6	.8	—	—	—	34.3	3.8	152.6
2003	19.8	5.3	78.7	13.0	116.8	—	—	4.2	28.0	.7	—	—	—	32.9	4.8	154.5
2004	19.8	6.0	79.0	11.7	116.4	—	—	3.2	28.4	.8	—	—	—	32.4	5.1	153.9
2005	19.5	5.4	72.9	9.7	107.4	—	—	3.2	28.3	.7	—	—	—	32.2	5.1	144.7
2006	19.5	4.2	77.7	9.9	111.3	—	—	2.9	28.4	.6	—	—	—	31.9	5.1	148.3
2007	16.7	4.2	77.6	9.4	107.9	—	—	1.6	28.3	.6	—	—	—	30.5	4.7	143.1
2008	15.7	3.2	76.4	8.5	103.9	—	—	1.7	26.6	.8	—	—	—	29.1	4.1	137.1
2009	13.7	3.0	75.7	7.6	100.0	—	—	1.9	25.3	.7	—	—	—	27.9	4.5	132.3
2010	18.4	R2.3	R81.6	R8.3	R110.6	—	—	R1.7	R25.7	R.9	—	(s)	—	R28.2	R5.2	R144.1
2011 <sup>P</sup>	18.4	1.8	81.5	8.1	109.9	—	—	1.8	26.4	.9	—	(s)	(s)	29.1	3.3	142.3

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Pumped storage facility production minus energy used for pumping.

<sup>6</sup> Wood and wood-derived fuels.

<sup>7</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>8</sup> Solar thermal and photovoltaic (PV) energy.

<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>11</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.05 billion kilowatthours.

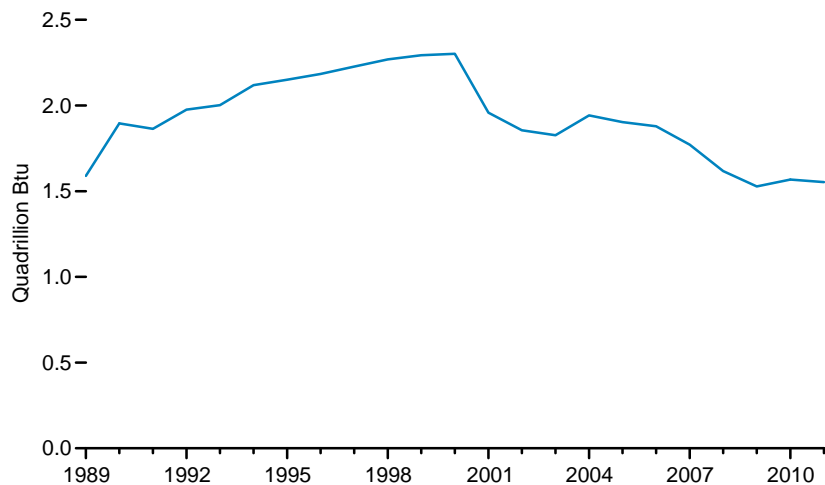
Notes: • See Tables 8.2b and 8.2c for electric power sector electricity-only and CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1989. • See <http://www.eia.gov/electricity/> for related information.

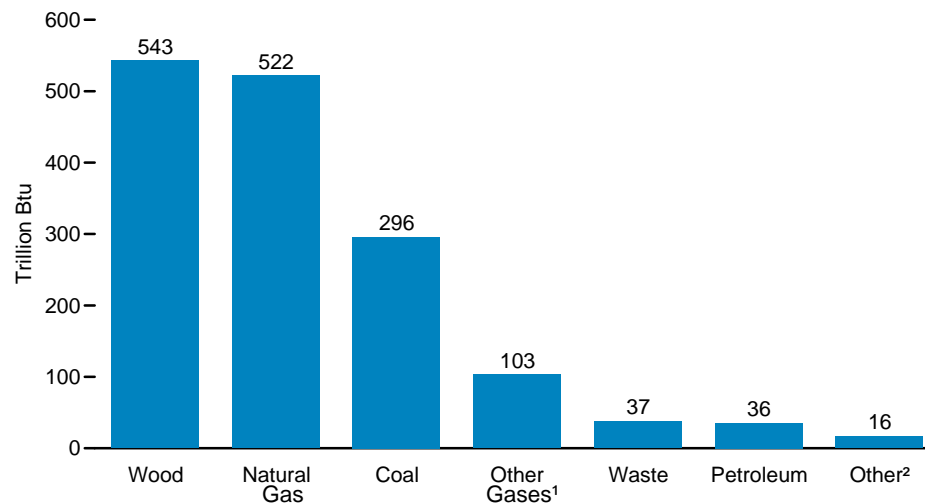
Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Figure 8.3 Useful Thermal Output at Combined-Heat-and-Power Plants**

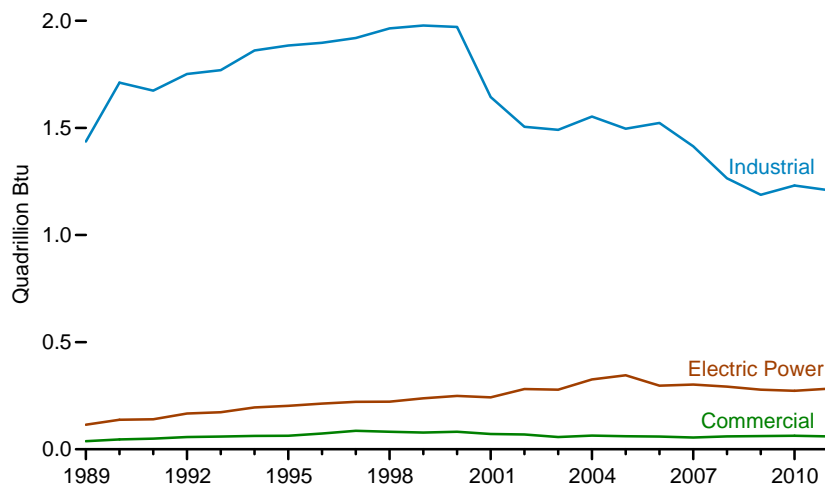
**Total (All Sectors), 1989-2011**



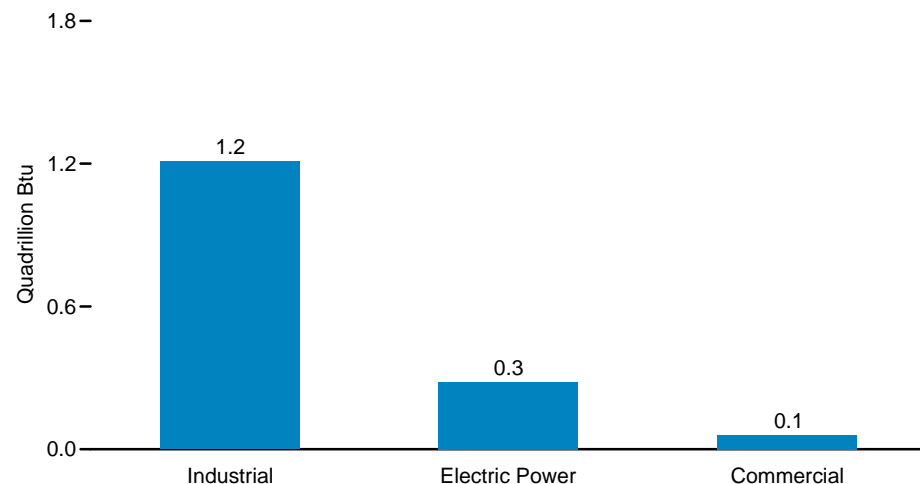
**Total (All Sectors) by Source, 2011**



**By Sector, 1989-2011**



**By Sector, 2011**



<sup>1</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>2</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

Sources: Tables 8.3a–8.3c.



**Table 8.3a Useful Thermal Output at Combined-Heat-and-Power Plants: Total (All Sectors), 1989-2011**

(Sum of Tables 8.3b and 8.3c; Trillion Btu)

Year	Fossil Fuels					Renewable Energy			Other <sup>7</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total	Biomass		Total		
						Wood <sup>5</sup>	Waste <sup>6</sup>			
1989	323	96	462	93	973	546	30	577	39	1,589
1990	363	127	538	141	1,168	651	36	687	40	1,896
1991	352	112	547	148	1,159	623	37	660	44	1,863
1992	367	117	592	160	1,236	658	40	698	42	1,976
1993	373	129	604	142	1,248	668	45	713	41	2,002
1994	388	133	646	144	1,309	722	45	767	42	2,119
1995	386	121	686	145	1,338	721	47	768	44	2,151
1996	392	133	711	150	1,385	701	55	756	43	2,184
1997	389	137	713	150	1,389	731	55	785	53	2,227
1998	382	136	782	167	1,466	700	57	757	46	2,269
1999	386	125	811	179	1,501	690	55	744	48	2,294
2000	384	108	812	184	1,488	707	56	764	50	2,302
2001	354	90	741	133	1,318	557	28	585	55	1,958
2002	337	73	709	118	1,236	546	26	572	48	1,856
2003	333	85	610	110	1,139	597	35	632	55	1,826
2004	352	97	654	126	1,230	637	30	667	45	1,943
2005	342	92	624	138	1,197	628	36	665	41	1,903
2006	333	78	603	126	1,140	653	37	690	49	1,879
2007	327	76	554	116	1,074	616	35	651	47	1,772
2008	315	48	509	111	983	572	38	610	24	1,617
2009	282	53	513	100	947	509	38	547	33	1,527
2010	<sup>R</sup> 300	<sup>R</sup> 41	<sup>R</sup> 524	<sup>R</sup> 91	<sup>R</sup> 958	<sup>R</sup> 542	<sup>R</sup> 40	<sup>R</sup> 581	<sup>R</sup> 29	<sup>R</sup> 1,568
2011 <sup>P</sup>	296	36	522	103	956	543	37	580	16	1,553

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood and wood-derived fuels.

<sup>6</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>7</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and,

beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

R=Revised. P=Preliminary.

Notes: • Data do not include electric utility combined-heat-and-power (CHP) plants. • See Note 1, "Coverage of Electricity Statistics," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: Tables 8.3b and 8.3c.

**Table 8.3b Useful Thermal Output at Combined-Heat-and-Power Plants: Electric Power Sector, 1989-2011**  
(Subset of Table 8.3a; Trillion Btu)

Year	Fossil Fuels					Renewable Energy			Other <sup>7</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total	Biomass		Total		
						Wood <sup>5</sup>	Waste <sup>6</sup>			
1989	13	8	67	2	90	19	5	24	1	114
1990	21	9	80	4	114	18	6	25	(s)	138
1991	21	6	82	4	113	17	9	26	1	140
1992	28	6	102	5	140	17	8	25	2	167
1993	30	8	107	3	147	16	8	24	1	173
1994	37	9	119	5	170	15	10	24	1	195
1995	40	13	118	4	176	15	12	27	(s)	203
1996	43	12	121	4	180	16	16	33	(s)	213
1997	39	12	132	8	191	16	14	30	(s)	221
1998	43	6	142	5	196	10	16	26	(s)	222
1999	52	7	146	4	208	10	20	30	(s)	238
2000	53	7	158	5	223	6	19	26	(s)	249
2001	52	6	164	5	226	8	4	13	3	243
2002	40	4	214	6	264	8	5	13	5	281
2003	38	7	200	9	255	9	11	20	3	278
2004	39	8	239	18	305	9	9	17	4	326
2005	40	8	239	37	323	10	8	18	4	346
2006	38	7	207	23	275	10	7	17	4	297
2007	38	7	213	20	279	11	8	19	4	302
2008	37	7	204	22	270	9	8	17	5	292
2009	38	7	191	20	256	9	8	18	5	278
2010	<sup>R</sup> 38	6	<sup>R</sup> 187	<sup>R</sup> 20	<sup>R</sup> 251	<sup>R</sup> 10	8	<sup>R</sup> 18	5	<sup>R</sup> 273
2011 <sup>P</sup>	37	6	197	22	262	9	7	16	6	283

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood and wood-derived fuels.

<sup>6</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>7</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

R=Revised. P=Preliminary. (s)=Less than 0.5 trillion Btu.

Notes: • Data are for combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity and heat to the public. Data do not include electric utility CHP plants.

• See Table 8.3c for commercial and industrial CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Table 8.3c Useful Thermal Output at Combined-Heat-and-Power Plants: Commercial and Industrial Sectors, Selected Years, 1989-2011** (Subset of Table 8.3a; Trillion Btu)

Year	Fossil Fuels					Renewable Energy			Other <sup>7</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total	Biomass		Total		
						Wood <sup>5</sup>	Waste <sup>6</sup>			
<b>Commercial Sector <sup>8</sup></b>										
1989	14	4	10	(s)	27	(s)	10	10	—	38
1990	15	5	16	(s)	36	(s)	10	11	—	46
1995	17	3	29	—	48	(s)	15	15	(s)	63
1996	20	3	33	R —	55	1	17	18	—	73
1997	22	4	40	(s)	66	1	19	20	—	86
1998	20	5	39	(s)	64	1	18	18	—	82
1999	20	3	37	R —	61	1	17	17	—	78
2000	21	4	39	R —	64	1	17	18	—	82
2001	18	4	35	—	58	1	8	8	6	72
2002	18	3	36	—	57	1	6	7	5	69
2003	23	3	17	—	42	1	8	8	6	57
2004	22	4	22	—	49	(s)	8	9	6	64
2005	23	4	20	—	47	(s)	8	9	6	61
2006	22	2	19	(s)	44	(s)	9	9	6	59
2007	23	2	20	—	44	1	6	7	4	55
2008	23	2	20	—	45	(s)	9	9	6	60
2009	20	1	26	—	47	(s)	8	8	6	61
2010	R19	1	R30	R(s)	R50	(s)	R8	8	5	R63
2011 <sup>P</sup>	17	1	28	(s)	46	(s)	8	8	6	60
<b>Industrial Sector <sup>9</sup></b>										
1989	297	84	385	90	856	527	15	542	38	1,437
1990	327	113	443	137	1,019	632	20	652	40	1,711
1995	329	105	540	140	1,114	706	20	726	44	1,884
1996	329	118	557	146	1,150	684	21	705	43	1,897
1997	328	121	541	142	1,132	713	22	735	53	1,920
1998	318	124	601	162	1,206	689	24	713	46	1,965
1999	313	115	629	175	1,233	679	18	697	48	1,978
2000	309	98	615	179	1,201	700	20	720	50	1,971
2001	284	80	542	128	1,034	548	16	564	46	1,644
2002	278	66	458	112	914	537	15	552	39	1,505
2003	272	75	393	101	842	588	16	604	46	1,491
2004	290	85	393	108	876	628	13	641	35	1,553
2005	280	81	364	102	827	618	20	638	32	1,496
2006	272	69	377	103	821	642	21	663	39	1,523
2007	266	67	322	96	751	605	21	625	38	1,414
2008	255	39	285	89	668	563	21	584	13	1,265
2009	223	45	296	80	644	500	21	521	22	1,188
2010	R243	R34	R308	R72	R657	R531	R24	R556	R18	R1,231
2011 <sup>P</sup>	241	29	297	81	648	533	23	557	5	1,209

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood and wood-derived fuels.

<sup>6</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>7</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>8</sup> Commercial combined-heat-and-power (CHP) plants.

<sup>9</sup> Industrial combined-heat-and-power (CHP) plants.

R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.5 trillion Btu.

Notes: • See Table 8.3b for electric power sector CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

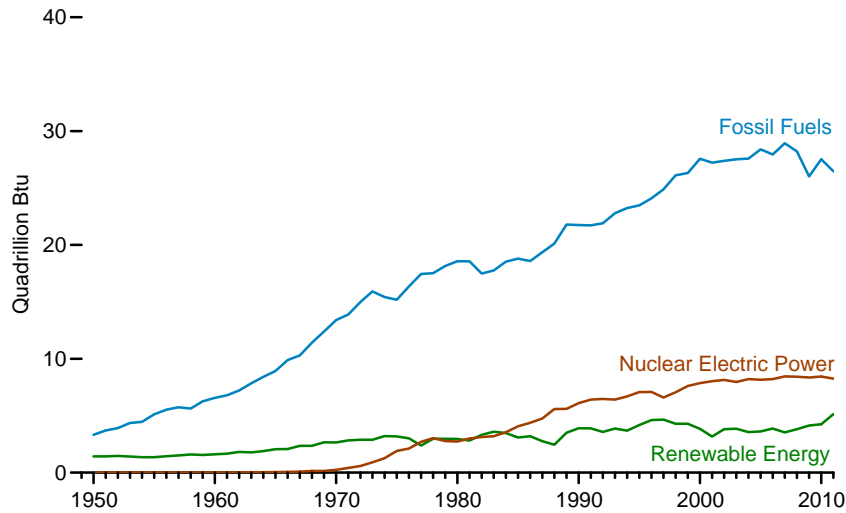
Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1989.

• For related information, see <http://www.eia.gov/electricity/>.

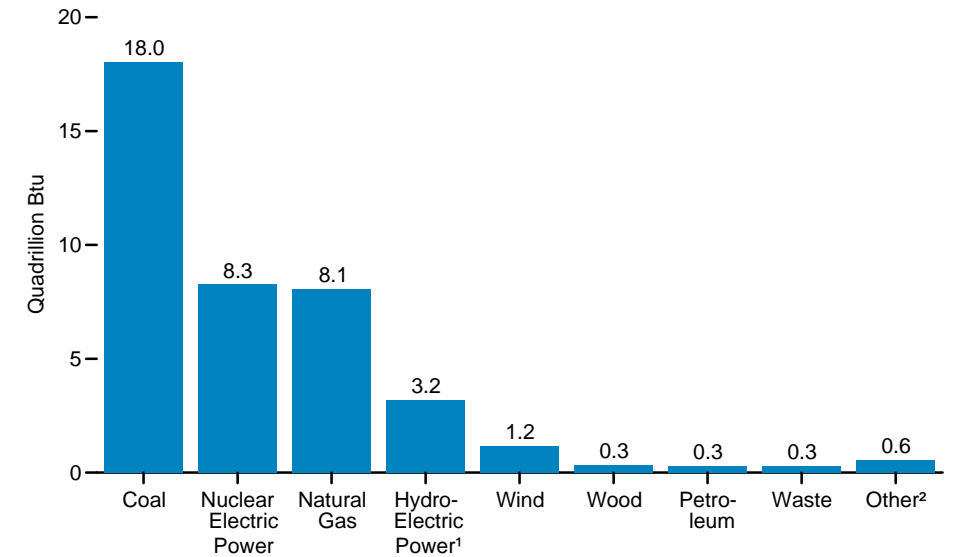
Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Figure 8.4 Consumption for Electricity Generation**

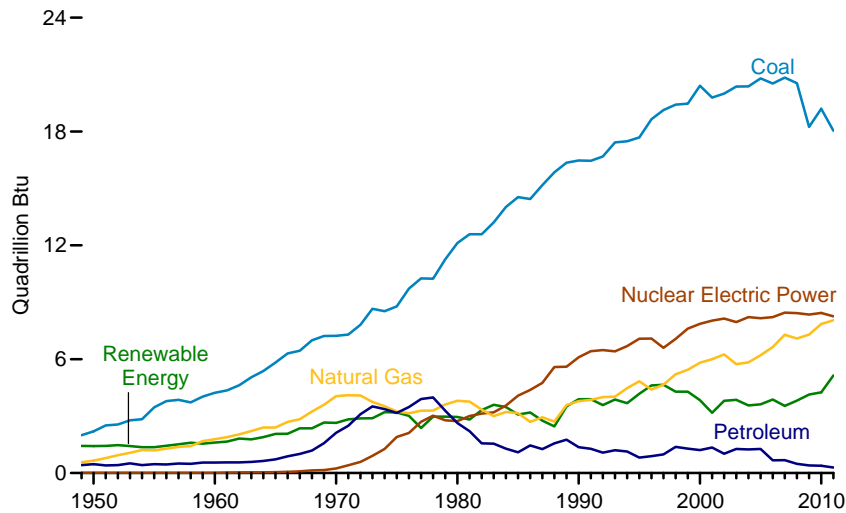
**By Major Category, 1949-2011**



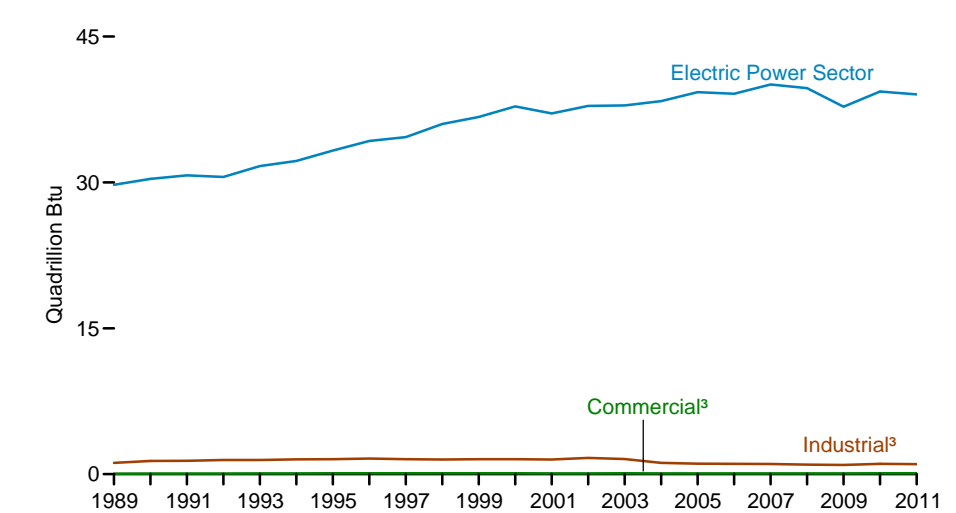
**By Major Fuel, 2011**



**By Major Source, 1949-2011**



**By Sector, 1989-2011**



<sup>1</sup> Conventional hydroelectric power.

<sup>2</sup> Geothermal, other gases, electricity net imports, solar thermal and photovoltaic energy, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies,

and non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>3</sup> Combined-heat-and-power plants and a small number of electricity-only plants.

Sources: Tables 8.4a-8.4c.

**Table 8.4a Consumption for Electricity Generation by Energy Source: Total (All Sectors), Selected Years, 1949-2011**  
(Sum of Tables 8.4b and 8.4c; Trillion Btu)

Year	Fossil Fuels					Nuclear Electric Power <sup>5</sup>	Renewable Energy							Other <sup>9</sup>	Electricity Net Imports <sup>10</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total		Conventional Hydroelectric Power <sup>5</sup>	Biomass		Geo-thermal <sup>5</sup>	Solar/PV <sup>5,8</sup>	Wind <sup>5</sup>	Total			
								Wood <sup>6</sup>	Waste <sup>7</sup>							
1949	1,995	415	569	NA	2,979	0	1,425	6	NA	NA	NA	NA	1,431	NA	5	4,415
1950	2,199	472	651	NA	3,322	0	1,415	5	NA	NA	NA	NA	1,421	NA	6	4,749
1955	3,458	471	1,194	NA	5,123	0	1,360	3	NA	NA	NA	NA	1,363	NA	14	6,500
1960	4,228	553	1,785	NA	6,565	6	1,608	2	NA	(s)	NA	NA	1,610	NA	15	8,197
1965	5,821	722	2,395	NA	8,938	43	2,059	3	NA	2	NA	NA	2,064	NA	(s)	11,045
1970	7,227	2,117	4,054	NA	13,399	239	2,634	1	2	6	NA	NA	2,643	NA	7	16,287
1975	8,786	3,166	3,240	NA	15,191	1,900	3,155	(s)	2	34	NA	NA	3,190	NA	21	20,303
1976	9,720	3,477	3,152	NA	16,349	2,111	2,976	1	2	38	NA	NA	3,017	NA	29	21,506
1977	10,262	3,901	3,284	NA	17,446	2,702	2,333	3	2	37	NA	NA	2,376	NA	59	22,583
1978	10,238	3,987	3,297	NA	17,522	3,024	2,937	2	1	31	NA	NA	2,971	NA	67	23,585
1979	11,260	3,283	3,613	NA	18,156	2,776	2,931	3	2	40	NA	NA	2,976	NA	69	23,977
1980	12,123	2,634	3,810	NA	18,567	2,739	2,900	3	2	53	NA	NA	2,957	NA	71	24,335
1981	12,583	2,202	3,768	NA	18,553	3,008	2,758	3	1	59	NA	NA	2,821	NA	113	24,495
1982	12,582	1,568	3,342	NA	17,491	3,131	3,266	2	1	51	NA	NA	3,320	NA	100	24,042
1983	13,213	1,544	2,998	NA	17,754	3,203	3,527	2	2	64	NA	(s)	3,595	NA	121	24,673
1984	14,019	1,286	3,220	NA	18,526	3,553	3,386	5	4	81	(s)	(s)	3,476	NA	135	25,690
1985	14,542	1,090	3,160	NA	18,792	4,076	2,970	8	7	97	(s)	(s)	3,082	NA	140	26,090
1986	14,444	1,452	2,691	NA	18,586	4,380	3,071	5	7	108	(s)	(s)	3,191	NA	122	26,280
1987	15,173	1,257	2,935	NA	19,365	4,754	2,635	8	7	112	(s)	(s)	2,762	NA	158	27,040
1988	15,850	1,563	2,709	NA	20,123	5,587	2,334	10	8	106	(s)	(s)	2,458	NA	108	28,276
1989	<sup>11</sup> 16,359	<sup>11</sup> 1,756	<sup>11</sup> 3,582	90	<sup>11</sup> 21,788	<sup>11</sup> 5,602	<sup>12</sup> 2,837	<sup>11</sup> 345	<sup>11</sup> 151	<sup>11</sup> 152	<sup>11</sup> 3	<sup>11</sup> 22	<sup>11</sup> 3,510	39	37	30,976
1990	16,477	1,366	3,791	112	21,746	6,104	3,046	442	211	161	4	29	3,893	36	8	31,788
1991	16,460	1,276	3,861	125	21,723	6,422	3,016	425	247	167	5	31	3,889	59	67	32,160
1992	16,686	1,076	3,999	141	21,903	6,479	2,617	481	283	167	4	30	3,582	40	87	32,091
1993	17,424	1,203	4,027	136	22,790	6,410	2,892	485	288	173	5	31	3,874	34	95	33,203
1994	17,485	1,135	4,476	136	23,233	6,694	2,683	498	301	160	5	36	3,683	40	153	33,803
1995	17,687	813	4,840	133	23,473	7,075	3,205	480	316	138	5	33	4,177	42	134	34,901
1996	18,650	888	4,400	159	24,097	7,087	3,590	513	324	148	5	33	4,613	37	137	35,971
1997	19,128	985	4,658	119	24,890	6,597	3,640	484	339	150	5	34	4,653	36	116	36,293
1998	19,417	1,378	5,205	125	26,124	7,068	3,297	475	332	151	5	31	4,290	36	88	37,607
1999	19,467	1,285	5,441	126	26,320	7,610	3,268	490	332	152	5	46	4,292	41	99	38,362
2000	20,411	1,212	5,818	126	27,567	7,862	2,811	496	330	144	5	57	3,843	46	115	39,433
2001	19,789	1,347	6,001	97	27,235	8,029	2,242	486	228	142	6	70	3,173	160	75	38,672
2002	19,997	1,014	6,250	131	27,392	8,145	2,689	605	257	147	6	105	3,809	191	72	39,610
2003	20,367	1,266	5,736	156	27,525	7,959	2,825	519	249	148	5	115	3,860	193	22	39,559
2004	20,376	1,248	5,827	135	27,586	8,222	2,690	344	230	148	6	142	3,560	183	39	39,591
2005	20,802	1,269	6,212	110	28,393	8,161	2,703	355	230	147	6	178	3,619	173	85	40,430
2006	20,527	668	6,644	115	27,954	8,215	2,869	350	241	145	5	264	3,873	162	63	40,268
2007	20,842	683	7,288	115	28,927	8,455	2,446	353	245	145	6	341	3,536	168	107	41,193
2008	20,549	485	7,087	97	28,218	8,427	2,511	339	267	146	9	546	3,817	172	112	40,747
2009	18,241	403	7,302	84	26,029	8,356	2,669	320	272	146	9	721	4,137	170	116	38,808
2010	<sup>R</sup> 19,196	<sup>R</sup> 386	<sup>R</sup> 7,853	<sup>R</sup> 90	<sup>R</sup> 27,525	<sup>R</sup> 8,434	<sup>R</sup> 2,539	<sup>R</sup> 350	<sup>R</sup> 281	<sup>R</sup> 148	<sup>R</sup> 12	<sup>R</sup> 923	<sup>R</sup> 4,253	<sup>R</sup> 184	<sup>R</sup> 89	<sup>R</sup> 40,485
2011 <sup>P</sup>	18,044	291	8,051	91	26,477	8,259	3,171	333	287	163		1,168	5,140	162	127	40,166

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Values are converted from kilowatt-hours to Btu using the approximate heat rates in Table A6.

<sup>6</sup> Wood and wood-derived fuels.

<sup>7</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>8</sup> Solar thermal and photovoltaic (PV) energy.

<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Net imports equal imports minus exports. See Note 3, "Electricity Imports and Exports," at end of section.

<sup>11</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities,

independent power producers, commercial plants, and industrial plants.

<sup>12</sup> Through 1988, data are for electric utilities and industrial plants. Beginning in 1989, data are for electric utilities, independent power producers, commercial plants, and industrial plants.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

Notes: • Data are for energy consumed to produce electricity. Data also include energy consumed to produce useful thermal output at a small number of electric utility combined-heat-and-power (CHP) plants.

• This table no longer shows energy consumption by hydroelectric pumped storage plants. The change was made because most of the electricity used to pump water into elevated storage reservoirs is generated by plants other than pumped-storage plants; thus, the associated energy is already accounted for in other data columns in this table. • See Note 1, "Coverage of Electricity Statistics," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1949.

• For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1949-1988—Table 8.4b for electric power sector, and Tables 8.1 and A6 for industrial sector. • 1989 forward—Tables 8.4b and 8.4c.

**Table 8.4b Consumption for Electricity Generation by Energy Source: Electric Power Sector, Selected Years, 1949-2011** (Subset of Table 8.4a; Trillion Btu)

Year	Fossil Fuels					Nuclear Electric Power <sup>5</sup>	Renewable Energy							Other <sup>9</sup>	Electricity Net Imports <sup>10</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total		Conventional Hydroelectric Power <sup>5</sup>	Biomass		Geo-thermal <sup>5</sup>	Solar/PV <sup>5,8</sup>	Wind <sup>5</sup>	Total			
								Wood <sup>6</sup>	Waste <sup>7</sup>							
1949	1,995	415	569	NA	2,979	0	1,349	6	NA	NA	NA	NA	1,355	NA	5	4,339
1950	2,199	472	651	NA	3,322	0	1,346	5	NA	NA	NA	NA	1,351	NA	6	4,679
1955	3,458	471	1,194	NA	5,123	0	1,322	3	NA	NA	NA	NA	1,325	NA	14	6,461
1960	4,228	553	1,785	NA	6,565	6	1,569	2	NA	(s)	NA	NA	1,571	NA	15	8,158
1965	5,821	722	2,395	NA	8,938	43	2,026	3	NA	2	NA	NA	2,031	NA	(s)	11,012
1970	7,227	2,117	4,054	NA	13,399	239	2,600	1	2	6	NA	NA	2,609	NA	7	16,253
1975	8,786	3,166	3,240	NA	15,191	1,900	3,122	(s)	2	34	NA	NA	3,158	NA	21	20,270
1976	9,720	3,477	3,152	NA	16,349	2,111	2,943	1	2	38	NA	NA	2,983	NA	29	21,473
1977	10,262	3,901	3,284	NA	17,446	2,702	2,301	3	2	37	NA	NA	2,343	NA	59	22,551
1978	10,238	3,987	3,297	NA	17,522	3,024	2,905	2	1	31	NA	NA	2,940	NA	67	23,553
1979	11,260	3,283	3,613	NA	18,156	2,776	2,897	3	2	40	NA	NA	2,942	NA	69	23,943
1980	12,123	2,634	3,810	NA	18,567	2,739	2,867	3	2	53	NA	NA	2,925	NA	71	24,302
1981	12,583	2,202	3,768	NA	18,553	3,008	2,725	3	1	59	NA	NA	2,788	NA	113	24,462
1982	12,582	1,568	3,342	NA	17,491	3,131	3,233	2	1	51	NA	NA	3,286	NA	100	24,009
1983	13,213	1,544	2,998	NA	17,754	3,203	3,494	2	2	64	NA	(s)	3,562	NA	121	24,639
1984	14,019	1,286	3,220	NA	18,526	3,553	3,353	5	4	81	(s)	(s)	3,443	NA	135	25,657
1985	14,542	1,090	3,160	NA	18,792	4,076	2,937	8	7	97	(s)	(s)	3,049	NA	140	26,057
1986	14,444	1,452	2,691	NA	18,586	4,380	3,038	5	7	108	(s)	(s)	3,158	NA	122	26,247
1987	15,173	1,257	2,935	NA	19,365	4,754	2,602	8	7	112	(s)	(s)	2,729	NA	158	27,007
1988	15,850	1,563	2,709	NA	20,123	5,587	2,302	10	8	106	(s)	(s)	2,425	NA	108	28,244
1989	<sup>11</sup> 16,121	<sup>11</sup> 1,697	<sup>11</sup> 3,107	7	<sup>11</sup> 20,932	<sup>11</sup> 5,602	<sup>11</sup> 2,808	<sup>11</sup> 75	<sup>11</sup> 126	<sup>11</sup> 152	<sup>11</sup> 13	<sup>11</sup> 22	<sup>11</sup> 3,187	2	37	29,761
1990	16,235	1,281	3,233	6	20,755	6,104	3,014	106	180	161	4	29	3,493	(s)	8	30,361
1991	16,223	1,199	3,296	6	20,725	6,422	2,985	104	217	167	5	31	3,509	4	67	30,727
1992	16,431	990	3,407	12	20,840	6,479	2,586	120	252	167	4	30	3,158	3	87	30,568
1993	17,159	1,122	3,426	12	21,719	6,410	2,861	129	255	173	5	31	3,454	3	95	31,681
1994	17,215	1,056	3,851	12	22,134	6,694	2,620	134	269	160	5	36	3,224	2	153	32,207
1995	17,416	743	4,179	18	22,356	7,075	3,149	106	282	138	5	33	3,713	2	134	33,281
1996	18,375	810	3,730	16	22,930	7,087	3,528	117	280	148	5	33	4,112	2	137	34,268
1997	18,855	917	3,981	14	23,768	6,597	3,581	117	292	150	5	34	4,179	1	116	34,660
1998	19,162	1,306	4,520	23	25,011	7,068	3,241	125	287	151	5	31	3,840	2	88	36,008
1999	19,214	1,211	4,742	14	25,181	7,610	3,218	125	290	152	5	46	3,836	1	99	36,728
2000	20,153	1,145	5,120	19	26,438	7,862	2,768	126	294	144	5	57	3,394	1	115	37,811
2001	19,549	1,280	5,290	9	26,128	8,029	2,209	116	205	142	6	70	2,747	109	75	37,089
2002	19,733	955	5,522	25	26,235	8,145	2,650	141	224	147	6	105	3,273	137	72	37,861
2003	20,137	1,199	5,009	30	26,374	7,959	2,781	156	216	148	5	115	3,421	136	22	37,912
2004	20,217	1,202	5,209	27	26,655	8,222	2,656	150	206	148	6	142	3,308	131	39	38,355
2005	20,649	1,227	5,643	24	27,543	8,161	2,670	166	205	147	6	178	3,372	116	85	39,276
2006	20,377	635	6,055	28	27,095	8,215	2,839	163	216	145	5	264	3,632	117	63	39,122
2007	20,723	651	6,681	27	28,083	8,455	2,430	165	221	145	6	341	3,307	117	107	40,068
2008	20,431	463	6,516	23	27,434	8,427	2,494	159	242	146	9	546	3,596	122	112	39,691
2009	18,135	382	6,731	21	25,270	8,356	2,650	160	244	146	9	721	3,931	115	116	37,788
2010	<sup>R</sup> 19,043	<sup>R</sup> 371	<sup>R</sup> 7,242	20	<sup>R</sup> 26,675	<sup>R</sup> 8,434	<sup>R</sup> 2,521	<sup>R</sup> 177	<sup>R</sup> 249	<sup>R</sup> 148	<sup>R</sup> 12	<sup>R</sup> 923	<sup>R</sup> 4,031	<sup>R</sup> 116	<sup>R</sup> 89	<sup>R</sup> 39,345
2011 <sup>P</sup>	17,897	278	7,433	20	25,629	8,259	3,153	160	256	163	18	1,168	4,917	117	127	39,049

1 Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.  
2 Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.  
3 Natural gas, plus a small amount of supplemental gaseous fuels.  
4 Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
5 Values are converted from kilowatt-hours to Btu using the approximate heat rates in Table A6.  
6 Wood and wood-derived fuels.  
7 Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
8 Solar thermal and photovoltaic (PV) energy.  
9 Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
10 Net imports equal imports minus exports. See Note 3, "Electricity Imports and Exports," at end of section.  
11 Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities and independent power producers.  
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.  
Notes: • Data are for energy consumed to produce electricity. Data also include energy consumed to

produce useful thermal output at a small number of electric utility combined-heat-and-power (CHP) plants.  
• The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public.  
• See Table 8.4c for commercial and industrial CHP and electricity-only data. • This table no longer shows energy consumption by hydroelectric pumped storage plants. The change was made because most of the electricity used to pump water into elevated storage reservoirs is generated by plants other than pumped-storage plants; thus, the associated energy is already accounted for in other data columns in this table. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1949.  
• For related information, see <http://www.eia.gov/electricity/>.  
Sources: **Electricity Net Imports:** Tables 8.1 and A6. **All Other Data:** • 1949-1988—Tables 8.2b, 8.5b, A1, A4, A5, and A6. • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report," and Form EIA-867, "Annual Nonutility Power Producer Report."  
• 1998-2000—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-860B, "Annual Electric Generator Report—Nonutility."  
• 2001-2003—EIA, Form EIA-906, "Power Plant Report."  
• 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."  
• 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Table 8.4c Consumption for Electricity Generation by Energy Source: Commercial and Industrial Sectors, Selected Years, 1989-2011** (Subset of Table 8.4a; Trillion Btu)

Year	Fossil Fuels					Nuclear Electric Power	Renewable Energy							Electricity Net Imports	Total	
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total		Conventional Hydroelectric Power <sup>5</sup>	Biomass		Geo-thermal	Solar/PV <sup>5,8</sup>	Wind <sup>5</sup>	Total			Other <sup>9</sup>
								Wood <sup>6</sup>	Waste <sup>7</sup>							
<b>Commercial Sector <sup>10</sup></b>																
1989	9	7	18	1	36	—	1	2	9	—	—	—	12	—	—	47
1990	9	6	28	1	45	—	1	2	15	—	—	—	18	—	—	63
1995	12	4	44	—	60	—	1	1	21	—	—	—	23	(s)	—	83
1996	14	4	44	(s)	62	—	1	1	31	—	—	—	33	(s)	—	95
1997	14	5	40	(s)	59	—	1	1	34	—	—	—	35	(s)	—	94
1998	11	5	42	(s)	57	—	1	1	32	—	—	—	34	—	—	91
1999	12	6	40	(s)	57	—	1	(s)	33	—	—	—	35	(s)	—	92
2000	12	5	38	(s)	55	—	1	(s)	26	—	—	—	28	(s)	—	82
2001	13	6	37	(s)	56	—	1	(s)	15	—	—	—	16	7	—	79
2002	9	4	31	(s)	44	—	(s)	(s)	18	—	—	—	19	11	—	73
2003	13	5	39	—	58	—	1	(s)	19	—	—	—	21	11	—	89
2004	8	5	34	—	46	—	1	(s)	19	—	—	—	21	11	—	78
2005	8	4	35	—	46	—	1	(s)	20	—	—	—	21	10	—	78
2006	8	2	35	(s)	45	—	1	(s)	21	—	—	—	22	10	—	77
2007	8	2	35	—	44	—	1	(s)	19	—	—	—	20	10	—	75
2008	8	1	34	—	43	—	1	(s)	20	—	(s)	—	21	11	—	75
2009	7	1	35	—	43	—	1	(s)	23	—	(s)	(s)	24	13	—	80
2010	7	1	<sup>R</sup> 40	<sup>R</sup> (s)	<sup>R</sup> 48	—	1	(s)	<sup>R</sup> 24	—	(s)	(s)	<sup>R</sup> 25	<sup>R</sup> 14	—	<sup>R</sup> 87
2011 <sup>P</sup>	6	1	39	(s)	45	—	1	(s)	24	—	(s)	(s)	25	14	—	84
<b>Industrial Sector <sup>11</sup></b>																
1989	229	52	456	83	820	—	28	267	15	—	—	—	311	37	—	1,168
1990	233	79	530	104	946	—	31	335	16	—	—	—	382	36	—	1,364
1995	259	66	617	114	1,057	—	55	373	13	—	—	—	440	40	—	1,537
1996	261	74	626	143	1,104	—	61	394	13	—	—	—	468	35	—	1,607
1997	260	63	637	105	1,064	—	58	367	14	—	—	—	439	36	—	1,538
1998	245	67	643	102	1,056	—	55	349	13	—	—	—	417	35	—	1,508
1999	242	68	660	112	1,081	—	49	364	8	—	—	—	422	39	—	1,542
2000	245	61	660	107	1,074	—	42	369	10	—	—	—	421	45	—	1,540
2001	227	62	674	88	1,051	—	33	370	7	—	—	—	410	44	—	1,504
2002	255	55	697	106	1,113	—	39	464	15	—	—	—	518	43	—	1,675
2003	217	61	687	127	1,093	—	43	362	13	—	—	—	419	46	—	1,558
2004	151	42	585	108	885	—	33	194	5	—	—	—	231	41	—	1,158
2005	145	39	534	85	804	—	32	189	5	—	—	—	226	46	—	1,076
2006	143	31	554	87	814	—	29	187	3	—	—	—	219	35	—	1,068
2007	111	30	572	88	800	—	16	188	4	—	—	—	208	41	—	1,050
2008	109	21	537	73	740	—	17	179	5	—	—	—	200	39	—	980
2009	99	20	535	62	716	—	18	160	4	—	—	—	182	42	—	940
2010	<sup>R</sup> 146	<sup>R</sup> 14	<sup>R</sup> 570	<sup>R</sup> 70	<sup>R</sup> 801	—	16	<sup>R</sup> 172	<sup>R</sup> 8	—	(s)	—	<sup>R</sup> 197	<sup>R</sup> 55	—	<sup>R</sup> 1,053
2011 <sup>P</sup>	141	12	580	71	803	—	18	173	8	—	(s)	(s)	199	31	—	1,033

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Values are converted from kilowatt-hours to Btu using the approximate heat rates in Table A6.

<sup>6</sup> Wood and wood-derived fuels.

<sup>7</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>8</sup> Solar thermal and photovoltaic (PV) energy.

<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>11</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

R=Revised. P=Preliminary. — =Not applicable. — =No data reported. (s)=Less than 0.5 trillion Btu.

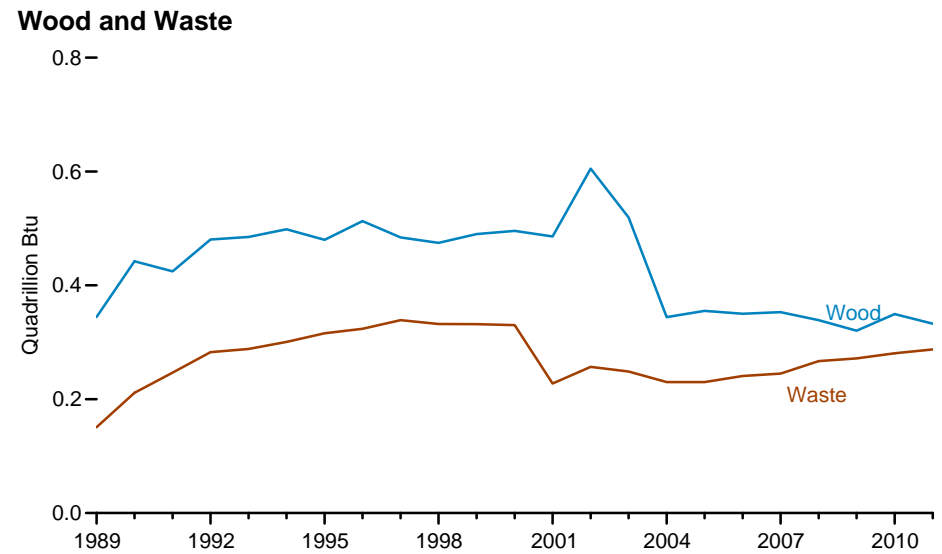
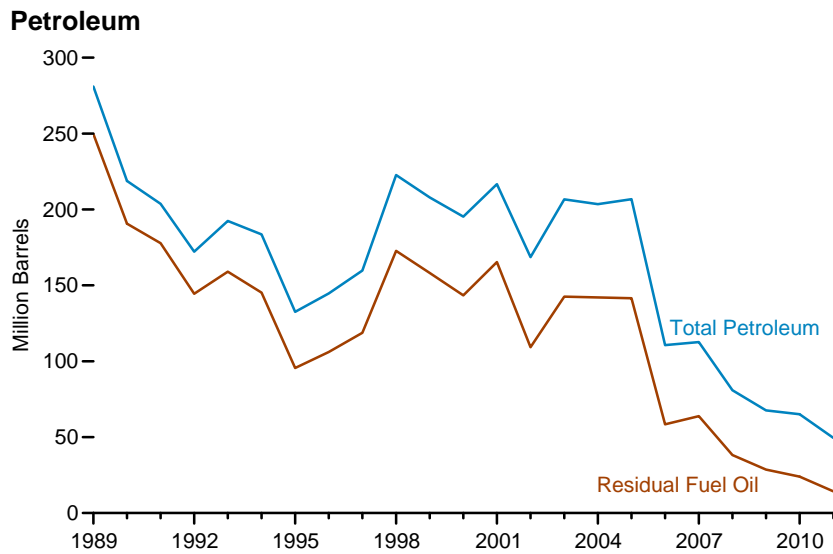
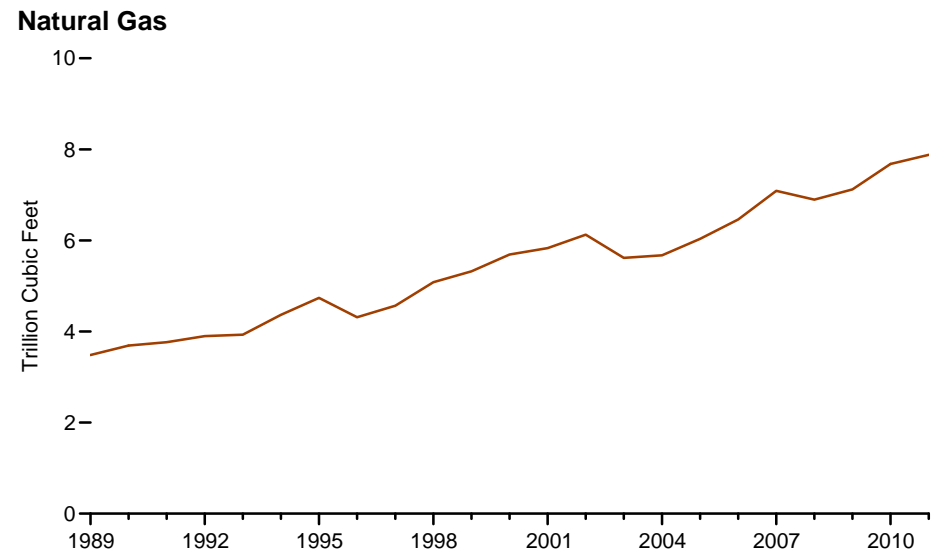
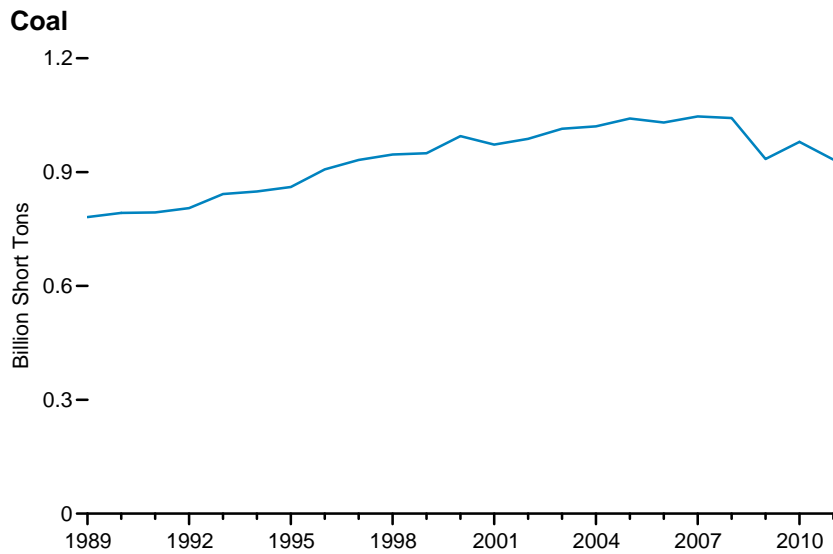
Notes: • Data are for energy consumed to produce electricity. • See Table 8.4b for electric power sector electricity-only and CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1989.

• For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

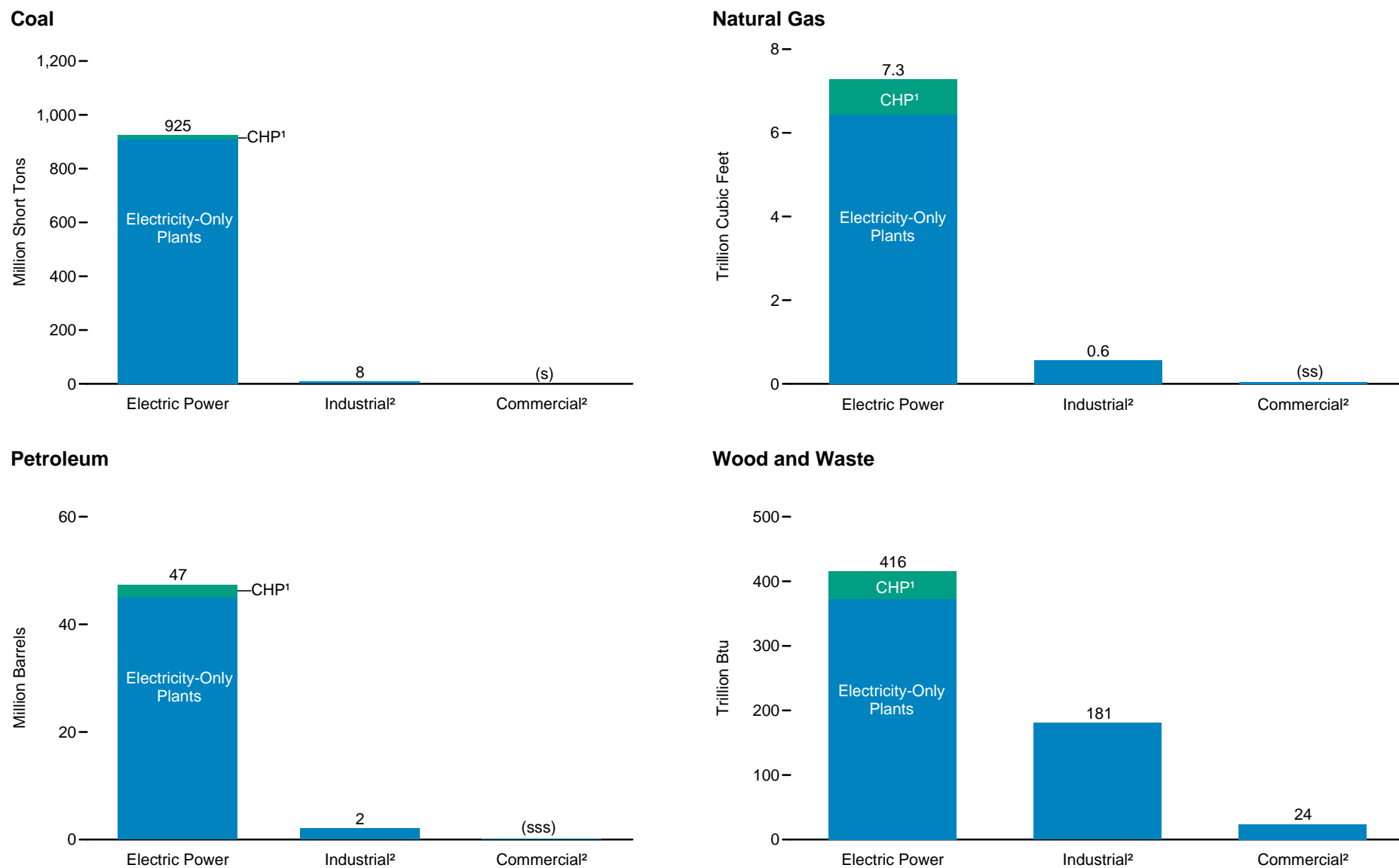
**Figure 8.5a Consumption of Combustible Fuels for Electricity Generation (All Sectors), 1989-2011**



Source: Table 8.5a.



**Figure 8.5b Consumption of Combustible Fuels for Electricity Generation by Sector, 2011**



<sup>1</sup> Combined-heat-and-power plants.

<sup>2</sup> Combined-heat-and-power and electricity-only plants.

(s)=Less than 0.5 million short tons.

(ss)=Less than 0.05 trillion cubic feet.

(sss)=Less than 0.5 million barrels.

Sources: Tables 8.5b-8.5d.

**Table 8.5a Consumption of Combustible Fuels for Electricity Generation: Total (All Sectors), Selected Years, 1949-2011**  
(Sum of Tables 8.5b and 8.5d)

Year	Coal <sup>1</sup> Thousand Short Tons	Petroleum					Natural Gas <sup>6</sup> Million Cubic Feet	Other Gases <sup>7</sup> Trillion Btu	Biomass		Other <sup>10</sup> Trillion Btu
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
1949	83,963	4,767	61,534	NA	NA	66,301	550,121	NA	6	NA	NA
1950	91,871	5,423	69,998	NA	NA	75,421	628,919	NA	5	NA	NA
1955	143,759	5,412	69,862	NA	NA	75,274	1,153,280	NA	3	NA	NA
1960	176,685	3,824	84,371	NA	NA	88,195	1,724,762	NA	2	NA	NA
1965	244,788	4,928	110,274	NA	NA	115,203	2,321,101	NA	3	NA	NA
1970	320,182	24,123	311,381	NA	636	338,686	3,931,860	NA	1	2	NA
1975	405,962	38,907	467,221	NA	70	506,479	3,157,669	NA	(s)	2	NA
1976	448,371	41,843	514,077	NA	68	556,261	3,080,868	NA	1	2	NA
1977	477,126	48,837	574,869	NA	98	624,193	3,191,200	NA	3	2	NA
1978	481,235	47,520	588,319	NA	398	637,830	3,188,363	NA	2	1	NA
1979	527,051	30,691	492,606	NA	268	524,636	3,490,523	NA	3	2	NA
1980	569,274	29,051	391,163	NA	179	421,110	3,681,595	NA	3	2	NA
1981	596,797	21,313	329,798	NA	139	351,806	3,640,154	NA	3	1	NA
1982	593,666	15,337	234,434	NA	149	250,517	3,225,518	NA	2	1	NA
1983	625,211	16,512	228,984	NA	261	246,804	2,910,767	NA	2	2	NA
1984	664,399	15,190	189,289	NA	252	205,736	3,111,342	NA	5	4	NA
1985	693,841	14,635	158,779	NA	231	174,571	3,044,083	NA	8	7	NA
1986	685,056	14,326	216,156	NA	313	232,046	2,602,370	NA	5	7	NA
1987	717,894	15,367	184,011	NA	348	201,116	2,844,051	NA	8	7	NA
1988	758,372	18,769	229,327	NA	409	250,141	2,635,613	NA	10	8	NA
1989 <sup>11</sup>	781,672	27,733	249,614	303	667	280,986	3,485,429	90	345	151	39
1990	792,457	18,143	190,652	437	1,914	218,800	3,691,563	112	442	211	36
1991	793,666	16,564	177,780	380	1,789	203,669	3,764,778	125	425	247	59
1992	805,140	14,493	144,467	759	2,504	172,241	3,899,718	141	481	283	40
1993	842,153	16,845	159,059	715	3,169	192,462	3,928,653	136	485	288	34
1994	848,796	22,365	145,225	929	3,020	183,618	4,367,148	136	498	301	40
1995	860,594	19,615	95,507	680	3,355	132,578	4,737,871	133	480	316	42
1996	907,209	20,252	106,055	1,712	3,322	144,626	4,312,458	159	513	324	37
1997	931,949	20,309	118,741	237	4,086	159,715	4,564,770	119	484	339	36
1998	946,295	25,062	172,728	549	4,860	222,640	5,081,384	125	475	332	36
1999	949,802	25,951	158,187	974	4,552	207,871	5,321,984	126	490	332	41
2000	994,933	31,675	143,381	1,450	3,744	195,228	5,691,481	126	496	330	46
2001	972,691	31,150	165,312	855	3,871	216,672	5,832,305	97	486	228	160
2002	987,583	23,286	109,235	1,894	6,836	168,597	6,126,062	131	605	257	191
2003	1,014,058	29,672	142,518	2,947	6,303	206,653	5,616,135	156	519	249	193
2004	1,020,523	20,163	142,088	2,856	7,677	203,494	5,674,580	135	344	230	183
2005	1,041,448	20,651	141,518	2,968	8,330	206,785	6,036,370	110	355	230	173
2006	1,030,556	13,174	58,473	2,174	7,363	110,634	6,461,615	115	350	241	162
2007	1,046,795	15,683	63,833	2,917	6,036	112,615	7,089,342	115	353	245	168
2008	1,042,335	12,832	38,191	2,822	5,417	80,932	6,895,843	97	339	267	172
2009	934,683	12,658	28,576	2,328	4,821	67,668	7,121,069	84	320	272	170
2010	<sup>R</sup> 979,684	<sup>R</sup> 14,050	<sup>R</sup> 23,997	<sup>R</sup> 2,056	<sup>R</sup> 4,994	<sup>R</sup> 65,071	<sup>R</sup> 7,680,185	<sup>R</sup> 90	<sup>R</sup> 350	<sup>R</sup> 281	<sup>R</sup> 184
2011 <sup>P</sup>	932,911	10,775	14,246	1,707	4,561	49,533	7,880,481	91	333	287	162

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.  
<sup>2</sup> Fuel oil nos. 1, 2, and 4. For 1949–1979, data are for gas turbine and internal combustion plant use of petroleum. For 1980–2000, electric utility data also include small amounts of kerosene and jet fuel.  
<sup>3</sup> Fuel oil nos. 5 and 6. For 1949–1979, data are for steam plant use of petroleum. For 1980–2000, electric utility data also include a small amount of fuel oil no. 4.  
<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.  
<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.  
<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.  
<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>8</sup> Wood and wood-derived fuels.  
<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and,

beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>11</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities, independent power producers, commercial plants, and industrial plants.  
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.  
Notes: • Data are for fuels consumed to produce electricity. Data also include fuels consumed to produce useful thermal output at a small number of electric utility combined-heat-and-power (CHP) plants.  
• See Note 1, "Coverage of Electricity Statistics," at end of section. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1949. • See <http://www.eia.gov/electricity/> for related information.  
Sources: Tables 8.5b and 8.5d.

**Table 8.5b Consumption of Combustible Fuels for Electricity Generation: Electric Power Sector, Selected Years, 1949-2011** (Subset of Table 8.5a)

Year	Coal <sup>1</sup> Thousand Short Tons	Petroleum					Natural Gas <sup>6</sup> Million Cubic Feet	Other Gases <sup>7</sup> Trillion Btu	Biomass		Other <sup>10</sup> Trillion Btu
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
		Thousand Barrels							Thousand Short Tons	Thousand Barrels	
1949	83,963	4,767	61,534	NA	NA	66,301	550,121	NA	6	NA	NA
1950	91,871	5,423	69,998	NA	NA	75,421	628,919	NA	5	NA	NA
1955	143,759	5,412	69,862	NA	NA	75,274	1,153,280	NA	3	NA	NA
1960	176,685	3,824	84,371	NA	NA	88,195	1,724,762	NA	2	NA	NA
1965	244,788	4,928	110,274	NA	NA	115,203	2,321,101	NA	3	NA	NA
1970	320,182	24,123	311,381	NA	636	338,686	3,931,860	NA	1	2	NA
1975	405,962	38,907	467,221	NA	70	506,479	3,157,669	NA	(s)	2	NA
1976	448,371	41,843	514,077	NA	68	556,261	3,080,868	NA	1	2	NA
1977	477,126	48,837	574,869	NA	98	624,193	3,191,200	NA	3	2	NA
1978	481,235	47,520	588,319	NA	398	637,830	3,188,363	NA	2	1	NA
1979	527,051	30,691	492,606	NA	268	524,636	3,490,523	NA	3	2	NA
1980	569,274	29,051	391,163	NA	179	421,110	3,681,595	NA	3	2	NA
1981	596,797	21,313	329,798	NA	139	351,806	3,640,154	NA	3	1	NA
1982	593,666	15,337	234,434	NA	149	250,517	3,225,518	NA	2	1	NA
1983	625,211	16,512	228,984	NA	261	246,804	2,910,767	NA	2	2	NA
1984	664,399	15,190	189,289	NA	252	205,736	3,111,342	NA	5	4	NA
1985	693,841	14,635	158,779	NA	231	174,571	3,044,083	NA	8	7	NA
1986	685,056	14,326	216,156	NA	313	232,046	2,602,370	NA	5	7	NA
1987	717,894	15,367	184,011	NA	348	201,116	2,844,051	NA	8	7	NA
1988	758,372	18,769	229,327	NA	409	250,141	2,635,613	NA	10	8	NA
1989 <sup>11</sup>	771,551	26,036	242,708	9	517	271,340	3,023,513	7	75	126	2
1990	781,301	16,394	183,285	25	1,008	204,745	3,147,289	6	106	180	(s)
1991	782,653	14,255	171,629	58	974	190,810	3,216,056	6	104	217	4
1992	793,390	12,469	137,681	118	1,490	157,719	3,324,963	12	120	252	3
1993	829,851	14,559	151,407	213	2,571	179,034	3,344,239	12	129	255	3
1994	836,113	20,241	137,198	667	2,256	169,387	3,758,484	12	134	269	2
1995	847,854	18,066	88,895	441	2,452	119,663	4,093,773	18	106	282	2
1996	894,400	18,472	98,795	567	2,467	130,168	3,659,810	16	117	280	2
1997	919,009	18,646	112,423	130	3,201	147,202	3,903,195	14	117	292	1
1998	934,126	23,166	165,875	411	3,999	209,447	4,415,813	23	125	287	2
1999	937,888	23,875	151,921	514	3,607	194,345	4,643,775	14	125	290	1
2000	982,713	29,722	138,047	403	3,155	183,946	5,014,071	19	126	294	1
2001	961,523	29,056	159,150	374	3,308	205,119	5,142,493	9	116	205	109
2002	975,251	21,810	104,577	1,243	5,705	156,154	5,408,279	25	141	224	137
2003	1,003,036	27,441	137,361	1,937	5,719	195,336	4,909,248	30	156	216	136
2004	1,012,459	18,793	138,831	2,511	7,135	195,809	5,075,339	27	150	206	131
2005	1,033,567	19,450	138,337	2,591	7,877	199,760	5,484,780	24	166	205	116
2006	1,022,802	12,578	56,347	1,783	6,905	105,235	5,891,222	28	163	221	117
2007	1,041,346	15,135	62,072	2,496	5,523	107,316	6,501,612	27	165	216	117
2008	1,036,891	12,318	37,222	2,608	5,000	77,149	6,342,331	23	159	242	122
2009	929,692	11,848	27,768	2,110	4,485	64,151	6,566,991	21	160	244	115
2010	R971,245	R13,677	R23,560	R1,848	R4,679	R62,477	R7,085,416	20	R177	R249	R116
2011 <sup>P</sup>	924,523	10,513	13,914	1,564	4,281	47,398	7,278,562	20	160	256	117

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.  
<sup>2</sup> Fuel oil nos. 1, 2, and 4. For 1949–1979, data are for gas turbine and internal combustion plant use of petroleum. For 1980–2000, electric utility data also include small amounts of kerosene and jet fuel.  
<sup>3</sup> Fuel oil nos. 5 and 6. For 1949–1979, data are for steam plant use of petroleum. For 1980–2000, electric utility data also include a small amount of fuel oil no. 4.  
<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.  
<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.  
<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.  
<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>8</sup> Wood and wood-derived fuels.  
<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>11</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities and independent power producers.  
R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

Notes: • Data are for fuels consumed to produce electricity. Data also include fuels consumed to produce useful thermal output at a small number of electric utility combined-heat-and-power (CHP) plants.  
• The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public.  
• See Table 8.5d for commercial and industrial CHP and electricity-only data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1949. • See <http://www.eia.gov/electricity/> for related information.  
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982-1988—U.S. Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." • 1989-1997—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Table 8.5c Consumption of Combustible Fuels for Electricity Generation: Electric Power Sector by Plant Type, Selected Years, 1989-2011** (Breakout of Table 8.5b)

Year	Coal <sup>1</sup> Thousand Short Tons	Petroleum					Natural Gas <sup>6</sup> Million Cubic Feet	Other Gases <sup>7</sup> Trillion Btu	Biomass		Other <sup>10</sup> Trillion Btu
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
<b>Electricity-Only Plants <sup>11</sup></b>											
1989	767,378	25,574	241,960	3	517	270,125	2,790,567	—	59	111	—
1990	774,213	14,956	181,231	17	1,008	201,246	2,794,110	(s)	87	162	—
1995	832,928	16,169	86,584	133	1,082	108,297	3,287,571	(s)	84	262	—
1996	878,825	17,361	96,386	50	1,010	118,848	2,823,724	(s)	94	258	—
1997	904,245	17,702	109,989	30	1,687	136,156	3,039,227	1	91	266	—
1998	920,353	22,293	163,541	295	2,202	197,137	3,543,931	1	95	263	—
1999	924,692	22,877	149,193	380	1,891	181,905	3,729,175	1	105	264	—
2000	967,080	28,001	135,419	94	1,457	170,799	4,092,729	2	105	267	—
2001	946,068	27,695	157,090	26	1,827	193,945	4,163,930	(s)	96	179	98
2002	960,077	21,521	102,622	444	3,925	144,212	4,258,467	6	118	193	117
2003	983,538	25,951	136,050	936	4,794	186,904	3,780,314	6	127	185	120
2004	994,774	17,944	137,736	1,441	6,096	187,601	4,141,535	5	134	190	122
2005	1,015,640	18,689	137,082	1,676	6,876	191,827	4,592,271	(s)	143	189	108
2006	1,004,769	12,375	155,192	991	5,988	98,497	5,091,049	(s)	141	198	107
2007	1,022,840	14,626	60,929	1,709	4,711	100,818	5,611,600	2	142	203	107
2008	1,017,806	11,950	36,059	2,478	4,254	71,760	5,520,491	2	136	223	112
2009	913,566	11,509	26,569	1,911	3,642	58,197	5,750,589	2	133	222	105
2010	<sup>R</sup> 954,514	<sup>R</sup> 13,337	<sup>R</sup> 22,470	<sup>R</sup> 1,777	<sup>R</sup> 4,464	<sup>R</sup> 59,902	<sup>R</sup> 6,239,466	<sup>R</sup> 1	<sup>R</sup> 153	<sup>R</sup> 228	<sup>R</sup> 105
2011 <sup>P</sup>	909,645	10,374	12,817	1,546	4,059	45,032	6,439,729	1	137	235	107
<b>Combined-Heat-and-Power Plants <sup>12</sup></b>											
1989	4,173	462	747	6	—	1,215	232,946	7	16	16	2
1990	7,088	1,438	2,054	7	—	3,499	353,179	6	18	18	(s)
1995	14,926	1,898	2,311	307	1,370	11,366	806,202	18	22	20	2
1996	15,575	1,111	2,410	517	1,456	11,320	836,086	15	24	22	2
1997	14,764	944	2,434	100	1,514	11,046	863,968	14	26	26	1
1998	13,773	872	2,334	117	1,797	12,310	871,881	21	30	24	2
1999	13,197	998	2,728	134	1,716	12,440	914,600	14	20	26	1
2000	15,634	1,721	2,627	310	1,698	13,147	921,341	17	21	28	1
2001	15,455	1,360	2,059	347	1,482	11,175	978,563	9	20	26	11
2002	15,174	289	1,955	800	1,780	11,942	1,149,812	20	23	30	20
2003	19,498	1,491	1,311	1,002	926	8,431	1,128,935	23	29	31	16
2004	17,685	850	1,095	1,070	1,039	8,209	933,804	22	16	16	9
2005	17,927	760	1,254	915	1,001	7,933	892,509	24	22	17	9
2006	18,033	203	1,155	792	918	6,738	800,173	27	22	18	10
2007	18,506	509	1,144	787	812	6,498	890,012	25	23	18	9
2008	19,085	368	1,162	130	746	5,389	821,839	22	23	18	10
2009	16,126	340	1,199	199	843	5,953	816,402	19	27	22	11
2010	<sup>R</sup> 16,731	<sup>R</sup> 340	1,090	<sup>R</sup> 71	<sup>R</sup> 215	<sup>R</sup> 2,575	<sup>R</sup> 845,950	<sup>R</sup> 19	<sup>R</sup> 24	<sup>R</sup> 21	<sup>R</sup> 10
2011 <sup>P</sup>	14,878	139	1,097	18	223	2,366	838,833	19	23	21	10

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.  
<sup>2</sup> Fuel oil nos. 1, 2, and 4. Through 2000, electric utility data also include small amounts of kerosene and jet fuel.  
<sup>3</sup> Fuel oil nos. 5 and 6. Through 2000, electric utility data also include a small amount of fuel oil no. 4.  
<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.  
<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.  
<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.  
<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.  
<sup>8</sup> Wood and wood-derived fuels.  
<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).  
<sup>11</sup> Electricity-only plants within the NAICS 22 category whose primary business is to sell electricity to the public. Data also include a small number of electric utility combined-heat-and-power (CHP) plants.

<sup>12</sup> Combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity and heat to the public. Data do not include electric utility CHP plants—these are included under "Electricity-Only Plants."  
R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.5.  
Notes: • Data are for fuels consumed to produce electricity. Data also include fuels consumed to produce useful thermal output at a small number of electric utility combined-heat-and-power (CHP) plants.  
• See Table 8.5d for commercial and industrial CHP and electricity-only data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1989.  
• For related information, see <http://www.eia.gov/electricity/>.  
Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report," and Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Table 8.5d Consumption of Combustible Fuels for Electricity Generation: Commercial and Industrial Sectors, Selected Years, 1989-2011** (Subset of Table 8.5a)

Year	Coal <sup>1</sup>	Petroleum					Natural Gas <sup>6</sup>	Other Gases <sup>7</sup>	Biomass		Other <sup>10</sup>
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
	Thousand Short Tons	Thousand Barrels			Thousand Short Tons	Thousand Barrels	Million Cubic Feet	Trillion Btu	Trillion Btu		Trillion Btu
<b>Commercial Sector <sup>11</sup></b>											
1989	414	882	282	—	—	1,165	17,987	1	2	9	—
1990	417	580	372	(s)	—	953	27,544	1	2	15	—
1995	569	493	152	(s)	1	649	42,700	—	1	21	(s)
1996	656	422	218	(s)	1	645	42,380	(s)	1	31	(s)
1997	630	583	200	—	1	790	38,975	(s)	1	34	(s)
1998	440	436	359	—	1	802	40,693	(s)	1	32	—
1999	481	506	421	—	1	931	39,045	(s)	(s)	33	(s)
2000	514	505	310	1	1	823	37,029	(s)	(s)	26	(s)
2001	532	520	469	2	6	1,023	36,248	(s)	(s)	15	7
2002	477	524	292	10	2	834	32,545	(s)	(s)	18	11
2003	582	553	326	3	2	894	38,480	—	(s)	19	11
2004	377	545	214	1	1	766	32,839	—	(s)	19	11
2005	377	377	201	1	1	585	33,785	—	(s)	20	10
2006	347	211	116	(s)	1	333	34,623	—	(s)	21	10
2007	361	156	94	—	2	258	34,087	—	(s)	19	10
2008	369	131	29	(s)	1	166	33,403	—	(s)	20	11
2009	317	145	39	(s)	1	190	34,279	—	(s)	23	13
2010	<sup>R</sup> 314	<sup>R</sup> 143	<sup>R</sup> 21	(s)	2	<sup>R</sup> 172	<sup>R</sup> 39,462	<sup>R</sup> (s)	(s)	<sup>R</sup> 24	<sup>R</sup> 14
2011 <sup>P</sup>	297	94	15	(s)	1	112	37,773	(s)	(s)	24	14
<b>Industrial Sector <sup>12</sup></b>											
1989	9,707	815	6,624	294	150	8,482	443,928	83	267	15	37
1990	10,740	1,169	6,995	412	905	13,103	516,729	104	335	16	36
1995	12,171	1,056	6,460	239	902	12,265	601,397	114	373	13	40
1996	12,153	1,359	7,042	1,145	853	13,813	610,268	143	394	13	35
1997	12,311	1,079	6,118	107	884	11,723	622,599	105	367	14	36
1998	11,728	1,461	6,494	137	860	12,392	624,878	102	349	13	35
1999	11,432	1,571	5,845	460	944	12,595	639,165	112	364	8	39
2000	11,706	1,448	5,024	1,046	588	10,459	640,381	107	369	10	45
2001	10,636	1,574	5,693	479	557	10,530	653,565	88	370	7	44
2002	11,855	952	4,366	640	1,130	11,608	685,239	106	464	15	43
2003	10,440	1,678	4,831	1,006	582	10,424	668,407	127	362	13	46
2004	7,687	825	3,043	344	541	6,919	566,401	108	194	5	41
2005	7,504	824	2,980	377	452	6,440	517,805	85	189	5	46
2006	7,408	385	2,010	391	456	5,066	535,770	87	187	3	35
2007	5,089	392	1,666	421	512	5,041	553,643	88	188	4	41
2008	5,075	383	941	214	416	3,617	520,109	73	179	5	39
2009	4,674	664	769	218	335	3,328	519,799	62	160	4	42
2010	<sup>R</sup> 8,125	<sup>R</sup> 231	<sup>R</sup> 416	<sup>R</sup> 208	<sup>R</sup> 313	<sup>R</sup> 2,422	<sup>R</sup> 555,307	<sup>R</sup> 70	<sup>R</sup> 172	<sup>R</sup> 8	<sup>R</sup> 55
2011 <sup>P</sup>	8,091	168	318	144	279	2,023	564,146	71	173	8	31

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Fuel oil nos. 1, 2, and 4.

<sup>3</sup> Fuel oil nos. 5 and 6.

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>8</sup> Wood and wood-derived fuels.

<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>11</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>12</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

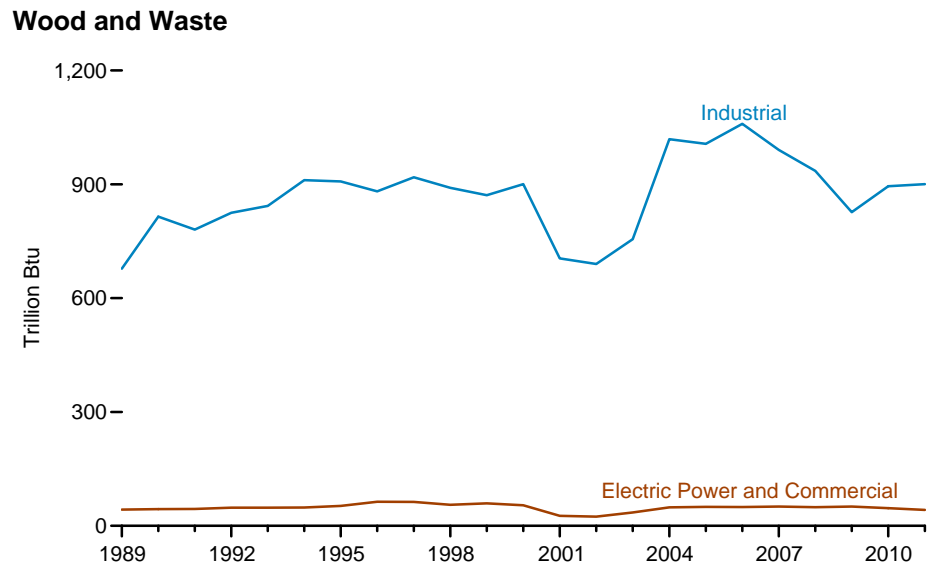
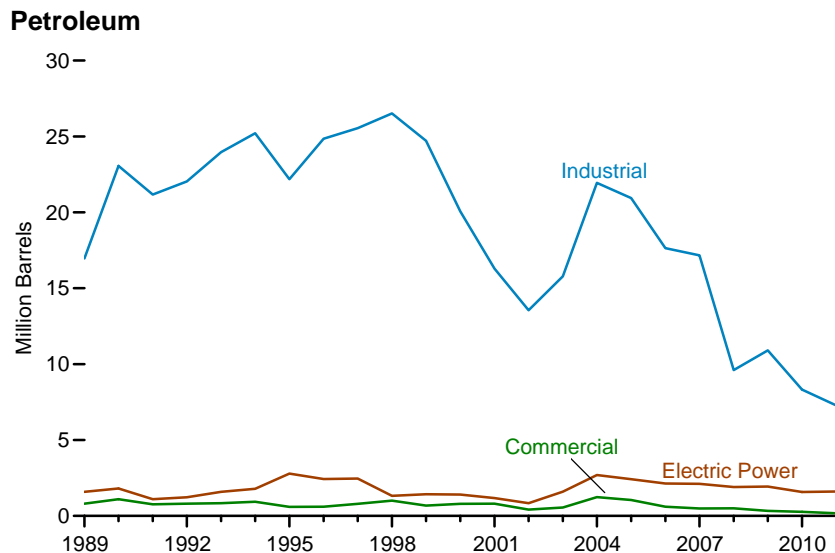
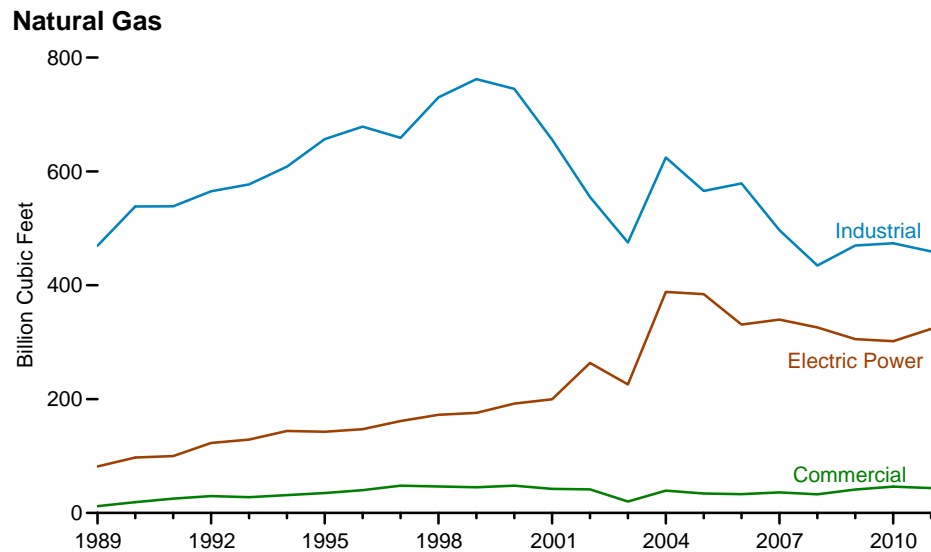
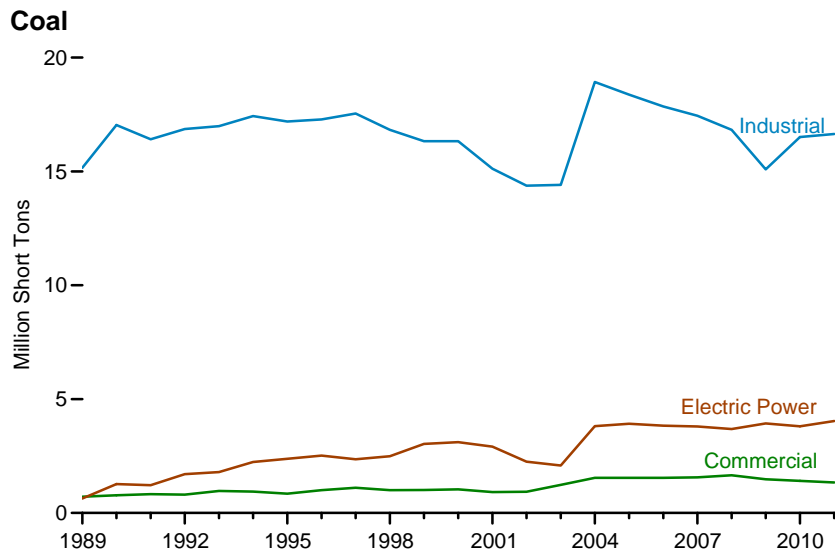
R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.5.

Notes: • Data are for fuels consumed to produce electricity. • See Tables 8.5b and 8.5c for electric power sector electricity-only and CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1989. • See <http://www.eia.gov/electricity/> for related information.

Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Figure 8.6 Estimated Consumption of Combustible Fuels for Useful Thermal Output at Combined-Heat-and-Power Plants by Sector, 1989-2011**



Sources: Tables 8.6b and 8.6c.

**Table 8.6a Estimated Consumption of Combustible Fuels for Useful Thermal Output at Combined-Heat-and-Power Plants: Total (All Sectors), 1989-2011** (Sum of Tables 8.6b and 8.6c)

Year	Coal <sup>1</sup>	Petroleum					Natural Gas <sup>6</sup>	Other Gases <sup>7</sup>	Biomass		Other <sup>10</sup>
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
	Thousand Short Tons	Thousand Barrels				Thousand Short Tons	Thousand Barrels	Million Cubic Feet	Trillion Btu	Trillion Btu	Trillion Btu
1989	16,510	1,410	16,357	353	247	19,357	563,307	116	683	38	49
1990	19,081	2,050	18,428	895	918	25,965	654,749	176	813	46	50
1991	18,458	3,027	15,293	835	777	23,039	663,963	185	779	46	55
1992	19,372	2,358	16,474	935	862	24,077	717,860	200	822	51	52
1993	19,750	2,449	17,933	857	1,031	26,394	733,584	178	836	56	51
1994	20,609	2,811	18,822	609	1,137	27,929	784,015	180	903	57	53
1995	20,418	2,082	16,661	642	1,235	25,562	834,382	181	902	59	55
1996	20,806	2,192	18,552	756	1,275	27,873	865,774	187	876	69	54
1997	21,005	2,584	15,882	289	2,009	28,802	868,569	188	913	68	67
1998	20,320	4,944	16,539	681	1,336	28,845	949,106	209	875	72	58
1999	20,373	4,665	14,133	838	1,437	26,822	982,958	224	862	68	60
2000	20,466	2,897	13,292	1,455	924	22,266	985,263	230	884	71	63
2001	18,944	2,574	11,826	563	661	18,268	898,286	166	696	35	69
2002	17,561	1,462	9,402	1,363	517	14,811	860,019	147	682	32	60
2003	17,720	2,153	10,341	1,629	763	17,939	721,267	138	746	44	69
2004	24,275	3,357	15,390	1,908	1,043	25,870	1,052,100	218	1,016	51	70
2005	23,833	3,795	15,397	1,302	783	24,408	984,340	238	997	59	64
2006	23,227	1,481	11,373	1,222	1,259	20,371	942,817	226	1,049	60	75
2007	22,810	1,359	10,783	1,320	1,262	19,775	872,579	214	982	59	71
2008	22,168	1,305	5,285	943	897	12,016	793,537	203	924	61	39
2009	20,507	2,142	5,097	890	1,007	13,161	816,787	176	816	61	58
2010	<sup>R</sup> 21,727	<sup>R</sup> 1,197	<sup>R</sup> 2,947	<sup>R</sup> 722	<sup>R</sup> 1,059	<sup>R</sup> 10,161	<sup>R</sup> 821,775	172	<sup>R</sup> 876	<sup>R</sup> 66	<sup>R</sup> 52
2011 <sup>P</sup>	22,014	599	2,432	495	1,105	9,054	826,548	190	881	62	27

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Fuel oil nos. 1, 2, and 4.

<sup>3</sup> Fuel oil nos. 5 and 6.

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>8</sup> Wood and wood-derived fuels.

<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

R=Revised. P=Preliminary.

Notes: • Estimates are for fuels consumed to produce useful thermal output; they exclude fuels consumed to produce electricity. • Estimates do not include electric utility combined-heat-and-power (CHP) plants. • See Note 1, "Coverage of Electricity Statistics," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: Tables 8.6b and 8.6c.

**Table 8.6b Estimated Consumption of Combustible Fuels for Useful Thermal Output at Combined-Heat-and-Power Plants: Electric Power Sector, 1989-2011** (Subset of Table 8.6a)

Year	Coal <sup>1</sup>	Petroleum					Natural Gas <sup>6</sup>	Other Gases <sup>7</sup>	Biomass		Other <sup>10</sup>
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
	Thousand Short Tons	Thousand Barrels				Thousand Short Tons	Thousand Barrels	Million Cubic Feet	Trillion Btu	Trillion Btu	Trillion Btu
1989	639	120	1,471	1	—	1,591	81,670	3	24	6	1
1990	1,266	173	1,630	2	—	1,805	97,330	5	23	8	(s)
1991	1,221	104	995	1	—	1,101	99,868	5	21	11	1
1992	1,704	154	1,045	10	4	1,229	122,908	6	21	10	2
1993	1,794	290	1,074	27	40	1,591	128,743	4	21	10	2
1994	2,241	371	1,024	104	58	1,791	144,062	6	18	12	1
1995	2,376	486	1,127	58	222	2,784	142,753	5	19	15	(s)
1996	2,520	308	1,155	86	175	2,424	147,091	5	20	21	(s)
1997	2,355	343	1,246	23	171	2,466	161,608	10	20	17	(s)
1998	2,493	134	653	19	103	1,322	172,471	6	12	20	(s)
1999	3,033	183	572	30	128	1,423	175,757	4	13	25	(s)
2000	3,107	294	467	51	120	1,412	192,253	7	8	24	(s)
2001	2,910	219	355	3	119	1,171	199,808	6	10	5	4
2002	2,255	66	197	23	111	841	263,619	7	10	6	6
2003	2,080	190	919	88	80	1,596	225,967	12	11	14	4
2004	3,809	314	985	202	237	2,688	388,424	31	15	17	7
2005	3,918	225	1,072	95	206	2,424	384,365	60	19	15	7
2006	3,834	69	998	87	195	2,129	330,878	37	19	14	8
2007	3,795	192	1,014	98	162	2,114	339,796	34	21	16	8
2008	3,689	230	1,019	62	119	1,907	326,048	38	18	16	8
2009	3,935	187	1,015	100	126	1,930	305,542	34	20	17	8
2010	<sup>R</sup> 3,808	<sup>R</sup> 113	944	<sup>R</sup> 29	<sup>R</sup> 98	<sup>R</sup> 1,578	<sup>R</sup> 301,769	<sup>R</sup> 33	<sup>R</sup> 18	<sup>R</sup> 15	<sup>R</sup> 8
2011 <sup>P</sup>	4,035	73	963	4	113	1,605	323,364	36	16	13	9

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Fuel oil nos. 1, 2, and 4.

<sup>3</sup> Fuel oil nos. 5 and 6.

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>8</sup> Wood and wood-derived fuels.

<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.5.

Notes: • Estimates are for fuels consumed to produce useful thermal output; they exclude fuels consumed to produce electricity. • Estimates are for combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity and heat to the public. Estimates do not include electric utility CHP plants. • See Table 8.6c for commercial and industrial CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."



**Table 8.6c Estimated Consumption of Combustible Fuels for Useful Thermal Output at Combined-Heat-and-Power Plants: Commercial and Industrial Sectors, Selected Years, 1989-2011** (Subset of Table 8.6a)

Year	Coal <sup>1</sup> Thousand Short Tons	Petroleum					Natural Gas <sup>6</sup> Million Cubic Feet	Other Gases <sup>7</sup> Trillion Btu	Biomass		Other <sup>10</sup> Trillion Btu
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
	Thousand Barrels					Thousand Short Tons	Thousand Barrels	Trillion Btu		Trillion Btu	
<b>Commercial Sector <sup>11</sup></b>											
1989	711	202	601	—	—	803	12,049	(s)	(s)	13	—
1990	773	389	715	(s)	—	1,104	18,913	(s)	(s)	13	—
1995	850	319	261	(s)	3	596	34,964	—	(s)	19	(s)
1996	1,005	260	328	(s)	3	601	40,075	—	1	22	(s)
1997	1,108	470	309	—	3	794	47,941	(s)	1	24	—
1998	1,002	418	573	—	3	1,006	46,527	(s)	1	22	—
1999	1,009	254	412	—	3	682	44,991	—	1	21	—
2000	1,034	403	366	2	4	792	47,844	—	1	21	—
2001	916	505	304	—	—	809	42,407	—	1	10	7
2002	929	248	108	28	6	416	41,430	—	1	8	6
2003	1,234	119	381	12	9	555	19,973	—	1	10	8
2004	1,540	570	613	20	8	1,243	39,233	—	1	15	11
2005	1,544	417	587	(s)	8	1,045	34,172	—	1	14	10
2006	1,539	155	404	—	9	601	33,112	(s)	1	16	10
2007	1,566	101	340	—	11	494	35,987	—	2	12	7
2008	1,652	287	173	—	9	504	32,813	—	1	14	10
2009	1,481	120	173	—	8	331	41,275	—	1	13	9
2010	<sup>R</sup> 1,406	<sup>R</sup> 90	<sup>R</sup> 122	—	11	<sup>R</sup> 265	<sup>R</sup> 46,324	<sup>R</sup> (s)	1	12	8
2011 <sup>P</sup>	1,336	53	88	—	6	169	43,661	(s)	1	12	9
<b>Industrial Sector <sup>12</sup></b>											
1989	15,160	1,088	14,285	352	247	16,963	469,588	113	659	19	48
1990	17,041	1,488	16,084	893	918	23,056	538,506	171	790	25	50
1995	17,192	1,277	15,272	584	1,010	22,182	656,665	175	882	25	55
1996	17,281	1,624	17,069	670	1,097	24,848	678,608	182	855	26	53
1997	17,542	1,772	14,328	267	1,835	25,541	659,021	178	892	27	67
1998	16,824	4,391	15,313	662	1,230	26,518	730,108	202	862	29	58
1999	16,330	4,228	13,148	808	1,307	24,718	762,210	219	849	23	60
2000	16,325	2,200	12,459	1,402	800	20,062	745,165	223	875	25	63
2001	15,119	1,850	11,167	560	542	16,287	656,071	160	685	20	58
2002	14,377	1,149	9,097	1,312	399	13,555	554,970	139	672	18	48
2003	14,406	1,844	9,041	1,529	675	15,788	475,327	126	735	21	57
2004	18,926	2,473	13,791	1,686	798	21,939	624,443	187	1,000	19	53
2005	18,371	3,153	13,738	1,207	568	20,940	565,803	179	977	30	48
2006	17,854	1,258	9,971	1,136	1,055	17,640	578,828	190	1,029	30	57
2007	17,449	1,066	9,429	1,222	1,090	17,166	496,796	180	959	31	57
2008	16,827	788	4,093	882	769	9,605	434,676	165	905	31	22
2009	15,091	1,835	3,909	790	873	10,900	469,970	142	796	31	41
2010	<sup>R</sup> 16,513	<sup>R</sup> 993	<sup>R</sup> 1,882	<sup>R</sup> 692	<sup>R</sup> 950	<sup>R</sup> 8,318	<sup>R</sup> 473,683	<sup>R</sup> 139	<sup>R</sup> 857	<sup>R</sup> 38	<sup>R</sup> 36
2011 <sup>P</sup>	16,643	473	1,381	491	987	7,279	459,524	154	864	36	9

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Fuel oil nos. 1, 2, and 4.

<sup>3</sup> Fuel oil nos. 5 and 6.

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>8</sup> Wood and wood-derived fuels.

<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>11</sup> Commercial combined-heat-and-power (CHP) plants.

<sup>12</sup> Industrial combined-heat-and-power (CHP) plants.

R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.5.

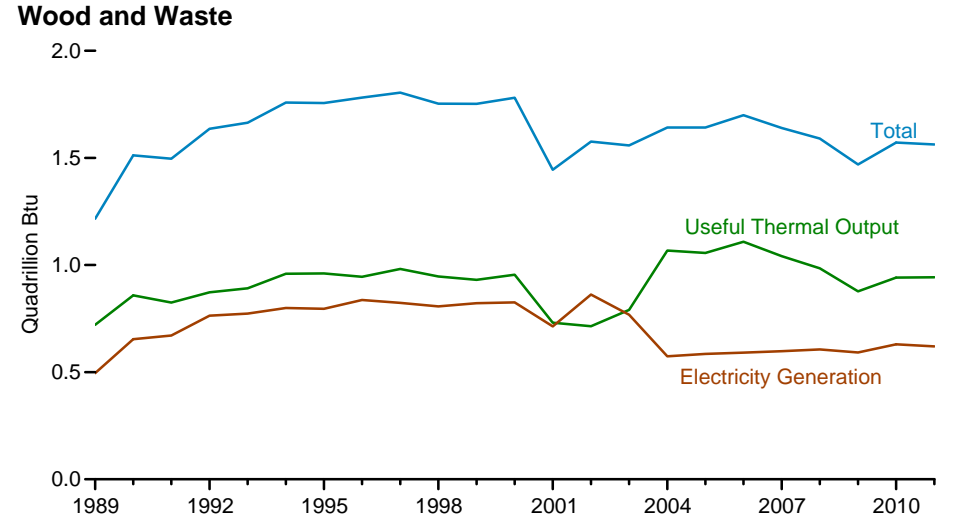
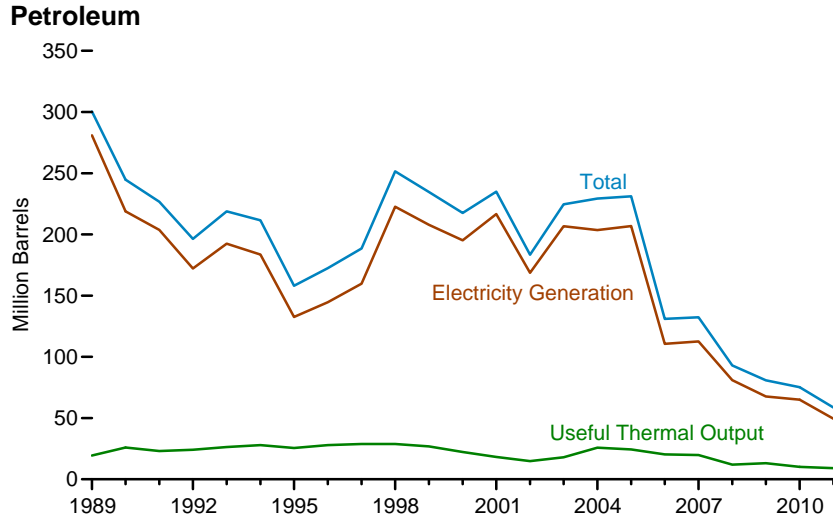
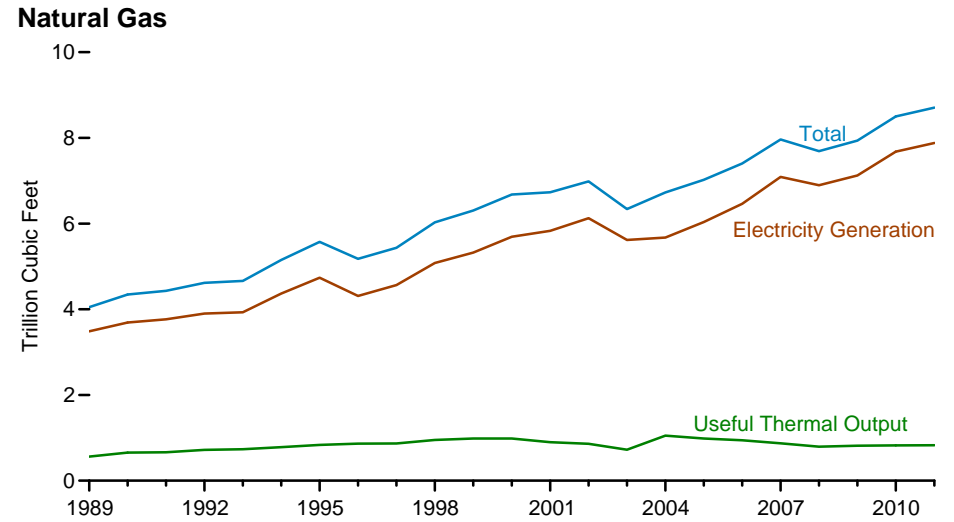
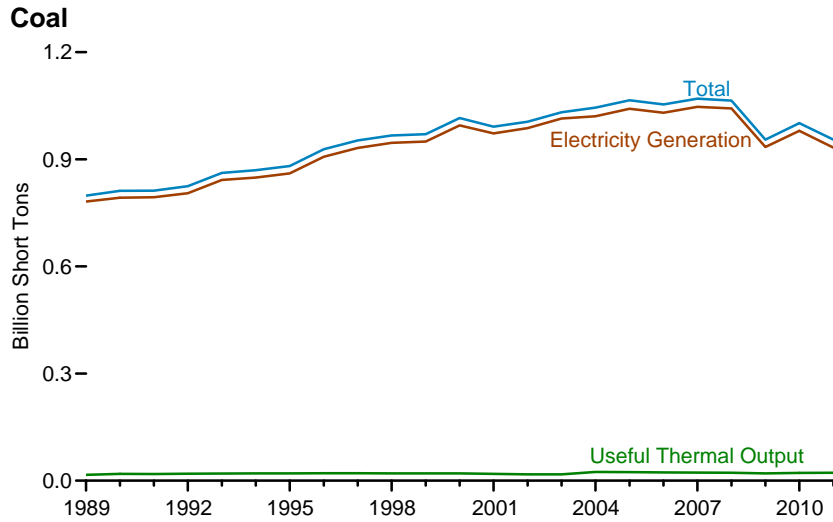
Notes: • Estimates are for fuels consumed to produce useful thermal output; they exclude fuels consumed to produce electricity. • See Table 8.6b for electric power sector CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1989.

• For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Figure 8.7 Consumption of Combustible Fuels for Electricity Generation and Useful Thermal Output, 1989-2011**



Sources: Tables 8.5a, 8.6a, and 8.7a.

**Table 8.7a Consumption of Combustible Fuels for Electricity Generation and Useful Thermal Output:  
Total (All Sectors), 1989-2011 (Sum of Tables 8.7b and 8.7c)**

Year	Coal <sup>1</sup>	Petroleum					Natural Gas <sup>6</sup>	Other Gases <sup>7</sup>	Biomass		Other <sup>10</sup>
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
	Thousand Short Tons	Thousand Barrels				Thousand Short Tons	Thousand Barrels	Million Cubic Feet	Trillion Btu	Trillion Btu	Trillion Btu
1989	798,181	29,143	265,970	656	915	300,342	4,048,736	206	1,028	189	88
1990	811,538	20,194	209,081	1,332	2,832	244,765	4,346,311	288	1,256	257	86
1991	812,124	19,590	193,073	1,215	2,566	226,708	4,428,742	311	1,204	292	114
1992	824,512	16,852	160,941	1,695	3,366	196,318	4,617,578	341	1,303	333	92
1993	861,904	19,293	176,992	1,571	4,200	218,855	4,662,236	314	1,321	344	85
1994	869,405	25,177	164,047	1,539	4,157	211,547	5,151,163	316	1,401	357	92
1995	881,012	21,697	112,168	1,322	4,590	158,140	5,572,253	313	1,382	374	97
1996	928,015	22,444	124,607	2,468	4,596	172,499	5,178,232	346	1,389	392	91
1997	952,955	22,893	134,623	526	6,095	188,517	5,433,338	307	1,397	407	103
1998	966,615	30,006	189,267	1,230	6,196	251,486	6,030,490	334	1,349	404	95
1999	970,175	30,616	172,319	1,812	5,989	234,694	6,304,942	350	1,352	400	101
2000	1,015,398	34,572	156,673	2,904	4,669	217,494	6,676,744	356	1,380	401	109
2001	991,635	33,724	177,137	1,418	4,532	234,940	6,730,591	263	1,182	263	229
2002	1,005,144	24,748	118,637	3,257	7,353	183,408	6,986,081	278	1,287	289	252
2003	1,031,778	31,825	152,859	4,576	7,067	224,593	6,337,402	294	1,266	293	262
2004	1,044,798	23,520	157,478	4,764	8,721	229,364	6,726,679	353	1,360	282	254
2005	1,065,281	24,446	156,915	4,270	9,113	231,193	7,020,709	348	1,353	289	237
2006	1,053,783	14,655	69,846	3,396	8,622	131,005	7,404,432	341	1,399	300	237
2007	1,069,606	17,042	74,616	4,237	7,299	132,389	7,961,922	329	1,336	304	239
2008	1,064,503	14,137	43,477	3,765	6,314	92,948	7,689,380	300	1,263	328	212
2009	955,190	14,800	33,672	3,218	5,828	80,830	7,937,856	259	1,137	333	228
2010	<sup>R</sup> 1,001,411	<sup>R</sup> 15,247	<sup>R</sup> 26,944	<sup>R</sup> 2,777	<sup>R</sup> 6,053	<sup>R</sup> 75,231	<sup>R</sup> 8,501,960	<sup>R</sup> 262	<sup>R</sup> 1,226	<sup>R</sup> 346	<sup>R</sup> 237
2011 <sup>P</sup>	954,925	11,374	16,678	2,203	5,666	58,586	8,707,029	281	1,214	349	189

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Fuel oil nos. 1, 2, and 4. Through 2000, electric utility data also include small amounts of kerosene and jet fuel.

<sup>3</sup> Fuel oil nos. 5 and 6. Through 2000, electric utility data also include a small amount of fuel oil no. 4.

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>8</sup> Wood and wood-derived fuels.

<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from

non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

R=Revised. P=Preliminary.

Notes: • See Note 1, "Coverage of Electricity Statistics," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/electricity/> for related information.

Sources: Tables 8.7b and 8.7c.

**Table 8.7b Consumption of Combustible Fuels for Electricity Generation and Useful Thermal Output:  
Electric Power Sector, 1989-2011** (Subset of Table 8.7a)

Year	Coal <sup>1</sup>	Petroleum					Natural Gas <sup>6</sup>	Other Gases <sup>7</sup>	Biomass		Other <sup>10</sup>
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>	
	Thousand Short Tons	Thousand Barrels				Thousand Short Tons	Thousand Barrels	Million Cubic Feet	Trillion Btu	Trillion Btu	Trillion Btu
1989	772,190	26,156	244,179	10	517	272,931	3,105,183	9	100	132	3
1990	782,567	16,567	184,915	26	1,008	206,550	3,244,619	11	129	188	(s)
1991	783,874	14,359	172,625	59	974	191,911	3,315,925	11	126	229	4
1992	795,094	12,623	138,726	128	1,494	158,948	3,447,871	18	140	262	5
1993	831,645	14,849	152,481	239	2,611	180,625	3,472,982	16	150	265	5
1994	838,354	20,612	138,222	771	2,315	171,178	3,902,546	19	152	282	3
1995	850,230	18,553	90,023	499	2,674	122,447	4,236,526	24	125	296	2
1996	896,921	18,780	99,951	653	2,642	132,593	3,806,901	20	138	300	2
1997	921,364	18,989	113,669	152	3,372	149,668	4,064,803	24	137	309	1
1998	936,619	23,300	166,528	431	4,102	210,769	4,588,284	29	137	308	2
1999	940,922	24,058	152,493	544	3,735	195,769	4,819,531	19	138	315	1
2000	985,821	30,016	138,513	454	3,275	185,358	5,206,324	25	134	318	1
2001	964,433	29,274	159,504	377	3,427	206,291	5,342,301	15	126	211	113
2002	977,507	21,876	104,773	1,267	5,816	156,995	5,671,897	33	150	230	143
2003	1,005,116	27,632	138,279	2,026	5,799	196,932	5,135,215	41	167	230	140
2004	1,016,268	19,107	139,816	2,713	7,372	198,498	5,463,763	58	165	223	138
2005	1,037,485	19,675	139,409	2,685	8,083	202,184	5,869,145	84	185	221	123
2006	1,026,636	12,646	57,345	1,870	7,101	107,365	6,222,100	65	182	231	125
2007	1,045,141	15,327	63,086	2,594	5,685	109,431	6,841,408	61	186	237	124
2008	1,040,580	12,547	38,241	2,670	5,119	79,056	6,668,379	61	177	258	131
2009	933,627	12,035	28,782	2,210	4,611	66,081	6,872,533	55	180	261	124
2010	<sup>R</sup> 975,052	<sup>R</sup> 13,790	<sup>R</sup> 24,503	<sup>R</sup> 1,877	<sup>R</sup> 4,777	<sup>R</sup> 64,055	<sup>R</sup> 7,387,184	52	<sup>R</sup> 196	<sup>R</sup> 264	124
2011 <sup>P</sup>	928,558	10,586	14,876	1,568	4,394	49,003	7,601,926	56	175	269	126

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Fuel oil nos. 1, 2, and 4. Through 2000, electric utility data also include small amounts of kerosene and jet fuel.

<sup>3</sup> Fuel oil nos. 5 and 6. Through 2000, electric utility data also include a small amount of fuel oil no. 4.

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>8</sup> Wood and wood-derived fuels.

<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

R=Revised. P=Preliminary. (s)=Less than 0.5.

Notes: • The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. • See Table 8.7c for commercial and industrial CHP and electricity-only data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/electricity/> for related information.

Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report," and Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Table 8.7c Consumption of Combustible Fuels for Electricity Generation and Useful Thermal Output: Commercial and Industrial Sectors, Selected Years, 1989-2011** (Subset of Table 8.7a)

Year	Coal <sup>1</sup> Thousand Short Tons	Petroleum					Natural Gas <sup>6</sup> Million Cubic Feet	Other Gases <sup>7</sup> Trillion Btu	Biomass		Other <sup>10</sup> Trillion Btu	
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	Total <sup>5</sup>			Wood <sup>8</sup>	Waste <sup>9</sup>		
	Thousand Barrels					Thousand Short Tons	Thousand Barrels	Trillion Btu		Trillion Btu		
<b>Commercial Sector <sup>11</sup></b>												
1989	1,125	1,085	883	—	—	1,967	30,037	1	2	22	—	
1990	1,191	969	1,087	(s)	—	2,056	46,458	1	2	28	—	
1995	1,419	812	413	(s)	4	1,245	77,664	—	1	40	(s)	
1996	1,660	682	545	(s)	4	1,246	82,455	(s)	2	53	(s)	
1997	1,738	1,053	509	—	4	1,584	86,915	(s)	2	58	(s)	
1998	1,443	854	932	—	4	1,807	87,220	(s)	2	54	—	
1999	1,490	759	834	—	4	1,613	84,037	(s)	1	54	(s)	
2000	1,547	908	676	3	6	1,615	84,874	(s)	1	47	(s)	
2001	1,448	1,026	773	2	6	1,832	78,655	(s)	1	25	15	
2002	1,405	771	400	38	8	1,250	73,975	(s)	1	26	17	
2003	1,816	671	708	16	11	1,449	58,453	—	1	29	18	
2004	1,917	1,115	827	21	9	2,009	72,072	—	2	34	21	
2005	1,922	794	789	1	9	1,630	67,957	—	1	34	20	
2006	1,886	366	520	(s)	10	935	67,735	(s)	1	36	21	
2007	1,927	257	434	—	12	752	70,074	—	2	31	17	
2008	2,021	418	202	(s)	10	671	66,216	—	1	34	21	
2009	1,798	266	212	(s)	9	521	75,555	—	1	36	22	
2010	R1,720	R233	R143	(s)	12	R437	R85,786	R	(s)	1	R36	R22
2011 <sup>P</sup>	1,633	147	103	(s)	6	282	81,433	(s)	1	36	23	
<b>Industrial Sector <sup>12</sup></b>												
1989	24,867	1,903	20,909	646	397	25,444	913,516	195	926	35	85	
1990	27,781	2,657	23,079	1,305	1,824	36,159	1,055,235	275	1,125	41	86	
1995	29,363	2,333	21,732	823	1,912	34,448	1,258,063	290	1,255	38	95	
1996	29,434	2,983	24,111	1,815	1,950	38,661	1,288,876	325	1,249	39	89	
1997	29,853	2,851	20,445	374	2,719	37,265	1,281,620	283	1,259	41	102	
1998	28,553	5,852	21,807	800	2,090	38,910	1,354,986	305	1,211	42	93	
1999	27,763	5,799	18,993	1,268	2,251	37,312	1,401,374	331	1,213	31	99	
2000	28,031	3,648	17,483	2,448	1,388	30,520	1,385,546	331	1,244	35	108	
2001	25,755	3,424	16,860	1,039	1,099	26,817	1,309,636	248	1,054	27	101	
2002	26,232	2,101	13,463	1,953	1,529	25,163	1,240,209	245	1,136	34	92	
2003	24,846	3,522	13,872	2,535	1,257	26,212	1,143,734	253	1,097	34	103	
2004	26,613	3,298	16,835	2,030	1,339	28,857	1,190,844	295	1,193	24	94	
2005	25,875	3,977	16,718	1,583	1,020	27,380	1,083,607	264	1,166	34	94	
2006	25,262	1,643	11,981	1,526	1,511	22,706	1,114,597	277	1,216	33	92	
2007	22,537	1,458	11,096	1,643	1,602	22,207	1,050,439	268	1,148	36	98	
2008	21,902	1,171	5,034	1,095	1,184	13,222	954,785	239	1,084	35	60	
2009	19,766	2,499	4,678	1,008	1,209	14,228	989,769	204	955	35	82	
2010	R24,638	R1,224	R2,298	R900	R1,264	R10,740	R1,028,990	R210	R1,029	R47	R91	
2011 <sup>P</sup>	24,733	641	1,699	635	1,265	9,302	1,023,670	224	1,037	44	40	

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Fuel oil nos. 1, 2, and 4.

<sup>3</sup> Fuel oil nos. 5 and 6.

<sup>4</sup> Jet fuel, kerosene, other petroleum liquids, and waste oil.

<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>6</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>8</sup> Wood and wood-derived fuels.

<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>10</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, miscellaneous technologies, and, beginning in 2001, non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>11</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>12</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.5.

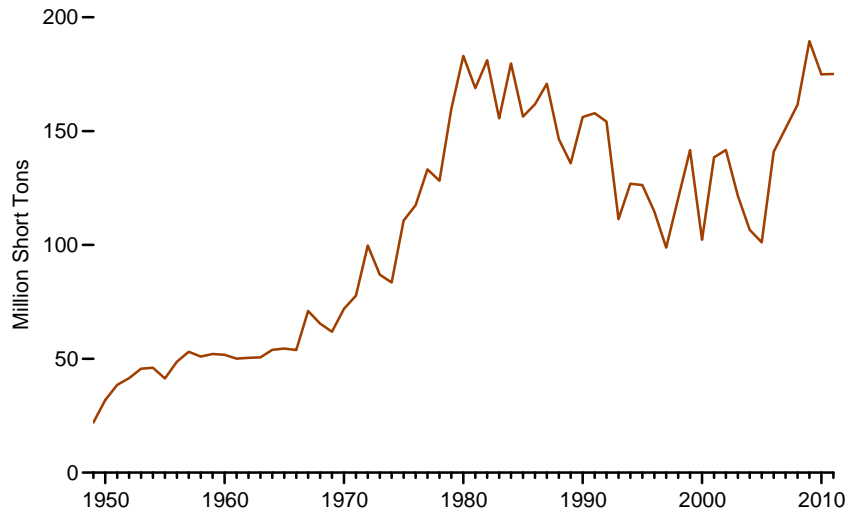
Notes: • See Table 8.7b for electric power sector electricity-only and CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1989. • See <http://www.eia.gov/electricity/> for related information.

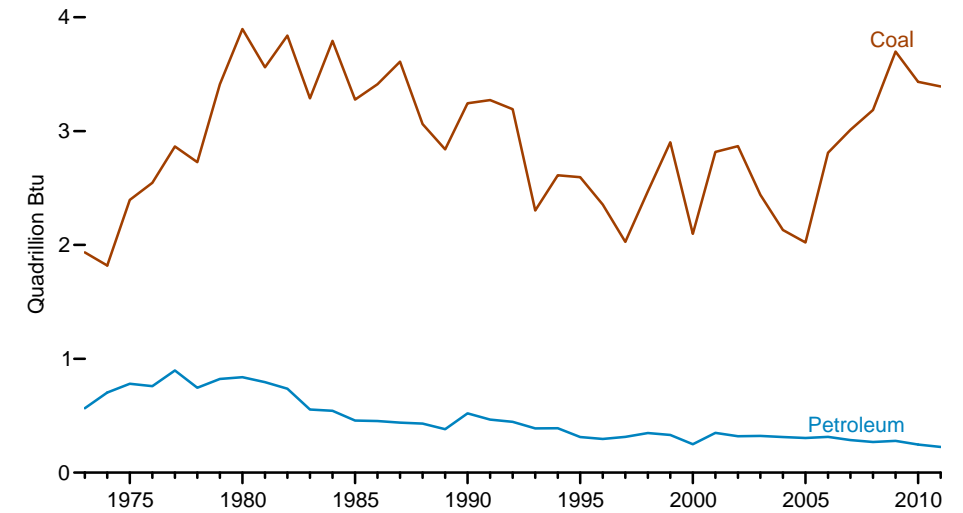
Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Figure 8.8 Stocks of Coal and Petroleum: Electric Power Sector, End of Year**

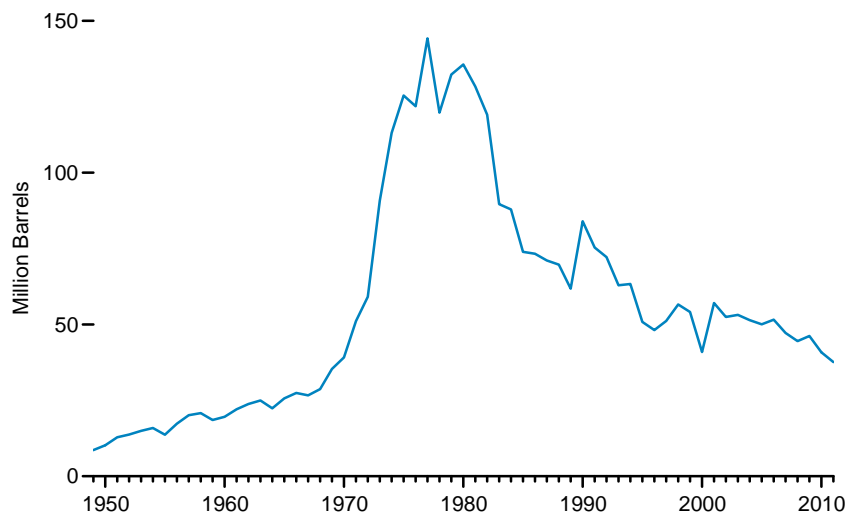
**Coal, 1949-2011**



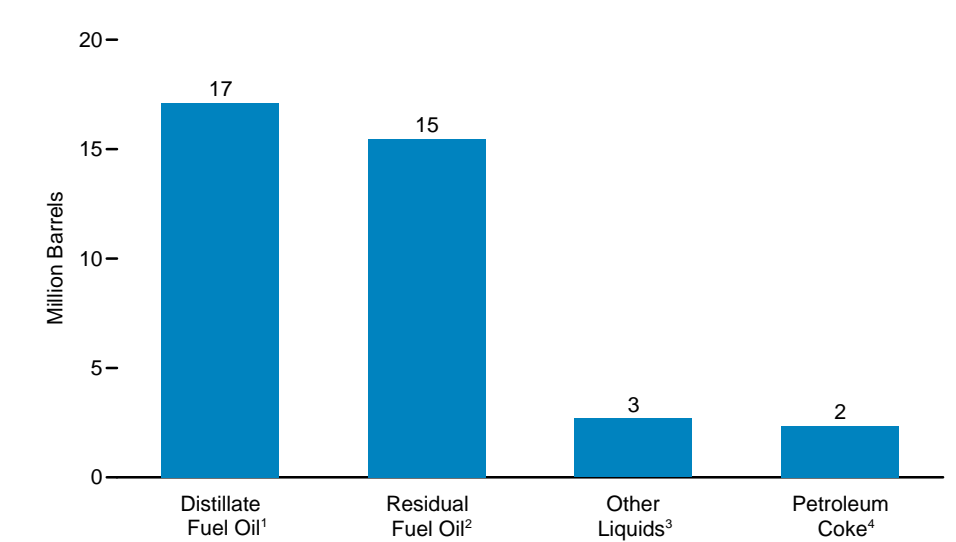
**Coal and Petroleum, 1973-2011**



**Petroleum, 1949-2011**



**Petroleum Products, 2011**



<sup>1</sup> Fuel oil nos. 1, 2, and 4.

<sup>2</sup> Fuel oil nos. 5 and 6.

<sup>3</sup> Jet fuel and kerosene.

<sup>4</sup> Petroleum coke, which is reported in short tons, is converted at a rate of 5 barrels per short ton.

Sources: Tables 8.8, A3, and A5.

**Table 8.8 Stocks of Coal and Petroleum: Electric Power Sector, Selected Years, End of Year 1949-2011**

Year	Coal <sup>1</sup>	Petroleum				Total <sup>5,6</sup>
		Distillate Fuel Oil <sup>2</sup>	Residual Fuel Oil <sup>3</sup>	Other Liquids <sup>4</sup>	Petroleum Coke <sup>5</sup>	
	Thousand Short Tons	Thousand Barrels			Thousand Short Tons	Thousand Barrels
1949	22,054	NA	NA	NA	NA	8,604
1950	31,842	NA	NA	NA	NA	10,201
1955	41,391	NA	NA	NA	NA	13,671
1960	51,735	NA	NA	NA	NA	19,572
1965	54,525	NA	NA	NA	NA	25,647
1970	71,908	NA	NA	NA	239	39,151
1975	110,724	16,432	108,825	NA	31	125,413
1976	117,436	14,703	106,993	NA	32	121,857
1977	133,219	19,281	124,750	NA	44	144,252
1978	128,225	16,386	102,402	NA	198	119,778
1979	159,714	20,301	111,121	NA	183	132,338
1980	183,010	30,023	105,351	NA	52	135,635
1981	168,893	26,094	102,042	NA	42	128,345
1982	181,132	23,369	95,515	NA	41	119,090
1983	155,598	18,801	70,573	NA	55	89,652
1984	179,727	19,116	68,503	NA	50	87,870
1985	156,376	16,386	57,304	NA	49	73,933
1986	161,806	16,269	56,841	NA	40	73,313
1987	170,797	15,759	55,069	NA	51	71,084
1988	146,507	15,099	54,187	NA	86	69,714
1989	135,860	13,824	47,446	NA	105	61,795
1990	156,166	16,471	67,030	NA	94	83,970
1991	157,876	16,357	58,636	NA	70	75,343
1992	154,130	15,714	56,135	NA	67	72,183
1993	111,341	15,674	46,770	NA	89	62,890
1994	126,897	16,644	46,344	NA	69	63,333
1995	126,304	15,392	35,102	NA	65	50,821
1996	114,623	15,216	32,473	NA	91	48,146
1997	98,826	15,456	33,336	NA	469	51,138
1998	120,501	16,343	37,451	NA	559	56,591
1999 <sup>7</sup>	141,604	17,995	34,256	NA	372	54,109
2000	102,296	15,127	24,748	NA	211	40,932
2001	138,496	20,486	34,594	NA	390	57,031
2002	141,714	17,413	25,723	800	1,711	52,490
2003	121,567	19,153	25,820	779	1,484	53,170
2004	106,669	19,275	26,596	879	937	51,434
2005	101,137	18,778	27,624	1,012	530	50,062
2006	140,964	18,013	28,823	1,380	674	51,583
2007	151,221	18,395	24,136	1,902	554	47,203
2008	161,589	17,761	21,088	1,955	739	44,498
2009	189,467	17,886	19,068	2,257	1,394	46,181
2010	<sup>R</sup> 174,917	<sup>R</sup> 16,758	<sup>R</sup> 16,629	<sup>R</sup> 2,319	<sup>R</sup> 1,019	<sup>R</sup> 40,800
2011 <sup>P</sup>	175,100	17,101	15,469	2,690	470	37,608

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, and lignite.

<sup>2</sup> Fuel oil nos. 1, 2, and 4. For 1973–1979, data are for gas turbine and internal combustion plant stocks of petroleum. For 1980–2000, electric utility data also include small amounts of kerosene and jet fuel.

<sup>3</sup> Fuel oil nos. 5 and 6. For 1973–1979, data are for steam plant stocks of petroleum. For 1980–2000, electric utility data also include a small amount of fuel oil no. 4.

<sup>4</sup> Jet fuel and kerosene. Through 2003, data also include a small amount of waste oil.

<sup>5</sup> Petroleum coke is converted from short tons to barrels by multiplying by 5.

<sup>6</sup> Distillate fuel oil and residual fuel oil; beginning in 1970, also includes petroleum coke; and beginning in 2002, also includes other liquids.

<sup>7</sup> Through 1998, data are for electric utilities only. Beginning in 1999, data are for electric utilities and independent power producers.

R=Revised. P=Preliminary. NA=Not available.

Notes: • The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants

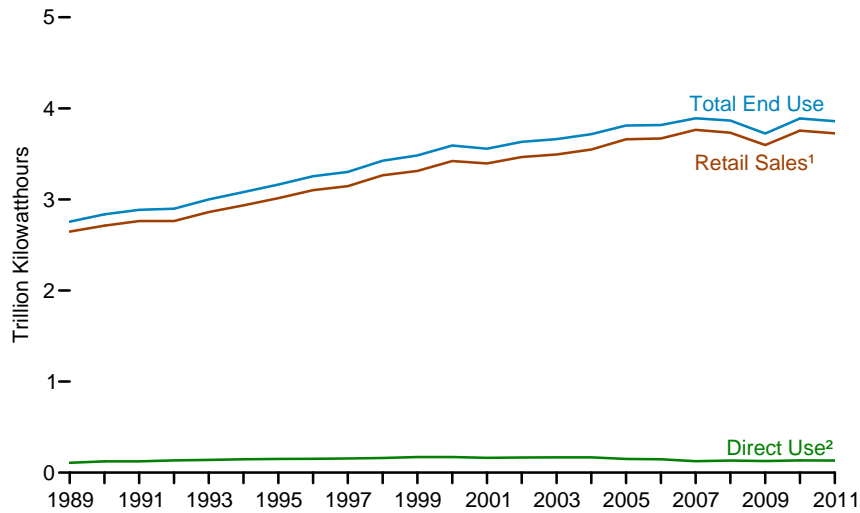
Into Energy-Use Sectors," at end of section. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1949. • See <http://www.eia.gov/electricity/> for related information.

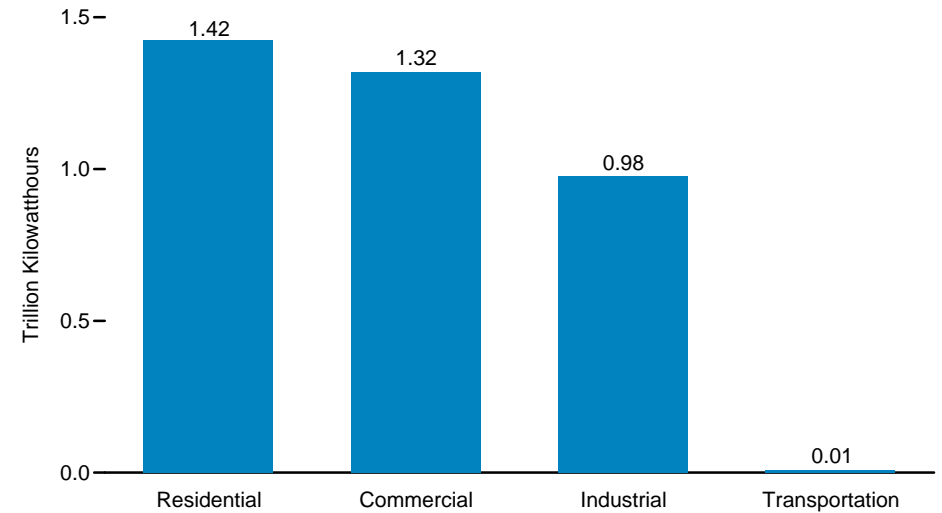
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982-1988—U.S. Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." • 1989-1997—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-759, "Monthly Power Plant Report," and Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001-2003—EIA, Form EIA-906, "Power Plant Report." • 2004-2007—EIA, Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report." • 2008 forward—EIA, Form EIA-923, "Power Plant Operations Report."

**Figure 8.9 Electricity End Use**

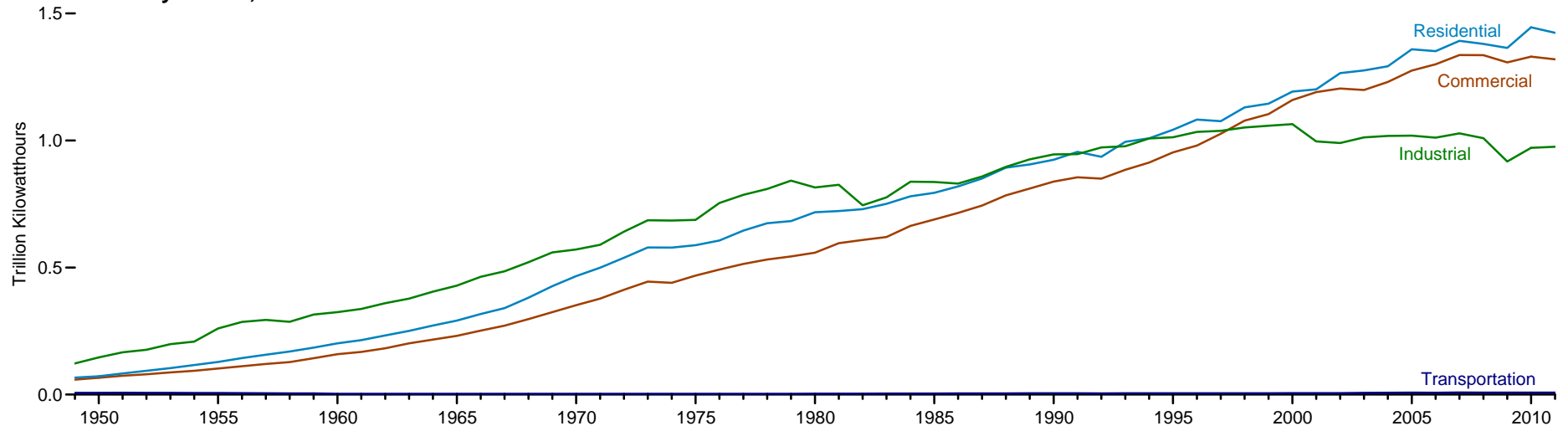
**Overview, 1989-2011**



**Retail Sales<sup>1</sup> by Sector, 2011**



**Retail Sales<sup>1</sup> by Sector, 1949-2011**



<sup>1</sup> Electricity retail sales to ultimate customers reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>2</sup> Use of electricity that is 1) self-generated, 2) produced by either the same entity that consumes the power or an affiliate, and 3) used in direct support of a service or industrial

process located within the same facility or group of facilities that house the generating equipment. Direct use is exclusive of station use.

Source: Table 8.9.



**Table 8.9 Electricity End Use, Selected Years, 1949-2011**  
(Billion Kilowatthours)

Year	Retail Sales <sup>1</sup>					Direct Use <sup>6</sup>	Total End Use <sup>7</sup>	Discontinued Retail Sales Series	
	Residential	Commercial <sup>2</sup>	Industrial <sup>3</sup>	Transportation <sup>4</sup>	Total Retail Sales <sup>5</sup>			Commercial (Old) <sup>8</sup>	Other (Old) <sup>9</sup>
1949	67	E59	123	E6	255	NA	255	45	20
1950	72	E66	146	E7	291	NA	291	51	22
1955	128	E103	260	E6	497	NA	497	79	29
1960	201	E159	324	E3	688	NA	688	131	32
1965	291	E231	429	E3	954	NA	954	200	34
1970	466	E352	571	E3	1,392	NA	1,392	307	48
1975	588	E468	688	E3	1,747	NA	1,747	403	68
1976	606	E492	754	E3	1,855	NA	1,855	425	70
1977	645	E514	786	E3	1,948	NA	1,948	447	71
1978	674	E531	809	E3	2,018	NA	2,018	461	73
1979	683	543	842	3	2,071	NA	2,071	473	73
1980	717	559	815	3	2,094	NA	2,094	488	74
1981	722	596	826	3	2,147	NA	2,147	514	85
1982	730	609	745	3	2,086	NA	2,086	526	86
1983	751	620	776	4	2,151	NA	2,151	544	80
1984	780	664	838	4	2,286	NA	2,286	583	85
1985	794	689	837	4	2,324	NA	2,324	606	87
1986	819	715	831	4	2,369	NA	2,369	631	89
1987	850	744	858	5	2,457	NA	2,457	660	88
1988	893	784	896	5	2,578	NA	2,578	699	90
1989	906	811	926	5	2,647	109	2,756	726	90
1990	924	838	946	5	2,713	125	2,837	751	92
1991	955	855	947	5	2,762	124	2,886	766	94
1992	936	850	973	5	2,763	134	2,897	761	93
1993	995	885	977	5	2,861	139	3,001	795	95
1994	1,008	913	1,008	5	2,935	146	3,081	820	98
1995	1,043	953	1,013	5	3,013	151	3,164	863	95
1996	1,083	980	1,034	5	3,101	153	3,254	887	98
1997	1,076	1,027	1,038	5	3,146	156	3,302	929	103
1998	1,130	1,078	1,051	5	3,264	161	3,425	979	104
1999	1,145	1,104	1,058	5	3,312	172	3,484	1,002	107
2000	1,192	1,159	1,064	5	3,421	171	3,592	1,055	109
2001	1,202	1,191	997	6	3,394	163	3,557	1,083	113
2002	1,265	1,205	990	6	3,465	166	3,632	1,104	106
2003	1,276	1,199	1,012	7	3,494	168	3,662	--	--
2004	1,292	1,230	1,018	7	3,547	168	3,716	--	--
2005	1,359	1,275	1,019	8	3,661	150	3,811	--	--
2006	1,352	1,300	1,011	7	3,670	147	3,817	--	--
2007	1,392	1,336	1,028	8	3,765	126	3,890	--	--
2008	1,380	1,336	1,009	8	3,733	132	3,865	--	--
2009	1,364	1,307	917	8	3,597	127	3,724	--	--
2010	R1,446	R1,330	R971	8	R3,754	R132	R3,886	--	--
2011	P1,424	P1,319	P976	P8	P3,726	E130	P3,856	--	--

<sup>1</sup> Electricity retail sales to ultimate customers reported by electric utilities and, beginning in 1996, other energy service providers.

<sup>2</sup> Commercial sector, including public street and highway lighting, interdepartmental sales, and other sales to public authorities.

<sup>3</sup> Industrial sector. Through 2002, excludes agriculture and irrigation; beginning in 2003, includes agriculture and irrigation.

<sup>4</sup> Transportation sector, including sales to railroads and railways.

<sup>5</sup> The sum of "Residential," "Commercial," "Industrial," and "Transportation."

<sup>6</sup> Use of electricity that is 1) self-generated, 2) produced by either the same entity that consumes the power or an affiliate, and 3) used in direct support of a service or industrial process located within the same facility or group of facilities that house the generating equipment. Direct use is exclusive of station use.

<sup>7</sup> The sum of "Total Retail Sales" and "Direct Use."

<sup>8</sup> "Commercial (Old)" is a discontinued series—data are for the commercial sector, excluding public street and highway lighting, interdepartmental sales, and other sales to public authorities.

<sup>9</sup> "Other (Old)" is a discontinued series—data are for public street and highway lighting, interdepartmental sales, other sales to public authorities, agriculture and irrigation, and transportation including railroads and railways.

R=Revised. P=Preliminary. E=Estimate. NA=Not available. -- =Not applicable.

Note: Totals may not equal sum of components due to independent rounding.

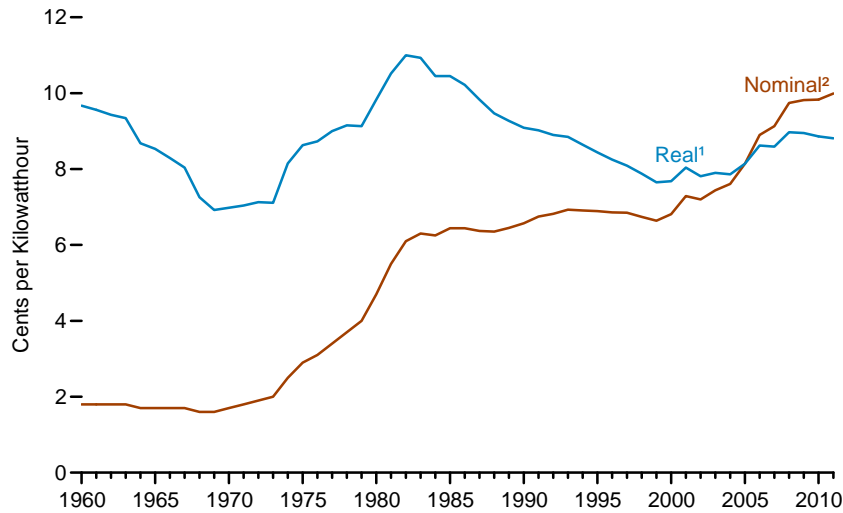
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#electricity> for updated monthly and

annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1949. • See <http://www.eia.gov/electricity/> for related information.

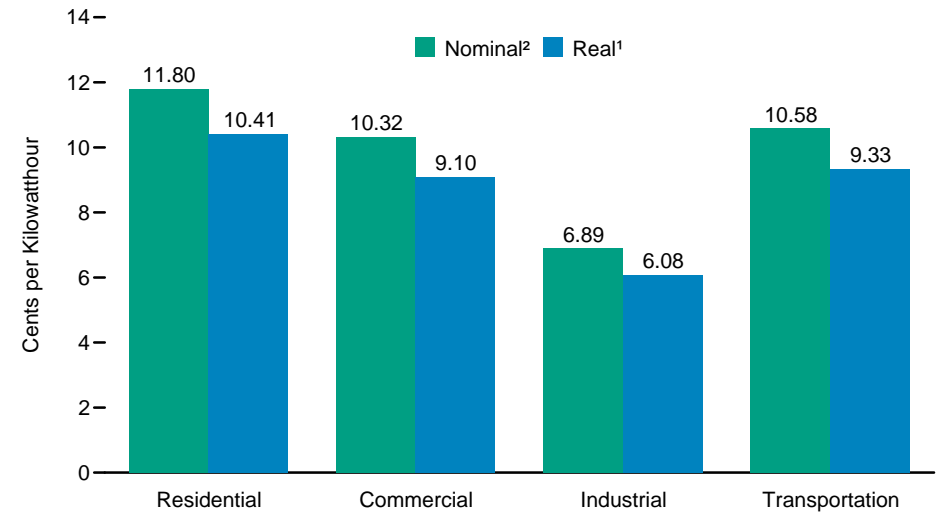
Sources: **Residential and Industrial:** • 1949-September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." • October 1977-February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." • March 1980-1982—FERC, Form FPC-5, "Electric Utility Company Monthly Statement." • 1983—U.S. Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." • 1984-1996—EIA, Form EIA-861, "Annual Electric Utility Report." • 1997 forward—EIA, *Electric Power Monthly (EPM)* (February 2012), Table 5.1. **Commercial:** • 1949-2002—Estimated by EIA as the sum of "Commercial (Old)" and the non-transportation portion of "Other (Old)." See estimation methodology at [http://www.eia.gov/state/seds/sep\\_use/notes/use\\_elec.pdf](http://www.eia.gov/state/seds/sep_use/notes/use_elec.pdf). • 2003 forward—EIA, EPM (February 2012), Table 5.1. **Transportation:** • 1949-2002—Estimated by EIA as the transportation portion of "Other (Old)." See estimation methodology at [http://www.eia.gov/state/seds/sep\\_use/notes/use\\_elec.pdf](http://www.eia.gov/state/seds/sep_use/notes/use_elec.pdf). • 2003 forward—EIA, EPM (February 2012), Table 5.1. **Direct Use:** • 1989-1997—EIA, Form EIA-867, "Annual Nonutility Power Producer Report." • 1998—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 1999-2010—EIA, *Electric Power Annual 2010* (November 2011), Table 7.2. • 2011—Estimate based on the 2010 value adjusted by the percentage change in commercial and industrial net generation on Table 8.1. **Commercial (Old) and Other (Old):** • 1949-2002—See sources for "Residential" and "Industrial."

**Figure 8.10 Average Retail Prices of Electricity**

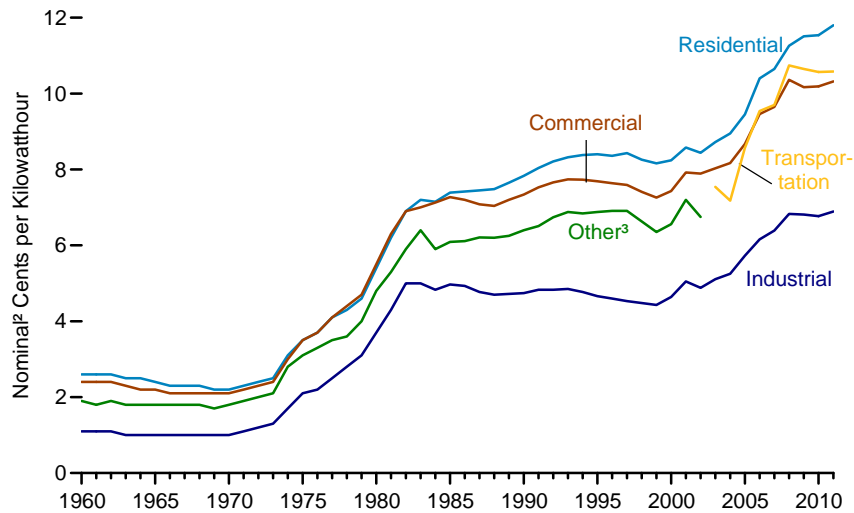
**Total, 1960-2011**



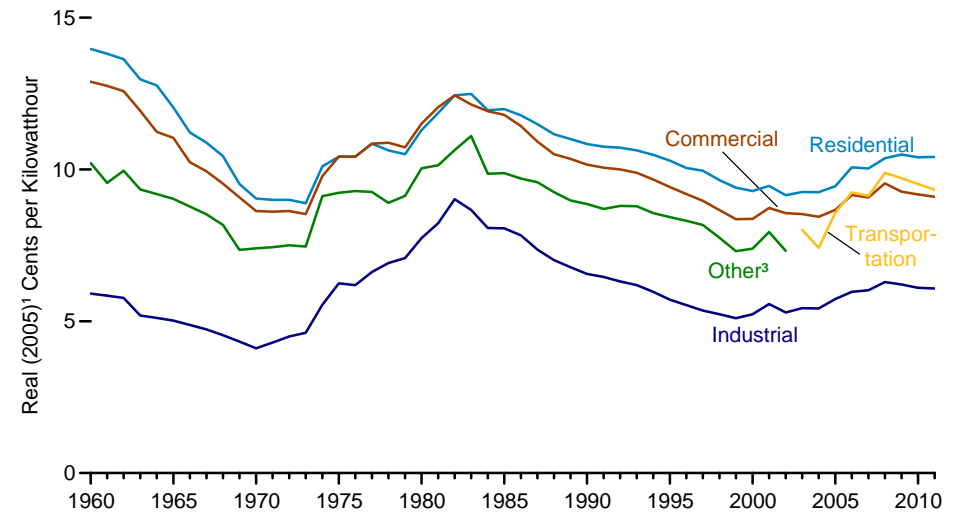
**By Sector, 2011**



**By Sector, Nominal<sup>2</sup> Prices, 1960-2011**



**By Sector, Real<sup>1</sup> Prices, 1960-2011**



<sup>1</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

<sup>2</sup> See "Nominal Price" in Glossary.

<sup>3</sup> Public street and highway lighting, interdepartmental sales, other sales to public authorities, agriculture and irrigation, and transportation including railroads and railways.

Note: Taxes are included.

Source: Table 8.10.

**Table 8.10 Average Retail Prices of Electricity, Selected Years, 1960-2011**  
(Cents per Kilowatthour, Including Taxes)

Year	Residential		Commercial <sup>1</sup>		Industrial <sup>2</sup>		Transportation <sup>3</sup>		Other <sup>4</sup>		Total	
	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>	Nominal <sup>5</sup>	Real <sup>6</sup>
1960	2.6	14.0	2.4	12.9	1.1	5.9	NA	NA	1.9	10.2	1.8	9.7
1965	2.4	R12.0	2.2	11.0	1.0	5.0	NA	NA	1.8	9.0	1.7	8.5
1966	2.3	11.2	2.1	R10.2	1.0	4.9	NA	NA	1.8	8.8	1.7	8.3
1967	2.3	10.9	2.1	R9.9	1.0	4.7	NA	NA	1.8	8.5	1.7	R8.0
1968	2.3	R10.4	2.1	9.5	1.0	4.5	NA	NA	1.8	8.2	1.6	7.3
1969	2.2	9.5	2.1	9.1	1.0	4.3	NA	NA	1.7	7.4	1.6	6.9
1970	2.2	R9.0	2.1	8.6	1.0	4.1	NA	NA	1.8	7.4	1.7	7.0
1971	2.3	9.0	2.2	8.6	1.1	4.3	NA	NA	1.9	7.4	1.8	R7.0
1972	2.4	9.0	2.3	8.6	1.2	4.5	NA	NA	2.0	7.5	1.9	7.1
1973	2.5	8.9	2.4	8.5	1.3	4.6	NA	NA	2.1	7.5	2.0	7.1
1974	3.1	10.1	3.0	9.8	1.7	5.5	NA	NA	2.8	9.1	2.5	8.2
1975	3.5	10.4	3.5	10.4	2.1	6.3	NA	NA	3.1	9.2	2.9	8.6
1976	3.7	10.4	3.7	10.4	2.2	6.2	NA	NA	3.3	9.3	3.1	8.7
1977	4.1	10.9	4.1	10.9	2.5	6.6	NA	NA	3.5	9.3	3.4	9.0
1978	4.3	10.6	4.4	10.9	2.8	6.9	NA	NA	3.6	8.9	3.7	9.2
1979	4.6	10.5	4.7	10.7	3.1	7.1	NA	NA	4.0	9.1	4.0	9.1
1980	5.4	11.3	5.5	11.5	3.7	R7.7	NA	NA	4.8	R10.0	4.7	9.8
1981	6.2	11.9	6.3	12.1	4.3	8.2	NA	NA	5.3	R10.1	5.5	10.5
1982	6.9	R12.4	6.9	R12.4	5.0	9.0	NA	NA	5.9	R10.6	6.1	11.0
1983	7.2	12.5	7.0	R12.1	5.0	8.7	NA	NA	6.4	11.1	6.3	10.9
1984	7.15	R11.95	7.13	R11.92	4.83	R8.07	NA	NA	5.90	R9.86	6.25	R10.45
1985	7.39	R11.99	7.27	R11.80	4.97	R8.06	NA	NA	6.09	R9.88	6.44	R10.45
1986	7.42	R11.78	7.20	R11.43	4.93	7.83	NA	NA	6.11	R9.70	6.44	R10.22
1987	7.45	R11.49	7.08	R10.92	4.77	R7.36	NA	NA	6.21	R9.58	6.37	R9.83
1988	7.48	R11.16	7.04	R10.50	4.70	R7.01	NA	NA	6.20	R9.25	6.35	R9.47
1989	7.65	11.00	7.20	R10.35	4.72	R6.78	NA	NA	6.25	R8.98	6.45	R9.27
1990	7.83	10.84	7.34	R10.16	4.74	R6.56	NA	NA	6.40	8.86	6.57	R9.09
1991	8.04	10.75	7.53	R10.06	4.83	6.46	NA	NA	6.51	R8.70	6.75	R9.02
1992	8.21	R10.72	7.66	R10.00	4.83	6.31	NA	NA	6.74	R8.80	6.82	R8.90
1993	8.32	R10.63	7.74	9.89	4.85	R6.19	NA	NA	6.88	R8.79	6.93	R8.85
1994	8.38	R10.48	7.73	R9.67	4.77	5.97	NA	NA	6.84	8.56	6.91	R8.64
1995	8.40	R10.29	7.69	R9.42	4.66	R5.71	NA	NA	6.88	R8.43	6.89	R8.44
1996	8.36	R10.05	7.64	R9.19	4.60	R5.53	NA	NA	6.91	R8.31	6.86	R8.25
1997	8.43	R9.96	7.59	R8.97	4.53	R5.35	NA	NA	6.91	8.17	6.85	R8.09
1998	8.26	R9.65	7.41	R8.66	4.48	R5.23	NA	NA	6.63	7.75	6.74	7.88
1999	8.16	9.40	7.26	R8.36	4.43	R5.10	NA	NA	6.35	R7.31	6.64	7.65
2000	8.24	R9.29	7.43	R8.37	4.64	5.23	NA	NA	6.56	R7.39	6.81	7.68
2001	8.58	9.46	7.92	R8.73	5.05	5.57	NA	NA	7.20	7.94	7.29	8.04
2002	8.44	R9.15	7.89	R8.56	4.88	R5.29	NA	NA	6.75	R7.32	7.20	R7.81
2003	8.72	R9.26	8.03	8.53	5.11	5.43	7.54	8.01	--	--	7.44	R7.90
2004	8.95	9.25	8.17	8.44	5.25	R5.42	7.18	7.42	--	--	7.61	7.86
2005	9.45	9.45	8.67	8.67	5.73	5.73	8.57	8.57	--	--	8.14	8.14
2006	10.40	10.07	9.46	9.16	6.16	5.97	9.54	9.24	--	--	8.90	8.62
2007	10.65	R10.03	9.65	9.08	6.39	R6.02	9.70	9.13	--	--	9.13	8.59
2008	11.26	10.37	10.36	9.54	6.83	6.29	10.74	9.89	--	--	9.74	8.97
2009	11.51	R10.49	10.17	R9.27	6.81	6.21	10.65	R9.71	--	--	9.82	R8.95
2010	R11.54	R10.40	R10.19	R9.18	R6.77	R6.10	R10.57	R9.52	--	--	R9.83	R8.86
2011 <sup>P</sup>	11.80	10.41	10.32	9.10	6.89	6.08	10.58	9.33	--	--	9.99	8.81

<sup>1</sup> Commercial sector. For 1960–2002, prices exclude public street and highway lighting, interdepartmental sales, and other sales to public authorities.

<sup>2</sup> Industrial sector. For 1960–2002, prices exclude agriculture and irrigation.

<sup>3</sup> Transportation sector, including railroads and railways.

<sup>4</sup> Public street and highway lighting, interdepartmental sales, other sales to public authorities, agriculture and irrigation, and transportation including railroads and railways.

<sup>5</sup> See "Nominal Price" in Glossary.

<sup>6</sup> In chained (2005) dollars, calculated by using gross domestic product implicit price deflators in Table D1. See "Chained Dollars" in Glossary.

R=Revised. P=Preliminary. NA=Not available. --=Not applicable.

Notes: • Beginning in 2003, the category "Other" has been replaced by "Transportation," and the categories "Commercial" and "Industrial" have been redefined. • Data represent revenue from electricity retail sales divided by electricity retail sales. • Prices include State and local taxes, energy or demand charges, customer service charges, environmental surcharges, franchise fees, fuel adjustments, and other miscellaneous charges applied to end-use customers during normal billing operations. Prices do not include deferred charges, credits, or other adjustments, such as fuel or revenue from purchased power, from

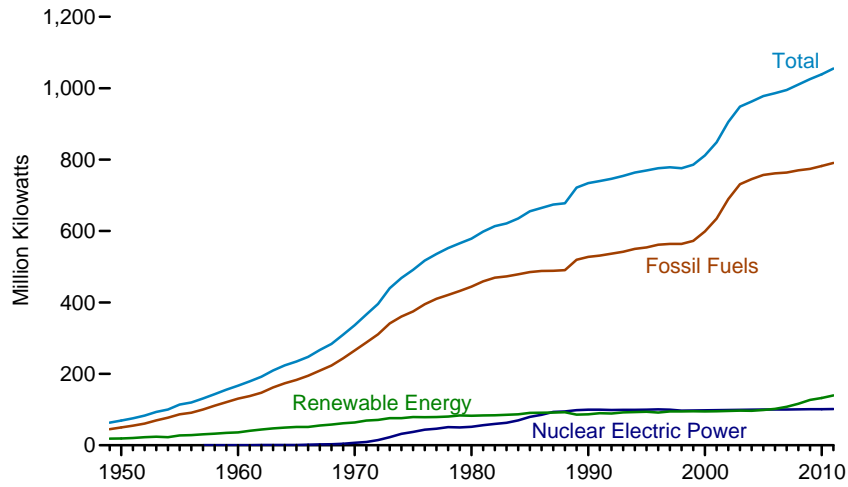
previous reporting periods. • Through 1979, data are for Classes A and B privately owned electric utilities only. (Class A utilities are those with operating revenues of \$2.5 million or more; Class B utilities are those with between \$1 million and \$2.5 million.) For 1980–1982, data are for selected Class A utilities whose electric operating revenues were \$100 million or more during the previous year. For 1983, data are for a selected sample of electric utilities. Beginning in 1984, data are for a census of electric utilities. Beginning in 1996, data also include energy service providers selling to retail customers.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#prices> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all annual data beginning in 1960. • See <http://www.eia.gov/electricity/> for related information.

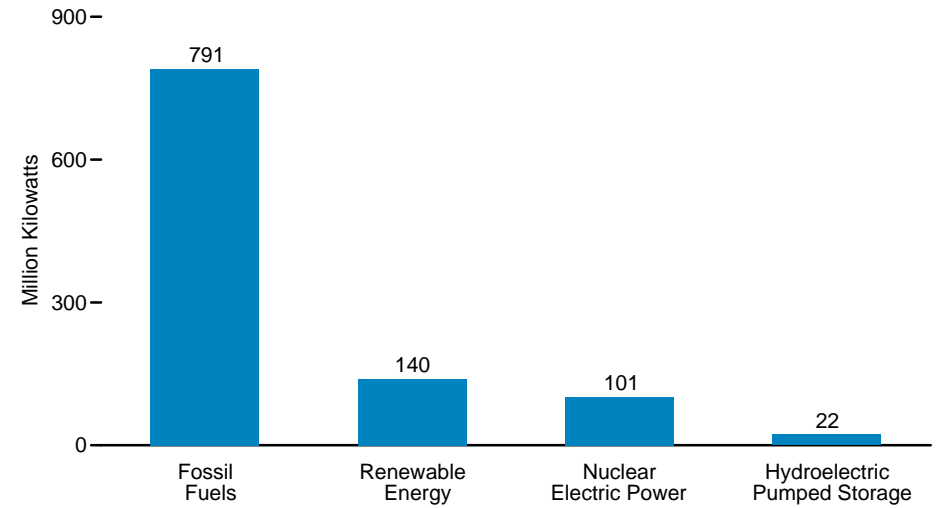
Sources: • 1960-September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." • October 1977-February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." • March 1980-1982—FERC, Form FERC-5, "Electric Utility Company Monthly Statement." • 1983—U.S. Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." • 1984-1996—EIA, Form EIA-861, "Annual Electric Utility Report." • 1997 forward—EIA, *Electric Power Monthly* (February 2012), Table 5.3.

**Figure 8.11a Electric Net Summer Capacity, Total (All Sectors)**

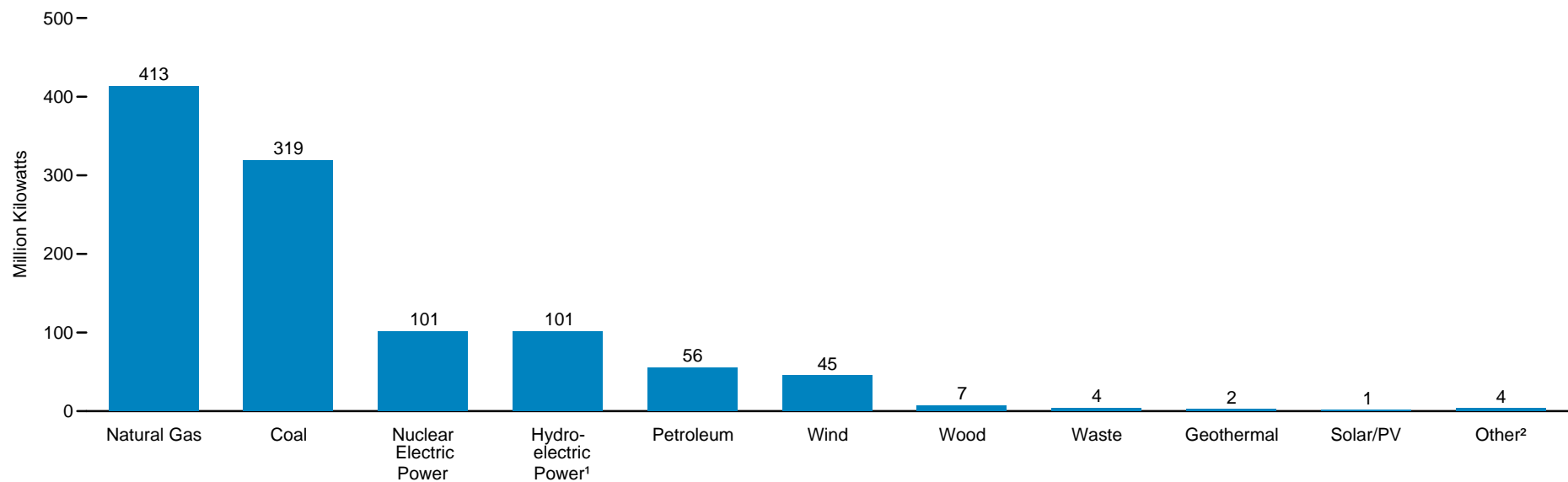
**Total, 1949-2011**



**By Major Category, 2011**



**By Source, 2011**



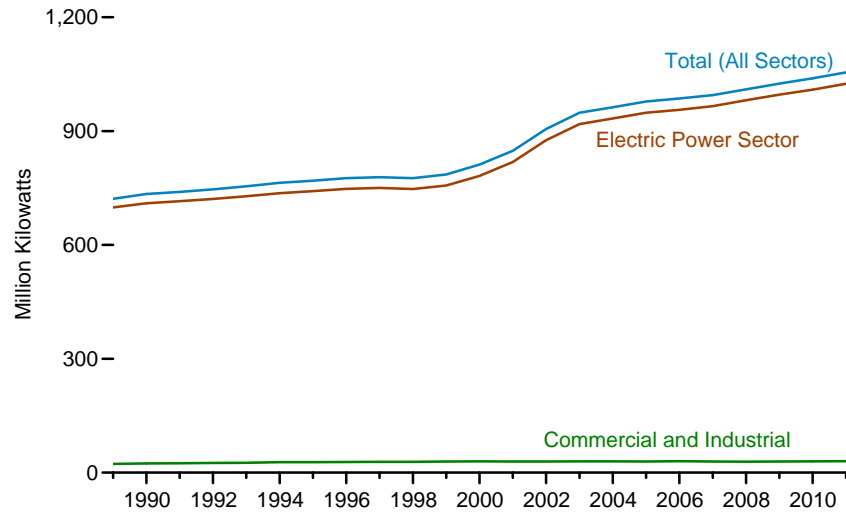
<sup>1</sup> Conventional and pumped storage.

Source: Table 8.11a.

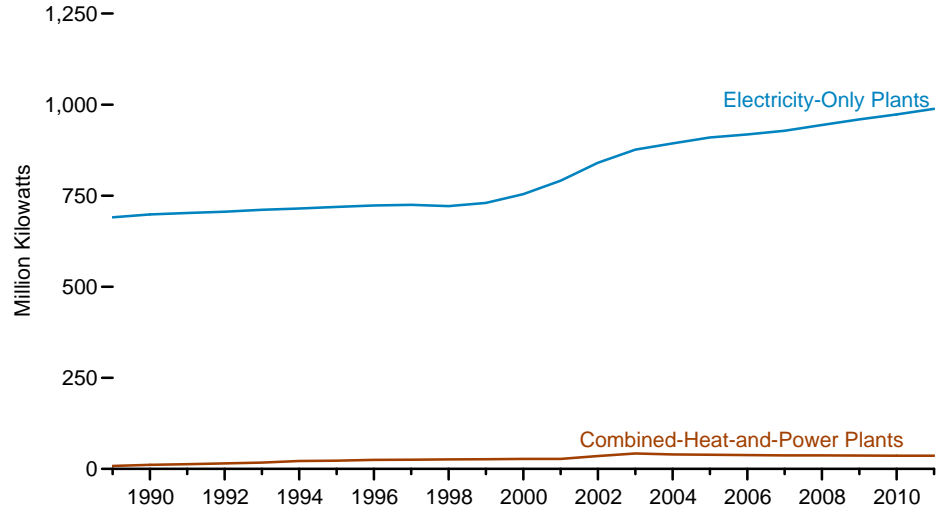
<sup>2</sup> Blast furnace gas, propane gas, other manufactured and waste gases derived from fossil fuels, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

**Figure 8.11b Electric Net Summer Capacity by Sector**

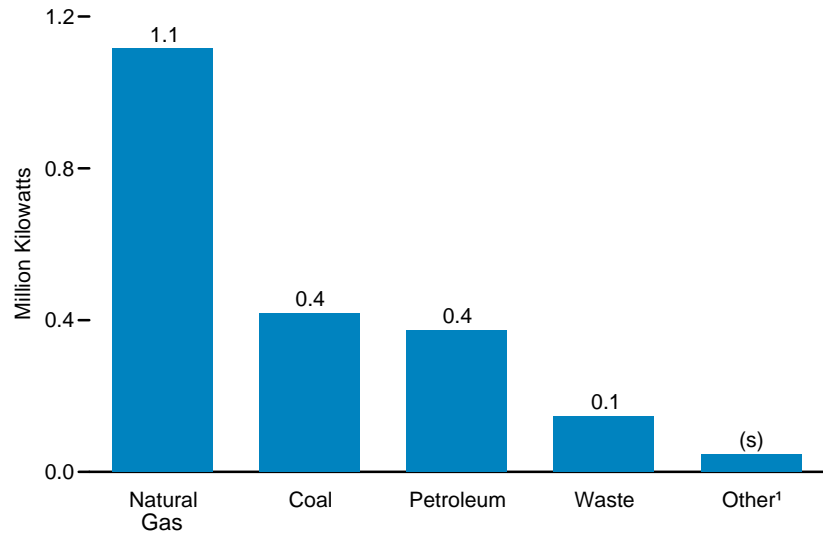
**Total (All Sectors) and Sectors, 1989-2011**



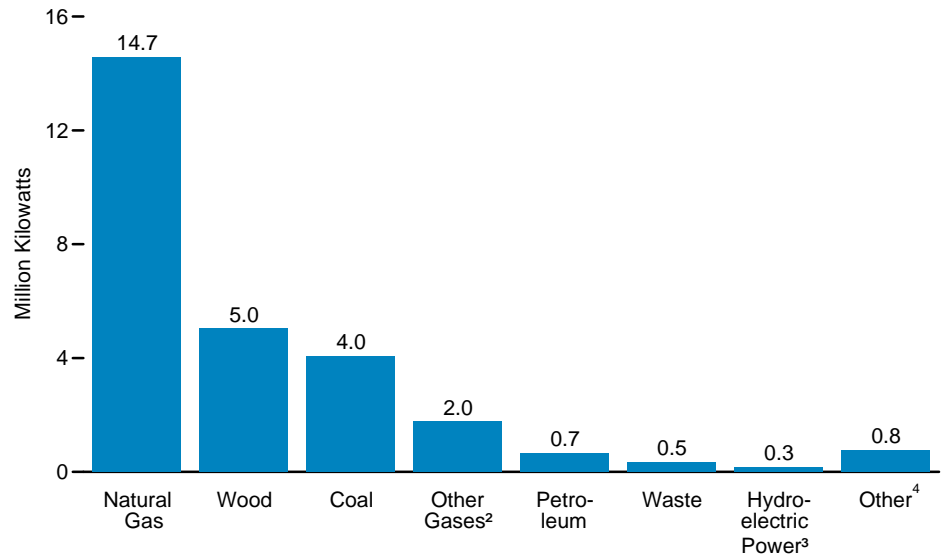
**Electric Power Sector by Plant Type, 1989-2011**



**Commercial Sector, 2011**



**Industrial Sector, 2011**



<sup>1</sup> Conventional hydroelectric power, solar/PV, wood, wind, blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>2</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels

<sup>3</sup> Conventional hydroelectric power.

<sup>4</sup> Solar/PV, wind, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

(s)=Less than 0.05 million kilowatts.

Sources: Tables 8.11a-8.11d.

**Table 8.11a Electric Net Summer Capacity: Total (All Sectors), Selected Years, 1949-2011**

(Sum of Tables 8.11b and 8.11d; Million Kilowatts)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage	Renewable Energy							Other <sup>9</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power <sup>5</sup>	Biomass		Geo-thermal	Solar/PV <sup>8</sup>	Wind	Total		
									Wood <sup>6</sup>	Waste <sup>7</sup>						
1949	NA	NA	NA	NA	44.9	0.0	( <sup>5</sup> )	18.5	(s)	( <sup>10</sup> )	NA	NA	NA	18.5	NA	63.4
1950	NA	NA	NA	NA	50.0	.0	( <sup>5</sup> )	19.2	(s)	( <sup>10</sup> )	NA	NA	NA	19.2	NA	69.2
1955	NA	NA	NA	NA	86.8	.0	( <sup>5</sup> )	27.4	(s)	( <sup>10</sup> )	NA	NA	NA	27.4	NA	114.2
1960	NA	NA	NA	NA	130.8	.4	( <sup>5</sup> )	35.8	.1	( <sup>10</sup> )	(s)	NA	NA	35.9	NA	167.1
1965	NA	NA	NA	NA	182.9	.8	( <sup>5</sup> )	51.0	.1	( <sup>10</sup> )	(s)	NA	NA	51.1	NA	234.8
1970	NA	NA	NA	NA	265.4	7.0	( <sup>5</sup> )	63.8	.1	( <sup>10</sup> )	.1	NA	NA	63.9	NA	336.4
1975	NA	NA	NA	NA	375.1	37.3	( <sup>5</sup> )	78.4	.1	( <sup>10</sup> )	.5	NA	NA	79.0	NA	491.3
1976	NA	NA	NA	NA	394.8	43.8	( <sup>5</sup> )	78.0	.1	( <sup>10</sup> )	.5	NA	NA	78.6	NA	517.2
1977	NA	NA	NA	NA	410.4	46.3	( <sup>5</sup> )	78.6	.1	( <sup>10</sup> )	.5	NA	NA	79.2	NA	535.9
1978	NA	NA	NA	NA	420.8	50.8	( <sup>5</sup> )	79.9	.1	( <sup>10</sup> )	.5	NA	NA	80.5	NA	552.1
1979	NA	NA	NA	NA	432.1	49.7	( <sup>5</sup> )	82.9	.1	( <sup>10</sup> )	.7	NA	NA	83.6	NA	565.5
1980	NA	NA	NA	NA	444.1	51.8	( <sup>5</sup> )	81.7	.1	( <sup>10</sup> )	.9	NA	NA	82.7	NA	578.6
1981	NA	NA	NA	NA	458.9	56.0	( <sup>5</sup> )	82.4	.1	( <sup>10</sup> )	.9	NA	(s)	83.4	NA	598.3
1982	NA	NA	NA	NA	469.6	60.0	( <sup>5</sup> )	83.0	.1	( <sup>10</sup> )	1.0	NA	(s)	84.1	NA	613.7
1983	NA	NA	NA	NA	472.8	63.0	( <sup>5</sup> )	83.9	.2	( <sup>10</sup> )	1.2	NA	(s)	85.3	NA	621.1
1984	NA	NA	NA	NA	478.6	69.7	( <sup>5</sup> )	85.3	.3	( <sup>10</sup> )	1.2	( <sup>11</sup> )	(s)	86.9	NA	635.1
1985	NA	NA	NA	NA	485.0	79.4	( <sup>5</sup> )	88.9	.2	.2	1.6	( <sup>11</sup> )	(s)	90.8	NA	655.2
1986	NA	NA	NA	NA	488.3	85.2	( <sup>5</sup> )	89.3	.2	.2	1.6	( <sup>11</sup> )	(s)	91.2	NA	664.8
1987	NA	NA	NA	NA	488.8	93.6	( <sup>5</sup> )	89.7	.2	.2	1.5	( <sup>11</sup> )	(s)	91.7	NA	674.1
1988	NA	NA	NA	NA	490.6	94.7	( <sup>5</sup> )	90.3	.2	.2	1.7	( <sup>11</sup> )	(s)	92.4	NA	677.7
1989 <sup>12</sup>	303.1	79.1	135.7	1.5	519.4	98.2	18.1	74.1	5.2	2.1	2.6	.2	1.5	85.7	.5	721.8
1990	307.4	77.9	140.8	1.6	527.8	99.6	19.5	73.9	5.5	2.5	2.7	.3	1.8	86.8	.5	734.1
1991	307.4	74.2	147.6	2.1	531.4	99.6	18.4	76.0	6.1	2.9	2.6	.3	1.9	89.9	.5	739.9
1992	309.4	73.1	152.2	2.1	536.7	99.0	21.2	74.8	6.2	3.0	2.9	.3	1.8	89.1	.5	746.5
1993	310.1	71.1	158.6	1.9	541.8	99.0	21.1	77.4	6.5	3.1	2.9	.3	1.8	92.1	.5	754.6
1994	311.4	71.7	164.8	2.1	550.0	99.1	21.2	78.0	6.7	3.3	3.0	.3	1.7	93.1	.5	764.0
1995	311.4	66.6	174.5	1.7	554.2	99.5	21.4	78.6	6.7	3.5	3.0	.3	1.7	93.9	.5	769.5
1996	313.4	72.5	174.1	1.7	561.7	100.8	21.1	76.4	6.8	3.6	2.9	.3	1.7	91.7	.5	775.9
1997	313.6	72.5	176.5	1.5	564.1	99.7	19.3	79.4	6.9	3.6	2.9	.3	1.6	94.8	.8	778.6
1998	315.8	66.3	180.3	1.5	563.9	97.1	19.5	79.2	6.8	3.7	2.9	.3	1.7	94.6	.8	775.9
1999	315.5	60.1	195.1	1.9	572.6	97.4	19.6	79.4	6.8	3.7	2.8	.4	2.3	95.3	1.0	785.9
2000	315.1	61.8	219.6	2.3	598.9	97.9	19.5	79.4	6.1	3.9	2.8	.4	2.4	94.9	.5	811.7
2001	314.2	66.2	252.8	1.7	634.9	98.2	19.7	78.9	5.9	3.7	2.2	.4	3.9	95.0	.5	848.3
2002	315.4	59.7	312.5	2.0	689.5	98.7	20.4	79.4	5.8	3.8	2.3	.4	4.4	96.1	.7	905.3
2003	313.0	60.7	355.4	2.0	731.2	99.2	20.5	78.7	5.9	3.8	2.1	.4	6.0	96.8	.7	948.4
2004	313.0	59.1	371.0	2.3	745.4	99.6	20.8	77.6	6.2	3.5	2.2	.4	6.5	96.4	.7	962.9
2005	313.4	58.5	383.1	2.1	757.1	100.0	21.3	77.5	6.2	3.6	2.3	.4	8.7	98.7	.9	978.0
2006	313.0	58.1	388.3	2.3	761.6	100.3	21.5	77.8	6.4	3.7	2.3	.4	11.3	101.9	.9	986.2
2007	312.7	56.1	392.9	2.3	764.0	100.3	21.9	77.9	6.7	4.1	2.2	.5	16.5	108.0	.8	994.9
2008	313.3	57.4	397.5	2.0	770.2	100.8	21.9	77.9	6.9	4.2	2.2	.5	24.7	116.4	.9	1,010.2
2009	314.3	56.8	401.3	1.9	774.3	101.0	22.2	78.5	6.9	4.3	2.4	.6	34.3	127.1	.9	1,025.4
2010	<sup>R</sup> 316.8	<sup>R</sup> 55.6	<sup>R</sup> 407.0	<sup>R</sup> 2.7	<sup>R</sup> 782.2	<sup>R</sup> 101.2	<sup>R</sup> 22.2	<sup>R</sup> 78.8	7.0	4.4	2.4	.9	<sup>R</sup> 39.1	<sup>R</sup> 132.6	<sup>R</sup> .9	<sup>R</sup> 1,039.1
2011 <sup>P</sup>	319.2	55.6	413.1	2.7	790.7	101.4	22.3	78.9	7.1	4.4	2.4	1.5	45.2	139.6	.9	1,054.8

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Through 1988, hydroelectric pumped storage is included in "Conventional Hydroelectric Power."

<sup>6</sup> Wood and wood-derived fuels.

<sup>7</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. For all years, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>8</sup> Solar thermal and photovoltaic (PV) energy.

<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>10</sup> Included in "Wood."

<sup>11</sup> Included in "Wind."

<sup>12</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities, independent power producers, commercial plants, and industrial plants.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.05 million kilowatts.

Notes: • Data are at end of year. • For plants that use multiple sources of energy, capacity is assigned to the energy source reported as the predominant one. • See Note 1, "Coverage of Electricity Statistics," at end of section. • See "Generator Net Summer Capacity" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1949.

• For related information, see <http://www.eia.gov/electricity/>.

Sources: Tables 8.11b and 8.11d.

**Table 8.11b Electric Net Summer Capacity: Electric Power Sector, Selected Years, 1949-2011**  
(Subset of Table 8.11a; Million Kilowatts)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage	Renewable Energy						Other <sup>9</sup>	Total	
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power <sup>5</sup>	Biomass		Geo-thermal	Solar/PV <sup>8</sup>	Wind			Total
									Wood <sup>6</sup>	Waste <sup>7</sup>						
1949	NA	NA	NA	NA	44.9	0.0	( <sup>5</sup> )	18.5	(s)	( <sup>10</sup> )	NA	NA	NA	18.5	NA	63.4
1950	NA	NA	NA	NA	50.0	.0	( <sup>5</sup> )	19.2	(s)	( <sup>10</sup> )	NA	NA	NA	19.2	NA	69.2
1955	NA	NA	NA	NA	86.8	.0	( <sup>5</sup> )	27.4	(s)	( <sup>10</sup> )	NA	NA	NA	27.4	NA	114.2
1960	NA	NA	NA	NA	130.8	.4	( <sup>5</sup> )	35.8	.1	( <sup>10</sup> )	(s)	NA	NA	35.9	NA	167.1
1965	NA	NA	NA	NA	182.9	.8	( <sup>5</sup> )	51.0	.1	( <sup>10</sup> )	(s)	NA	NA	51.1	NA	234.8
1970	NA	NA	NA	NA	265.4	7.0	( <sup>5</sup> )	63.8	.1	( <sup>10</sup> )	.1	NA	NA	63.9	NA	336.4
1975	NA	NA	NA	NA	375.1	37.3	( <sup>5</sup> )	78.4	.1	( <sup>10</sup> )	.5	NA	NA	79.0	NA	491.3
1976	NA	NA	NA	NA	394.8	43.8	( <sup>5</sup> )	78.0	.1	( <sup>10</sup> )	.5	NA	NA	78.6	NA	517.2
1977	NA	NA	NA	NA	410.4	46.3	( <sup>5</sup> )	78.6	.1	( <sup>10</sup> )	.5	NA	NA	79.2	NA	535.9
1978	NA	NA	NA	NA	420.8	50.8	( <sup>5</sup> )	79.9	.1	( <sup>10</sup> )	.5	NA	NA	80.5	NA	552.1
1979	NA	NA	NA	NA	432.1	49.7	( <sup>5</sup> )	82.9	.1	( <sup>10</sup> )	.7	NA	NA	83.6	NA	565.5
1980	NA	NA	NA	NA	444.1	51.8	( <sup>5</sup> )	81.7	.1	( <sup>10</sup> )	.9	NA	NA	82.7	NA	578.6
1981	NA	NA	NA	NA	458.9	56.0	( <sup>5</sup> )	82.4	.1	( <sup>10</sup> )	.9	NA	(s)	83.4	NA	598.3
1982	NA	NA	NA	NA	469.6	60.0	( <sup>5</sup> )	83.0	.1	( <sup>10</sup> )	1.0	NA	(s)	84.1	NA	613.7
1983	NA	NA	NA	NA	472.8	63.0	( <sup>5</sup> )	83.9	.2	( <sup>10</sup> )	1.2	NA	(s)	85.3	NA	621.1
1984	NA	NA	NA	NA	478.6	69.7	( <sup>5</sup> )	85.3	.3	( <sup>10</sup> )	1.2	( <sup>11</sup> )	(s)	86.9	NA	635.1
1985	NA	NA	NA	NA	485.0	79.4	( <sup>5</sup> )	88.9	.2	.2	1.6	( <sup>11</sup> )	(s)	90.8	NA	655.2
1986	NA	NA	NA	NA	488.3	85.2	( <sup>5</sup> )	89.3	.2	.2	1.6	( <sup>11</sup> )	(s)	91.2	NA	664.8
1987	NA	NA	NA	NA	488.8	93.6	( <sup>5</sup> )	89.7	.2	.2	1.5	( <sup>11</sup> )	(s)	91.7	NA	674.1
1988	NA	NA	NA	NA	490.6	94.7	( <sup>5</sup> )	90.3	.2	.2	1.7	( <sup>11</sup> )	(s)	92.4	NA	677.7
1989 <sup>12</sup>	298.0	78.1	125.4	.4	501.9	98.2	18.1	73.6	1.1	1.7	-2.6	.2	1.5	80.7	-	698.8
1990	302.3	76.8	129.9	.4	509.3	99.6	19.5	73.3	1.2	2.1	2.7	.3	1.8	81.4	(s)	709.9
1991	302.5	73.0	137.1	.7	513.3	99.6	18.4	75.4	1.3	2.5	2.6	.3	1.9	84.0	-	715.3
1992	304.3	71.8	141.0	.7	517.9	99.0	21.2	74.2	1.4	2.5	2.9	.3	1.8	83.1	-	721.2
1993	305.0	69.9	146.9	.7	522.5	99.0	21.1	76.8	1.5	2.6	2.9	.3	1.8	85.9	-	728.6
1994	306.1	70.5	152.5	.7	529.8	99.1	21.2	76.9	1.7	2.7	3.0	.3	1.7	86.4	-	736.5
1995	306.0	65.4	161.9	.3	533.7	99.5	21.4	77.4	1.8	3.0	3.0	.3	1.7	87.3	-	741.8
1996	308.1	71.3	161.4	.1	540.9	100.8	21.1	75.3	1.7	2.9	2.9	.3	1.7	84.9	-	747.7
1997	308.5	71.0	163.4	.2	543.1	99.7	19.3	78.3	1.8	2.9	2.9	.3	1.6	87.8	.2	750.1
1998	310.9	65.0	167.1	.1	543.0	97.1	19.5	78.0	1.8	3.0	2.9	.3	1.7	87.8	.2	747.6
1999	310.7	58.6	181.1	.2	550.7	97.4	19.6	78.3	1.8	3.0	2.8	.4	2.3	88.6	.2	756.5
2000	310.2	60.7	204.7	.3	575.9	97.9	19.5	78.2	1.7	3.3	2.8	.4	2.4	88.8	(s)	782.1
2001	309.8	64.7	236.8	.3	611.6	98.2	19.7	77.9	1.6	3.3	2.2	.4	3.9	89.2	.1	818.8
2002	311.0	58.6	296.6	.3	666.5	98.7	20.4	78.3	1.6	3.3	2.3	.4	4.4	90.2	.1	875.8
2003	308.5	59.6	339.1	.3	707.6	99.2	20.5	77.9	1.6	3.3	2.1	.4	6.0	91.3	.1	918.6
2004	308.8	58.0	355.2	.4	722.4	99.6	20.8	77.0	1.6	2.9	2.2	.4	6.5	90.6	.1	933.4
2005	309.0	57.4	367.5	.3	734.3	100.0	21.3	76.9	1.6	3.0	2.3	.4	8.7	92.9	.1	948.6
2006	309.2	56.8	372.0	.4	738.4	100.3	21.5	77.1	1.7	3.1	2.3	.4	11.3	95.9	.1	956.2
2007	309.1	54.8	377.1	.5	741.5	100.3	21.9	77.5	1.7	3.5	2.2	.5	16.5	102.0	.1	965.7
2008	309.6	56.4	381.8	.2	748.1	100.8	21.9	77.6	1.8	3.6	2.2	.5	24.7	110.5	.1	981.3
2009	310.5	55.7	385.5	.2	751.9	101.0	22.2	78.2	1.9	3.7	2.4	.6	34.3	121.1	.1	996.2
2010	R <sup>3</sup> 12.4	R <sup>5</sup> 4.6	R <sup>3</sup> 91.4	R <sup>7</sup>	R <sup>7</sup> 59.1	R <sup>4</sup> 101.2	R <sup>2</sup> 2.2	R <sup>7</sup> 85.5	R <sup>2</sup> 1	R <sup>3</sup> 7	2.4	.9	R <sup>3</sup> 9.1	R <sup>4</sup> 126.6	R <sup>1</sup>	1,009.2
2011 <sup>P</sup>	314.8	54.6	397.3	.7	767.4	101.4	22.3	78.6	2.1	3.8	2.4	1.5	45.2	133.5	.1	1,024.8

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Through 1988, hydroelectric pumped storage is included in "Conventional Hydroelectric Power."

<sup>6</sup> Wood and wood-derived fuels.

<sup>7</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. For all years, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>8</sup> Solar thermal and photovoltaic (PV) energy.

<sup>9</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>10</sup> Included in "Wood."

<sup>11</sup> Included in "Wind."

<sup>12</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities and independent power producers.

R=Revised. P=Preliminary. NA=Not available. - =No data reported. (s)=Less than 0.05 million

kilowatts.

Notes: • Data are at end of year. • For plants that use multiple sources of energy, capacity is assigned to the energy source reported as the predominant one. • The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. • See Table 8.11d for commercial and industrial CHP and electricity-only data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Generator Net Summer Capacity" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1949.

• For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1949-1984—U.S. Energy Information Administration (EIA) estimates. • 1985-1988—EIA, Form EIA-860, "Annual Electric Generator Report." • 1989-1997—EIA, Form EIA-860, "Annual Electric Generator Report," and Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860A, "Annual Electric Generator Report—Utility," and Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001 forward—EIA, Form EIA-860, "Annual Electric Generator Report."

**Table 8.11c Electric Net Summer Capacity: Electric Power Sector by Plant Type, Selected Years, 1989-2011**  
(Breakout of Table 8.11b; Million Kilowatts)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage	Renewable Energy							Other <sup>8</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power	Biomass		Geo-thermal	Solar/PV <sup>7</sup>	Wind	Total		
									Wood <sup>5</sup>	Waste <sup>6</sup>						
<b>Electricity-Only Plants <sup>9</sup></b>																
1989	296.5	78.0	119.3	0.4	494.2	98.2	18.1	73.6	0.9	1.5	2.6	0.2	1.5	80.3	—	690.7
1990	299.9	76.6	121.8	.4	498.6	99.6	19.5	73.3	1.0	1.9	2.7	.3	1.8	80.9	(s)	698.6
1995	301.3	64.7	145.3	.3	511.5	99.5	21.4	77.4	1.5	2.7	3.0	.3	1.7	86.6	—	719.1
1996	303.1	70.6	143.1	.1	516.9	100.8	21.1	75.3	1.4	2.6	2.9	.3	1.7	84.2	—	723.0
1997	303.6	70.2	144.7	.2	518.7	99.7	19.3	78.3	1.5	2.5	2.9	.3	1.6	87.1	.2	725.0
1998	305.9	64.2	147.5	.1	517.5	97.1	19.5	78.0	1.4	2.6	2.9	.3	1.7	87.0	.2	721.4
1999	305.5	57.5	161.7	.2	525.0	97.4	19.6	78.3	1.5	2.6	2.8	.4	2.3	87.8	.2	730.0
2000	305.2	59.8	184.0	.1	549.0	97.9	19.5	78.2	1.5	2.8	2.8	.4	2.4	88.1	(s)	754.5
2001	305.2	63.8	215.5	.1	584.5	98.2	19.7	77.9	1.5	2.9	2.2	.4	3.9	88.7	.1	791.1
2002	305.8	57.5	268.1	.1	631.5	98.7	20.4	78.3	1.4	2.9	2.3	.4	4.4	89.7	.1	840.3
2003	303.0	58.6	304.2	.1	665.9	99.2	20.5	77.9	1.4	2.8	2.1	.4	6.0	90.6	.1	876.3
2004	303.2	57.3	322.6	.1	683.2	99.6	20.8	77.0	1.5	2.6	2.2	.4	6.5	90.0	.1	893.7
2005	303.4	56.9	335.8	(s)	696.2	100.0	21.3	76.9	1.4	2.6	2.3	.4	8.7	92.3	.1	909.8
2006	303.4	55.8	341.9	.1	701.2	100.3	21.5	77.1	1.5	2.7	2.3	.4	11.3	95.3	.1	918.4
2007	303.2	53.9	347.6	.1	704.9	100.3	21.9	77.5	1.5	3.1	2.2	.5	16.5	101.3	.1	928.5
2008	303.7	55.5	352.3	—	711.5	100.8	21.9	77.6	1.6	3.2	2.2	.5	24.7	109.8	.1	944.0
2009	304.5	54.8	356.6	(s)	716.0	101.0	22.2	78.2	1.7	3.2	2.4	.6	34.3	120.3	.1	959.5
2010	<sup>R</sup> 306.9	<sup>R</sup> 53.8	<sup>R</sup> 362.4	<sup>R</sup> .5	<sup>R</sup> 723.7	<sup>R</sup> 101.2	<sup>R</sup> 22.2	<sup>R</sup> 78.5	1.7	3.3	2.4	.9	<sup>R</sup> 39.1	<sup>R</sup> 125.8	<sup>R</sup> .1	<sup>R</sup> 973.0
2011 <sup>P</sup>	309.4	53.8	368.3	.5	732.0	101.4	22.3	78.6	1.7	3.3	2.4	1.5	45.2	132.6	.1	988.5
<b>Combined-Heat-and-Power Plants <sup>10</sup></b>																
1989	1.5	0.2	6.1	—	7.7	—	—	—	0.2	0.2	—	—	—	0.4	—	8.1
1990	2.4	.2	8.1	—	10.7	—	—	—	.2	.2	—	—	—	.5	—	11.2
1995	4.8	.8	16.6	—	22.1	—	—	—	.4	.2	—	—	—	.6	—	22.7
1996	5.0	.7	18.4	—	24.0	—	—	—	.3	.3	—	—	—	.6	—	24.6
1997	4.9	.8	18.7	(s)	24.4	—	—	—	.3	.4	—	—	—	.7	—	25.1
1998	5.0	.8	19.6	—	25.5	—	—	—	.4	.4	—	—	—	.7	—	26.2
1999	5.2	1.1	19.4	—	25.7	—	—	—	.4	.4	—	—	—	.7	—	26.5
2000	5.0	.9	20.7	.3	26.9	—	—	—	.2	.5	—	—	—	.7	—	27.7
2001	4.6	1.0	21.2	.3	27.1	—	—	(s)	.1	.4	—	—	—	.5	(s)	27.6
2002	5.2	1.1	28.5	.2	34.9	—	—	—	.1	.4	—	—	—	.6	—	35.5
2003	5.5	1.1	34.9	.2	41.7	—	—	(s)	.2	.5	—	—	—	.7	—	42.3
2004	5.6	.7	32.6	.3	39.2	—	—	(s)	.2	.4	—	—	—	.6	—	39.7
2005	5.6	.5	31.7	.3	38.1	—	—	(s)	.2	.4	—	—	—	.6	—	38.7
2006	5.8	1.0	30.0	.3	37.2	—	—	(s)	.2	.4	—	—	—	.6	—	37.8
2007	5.9	.9	29.5	.3	36.6	—	—	—	.2	.4	—	—	—	.7	—	37.3
2008	5.9	.9	29.6	.2	36.6	—	—	—	.2	.5	—	—	—	.7	—	37.3
2009	5.9	.9	28.9	.2	35.9	—	—	—	.2	.5	—	—	—	.7	—	36.7
2010	<sup>R</sup> 5.5	<sup>R</sup> .8	<sup>R</sup> 29.0	.2	<sup>R</sup> 35.4	—	—	—	<sup>R</sup> .4	.5	—	—	—	.8	—	<sup>R</sup> 36.3
2011 <sup>P</sup>	5.5	.8	29.0	.2	35.4	—	—	—	.4	.5	—	—	—	.9	—	36.3

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal synfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood and wood-derived fuels.

<sup>6</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. For all years, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>7</sup> Solar thermal and photovoltaic (PV) energy.

<sup>8</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>9</sup> Electricity-only plants within the NAICS 22 category whose primary business is to sell electricity to the public. Data also include a small number of electric utility combined-heat-and-power (CHP) plants.

<sup>10</sup> Combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity and heat to the public. Data do not include electric utility CHP plants—these are included

under "Electricity-Only Plants."

R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.05 million kilowatts.

Notes: • Data are at end of year. • For plants that use multiple sources of energy, capacity is assigned to the energy source reported as the predominant one. • See Table 8.11d for commercial and industrial CHP and electricity-only data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Generator Net Summer Capacity" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1989.

• For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report," and Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860A, "Annual Electric Generator Report—Utility," and Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001 forward—EIA, Form EIA-860, "Annual Electric Generator Report."



**Table 8.11d Electric Net Summer Capacity: Commercial and Industrial Sectors, Selected Years, 1989-2011**

(Subset of Table 8.11a; Million Kilowatts)

Year	Fossil Fuels					Nuclear Electric Power	Hydro-electric Pumped Storage	Renewable Energy							Other <sup>8</sup>	Total
	Coal <sup>1</sup>	Petroleum <sup>2</sup>	Natural Gas <sup>3</sup>	Other Gases <sup>4</sup>	Total			Conventional Hydroelectric Power	Biomass		Geo-thermal	Solar/PV <sup>7</sup>	Wind	Total		
									Wood <sup>5</sup>	Waste <sup>6</sup>						
<b>Commercial Sector <sup>9</sup></b>																
1989	0.3	0.2	0.6	—	1.0	—	—	(s)	(s)	0.2	—	—	—	0.2	—	1.2
1990	.3	.2	.7	—	1.2	—	—	(s)	(s)	.2	—	—	—	.2	—	1.4
1995	.3	.2	1.2	—	1.8	—	—	(s)	(s)	.3	—	—	—	.3	—	2.1
1996	.3	.3	1.2	—	1.8	—	—	(s)	(s)	.4	—	—	—	.5	—	2.3
1997	.3	.4	1.2	—	1.9	—	—	(s)	(s)	.4	—	—	—	.5	—	2.3
1998	.3	.3	1.2	—	1.8	—	—	(s)	(s)	.5	—	—	—	.5	—	2.3
1999	.3	.4	1.1	—	1.8	—	—	(s)	(s)	.5	—	—	—	.5	—	2.3
2000	.3	.3	1.2	—	1.8	—	—	(s)	(s)	.4	—	—	—	.4	—	2.2
2001	.3	.3	1.9	—	2.5	—	—	(s)	(s)	.3	—	—	—	.4	—	2.9
2002	.3	.3	1.2	—	1.8	—	—	(s)	(s)	.4	—	—	—	.4	—	2.2
2003	.3	.3	1.0	—	1.7	—	—	(s)	(s)	.4	—	—	—	.4	—	2.1
2004	.4	.3	1.1	(s)	1.8	—	—	(s)	(s)	.4	—	—	—	.4	—	2.2
2005	.4	.3	1.0	(s)	1.8	—	—	(s)	(s)	.4	—	—	—	.5	—	2.2
2006	.4	.3	1.0	(s)	1.8	—	—	(s)	(s)	.4	—	—	—	.5	—	2.3
2007	.4	.3	1.1	(s)	1.8	—	—	(s)	(s)	.4	—	—	—	.5	(s)	2.3
2008	.4	.4	1.1	(s)	1.8	—	—	(s)	(s)	.4	—	(s)	—	.5	(s)	2.3
2009	.4	.3	1.1	(s)	1.9	—	—	(s)	(s)	.5	—	(s)	(s)	.5	(s)	2.4
2010	.4	<sup>R</sup> .4	1.2	(s)	1.9	—	—	(s)	(s)	.5	—	(s)	(s)	.5	(s)	2.5
2011 <sup>P</sup>	.4	.4	1.1	(s)	1.9	—	—	(s)	(s)	.1	—	(s)	(s)	.2	(s)	2.1
<b>Industrial Sector <sup>10</sup></b>																
1989	4.8	0.7	9.7	1.2	16.5	—	—	0.5	4.1	0.2	—	—	—	4.8	0.5	21.8
1990	4.8	.9	10.3	1.3	17.3	—	—	.6	4.3	.2	—	—	—	5.1	.5	22.9
1995	5.0	1.0	11.3	1.4	18.7	—	—	1.1	4.9	.2	—	—	—	6.3	.5	25.5
1996	5.0	.9	11.5	1.6	19.0	—	—	1.1	5.1	.2	—	—	—	6.4	.5	25.9
1997	4.8	1.1	11.9	1.3	19.2	—	—	1.1	5.1	.2	—	—	—	6.5	.6	26.2
1998	4.6	1.0	12.0	1.5	19.1	—	—	1.1	5.0	.2	—	—	—	6.3	.6	26.0
1999	4.4	1.1	12.9	1.7	20.1	—	—	1.1	5.0	.2	—	—	—	6.2	.8	27.1
2000	4.6	.8	13.7	2.0	21.2	—	—	1.1	4.4	.2	—	—	—	5.7	.5	27.3
2001	4.2	1.1	14.1	1.3	20.7	—	—	1.0	4.2	.1	—	—	—	5.4	.4	26.6
2002	4.0	.7	14.7	1.8	21.2	—	—	1.0	4.3	.1	—	—	—	5.5	.6	27.3
2003	4.1	.7	15.3	1.7	21.9	—	—	.8	4.3	.1	—	—	—	5.2	.6	27.7
2004	3.8	.8	14.8	1.9	21.3	—	—	.6	4.5	.2	—	—	—	5.4	.7	27.4
2005	4.0	.8	14.5	1.8	21.0	—	—	.7	4.5	.2	—	—	—	5.4	.8	27.2
2006	3.3	1.0	15.3	1.8	21.4	—	—	.7	4.7	.2	—	—	—	5.6	.8	27.8
2007	3.2	.9	14.7	1.9	20.6	—	—	.3	5.0	.2	—	(s)	—	5.5	.7	26.8
2008	3.2	.7	14.6	1.8	20.3	—	—	.3	5.0	.1	—	(s)	—	5.4	.9	26.6
2009	3.4	.7	14.7	1.7	20.5	—	—	.3	5.0	.1	—	(s)	—	5.5	.8	26.8
2010	4.0	.7	<sup>R</sup> 14.4	<sup>R</sup> 2.0	<sup>R</sup> 21.1	—	—	.3	<sup>R</sup> 4.9	<sup>R</sup> .2	—	(s)	<sup>R</sup> (s)	5.5	.8	<sup>R</sup> 27.4
2011 <sup>P</sup>	4.0	.7	14.7	2.0	21.3	—	—	.3	5.0	.5	—	(s)	(s)	5.9	.7	28.0

<sup>1</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and coal symfuel.

<sup>2</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

<sup>5</sup> Wood and wood-derived fuels.

<sup>6</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. For all years, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>7</sup> Solar thermal and photovoltaic (PV) energy.

<sup>8</sup> Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>9</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>10</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

R=Revised. P=Preliminary. —=No data reported. (s)=Less than 0.05 million kilowatts.

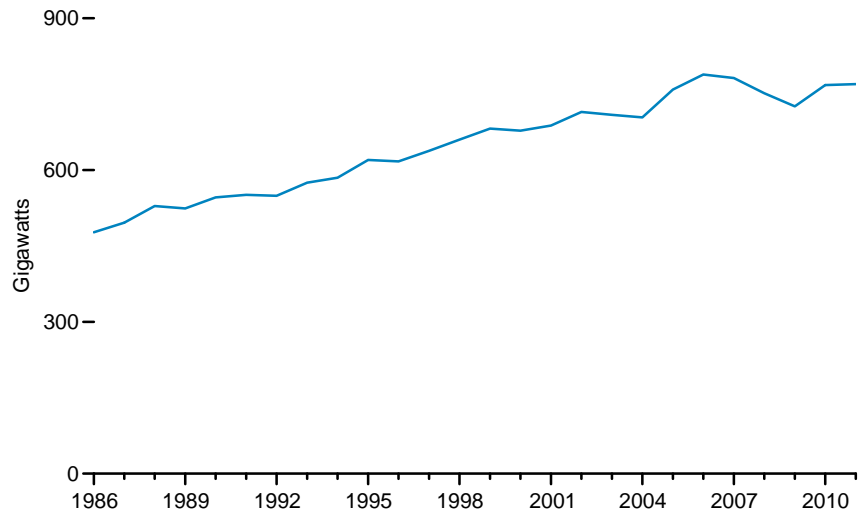
Notes: • Data are at end of year. • For plants that use multiple sources of energy, capacity is assigned to the energy source reported as the predominant one. • See Tables 8.11b and 8.11c for electric power sector electricity-only and CHP data. • See Note 1, "Coverage of Electricity Statistics," and Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of section. • See "Generator Net Summer Capacity" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#electricity> for all data beginning in 1989. • For related information, see <http://www.eia.gov/electricity/>.

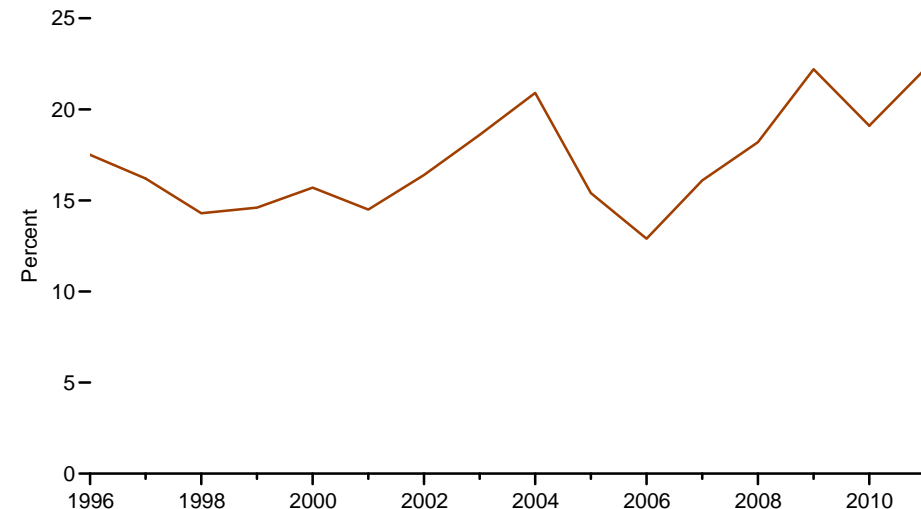
Sources: • 1989-1997—U.S. Energy Information Administration (EIA), Form EIA-867, "Annual Nonutility Power Producer Report." • 1998-2000—EIA, Form EIA-860B, "Annual Electric Generator Report—Nonutility." • 2001 forward—EIA, Form EIA-860, "Annual Electric Generator Report."

**Figure 8.12a Electric Noncoincident Peak Load and Capacity Margin: Summer Peak Period**

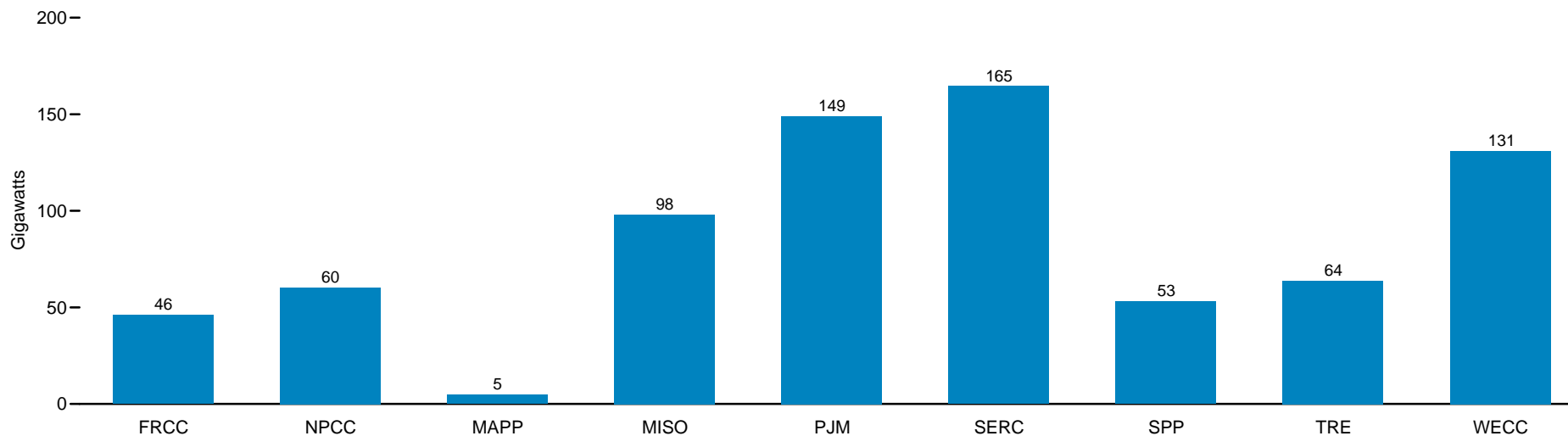
**U.S.<sup>1</sup> Summer Peak Load,<sup>2</sup> All Interconnections, 1986-2011**



**Summer Capacity Margin, 1996-2011**



**U.S.<sup>1</sup> Summer Peak Load<sup>2</sup> by NERC<sup>3</sup> Regional Assessment Area, 2011**



<sup>1</sup> United States excluding Alaska and Hawaii.

<sup>2</sup> See "Noncoincident Peak Load" in Glossary.

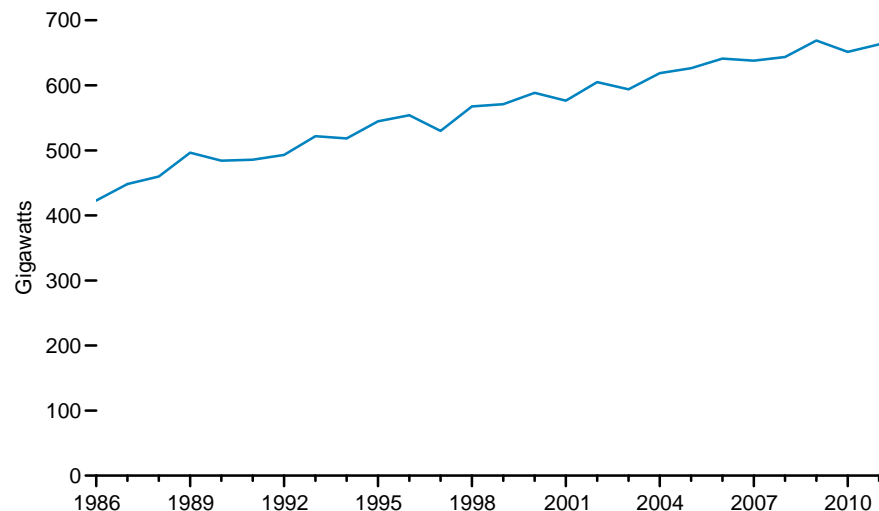
<sup>3</sup> See "North American Electric Reliability Corporation (NERC)" in Glossary.

Notes: • Values for 2011 are forecast. • The summer peak period is June through September.

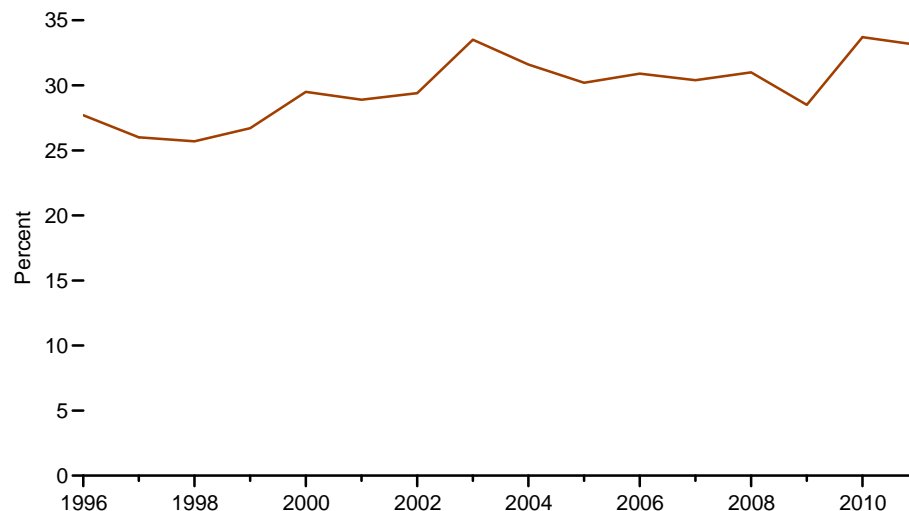
Source: Table 8.12a.

**Figure 8.12b Electric Noncoincident Peak Load and Capacity Margin: Winter Peak Period**

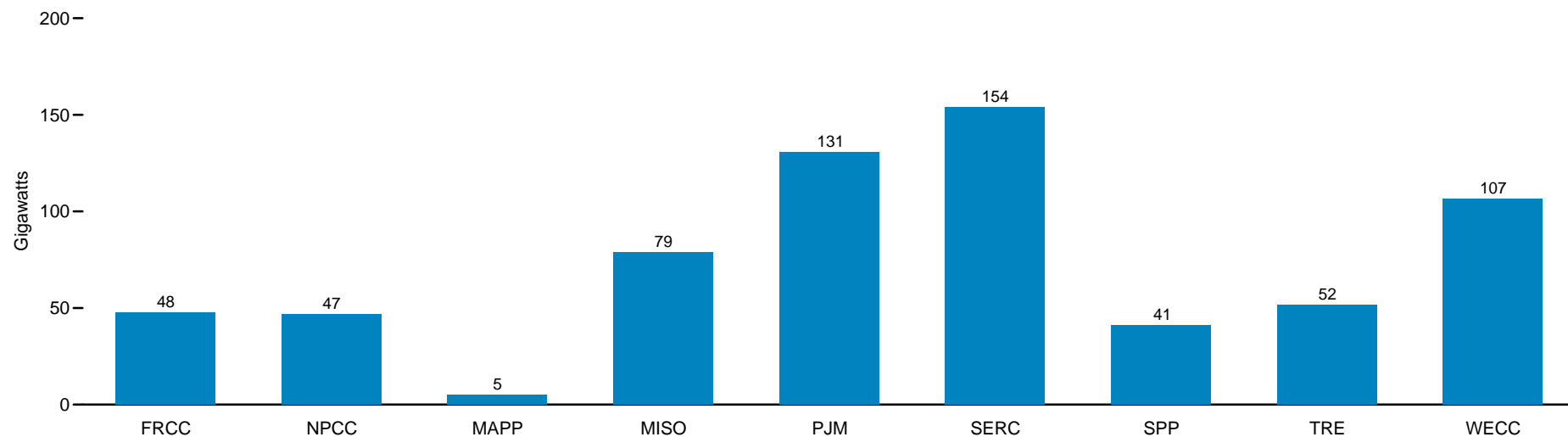
**U.S.<sup>1</sup> Winter Peak Load,<sup>2</sup> All Interconnections, 1986-2011**



**Winter Capacity Margin, 1996-2011**



**U.S.<sup>1</sup> Winter Peak Load<sup>2</sup> by NERC<sup>3</sup> Regional Assessment Area, 2011**



<sup>1</sup> United States excluding Alaska and Hawaii.

<sup>2</sup> See "Noncoincident Peak Load" in Glossary.

<sup>3</sup> See "North American Electric Reliability Corporation (NERC)" in Glossary.

Notes: • Values for 2011 are forecast. • The winter peak period is October through May.  
Source: Table 8.12b.

**Table 8.12a Electric Noncoincident Peak Load and Capacity Margin: Summer Peak Period, 1986-2011**  
(Megawatts, Except as Noted)

Year	Noncoincident Peak Load <sup>1</sup> by North American Electric Reliability Corporation (NERC) <sup>2</sup> Regional Assessment Area																Capacity Margin <sup>21</sup> (percent)	
	Eastern Interconnection														ERCOT <sup>4</sup>	Western Inter-connection		All Inter-connections
	FRCC <sup>5</sup>	NPCC <sup>6</sup>	Balance of Eastern Region <sup>3</sup>											TRE <sup>18</sup>				
		ECAR <sup>7,8</sup>	MAAC <sup>8,9</sup>	MAIN <sup>8,10</sup>	MAPP <sup>11</sup>	MISO <sup>12</sup>	MRO <sup>13</sup>	PJM <sup>14</sup>	RFC <sup>8,15</sup>	SERC <sup>16</sup>	SPP <sup>17</sup>	Subtotal						
1986	--	39,026	69,606	37,564	35,943	--	--	21,029	--	--	105,570	47,123	316,835	39,335	81,787	476,983	NA	
1987	--	42,651	72,561	40,526	37,446	--	--	23,162	--	--	109,798	47,723	331,216	39,339	82,967	496,173	NA	
1988	--	45,245	79,149	43,110	41,139	--	--	24,899	--	--	115,168	49,356	352,821	40,843	90,551	529,460	NA	
1989	--	45,031	75,442	41,614	39,460	--	--	24,336	--	--	117,729	49,439	348,020	40,402	90,657	524,110	NA	
1990	--	44,116	79,258	42,613	40,740	--	--	24,994	--	--	121,943	52,541	362,089	42,737	97,389	546,331	21.6	
1991	--	46,594	81,224	45,937	41,598	--	--	25,498	--	--	124,716	51,885	370,858	41,870	92,096	551,418	20.9	
1992	--	43,658	78,550	43,658	38,819	--	--	22,638	--	--	128,236	51,324	363,225	42,619	99,205	548,707	20.5	
1993	--	46,706	80,930	46,494	41,956	--	--	24,396	--	--	135,704	57,106	386,586	44,255	97,809	575,356	19.9	
1994	--	47,581	87,165	46,019	42,562	--	--	27,000	--	--	132,584	56,035	391,365	44,162	102,212	585,320	18.7	
1995	--	47,705	92,619	48,577	45,782	--	--	29,192	--	--	146,569	59,595	422,334	46,618	103,592	620,249	18.9	
1996	--	45,094	90,798	44,302	46,402	--	--	28,253	--	--	145,650	60,072	415,477	47,480	108,739	616,790	17.5	
1997	35,375	49,269	93,492	49,464	45,887	--	--	29,787	--	--	137,382	36,479	392,491	50,541	110,001	637,677	16.2	
1998	38,730	49,566	93,784	48,445	47,509	--	--	30,722	--	--	143,226	37,724	401,410	54,666	115,921	660,293	14.3	
1999	37,493	52,855	99,239	51,645	51,535	--	--	31,903	--	--	149,685	38,609	422,616	55,529	113,629	682,122	14.6	
2000	37,194	50,057	92,033	49,477	52,552	--	--	28,605	--	--	156,088	40,199	418,954	57,606	114,602	678,413	15.7	
2001	39,062	55,949	100,235	54,015	56,344	--	--	28,321	--	--	149,293	40,273	428,481	55,201	109,119	687,812	14.5	
2002	40,696	56,012	102,996	55,569	56,396	--	--	29,119	--	--	158,767	39,688	442,535	56,248	119,074	714,565	16.4	
2003	40,475	55,018	98,487	53,566	56,988	--	--	28,831	--	--	153,110	40,367	431,349	59,996	122,537	709,375	18.6	
2004	42,383	52,549	95,300	52,049	53,439	--	--	29,351	--	--	157,615	40,106	427,860	58,531	123,136	704,459	20.9	
2005	46,396	58,960	--	--	--	--	--	39,918	--	190,200	190,705	41,727	462,550	60,210	130,760	758,876	15.4	
2006	45,751	63,241	--	--	--	--	--	42,194	--	191,920	199,052	42,882	476,048	62,339	142,096	789,475	12.9	
2007	46,676	58,314	--	--	--	--	--	41,684	--	181,700	209,109	43,167	475,660	62,188	139,389	782,227	16.1	
2008	44,836	58,543	--	--	--	--	--	39,677	--	169,155	199,779	43,476	452,087	62,174	134,829	752,470	18.2	
2009	46,550	55,944	--	--	--	--	--	37,963	--	161,241	191,032	41,465	431,701	63,518	128,245	725,958	22.2	
2010	<sup>R</sup> 45,722	<sup>R</sup> 60,554	--	--	--	4,598	108,346	<sup>R</sup> --	136,465	<sup>R</sup> --	<sup>R</sup> 164,058	<sup>R</sup> 53,077	466,543	<sup>R</sup> 65,776	<sup>R</sup> 129,352	<sup>R</sup> 767,948	<sup>R</sup> 19.1	
2011 <sup>F</sup>	46,091	60,262	--	--	--	4,810	98,068	--	148,941	--	164,510	53,084	469,412	63,770	130,962	770,497	22.2	

<sup>1</sup> Noncoincident peak load is the sum of two or more peak loads on individual systems that do not occur at the same time interval. Peak load represents one hour of a day during the associated peak period. See "Noncoincident Peak Load" in Glossary.

<sup>2</sup> See "North American Electric Reliability Corporation (NERC)" in Glossary. Data include the U.S. portion of NERC only.

<sup>3</sup> Historically, the MRO, RFC, SERC, and SPP regional boundaries were altered as utilities changed reliability organizations. The historical data series for these regions have not been adjusted. Instead, the "Balance of Eastern Region" category was introduced to provide a consistent trend of the Eastern Interconnection.

<sup>4</sup> Electric Reliability Council of Texas (ERCOT).

<sup>5</sup> Florida Reliability Coordinating Council (FRCC).

<sup>6</sup> Northeast Power Coordinating Council (NPCC).

<sup>7</sup> East Central Area Reliability Coordination Agreement (ECAR).

<sup>8</sup> ECAR, MAAC, and MAIN dissolved at the end of 2005. Many of the former utility members joined RFC, which came into existence on January 1, 2006. RFC submitted a consolidated filing covering the historical NERC regions of ECAR, MAAC, and MAIN.

<sup>9</sup> Mid-Atlantic Area Council (MAAC).

<sup>10</sup> Mid-America Interconnected Network (MAIN).

<sup>11</sup> Mid-Continent Area Power Pool (MAPP).

<sup>12</sup> Midwest Independent Transmission System Operator (MISO).

<sup>13</sup> Midwest Reliability Organization (MRO).

<sup>14</sup> PJM Interconnection (PJM).

<sup>15</sup> ReliabilityFirst Corporation (RFC).

<sup>16</sup> SERC Reliability Corporation (SERC).

<sup>17</sup> Southwest Power Pool (SPP).

<sup>18</sup> Texas Reliability Entity (TRE).

<sup>19</sup> Western Electricity Coordinating Council (WECC).

<sup>20</sup> United States excluding Alaska and Hawaii.

<sup>21</sup> Capacity margin is the amount of unused available capability of an electric power system at peak load as a percentage of capacity resources. Data are for the United States excluding Alaska and Hawaii.

R=Revised. F=Forecast. NA=Not available. --=Not applicable.

Notes: • The summer peak period is June through September. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: U.S. Energy Information Administration (EIA), *Electric Power Annual 2010* (November 2011), Tables 4.1.A., 4.1.B., 4.3.A., and 4.3.B.; and EIA, Form EIA-411, "Coordinated Bulk Power Supply and Demand Program Report," and predecessor forms.

**Table 8.12b Electric Noncoincident Peak Load and Capacity Margin: Winter Peak Period, 1986-2011**  
(Megawatts, Except as Noted)

Year	Noncoincident Peak Load <sup>1</sup> by North American Electric Reliability Corporation (NERC) <sup>2</sup> Regional Assessment Area																Capacity Margin <sup>21</sup> (percent)
	Eastern Interconnection													ERCOT <sup>4</sup>	Western Inter-connection	All Inter-connections	
	FRCC <sup>5</sup>	NPCC <sup>6</sup>	Balance of Eastern Region <sup>3</sup>										TRE <sup>18</sup>				
		ECAR <sup>7,8</sup>	MAAC <sup>8,9</sup>	MAIN <sup>8,10</sup>	MAPP <sup>11</sup>	MISO <sup>12</sup>	MRO <sup>13</sup>	PJM <sup>14</sup>	RFC <sup>8,15</sup>	SERC <sup>16</sup>	SPP <sup>17</sup>	Subtotal					
1986	--	37,976	64,561	32,807	28,036	--	--	18,850	--	--	101,849	33,877	279,980	28,730	76,171	422,857	NA
1987	--	41,902	68,118	35,775	30,606	--	--	19,335	--	--	105,476	34,472	293,782	31,399	81,182	448,265	NA
1988	--	42,951	67,771	36,363	30,631	--	--	20,162	--	--	108,649	35,649	299,225	34,621	82,937	459,734	NA
1989	--	42,588	73,080	38,161	33,770	--	--	21,360	--	--	121,995	42,268	330,634	38,388	84,768	496,378	NA
1990	--	40,545	67,097	36,551	32,461	--	--	21,113	--	--	117,448	38,949	313,619	35,815	94,252	484,231	NA
1991	--	41,866	71,181	37,983	33,420	--	--	21,432	--	--	119,575	38,759	322,350	35,448	86,097	485,761	NA
1992	--	41,125	72,885	37,915	31,289	--	--	21,866	--	--	121,250	39,912	325,117	35,055	91,686	492,983	NA
1993	--	42,063	81,846	41,406	34,966	--	--	21,955	--	--	133,635	41,644	355,452	35,407	88,811	521,733	NA
1994	--	42,547	75,638	40,653	33,999	--	--	23,033	--	--	132,661	42,505	348,489	36,180	91,037	518,253	NA
1995	--	42,755	83,465	40,790	35,734	--	--	23,429	--	--	142,032	44,624	370,074	36,965	94,890	544,684	NA
1996	--	41,208	84,534	40,468	37,162	--	--	24,251	--	--	143,060	49,095	378,570	38,868	95,435	554,081	27.7
1997	33,076	41,338	75,670	37,217	34,973	--	--	25,390	--	--	122,649	27,437	323,336	37,966	94,158	529,874	26.0
1998	39,975	44,199	84,401	36,532	37,410	--	--	26,080	--	--	127,416	27,847	339,686	41,876	101,822	567,558	25.7
1999	40,178	45,227	86,239	40,220	39,081	--	--	25,200	--	--	128,563	27,963	347,266	39,164	99,080	570,915	26.7
2000	38,606	43,852	84,546	43,256	41,943	--	--	24,536	--	--	139,146	30,576	364,003	44,641	97,324	588,426	29.5
2001	40,922	42,670	85,485	39,458	40,529	--	--	21,815	--	--	135,182	29,614	352,083	44,015	96,622	576,312	28.9
2002	45,635	46,009	87,300	46,551	42,412	--	--	23,645	--	--	141,882	30,187	371,977	45,414	95,951	604,986	29.4
2003	36,841	48,079	86,332	45,625	41,719	--	--	24,134	--	--	137,972	28,450	364,232	42,702	102,020	593,874	33.5
2004	44,839	48,176	91,800	45,905	42,929	--	--	24,526	--	--	144,337	29,490	378,987	44,010	102,689	618,701	31.6
2005	42,657	46,828	--	--	--	--	--	33,748	--	151,600	164,638	31,260	381,246	48,141	107,493	626,365	30.2
2006	42,526	46,697	--	--	--	--	--	34,677	--	149,631	175,163	30,792	390,263	50,402	111,093	640,981	30.9
2007	41,701	46,795	--	--	--	--	--	33,191	--	141,900	179,888	31,322	386,301	50,408	112,700	637,905	30.4
2008	45,275	46,043	--	--	--	--	--	36,029	--	142,395	179,596	32,809	390,829	47,806	113,605	643,557	31.0
2009	53,022	44,864	--	--	--	--	--	35,351	--	143,827	193,135	32,863	405,176	56,191	109,565	668,818	28.5
2010	<sup>R</sup> 46,135	<sup>R</sup> 45,712	--	--	--	5,069	86,728	<sup>R</sup> --	115,535	<sup>R</sup> --	<sup>R</sup> 152,030	<sup>R</sup> 41,226	400,589	<sup>R</sup> 57,315	<sup>R</sup> 101,668	<sup>R</sup> 651,418	<sup>R</sup> 33.7
2011 <sup>F</sup>	47,613	46,788	--	--	--	5,118	79,052	--	130,711	--	154,150	41,138	410,168	51,642	106,717	662,928	33.1

<sup>1</sup> Noncoincident peak load is the sum of two or more peak loads on individual systems that do not occur at the same time interval. Peak load represents one hour of a day during the associated peak period. See "Noncoincident Peak Load" in Glossary.

<sup>2</sup> See "North American Electric Reliability Corporation (NERC)" in Glossary. Data include the U.S. portion of NERC only.

<sup>3</sup> Historically, the MRO, RFC, SERC, and SPP regional boundaries were altered as utilities changed reliability organizations. The historical data series for these regions have not been adjusted. Instead, the "Balance of Eastern Region" category was introduced to provide a consistent trend of the Eastern Interconnection.

<sup>4</sup> Electric Reliability Council of Texas (ERCOT).

<sup>5</sup> Florida Reliability Coordinating Council (FRCC).

<sup>6</sup> Northeast Power Coordinating Council (NPCC).

<sup>7</sup> East Central Area Reliability Coordination Agreement (ECAR).

<sup>8</sup> ECAR, MAAC, and MAIN dissolved at the end of 2005. Many of the former utility members joined RFC, which came into existence on January 1, 2006. RFC submitted a consolidated filing covering the historical NERC regions of ECAR, MAAC, and MAIN.

<sup>9</sup> Mid-Atlantic Area Council (MAAC).

<sup>10</sup> Mid-America Interconnected Network (MAIN).

<sup>11</sup> Mid-Continent Area Power Pool (MAPP).

<sup>12</sup> Midwest Independent Transmission System Operator (MISO).

<sup>13</sup> Midwest Reliability Organization (MRO).

<sup>14</sup> PJM Interconnection (PJM).

<sup>15</sup> ReliabilityFirst Corporation (RFC).

<sup>16</sup> SERC Reliability Corporation (SERC).

<sup>17</sup> Southwest Power Pool (SPP).

<sup>18</sup> Texas Reliability Entity (TRE).

<sup>19</sup> Western Electricity Coordinating Council (WECC).

<sup>20</sup> United States excluding Alaska and Hawaii.

<sup>21</sup> Capacity margin is the amount of unused available capability of an electric power system at peak load as a percentage of capacity resources. Data are for the United States excluding Alaska and Hawaii.

R=Revised. F=Forecast. NA=Not available. --=Not applicable.

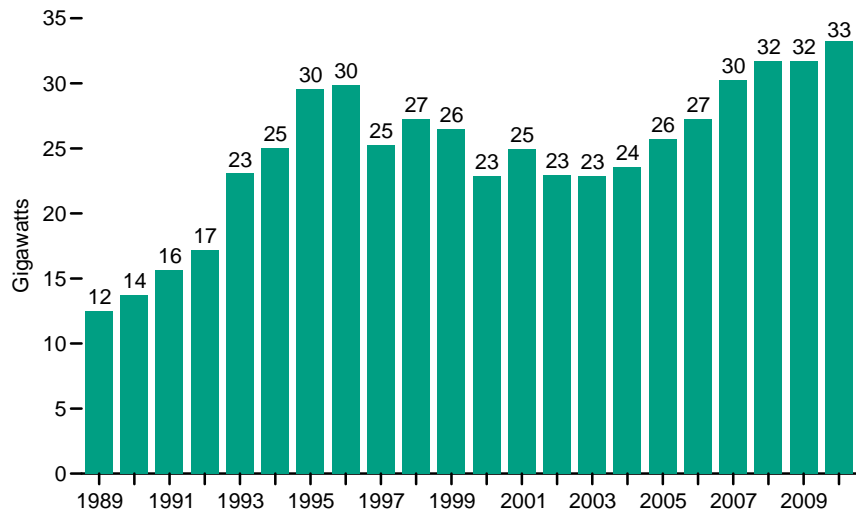
Notes: • The winter peak period is October through May of the following year. In this table, data years correspond to the beginning of the winter peak period; for example, data year 2011 represents October 2011–May 2012. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

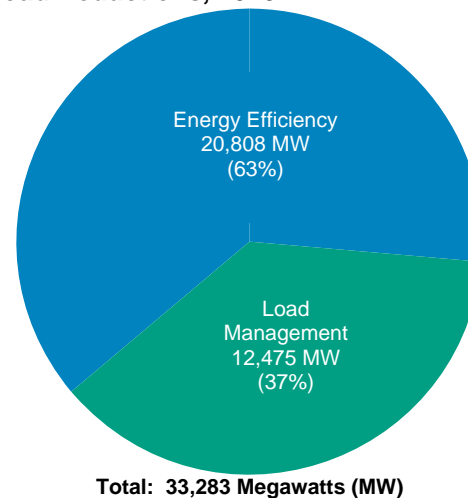
Sources: U.S. Energy Information Administration (EIA), *Electric Power Annual 2010* (November 2011), Tables 4.1.A., 4.1.B., 4.4.A., and 4.4.B.; and EIA, Form EIA-411, "Coordinated Bulk Power Supply and Demand Program Report," and predecessor forms.

**Figure 8.13 Electric Utility Demand-Side Management Programs**

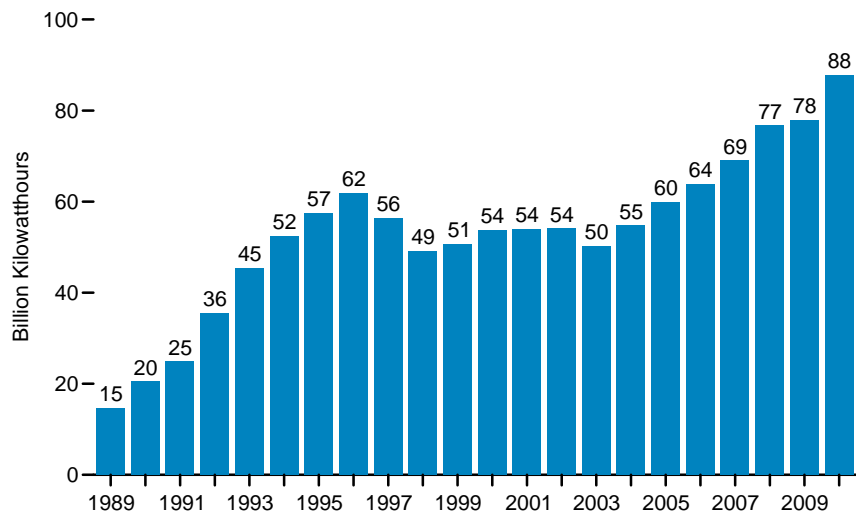
**Actual Peakload Reductions Total, 1989-2010**



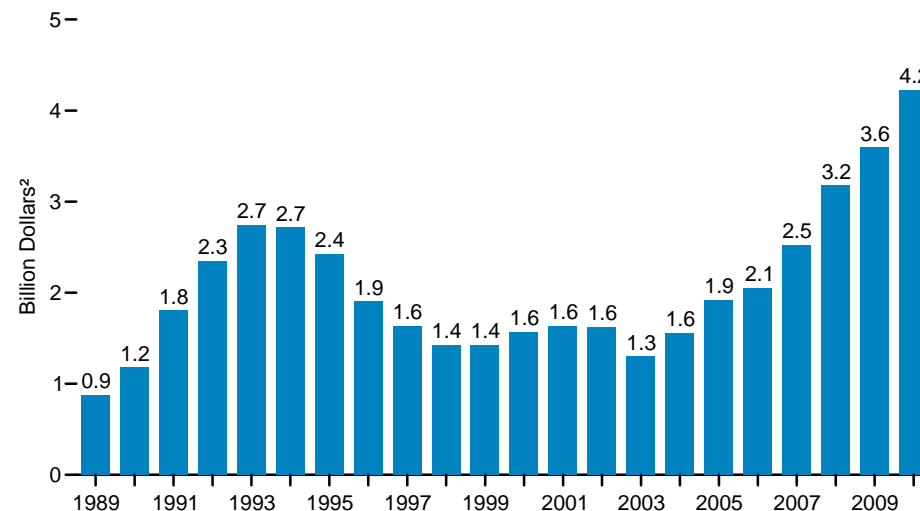
**Actual Peakload Reductions, 2010**



**Energy Savings, 1989-2010**



**Electric Utility Costs,<sup>1</sup> 1989-2010**



<sup>1</sup> Program costs consist of all costs associated with providing the various Demand-Side Management (DSM) programs or measures. The costs of DSM programs fall into these major categories: customer rebates/incentives, administration/marketing/training, performance incentives, research and evaluation, and other (most likely indirect) costs.

<sup>2</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary. Source: Table 8.13.

**Table 8.13 Electric Utility Demand-Side Management Programs, 1989-2010**

Year	Actual Peakload Reductions <sup>1</sup>			Energy Savings Million Kilowatthours	Electric Utility Costs <sup>4</sup> Thousand Dollars <sup>5</sup>
	Energy Efficiency <sup>2</sup>	Load Management <sup>3</sup>	Total		
	Megawatts				
1989	NA	NA	12,463	14,672	872,935
1990	NA	NA	13,704	20,458	1,177,457
1991	NA	NA	15,619	24,848	1,803,773
1992	7,890	9,314	17,204	35,563	2,348,094
1993	10,368	12,701	23,069	45,294	2,743,533
1994	11,662	13,340	25,001	52,483	2,715,657
1995	13,212	16,347	29,561	57,421	2,421,284
1996	14,243	15,650	29,893	61,842	1,902,197
1997	13,327	11,958	25,284	56,406	1,636,020
1998	13,591	13,640	27,231	49,167	1,420,920
1999	13,452	13,003	26,455	50,563	1,423,644
2000	12,873	10,027	22,901	53,701	1,564,901
2001	13,027	11,928	24,955	53,936	1,630,286
2002	13,420	9,516	22,936	54,075	1,625,537
2003	13,581	9,323	22,904	50,265	1,297,210
2004	14,272	9,260	23,532	54,710	1,557,466
2005	15,351	10,359	25,710	59,897	1,921,352
2006	15,959	11,281	27,240	63,817	2,051,394
2007	17,710	12,543	30,253	68,992	2,523,117
2008	19,707	12,028	31,735	76,674	3,175,410
2009	19,766	11,916	31,682	77,907	3,593,750
2010	20,808	12,475	33,283	87,839	4,220,064

<sup>1</sup> The actual reduction in peak load reflects the change in demand for electricity that results from a utility demand-side management (DSM) program that is in effect at the time that the utility experiences its actual peak load as opposed to the potential installed peakload reduction capacity. Differences between actual and potential peak reduction result from changes in weather, economic activity, and other variable conditions.

<sup>2</sup> "Energy Efficiency" refers to programs that are aimed at reducing the energy used by specific end-use devices and systems, typically without affecting the services provided. These programs reduce overall electricity consumption, often without explicit consideration for the timing of program-induced savings. Such savings are generally achieved by substituting technically more advanced equipment to produce the same level of end-use services (e.g., lighting, heating, motor drive) with less electricity. Examples include high-efficiency appliances, efficient lighting programs, high-efficiency heating, ventilating, and air conditioning systems or control modifications, efficient building design, advanced electric motor drives, and heat recovery systems.

<sup>3</sup> "Load Management" includes programs such as "Direct Load Control," "Interruptible Load Control," and "Other Types" of DSM programs. "Direct Load Control" refers to program activities that can interrupt consumer load at the time of annual peak load by direct control of the utility system operator by interrupting power supply to individual appliances or equipment on consumer premises. This type of control usually involves residential consumers. "Interruptible Load Control" refers to program activities that, in accordance with contractual arrangements, can interrupt consumer load at times of seasonal peak load by direct control of the utility system operator or by action of the consumer at the direct request of the system operator. It

usually involves commercial and industrial consumers. In some instances, the load reduction may be affected by direct action of the system operator (remote tripping) after notice to the consumer in accordance with contractual provisions. "Other Types" are programs that limit or shift peak loads from on-peak to off-peak time periods, such as space heating and water heating storage systems.

<sup>4</sup> Program costs consist of all costs associated with providing the various DSM programs or measures. The costs of DSM programs fall into these major categories: customer rebates/incentives, administration/marketing/training, performance, incentives, research and evaluation, and other (most likely indirect) costs.

<sup>5</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

NA=Not available.

Note: This table reports on the results of DSM programs operated by electric utilities. The decrease since 1998 in peakload reductions from DSM programs can be attributed in part to utilities cutting back or terminating these programs due to industry deregulation. Some State governments have created new programs to promote DSM. Examples include the "Energy Smart Loan Fund" administered by the New York Energy Research and Development Authority and the "Efficiency Vermont" program of the Vermont Public Service Board. Data on energy savings attributable to these non-utility programs are not collected by the U.S. Energy Information Administration (EIA).

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1989-1998—EIA, Form EIA-861, "Annual Electric Utility Report." • 1999 forward—EIA, *Electric Power Annual 2010* (November 2011), Tables 9.1, 9.6, and 9.7.

## Electricity

**Note 1. Coverage of Electricity Statistics.** Through 1984, data for electric utilities also include institutions (such as universities) and military facilities that generated electricity primarily for their own use; beginning in 1985, data for electric utilities exclude institutions and military facilities. Data for independent power producers, commercial plants, and industrial plants include plants with a generator nameplate capacity of 1 megawatt or greater; they exclude plants with a generator nameplate capacity less than 1 megawatt. Also excluded from the electricity statistics in Section 8 are data for residential and commercial self-generation from solar energy, except for the small amount sold to the grid and included in data for the electric power sector.

**Note 2. Classification of Power Plants Into Energy-Use Sectors.** The U.S. Energy Information Administration (EIA) classifies power plants (both electricity-only and combined-heat-and-power plants) into energy-use sectors based on the North American Industry Classification System (NAICS), which replaced the Standard Industrial Classification (SIC) system in 1997. Plants with a NAICS code of 22 are assigned to the Electric Power Sector. Those with NAICS codes beginning with 11 (agriculture, forestry, fishing, and hunting); 21 (mining, including oil and gas extraction); 23 (construction); 31-33 (manufacturing); 2212 (natural gas distribution); and 22131 (water supply and irrigation systems) are assigned to the Industrial Sector. Those with all other codes are assigned to the Commercial Sector. Form EIA-860, "Annual Electric Generator Report," asks respondents to indicate the primary purpose of the facility by assigning a NAICS code from the list at: <http://www.eia.gov/cneaf/electricity/forms/eia860.doc>.

**Note 3. Electricity Imports and Exports.** Through the *Annual Energy Review* (AER) 2001, EIA estimated the proportions of traded electricity from fossil fuels and hydropower (and applied the fossil-fuel steam-electric-plant heat rate to convert from kilowatthours to Btu) and from geothermal (and applied the heat rate for geothermal energy plants). Beginning with the AER 2002, because of inadequate data, EIA is applying an overall rate of 3,412 Btu per kilowatthour to all traded electricity. In addition, electricity net imports derived from hydroelectric power and geothermal energy are no longer included in renewable energy

consumption data. They continue to be included in total U.S. energy consumption as components of electricity net imports, with energy sources unspecified (see Tables 1.3 and 2.1f). This change between AER 2001 and AER 2002 resulted in a 0.0-to-0.5 quadrillion Btu drop in total renewable energy consumption from 1949 forward.

**Table 8.1 Sources: Net Generation, Electric Power Sector:** Table 8.2b. **Net Generation, Commercial Sector:** Table 8.2d. **Net Generation, Industrial Sector:** • 1949-September 1977—Federal Power Commission (FPC), Form FPC-4, "Monthly Power Plant Report," for plants with generating capacity exceeding 10 megawatts, and FPC, Form FPC-12C, "Industrial Electric Generating Capacity," for all other plants. • October 1977-1978—Federal Energy Regulatory Commission (FERC), Form FPC-4, "Monthly Power Plant Report," for plants with generating capacity exceeding 10 megawatts, and FERC, Form FPC-12C, "Industrial Electric Generating Capacity," for all other plants. • 1979—FERC, Form FPC-4, "Monthly Power Plant Report," for plants with generating capacity exceeding 10 megawatts, and EIA estimates for all other plants. • 1980-1988—Estimated by U.S. Energy Information Administration (EIA) as the average generation over the 6-year period of 1974-1979. • 1989 forward—Table 8.2d. **Net Generation, Total:** Table 8.2a. **Imports and Exports:** • 1949-September 1977—Unpublished FPC data. • October 1977-1980—Unpublished Economic Regulatory Administration (ERA) data. • 1981—U.S. Department of Energy (DOE), Office of Energy Emergency Operations, "Report on Electric Energy Exchanges with Canada and Mexico for Calendar Year 1981," April 1982 (revised June 1982). • 1982 and 1983—DOE, ERA, *Electricity Exchanges Across International Borders*. • 1984-1986—DOE, ERA, *Electricity Transactions Across International Borders*. • 1987 and 1988—DOE, ERA, Form ERA-781R, "Annual Report of International Electrical Export/Import Data." • 1989—DOE, Fossil Energy, Form FE-781R, "Annual Report of International Electrical Export/Import Data." • 1990 forward—National Energy Board of Canada, and DOE, Office of Electricity Delivery and Energy Reliability, Form OE-781R, "Monthly Electricity Imports and Exports Report," and predecessor form. For 2001 forward, data from the California Independent System Operator are used in combination with the Form OE-781 values to estimate electricity trade with Mexico. **T & D Losses and Unaccounted for:** Calculated as the sum of total net generation and imports minus total end use and exports. **End Use:** Table 8.9.

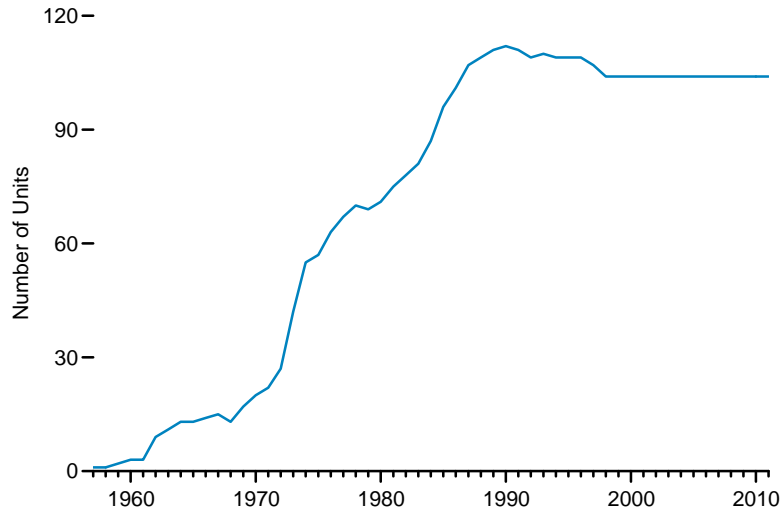


# 9. Nuclear Energy

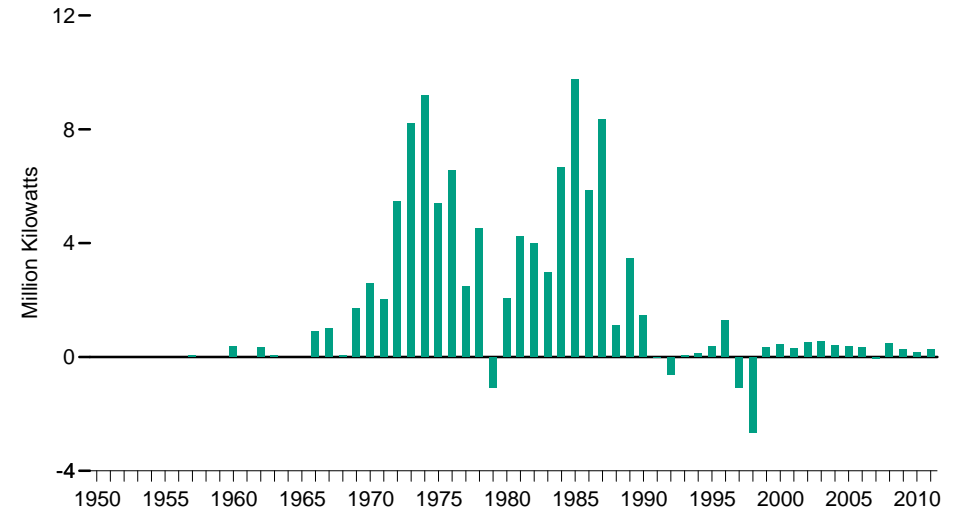
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## Figure 9.1 Nuclear Generating Units

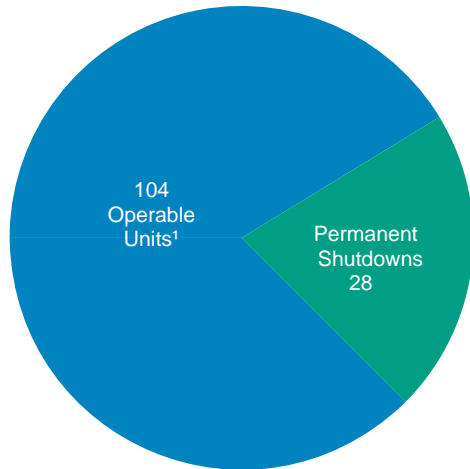
### Operable Units,<sup>1</sup> 1957-2011



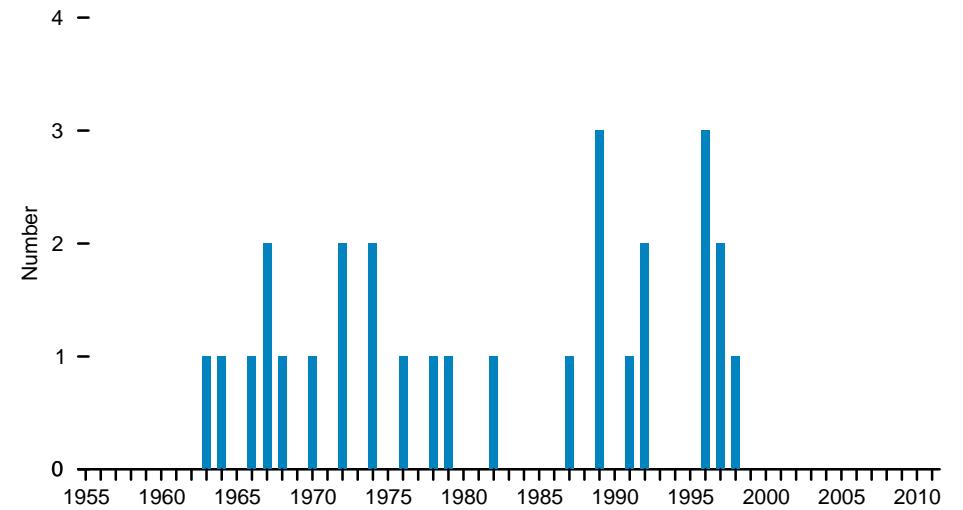
### Nuclear Net Summer Capacity Change, 1950-2011



### Status of All Nuclear Generating Units, 2011



### Permanent Shutdowns by Year, 1955-2011



<sup>1</sup> Units holding full-power operating licenses, or equivalent permission to operate, at the end of the year.

Note: Data are at end of year.  
Sources: Tables 9.1 and 8.11a.

**Table 9.1 Nuclear Generating Units, 1955-2011**

Year	Original Licensing Regulations (10 CFR Part 50) <sup>1</sup>			Current Licensing Regulations (10 CFR Part 52) <sup>1</sup>			Permanent Shutdowns	Operable Units <sup>7</sup>
	Construction Permits Issued <sup>2,3</sup>	Low-Power Operating Licenses Issued <sup>3,4</sup>	Full-Power Operating Licenses Issued <sup>3,5</sup>	Early Site Permits Issued <sup>3</sup>	Combined License Applications Received <sup>6</sup>	Combined Licenses Issued <sup>3</sup>		
1955	1	0	0	--	--	--	0	0
1956	3	0	0	--	--	--	0	0
1957	1	1	1	--	--	--	0	1
1958	0	0	0	--	--	--	0	1
1959	3	1	1	--	--	--	0	2
1960	7	1	1	--	--	--	0	3
1961	0	0	0	--	--	--	0	3
1962	1	7	6	--	--	--	0	9
1963	1	3	2	--	--	--	R1	11
1964	3	2	3	--	--	--	1	13
1965	1	0	0	--	--	--	0	13
1966	5	1	2	--	--	--	1	14
1967	14	3	3	--	--	--	2	15
1968	23	0	0	--	--	--	R1	13
1969	7	4	4	--	--	--	0	17
1970	10	4	3	--	--	--	R1	20
1971	4	5	2	--	--	--	0	22
1972	8	6	6	--	--	--	R2	27
1973	14	12	15	--	--	--	0	42
1974	23	14	15	--	--	--	2	55
1975	9	3	2	--	--	--	0	57
1976	9	7	7	--	--	--	1	63
1977	15	4	4	--	--	--	0	67
1978	13	3	4	--	--	--	1	70
1979	2	0	0	--	--	--	1	69
1980	0	5	2	--	--	--	0	71
1981	0	3	4	--	--	--	0	75
1982	0	6	4	--	--	--	1	78
1983	0	3	3	--	--	--	0	81
1984	0	7	6	--	--	--	0	87
1985	0	7	9	--	--	--	0	96
1986	0	7	5	--	--	--	0	101
1987	0	6	8	--	--	--	R1	107
1988	0	1	2	--	--	--	0	109
1989	0	3	4	--	--	--	R3	111
1990	0	1	2	--	--	--	R0	112
1991	0	0	0	--	--	--	1	111
1992	0	0	0	--	--	--	2	109
1993	0	1	1	--	--	--	0	110
1994	0	0	0	--	--	--	R0	109
1995	0	1	0	--	--	--	0	109
1996	0	0	1	--	--	--	R3	109
1997	0	0	0	0	0	0	2	107
1998	0	0	0	0	0	0	R1	104
1999-2006	0	0	0	0	0	0	0	104
2007	0	0	0	3	5	0	0	104
2008	0	0	0	0	R12	0	0	104
2009	0	0	0	1	1	0	0	104
2010	0	0	0	0	0	0	0	104
2011	0	0	0	0	0	0	0	104
Total	177	132	132	4	R18	0	28	--

<sup>1</sup> Data in columns 1–3 are based on the U.S. Nuclear Regulatory Commission (NRC) regulation 10 CFR Part 50. Data in columns 4–6 are based on the NRC regulation 10 CFR Part 52. See Note 1, "Pending Actions on Nuclear Generating Units," at end of section.

<sup>2</sup> Issuance by regulatory authority of a permit, or equivalent permission, to begin construction. Under current licensing regulations, the construction permit is no longer issued separately from the operating license.

<sup>3</sup> Numbers reflect permits or licenses issued in a given year, not extant permits or licenses.

<sup>4</sup> Issuance by regulatory authority of license, or equivalent permission, to conduct testing but not to operate at full power.

<sup>5</sup> Issuance by regulatory authority of full-power operating license, or equivalent permission (note that some units receive full-power licenses the same year they receive low-power licenses). Units initially

undergo low-power testing prior to commercial operation.

<sup>6</sup> Number of applications received for combined construction and operating licenses, including one that was subsequently withdrawn. Does not represent the total number of reactor units included in the applications. See Note 1, "Pending Actions on Nuclear Generating Units," at end of Section.

<sup>7</sup> Total of nuclear generating units holding full-power licenses, or equivalent permission to operate, at the end of the year (the number of operable units equals the cumulative number of units holding full-power licenses minus the cumulative number of permanent shutdowns).

--=Not applicable.

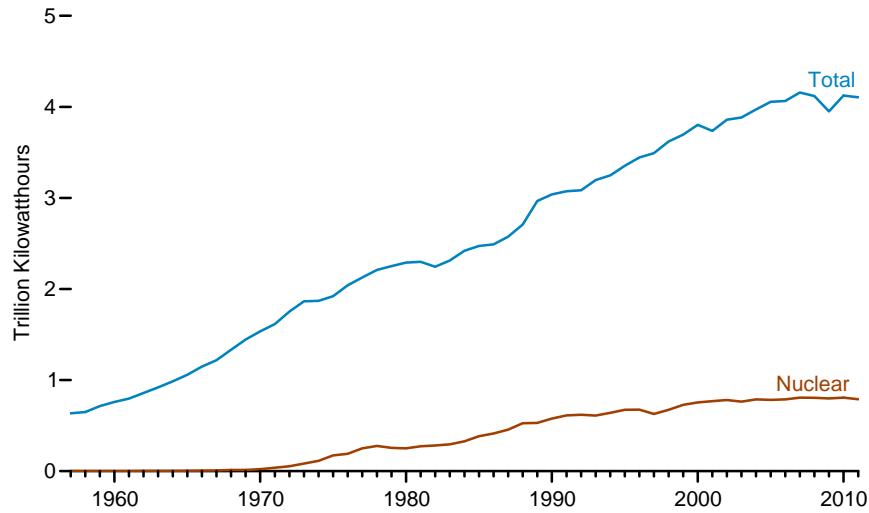
Note: See Note 2, "Coverage of Nuclear Energy Statistics," at end of section.

Web Page: For related information, see <http://www.eia.gov/nuclear/>.

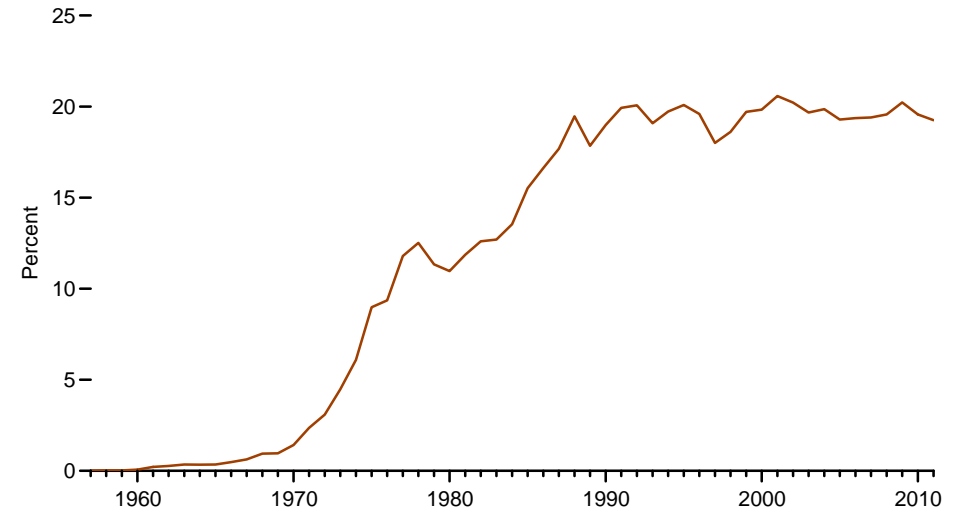
Sources: See end of section.

## Figure 9.2 Nuclear Power Plant Operations

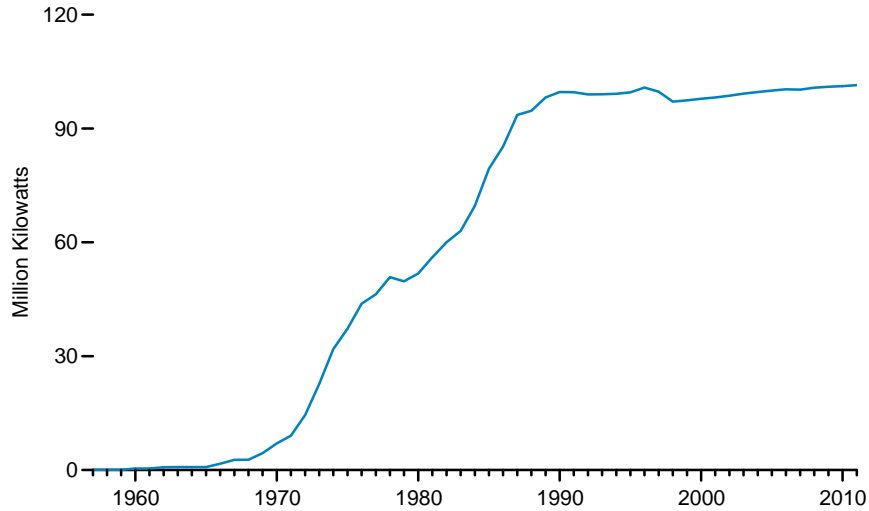
**Total Electricity and Nuclear Electricity Net Generation, 1957-2011**



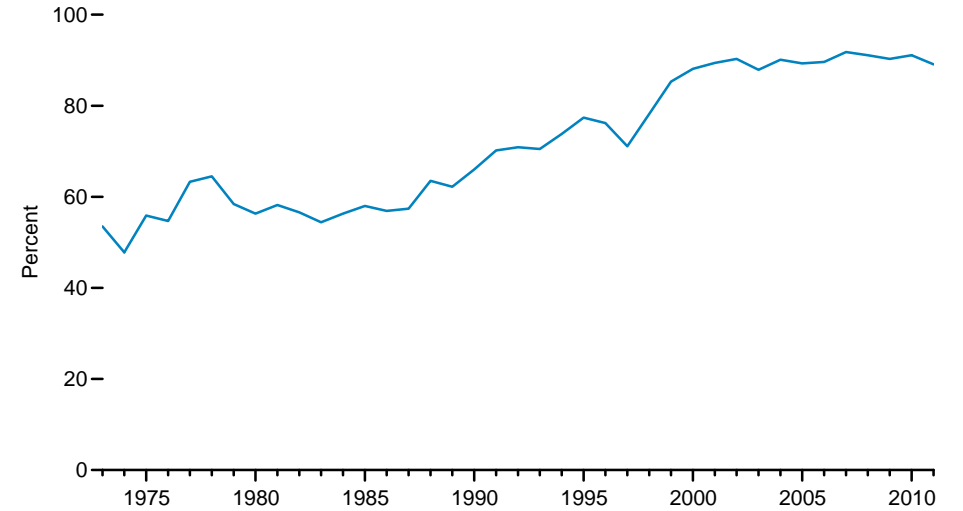
**Nuclear Share of Total Electricity Net Generation, 1957-2011**



**Net Summer Capacity of Operable Units, 1957-2011**



**Capacity Factor, 1973-2011**



Sources: Tables 8.1 and 9.2.

**Table 9.2 Nuclear Power Plant Operations, 1957-2011**

Year	Nuclear Electricity Net Generation	Nuclear Share of Total Electricity Net Generation	Net Summer Capacity of Operable Units <sup>1</sup>	Capacity Factor <sup>2</sup>
	Billion Kilowatthours	Percent	Million Kilowatts	Percent
1957	(s)	(s)	0.1	NA
1958	.2	(s)	.1	NA
1959	.2	(s)	.1	NA
1960	.5	.1	.4	NA
1961	1.7	.2	.4	NA
1962	2.3	.3	.7	NA
1963	3.2	.3	.8	NA
1964	3.3	.3	.8	NA
1965	3.7	.3	.8	NA
1966	5.5	.5	1.7	NA
1967	7.7	.6	2.7	NA
1968	12.5	.9	2.7	NA
1969	13.9	1.0	4.4	NA
1970	21.8	1.4	7.0	NA
1971	38.1	2.4	9.0	NA
1972	54.1	3.1	14.5	NA
1973	83.5	4.5	22.7	53.5
1974	114.0	6.1	31.9	47.8
1975	172.5	9.0	37.3	55.9
1976	191.1	9.4	43.8	54.7
1977	250.9	11.8	46.3	63.3
1978	276.4	12.5	50.8	64.5
1979	255.2	11.3	49.7	58.4
1980	251.1	11.0	51.8	56.3
1981	272.7	11.9	56.0	58.2
1982	282.8	12.6	60.0	56.6
1983	293.7	12.7	63.0	54.4
1984	327.6	13.5	69.7	56.3
1985	383.7	15.5	79.4	58.0
1986	414.0	16.6	85.2	56.9
1987	455.3	17.7	93.6	57.4
1988	527.0	19.5	94.7	63.5
1989	529.4	17.8	98.2	62.2
1990	576.9	19.0	99.6	66.0
1991	612.6	19.9	99.6	70.2
1992	618.8	20.1	99.0	70.9
1993	610.3	19.1	99.0	70.5
1994	640.4	19.7	99.1	73.8
1995	673.4	20.1	99.5	77.4
1996	674.7	19.6	100.8	76.2
1997	628.6	18.0	99.7	71.1
1998	673.7	18.6	97.1	78.2
1999	728.3	19.7	97.4	85.3
2000	753.9	19.8	97.9	88.1
2001	768.8	20.6	98.2	89.4
2002	780.1	20.2	98.7	90.3
2003	763.7	19.7	99.2	87.9
2004	788.5	19.9	99.6	90.1
2005	782.0	19.3	100.0	89.3
2006	787.2	19.4	100.3	89.6
2007	806.4	19.4	100.3	91.8
2008	806.2	19.6	100.8	91.1
2009	798.9	20.2	101.0	90.3
2010	807.0	19.6	<sup>R</sup> 101.2	<sup>R</sup> 91.1
2011 <sup>P</sup>	790.2	19.2	101.4	89.1

<sup>1</sup> At end of year. See "Generator Net Summer Capacity" in Glossary.

<sup>2</sup> See "Generator Capacity Factor" in Glossary.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.05.

Note: See Note 2, "Coverage of Nuclear Energy Statistics," at end of section.

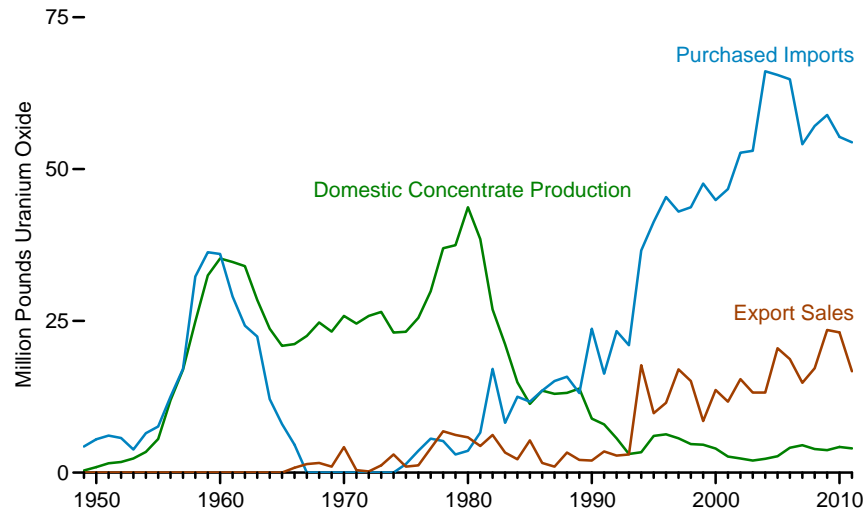
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#nuclear> for updated monthly and

annual data. • See <http://www.eia.gov/nuclear/> for related information.

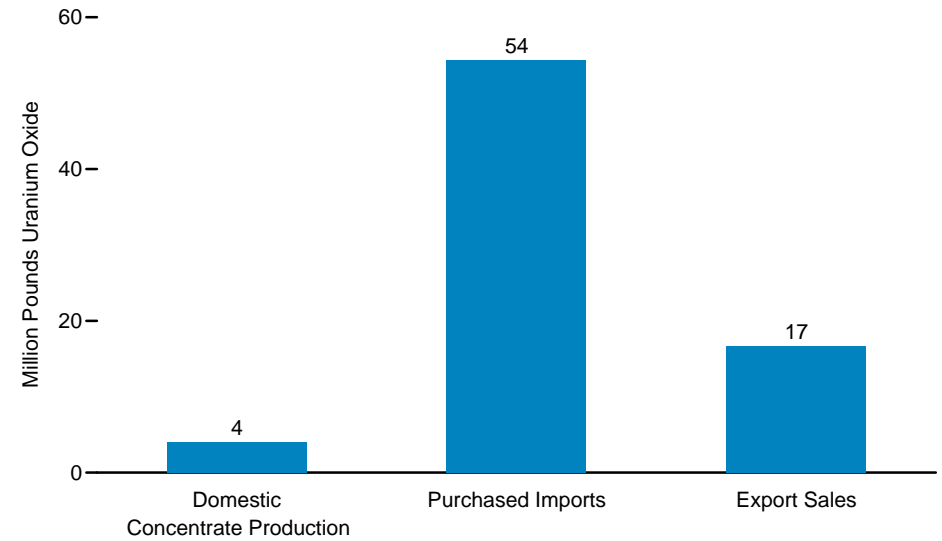
Sources: **Nuclear Electricity Net Generation** and **Nuclear Share of Electricity Net Generation:** Table 8.2a. **Net Summer Capacity of Operable Units:** Table 8.11a. **Capacity Factor:** U.S. Energy Information Administration, *Monthly Energy Review* (April 2012), Table 8.1. Annual capacity factors are weighted averages of monthly capacity factors.

## Figure 9.3 Uranium Overview

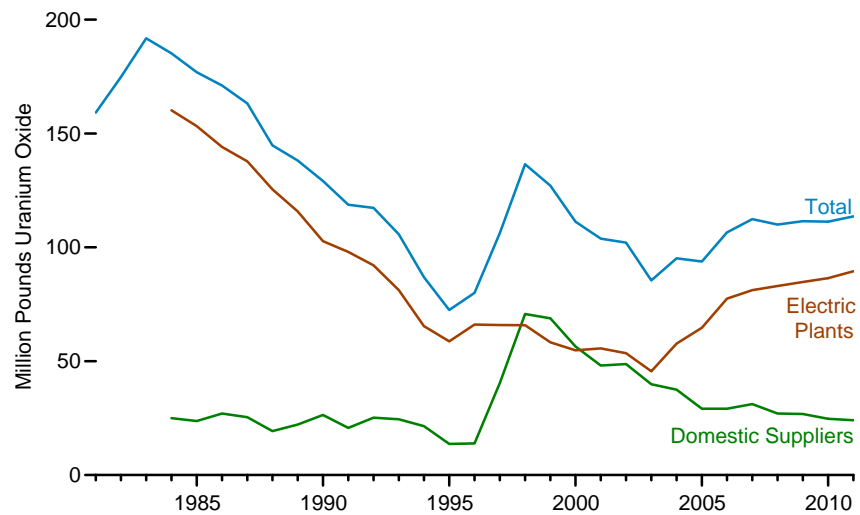
### Production and Trade, 1949-2011



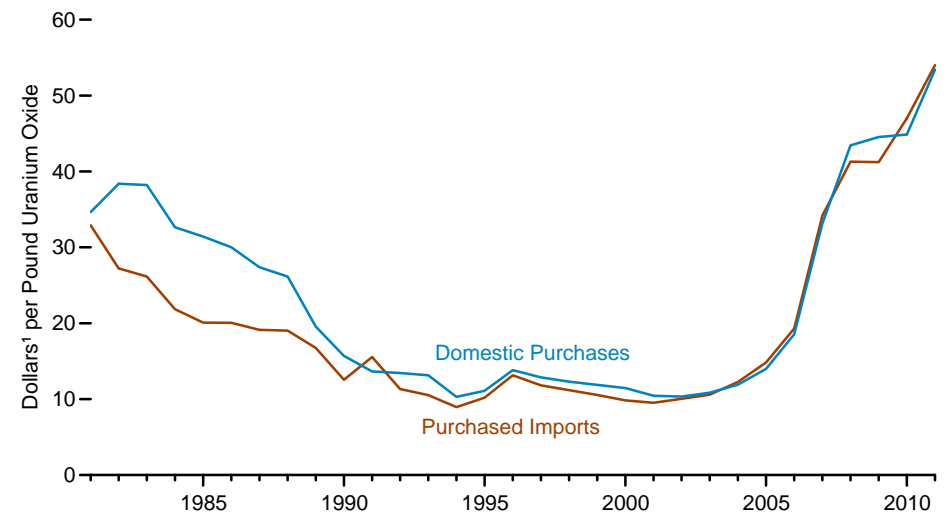
### Production and Trade, 2011



### Inventories, End of Year 1981-2011



### Average Prices, 1981-2011



<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.  
Note: See "Uranium Oxide" in Glossary.

Source: Table 9.3.

**Table 9.3 Uranium Overview, Selected Years, 1949-2011**

Year	Domestic Concentrate Production <sup>1</sup>	Purchased Imports <sup>2</sup>	Export <sup>2</sup> Sales	Electric Plant Purchases From Domestic Suppliers	Loaded Into U.S. Nuclear Reactors <sup>3</sup>	Inventories			Average Price	
						Domestic Suppliers	Electric Plants	Total	Purchased Imports	Domestic Purchases
						Million Pounds Uranium Oxide				
1949	0.36	4.3	0.0	NA	NA	NA	NA	NA	NA	NA
1950	.92	5.5	.0	NA	NA	NA	NA	NA	NA	NA
1955	5.56	7.6	.0	NA	NA	NA	NA	NA	NA	NA
1960	35.28	36.0	.0	NA	NA	NA	NA	NA	NA	NA
1965	20.88	8.0	.0	NA	NA	NA	NA	NA	NA	NA
1970	25.81	.0	4.2	NA	NA	NA	NA	NA	--	NA
1975	23.20	1.4	1.0	NA	NA	NA	NA	NA	NA	NA
1976	25.49	3.6	1.2	NA	NA	NA	NA	NA	NA	NA
1977	29.88	5.6	4.0	NA	NA	NA	NA	NA	NA	NA
1978	36.97	5.2	6.8	NA	NA	NA	NA	NA	NA	NA
1979	37.47	3.0	6.2	NA	NA	NA	NA	NA	NA	NA
1980	43.70	3.6	5.8	NA	NA	NA	NA	NA	NA	NA
1981	38.47	6.6	4.4	32.6	NA	NA	NA	159.2	32.90	34.65
1982	26.87	17.1	6.2	27.1	NA	NA	NA	174.8	27.23	38.37
1983	21.16	8.2	3.3	24.2	NA	NA	NA	191.8	26.16	38.21
1984	14.88	12.5	2.2	22.5	NA	25.0	160.2	185.2	21.86	32.65
1985	11.31	11.7	5.3	21.7	NA	23.7	153.2	176.9	20.08	31.43
1986	13.51	13.5	1.6	18.9	NA	27.0	144.1	171.1	20.07	30.01
1987	12.99	15.1	1.0	20.8	NA	25.4	137.8	163.2	19.14	27.37
1988	13.13	15.8	3.3	17.6	NA	19.3	125.5	144.8	19.03	26.15
1989	13.84	13.1	2.1	18.4	NA	22.2	115.8	138.1	16.75	19.56
1990	8.89	23.7	2.0	20.5	NA	26.4	102.7	129.1	12.55	15.70
1991	7.95	16.3	3.5	26.8	34.6	20.7	98.0	118.7	15.55	13.66
1992	5.65	23.3	2.8	23.4	43.0	25.2	92.1	117.3	11.34	13.45
1993	3.06	21.0	3.0	15.5	45.1	24.5	81.2	105.7	10.53	13.14
1994	3.35	36.6	17.7	22.7	40.4	21.5	65.4	86.9	8.95	10.30
1995	6.04	41.3	9.8	22.3	51.1	13.7	58.7	72.5	10.20	11.11
1996	6.32	45.4	11.5	23.7	46.2	13.9	66.1	80.0	13.15	13.81
1997	5.64	43.0	17.0	19.4	48.2	40.4	65.9	106.2	11.81	12.87
1998	4.71	43.7	15.1	21.6	38.2	70.7	65.8	136.5	11.19	12.31
1999	4.61	47.6	8.5	21.4	58.8	68.8	58.3	127.1	10.55	11.88
2000	3.96	44.9	13.6	24.3	51.5	56.5	54.8	111.3	9.84	11.45
2001	2.64	46.7	11.7	27.5	52.7	48.1	55.6	103.8	9.51	10.45
2002	2.34	52.7	15.4	22.7	57.2	48.7	53.5	102.1	10.05	10.35
2003	<sup>5</sup> E2.00	53.0	13.2	21.7	62.3	39.9	45.6	85.5	10.59	10.84
2004	2.28	66.1	13.2	28.2	50.1	37.5	57.7	95.2	12.25	11.91
2005	2.69	65.5	20.5	27.3	58.3	29.1	64.7	93.8	14.83	13.98
2006	4.11	64.8	18.7	27.9	51.7	29.1	77.5	106.6	19.31	18.54
2007	4.53	54.1	14.8	18.5	45.5	31.2	81.2	112.4	34.18	33.13
2008	3.90	57.1	17.2	20.4	51.3	27.0	83.0	110.0	41.30	43.43
2009	3.71	58.9	23.5	17.6	49.4	26.8	84.8	111.5	41.23	44.53
2010	4.23	55.3	23.1	16.2	44.3	<sup>R</sup> 24.7	86.5	<sup>R</sup> 111.3	47.01	44.88
2011	3.99	54.4	16.7	19.8	<sup>P</sup> 52.0	<sup>P</sup> 24.1	<sup>P</sup> 89.5	<sup>P</sup> 113.6	54.00	53.41

<sup>1</sup> See "Uranium Concentrate" in Glossary.

<sup>2</sup> Import quantities through 1970 are reported for fiscal years. Prior to 1968, the Atomic Energy Commission was the sole purchaser of all imported uranium oxide. Trade data prior to 1982 were for transactions conducted by uranium suppliers only. For 1982 forward, transactions by uranium buyers (consumers) have been included. Buyer imports and exports prior to 1982 are believed to be small.

<sup>3</sup> Does not include any fuel rods removed from reactors and later reloaded.

<sup>4</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>5</sup> Value has been rounded to avoid disclosure of individual company data.

R=Revised. P=Preliminary. E=Estimate. NA=Not available. --=Not applicable.

Note: See "Uranium Oxide" in Glossary.

Web Pages: • For all data beginning in 1949, see <http://www.eia.gov/totalenergy/data/annual/#nuclear>.  
• For related information, see <http://www.eia.gov/nuclear/>.

Sources: • 1949-1966—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry*, Report No. GJO-100, annual reports. • 1967-2002—U.S. Energy Information Administration (EIA), *Uranium Industry Annual*, annual reports. • 2003-2006—EIA, "Uranium Marketing Annual Report," annual reports. • 2007 forward—EIA, "2011 Domestic Uranium Production Report" (May 2012), Table 3; EIA, "2011 Uranium Marketing Annual Report" (May 2012), Tables 5, 18, 19, 21, and 22; and EIA, Form EIA-858, "Uranium Marketing Annual Survey."

## Nuclear Energy

**Note 1. Pending Actions on Nuclear Generating Units.** Much of Table 9.1 is based on the U.S. Nuclear Regulatory Commission (NRC) regulation 10 CFR Part 50, which has in most instances been supplanted by 10 CFR Part 52 following the passage of the Energy Policy Act of 1992 and procedural reforms initiated in 1989 by the NRC. (This statement applies to permit and license procedures only.)

The NRC did not issue any Early Site Permits (ESP) during 2011. Two ESP applications are currently under review; one to Victoria County Station and the other to PSEG Site.

As of December 31, 2011, the NRC had received 18 Combined License (COL) applications representing 28 nuclear generating units. The following 14 COL applications are under review: Bell Bend (Pennsylvania); Bellefonte Units 3 and 4 (Alabama); Calvert Cliffs Unit 3 (Maryland); Comanche Peak Units 3 and 4 (Texas); Fermi Unit 3 (Michigan); Levy County Units 1 and 2 (Florida); Nine Mile Point Unit 3 (New York); North Anna Unit 3 (Virginia); Shearon Harris Units 2 and 3 (North Carolina); South Texas Units 3 and 4 (Texas); Turkey Point Units 6 and 7 (Florida); Virgil C. Summer Units 2 and 3 (South Carolina); Vogtle Units 3 and 4 (Georgia); and William States Lee III Units 1 and 2 (South Carolina). At the request of the applicants, review has been suspended for three COL applications: Callaway Unit 2 (Missouri), Grand Gulf Unit 3 (Mississippi), and River Bend Unit 3 (Louisiana). The Victoria County Units 1 and 2 COL application was withdrawn in 2010 following the announcement that the applicant intends to apply instead for an ESP with the reactor choice unspecified. In addition to the COL applications currently under review, Watts Bar Unit 2 is currently under construction. Watts Bar Unit 2 was issued a construction permit in 1973, and the U.S. Energy Information Administration projects that it will be brought on line in 2013. This is the only reactor that is anticipated to apply for the license separate of construction permit. TVA has also requested that Bellefonte Units 1 and 2, two partially completed units, be moved to 'deferred plan' status as the Agency considers completing one or both.

As of December 31, 2011, 11 applications for license extensions were under review by the NRC. The NRC granted 20-year license extensions in 2011 to: Kewaunee Power Station on February 24, Vermont Yankee Nuclear Power Station on March 21, Palo Verde Units 1, 2, and 3 on April 21, Prairie Island Units 1 and 2 on June 27, Salem Units 1 and 2 on June 30, and Hope Creek on July 20.

For more information on nuclear reactors, see <http://www.nrc.gov/reactors.html>.

**Note 2. Coverage of Nuclear Energy Statistics.** In 1997, the U.S. Energy Information Administration undertook a major revision of Table 9.1 to more fully describe the history of the U.S. commercial nuclear power industry. The time frame was extended back to the birth of the industry in 1953 and the data categories were revised for greater relevance to current industry conditions and trends. To acquire the data for the revised categories, it was necessary to develop a reactor unit database employing different sources than those used previously for Table 9.1 and still used for Table 9.2.

The data in Table 9.1 apply to commercial nuclear power units, meaning that the units contributed power to the commercial electricity grid. A total of 259 units have been ordered over the lifetime of the nuclear industry. Although most orders were placed by electric utilities, several units were ordered, owned, and operated wholly or in part by the Federal Government, including BONUS (Boiling Nuclear Superheater Power Station), Elk River, Experimental Breeder Reactor 2, Hallam, Hanford N, Piqua, and Shippingport.

A reactor is generally defined as operable in Table 9.1 if it possesses a full-power license, or an equivalent, from the NRC or its predecessor, the Atomic Energy Commission, at the end of the year. The definition is liberal in that it does not exclude units retaining full-power licenses during long, non-routine shutdowns.

For example:

- In 1985, the five Tennessee Valley Authority units (Browns Ferry 1, 2, and 3 and Sequoyah 1 and 2) were shut down under a regulatory forced outage. Browns Ferry 1 was authorized by the NRC to restart in 2007, while the other units restarted in 1991, 1995, 1988, and 1988, respectively. All five units were counted as operable during the shutdowns.
- Shippingport was shut down from 1974 through 1976 for conversion to a lightwater breeder reactor, but is counted as operable until its retirement in 1982.
- Calvert Cliffs 2 was shut down in 1989 and 1990 for replacement of pressurizer heater sleeves but is counted as operable during those years.

Exceptions to the rule are Shoreham and Three Mile Island 2. Shoreham was granted a full-power license in April 1989, but was shut down two months later and never restarted. In 1991, the license was changed to Possession Only. Although not operable at the end of the year, Shoreham is treated as operable during 1989 and shut down in 1990, because counting it as operable and shut down in the same year would introduce a statistical discrepancy in the tallies. A major accident closed Three Mile Island 2 in 1979, and although the unit retained its full-power license for several years, it is considered permanently shut down since that year.

**Table 9.1 Sources: Operable Units:** • 1955-1982—Compiled from various sources, primarily U.S. Department of Energy (DOE), Office of Nuclear Reactor Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones." • 1983 forward—U.S. Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report," and predecessor forms. **All Other Data:** • 1955-1997—U.S. Atomic Energy Commission, *1973 Annual Report to Congress, Volume 2, Regulatory Activities*; Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development* (1988); EIA, *Commercial Nuclear Power 1991* (September 1991); DOE, *Nuclear Reactors Built, Being Built, and Planned: 1995*; U.S. Nuclear Regulatory Commission (NRC), *Information Digest* (1997 and 1998) and "Plant Status Report"; and various utility, Federal, and contractor officials. • 1998 forward—NRC, *Information Digest*, annual reports.

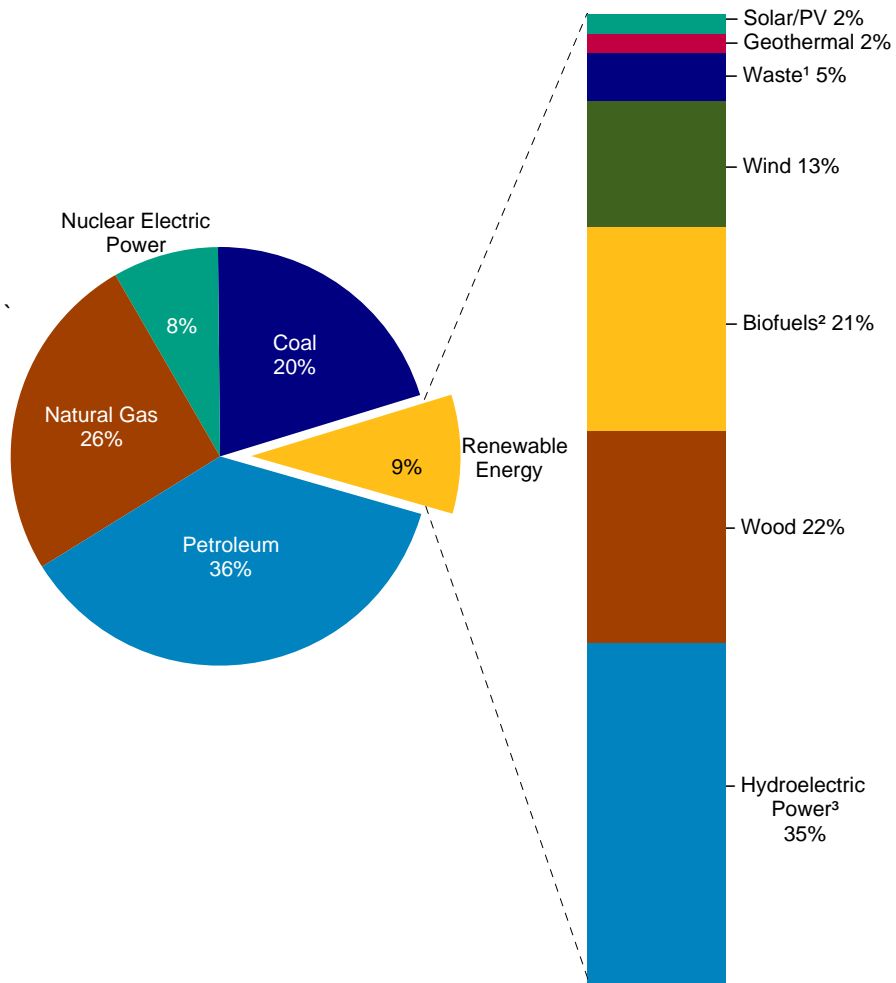


# 10. Renewable Energy

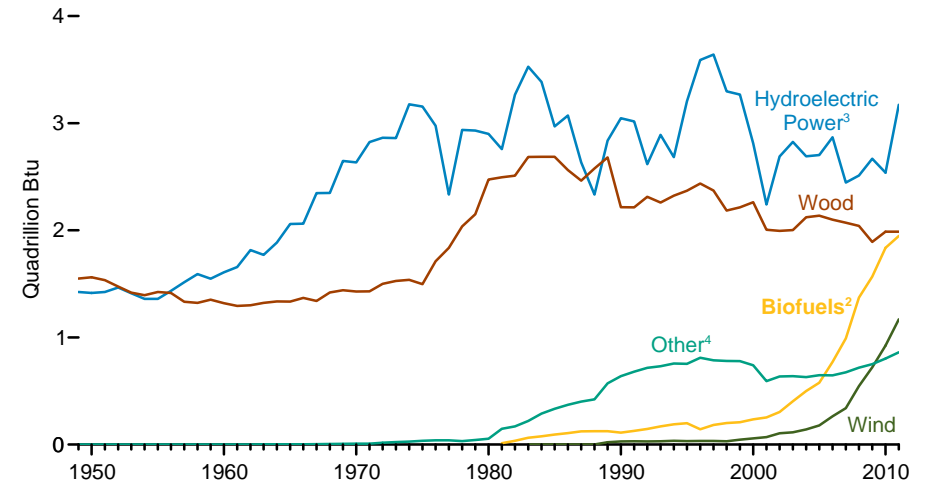
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**Figure 10.1 Renewable Energy Consumption by Major Source**

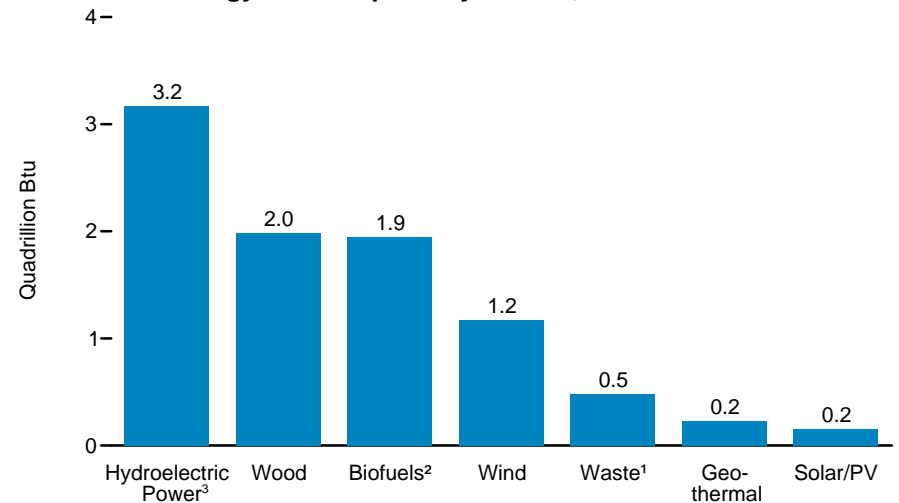
**Renewable Energy as Share of Total Primary Energy Consumption, 2011**



**Renewable Energy Consumption by Source, 1949-2011**



**Renewable Energy Consumption by Source, 2011**



<sup>1</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass.

<sup>2</sup> Fuel ethanol (minus denaturant) and biodiesel consumption, plus losses and co-products from the production of fuel ethanol and biodiesel.

<sup>3</sup> Conventional hydroelectric power.

<sup>4</sup> Geothermal, solar/PV, and waste.

Notes: Sum of components may not equal 100 percent due to independent rounding. Sources: Tables 1.3 and 10.1.

**Table 10.1 Renewable Energy Production and Consumption by Primary Energy Source, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Production <sup>1</sup>			Consumption								
	Biomass		Total Renewable Energy <sup>4</sup>	Hydro-electric Power <sup>5</sup>	Geo-thermal <sup>6</sup>	Solar/PV <sup>7</sup>	Wind <sup>8</sup>	Biomass				Total Renewable Energy
	Biofuels <sup>2</sup>	Total <sup>3</sup>						Wood <sup>9</sup>	Waste <sup>10</sup>	Biofuels <sup>11</sup>	Total	
1949	NA	1,549	2,974	1,425	NA	NA	NA	1,549	NA	NA	1,549	2,974
1950	NA	1,562	2,978	1,415	NA	NA	NA	1,562	NA	NA	1,562	2,978
1955	NA	1,424	2,784	1,360	NA	NA	NA	1,424	NA	NA	1,424	2,784
1960	NA	1,320	2,928	1,608	(s)	NA	NA	1,320	NA	NA	1,320	2,928
1965	NA	1,335	3,396	2,059	2	NA	NA	1,335	NA	NA	1,335	3,396
1970	NA	1,431	4,070	2,634	6	NA	NA	1,429	2	NA	1,431	4,070
1975	NA	1,499	4,687	3,155	34	NA	NA	1,497	2	NA	1,499	4,687
1976	NA	1,713	4,727	2,976	38	NA	NA	1,711	2	NA	1,713	4,727
1977	NA	1,838	4,209	2,333	37	NA	NA	1,837	2	NA	1,838	4,209
1978	NA	2,038	5,005	2,937	31	NA	NA	2,036	1	NA	2,038	5,005
1979	NA	2,152	5,123	2,931	40	NA	NA	2,150	2	NA	2,152	5,123
1980	NA	2,476	5,428	2,900	53	NA	NA	2,474	2	NA	2,476	5,428
1981	13	2,596	5,414	2,758	59	NA	NA	2,496	88	13	2,596	5,414
1982	34	2,663	5,980	3,266	51	NA	NA	2,510	119	34	2,663	5,980
1983	63	2,904	6,496	3,527	64	NA	(s)	2,684	157	63	2,904	6,496
1984	77	2,971	6,438	3,386	81	(s)	(s)	2,686	208	77	2,971	6,438
1985	93	3,016	6,084	2,970	97	(s)	(s)	2,687	236	93	3,016	6,084
1986	107	2,932	6,111	3,071	108	(s)	(s)	2,562	263	107	2,932	6,111
1987	123	2,875	5,622	2,635	112	(s)	(s)	2,463	289	123	2,875	5,622
1988	124	3,016	5,457	2,334	106	(s)	(s)	2,577	315	124	3,016	5,457
1989	125	3,159	6,235	2,837	162	55	22	2,680	354	125	3,159	6,235
1990	111	2,735	6,041	3,046	171	59	29	2,216	408	111	2,735	6,041
1991	128	2,782	6,069	3,016	178	62	31	2,214	440	128	2,782	6,069
1992	145	2,932	5,821	2,617	179	64	30	2,313	473	145	2,932	5,821
1993	169	2,908	6,083	2,892	186	66	31	2,260	479	169	2,908	6,083
1994	188	3,028	5,988	2,683	173	68	36	2,324	515	188	3,028	5,988
1995	198	3,099	6,558	3,205	152	69	33	2,370	531	200	3,101	6,560
1996	141	3,155	7,012	3,590	163	70	33	2,437	577	143	3,157	7,014
1997	186	3,108	7,018	3,640	167	70	34	2,371	551	184	3,105	7,016
1998	202	2,929	6,494	3,297	168	69	31	2,184	542	201	2,927	6,493
1999	211	2,965	6,517	3,268	171	68	46	2,214	540	209	2,963	6,516
2000	233	3,006	6,104	2,811	164	R66	57	2,262	511	236	3,008	6,106
2001	254	2,624	5,164	2,242	164	64	70	2,006	364	253	2,622	5,163
2002	308	2,705	5,734	2,689	171	63	105	1,995	402	303	2,701	5,729
2003	402	2,805	5,982	2,825	175	62	115	2,002	401	404	2,807	5,983
2004	487	2,998	6,070	2,690	178	63	142	2,121	389	499	3,010	6,082
2005	564	3,104	6,229	2,703	181	63	178	R2,137	403	577	R3,117	6,242
2006	720	R3,216	R6,599	2,869	181	68	264	R2,099	397	771	R3,267	R6,649
2007	978	R3,461	R6,509	2,446	186	76	341	R2,070	413	991	R3,474	R6,523
2008	1,387	R3,864	R7,202	2,511	192	89	546	R2,040	436	1,372	R3,849	R7,186
2009	R1,584	R3,928	R7,616	2,669	200	98	721	R1,891	R453	R1,568	R3,912	R7,600
2010	R1,884	R4,341	R8,136	R2,539	R208	R126	R923	R1,988	R469	R1,837	R4,294	R8,090
2011 <sup>P</sup>	2,047	4,511	9,236	3,171	226	158	1,168	1,987	477	1,947	4,411	9,135

<sup>1</sup> Production equals consumption for all renewable energy sources except biofuels.

<sup>2</sup> Total biomass inputs to the production of fuel ethanol and biodiesel.

<sup>3</sup> Wood and wood-derived fuels, biomass waste, and total biomass inputs to the production of fuel ethanol and biodiesel.

<sup>4</sup> Hydroelectric power, geothermal, solar thermal/photovoltaic, wind, and biomass.

<sup>5</sup> Conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>6</sup> Geothermal electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6), and geothermal heat pump and direct use energy.

<sup>7</sup> Solar thermal and photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6), and solar thermal direct use energy.

<sup>8</sup> Wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>9</sup> Wood and wood-derived fuels.

<sup>10</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>11</sup> Fuel ethanol (minus denaturant) and biodiesel consumption, plus losses and co-products from the production of fuel ethanol and biodiesel.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

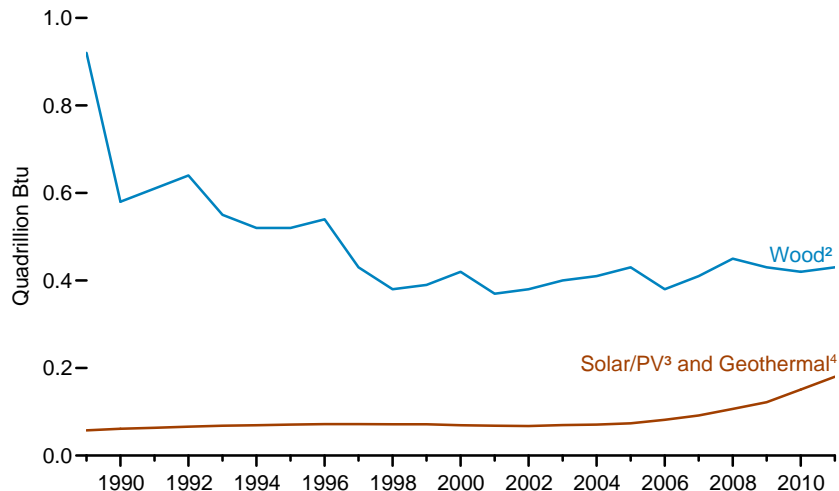
Notes: • Most data for the residential, commercial, industrial, and transportation sectors are estimates. See notes and sources for Tables 10.2a and 10.2b. • See Tables 8.2a–8.2d and 8.3a–8.3c for electricity net generation and useful thermal output from renewable energy sources; Tables 8.4a–8.4c, 8.5a–8.5d, 8.6a–8.6c, and 8.7a–8.7c for renewable energy consumption for electricity generation and useful thermal output; and Tables 8.11a–8.11d for renewable energy electric net summer capacity. • See Note, "Renewable Energy Production and Consumption," at end of section. • See Table E1 for estimated renewable energy consumption for 1635–1945. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#renewable> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#renewable> for all annual data beginning in 1949. • See <http://www.eia.gov/renewable/> for related information.

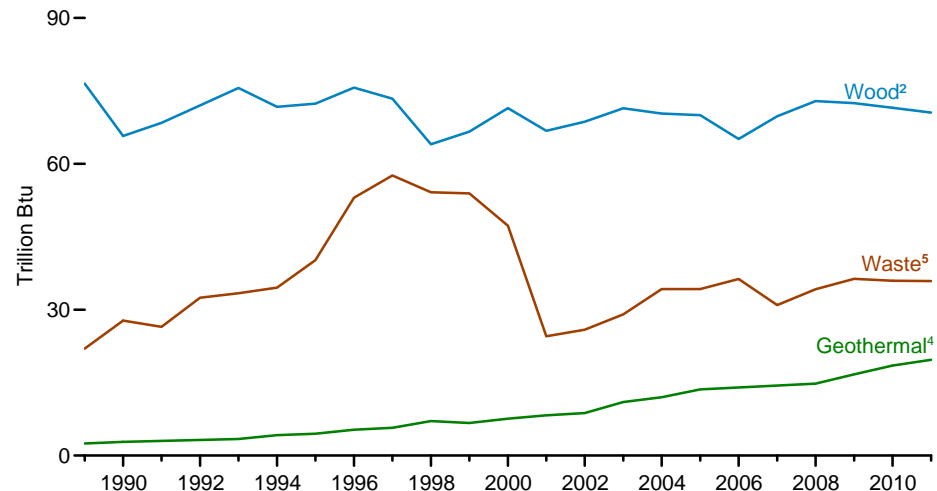
Sources: **Biofuels:** Tables 10.3 and 10.4. **All Other Data:** Tables 10.2a–10.2c.

**Figure 10.2a Renewable Energy Consumption: End-Use Sectors, 1989-2011**

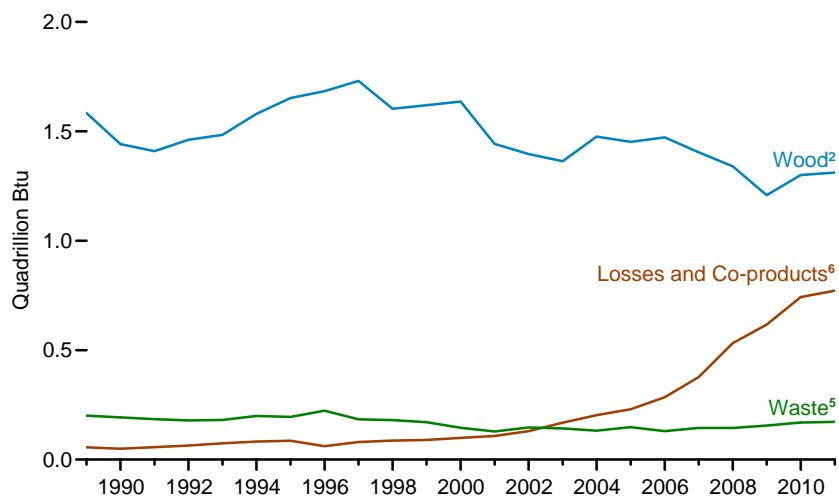
**Residential Sector**



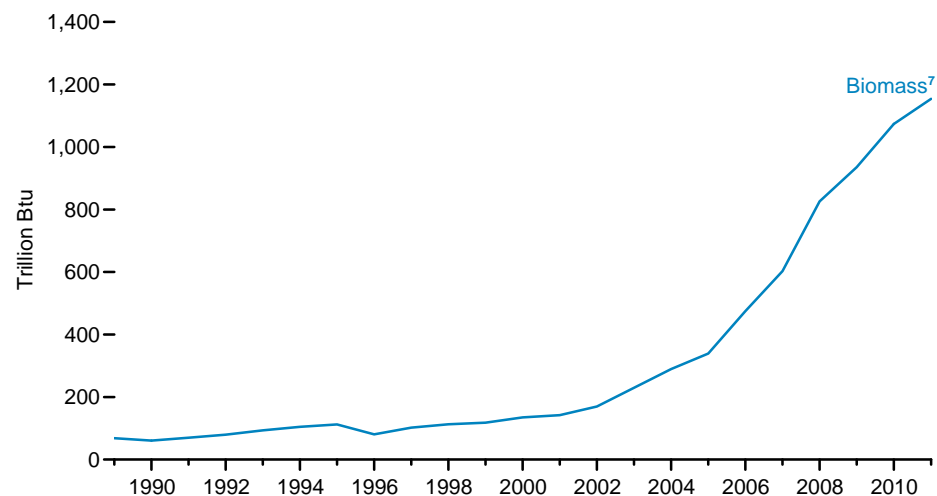
**Commercial¹ Sector, Major Sources**



**Industrial¹ Sector, Major Sources**



**Transportation Sector**



<sup>1</sup> Includes fuel used at combined-heat-and-power (CHP) plants and a small number of electricity-only plants.

<sup>2</sup> Wood and wood-derived fuels.

<sup>3</sup> Solar thermal direct use energy, and photovoltaic (PV) electricity net generation. Includes small amounts of distributed solar thermal and PV energy used in the commercial, industrial, and electric power sectors.

<sup>4</sup> Geothermal heat pump and direct use energy.

<sup>5</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>6</sup> From the production of fuel ethanol and biodiesel.

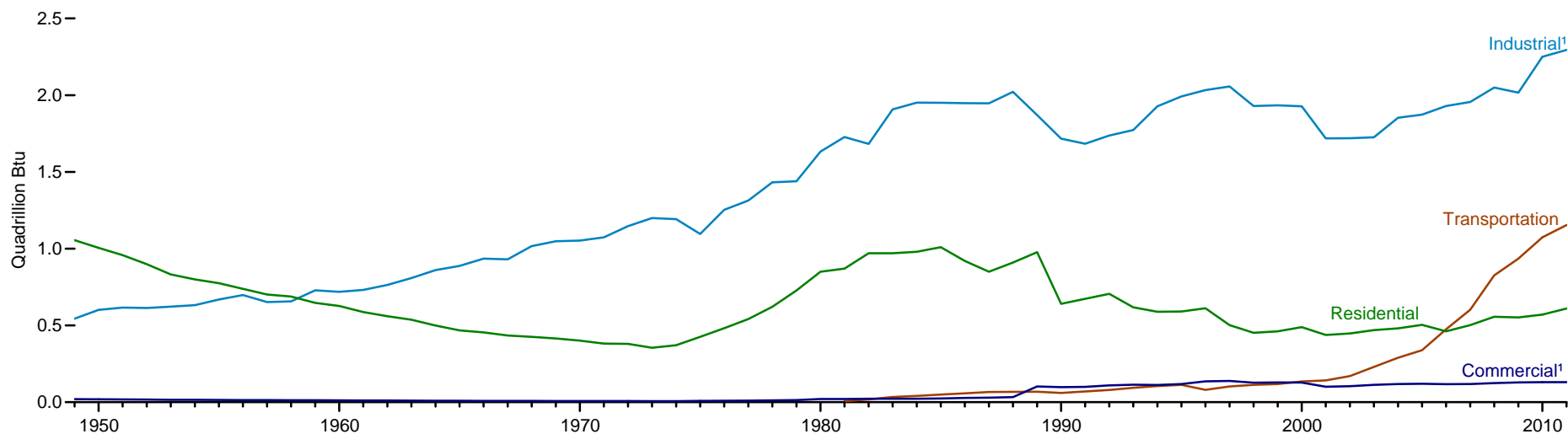
<sup>7</sup> The fuel ethanol (minus denaturant) portion of motor fuels (such as E10 and E85), and biodiesel. See "Biodiesel" in Glossary.

Note: See related Figures 10.2b and 10.2c.

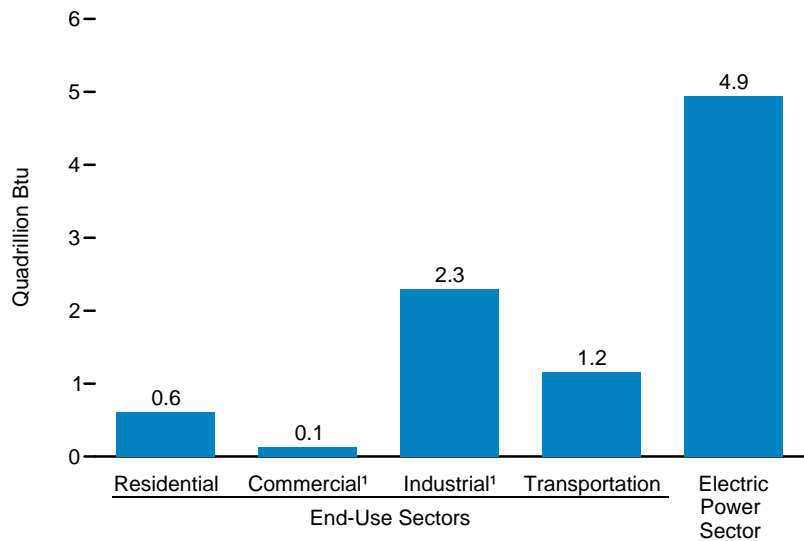
Sources: Tables 10.2a and 10.2b.

**Figure 10.2b Renewable Energy Consumption: End-Use Sectors and Electric Power Sector**

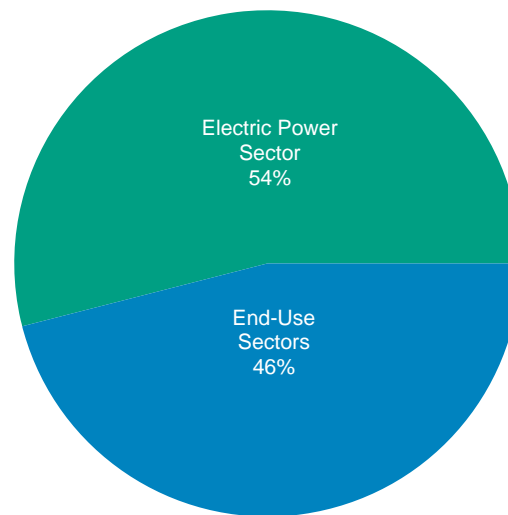
**End-Use Sectors, 1949-2011**



**End-Use Sectors and Electric Power Sector, 2011**



**End-Use Sectors and Electric Power Sector Shares of Total Renewable Energy Consumption, 2011**



<sup>1</sup> Includes fuel use at combined-heat-and-power (CHP) plants and a small number of electricity-only plants.

Note: See related Figures 10.2a and 10.2c.  
Sources: Tables 10.2a-10.2c.

**Table 10.2a Renewable Energy Consumption: Residential and Commercial Sectors, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Residential Sector				Commercial Sector <sup>1</sup>								
	Geo-thermal <sup>2</sup>	Solar/PV <sup>3</sup>	Biomass	Total	Hydro-electric Power <sup>5</sup>	Geo-thermal <sup>2</sup>	Solar/PV <sup>6</sup>	Wind <sup>7</sup>	Biomass			Total	Total
			Wood <sup>4</sup>						Wood <sup>4</sup>	Waste <sup>8</sup>	Fuel Ethanol <sup>9</sup>		
1949	NA	NA	1,055	1,055	NA	NA	NA	NA	20	NA	NA	20	20
1950	NA	NA	1,006	1,006	NA	NA	NA	NA	19	NA	NA	19	19
1955	NA	NA	775	775	NA	NA	NA	NA	15	NA	NA	15	15
1960	NA	NA	627	627	NA	NA	NA	NA	12	NA	NA	12	12
1965	NA	NA	468	468	NA	NA	NA	NA	9	NA	NA	9	9
1970	NA	NA	401	401	NA	NA	NA	NA	8	NA	NA	8	8
1975	NA	NA	425	425	NA	NA	NA	NA	8	NA	NA	8	8
1976	NA	NA	482	482	NA	NA	NA	NA	9	NA	NA	9	9
1977	NA	NA	542	542	NA	NA	NA	NA	10	NA	NA	10	10
1978	NA	NA	622	622	NA	NA	NA	NA	12	NA	NA	12	12
1979	NA	NA	728	728	NA	NA	NA	NA	14	NA	NA	14	14
1980	NA	NA	850	850	NA	NA	NA	NA	21	NA	NA	21	21
1981	NA	NA	870	870	NA	NA	NA	NA	21	NA	(s)	21	21
1982	NA	NA	970	970	NA	NA	NA	NA	22	NA	(s)	22	22
1983	NA	NA	970	970	NA	NA	NA	NA	22	NA	(s)	22	22
1984	NA	NA	980	980	NA	NA	NA	NA	22	NA	(s)	22	22
1985	NA	NA	1,010	1,010	NA	NA	NA	NA	24	NA	(s)	24	24
1986	NA	NA	920	920	NA	NA	NA	NA	27	NA	(s)	27	27
1987	NA	NA	850	850	NA	NA	NA	NA	29	NA	1	30	30
1988	NA	NA	910	910	NA	NA	NA	NA	32	NA	1	33	33
1989	5	52	920	977	1	3	—	—	76	22	1	99	102
1990	6	56	580	641	1	3	—	—	66	28	(s)	94	98
1991	6	57	610	673	1	3	—	—	68	26	(s)	95	100
1992	6	R60	640	706	1	3	—	—	72	32	(s)	105	109
1993	7	61	550	618	1	3	—	—	76	33	(s)	109	114
1994	6	63	520	589	1	4	—	—	72	35	(s)	106	112
1995	7	64	520	591	1	5	—	—	72	40	(s)	113	118
1996	7	65	540	612	1	5	—	—	76	53	(s)	129	135
1997	8	64	430	502	1	6	—	—	73	58	(s)	131	138
1998	8	64	380	452	1	7	—	—	64	54	(s)	118	127
1999	9	63	390	461	1	7	—	—	67	54	(s)	121	129
2000	9	R61	420	489	1	8	—	—	71	47	(s)	119	128
2001	9	59	370	438	1	8	—	—	67	25	(s)	92	101
2002	10	57	380	448	(s)	9	—	—	69	26	(s)	95	104
2003	13	57	400	470	1	11	—	—	71	29	1	101	113
2004	14	57	410	481	1	12	—	—	70	34	1	105	118
2005	16	58	430	504	1	14	—	—	70	34	1	105	R120
2006	18	63	R380	R462	1	14	—	—	65	36	1	R103	R118
2007	22	70	R410	R502	1	14	—	—	R70	31	2	R103	118
2008	26	80	450	R557	1	15	(s)	—	73	34	2	109	125
2009	33	89	430	552	1	17	(s)	(s)	72	36	3	112	129
2010	37	R114	420	R571	1	19	(s)	(s)	R72	R36	3	R111	R130
2011 <sup>P</sup>	40	140	430	610	1	20	(s)	(s)	71	36	3	110	131

<sup>1</sup> Commercial sector, including commercial combined-heat-and-power (CHP) and commercial electricity-only plants. See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8.

<sup>2</sup> Geothermal heat pump and direct use energy.

<sup>3</sup> Solar thermal direct use energy, and photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6). Includes distributed solar thermal and PV energy used in the commercial, industrial, and electric power sectors.

<sup>4</sup> Wood and wood-derived fuels.

<sup>5</sup> Conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>6</sup> Photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6) at commercial plants with capacity of 1 megawatt or greater.

<sup>7</sup> Wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>8</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from

non-biogenic sources, and tire-derived fuels).

<sup>9</sup> The fuel ethanol (minus denaturant) portion of motor fuels, such as E10, consumed by the commercial sector.

R=Revised. P=Preliminary. NA=Not available. —=No data reported. (s)=Less than 0.5 trillion Btu.

Notes: • Data are estimates, except for commercial sector solar/PV, hydroelectric power, wind, and waste. • See Tables 8.2a–8.2d and 8.3a–8.3c for electricity net generation and useful thermal output from renewable energy sources; Tables 8.4a–8.4c, 8.5a–8.5d, 8.6a–8.6c, and 8.7a–8.7c for renewable energy consumption for electricity generation and useful thermal output; and Tables 8.11a–8.11d for renewable energy electric net summer capacity. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#renewable> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#renewable> for all annual data beginning in 1949. • See <http://www.eia.gov/renewable/> for related information.

Sources: See end of section.

**Table 10.2b Renewable Energy Consumption: Industrial and Transportation Sectors, Selected Years, 1949-2011**  
(Trillion Btu)

Year	Industrial Sector <sup>1</sup>										Transportation Sector		
	Hydro-electric Power <sup>2</sup>	Geo-thermal <sup>3</sup>	Solar/PV <sup>4</sup>	Wind <sup>5</sup>	Biomass					Total	Biomass		
					Wood <sup>6</sup>	Waste <sup>7</sup>	Fuel Ethanol <sup>8</sup>	Losses and Co-products <sup>9</sup>	Total		Fuel Ethanol <sup>10</sup>	Biodiesel	Total
1949	76	NA	NA	NA	468	NA	NA	NA	468	544	NA	NA	NA
1950	69	NA	NA	NA	532	NA	NA	NA	532	602	NA	NA	NA
1955	38	NA	NA	NA	631	NA	NA	NA	631	669	NA	NA	NA
1960	39	NA	NA	NA	680	NA	NA	NA	680	719	NA	NA	NA
1965	33	NA	NA	NA	855	NA	NA	NA	855	888	NA	NA	NA
1970	34	NA	NA	NA	1,019	NA	NA	NA	1,019	1,053	NA	NA	NA
1975	32	NA	NA	NA	1,063	NA	NA	NA	1,063	1,096	NA	NA	NA
1976	33	NA	NA	NA	1,220	NA	NA	NA	1,220	1,253	NA	NA	NA
1977	33	NA	NA	NA	1,281	NA	NA	NA	1,281	1,314	NA	NA	NA
1978	32	NA	NA	NA	1,400	NA	NA	NA	1,400	1,432	NA	NA	NA
1979	34	NA	NA	NA	1,405	NA	NA	NA	1,405	1,439	NA	NA	NA
1980	33	NA	NA	NA	1,600	NA	NA	NA	1,600	1,633	NA	NA	NA
1981	33	NA	NA	NA	1,602	87	(s)	6	1,695	1,728	7	NA	7
1982	33	NA	NA	NA	1,516	118	(s)	16	1,650	1,683	18	NA	18
1983	33	NA	NA	NA	1,690	155	(s)	29	1,874	1,908	34	NA	34
1984	33	NA	NA	NA	1,679	204	1	35	1,918	1,951	41	NA	41
1985	33	NA	NA	NA	1,645	230	1	42	1,918	1,951	50	NA	50
1986	33	NA	NA	NA	1,610	256	1	48	1,915	1,948	57	NA	57
1987	33	NA	NA	NA	1,576	282	1	55	1,914	1,947	66	NA	66
1988	33	NA	NA	NA	1,625	308	1	55	1,989	2,022	67	NA	67
1989	28	2	—	—	1,584	200	1	56	1,841	1,871	68	NA	68
1990	31	2	—	—	1,442	192	1	49	1,684	1,717	60	NA	60
1991	30	2	—	—	1,410	185	1	56	1,652	1,684	70	NA	70
1992	31	2	—	—	1,461	179	1	64	1,705	1,737	80	NA	80
1993	30	2	—	—	1,484	181	1	74	1,741	1,773	94	NA	94
1994	62	3	—	—	1,580	199	1	82	1,862	1,927	105	NA	105
1995	55	3	—	—	1,652	195	2	86	1,934	1,992	112	NA	112
1996	61	3	—	—	1,683	224	1	61	1,969	2,033	81	NA	81
1997	58	3	—	—	1,731	184	1	80	1,996	2,057	102	NA	102
1998	55	3	—	—	1,603	180	1	86	1,872	1,929	113	NA	113
1999	49	4	—	—	1,620	171	1	90	1,882	1,934	118	NA	118
2000	42	4	—	—	1,636	145	1	99	1,881	1,928	135	NA	135
2001	33	5	—	—	1,443	129	3	108	1,681	1,719	141	1	142
2002	39	5	—	—	1,396	146	3	130	1,676	1,720	168	2	170
2003	43	3	—	—	1,363	142	4	169	1,679	1,726	228	2	230
2004	33	4	—	—	1,476	132	6	203	1,817	1,853	286	3	290
2005	32	4	—	—	1,452	148	7	230	1,837	1,873	327	12	339
2006	29	4	—	—	1,472	130	10	285	1,897	1,930	442	33	475
2007	16	5	—	—	R1,405	144	10	377	R1,936	R1,956	557	46	602
2008	17	5	—	—	R1,340	144	12	532	R2,028	R2,049	786	40	826
2009	18	4	—	—	R1,208	R155	13	617	R1,994	R2,016	894	R42	R935
2010	16	4	(s)	(s)	R1,301	R169	R17	R742	R2,230	R2,250	R1,040	R34	R1,074
2011 <sup>P</sup>	18	4	(s)	(s)	1,311	172	17	772	2,273	2,295	1,042	112	1,154

<sup>1</sup> Industrial sector, including industrial combined-heat-and-power (CHP) and industrial electricity-only plants. See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8.

<sup>2</sup> Conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>3</sup> Geothermal heat pump and direct use energy.

<sup>4</sup> Photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6) at industrial plants with capacity of 1 megawatt or greater.

<sup>5</sup> Wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>6</sup> Wood and wood-derived fuels.

<sup>7</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>8</sup> The fuel ethanol (minus denaturant) portion of motor fuels, such as E10, consumed by the industrial sector.

<sup>9</sup> Losses and co-products from the production of fuel ethanol and biodiesel. Does not include natural

gas, electricity, and other non-biomass energy used in the production of fuel ethanol and biodiesel—these are included in the industrial sector consumption statistics for the appropriate energy source.

<sup>10</sup> The fuel ethanol (minus denaturant) portion of motor fuels, such as E10 and E85, consumed by the transportation sector.

R=Revised. P=Preliminary. NA=Not available. —=No data reported. (s)=Less than 0.5 trillion Btu.

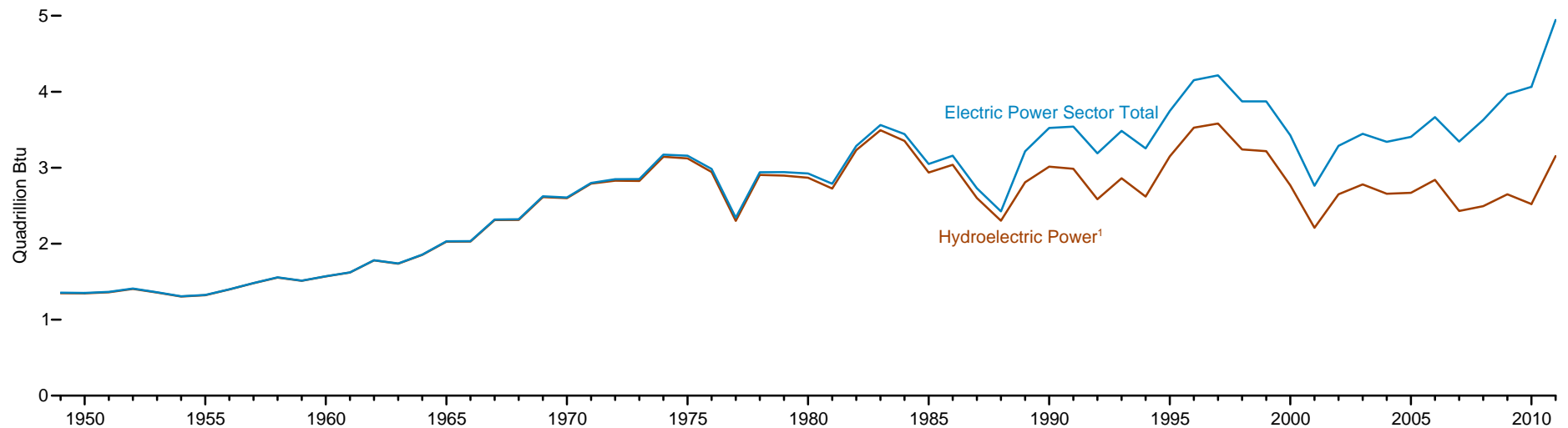
Notes: • Data are estimates, except for industrial sector hydroelectric power in 1949–1978 and 1989 forward, solar/PV, and wind. • See Tables 8.2a–8.2d and 8.3a–8.3c for electricity net generation and useful thermal output from renewable energy sources; Tables 8.4a–8.4c, 8.5a–8.5d, 8.6a–8.6c, and 8.7a–8.7c for renewable energy consumption for electricity generation and useful thermal output; and Tables 8.11a–8.11d for renewable energy electric net summer capacity. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#renewable> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#renewable> for all annual data beginning in 1949. • See <http://www.eia.gov/renewable/> for related information.

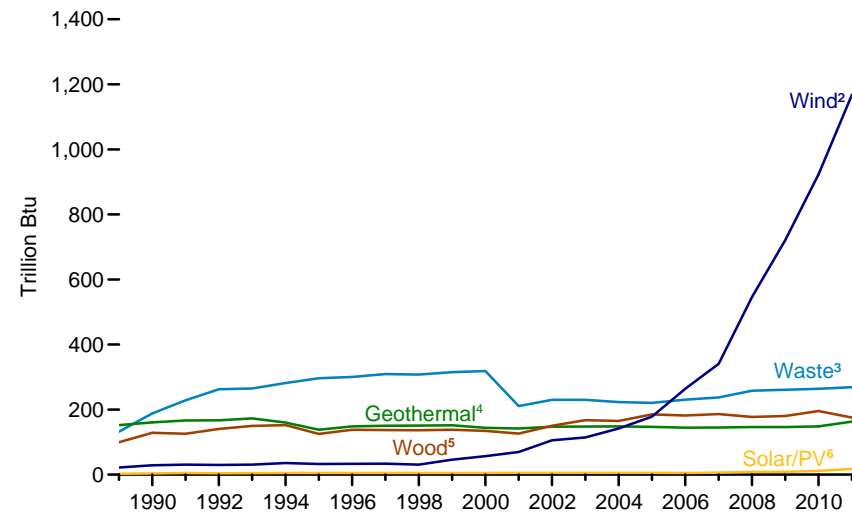
Sources: See end of section.

## Figure 10.2c Renewable Energy Consumption: Electric Power Sector

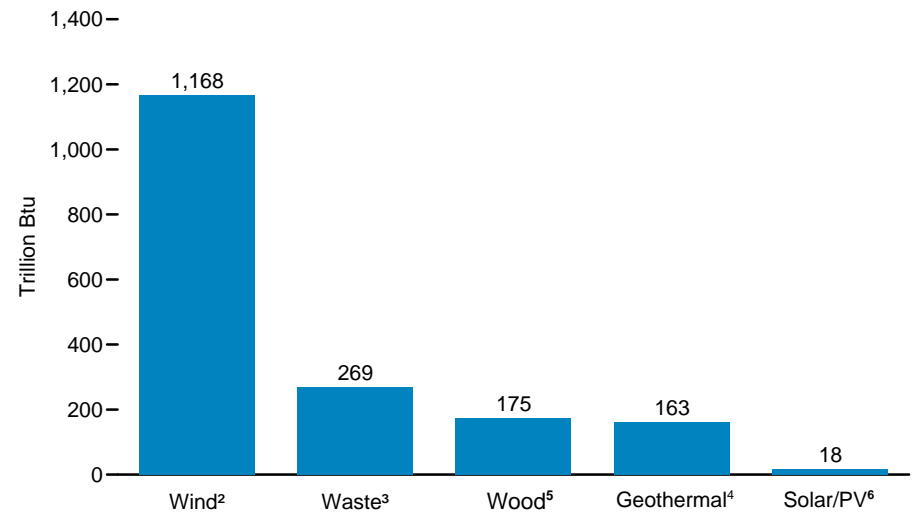
### Electric Power Sector Total and Hydroelectric Power, 1949-2011



### Non-Hydroelectric Power Sources, 1989-2011



### Non-Hydroelectric Power Sources, 2011



<sup>1</sup> Conventional hydroelectricity net generation.

<sup>2</sup> Wind electricity net generation.

<sup>3</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>4</sup> Geothermal electricity net generation.

<sup>5</sup> Wood and wood-derived fuels.

<sup>6</sup> Solar thermal and photovoltaic (PV) electricity net generation.

Note: See related Figures 10.2a and 10.2b on the end-use sectors.

Source: Table 10.2c.



**Table 10.2c Renewable Energy Consumption: Electric Power Sector, Selected Years, 1949-2011**

(Trillion Btu)

Year	Hydroelectric Power <sup>1</sup>	Geothermal <sup>2</sup>	Solar/PV <sup>3</sup>	Wind <sup>4</sup>	Biomass			Total
					Wood <sup>5</sup>	Waste <sup>6</sup>	Total	
1949	1,349	NA	NA	NA	6	NA	6	1,355
1950	1,346	NA	NA	NA	5	NA	5	1,351
1955	1,322	NA	NA	NA	3	NA	3	1,325
1960	1,569	(s)	NA	NA	2	NA	2	1,571
1965	2,026	2	NA	NA	3	NA	3	2,031
1970	2,600	6	NA	NA	1	2	4	2,609
1975	3,122	34	NA	NA	(s)	2	2	3,158
1976	2,943	38	NA	NA	1	2	3	2,983
1977	2,301	37	NA	NA	3	2	5	2,343
1978	2,905	31	NA	NA	2	1	3	2,940
1979	2,897	40	NA	NA	3	2	5	2,942
1980	2,867	53	NA	NA	3	2	5	2,925
1981	2,725	59	NA	NA	3	1	4	2,788
1982	3,233	51	NA	NA	2	1	3	3,286
1983	3,494	64	NA	(s)	2	2	4	3,562
1984	3,353	81	(s)	(s)	5	4	9	3,443
1985	2,937	97	(s)	(s)	8	7	14	3,049
1986	3,038	108	(s)	(s)	5	7	12	3,158
1987	2,602	112	(s)	(s)	8	7	15	2,729
1988	2,302	106	(s)	(s)	10	8	17	2,425
1989 <sup>7</sup>	2,808	152	3	22	100	132	232	3,217
1990	3,014	161	4	29	129	188	317	3,524
1991	2,985	167	5	31	126	229	354	3,542
1992	2,586	167	4	30	140	262	402	3,189
1993	2,861	173	5	31	150	265	415	3,484
1994	2,620	160	5	36	152	282	434	3,255
1995	3,149	138	5	33	125	296	422	3,747
1996	3,528	148	5	33	138	300	438	4,153
1997	3,581	150	5	34	137	309	446	4,216
1998	3,241	151	5	31	137	308	444	3,872
1999	3,218	152	5	46	138	315	453	3,874
2000	2,768	144	5	57	134	318	453	3,427
2001	2,209	142	6	70	126	211	337	2,763
2002	2,650	147	6	105	150	230	380	3,288
2003	2,781	148	5	115	167	230	397	3,445
2004	2,656	148	6	142	165	223	388	3,340
2005	2,670	147	6	178	185	221	406	3,406
2006	2,839	145	5	264	182	231	412	3,665
2007	2,430	145	6	341	186	237	423	3,345
2008	2,494	146	9	546	177	258	435	3,630
2009	2,650	146	9	721	180	261	441	3,967
2010	<sup>R</sup> 2,521	<sup>R</sup> 148	<sup>R</sup> 12	<sup>R</sup> 923	<sup>R</sup> 196	<sup>R</sup> 264	<sup>R</sup> 459	<sup>R</sup> 4,064
2011 <sup>P</sup>	3,153	163	18	1,168	175	269	444	4,945

<sup>1</sup> Conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>2</sup> Geothermal electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>3</sup> Solar thermal and photovoltaic (PV) electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>4</sup> Wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6).

<sup>5</sup> Wood and wood-derived fuels.

<sup>6</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass. Through 2000, also includes non-renewable waste (municipal solid waste from non-biogenic sources, and tire-derived fuels).

<sup>7</sup> Through 1988, data are for electric utilities only. Beginning in 1989, data are for electric utilities and independent power producers.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

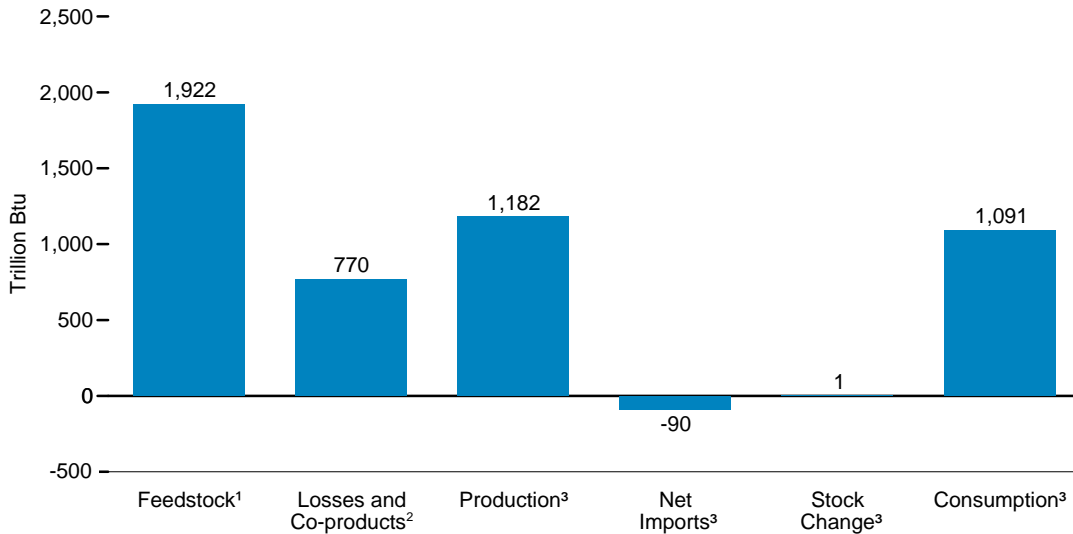
Notes: • The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. • See Tables 8.2a–8.2d and 8.3a–8.3c for electricity net generation and useful thermal output from renewable energy sources; Tables 8.4a–8.4c, 8.5a–8.5d, 8.6a–8.6c, and 8.7a–8.7c for renewable energy consumption for electricity generation and useful thermal output; and Tables 8.11a–8.11d for renewable energy electric net summer capacity. • See Note 3, "Electricity Imports and Exports," at end of Section 8. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#renewable> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#renewable> for all annual data beginning in 1949. • See <http://www.eia.gov/renewable/> for related information.

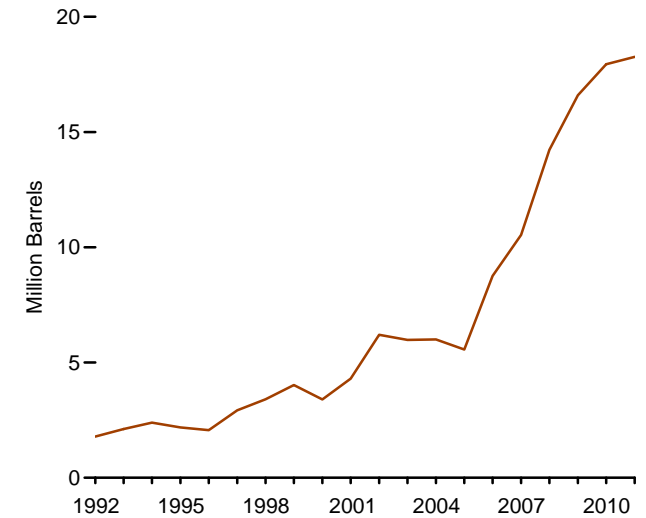
Sources: Tables 8.2b, 8.5b, 8.7b, and A6.

## Figure 10.3 Fuel Ethanol Overview

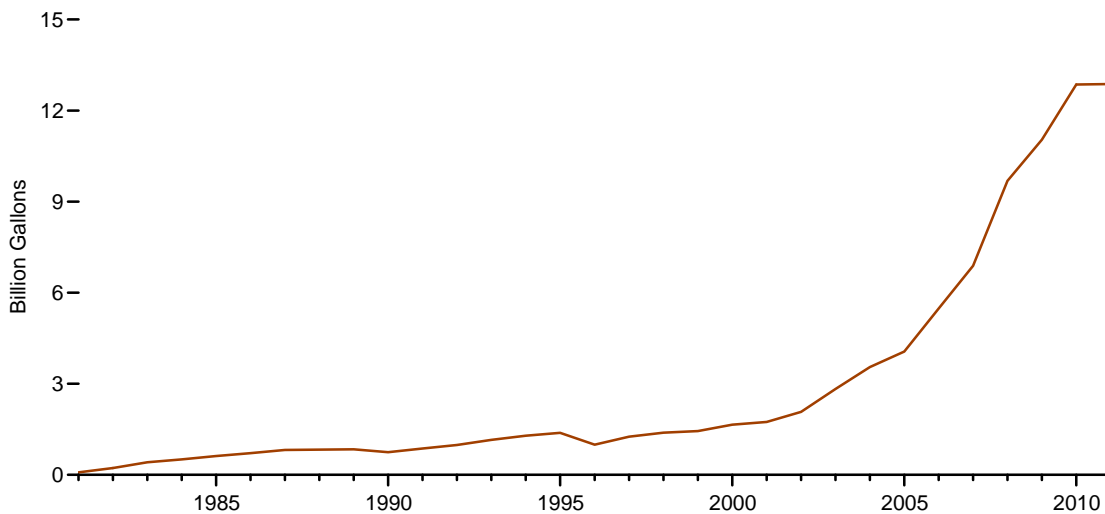
### Overview, 2011



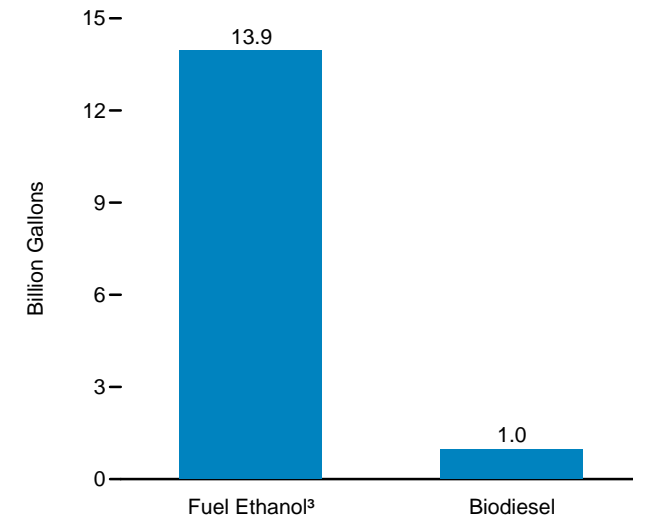
### Stocks,<sup>3</sup> End of Year 1992-2011



### Consumption,<sup>3</sup> 1981-2011



### Fuel Ethanol and Biodiesel Production, 2011



<sup>1</sup> Total corn and other biomass inputs to the production of undenatured ethanol used for fuel ethanol.

<sup>2</sup> Losses and co-products from the production of fuel ethanol.

<sup>3</sup> Includes denaturant.

Sources: Tables 10.3, 10.4, and A3.

**Table 10.3 Fuel Ethanol Overview, 1981-2011**

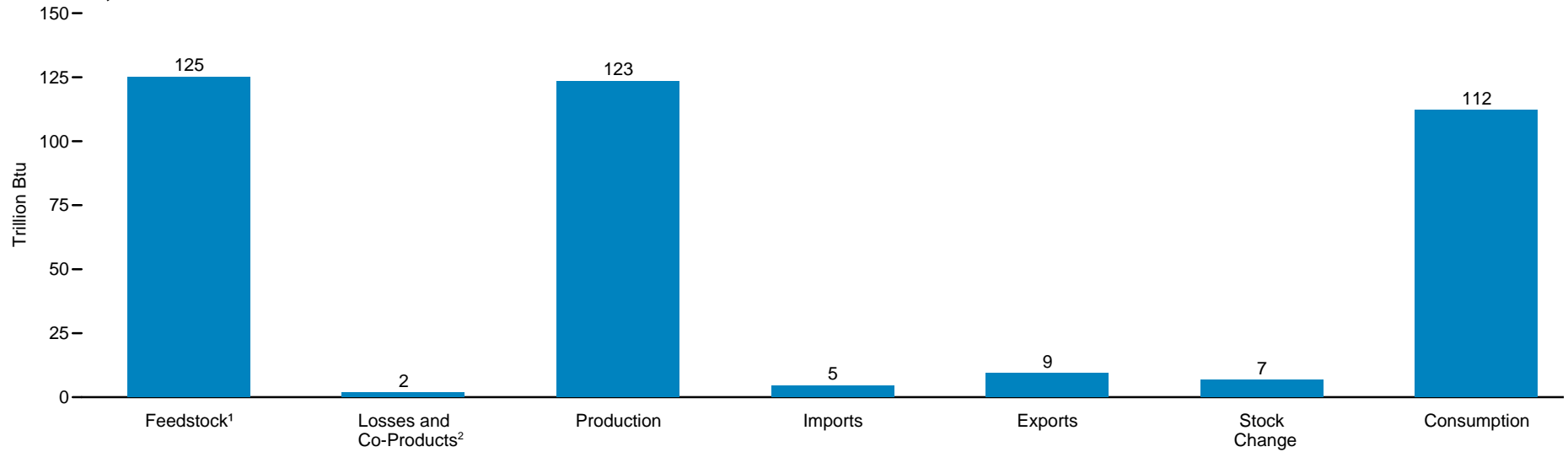
Year	Feed-stock <sup>1</sup> Trillion Btu	Losses and Co-products <sup>2</sup> Trillion Btu	Denaturant <sup>3</sup> Thousand Barrels	Production <sup>4</sup>			Trade <sup>4</sup>			Stocks, <sup>4</sup> End of Year Thousand Barrels	Stock Change <sup>4,6</sup> Thousand Barrels	Consumption <sup>4</sup>			Consumption Minus Denaturant <sup>7</sup> Trillion Btu
				Thousand Barrels	Million Gallons	Trillion Btu	Imports	Exports	Net Imports <sup>5</sup>			Thousand Barrels	Million Gallons	Trillion Btu	
				Thousand Barrels	Million Gallons	Trillion Btu	Thousand Barrels	Thousand Barrels	Thousand Barrels			Thousand Barrels	Million Gallons	Trillion Btu	
1981	13	6	40	1,978	83	7	NA	NA	NA	NA	NA	1,978	83	7	7
1982	34	16	107	5,369	225	19	NA	NA	NA	NA	NA	5,369	225	19	19
1983	63	29	198	9,890	415	35	NA	NA	NA	NA	NA	9,890	415	35	34
1984	77	35	243	12,150	510	43	NA	NA	NA	NA	NA	12,150	510	43	42
1985	93	42	294	14,693	617	52	NA	NA	NA	NA	NA	14,693	617	52	51
1986	107	48	339	16,954	712	60	NA	NA	NA	NA	NA	16,954	712	60	59
1987	123	55	390	19,497	819	69	NA	NA	NA	NA	NA	19,497	819	69	68
1988	124	55	396	19,780	831	70	NA	NA	NA	NA	NA	19,780	831	70	69
1989	125	56	401	20,062	843	71	NA	NA	NA	NA	NA	20,062	843	71	70
1990	111	49	356	17,802	748	63	NA	NA	NA	NA	NA	17,802	748	63	62
1991	128	56	413	20,627	866	73	NA	NA	NA	NA	NA	20,627	866	73	72
1992	145	64	469	23,453	985	84	NA	NA	NA	1,791	NA	23,453	985	84	81
1993	169	74	550	27,484	1,154	98	244	NA	244	2,114	323	27,405	1,151	98	95
1994	188	82	614	30,689	1,289	109	279	NA	279	2,393	279	30,689	1,289	109	106
1995	198	86	647	32,325	1,358	115	387	NA	387	2,186	-207	32,919	1,383	117	114
1996	141	61	464	23,178	973	83	313	NA	313	2,065	-121	23,612	992	84	82
1997	186	80	613	30,674	1,288	109	85	NA	85	2,925	860	29,899	1,256	107	104
1998	202	86	669	33,453	1,405	119	66	NA	66	3,406	481	33,038	1,388	118	115
1999	211	90	698	34,881	1,465	124	87	NA	87	4,024	618	34,350	1,443	122	119
2000	233	99	773	38,627	1,622	138	116	NA	116	3,400	-624	39,367	1,653	140	137
2001	253	108	841	42,028	1,765	150	315	NA	315	4,298	898	41,445	1,741	148	144
2002	307	130	1,019	50,956	2,140	182	306	NA	306	6,200	1,902	49,360	2,073	176	171
2003	400	169	1,335	66,772	2,804	238	292	NA	292	5,978	-222	67,286	2,826	240	233
2004	484	203	1,621	81,058	3,404	289	3,542	NA	3,542	6,002	24	84,576	3,552	301	293
2005	552	230	1,859	92,961	3,904	331	3,234	NA	3,234	5,563	-439	96,634	4,059	344	335
2006	688	285	2,326	116,294	4,884	414	17,408	NA	17,408	8,760	3,197	130,505	5,481	465	453
2007	914	376	3,105	155,263	6,521	553	10,457	NA	10,457	10,535	1,775	163,945	6,886	584	569
2008	1,300	531	4,433	221,637	9,309	790	12,610	NA	12,610	14,226	3,691	230,556	9,683	821	800
2009	1,517	616	5,688	260,424	10,938	928	4,720	NA	4,720	16,594	2,368	262,776	11,037	936	910
2010	R1,839	R742	R6,506	R316,617	R13,298	R1,127	R373	R9,488	R-9,115	R17,941	R1,347	R306,155	R12,858	R1,090	R1,061
2011 <sup>P</sup>	1,922	770	6,636	332,107	13,948	1,182	3,135	28,457	-25,322	18,261	8321	306,464	12,871	1,091	1,063

<sup>1</sup> Total corn and other biomass inputs to the production of undenatured ethanol used for fuel ethanol.  
<sup>2</sup> Losses and co-products from the production of fuel ethanol. Does not include natural gas, electricity, and other non-biomass energy used in the production of fuel ethanol—these are included in the industrial sector consumption statistics for the appropriate energy source.  
<sup>3</sup> The amount of denaturant in fuel ethanol produced.  
<sup>4</sup> Includes denaturant.  
<sup>5</sup> Net imports equal imports minus exports.  
<sup>6</sup> A negative value indicates a decrease in stocks and a positive value indicates an increase.  
<sup>7</sup> Consumption of fuel ethanol minus denaturant. Data for fuel ethanol minus denaturant are used to develop data for "Renewable Energy/Biomass" in Tables 10.1–10.2b, as well as in Sections 1 and 2.  
<sup>8</sup> Derived from the preliminary 2010 stocks value (17,940 thousand barrels), not the final 2010 value (17,941 thousand barrels) that is shown under "Stocks."  
R=Revised. P=Preliminary. NA=Not available.  
Notes: • Fuel ethanol data in thousand barrels are converted to million gallons by multiplying by 0.042, and are converted to Btu by multiplying by the approximate heat content of fuel ethanol—see Table A3.  
• Through 1980, data are not available. For 1981–1992, data are estimates. For 1993–2008, only data for feedstock, losses and co-products, and denaturant are estimates. Beginning in 2009, only data for feedstock, and losses and co-products, are estimates. • See "Denaturant," "Ethanol," "Fuel Ethanol," and "Fuel Ethanol Minus Denaturant" in Glossary. • Totals may not equal sum of components due to independent rounding.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#renewable> for updated monthly and annual data. • See <http://www.eia.gov/petroleum/supply/monthly/> for related information.  
Sources: **Feedstock:** Calculated as fuel ethanol production (in thousand barrels) minus denaturant, and then multiplied by the fuel ethanol feedstock factor—see Table A3. **Losses and Co-products:** Calculated as fuel ethanol feedstock plus denaturant minus fuel ethanol production. **Denaturant:** • 1981–2008—Data in thousand barrels for petroleum denaturant in fuel ethanol produced are estimated as 2 percent of fuel ethanol production; these data are converted to Btu by multiplying by 4.645 million Btu per barrel (the estimated quantity-weighted factor of pentanes plus and conventional motor gasoline used as denaturant).  
• 2009 forward—U.S. Energy Information Administration (EIA), *Petroleum Supply Annual (PSA)*, annual

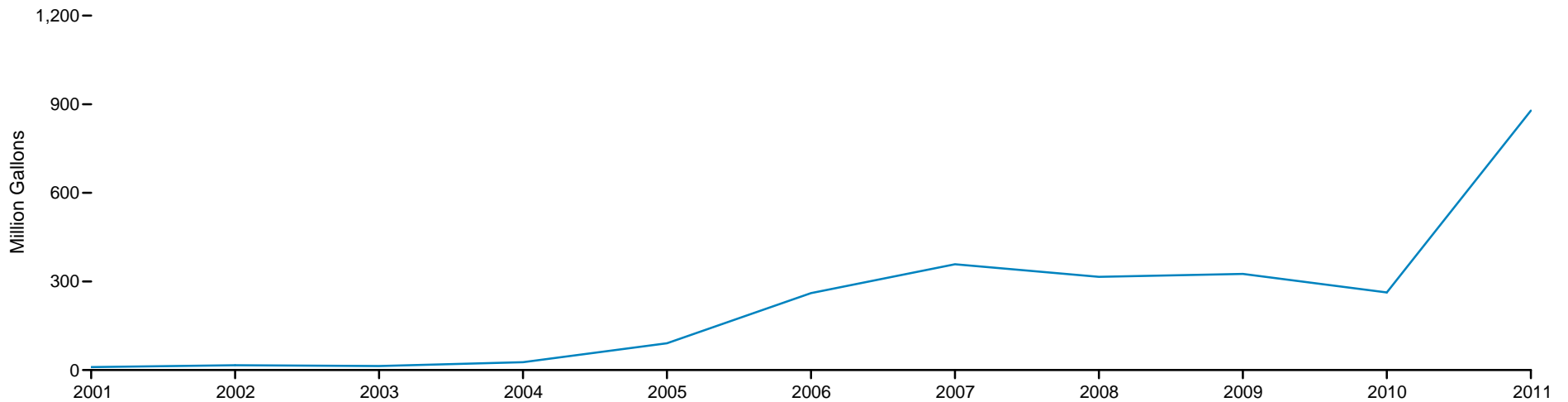
report, Table 1, and *Petroleum Supply Monthly (PSM)*, monthly reports, Table 1. Data in thousand barrels for net production of pentanes plus at renewable fuels and oxygenate plants are multiplied by -1; these data are converted to Btu by multiplying by 4.620 million Btu per barrel (the approximate heat content of pentanes plus). Data in thousand barrels for net production of conventional motor gasoline and motor gasoline blending components at renewable fuels and oxygenate plants are multiplied by -1; these data are converted to Btu by multiplying by 5.253 million Btu per barrel (the approximate heat content of conventional motor gasoline). Total denaturant is the sum of the values for pentanes plus, conventional motor gasoline, and motor gasoline blending components. **Production:** • 1981–1992—Fuel ethanol production is assumed to equal fuel ethanol consumption—see sources for "Consumption."  
• 1993–2004—Calculated as fuel ethanol consumption plus fuel ethanol stock change minus fuel ethanol net imports. These data differ slightly from the original production data from EIA, Form EIA-819, "Monthly Oxygenate Report," and predecessor form, which were not reconciled and updated to be consistent with the final balance. • 2005–2008—EIA, Form EIA-819, "Monthly Oxygenate Report." • 2009 and 2010—EIA, PSA, Table 1, data for net production of fuel ethanol at renewable fuels and oxygenate plants.  
• 2011—EIA, PSM (February 2012), Table 1, data for net production of fuel ethanol at renewable fuels and oxygenate plants. **Trade, Stocks, and Stock Change:** • 1992–2010—EIA, PSA, annual reports, Table 1.  
• 2011—EIA, PSM (February 2012), Table 1. **Consumption:** • 1981–1989—EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 10; and interpolated values for 1982, 1983, 1985, 1986, and 1988.  
• 1990–1992—EIA, *Estimates of U.S. Biomass Energy Consumption 1992*, Table D2; and interpolated value for 1991. • 1993–2004—EIA, PSA, annual reports, Tables 2 and 16. Calculated as 10 percent of oxygenated finished motor gasoline field production (Table 2), plus fuel ethanol refinery input (Table 16).  
• 2005–2008—EIA, PSA, annual reports, Tables 1 and 15. Calculated as motor gasoline blending components adjustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery and blender net inputs (Table 15). • 2009 and 2010—EIA, PSA, Table 1. Calculated as fuel ethanol refinery and blender net inputs minus fuel ethanol adjustments. • 2011—EIA, PSM (February 2012), Table 1. Calculated as fuel ethanol refinery and blender net inputs minus fuel ethanol adjustments. **Consumption Minus Denaturant:** Calculated as fuel ethanol consumption minus the amount of denaturant in fuel ethanol consumed. Denaturant in fuel ethanol consumed is estimated by multiplying denaturant in fuel ethanol produced by the fuel ethanol consumption-to-production ratio.

## Figure 10.4 Biodiesel Overview

### Overview, 2011



### Consumption, 2001-2011



<sup>1</sup> Total vegetable oil and other biomass inputs to the production of biodiesel.

<sup>2</sup> Losses and co-products from the production of biodiesel.

Sources: Tables 10.4 and A3.

**Table 10.4 Biodiesel Overview, 2001-2011**

Year	Feedstock <sup>1</sup>	Losses and Co-products <sup>2</sup>	Production			Trade			Stocks, End of Year	Stock Change <sup>4</sup>	Balancing Item <sup>5</sup>	Consumption		
						Imports	Exports	Net Imports <sup>3</sup>						
			Trillion Btu	Trillion Btu	Thousand Barrels	Million Gallons	Trillion Btu	Thousand Barrels				Thousand Barrels	Thousand Barrels	Thousand Barrels
2001	1	(s)	204	9	1	78	39	39	NA	NA	NA	243	10	1
2002	1	(s)	250	10	1	191	56	135	NA	NA	NA	385	16	2
2003	2	(s)	338	14	2	94	110	-16	NA	NA	NA	322	14	2
2004	4	(s)	666	28	4	97	124	-26	NA	NA	NA	640	27	3
2005	12	(s)	2,162	91	12	207	206	1	NA	NA	NA	2,163	91	12
2006	32	(s)	5,963	250	32	1,069	828	242	NA	NA	NA	6,204	261	33
2007	63	1	11,662	490	62	3,342	6,477	-3,135	NA	NA	NA	8,528	358	46
2008	88	1	16,145	678	87	7,502	16,128	-8,626	NA	NA	NA	7,519	316	40
2009	<sup>R</sup> 67	1	<sup>R</sup> 12,281	<sup>R</sup> 516	<sup>R</sup> 66	1,844	6,332	-4,489	711	711	<sup>R</sup> 669	<sup>R</sup> 7,750	<sup>R</sup> 326	<sup>R</sup> 42
2010	<sup>R</sup> 44	1	<sup>R</sup> 8,177	<sup>R</sup> 343	<sup>R</sup> 44	546	2,503	-1,958	<sup>R</sup> 672	<sup>R</sup> -39	0	<sup>R</sup> 6,258	<sup>R</sup> 263	<sup>R</sup> 34
2011 <sup>P</sup>	125	2	23,034	967	123	861	1,740	-879	1,902	<sup>6</sup> 1,240	0	20,915	878	112

<sup>1</sup> Total vegetable oil and other biomass inputs to the production of biodiesel.

<sup>2</sup> Losses and co-products from the production of biodiesel. Does not include natural gas, electricity, and other non-biomass energy used in the production of biodiesel—these are included in the industrial sector consumption statistics for the appropriate energy source.

<sup>3</sup> Net imports equal imports minus exports.

<sup>4</sup> A negative value indicates a decrease in stocks and a positive value indicates an increase.

<sup>5</sup> Beginning in 2009, because of incomplete data coverage and different data sources, "Balancing Item" is used to balance biodiesel supply and disposition.

<sup>6</sup> Derived from the preliminary 2010 stocks value (662 thousand barrels), not the final 2010 value (672 thousand barrels) that is shown under "Stocks."

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 trillion Btu.

Notes: • Biodiesel data in thousand barrels are converted to million gallons by multiplying by 0.042, and are converted to Btu by multiplying by 5.359 million Btu per barrel (the approximate heat content of biodiesel—see Table A3). • Through 2000, data are not available. Beginning in 2001, data not from U.S. Energy Information Administration (EIA) surveys are estimates. • Totals may not equal sum of components due to independent rounding.

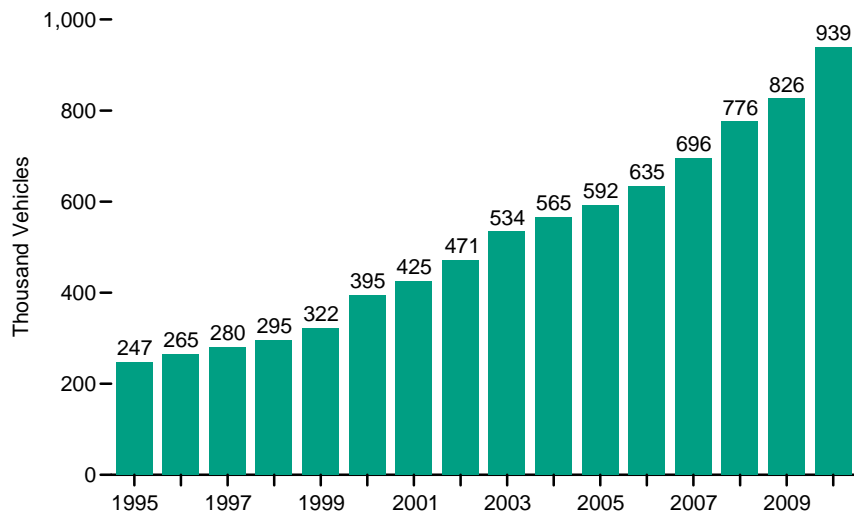
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#renewable> for updated monthly and annual data. • See <http://www.eia.gov/biofuels/biodiesel/production/> for related information.

Sources: **Feedstock:** Calculated as biodiesel production in thousand barrels multiplied by 5.433 million Btu per barrel (the biodiesel feedstock factor—see Table A3). **Losses and Co-products:** Calculated as biodiesel feedstock minus biodiesel production. **Production:** • 2001-2005—U.S. Department of Agriculture, Commodity Credit Corporation, Bioenergy Program records. Annual data are derived from quarterly data. • 2006—U.S. Department of Commerce, Bureau of the Census, "M311K - Fats and Oils:

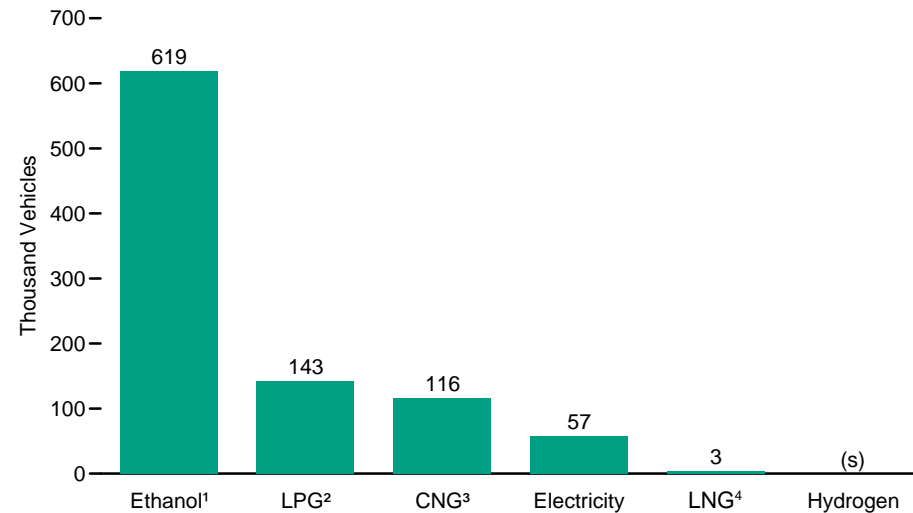
Production, Consumption, and Stocks," data for soybean oil consumed in methyl esters (biodiesel). In addition, EIA estimates that 14.4 million gallons of yellow grease were consumed in methyl esters (biodiesel). • 2007—U.S. Department of Commerce, Bureau of the Census, "M311K - Fats and Oils: Production, Consumption, and Stocks," data for all fats and oils consumed in methyl esters (biodiesel). • 2008—EIA, *Monthly Biodiesel Production Report, December 2009* (release date October 2010), Table 11. • 2009 forward—EIA, *Monthly Biodiesel Production Report* (May 2012), Table 1. **Trade:** U.S. Department of Agriculture, imports data for Harmonized Tariff Schedule codes 3824.90.40.20, "Fatty Esters Animal/Vegetable/Mixture" (for data through June 2010), and 3824.90.40.30, "Biodiesel/Mixes" (for data beginning in July 2010); and exports data for Schedule B code 3824.90.40.00, "Fatty Substances Animal/Vegetable/Mixture" (for data through 2010), and 3824.90.40.30, "Biodiesel <70%" (for data for 2011). Although these categories include products other than biodiesel (such as those destined for soaps, cosmetics, and other items), biodiesel is the largest component. In the absence of other reliable data for biodiesel trade, EIA sees these data as good estimates. **Stocks and Stock Change:** • 2009 and 2010—EIA, *Petroleum Supply Annual*, annual reports, Table 1, data for renewable fuels except fuel ethanol. • 2011—EIA, *Petroleum Supply Monthly (PSM)*, monthly reports, Table 1, data for renewable fuels except fuel ethanol. **Balancing Item:** • 2009 forward—Calculated as biodiesel consumption and biodiesel stock change minus biodiesel production and biodiesel net imports. **Consumption:** • 2001-2008—Calculated as biodiesel production plus biodiesel net imports. • 2009—Calculated as the sum of the monthly consumption data. Data for January and February 2009 are from EIA, PSM, monthly reports, Table 1, refinery and blender net inputs of renewable fuels except fuel ethanol. Data for March-December 2009 are calculated as biodiesel production plus biodiesel net imports minus biodiesel stock change. • 2010 and 2011—Calculated as biodiesel production plus biodiesel net imports minus biodiesel stock change.

**Figure 10.5 Estimated Number of Alternative-Fueled Vehicles in Use and Alternative Fuel Consumption**

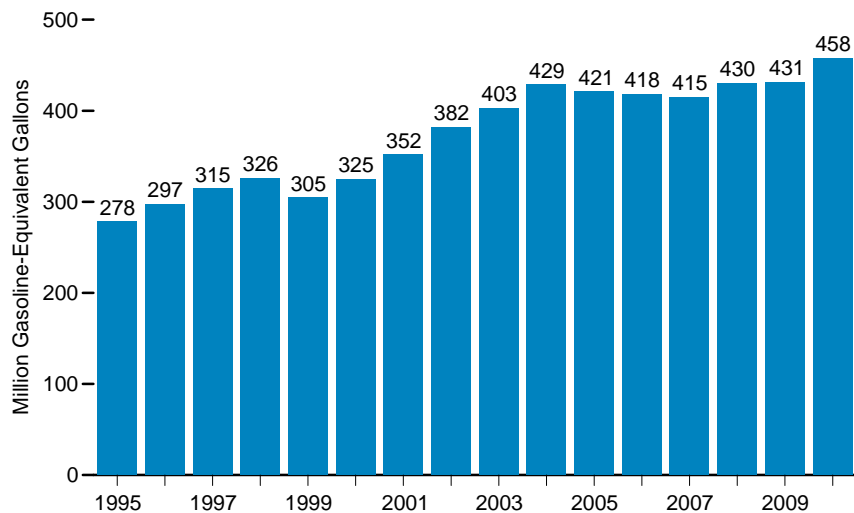
**Vehicles in Use, 1995-2010**



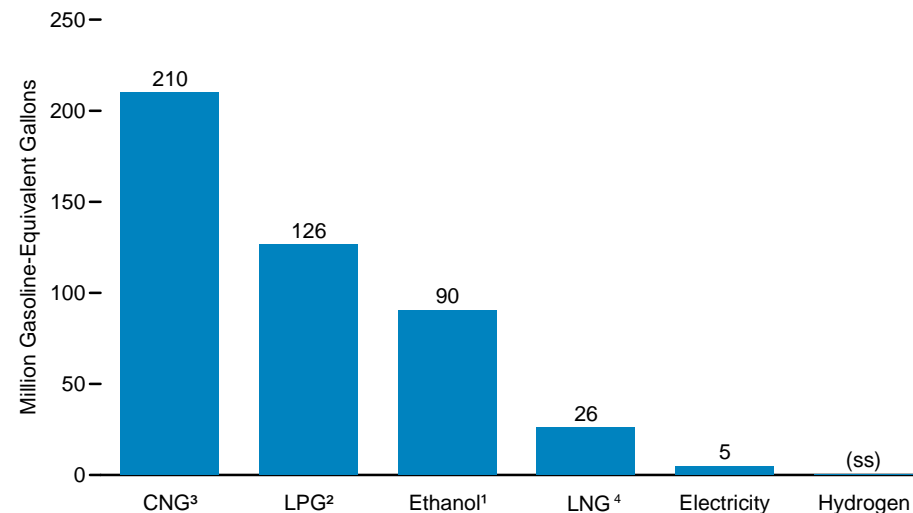
**Vehicles in Use by Fuel Type, 2010**



**Fuel Consumption,<sup>5</sup> 1995-2010**



**Fuel Consumption by Type, 2010**



<sup>1</sup> Ethanol, 85 percent (E85). Includes only those E85 vehicles believed to be used as alternative-fueled vehicles, primarily fleet-operated vehicles; excludes other vehicles with E85-fueling capability.

<sup>2</sup> Liquefied petroleum gases.

<sup>3</sup> Compressed natural gas.

<sup>4</sup> Liquefied natural gas.

<sup>5</sup> Excludes oxygenates and biodiesel.

(s)=Fewer than 0.5 thousand vehicles.

(ss)=Less than 0.5 million gasoline-equivalent gallons.

Source: Table 10.5.

**Table 10.5 Estimated Number of Alternative-Fueled Vehicles in Use and Fuel Consumption, 1992-2010**

Year	Alternative and Replacement Fuels <sup>1</sup>											Oxygenates <sup>2</sup>			Bio-diesel <sup>10</sup>	Total
	Liquefied Petroleum Gases	Compressed Natural Gas	Liquefied Natural Gas	Methanol, 85 Percent (M85) <sup>3</sup>	Methanol, Neat (M100) <sup>4</sup>	Ethanol, 85 Percent (E85) <sup>3,5</sup>	Ethanol, 95 Percent (E95) <sup>3</sup>	Electricity <sup>6</sup>	Hydrogen	Other Fuels <sup>7</sup>	Subtotal	Methyl Tertiary Butyl Ether <sup>8</sup>	Ethanol in Gasohol <sup>9</sup>	Total		
	Alternative-Fueled Vehicles in Use <sup>11</sup> (number)															
1992	NA	23,191	90	4,850	404	172	38	1,607	NA	NA	NA	NA	NA	NA	NA	NA
1993	NA	32,714	299	10,263	414	441	27	1,690	NA	NA	NA	NA	NA	NA	NA	NA
1994	NA	41,227	484	15,484	415	605	33	2,224	NA	NA	NA	NA	NA	NA	NA	NA
1995	172,806	50,218	603	18,319	386	1,527	136	2,860	0	0	246,855	NA	NA	NA	NA	NA
1996	175,585	60,144	663	20,265	172	4,536	361	3,280	0	0	265,006	NA	NA	NA	NA	NA
1997	175,679	68,571	813	21,040	172	9,130	347	4,453	0	0	280,205	NA	NA	NA	NA	NA
1998	177,183	78,782	1,172	19,648	200	12,788	14	5,243	0	0	295,030	NA	NA	NA	NA	NA
1999	178,610	91,267	1,681	18,964	198	24,604	14	6,964	0	0	322,302	NA	NA	NA	NA	NA
2000	181,994	100,750	2,090	10,426	0	87,570	4	11,830	0	0	394,664	NA	NA	NA	NA	NA
2001	185,053	111,851	2,576	7,827	0	100,303	0	17,847	0	0	425,457	NA	NA	NA	NA	NA
2002	187,680	120,839	2,708	5,873	0	120,951	0	33,047	0	0	471,098	NA	NA	NA	NA	NA
2003	190,369	114,406	2,640	0	0	179,090	0	47,485	9	0	533,999	NA	NA	NA	NA	NA
2004	182,864	118,532	2,717	0	0	211,800	0	49,536	43	0	565,492	NA	NA	NA	NA	NA
2005	173,795	117,699	2,748	0	0	246,363	0	51,398	119	3	592,125	NA	NA	NA	NA	NA
2006	164,846	116,131	2,798	0	0	297,099	0	53,526	159	3	634,562	NA	NA	NA	NA	NA
2007	158,254	114,391	2,781	0	0	364,384	0	55,730	223	3	695,766	NA	NA	NA	NA	NA
2008	151,049	113,973	3,101	0	0	450,327	0	56,901	313	3	775,667	NA	NA	NA	NA	NA
2009	147,030	114,270	3,176	0	0	504,297	0	57,185	357	3	826,318	NA	NA	NA	NA	NA
2010	143,037	115,863	3,354	0	0	618,505	0	57,462	421	0	938,643	NA	NA	NA	NA	NA
Fuel Consumption <sup>12</sup> (thousand gasoline-equivalent gallons)																
1992	NA	17,159	598	1,121	2,672	22	87	359	NA	NA	NA	1,175,964	719,408	1,895,372	NA	NA
1993	NA	22,035	1,944	1,671	3,321	49	82	288	NA	NA	NA	2,070,897	779,958	2,850,854	NA	NA
1994	NA	24,643	2,398	2,455	3,347	82	144	430	NA	NA	NA	2,020,455	868,113	2,888,569	NA	NA
1995	233,178	35,865	2,821	2,122	2,255	195	1,021	663	0	0	278,121	2,693,407	934,615	3,628,022	NA	3,906,142
1996	239,648	47,861	3,320	1,862	364	712	2,770	773	0	0	297,310	2,751,955	677,537	3,429,492	NA	3,726,802
1997	238,845	66,495	3,798	1,630	364	1,314	1,166	1,010	0	0	314,621	3,106,745	852,514	3,959,260	NA	4,273,880
1998	241,881	73,859	5,463	1,271	471	1,772	61	1,202	0	0	325,980	2,905,781	912,858	3,818,639	NA	4,144,620
1999	210,247	81,211	5,959	1,126	469	4,019	64	1,524	0	0	304,618	3,405,390	975,255	4,380,645	NA	4,685,263
2000	213,012	88,478	7,423	614	0	12,388	13	3,058	0	0	324,986	3,298,803	1,114,313	4,413,116	6,828	4,744,930
2001	216,319	106,584	9,122	461	0	15,007	0	4,066	0	0	351,558	3,354,949	1,173,323	4,528,272	10,627	4,890,457
2002	223,600	123,081	9,593	354	0	18,250	0	7,274	0	0	382,152	3,122,859	1,450,721	4,573,580	16,824	4,972,556
2003	224,697	133,222	13,503	0	0	26,376	0	5,141	2	0	402,941	2,368,400	1,919,572	4,287,972	14,082	4,704,995
2004	211,883	158,903	20,888	0	0	31,581	0	5,269	8	0	428,532	1,877,300	2,414,167	4,291,467	27,616	4,747,615
2005	188,171	166,878	22,409	0	0	38,074	0	5,219	25	2	420,778	1,654,500	2,756,663	4,411,163	93,281	4,925,222
2006	173,130	172,011	23,474	0	0	44,041	0	5,104	41	2	417,803	435,000	3,729,168	4,164,168	267,623	4,849,594
2007	152,360	178,565	24,594	0	0	54,091	0	5,037	66	2	414,715	0	4,694,304	4,694,304	367,764	5,476,783
2008	147,784	189,358	25,554	0	0	62,644	0	5,050	117	2	430,329	0	6,442,781	6,442,781	324,329	7,197,439
2009	129,631	199,513	25,652	0	0	71,213	0	4,956	140	2	431,107	0	7,343,133	7,343,133	325,102	8,099,342
2010	126,354	210,007	26,072	0	0	90,323	0	4,847	152	0	457,755	0	8,527,431	8,527,431	235,188	9,220,374

<sup>1</sup> See "Alternative Fuel" and "Replacement Fuel" in Glossary.

<sup>2</sup> See "Oxygenates" in Glossary.

<sup>3</sup> Remaining portion is motor gasoline. Consumption data include the motor gasoline portion of the fuel.

<sup>4</sup> One hundred percent methanol.

<sup>5</sup> Includes only those E85 vehicles believed to be used as alternative-fuels vehicles (AFVs), primarily fleet-operated vehicles; excludes other vehicles with E85-fueling capability. In 1997, some vehicle manufacturers began including E85-fueling capability in certain model lines of vehicles. For 2010, the U.S. Energy Information Administration (EIA) estimates that the number of E85 vehicles that are capable of operating on E85, motor gasoline, or both, is about 10 million. Many of these AFVs are sold and used as traditional gasoline-powered vehicles.

<sup>6</sup> Excludes gasoline-electric hybrids.

<sup>7</sup> May include P-Series fuel or any other fuel designated by the Secretary of Energy as an alternative fuel in accordance with the Energy Policy Act of 1995.

<sup>8</sup> In addition to methyl tertiary butyl ether (MTBE), includes a very small amount of other ethers, primarily tertiary amyl methyl ether (TAME) and ethyl tertiary butyl ether (ETBE).

<sup>9</sup> Data do not include the motor gasoline portion of the fuel.

<sup>10</sup> "Biodiesel" may be used as a diesel fuel substitute or diesel fuel additive or extender. See "Biodiesel" in Glossary.

<sup>11</sup> "Vehicles in Use" data represent accumulated acquisitions, less retirements, as of the end of each calendar year; data do not include concept and demonstration vehicles that are not ready for delivery to

end users. See "Alternative-Fuel Vehicle" in Glossary.

<sup>12</sup> Fuel consumption quantities are expressed in a common base unit of gasoline-equivalent gallons to allow comparisons of different fuel types. Gasoline-equivalent gallons do not represent gasoline displacement. Gasoline equivalent is computed by dividing the gross heat content of the replacement fuel by the gross heat content of gasoline (using an approximate heat content of 122,619 Btu per gallon) and multiplying the result by the replacement fuel consumption value. See "Heat Content" in Glossary.

NA=Not available.

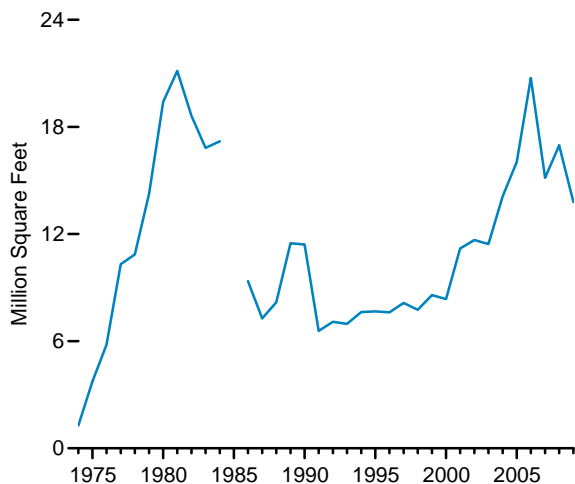
Note: Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/renewable/>.

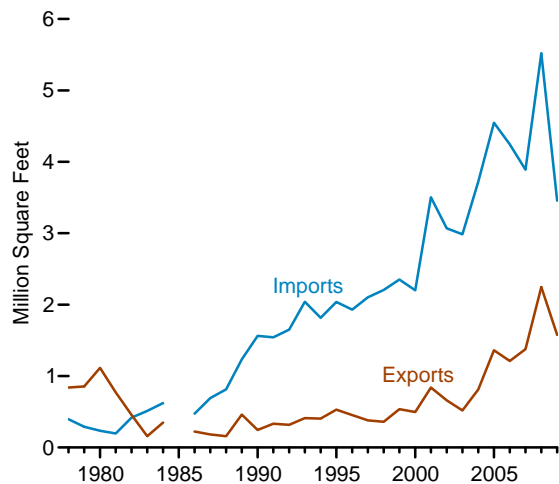
Sources: • 1992-1994—Science Applications International Corporation, "Alternative Transportation Fuels and Vehicles Data Development," unpublished final report prepared for the EIA, (McLean, VA, July 1996), and U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. Data were revised by using gross instead of net heat contents. For a table of gross and net heat contents, see EIA, *Alternatives to Traditional Transportation Fuels: An Overview* (June 1994), Table 22. • 1995-2002—EIA, "Alternatives to Traditional Transportation Fuels 2003 Estimated Data" (February 2004), Tables 1 and 10. Data were revised by using gross instead of net heat contents. • 2003 forward—EIA, Alternative-Fuel Vehicle Interactive Data Viewer (see [http://www.eia.gov/renewable/afv/users.cfm#tabs\\_charts-2](http://www.eia.gov/renewable/afv/users.cfm#tabs_charts-2) and <http://www.eia.gov/renewable/afv/xls/New%20C1%20GEGs.xls>); and "Alternatives to Traditional Transportation Fuels," annual reports, Table C1.

**Figure 10.6 Solar Thermal Collector Shipments by Type, Price, and Trade**

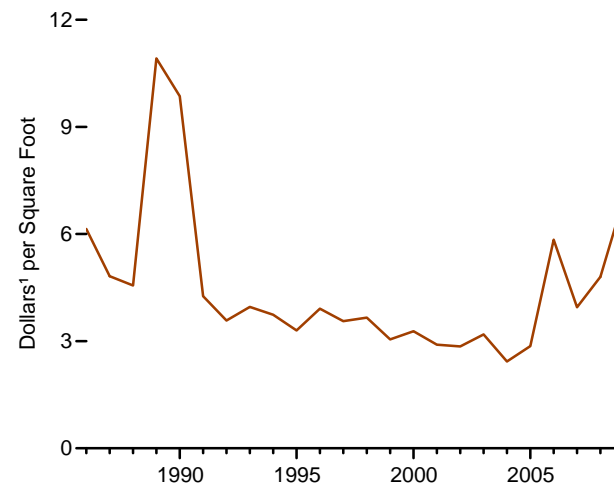
**Total Shipments, 1974-2009**



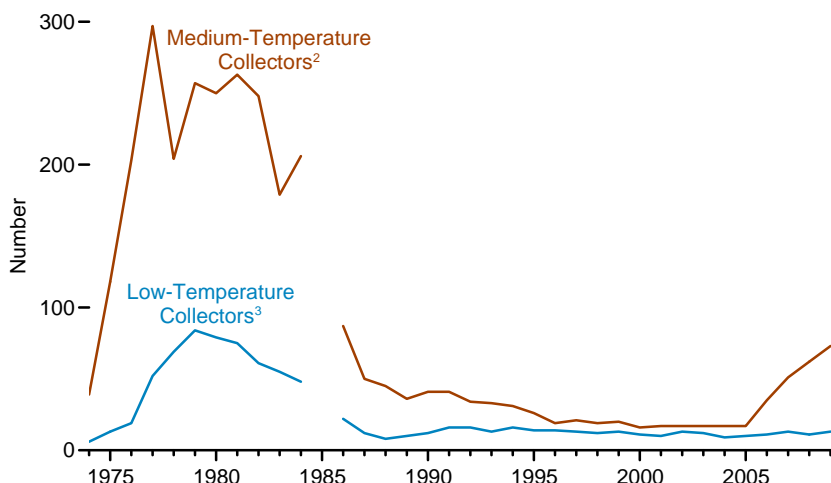
**Trade, 1978-2009**



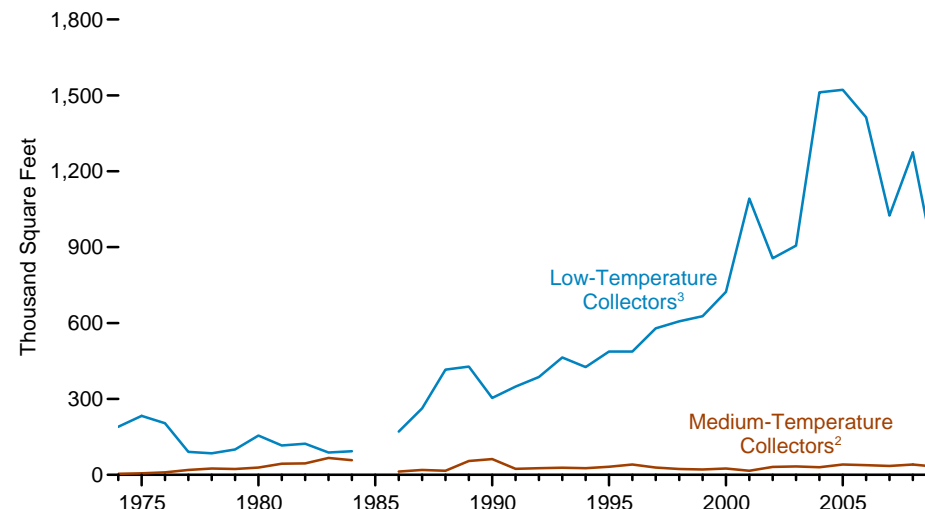
**Price of Total Shipments, 1986-2009**



**Number of U.S. Manufacturers by Type of Collector, 1974-2009**



**Average Annual Shipments per Manufacturer, 1974-2009**



<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>2</sup> Collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit. Special collectors—evacuated tube collectors or concentrating (focusing) collectors—are included in the medium-temperature category.

<sup>3</sup> Collectors that generally operate at temperatures below 110 degrees Fahrenheit.

Notes: • Shipments are for domestic and export shipments, and may include imports that subsequently were shipped to domestic or foreign customers. • Data were not collected for 1985.

Source: Table 10.6.



**Table 10.6 Solar Thermal Collector Shipments by Type, Price, and Trade, 1974-2009**

(Thousand Square Feet, Except as Noted)

Year	Low-Temperature Collectors <sup>1</sup>				Medium-Temperature Collectors <sup>2</sup>				High-Temperature Collectors <sup>3</sup>		Total Shipments		Trade	
	Number of U.S. Manufacturers	Quantity Shipped	Shipments per Manufacturer	Price <sup>4</sup> (dollars <sup>5</sup> per square foot)	Number of U.S. Manufacturers	Quantity Shipped	Shipments per Manufacturer	Price <sup>4</sup> (dollars <sup>5</sup> per square foot)	Quantity Shipped	Price <sup>4</sup> (dollars <sup>5</sup> per square foot)	Quantity Shipped	Price <sup>4</sup> (dollars <sup>5</sup> per square foot)	Imports	Exports
1974	6	1,137	190	NA	39	137	4	NA	NA	NA	1,274	NA	NA	NA
1975	13	3,026	233	NA	118	717	6	NA	NA	NA	3,743	NA	NA	NA
1976	19	3,876	204	NA	203	1,925	10	NA	NA	NA	5,801	NA	NA	NA
1977	52	4,743	91	NA	297	5,569	19	NA	NA	NA	10,312	NA	NA	NA
1978	69	5,872	85	NA	204	4,988	25	NA	NA	NA	10,860	NA	396	840
1979	84	8,394	100	NA	257	5,856	23	NA	NA	NA	14,251	NA	290	855
1980	79	12,233	155	NA	250	7,165	29	NA	NA	NA	19,398	NA	235	1,115
1981	75	8,677	116	NA	263	11,456	44	NA	NA	NA	21,133	NA	196	771
1982	61	7,476	123	NA	248	11,145	45	NA	NA	NA	18,621	NA	418	455
1983	55	4,853	88	NA	179	11,975	67	NA	NA	NA	16,828	NA	511	159
1984	48	4,479	93	NA	206	11,939	58	NA	773	NA	17,191	NA	621	348
1985 <sup>6</sup>	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1986	22	3,751	171	2.30	87	1,111	13	18.30	4,498	NA	9,360	6.14	473	224
1987	12	3,157	263	2.18	50	957	19	13.50	3,155	NA	7,269	4.82	691	182
1988	8	3,326	416	2.24	45	732	16	14.88	4,116	NA	8,174	4.56	814	158
1989	10	4,283	428	2.60	36	1,989	55	11.74	5,209	17.76	11,482	10.92	1,233	461
1990	12	3,645	304	2.90	41	2,527	62	7.68	5,237	15.74	11,409	9.86	1,562	245
1991	16	5,585	349	2.90	41	989	24	11.94	1	31.94	6,574	4.26	1,543	332
1992	16	6,187	387	2.50	34	897	26	10.96	2	75.66	7,086	3.58	1,650	316
1993	13	6,025	464	2.80	33	931	28	11.74	12	22.12	6,968	3.96	2,039	411
1994	16	6,823	426	2.54	31	803	26	13.54	2	177.00	7,627	3.74	1,815	405
1995	14	6,813	487	2.32	26	840	32	10.48	13	53.26	7,666	3.30	2,037	530
1996	14	6,821	487	2.67	19	785	41	14.48	10	18.75	7,616	3.91	1,930	454
1997	13	7,524	579	2.60	21	606	29	15.17	7	25.00	8,138	3.56	2,102	379
1998	12	7,292	607	2.83	19	443	23	15.17	21	53.21	7,756	3.66	2,206	360
1999	13	8,152	627	2.08	20	427	21	19.12	4	286.49	8,583	3.05	2,352	537
2000	11	7,948	723	2.09	16	400	25	W	5	W	8,354	3.28	2,201	496
2001	10	10,919	1,092	2.15	17	268	16	W	2	W	11,189	2.90	3,502	840
2002	13	11,126	856	1.97	17	535	31	W	2	W	11,663	2.85	3,068	659
2003	12	10,877	906	2.08	17	560	33	W	7	W	11,444	3.19	2,986	518
2004	9	13,608	1,512	1.80	17	506	30	19.30	-	-	14,114	2.43	3,723	813
2005	10	15,224	1,522	2.00	17	702	41	W	115	W	16,041	2.86	4,546	1,361
2006	11	15,546	1,413	1.95	35	1,346	38	W	3,852	W	20,744	5.84	4,244	1,211
2007	13	13,323	1,025	1.97	51	1,797	35	W	33	W	15,153	3.95	3,891	1,376
2008	11	14,015	1,274	1.89	62	2,560	41	19.57	388	11.96	16,963	4.80	5,517	2,247
2009	13	10,511	809	1.94	73	2,307	32	27.32	980	25.32	13,798	7.01	3,456	1,577

<sup>1</sup> Low-temperature collectors are solar thermal collectors that generally operate at temperatures below 110° F.

<sup>2</sup> Medium-temperature collectors are solar thermal collectors that generally operate in the temperature range of 140° F to 180° F but can also operate at temperatures as low as 110° F. Special collectors are included in this category. Special collectors are evacuated tube collectors or concentrating (focusing) collectors. They operate in the temperature range from just above ambient temperature (low concentration for pool heating) to several hundred degrees Fahrenheit (high concentration for air conditioning and specialized industrial processes).

<sup>3</sup> High-temperature collectors are solar thermal collectors that generally operate at temperatures above 180° F. High-temperature collector shipments are dominated by one manufacturer, and the collectors are used by the electric power sector to build new central station solar thermal power plants and generate electricity. Year-to-year fluctuations depend on how much new capacity is brought online.

<sup>4</sup> Prices equal shipment value divided by quantity shipped. Value includes charges for advertising and warranties. Excluded are excise taxes and the cost of freight or transportation for the shipments.

<sup>5</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>6</sup> No data are available for 1985.

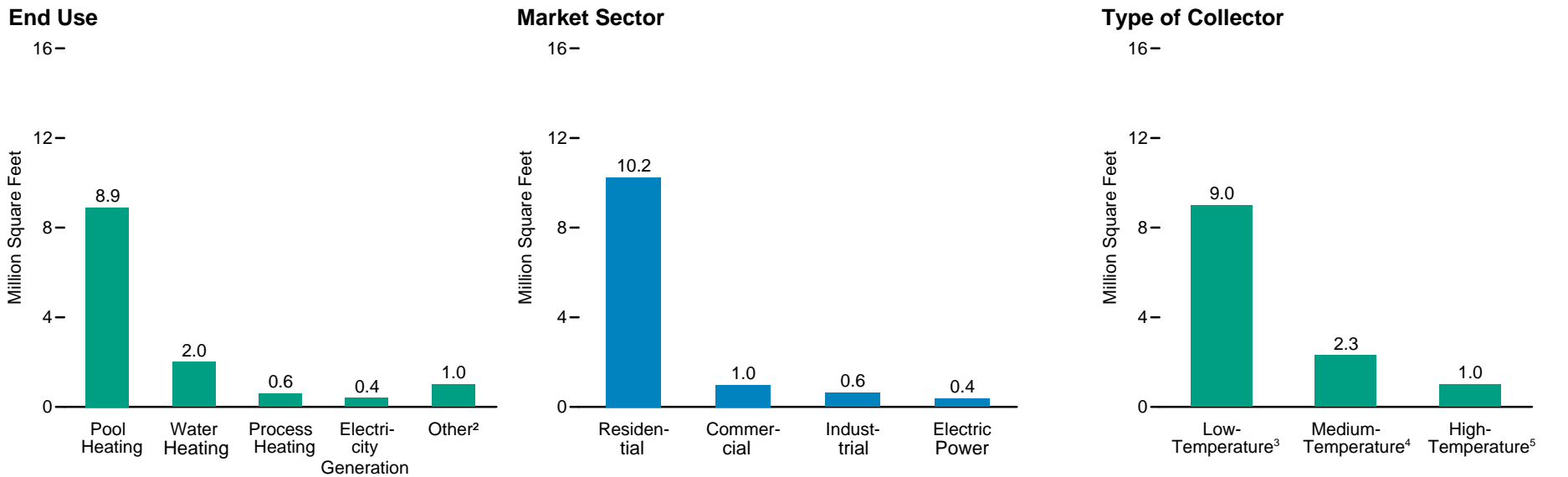
NA=Not available. --=No data reported. --=Not applicable. W=Value withheld to avoid disclosure of proprietary company data.

Notes: • Data for this table are not available for 2010. • Shipments data are for domestic and export shipments, and may include imports that subsequently were shipped to domestic or foreign customers. • Manufacturers producing more than one type of collector are accounted for in both groups.

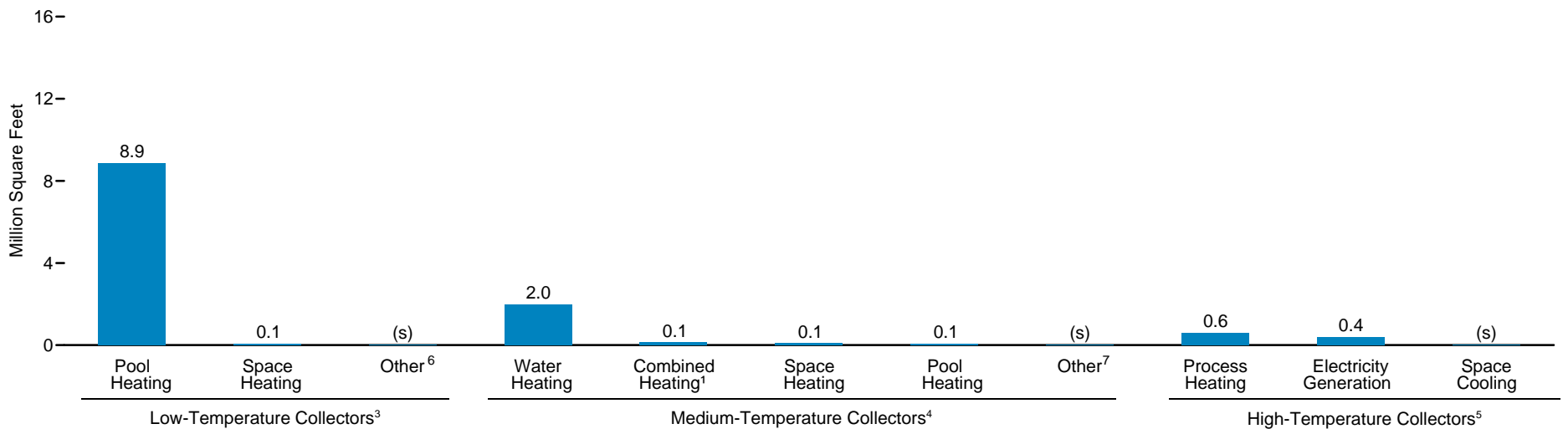
Web Page: For related information, see <http://www.eia.gov/renewable/>.

Sources: • 1974-1992—U.S. Energy Information Administration (EIA), *Solar Collector Manufacturing Activity*, annual reports, and Form CE-63A, "Annual Solar Thermal Collector Manufacturers Survey," and predecessor forms. • 1993-2002—EIA, *Renewable Energy Annual*, annual reports, and Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey," and predecessor form. • 2003 forward—EIA, *Solar Thermal Collector Manufacturing Activities* (and predecessor reports), annual reports, and Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Figure 10.7 Solar Thermal Collector Domestic Shipments by Market Sector, End-Use, and Type, 2009**



**End Use by Type of Collector**



<sup>1</sup> Combined space and water heating.

<sup>2</sup> Space heating, combined heating, and space cooling.

<sup>3</sup> Collectors that generally operate at temperatures below 110 degrees Fahrenheit.

<sup>4</sup> Collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit.

<sup>5</sup> Collectors that generally operate at temperatures above 180 degrees Fahrenheit.

<sup>6</sup> Water heating and combined heating.

<sup>7</sup> Space cooling, process heating, and electricity generation.

(s)=Less than 0.05 million square feet.

Source: Table 10.7.

**Table 10.7 Solar Thermal Collector Shipments by Market Sector, End Use, and Type, 2001-2009**  
(Thousand Square Feet)

Year and Type	By Market Sector					By End Use							Total
	Residential	Commercial <sup>1</sup>	Industrial <sup>2</sup>	Electric Power <sup>3</sup>	Other <sup>4</sup>	Pool Heating	Water Heating	Space Heating	Space Cooling	Combined Heating <sup>5</sup>	Process Heating	Electricity Generation	
<b>Total Shipments <sup>6</sup></b>													
<b>2001 Total</b> ....	<b>10,125</b>	<b>1,012</b>	<b>17</b>	<b>1</b>	<b>35</b>	<b>10,797</b>	<b>274</b>	<b>70</b>	<b>0</b>	<b>12</b>	<b>34</b>	<b>2</b>	<b>11,189</b>
Low <sup>7</sup> .....	9,885	987	12	0	34	10,782	42	61	0	0	34	0	10,919
Medium <sup>8</sup> .....	240	24	5	0	1	16	232	9	0	12	0	0	268
High <sup>9</sup> .....	0	1	0	1	0	0	0	0	0	0	0	2	2
<b>2002 Total</b> ....	<b>11,000</b>	<b>595</b>	<b>62</b>	<b>4</b>	<b>1</b>	<b>11,073</b>	<b>423</b>	<b>146</b>	<b>(s)</b>	<b>17</b>	<b>4</b>	<b>0</b>	<b>11,663</b>
Low <sup>7</sup> .....	10,519	524	2	0	0	11,045	1	0	0	0	0	0	11,046
Medium <sup>8</sup> .....	481	69	60	4	1	28	422	146	(s)	15	4	0	615
High <sup>9</sup> .....	0	2	0	0	0	0	0	0	0	2	0	0	2
<b>2003 Total</b> ....	<b>10,506</b>	<b>864</b>	<b>71</b>	<b>0</b>	<b>2</b>	<b>10,800</b>	<b>511</b>	<b>76</b>	<b>(s)</b>	<b>23</b>	<b>34</b>	<b>0</b>	<b>11,444</b>
Low <sup>7</sup> .....	9,993	813	71	0	0	10,778	0	65	0	0	34	0	10,877
Medium <sup>8</sup> .....	513	44	0	0	2	22	511	11	(s)	16	0	0	560
High <sup>9</sup> .....	0	7	0	0	0	0	0	0	0	7	0	0	7
<b>2004 Total</b> ....	<b>12,864</b>	<b>1,178</b>	<b>70</b>	<b>0</b>	<b>3</b>	<b>13,634</b>	<b>452</b>	<b>13</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>14,115</b>
Low <sup>7</sup> .....	12,386	1,178	44	0	0	13,600	0	8	0	0	0	0	13,608
Medium <sup>8</sup> .....	478	0	26	0	3	33	452	5	0	16	0	0	506
High <sup>9</sup> .....	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>2005 Total</b> ....	<b>14,681</b>	<b>1,160</b>	<b>31</b>	<b>114</b>	<b>56</b>	<b>15,041</b>	<b>640</b>	<b>228</b>	<b>2</b>	<b>16</b>	<b>0</b>	<b>114</b>	<b>16,041</b>
Low <sup>7</sup> .....	14,045	1,099	30	0	50	15,022	12	190	0	0	0	0	15,224
Medium <sup>8</sup> .....	636	58	1	0	6	20	628	38	0	16	0	0	702
High <sup>9</sup> .....	0	2	0	114	0	0	0	0	2	0	0	114	115
<b>2006 Total</b> ....	<b>15,123</b>	<b>1,626</b>	<b>42</b>	<b>3,845</b>	<b>107</b>	<b>15,362</b>	<b>1,136</b>	<b>330</b>	<b>3</b>	<b>66</b>	<b>0</b>	<b>3,847</b>	<b>20,744</b>
Low <sup>7</sup> .....	13,906	1,500	40	0	100	15,225	10	290	0	21	0	0	15,546
Medium <sup>8</sup> .....	1,217	120	2	0	7	137	1,126	40	3	38	0	2	1,346
High <sup>9</sup> .....	0	7	0	3,845	0	0	0	0	0	7	0	3,845	3,852
<b>Domestic Shipments <sup>6</sup></b>													
<b>2007 Total</b> ....	<b>12,799</b>	<b>931</b>	<b>46</b>	<b>1</b>	<b>-</b>	<b>12,076</b>	<b>1,393</b>	<b>189</b>	<b>13</b>	<b>73</b>	<b>27</b>	<b>6</b>	<b>13,777</b>
Low <sup>7</sup> .....	11,352	633	-	1	-	11,917	4	63	-	-	-	1	11,986
Medium <sup>8</sup> .....	1,447	298	18	-	-	158	1,389	126	13	73	-	5	1,764
High <sup>9</sup> .....	-	(s)	27	-	-	-	(s)	-	-	-	27	-	27
<b>2008 Total</b> ....	<b>13,000</b>	<b>1,294</b>	<b>128</b>	<b>294</b>	<b>-</b>	<b>11,973</b>	<b>1,978</b>	<b>186</b>	<b>18</b>	<b>148</b>	<b>50</b>	<b>361</b>	<b>14,716</b>
Low <sup>7</sup> .....	10,983	918	-	-	-	11,880	8	10	-	2	-	-	11,900
Medium <sup>8</sup> .....	2,017	376	33	6	-	93	1,971	176	18	141	21	12	2,432
High <sup>9</sup> .....	-	-	95	289	-	-	-	-	-	5	29	349	383
<b>2009 Total</b> ....	<b>10,239</b>	<b>974</b>	<b>634</b>	<b>374</b>	<b>-</b>	<b>8,934</b>	<b>1,992</b>	<b>150</b>	<b>10</b>	<b>137</b>	<b>608</b>	<b>389</b>	<b>12,221</b>
Low <sup>7</sup> .....	8,423	526	11	-	-	8,882	7	61	-	9	-	-	8,959
Medium <sup>8</sup> .....	1,816	439	29	-	-	52	1,985	89	(s)	128	14	15	2,284
High <sup>9</sup> .....	-	10	594	374	-	-	-	-	10	-	594	374	978

<sup>1</sup> Through 2006, data are for the commercial sector, excluding government, which is included in "Other." Beginning in 2007, data are for the commercial sector, including government.

<sup>2</sup> Through 2006, data are for the industrial sector and independent power producers. Beginning in 2007, data are for the industrial sector only; independent power producers are included in "Electric Power."

<sup>3</sup> Through 2006, data are for electric utilities only; independent power producers are included in "Industrial." Beginning in 2007, data are for electric utilities and independent power producers.

<sup>4</sup> Through 2006, data are for other sectors such as government, including the military, but excluding space applications. Beginning in 2007, data are for the transportation sector.

<sup>5</sup> Combined space and water heating.

<sup>6</sup> Through 2006, data are for domestic and export shipments, and may include imports that subsequently were shipped to domestic or foreign customers. Beginning in 2007, data are for domestic shipments only.

<sup>7</sup> Low-temperature collectors are solar thermal collectors that generally operate at temperatures below 110° F.

<sup>8</sup> Medium-temperature collectors are solar thermal collectors that generally operate in the temperature range of 140° F to 180° F, but can also operate at temperatures as low as 110° F. Special collectors are

included in this category. Special collectors are evacuated tube collectors or concentrating (focusing) collectors. They operate in the temperature range from just above ambient temperature (low concentration for pool heating) to several hundred degrees Fahrenheit (high concentration for air conditioning and specialized industrial processes).

<sup>9</sup> High-temperature collectors are solar thermal collectors that generally operate at temperatures above 180° F. These are parabolic dish/trough collectors used primarily by the electric power sector to generate electricity for the electric grid.

- = No data reported. (s) = Less than 0.5 thousand square feet.

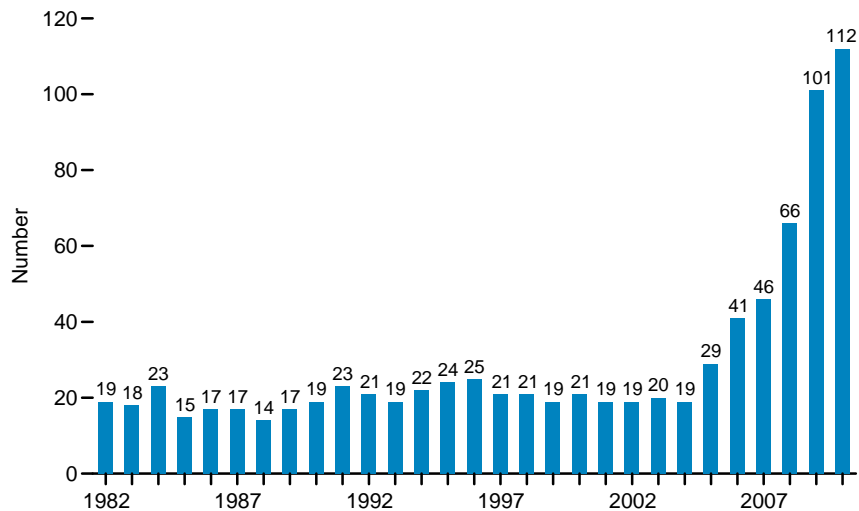
Notes: • Data for this table are not available for 2010. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/renewable/>.

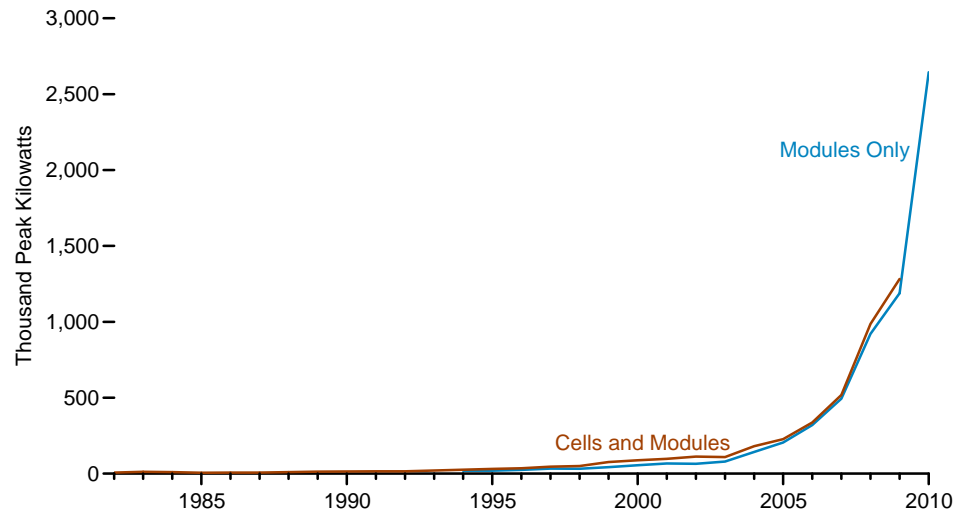
Sources: • 2001-2002—U.S. Energy Information Administration (EIA), *Renewable Energy Annual*, annual reports, and Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey." • 2003 forward—EIA, *Solar Thermal Collector Manufacturing Activities* (and predecessor reports), annual reports, and Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey."

**Figure 10.8 Photovoltaic Cell and Module Shipments, Trade, and Prices**

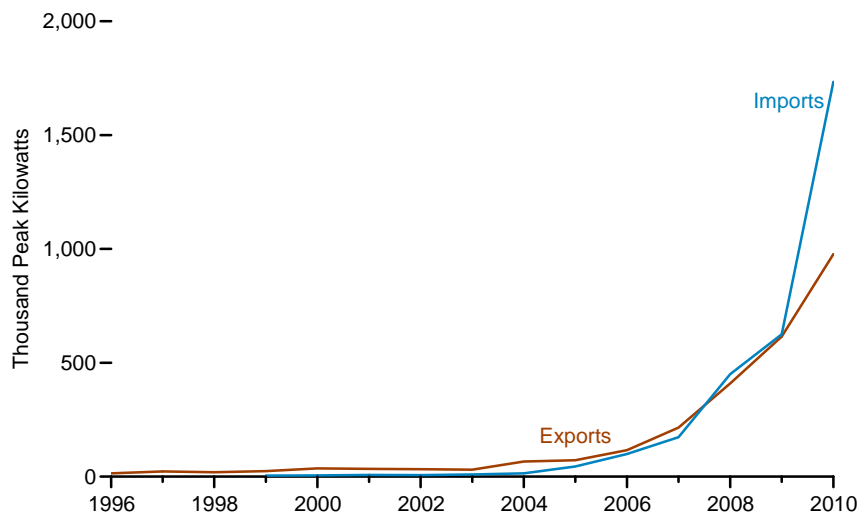
**Number of U.S. Companies Reporting Shipments, 1982-2010**



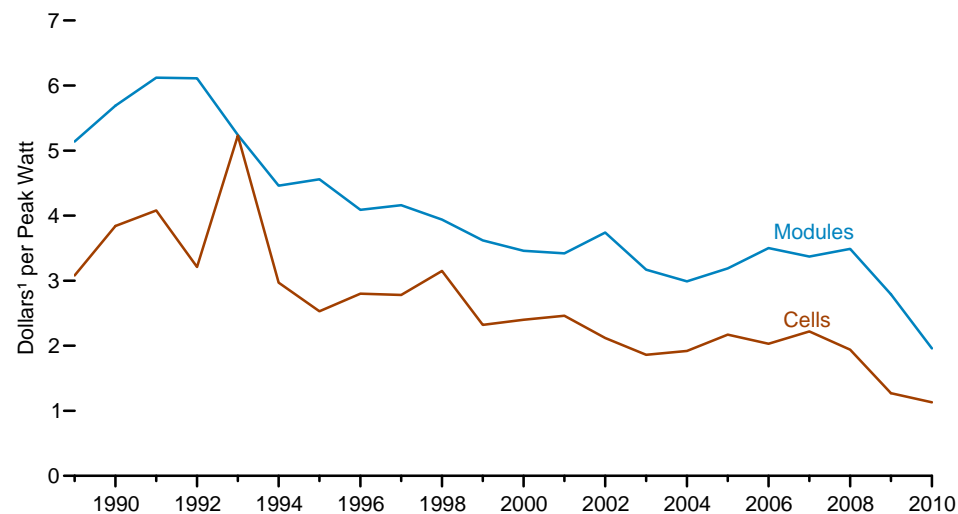
**Total Shipments, 1982-2010**



**Trade, Modules Only, 1996-2010**



**Prices, 1989-2010**



<sup>1</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

Note: Shipments are for domestic and export shipments, and may include imports that subsequently were shipped to domestic or foreign customers.

Source: Table 10.8.

**Table 10.8 Photovoltaic Cell and Module Shipments by Type, Trade, and Prices, 1982-2010**

Year	U.S. Companies Reporting Shipments Number	Shipments						Trade				Prices <sup>1</sup>	
		Crystalline Silicon		Thin-Film		Total <sup>2</sup>		Imports		Exports		Cells	Modules
		Cells and Modules	Modules Only	Cells and Modules	Modules Only	Cells and Modules	Modules Only	Cells and Modules	Modules Only	Cells and Modules	Modules Only		
Peak Kilowatts <sup>3</sup>											Dollars <sup>4</sup> per Peak Watt <sup>3</sup>		
1982	19	NA	NA	NA	NA	6,897	NA	NA	NA	NA	NA	NA	NA
1983	18	NA	NA	NA	NA	12,620	NA	NA	NA	1,903	NA	NA	NA
1984	23	NA	NA	NA	NA	9,912	NA	NA	NA	2,153	NA	NA	NA
1985	15	5,461	NA	303	NA	5,769	NA	285	NA	1,670	NA	NA	NA
1986	17	5,806	NA	516	NA	6,333	NA	678	NA	3,109	NA	NA	NA
1987	17	5,613	NA	1,230	NA	6,850	NA	921	NA	3,821	NA	NA	NA
1988	14	7,364	NA	1,895	NA	9,676	NA	1,453	NA	5,358	NA	NA	NA
1989	17	10,747	NA	1,628	NA	12,825	NA	826	NA	7,363	NA	3.08	5.14
1990	<sup>5</sup> 19	12,492	NA	1,321	NA	<sup>5</sup> 13,837	NA	1,398	NA	7,544	NA	3.84	5.69
1991	23	14,205	NA	723	NA	14,939	NA	2,059	NA	8,905	NA	4.08	6.12
1992	21	14,457	NA	1,075	NA	15,583	NA	1,602	NA	9,823	NA	3.21	6.11
1993	19	20,146	NA	782	NA	20,951	NA	1,767	NA	14,814	NA	5.23	5.24
1994	22	24,785	NA	1,061	NA	26,077	19,064	1,960	NA	17,714	NA	2.97	4.46
1995	24	29,740	NA	1,266	NA	31,059	19,627	1,337	NA	19,871	NA	2.53	4.56
1996	25	33,996	NA	1,445	NA	35,464	24,534	1,864	NA	22,448	14,128	2.80	4.09
1997	21	44,314	NA	1,886	NA	46,354	33,645	1,853	NA	33,793	22,956	2.78	4.16
1998	21	47,186	NA	3,318	NA	50,562	32,313	1,931	NA	35,493	19,015	3.15	3.94
1999	19	73,461	NA	3,269	NA	76,787	43,073	4,784	4,630	55,585	24,545	2.32	3.62
2000	21	85,155	NA	2,736	NA	88,221	55,007	8,821	5,016	68,382	36,277	2.40	3.46
2001	19	84,651	NA	12,541	NA	97,666	67,033	10,204	7,029	61,356	34,282	2.46	3.42
2002	19	104,123	NA	7,396	NA	112,090	64,413	7,297	6,378	66,778	32,559	2.12	3.74
2003	20	97,940	NA	10,966	NA	109,357	80,062	9,731	9,289	60,693	30,229	1.86	3.17
2004	19	159,138	NA	21,978	NA	181,116	143,274	47,703	14,096	102,770	66,278	1.92	2.99
2005	29	172,965	NA	53,826	NA	226,916	204,996	90,981	44,443	92,451	72,017	2.17	3.19
2006	41	233,518	NA	101,766	NA	337,268	320,208	173,977	99,687	130,757	116,561	2.03	3.50
2007	46	310,330	NA	202,519	NA	517,684	494,148	238,018	173,165	237,209	215,364	2.22	3.37
2008	66	665,795	NA	293,182	NA	986,504	920,693	586,558	449,813	462,252	409,261	1.94	3.49
2009	101	984,161	NA	266,547	NA	1,282,560	1,188,879	743,414	625,182	681,427	615,094	1.27	2.79
2010	112	( <sup>6</sup> )	2,114,881	( <sup>6</sup> )	519,516	( <sup>6</sup> )	2,644,498	( <sup>6</sup> )	1,734,149	( <sup>6</sup> )	976,955	1.13	1.96

<sup>1</sup> Prices equal shipment value divided by quantity shipped. Value includes charges for advertising and warranties. Excluded are excise taxes and the cost of freight or transportation for the shipments.

<sup>2</sup> Includes all types of photovoltaic cells and modules (single-crystal silicon, cast silicon, ribbon silicon, thin-film silicon, and concentrator silicon). Excludes cells and modules for space and satellite applications.

<sup>3</sup> See "Peak Kilowatt" and "Peak Watt" in Glossary.

<sup>4</sup> Prices are not adjusted for inflation. See "Nominal Dollars" in Glossary.

<sup>5</sup> Data were imputed for one nonrespondent who exited the industry during 1990.

<sup>6</sup> Beginning in 2010, because of changes to survey methodology, survey data for cells and modules cannot be summed.

NA=Not available.

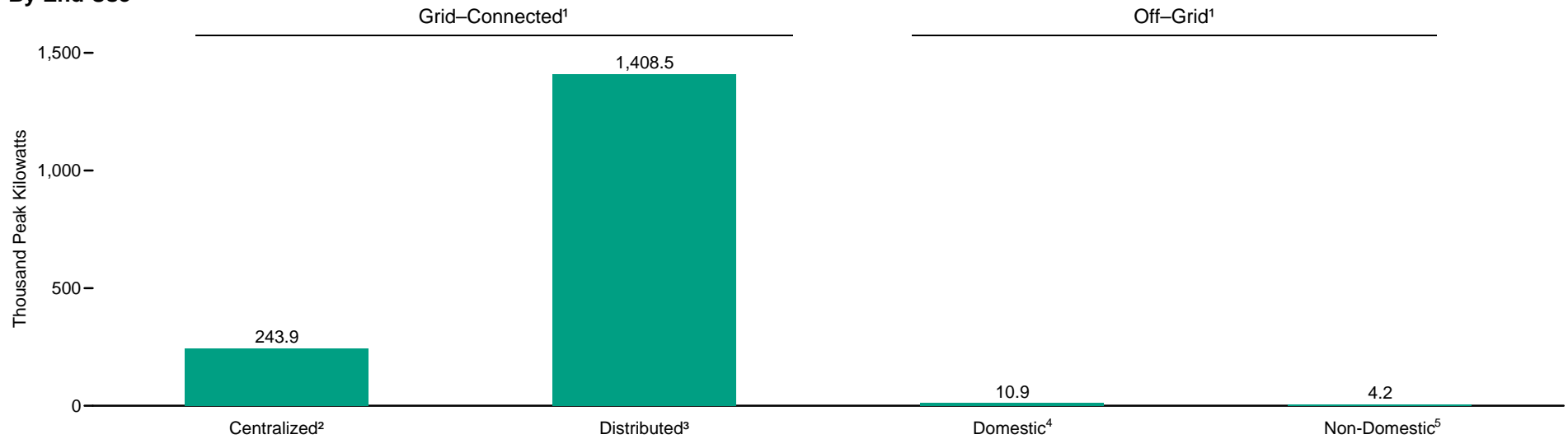
Note: Shipments data are for domestic and export shipments, and may include imports that subsequently were shipped to domestic or foreign customers.

Web Page: For related information, see <http://www.eia.gov/renewable/>.

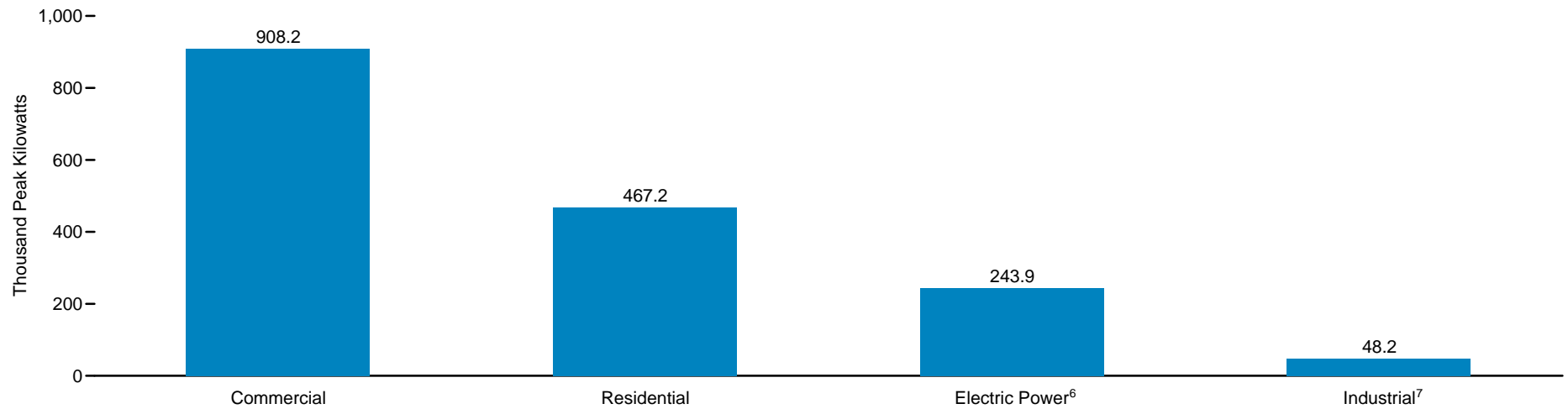
Sources: • 1982-1992—U.S. Energy Information Administration (EIA), *Solar Collector Manufacturing Activity*, annual reports. • 1993-2002—EIA, *Renewable Energy Annual*, annual reports. • 2003 forward—EIA, *Solar Photovoltaic Cell/Module Shipments Report* (and predecessor reports), annual reports.

**Figure 10.9 U.S. Shipments of Photovoltaic Modules Only by Sector and End Use, 2010**

**By End Use**



**By Sector**



<sup>1</sup> See "Electric Power Grid" in Glossary.

<sup>2</sup> Photovoltaic modules that are connected to the electric power grid, and whose output is fed directly into the grid.

<sup>3</sup> Photovoltaic modules that are connected to the electric power grid, and whose output is consumed mainly onsite.

<sup>4</sup> Photovoltaic modules that are not connected to the electric power grid, and that are used to provide electric power to remote households or communities.

<sup>5</sup> Photovoltaic modules that are not connected to the electric power grid, and that are used to provide electric power for a variety of non-domestic applications.

<sup>6</sup> Electric utilities and independent power producers.

<sup>7</sup> Industrial sector only; independent power producers are included in "Electric Power."

Source: Table 10.9.

**Table 10.9 Photovoltaic Cell and Module Shipments by Sector and End Use, 1989-2010**

(Peak Kilowatts <sup>1</sup>)

Year	By Sector					By End Use				Total
	Residential	Commercial <sup>3</sup>	Industrial <sup>4</sup>	Electric Power <sup>5</sup>	Other <sup>6</sup>	Grid-Connected <sup>2</sup>		Off-Grid <sup>2</sup>		
						Centralized <sup>7</sup>	Distributed <sup>8</sup>	Domestic <sup>9</sup>	Non-Domestic <sup>10</sup>	
<b>Total Shipments of Photovoltaic Cells and Modules <sup>11</sup></b>										
1989	1,439	R6,057	3,993	785	551	( <sup>12</sup> )	<sup>12</sup> 1,251	2,620	8,954	12,825
1990	1,701	R8,062	2,817	826	432	( <sup>12</sup> )	<sup>12</sup> 469	3,097	10,271	13,837
1991	3,624	R5,715	3,947	1,275	377	( <sup>12</sup> )	<sup>12</sup> 856	3,594	10,489	14,939
1992	4,154	R5,122	4,279	1,553	477	( <sup>12</sup> )	<sup>12</sup> 1,227	4,238	10,118	15,583
1993	5,237	R8,004	5,352	1,503	856	( <sup>12</sup> )	<sup>12</sup> 1,096	5,761	14,094	20,951
1994	6,632	R9,717	6,855	2,364	510	( <sup>12</sup> )	<sup>12</sup> 2,296	9,253	14,528	26,077
1995	6,272	R12,483	7,198	3,759	1,347	( <sup>12</sup> )	<sup>12</sup> 4,585	8,233	18,241	31,059
1996	8,475	R12,297	8,300	4,753	1,639	( <sup>12</sup> )	<sup>12</sup> 4,844	10,884	19,736	35,464
1997	10,993	R15,594	11,748	5,651	2,367	( <sup>12</sup> )	<sup>12</sup> 8,273	8,630	29,451	46,354
1998	15,936	R14,708	13,232	3,965	2,720	( <sup>12</sup> )	<sup>12</sup> 14,193	8,634	27,735	50,562
1999	19,817	R24,731	24,972	5,876	1,392	( <sup>12</sup> )	<sup>12</sup> 24,782	10,829	41,176	76,787
2000	24,814	R23,611	28,808	6,298	4,690	( <sup>12</sup> )	<sup>12</sup> 21,713	14,997	51,511	88,221
2001	33,262	R29,924	28,063	5,846	571	( <sup>12</sup> )	<sup>12</sup> 27,226	21,447	48,993	97,666
2002	29,315	R42,075	32,218	7,640	841	( <sup>12</sup> )	<sup>12</sup> 33,983	21,693	56,414	112,090
2003	23,389	R49,231	27,951	8,474	313	( <sup>12</sup> )	<sup>12</sup> 42,485	15,025	51,847	109,357
2004	53,928	R79,146	30,493	3,233	14,316	( <sup>12</sup> )	<sup>12</sup> 129,265	18,371	33,480	181,116
2005	75,040	R119,763	22,199	143	9,772	( <sup>12</sup> )	<sup>12</sup> 168,474	24,958	33,484	226,916
2006	95,815	R190,998	28,618	3,981	17,857	( <sup>12</sup> )	<sup>12</sup> 274,197	18,003	45,068	337,268
<b>U.S. Shipments of Photovoltaic Cells and Modules <sup>11</sup></b>										
2007	68,417	R144,061	32,702	35,294	--	( <sup>12</sup> )	<sup>12</sup> 253,101	10,867	16,507	280,475
2008	173,989	R262,952	51,493	35,819	--	( <sup>12</sup> )	<sup>12</sup> 500,854	15,527	7,871	524,252
2009	221,245	R282,807	43,445	53,636	--	( <sup>12</sup> )	<sup>12</sup> 585,189	8,119	7,825	601,133
<b>U.S. Shipments of Photovoltaic Modules Only <sup>11</sup></b>										
2010	467,165	908,224	48,208	243,947	--	243,947	1,408,462	10,941	4,193	1,667,543

<sup>1</sup> See "Peak Kilowatt" in Glossary.

<sup>2</sup> See "Electric Power Grid" in Glossary.

<sup>3</sup> Includes data that were previously shown in the "Commercial," "Government," and "Transportation" sector categories.

<sup>4</sup> Through 2006, data are for the industrial sector and independent power producers. Beginning in 2007, data are for the industrial sector only; independent power producers are included in "Electric Power."

<sup>5</sup> Through 2006, data are for electric utilities only; independent power producers are included in "Industrial." Beginning in 2007, data are for electric utilities and independent power producers.

<sup>6</sup> Through 2006, data are for specialty purposes such as research.

<sup>7</sup> Photovoltaic cells/modules that are connected to the electric power grid, and whose output is fed directly into the grid.

<sup>8</sup> Photovoltaic cells/modules that are connected to the electric power grid, and whose output is consumed mainly onsite.

<sup>9</sup> Photovoltaic cells/modules that are not connected to the electric power grid, and that are used to provide electric power to remote households or communities. Includes data that were previously shown in the "Remote" end-use category.

<sup>10</sup> Photovoltaic cells/modules that are not connected to the electric power grid, and that are used to provide electric power for a variety of non-domestic applications. Includes data that were previously shown

in the following end-use categories: "Communications," "Consumer Goods," "Health," "Original Equipment Manufacturers" (non-photovoltaic manufacturers that combine photovoltaic technology into existing or newly developed product lines), "Transportation," "Water Pumping," and "Other" (applications such as cooking food, desalination, and distilling).

<sup>11</sup> Through 2006, data are for domestic and export shipments of photovoltaic cells and modules, and may include imports that subsequently were shipped to domestic or foreign customers. For 2007-2009, data are for domestic shipments of photovoltaic cells and modules. For 2010, data are for domestic shipments of photovoltaic modules only.

<sup>12</sup> Through 2009, data for "Centralized" are included in "Distributed."

R=Revised. -- = Not applicable.

Notes: • See "Photovoltaic Cell (PVC)" and "Photovoltaic Module" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/fuelrenewable.html>.

Sources: • 1989-1992—U.S. Energy Information Administration (EIA), *Solar Collector Manufacturing Activity*, annual reports. • 1993-2002—EIA, *Renewable Energy Annual*, annual reports. • 2003 forward—EIA, *Solar Photovoltaic Cell/Module Shipments Report* (and predecessor reports), annual reports.

## Renewable Energy

**Note. Renewable Energy Production and Consumption.** In Tables 1.1, 1.3, and 10.1, renewable energy consumption consists of: conventional hydroelectricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6); geothermal electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6), and geothermal heat pump and geothermal direct use energy; solar thermal and photovoltaic electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6), and solar thermal direct use energy; wind electricity net generation (converted to Btu using the fossil-fuels heat rate—see Table A6); wood and wood-derived fuels consumption; biomass waste (municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass) consumption; fuel ethanol (minus denaturant) and biodiesel consumption; and losses and co-products from the production of fuel ethanol and biodiesel. In Tables 1.1, 1.2, and 10.1, renewable energy production is assumed to equal consumption for all renewable energy sources except biofuels (biofuels production comprises biomass inputs to the production of fuel ethanol and biodiesel).

### Table 10.2a Sources

**Residential Sector, Geothermal:** Oregon Institute of Technology, Geo-Heat Center.  
**Residential Sector, Solar/PV:** • 1989–2009: U.S. Energy Information Administration (EIA) estimates based on Form EIA-63A, “Annual Solar Thermal Collector Manufacturers Survey,” and Form EIA-63B, “Annual Photovoltaic Cell/Module Shipments Report.” • 2010 and 2011: EIA estimates based on Form EIA-63B, “Annual Photovoltaic Cell/Module Shipments Report”; Form EIA-63A, “Annual Solar Thermal Collector Manufacturers Survey” (pre-2010 data); and SEIA/GTM Research, *U.S. Solar Market Insight: 2010 Year in Review*.  
**Residential Sector, Wood:** • 1949–1979: EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2. • 1980 forward: EIA, Form EIA-457, “Residential Energy Consumption Survey”; and EIA estimates based on Form EIA-457 and regional heating degree-day data.  
**Commercial Sector, Hydroelectric Power:** EIA, *Annual Energy Review (AER)*, Tables 8.2d and A6.  
**Commercial Sector, Geothermal:** Oregon Institute of Technology, Geo-Heat Center.  
**Commercial Sector, Solar/PV:** EIA, AER, Tables 8.2d and A6.  
**Commercial Sector, Wind:** 2009 forward: EIA, AER, Tables 8.2d and A6.  
**Commercial Sector, Wood:** • 1949–1979: EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2. • 1980–1983: EIA, *Estimates of U.S. Wood Energy Consumption 1980-1983*, Table ES1. • 1984: EIA estimate based on the 1983 value. • 1985–1988: Values interpolated. • 1989 forward: EIA, AER, Table 8.7c; and EIA estimates based on Form EIA-871, “Commercial Buildings Energy Consumption Survey.”  
**Commercial Sector, Biomass Waste:** EIA, AER, Table 8.7c.

**Commercial Sector, Fuel Ethanol (Minus Denaturant):** EIA, AER, Tables 5.11, 5.13a, and 10.3. Calculated as commercial sector motor gasoline consumption (Table 5.13a) divided by total motor gasoline product supplied (Table 5.11), and then multiplied by fuel ethanol (minus denaturant) consumption (Table 10.3).

### Table 10.2b Sources

**Industrial Sector, Hydroelectric Power:** • 1949–1988: U.S. Energy Information Administration (EIA), *Annual Energy Review (AER)*, Tables 8.1 and A6. • 1989 forward: EIA, AER, Tables 8.2d and A6.  
**Industrial Sector, Geothermal:** Oregon Institute of Technology, Geo-Heat Center.  
**Industrial Sector, Solar/PV:** 2010 and 2011: EIA, AER, Tables 8.2d and A6.  
**Industrial Sector, Wind:** 2011: EIA, AER, Tables 8.2d and A6.  
**Industrial Sector, Wood:** • 1949–1979: EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2. • 1980–1983: EIA, *Estimates of U.S. Wood Energy Consumption 1980-1983*, Table ES1. • 1984: EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 1. • 1985 and 1986: Values interpolated. • 1987: EIA, *Estimates of Biofuels Consumption in the United States During 1987*, Table 2. • 1988: Value interpolated. • 1989 forward: EIA, AER, Table 8.7c; and EIA estimates based on Form EIA-846, “Manufacturing Energy Consumption Survey.”  
**Industrial Sector, Biomass Waste:** • 1981: EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 8, total waste consumption minus electric power sector waste consumption (see AER, Table 10.2c). • 1982 and 1983: EIA estimates for total waste consumption based on *Estimates of U.S. Biofuels Consumption 1990*, Table 8, minus electric power waste consumption (see AER, Table 10.2c). • 1984: EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 8, total waste consumption minus electric power sector waste consumption (see AER, Table 10.2c). • 1985 and 1986: Values interpolated. • 1987: EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 8, total waste consumption minus electric power sector waste consumption (see AER, Table 10.2c). • 1988: Value interpolated. • 1989 forward: EIA, AER, Table 8.7c; and EIA estimates based on information presented in Government Advisory Associates, *Resource Recovery Yearbook* and *Methane Recovery Yearbook*, and information provided by the U.S. Environmental Protection Agency, Landfill Methane Outreach Program.  
**Industrial Sector, Fuel Ethanol (Minus Denaturant):** EIA, AER, Tables 5.11, 5.13b, and 10.3. Calculated as industrial sector motor gasoline consumption (Table 5.13b) divided by total motor gasoline product supplied (Table 5.11), and then multiplied by fuel ethanol (minus denaturant) consumption (Table 10.3).  
**Industrial Sector, Losses and Co-products:** EIA, AER, Tables 10.3 and 10.4. Calculated as fuel ethanol losses and co-products (Table 10.3) plus biodiesel losses and co-products (Table 10.4).  
**Transportation Sector, Fuel Ethanol (Minus Denaturant):** EIA, AER, Tables 5.11, 5.13c, and 10.3. Calculated as transportation sector motor gasoline consumption (Table 5.13c) divided by total motor gasoline product supplied (Table 5.11), and then multiplied by fuel ethanol (minus denaturant) consumption (Table 10.3).  
**Transportation Sector, Biodiesel:** EIA, AER, Table 10.4.

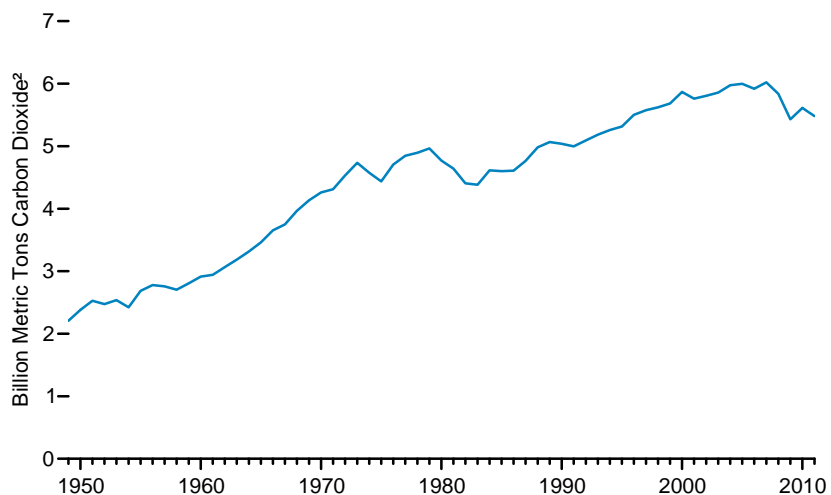


# 11. Environment

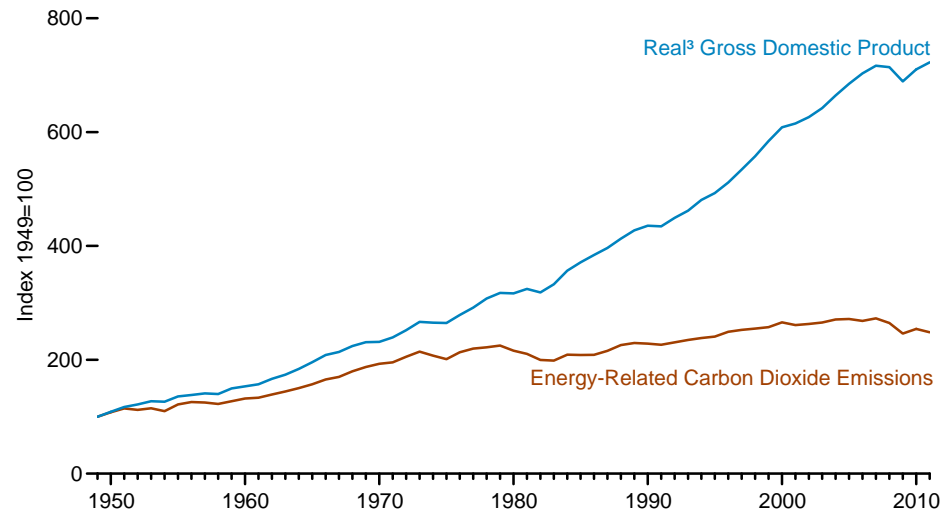
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# Figure 11.1 Carbon Dioxide Emissions From Energy Consumption

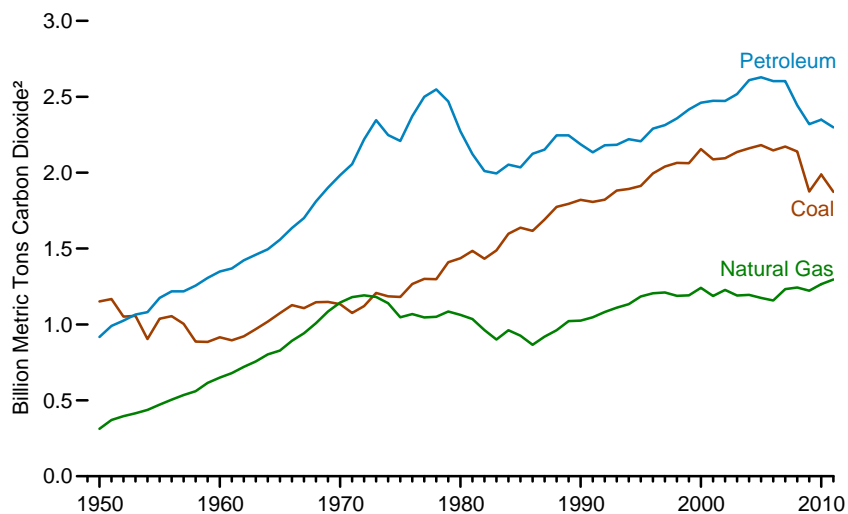
**Total<sup>1</sup> 1949-2011**



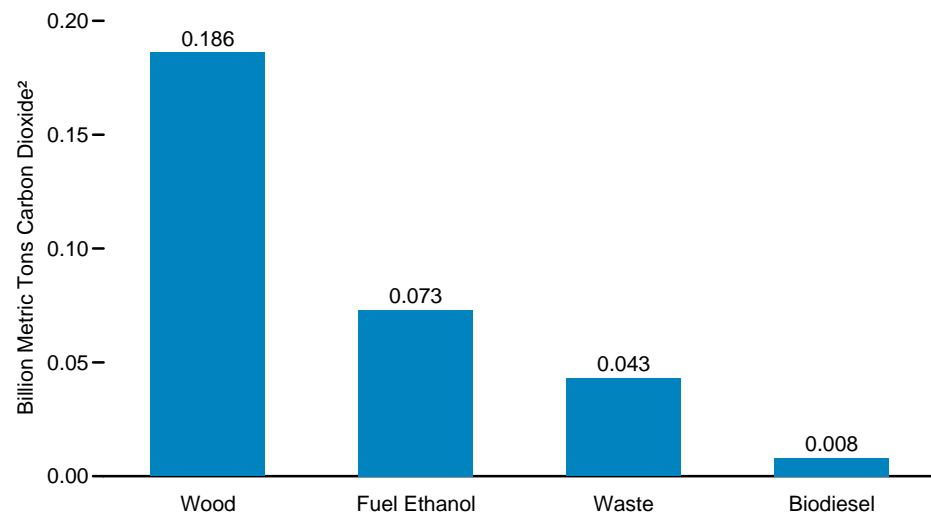
**Economic Growth and Carbon Dioxide Emissions, 1949-2011**



**By Major Source, 1949-2011**



**By Biomass<sup>1</sup> Source, 2011**



<sup>1</sup> Carbon dioxide emissions from biomass energy consumption are excluded from total emissions. See Note, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section.

<sup>2</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>3</sup> Based on chained (2005) dollars.

Sources: Tables 1.5, 11.1, and 11.2a-11.2e.

**Table 11.1 Carbon Dioxide Emissions From Energy Consumption by Source, Selected Years, 1949-2011**

(Million Metric Tons of Carbon Dioxide <sup>1</sup>)

Year	Coal <sup>3</sup>	Natural Gas <sup>4</sup>	Petroleum											Total <sup>2,9</sup>	Biomass <sup>2</sup>				
			Aviation Gasoline	Distillate Fuel Oil <sup>5</sup>	Jet Fuel	Kero-sene	LPG <sup>6</sup>	Lubri-cants	Motor Gasoline <sup>7</sup>	Petroleum Coke	Residual Fuel Oil	Other <sup>8</sup>	Total		Wood <sup>10</sup>	Waste <sup>11</sup>	Fuel Ethanol <sup>12</sup>	Bio-diesel	Total
1949	1,118	270	12	140	NA	42	13	7	329	8	244	25	820	2,207	145	NA	NA	NA	145
1950	1,152	313	14	168	NA	48	16	9	357	8	273	26	918	2,382	147	NA	NA	NA	147
1955	1,038	472	24	247	21	48	27	10	473	13	274	38	1,175	2,685	134	NA	NA	NA	134
1960	915	650	21	291	53	41	42	10	543	29	275	45	1,349	2,914	124	NA	NA	NA	124
1965	1,075	828	15	330	87	40	57	11	627	39	289	65	1,559	3,462	125	NA	NA	NA	125
1970	1,134	1,144	7	394	141	39	78	11	789	41	396	85	1,983	4,261	134	(s)	NA	NA	134
1975	1,181	1,047	5	443	146	24	82	11	911	48	443	97	2,209	4,437	140	(s)	NA	NA	141
1976	1,266	1,068	5	488	144	25	86	13	955	47	506	103	2,372	4,705	161	(s)	NA	NA	161
1977	1,300	1,046	5	520	152	26	85	13	979	52	553	115	2,500	4,846	172	(s)	NA	NA	172
1978	1,298	1,050	5	533	154	26	83	14	1,011	50	544	127	2,548	4,896	191	(s)	NA	NA	191
1979	1,410	1,085	5	514	157	28	95	15	960	48	509	139	2,469	4,964	202	(s)	NA	NA	202
1980	1,436	1,063	4	446	156	24	87	13	900	46	453	142	2,272	4,770	232	(s)	NA	NA	232
1981	1,485	1,036	4	439	147	19	85	13	899	48	376	93	2,122	4,642	234	5	(s)	NA	240
1982	1,433	963	3	415	148	19	85	11	892	49	309	80	2,011	4,406	235	7	1	NA	244
1983	1,488	901	3	418	153	19	85	12	904	48	255	98	1,995	4,383	252	10	2	NA	264
1984	1,598	962	3	443	172	17	88	13	914	51	247	106	2,053	4,613	252	13	3	NA	267
1985	1,638	926	3	445	178	17	86	12	930	55	216	93	2,035	4,600	252	14	3	NA	270
1986	1,617	866	4	453	191	15	83	12	958	56	255	98	2,125	4,608	240	16	4	NA	260
1987	1,691	920	3	463	202	14	82	13	982	60	227	106	2,152	4,764	231	18	5	NA	253
1988	1,775	962	3	487	212	14	83	13	1,003	63	249	119	2,246	4,982	242	19	5	NA	266
1989	1,795	1,022	3	491	218	13	82	13	1,000	62	246	118	2,246	5,067	251	22	5	NA	278
1990	1,821	1,025	3	470	223	6	69	13	988	67	220	127	2,187	5,039	208	24	4	NA	237
1991	1,807	1,047	3	454	215	7	71	12	982	66	207	117	2,134	4,996	208	26	5	NA	239
1992	1,822	1,082	3	464	213	6	77	12	999	74	196	135	2,180	5,093	217	27	6	NA	250
1993	1,882	1,110	3	473	215	7	76	12	1,015	76	193	114	2,184	5,185	212	28	7	NA	246
1994	1,893	1,134	3	492	224	7	79	13	1,022	74	183	124	2,221	5,258	218	29	7	NA	255
1995	1,913	1,184	3	498	222	8	78	13	1,044	75	152	114	2,207	5,314	222	30	8	NA	260
1996	1,995	1,205	3	524	232	9	84	12	1,063	78	152	132	2,290	5,501	229	32	6	NA	266
1997	2,040	1,211	3	534	234	10	85	13	1,075	79	142	138	2,313	5,575	222	30	7	NA	259
1998	2,064	1,189	2	538	238	12	75	14	1,107	89	158	125	2,358	5,622	205	30	8	NA	242
1999	2,062	1,192	3	555	245	11	91	14	1,127	93	148	130	2,417	5,682	208	29	8	NA	245
2000	2,155	1,241	3	580	254	10	102	14	1,135	84	163	117	2,461	5,867	212	27	9	NA	248
2001	2,088	1,187	2	598	243	11	92	13	1,151	88	145	132	2,473	5,759	188	33	10	(s)	231
2002	2,095	R1,227	2	587	237	6	98	12	1,183	94	125	127	2,472	R5,806	187	36	12	(s)	235
2003	2,136	1,191	2	610	231	8	95	11	1,188	94	138	140	2,518	5,857	188	36	16	(s)	240
2004	2,160	R1,195	2	632	240	10	98	12	1,214	105	155	142	2,609	5,975	199	35	20	(s)	255
2005	2,182	1,175	2	640	246	10	94	12	1,214	105	164	141	2,628	R5,997	200	37	23	1	261
2006	2,147	R1,158	2	648	240	8	93	11	1,224	104	122	150	2,603	R5,919	R197	36	31	2	R266
2007	2,172	R1,233	2	652	238	5	94	12	1,227	98	129	148	2,603	R6,020	R194	37	39	3	R274
2008	2,139	1,243	2	615	226	2	89	11	1,166	92	111	130	2,444	5,838	R191	40	55	3	289
2009	1,876	R1,222	2	564	204	3	91	10	1,157	87	91	111	2,320	R5,429	R177	41	62	3	R284
2010	R1,988	R1,265	2	R590	R210	3	R94	11	R1,146	77	R96	R120	R2,349	R5,612	186	R43	R73	2	304
2011 <sup>P</sup>	1,874	1,296	2	596	209	2	92	10	1,111	75	86	116	2,299	5,481	186	43	73	8	311

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Carbon dioxide emissions from biomass energy consumption are excluded from total emissions in this table. See Note, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section.

<sup>3</sup> Includes coal coke net imports.

<sup>4</sup> Natural gas, excluding supplemental gaseous fuels.

<sup>5</sup> Distillate fuel oil, excluding biodiesel.

<sup>6</sup> Liquefied petroleum gases.

<sup>7</sup> Finished motor gasoline, excluding fuel ethanol.

<sup>8</sup> Aviation gasoline blending components, crude oil, motor gasoline blending components, pentanes plus, petrochemical feedstocks, special naphthas, still gas, unfinished oils, waxes, and miscellaneous petroleum products.

<sup>9</sup> Includes electric power sector use of geothermal energy and non-biomass waste. See Table 11.3e.

<sup>10</sup> Wood and wood-derived fuels.

<sup>11</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass.

<sup>12</sup> Fuel ethanol minus denaturant.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 million metric tons of carbon dioxide.

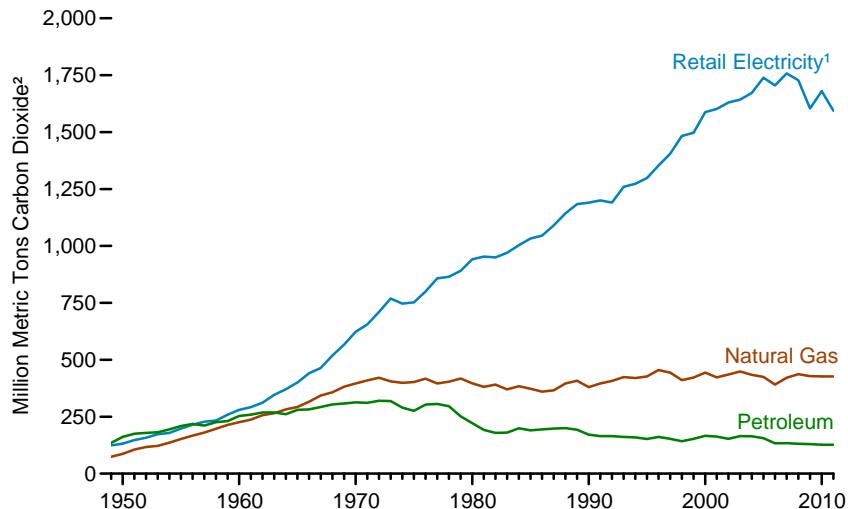
Notes: • Data are estimates for carbon dioxide emissions from energy consumption, including the non-combustion use of fossil fuels. • See "Carbon Dioxide" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#environment> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#environment> for all annual data beginning in 1949. • See <http://www.eia.gov/environment/> for related information.

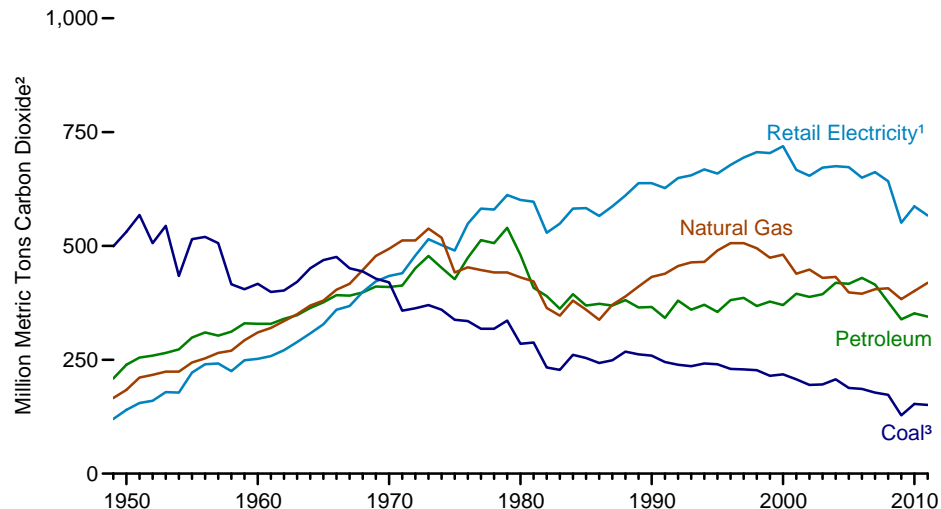
Sources: • 1949-1972—U.S. Energy Information Administration (EIA) estimates based on data in *Annual Energy Review* Tables 2.1b-2.1f, 5.12, 7.3, 7.8, 10.2a-10.2c, and A5. • 1973 forward—EIA, *Monthly Energy Review* (May 2012), Tables 12.1 and 12.7.

**Figure 11.2 Carbon Dioxide Emissions From Energy Consumption by Sector, 1949-2011**

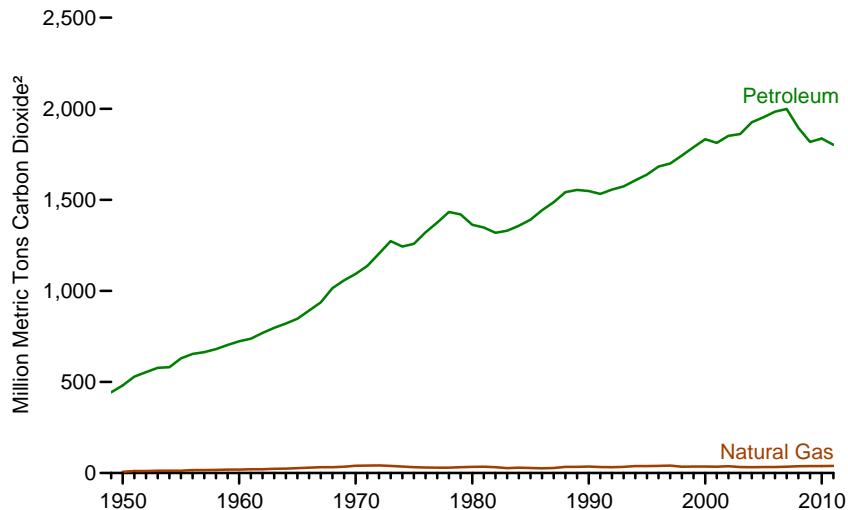
**Residential and Commercial, by Major Source**



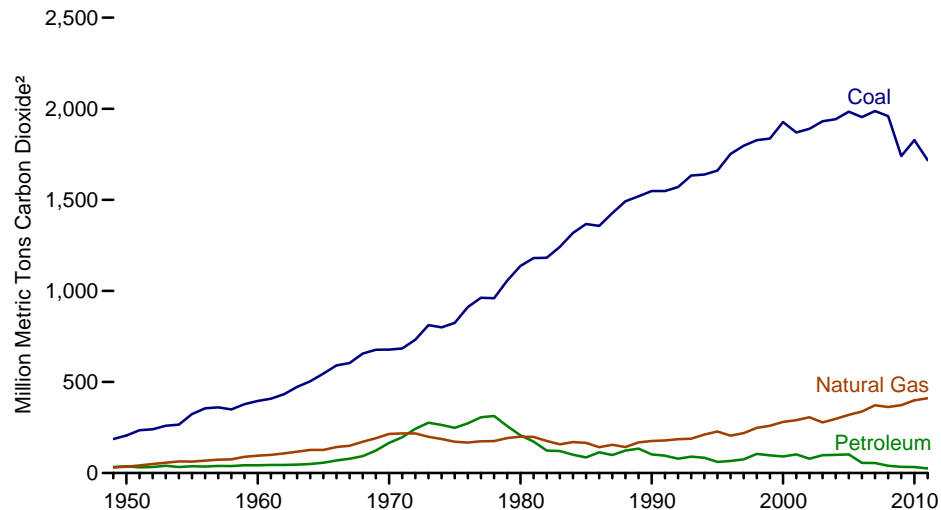
**Industrial, by Major Source**



**Transportation, by Major Source**



**Electric Power, by Major Source**



<sup>1</sup> Emissions from energy consumption in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales (see Tables 8.9 and 11.2e).

<sup>2</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>3</sup> Includes coal coke net imports.  
Source: Tables 11.2a-11.2e.

**Table 11.2a Carbon Dioxide Emissions From Energy Consumption: Residential Sector, Selected Years, 1949-2011**

(Million Metric Tons of Carbon Dioxide <sup>1</sup>)

Year	Coal	Natural Gas <sup>3</sup>	Petroleum				Retail Electricity <sup>5</sup>	Total <sup>2</sup>	Biomass <sup>2</sup>	
			Distillate Fuel Oil <sup>4</sup>	Kerosene	Liquefied Petroleum Gases	Total			Wood <sup>6</sup>	Total <sup>6</sup>
1949	121	55	51	21	7	80	66	321	99	99
1950	120	66	61	25	9	95	69	350	94	94
1955	83	117	87	27	13	127	110	436	73	73
1960	56	170	115	26	19	160	156	542	59	59
1965	34	214	125	24	24	174	223	644	44	44
1970	20	265	137	22	35	194	355	833	38	38
1975	6	266	132	12	32	176	419	867	40	40
1976	6	273	145	13	34	192	442	913	45	45
1977	5	261	146	12	33	191	478	935	51	51
1978	5	264	143	11	32	186	484	938	58	58
1979	4	268	119	10	21	150	496	918	68	68
1980	3	256	96	8	20	124	529	911	80	80
1981	3	245	84	6	19	109	522	878	82	82
1982	3	250	77	7	18	102	518	873	91	91
1983	3	238	68	6	22	95	531	867	91	91
1984	4	247	80	12	18	109	542	902	92	92
1985	4	241	80	11	20	111	553	909	95	95
1986	4	234	81	9	19	109	558	905	86	86
1987	4	234	85	9	22	115	581	934	80	80
1988	4	251	87	10	22	119	609	982	85	85
1989	3	260	85	8	24	117	625	1,005	86	86
1990	3	238	72	5	22	98	624	963	54	54
1991	2	248	68	5	24	97	633	980	57	57
1992	2	255	72	5	23	100	624	981	60	60
1993	2	269	71	5	25	101	667	1,040	52	52
1994	2	263	70	5	24	99	668	1,032	49	49
1995	2	263	66	5	25	96	678	1,039	49	49
1996	2	284	68	6	30	104	710	1,099	51	51
1997	2	270	64	7	29	99	719	1,090	40	40
1998	1	247	56	8	27	91	759	1,097	36	36
1999	1	257	61	8	33	102	762	1,122	37	37
2000	1	271	66	7	35	108	805	1,185	39	39
2001	1	259	66	7	33	106	805	1,172	35	35
2002	1	<sup>R</sup> 265	63	4	34	101	835	<sup>R</sup> 1,203	36	36
2003	1	276	66	5	34	106	847	1,230	38	38
2004	1	264	68	6	32	106	856	1,228	38	38
2005	1	262	62	6	32	101	897	1,261	40	40
2006	1	237	52	5	28	85	869	1,192	<sup>R</sup> 36	<sup>R</sup> 36
2007	1	257	53	3	31	87	897	<sup>R</sup> 1,241	<sup>R</sup> 38	<sup>R</sup> 38
2008	1	266	49	2	35	85	878	1,229	42	42
2009	1	259	44	2	35	81	819	1,159	40	40
2010	1	<sup>R</sup> 259	<sup>R</sup> 43	2	<sup>R</sup> 33	<sup>R</sup> 78	<sup>R</sup> 875	<sup>R</sup> 1,212	39	39
2011 <sup>P</sup>	1	256	43	1	33	78	827	1,162	40	40

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Carbon dioxide emissions from biomass energy consumption are excluded from total emissions in this table. See Note, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section.

<sup>3</sup> Natural gas, excluding supplemental gaseous fuels.

<sup>4</sup> Distillate fuel oil, excluding biodiesel.

<sup>5</sup> Emissions from energy consumption (for electricity and a small amount of useful thermal output) in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Tables 8.9 and 11.2e.

<sup>6</sup> Wood and wood-derived fuels.

R=Revised. P=Preliminary.

Notes: • Data are estimates for carbon dioxide emissions from energy consumption. • See "Carbon Dioxide" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#environment> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#environment> for all annual data beginning in 1949. • See <http://www.eia.gov/environment/> for related information.

Sources: • 1949-1972—U.S. Energy Information Administration (EIA) estimates based on data in *Annual Energy Review* Tables 2.1b, 5.14a, 8.9, 10.2a, and 11.2e. • 1973 forward—EIA, *Monthly Energy Review* (May 2012), Tables 12.2 and 12.7.

**Table 11.2b Carbon Dioxide Emissions From Energy Consumption: Commercial Sector, Selected Years, 1949-2011**

(Million Metric Tons of Carbon Dioxide <sup>1</sup>)

Year	Coal	Natural Gas <sup>3</sup>	Petroleum							Retail Electricity <sup>7</sup>	Total <sup>2</sup>	Biomass <sup>2</sup>			
			Distillate Fuel Oil <sup>4</sup>	Kerosene	LPG <sup>5</sup>	Motor Gasoline <sup>6</sup>	Petroleum Coke	Residual Fuel Oil	Total			Wood <sup>8</sup>	Waste <sup>9</sup>	Fuel Ethanol <sup>10</sup>	Total
1949	148	19	16	3	2	7	NA	28	55	58	280	2	NA	NA	2
1950	147	21	19	3	2	7	NA	33	66	63	297	2	NA	NA	2
1955	76	35	28	4	3	9	NA	38	82	88	281	1	NA	NA	1
1960	39	56	36	3	5	5	NA	44	93	124	312	1	NA	NA	1
1965	25	79	39	4	6	5	NA	51	106	177	387	1	NA	NA	1
1970	16	131	43	4	9	6	NA	56	119	268	534	1	NA	NA	1
1975	14	136	43	4	8	6	NA	39	100	333	583	1	NA	NA	1
1976	14	144	48	3	9	7	NA	45	111	358	627	1	NA	NA	1
1977	14	135	49	4	9	7	NA	46	115	380	645	1	NA	NA	1
1978	16	140	49	4	8	8	NA	42	110	381	648	1	NA	NA	1
1979	14	150	43	6	6	7	NA	40	102	395	661	1	NA	NA	1
1980	11	141	38	3	6	8	NA	44	98	412	662	2	NA	NA	2
1981	13	136	33	5	5	7	NA	33	83	431	663	2	NA	(s)	2
1982	15	141	32	2	5	6	NA	31	77	432	665	2	NA	(s)	2
1983	15	132	48	8	6	7	NA	16	85	439	671	2	NA	(s)	2
1984	16	137	54	3	5	8	NA	21	90	461	704	2	NA	(s)	2
1985	13	132	46	2	6	7	NA	18	79	480	704	2	NA	(s)	2
1986	13	126	46	4	6	8	NA	23	85	487	711	3	NA	(s)	3
1987	12	132	44	4	6	8	NA	21	83	509	736	3	NA	(s)	3
1988	12	145	44	2	6	8	NA	21	81	534	772	3	NA	(s)	3
1989	11	148	42	2	7	7	0	18	76	559	794	7	1	(s)	9
1990	12	142	39	1	6	8	0	18	73	566	793	6	2	(s)	8
1991	11	148	38	1	7	6	0	17	68	567	794	6	2	(s)	8
1992	11	152	37	1	7	6	(s)	15	65	567	796	7	2	(s)	9
1993	11	155	36	1	7	2	(s)	14	60	593	819	7	2	(s)	9
1994	11	157	37	1	7	2	(s)	14	60	605	833	7	2	(s)	9
1995	11	164	35	2	7	1	(s)	11	56	620	851	7	2	(s)	9
1996	12	171	35	2	8	2	(s)	11	57	643	883	7	3	(s)	10
1997	12	174	32	2	8	3	(s)	9	54	686	926	7	3	(s)	10
1998	9	164	31	2	7	3	(s)	7	51	724	947	6	3	(s)	9
1999	10	165	32	2	9	2	(s)	6	51	735	960	6	3	(s)	9
2000	9	173	36	2	9	3	(s)	7	58	783	1,022	7	2	(s)	9
2001	9	164	37	2	9	3	(s)	6	57	797	1,027	6	2	(s)	9
2002	9	<sup>R</sup> 170	32	1	9	3	(s)	6	52	795	<sup>R</sup> 1,026	6	2	(s)	9
2003	8	173	35	1	10	4	(s)	9	59	796	1,036	7	3	(s)	9
2004	10	170	34	1	10	3	(s)	10	58	816	1,054	7	3	(s)	10
2005	9	163	33	2	8	3	(s)	9	55	842	1,069	7	3	(s)	10
2006	6	154	29	1	8	3	(s)	6	48	836	1,043	6	3	(s)	9
2007	7	164	28	1	8	4	(s)	6	47	861	<sup>R</sup> 1,078	7	3	(s)	9
2008	7	171	27	(s)	10	3	(s)	6	46	850	1,074	7	3	(s)	10
2009	6	169	30	(s)	9	4	(s)	6	49	785	1,008	7	3	(s)	10
2010	<sup>R</sup> 6	<sup>R</sup> 168	<sup>R</sup> 30	(s)	9	4	(s)	<sup>R</sup> 6	<sup>R</sup> 49	805	<sup>R</sup> 1,027	7	3	(s)	10
2011 <sup>P</sup>	5	171	30	(s)	9	4	(s)	6	49	767	992	7	3	(s)	10

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Carbon dioxide emissions from biomass energy consumption are excluded from total emissions in this table. See Note, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section.

<sup>3</sup> Natural gas, excluding supplemental gaseous fuels.

<sup>4</sup> Distillate fuel oil, excluding biodiesel.

<sup>5</sup> Liquefied petroleum gases.

<sup>6</sup> Finished motor gasoline, excluding fuel ethanol.

<sup>7</sup> Emissions from energy consumption (for electricity and a small amount of useful thermal output) in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Tables 8.9 and 11.2e.

<sup>8</sup> Wood and wood-derived fuels.

<sup>9</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass.

<sup>10</sup> Fuel ethanol minus denaturant.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 million metric tons of carbon dioxide.

Notes: • Data are estimates for carbon dioxide emissions from energy consumption. • See "Carbon Dioxide" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#environment> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#environment> for all annual data beginning in 1949. • See <http://www.eia.gov/environment/> for related information.

Sources: • 1949-1972—U.S. Energy Information Administration (EIA) estimates based on data in *Annual Energy Review* Tables 2.1c, 5.14a, 8.9, 10.2a, and 11.2e. • 1973 forward—EIA, *Monthly Energy Review (MER)* (May 2012), Tables 12.3 and 12.7, and MER data system calculations.

**Table 11.2c Carbon Dioxide Emissions From Energy Consumption: Industrial Sector, Selected Years, 1949-2011**  
(Million Metric Tons of Carbon Dioxide <sup>1</sup>)

Year	Coal	Coal Coke Net Imports	Natural Gas <sup>3</sup>	Petroleum									Retail Elec- tricity <sup>8</sup>	Total <sup>2</sup>	Biomass <sup>2</sup>			
				Distillate Fuel Oil <sup>4</sup>	Kero- sene	LPG <sup>5</sup>	Lubri- cants	Motor Gasoline <sup>6</sup>	Petroleum Coke	Residual Fuel Oil	Other <sup>7</sup>	Total			Wood <sup>9</sup>	Waste <sup>10</sup>	Fuel Ethanol <sup>11</sup>	Total
1949	500	-1	166	41	18	3	3	16	8	95	25	209	120	995	44	NA	NA	44
1950	531	(s)	184	51	20	4	3	18	8	110	26	239	140	1,095	50	NA	NA	50
1955	516	-1	244	72	17	10	4	24	13	122	38	299	222	1,281	59	NA	NA	59
1960	418	-1	310	74	12	17	4	27	29	123	45	329	252	1,308	64	NA	NA	64
1965	471	-2	380	83	12	24	5	24	39	123	65	376	328	1,553	80	NA	NA	80
1970	427	-7	494	89	13	31	6	21	39	126	85	410	434	1,759	96	NA	NA	96
1975	336	2	442	97	9	39	6	16	48	117	97	427	490	1,696	100	NA	NA	100
1976	335	(s)	453	111	9	41	6	15	47	141	103	474	549	1,811	114	NA	NA	114
1977	316	2	447	125	10	40	7	14	52	150	115	513	582	1,860	120	NA	NA	120
1978	304	14	442	127	11	40	7	13	48	133	127	506	580	1,846	131	NA	NA	131
1979	329	7	442	128	13	66	8	11	47	128	139	540	612	1,931	132	NA	NA	132
1980	289	-4	431	96	13	61	7	11	45	105	142	480	601	1,797	150	NA	NA	150
1981	290	-2	422	101	8	58	6	11	47	83	93	408	597	1,715	150	5	(s)	156
1982	235	-2	364	95	10	60	6	10	48	81	80	390	529	1,515	142	7	(s)	149
1983	230	-2	347	83	5	55	6	8	48	61	98	362	549	1,486	159	9	(s)	168
1984	262	-1	380	87	3	62	7	11	50	68	106	394	582	1,617	157	12	(s)	170
1985	256	-2	360	81	3	58	6	15	54	57	93	369	583	1,566	154	14	(s)	168
1986	245	-2	338	84	2	56	6	15	55	57	98	373	566	1,520	151	16	(s)	167
1987	248	1	371	83	2	53	7	15	59	45	106	369	587	1,575	148	17	(s)	165
1988	263	5	389	82	2	54	7	14	61	42	119	381	611	1,648	152	19	(s)	171
1989	259	3	411	83	2	49	7	14	60	31	118	365	638	1,677	149	12	(s)	161
1990	258	1	432	84	1	39	7	13	64	31	127	366	638	1,695	135	12	(s)	147
1991	244	1	439	79	1	39	6	14	63	24	117	342	627	1,653	132	11	(s)	143
1992	235	4	456	81	1	45	6	14	70	28	135	380	649	1,724	137	10	(s)	148
1993	233	3	464	81	1	43	6	13	68	33	114	360	655	1,715	139	11	(s)	150
1994	235	7	465	81	1	46	7	14	67	31	124	371	668	1,745	148	11	(s)	160
1995	233	7	490	82	1	45	7	14	67	24	114	355	659	1,743	155	11	(s)	166
1996	227	3	506	86	1	46	6	14	70	24	132	381	678	1,795	158	12	(s)	170
1997	224	5	506	88	1	48	7	15	68	21	138	386	694	1,815	162	10	(s)	172
1998	219	8	495	88	2	39	7	14	77	16	125	368	706	1,796	150	10	(s)	160
1999	208	7	474	86	1	48	7	11	81	14	130	378	704	1,772	152	9	(s)	161
2000	211	7	481	87	1	56	7	11	74	17	117	370	719	1,788	153	8	(s)	161
2001	204	3	439	95	2	49	6	21	77	14	132	395	667	1,709	135	12	(s)	147
2002	188	7	R448	88	1	54	6	22	76	13	127	388	654	R1,685	131	13	(s)	144
2003	190	6	430	83	2	50	6	23	76	15	140	394	672	1,692	128	13	(s)	141
2004	191	16	R432	88	2	55	6	26	82	17	142	419	675	R1,732	138	12	(s)	151
2005	183	5	398	92	3	51	6	25	80	20	141	417	673	1,675	136	13	(s)	150
2006	179	7	R395	92	2	56	6	26	82	16	150	430	650	R1,662	138	12	1	151
2007	175	3	R405	92	1	54	6	21	80	13	148	415	662	R1,661	R132	13	1	146
2008	168	5	407	93	(s)	42	6	17	76	14	130	377	642	R1,599	126	13	1	140
2009	131	-3	383	80	(s)	46	5	17	73	7	111	339	551	1,401	R113	14	1	R128
2010	R154	-1	R401	R86	R1	R50	6	R19	62	8	R120	R352	R587	R1,494	R122	15	1	139
2011 <sup>P</sup>	150	1	419	88	(s)	48	5	18	62	8	116	345	567	1,482	123	16	1	140

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Carbon dioxide emissions from biomass energy consumption are excluded from total emissions in this table. See Note, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section.

<sup>3</sup> Natural gas, excluding supplemental gaseous fuels.

<sup>4</sup> Distillate fuel oil, excluding biodiesel.

<sup>5</sup> Liquefied petroleum gases.

<sup>6</sup> Finished motor gasoline, excluding fuel ethanol.

<sup>7</sup> Aviation gasoline blending components, crude oil, motor gasoline blending components, pentanes plus, petrochemical feedstocks, special naphthas, still gas, unfinished oils, waxes, and miscellaneous petroleum products.

<sup>8</sup> Emissions from energy consumption (for electricity and a small amount of useful thermal output) in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Tables 8.9 and 11.2e.

<sup>9</sup> Wood and wood-derived fuels.

<sup>10</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass.

<sup>11</sup> Fuel ethanol minus denaturant.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 and greater than -0.5 million metric tons of carbon dioxide.

Notes: • Data are estimates for carbon dioxide emissions from energy consumption, including the non-combustion use of fossil fuels. • See "Carbon Dioxide" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#environment> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#environment> for all annual data beginning in 1949. • See <http://www.eia.gov/environment/> for related information.

Sources: • 1949-1972—U.S. Energy Information Administration (EIA) estimates based on data in *Annual Energy Review* Tables 2.1d, 5.14b, 8.9, 10.2b, and 11.2e. • 1973 forward—EIA, *Monthly Energy Review (MER)* (May 2012), Tables 12.4 and 12.7, and MER data system calculations.

**Table 11.2d Carbon Dioxide Emissions From Energy Consumption: Transportation Sector, Selected Years, 1949-2011**  
(Million Metric Tons of Carbon Dioxide <sup>1</sup>)

Year	Coal	Natural Gas <sup>3</sup>	Petroleum								Retail Electricity <sup>7</sup>	Total <sup>2</sup>	Biomass <sup>2</sup>		
			Aviation Gasoline	Distillate Fuel Oil <sup>4</sup>	Jet Fuel	LPG <sup>5</sup>	Lubricants	Motor Gasoline <sup>6</sup>	Residual Fuel Oil	Total			Fuel Ethanol <sup>8</sup>	Biodiesel	Total
1949	161	NA	12	30	NA	(s)	4	306	91	443	6	611	NA	NA	NA
1950	146	7	14	35	NA	(s)	5	332	95	481	6	640	NA	NA	NA
1955	39	13	24	58	21	1	6	439	80	629	5	687	NA	NA	NA
1960	7	19	21	65	53	1	6	511	66	723	2	751	NA	NA	NA
1965	1	27	15	80	87	2	6	597	61	847	2	878	NA	NA	NA
1970	1	40	7	115	141	3	5	763	60	1,093	2	1,136	NA	NA	NA
1975	(s)	32	5	155	145	3	6	889	56	1,258	2	1,292	NA	NA	NA
1976	(s)	30	5	167	143	3	6	933	65	1,322	2	1,354	NA	NA	NA
1977	(s)	29	5	182	149	3	6	958	72	1,375	2	1,406	NA	NA	NA
1978	( <sup>9</sup> )	29	5	196	153	3	7	991	78	1,433	2	1,464	NA	NA	NA
1979	( <sup>9</sup> )	32	5	213	156	1	7	941	97	1,420	2	1,454	NA	NA	NA
1980	( <sup>9</sup> )	34	4	204	155	1	6	881	110	1,363	2	1,400	NA	NA	NA
1981	( <sup>9</sup> )	35	4	212	147	2	6	881	96	1,348	2	1,385	(s)	NA	(s)
1982	( <sup>9</sup> )	32	3	204	148	2	6	876	80	1,319	2	1,354	1	NA	1
1983	( <sup>9</sup> )	27	3	213	153	3	6	888	65	1,330	3	1,359	2	NA	2
1984	( <sup>9</sup> )	29	3	216	172	3	6	895	64	1,358	3	1,390	3	NA	3
1985	( <sup>9</sup> )	28	3	232	178	2	6	908	62	1,391	3	1,421	3	NA	3
1986	( <sup>9</sup> )	26	4	235	191	2	6	936	69	1,443	3	1,472	4	NA	4
1987	( <sup>9</sup> )	28	3	244	202	1	6	959	71	1,487	3	1,519	5	NA	5
1988	( <sup>9</sup> )	34	3	265	212	1	6	981	72	1,542	3	1,579	5	NA	5
1989	( <sup>9</sup> )	34	3	270	218	1	6	979	77	1,554	3	1,591	5	NA	5
1990	( <sup>9</sup> )	36	3	268	223	1	7	967	80	1,548	3	1,588	4	NA	4
1991	( <sup>9</sup> )	33	3	263	215	1	6	962	81	1,532	3	1,568	5	NA	5
1992	( <sup>9</sup> )	32	3	269	213	1	6	979	84	1,556	3	1,592	5	NA	5
1993	( <sup>9</sup> )	34	3	278	215	1	6	1,000	71	1,574	3	1,611	6	NA	6
1994	( <sup>9</sup> )	38	3	295	224	2	6	1,007	70	1,607	3	1,647	7	NA	7
1995	( <sup>9</sup> )	38	3	307	222	1	6	1,029	72	1,639	3	1,681	8	NA	8
1996	( <sup>9</sup> )	39	3	327	232	1	6	1,047	67	1,683	3	1,725	6	NA	6
1997	( <sup>9</sup> )	41	3	342	234	1	6	1,057	56	1,699	3	1,744	7	NA	7
1998	( <sup>9</sup> )	35	2	352	238	1	7	1,090	53	1,743	3	1,782	8	NA	8
1999	( <sup>9</sup> )	36	3	366	245	1	7	1,115	52	1,789	3	1,828	8	NA	8
2000	( <sup>9</sup> )	36	3	378	254	1	7	1,121	70	1,833	4	1,872	9	NA	9
2001	( <sup>9</sup> )	35	2	387	243	1	6	1,127	46	1,813	4	1,852	10	(s)	10
2002	( <sup>9</sup> )	37	2	394	237	1	6	1,158	53	1,851	4	1,892	11	(s)	12
2003	( <sup>9</sup> )	33	2	414	231	1	6	1,161	45	1,861	5	1,899	16	(s)	16
2004	( <sup>9</sup> )	32	2	434	240	1	6	1,185	58	1,926	5	1,962	20	(s)	20
2005	( <sup>9</sup> )	33	2	444	246	2	6	1,186	66	1,953	5	1,991	22	1	23
2006	( <sup>9</sup> )	33	2	469	240	2	5	1,194	71	1,984	5	2,022	30	2	33
2007	( <sup>9</sup> )	35	2	472	238	1	6	1,201	78	1,999	5	2,040	38	3	<sup>R</sup> 41
2008	( <sup>9</sup> )	37	2	440	226	3	5	1,146	72	1,895	5	1,937	54	3	57
2009	( <sup>9</sup> )	<sup>R</sup> 38	2	404	204	2	5	1,137	64	1,818	5	<sup>R</sup> 1,860	61	3	64
2010	( <sup>9</sup> )	<sup>R</sup> 38	2	<sup>R</sup> 425	<sup>R</sup> 210	2	5	<sup>R</sup> 1,124	<sup>R</sup> 69	<sup>R</sup> 1,836	5	<sup>R</sup> 1,879	<sup>R</sup> 71	2	<sup>R</sup> 74
2011 <sup>P</sup>	( <sup>9</sup> )	39	2	430	209	2	5	1,089	65	1,802	4	1,845	71	8	80

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Carbon dioxide emissions from biomass energy consumption are excluded from total emissions in this table. See Note, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section.

<sup>3</sup> Natural gas, excluding supplemental gaseous fuels.

<sup>4</sup> Distillate fuel oil, excluding biodiesel.

<sup>5</sup> Liquefied petroleum gases.

<sup>6</sup> Finished motor gasoline, excluding fuel ethanol.

<sup>7</sup> Emissions from energy consumption (for electricity and a small amount of useful thermal output) in the electric power sector are allocated to the end-use sectors in proportion to each sector's share of total electricity retail sales. See Tables 8.9 and 11.2e.

<sup>8</sup> Fuel ethanol minus denaturant.

<sup>9</sup> Beginning in 1978, the small amounts of coal consumed for transportation are reported as industrial sector consumption.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 million metric tons of carbon dioxide.

Notes: • Data are estimates for carbon dioxide emissions from energy consumption, including the non-combustion use of fossil fuels. • See "Carbon Dioxide" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#environment> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#environment> for all annual data beginning in 1949. • See <http://www.eia.gov/environment/> for related information.

Sources: • 1949-1972—U.S. Energy Information Administration (EIA) estimates based on data in *Annual Energy Review* Tables 2.1e, 5.14c, 8.9, 10.2b, and 11.2e. • 1973 forward—EIA, *Monthly Energy Review (MER)* (May 2012), Tables 12.5 and 12.7, and MER data system calculations.



**Table 11.2e Carbon Dioxide Emissions From Energy Consumption: Electric Power Sector, Selected Years, 1949-2011**

(Million Metric Tons of Carbon Dioxide <sup>1</sup>)

Year	Coal	Natural Gas <sup>3</sup>	Petroleum				Geo-thermal	Non-Biomass Waste <sup>5</sup>	Total <sup>2</sup>	Biomass <sup>2</sup>		
			Distillate Fuel Oil <sup>4</sup>	Petroleum Coke	Residual Fuel Oil	Total				Wood <sup>6</sup>	Waste <sup>7</sup>	Total
1949	187	30	2	NA	30	33	NA	NA	250	1	NA	1
1950	206	35	2	NA	35	37	NA	NA	278	1	NA	1
1955	324	63	2	NA	35	37	NA	NA	424	(s)	NA	(s)
1960	396	95	2	NA	42	43	NA	NA	535	(s)	NA	(s)
1965	546	127	2	NA	55	57	NA	NA	730	(s)	NA	(s)
1970	678	215	10	2	154	166	NA	NA	1,059	(s)	(s)	(s)
1975	824	172	17	(s)	231	248	NA	NA	1,244	(s)	(s)	(s)
1976	911	167	18	(s)	255	273	NA	NA	1,351	(s)	(s)	(s)
1977	962	174	21	(s)	285	306	NA	NA	1,442	(s)	(s)	(s)
1978	960	175	20	1	291	313	NA	NA	1,448	(s)	(s)	(s)
1979	1,056	192	13	1	244	258	NA	NA	1,505	(s)	(s)	(s)
1980	1,137	200	12	1	194	207	NA	NA	1,544	(s)	(s)	(s)
1981	1,180	198	9	(s)	163	173	NA	NA	1,551	(s)	(s)	(s)
1982	1,182	176	7	(s)	116	123	NA	NA	1,481	(s)	(s)	(s)
1983	1,242	158	7	1	113	121	NA	NA	1,521	(s)	(s)	(s)
1984	1,318	170	6	1	94	101	NA	NA	1,588	(s)	(s)	1
1985	1,367	166	6	1	79	86	NA	NA	1,619	1	(s)	1
1986	1,357	142	6	1	107	114	NA	NA	1,613	(s)	(s)	1
1987	1,427	155	7	1	91	99	NA	NA	1,680	1	(s)	1
1988	1,492	143	8	1	114	123	NA	NA	1,758	1	(s)	1
1989	1,519	168	11	2	121	134	(s)	4	1,826	9	8	17
1990	1,548	176	7	3	92	102	(s)	6	1,831	12	11	23
1991	1,548	179	6	3	86	95	(s)	7	1,830	12	13	25
1992	1,570	186	5	5	69	79	(s)	8	1,843	13	15	28
1993	1,633	188	6	8	76	90	(s)	9	1,919	14	15	29
1994	1,639	211	9	7	68	84	(s)	9	1,944	14	16	30
1995	1,661	228	8	8	45	61	(s)	10	1,960	12	17	28
1996	1,752	205	8	8	50	66	(s)	10	2,033	13	17	30
1997	1,797	219	8	10	56	75	(s)	10	2,101	13	17	30
1998	1,828	248	10	13	82	105	(s)	10	2,192	13	17	30
1999	1,836	260	10	11	76	97	(s)	10	2,204	13	17	30
2000	1,927	281	13	10	69	91	(s)	10	2,310	13	17	29
2001	1,870	290	12	11	79	102	(s)	11	2,273	12	19	31
2002	1,890	306	9	18	52	79	(s)	13	2,288	14	21	35
2003	1,931	278	12	18	69	98	(s)	11	2,319	16	21	37
2004	1,943	297	8	23	69	100	(s)	11	2,352	15	20	36
2005	1,984	319	8	25	69	102	(s)	11	2,417	17	20	37
2006	1,954	338	5	22	28	56	(s)	12	2,359	17	21	38
2007	1,987	372	7	17	31	55	(s)	11	2,426	17	22	39
2008	1,959	362	5	16	19	40	(s)	12	2,374	17	23	40
2009	1,741	373	5	14	14	34	(s)	11	2,159	17	24	41
2010	1,828	399	6	15	12	33	(s)	11	2,271	18	R24	R42
2011 <sup>P</sup>	1,718	411	5	14	7	25	(s)	11	2,166	16	24	41

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Carbon dioxide emissions from biomass energy consumption are excluded from total emissions in this table. See Note, "Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion," at end of section.

<sup>3</sup> Natural gas, excluding supplemental gaseous fuels.

<sup>4</sup> Distillate fuel oil, excluding biodiesel.

<sup>5</sup> Municipal solid waste from non-biogenic sources, and tire-derived fuels.

<sup>6</sup> Wood and wood-derived fuels.

<sup>7</sup> Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and

other biomass.

R=Revised. P=Preliminary. NA=Not available. (s)=Less than 0.5 million metric tons of carbon dioxide.

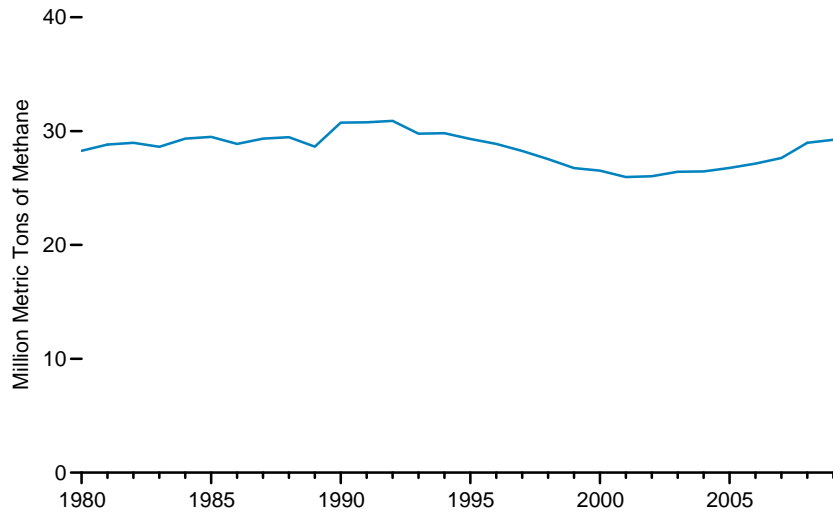
Notes: • Data are estimates for carbon dioxide emissions from energy consumption. • See "Carbon Dioxide" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#environment> for updated monthly and annual data. • See <http://www.eia.gov/totalenergy/data/annual/#environment> for all annual data beginning in 1949. • See <http://www.eia.gov/environment/> for related information.

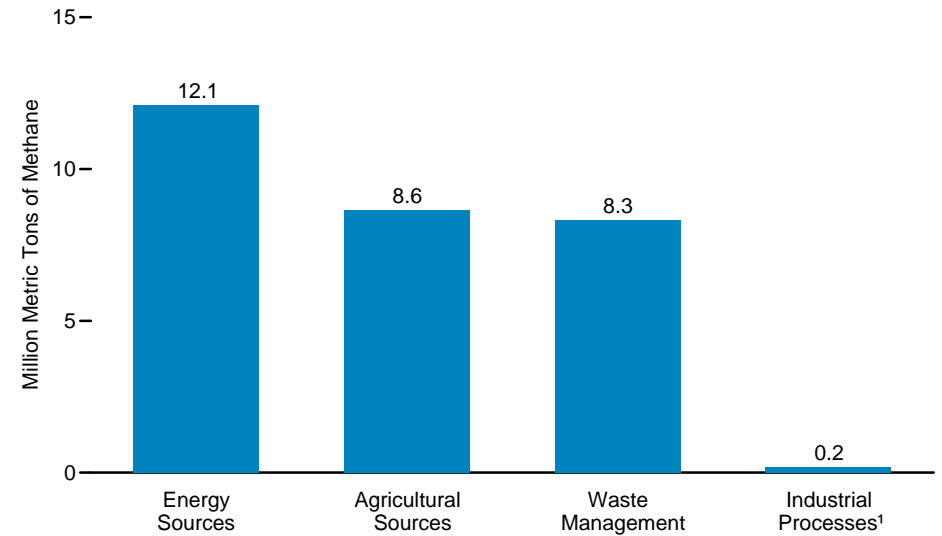
Sources: • 1949-1972—U.S. Energy Information Administration (EIA) estimates based on data in *Annual Energy Review* Tables 2.1f, 5.14c, and 10.2c. • 1973 forward—EIA, *Monthly Energy Review (MER)* (May 2012), Table 12.6 and MER data system calculations.

**Figure 11.3 Methane Emissions**

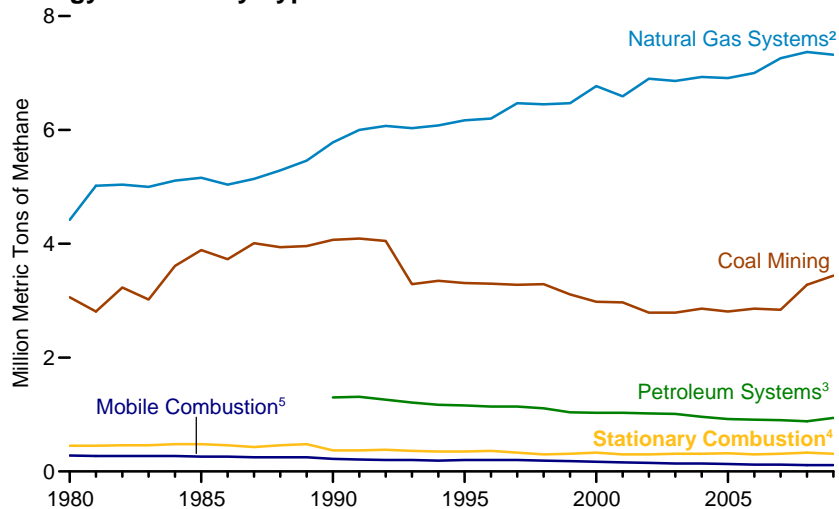
**Total, 1980-2009**



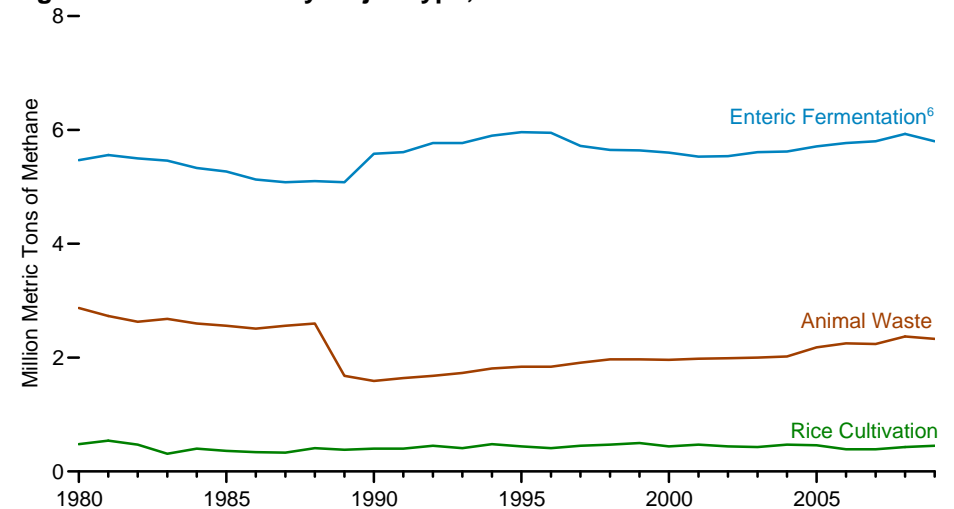
**By Source, 2009**



**Energy Sources by Type 1980-2009**



**Agricultural Sources by Major Type, 1980-2009**



<sup>1</sup> Chemical production, and iron and steel production.

<sup>2</sup> Natural gas production, processing, and distribution.

<sup>3</sup> Petroleum production, refining, and distribution.

<sup>4</sup> Consumption of coal, petroleum, natural gas, and wood for heat or electricity.

<sup>5</sup> Emissions from passenger cars, trucks, buses, motorcycles, and other transport.

<sup>6</sup> Methane emitted as a product of digestion in animals such as cattle, sheep, goats, and swine.

Source: Table 11.3.

**Table 11.3 Methane Emissions, 1980-2009**  
(Million Metric Tons of Methane)

Year	Energy Sources						Waste Management			Agricultural Sources					Industrial Processes <sup>9</sup>	Total <sup>5</sup>
	Coal Mining	Natural Gas Systems <sup>1</sup>	Petroleum Systems <sup>2</sup>	Mobile Combustion <sup>3</sup>	Stationary Combustion <sup>4</sup>	Total <sup>5</sup>	Landfills	Waste-water Treatment <sup>6</sup>	Total <sup>5</sup>	Enteric Fermentation <sup>7</sup>	Animal Waste <sup>8</sup>	Rice Cultivation	Crop Residue Burning	Total <sup>5</sup>		
1980	3.06	4.42	NA	0.28	0.45	8.20	10.52	0.52	11.04	5.47	2.87	0.48	0.04	8.86	0.17	28.27
1981	2.81	5.02	NA	.27	.45	8.55	10.69	.53	11.22	5.56	2.73	.54	.05	8.88	.18	28.82
1982	3.23	5.04	NA	.27	.46	9.01	10.63	.54	11.17	5.50	2.63	.47	.05	8.65	.13	28.97
1983	3.02	5.00	NA	.27	.46	8.76	10.67	.54	11.21	5.46	2.68	.31	.04	8.49	.15	28.62
1984	3.61	5.11	NA	.27	.48	9.46	10.68	.66	11.33	5.33	2.60	.40	.05	8.38	.16	29.34
1985	3.89	5.16	NA	.26	.48	9.79	10.65	.67	11.32	5.27	2.56	.36	.05	8.23	.15	29.49
1986	3.73	5.04	NA	.26	.46	9.48	10.53	.67	11.20	5.13	2.51	.34	.04	8.02	.16	28.87
1987	4.01	5.14	NA	.25	.43	9.85	10.63	.68	11.31	5.08	2.56	.33	.04	8.02	.17	29.34
1988	3.94	5.29	NA	.25	.46	9.95	10.51	.69	11.20	5.10	2.60	.41	.05	8.14	.18	29.47
1989	3.96	5.46	NA	.25	.48	10.15	10.43	.70	11.13	5.08	1.68	.38	.05	7.18	.18	28.64
1990	4.07	5.78	1.30	.22	.37	11.72	10.31	.91	11.23	5.58	1.59	.40	.05	7.62	.18	30.75
1991	4.09	6.00	1.31	.21	.37	11.98	10.00	.93	10.93	5.61	1.64	.40	.05	7.69	.19	30.78
1992	4.05	6.07	1.26	.20	.38	11.97	9.84	.95	10.79	5.77	1.68	.45	.05	7.95	.19	30.90
1993	3.29	6.03	1.21	.20	.36	11.08	9.58	.96	10.54	5.77	1.73	.41	.04	7.96	.20	29.77
1994	3.35	6.08	1.17	.19	.35	11.15	9.25	.98	10.23	5.90	1.81	.48	.05	8.23	.21	29.82
1995	3.31	6.17	1.16	.20	.35	11.20	8.62	1.00	9.61	5.96	1.84	.44	.05	8.28	.22	29.31
1996	3.30	6.20	1.14	.20	.36	11.20	8.19	1.01	9.19	5.95	1.84	.41	.05	8.25	.22	28.87
1997	3.28	6.47	1.14	.20	.33	11.42	7.45	1.02	8.47	5.72	1.91	.45	.05	8.13	.23	28.26
1998	3.29	6.45	1.11	.19	.30	11.34	6.80	1.03	7.83	5.65	1.97	.47	.05	8.14	.23	27.54
1999	3.11	6.47	1.04	.18	.31	11.11	6.21	1.05	7.25	5.64	1.97	.50	.05	8.16	.24	26.76
2000	2.98	6.77	1.03	.17	.33	11.27	5.93	1.05	6.98	5.60	1.96	.44	.05	8.05	.22	26.53
2001	2.97	6.59	1.03	.16	.30	11.05	5.65	1.05	6.70	5.53	1.98	.47	.05	8.02	.20	25.97
2002	2.79	6.90	1.02	.15	.30	11.16	5.58	1.06	6.64	5.54	1.99	.44	.05	8.03	.21	26.03
2003	2.79	6.86	1.01	.14	.31	11.11	5.97	1.06	7.03	5.61	2.00	.43	.05	8.08	.20	26.43
2004	2.86	6.93	.96	.14	.31	11.20	5.80	1.07	6.88	5.62	2.02	.47	.05	8.16	.22	26.46
2005	2.81	6.91	.92	.13	.32	11.08	6.02	1.08	7.09	5.71	2.18	.46	.05	8.40	.20	26.77
2006	2.86	7.00	.91	.12	.30	11.19	6.18	1.10	7.27	5.77	2.25	.39	.05	8.47	.20	27.14
2007	2.84	7.26	.90	.12	.31	11.43	6.40	1.11	7.51	5.80	2.24	.39	.05	8.49	.21	27.64
2008	3.28	7.37	.88	.11	.33	11.97	6.90	1.12	8.02	5.93	2.37	.43	.05	8.79	.18	28.97
2009	3.44	7.32	.94	.11	.31	12.12	7.19	1.12	8.31	5.80	2.33	.45	.06	8.64	.17	29.24

<sup>1</sup> Natural gas production, processing, and distribution; processing is not included in 1980 and is incompletely covered in 1981–1989.

<sup>2</sup> Petroleum production, refining, and distribution.

<sup>3</sup> Emissions from passenger cars, trucks, buses, motorcycles, and other transport.

<sup>4</sup> Consumption of coal, petroleum, natural gas, and wood for heat or electricity.

<sup>5</sup> See notes on components for specific coverage, which is inconsistent prior to 1990 in some cases.

<sup>6</sup> 1980–1983, domestic wastewater only; 1984 forward, industrial and domestic wastewater.

<sup>7</sup> Methane emitted as a product of digestion in animals such as cattle, sheep, goats, and swine.

<sup>8</sup> Estimation methods for 1990 forward reflect a shift in waste management away from liquid systems to dry-lot systems, thus lowering emissions.

<sup>9</sup> Chemical production, and iron and steel production.

NA=Not available.

Notes: • Data for this table are not available for 2010. • Emissions are from anthropogenic sources.

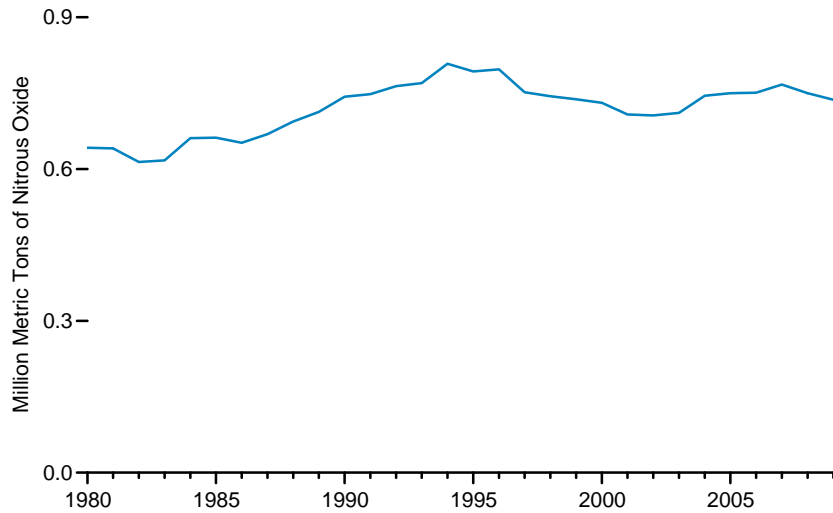
"Anthropogenic" means produced as the result of human activities, including emissions from agricultural activity and domestic livestock. Emissions from natural sources, such as wetlands and wild animals, are not included. • Under certain conditions, methane may be produced via anaerobic decomposition of organic materials in landfills, animal wastes, and rice paddies. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/environment/>.

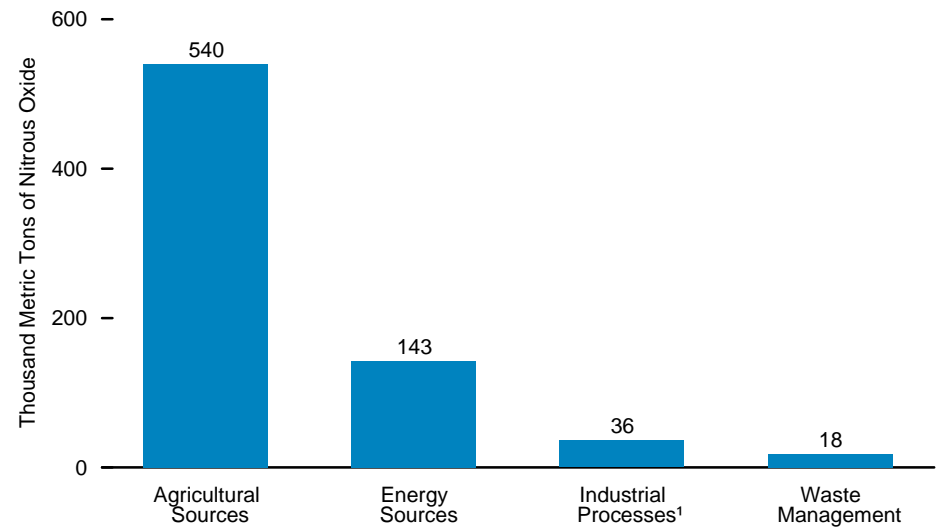
Sources: U.S. Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States 2009* (March 2011), Tables 17–21; and EIA estimates based on the Intergovernmental Panel on Climate Change's *Guidelines for National Greenhouse Gas Inventories* (2006 and revised 1996 guidelines)—see <http://www.ipcc-nggip.iges.or.jp/public/gl/invs6.html>; and the U.S. Environmental Protection Agency's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2008* (April 2010)—see <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.

**Figure 11.4 Nitrous Oxide Emissions**

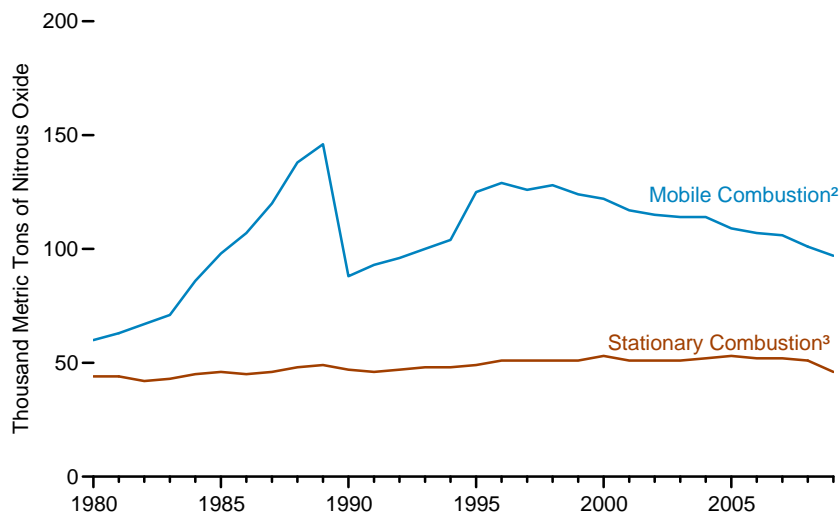
**Total, 1980-2009**



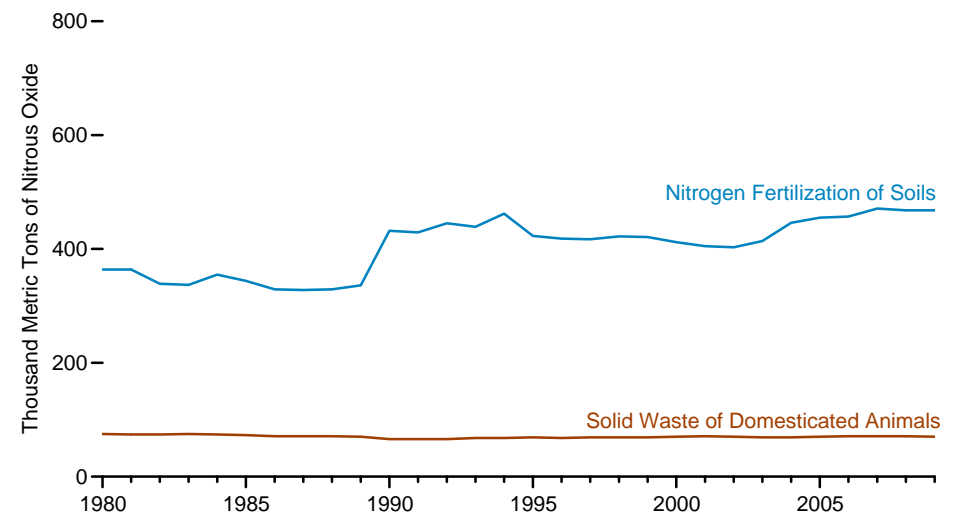
**By Source, 2009**



**Energy Sources by Type, 1980-2009**



**Agricultural Sources by Major Type, 1980-2009**



<sup>1</sup> Adipic acid production (primarily for the manufacture of nylon fibers and plastics) and nitric acid production (primarily for fertilizers).

<sup>2</sup> Emissions from passenger cars and trucks; air, rail, and marine transportation; and farm and construction equipment.

<sup>3</sup> Consumption of coal, petroleum, natural gas, and wood for heat or electricity.  
Source: Table 11.4.

**Table 11.4 Nitrous Oxide Emissions, 1980-2009**  
(Thousand Metric Tons of Nitrous Oxide)

Year	Energy Sources			Waste Management			Agricultural Sources				Industrial Processes <sup>3</sup>	Total
	Mobile Combustion <sup>1</sup>	Stationary Combustion <sup>2</sup>	Total	Waste Combustion	Human Sewage in Wastewater	Total	Nitrogen Fertilization of Soils	Crop Residue Burning	Solid Waste of Domesticated Animals	Total		
1980	60	44	104	1	10	11	364	1	75	440	88	642
1981	63	44	106	1	10	11	364	2	74	440	84	641
1982	67	42	108	1	10	11	339	2	74	414	80	614
1983	71	43	114	1	11	11	337	1	75	413	79	617
1984	86	45	132	1	11	11	355	2	74	431	87	661
1985	98	46	143	1	11	12	344	2	73	419	88	662
1986	107	45	152	1	11	12	329	2	71	402	86	652
1987	120	46	166	1	12	13	328	1	71	400	90	669
1988	138	48	185	1	12	13	329	1	71	401	95	694
1989	146	49	195	1	12	13	336	1	70	407	98	713
1990	88	47	135	1	12	13	432	1	66	499	96	743
1991	93	46	139	1	13	14	429	1	66	497	98	748
1992	96	47	143	1	13	14	445	2	66	512	95	764
1993	100	48	148	1	13	14	439	1	68	508	100	770
1994	104	48	152	1	13	15	462	2	68	532	110	808
1995	125	49	174	1	13	15	423	1	69	494	110	793
1996	129	51	180	1	14	15	418	2	68	487	115	797
1997	126	51	178	1	14	15	417	2	69	487	72	752
1998	128	51	179	1	14	15	422	2	69	493	57	744
1999	124	51	175	1	15	16	421	2	69	492	56	738
2000	122	53	175	1	15	16	412	2	70	484	56	731
2001	117	51	168	1	15	16	405	2	71	477	46	708
2002	115	51	166	1	15	16	403	2	70	474	50	706
2003	114	51	165	1	15	16	414	2	69	485	45	711
2004	114	52	167	1	15	17	446	2	69	517	45	745
2005	109	53	162	1	16	17	455	2	70	526	45	750
2006	107	52	159	1	16	17	457	2	71	530	46	751
2007	106	52	159	1	16	17	471	2	71	544	47	767
2008	101	51	151	1	16	17	468	2	71	541	41	750
2009	97	46	143	1	16	18	468	2	70	540	36	737

<sup>1</sup> Emissions from passenger cars and trucks; air, rail, and marine transportation; and farm and construction equipment.

<sup>2</sup> Consumption of coal, petroleum, natural gas, and wood for heat or electricity.

<sup>3</sup> Adipic acid production (primarily for the manufacture of nylon fibers and plastics), and nitric acid production (primarily for fertilizers).

Notes: • Data for this table are not available for 2010. • Emissions are from anthropogenic sources. "Anthropogenic" means produced as the result of human activities, including emissions from agricultural activity and domestic livestock. Emissions from natural sources, such as wetlands and wild animals, are

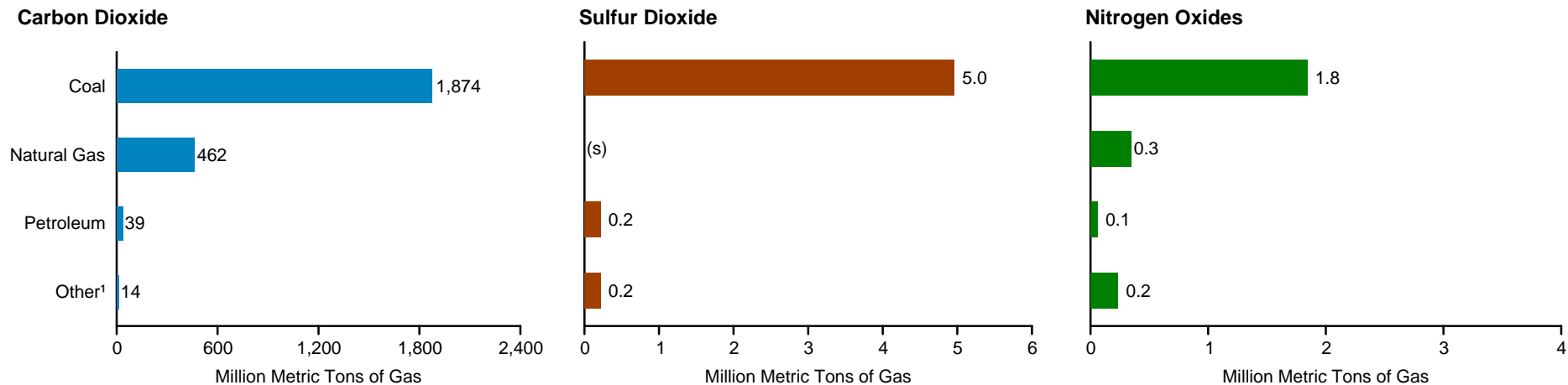
not included. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/environment/>.

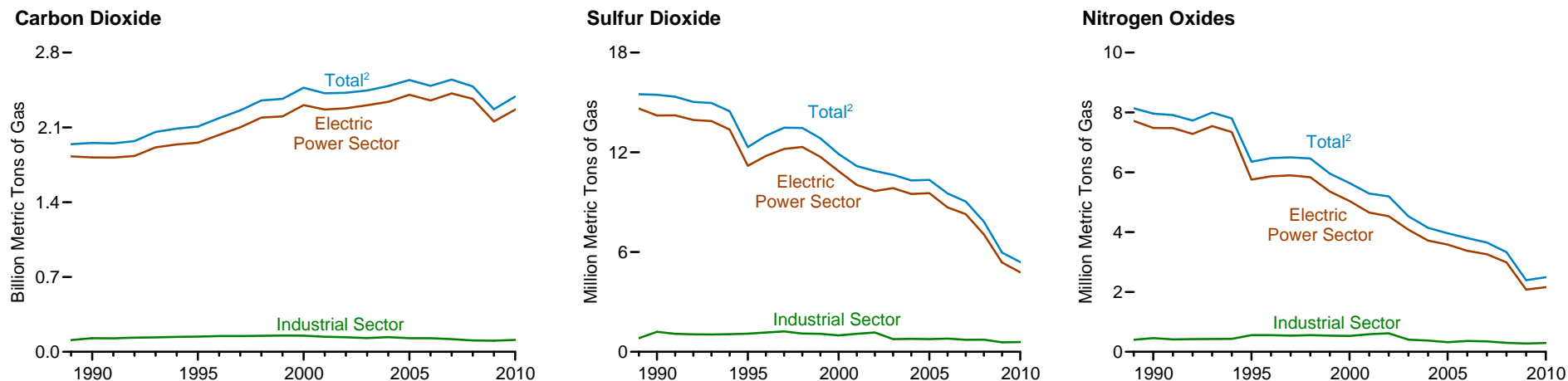
Sources: U.S. Energy Information Administration (EIA), *Emissions of Greenhouse Gases in the United States 2009* (March 2011), Table 22; and EIA estimates based on the Intergovernmental Panel on Climate Change's *Guidelines for National Greenhouse Gas Inventories* (2006 and revised 1996 guidelines)—see <http://www.ipcc-nggip.iges.or.jp/public/gl/invs6.html>; and the U.S. Environmental Protection Agency's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2008* (April 2010)—see <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.

**Figure 11.5 Emissions From Energy Consumption for Electricity Generation and Useful Thermal Output**

**Emissions by Type of Generating Unit, 2010**



**Emissions by Sector, 1989-2010**



<sup>1</sup> For carbon dioxide: municipal solid waste from non-biogenic sources; tire-derived fuel, and geothermal. For sulfur dioxide and nitrogen oxides: blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels; wood and wood-derived fuels; municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass; and chemicals, hydrogen, pitch, sulfur, and tar coal.

<sup>2</sup> Includes Commercial Sector.  
(s)=Less than 0.05 million metric tons.  
Sources: Tables 11.5a-11.5c.

**Table 11.5a Emissions From Energy Consumption for Electricity Generation and Useful Thermal Output:  
Total (All Sectors), 1989-2010** (Sum of Tables 11.5b and 11.5c; Thousand Metric Tons of Gas)

Year	Carbon Dioxide <sup>1</sup>						Sulfur Dioxide					Nitrogen Oxides				
	Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Geo-thermal <sup>5</sup>	Non-Biomass Waste <sup>6</sup>	Total	Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Other <sup>7</sup>	Total	Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Other <sup>7</sup>	Total
1989	1,573,566	218,384	145,399	363	5,590	1,943,302	14,469	1	984	39	15,493	7,281	495	269	93	8,136
1990	1,592,395	233,852	119,580	384	7,488	1,953,699	14,281	1	937	243	15,462	7,119	513	208	122	7,961
1991	1,592,186	238,084	111,351	398	8,447	1,950,466	14,240	1	856	246	15,342	7,109	498	193	113	7,913
1992	1,617,034	248,149	96,638	400	10,053	1,972,275	14,060	1	704	264	15,030	6,975	477	158	119	7,728
1993	1,687,623	250,411	108,164	415	10,439	2,057,053	13,843	1	851	271	14,966	7,225	475	173	124	7,997
1994	1,697,416	276,308	102,844	384	11,186	2,088,138	13,398	1	794	279	14,472	7,005	513	159	124	7,801
1995	1,720,062	298,601	77,032	329	11,982	2,108,006	11,188	2	826	298	12,314	5,136	653	332	234	6,355
1996	1,812,022	277,856	84,024	360	12,718	2,186,980	11,811	1	876	304	12,991	5,307	577	352	238	6,474
1997	1,858,944	293,139	93,497	374	13,368	2,259,322	12,211	1	965	303	13,480	5,322	619	326	233	6,500
1998	1,887,335	327,456	123,542	375	12,891	2,351,600	12,012	1	1,162	289	13,464	5,123	700	395	241	6,459
1999	1,894,211	343,090	115,677	381	12,943	2,366,302	11,453	1	1,101	288	12,843	4,687	632	391	245	5,955
2000	1,986,100	363,526	108,407	362	12,440	2,470,834	R <sup>10,669</sup>	1	933	300	R <sup>11,904</sup>	4,370	614	404	250	5,638
2001	1,920,901	367,146	117,196	353	13,010	2,418,607	9,905	2	1,002	265	11,174	4,096	631	294	268	5,290
2002	1,938,613	378,950	91,110	372	14,918	2,423,963	9,786	2	773	321	10,881	4,057	625	225	287	5,194
2003	1,973,597	345,119	112,065	371	13,943	2,445,094	9,688	2	717	239	10,646	3,607	453	240	232	4,532
2004	1,989,580	367,112	115,726	381	14,183	2,486,982	9,437	2	633	237	10,309	3,286	416	225	217	4,143
2005	2,028,614	383,461	117,086	377	14,299	2,543,838	9,499	2	587	251	10,340	3,135	383	221	222	3,961
2006	2,001,085	404,278	67,988	374	15,193	2,488,918	8,867	2	427	227	9,524	2,996	399	164	240	3,799
2007	2,029,804	434,536	67,769	376	14,548	2,547,032	8,389	3	422	227	9,042	2,870	382	157	242	3,650
2008	2,001,806	419,599	47,855	381	14,370	2,484,012	7,351	3	250	225	7,830	2,680	351	75	225	3,330
2009	1,781,278	432,206	41,474	386	14,163	2,269,508	5,535	2	210	223	5,970	1,769	336	66	225	2,395
2010	1,873,813	461,723	38,793	391	13,875	2,388,596	4,961	3	217	219	5,400	1,843	349	63	236	2,491

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>5</sup> Carbon dioxide in geothermal steam.

<sup>6</sup> Municipal solid waste from non-biogenic sources, and tire-derived fuel.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels;

wood and wood-derived fuels; municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass; and chemicals, hydrogen, pitch, sulfur, and tar coal.

R=Revised.

Notes: • Data are for emissions from energy consumption for electricity generation and useful thermal output. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: Tables 11.5b and 11.5c.

**Table 11.5b Emissions From Energy Consumption for Electricity Generation and Useful Thermal Output:  
Electric Power Sector, 1989-2010** (Subset of Table 11.5a; Thousand Metric Tons of Gas)

Year	Carbon Dioxide <sup>1</sup>						Sulfur Dioxide					Nitrogen Oxides				
	Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Geo-thermal <sup>5</sup>	Non-Biomass Waste <sup>6</sup>	Total	Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Other <sup>7</sup>	Total	Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Other <sup>7</sup>	Total
1989	1,520,230	169,653	133,546	363	4,366	1,828,158	13,815	1	810	7	14,633	7,055	390	246	25	7,717
1990	1,534,141	177,232	101,800	384	5,795	1,819,351	13,576	1	628	13	14,218	6,878	390	175	36	7,480
1991	1,534,559	180,541	95,149	398	7,207	1,817,854	13,590	1	621	15	14,227	6,886	384	165	42	7,476
1992	1,556,741	187,730	79,153	400	8,476	1,832,501	13,375	1	559	12	13,946	6,749	359	128	46	7,282
1993	1,626,161	188,291	90,400	415	8,592	1,913,860	13,133	1	735	13	13,882	6,996	357	143	49	7,544
1994	1,634,282	211,154	85,005	384	9,323	1,940,148	12,695	1	665	11	13,373	6,777	390	128	47	7,343
1995	1,656,743	228,675	61,057	329	10,015	1,956,819	10,573	1	581	34	11,189	4,974	402	282	95	5,754
1996	1,747,945	205,250	66,113	360	9,932	2,029,599	11,129	1	617	32	11,779	5,144	326	301	96	5,866
1997	1,794,629	220,174	75,079	374	10,372	2,100,628	11,515	1	653	36	12,205	5,157	370	269	98	5,894
1998	1,825,027	249,836	105,539	375	10,264	2,191,041	11,373	1	911	37	12,321	4,965	431	337	103	5,836
1999	1,831,670	262,455	97,892	381	10,312	2,202,710	10,843	1	836	42	11,722	4,535	381	332	109	5,357
2000	1,923,054	283,034	92,226	362	10,178	2,308,855	R <sup>10,081</sup>	1	746	45	R <sup>10,872</sup>	4,225	338	367	111	5,040
2001	1,862,800	291,101	102,900	353	10,900	2,268,054	9,281	2	754	5	10,041	3,878	425	253	96	4,652
2002	1,878,923	307,455	78,820	372	12,758	2,278,328	9,106	2	549	16	9,672	3,813	425	187	104	4,528
2003	1,917,303	279,300	98,208	371	11,453	2,306,635	9,255	2	579	13	9,849	3,496	282	207	98	4,082
2004	1,929,818	297,782	100,236	381	11,177	2,339,394	8,991	2	493	9	9,495	3,183	241	193	101	3,717
2005	1,970,908	320,545	102,537	377	11,257	2,405,625	9,071	2	461	10	9,543	3,051	243	189	103	3,585
2006	1,944,759	339,557	55,358	374	11,544	2,351,592	8,416	2	264	8	8,690	2,902	230	135	107	3,374
2007	1,977,528	373,268	55,545	376	11,304	2,418,022	8,002	3	265	9	8,279	2,781	236	130	112	3,259
2008	1,951,138	363,749	40,442	381	11,620	2,367,331	6,909	2	146	8	7,065	2,578	230	58	124	2,990
2009	1,736,284	374,082	33,700	386	11,256	2,155,707	5,253	2	110	9	5,374	1,688	214	50	128	2,080
2010	1,821,497	400,974	32,667	391	11,034	2,266,563	4,662	2	111	8	4,783	1,751	224	49	135	2,159

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>5</sup> Carbon dioxide in geothermal steam.

<sup>6</sup> Municipal solid waste from non-biogenic sources, and tire-derived fuel.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels; wood and wood-derived fuels; municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass; and chemicals, hydrogen, pitch, sulfur, and tar coal.

R=Revised.

Notes: • There are small differences in carbon dioxide emissions values between this table and Table 11.2e due to differences in the methodologies for calculating the data. • Data are for emissions from

energy consumption for electricity generation and useful thermal output. • The electric power sector comprises electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. • See Table 11.5c for commercial and industrial CHP and electricity-only data. • See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8. • See "Useful Thermal Output" in Glossary. • Totals may not equal sum of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: **Carbon Dioxide:** U.S. Energy Information Administration (EIA) estimates based on Form EIA-923, "Power Plant Operations Report" (and predecessor forms). **Sulfur Dioxide and Nitrogen Oxides:** EIA estimates based on Form EIA-923, "Power Plant Operations Report" (and predecessor forms). Data were adjusted by the U.S. Environmental Protection Agency's Continuous Emissions Monitoring System.



**Table 11.5c Emissions From Energy Consumption for Electricity Generation and Useful Thermal Output: Commercial and Industrial Sectors, 1989-2010** (Subset of Table 11.5a; Thousand Metric Tons of Gas)

Year	Carbon Dioxide <sup>1</sup>					Total	Sulfur Dioxide					Total	Nitrogen Oxides					Total
	Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Geo-thermal <sup>5</sup>	Non-Biomass Waste <sup>6</sup>		Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Other <sup>7</sup>	Total		Coal <sup>2</sup>	Natural Gas <sup>3</sup>	Petroleum <sup>4</sup>	Other <sup>7</sup>	Total	
<b>Commercial Sector <sup>8</sup></b>																		
1989	2,320	1,542	637	–	804	5,303	37	(s)	5	1	43	9	3	2	3	17		
1990	2,418	2,294	706	–	959	6,377	39	(s)	4	1	45	10	6	1	4	21		
1991	2,680	2,287	544	–	1,014	6,526	32	(s)	3	1	35	10	6	1	4	21		
1992	2,552	2,787	474	–	1,258	7,070	32	(s)	3	1	35	10	7	1	4	21		
1993	2,988	3,315	616	–	1,285	8,205	40	(s)	3	1	44	12	7	1	4	24		
1994	2,932	3,722	654	–	1,292	8,601	39	(s)	3	(s)	42	11	8	1	4	24		
1995	3,106	4,070	509	–	1,462	9,147	30	(s)	3	3	35	8	20	6	11	45		
1996	3,639	4,369	534	–	2,023	10,565	40	(s)	3	4	47	9	23	4	14	50		
1997	3,871	4,654	716	–	2,277	11,518	43	(s)	3	6	51	10	34	7	14	65		
1998	3,341	4,707	829	–	2,081	10,958	37	(s)	5	4	45	10	35	5	16	66		
1999	3,468	4,535	742	–	2,008	10,752	34	(s)	4	4	42	9	28	4	17	57		
2000	3,635	4,605	740	–	1,684	10,665	33	(s)	4	7	43	8	38	4	16	65		
2001	3,366	4,280	839	–	1,418	9,903	43	(s)	4	2	48	13	19	2	16	50		
2002	3,025	4,035	571	–	1,520	9,151	41	(s)	2	2	46	13	20	2	13	48		
2003	3,904	3,222	683	–	1,706	9,515	32	(s)	3	1	36	9	16	5	15	45		
2004	4,018	3,916	920	–	1,962	10,817	30	(s)	3	2	35	8	18	8	16	49		
2005	4,031	3,701	759	–	1,897	10,387	33	(s)	3	1	36	9	24	6	15	54		
2006	3,908	3,686	445	–	1,946	9,984	33	(s)	3	1	36	9	35	3	17	64		
2007	3,994	3,800	363	–	1,635	9,792	33	(s)	3	1	37	10	16	2	16	44		
2008	4,155	3,589	310	–	1,953	10,006	32	(s)	1	(s)	33	9	14	1	16	40		
2009	3,727	4,093	245	–	2,084	10,149	26	(s)	1	(s)	27	8	13	1	16	39		
2010	3,530	4,639	206	–	2,063	10,437	25	(s)	1	(s)	27	7	14	1	15	38		
<b>Industrial Sector <sup>9</sup></b>																		
1989	51,017	47,188	11,216	–	420	109,842	616	(s)	169	32	817	218	100	21	63	403		
1990	55,837	54,326	17,074	–	734	127,971	666	(s)	304	229	1,199	233	116	31	80	461		
1991	54,947	55,255	15,659	–	225	126,086	618	(s)	232	230	1,080	215	108	27	66	416		
1992	57,742	57,632	17,010	–	319	132,704	655	(s)	143	251	1,049	218	110	29	67	425		
1993	58,474	58,805	17,148	–	562	134,988	671	(s)	113	257	1,041	219	110	29	70	429		
1994	60,202	61,431	17,186	–	571	139,390	664	(s)	126	267	1,057	219	114	30	71	435		
1995	60,212	65,856	15,466	–	505	142,040	585	(s)	243	262	1,090	154	231	43	128	556		
1996	60,438	68,237	17,377	–	763	146,815	642	(s)	256	268	1,166	154	228	48	128	558		
1997	60,444	68,311	17,701	–	719	147,175	653	(s)	309	261	1,223	155	215	50	121	541		
1998	58,967	72,914	17,174	–	546	149,601	603	(s)	247	248	1,099	148	234	53	121	557		
1999	59,073	76,100	17,043	–	624	152,840	576	(s)	260	243	1,080	144	223	55	120	541		
2000	59,410	75,887	15,440	–	577	151,315	556	(s)	184	248	988	138	238	34	123	533		
2001	54,735	71,765	13,457	–	693	140,650	581	(s)	245	259	1,085	206	187	39	156	587		
2002	56,665	67,460	11,719	–	640	136,484	639	(s)	221	303	1,163	231	181	36	170	618		
2003	52,390	62,598	13,173	–	783	128,944	401	(s)	135	224	761	102	155	28	119	404		
2004	55,744	65,413	14,570	–	1,044	136,771	415	(s)	136	227	779	95	157	25	100	376		
2005	53,675	59,216	13,791	–	1,145	127,826	395	(s)	124	241	760	75	117	27	104	322		
2006	52,418	61,035	12,185	–	1,703	127,341	419	(s)	161	218	798	86	134	26	117	362		
2007	48,282	57,467	11,860	–	1,609	119,218	353	1	154	217	726	79	129	26	113	346		
2008	46,514	52,261	7,103	–	798	106,675	411	1	103	217	731	93	107	16	84	300		
2009	41,268	54,031	7,529	–	824	103,651	256	(s)	98	214	569	73	108	15	81	277		
2010	48,786	56,110	5,920	–	779	111,596	274	(s)	105	210	590	85	110	14	86	294		

<sup>1</sup> Metric tons of carbon dioxide can be converted to metric tons of carbon equivalent by multiplying by 12/44.

<sup>2</sup> Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

<sup>3</sup> Natural gas, plus a small amount of supplemental gaseous fuels.

<sup>4</sup> Distillate fuel oil, residual fuel oil, petroleum coke, jet fuel, kerosene, other petroleum, and waste oil.

<sup>5</sup> Carbon dioxide in geothermal steam.

<sup>6</sup> Municipal solid waste from non-biogenic sources, and tire-derived fuel.

<sup>7</sup> Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels; wood and wood-derived fuels; municipal solid waste, landfill gas, sludge waste, tires, agricultural byproducts, and other biomass; and chemicals, hydrogen, pitch, sulfur, and tar coal.

<sup>8</sup> Commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

<sup>9</sup> Industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

– =No data reported. (s)=Less than 0.5 thousand metric tons.

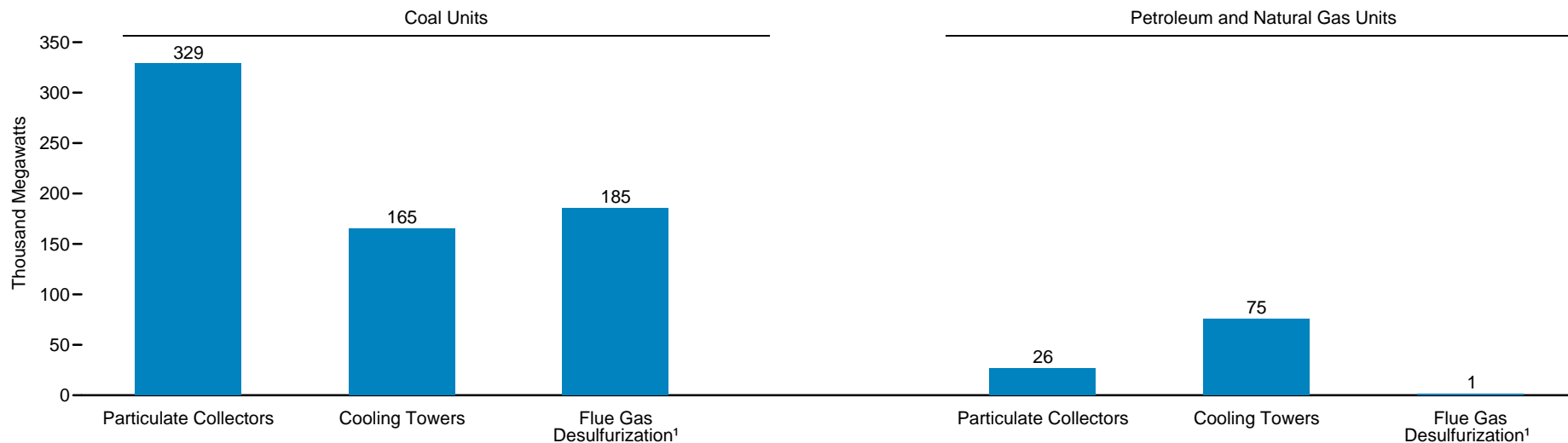
Notes: • Data are for emissions from energy consumption for electricity generation and useful thermal output. • See Table 11.5b for emissions from energy consumption for electricity generation and useful thermal output. • See Table 11.5b for electric power sector data. • See Note 2, "Classification of Power Plants Into Energy-Use Sectors," at end of Section 8. • See "Useful Thermal Output" in Glossary. • Totals may not equal sums of components due to independent rounding.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

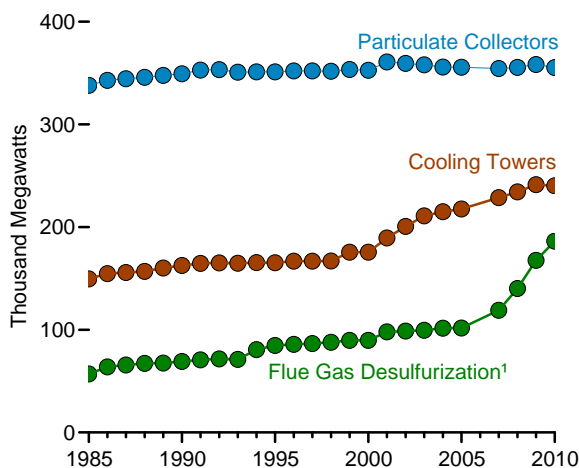
Sources: **Carbon Dioxide:** U.S. Energy Information Administration (EIA) estimates based on Form EIA-923, "Power Plant Operations Report" (and predecessor forms). **Sulfur Dioxide and Nitrogen Oxides:** EIA estimates based on Form EIA-923, "Power Plant Operations Report" (and predecessor forms). Data were adjusted by the U.S. Environmental Protection Agency's Continuous Emissions Monitoring System.

**Figure 11.6 Installed Nameplate Capacity of Fossil-Fuel Steam-Electric Generators With Environmental Equipment**

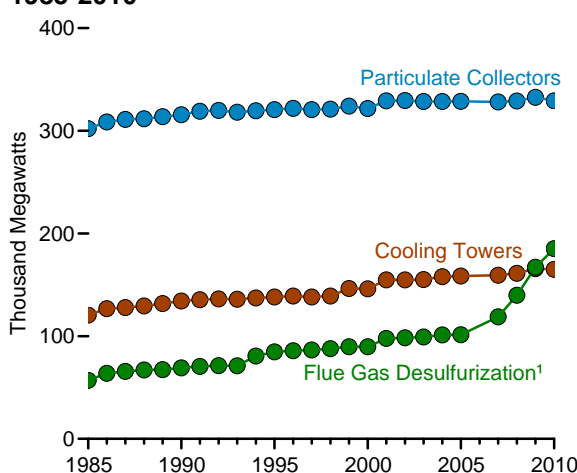
**By Fuel and Equipment Type, 2010**



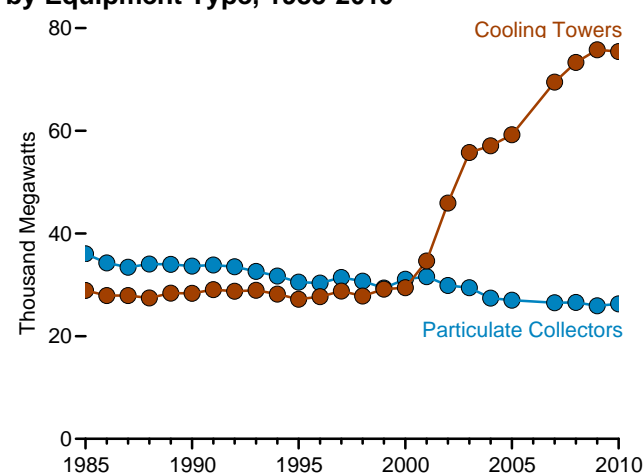
**Total Units by Equipment Type, 1985-2010<sup>2</sup>**



**Coal Units by Equipment Type, 1985-2010<sup>2</sup>**



**Petroleum and Natural Gas Units by Equipment Type, 1985-2010<sup>2</sup>**



<sup>1</sup> Also called “scrubbers.”

<sup>2</sup> Through 2000, data are for electric utility plants with fossil-fueled steam-electric capacity of 100 megawatts or greater. Beginning in 2001, data are for electric utility and unregulated generating plants (independent power producers, commercial plants, and industrial plants) in

operating or standby status, with fossil-fueled steam-electric capacity of 100 megawatts or greater, or combustible-renewable steam electric capacity of 10 megawatts or greater.

Note: • Components are not additive because some generators are included in more than one category.

Source: Table 11.6.

**Table 11.6 Installed Nameplate Capacity of Fossil-Fuel Steam-Electric Generators With Environmental Equipment, 1985-2010 (Megawatts)**

Year	Coal				Petroleum and Natural Gas				Total <sup>1</sup>			
	Particulate Collectors	Cooling Towers	Flue Gas Desulfurization (Scrubbers)	Total <sup>2</sup>	Particulate Collectors	Cooling Towers	Flue Gas Desulfurization (Scrubbers)	Total <sup>2</sup>	Particulate Collectors	Cooling Towers	Flue Gas Desulfurization (Scrubbers)	Total <sup>2</sup>
1985	302,056	120,591	56,955	304,706	36,054	28,895	65	62,371	338,110	149,486	57,020	367,078
1986	308,566	126,731	63,735	311,217	34,258	27,919	65	59,618	342,825	154,650	63,800	370,835
1987	311,043	127,875	65,688	312,885	33,431	27,912	65	58,783	344,474	155,786	65,753	371,668
1988	311,776	129,366	67,156	313,618	34,063	27,434	65	58,937	345,839	156,800	67,221	372,555
1989	313,680	131,701	67,469	315,521	33,975	28,386	65	59,736	347,655	160,087	67,534	375,257
1990	315,681	134,199	69,057	317,522	33,639	28,359	65	59,372	349,319	162,557	69,122	376,894
1991	319,046	135,565	70,474	319,110	33,864	29,067	260	59,773	352,910	164,632	70,734	378,883
1992	319,856	136,266	71,336	319,918	33,509	28,764	195	59,116	353,365	165,030	71,531	379,034
1993	318,188	135,885	71,106	318,251	32,620	28,922	–	58,580	350,808	164,807	71,106	376,831
1994	319,485	137,266	80,617	319,776	31,695	28,186	–	57,123	351,180	165,452	80,617	376,899
1995	320,685	138,108	84,677	320,749	30,513	27,187	–	54,942	351,198	165,295	84,677	375,691
1996	321,805	139,065	85,842	321,869	30,349	27,685	–	55,275	352,154	166,749	85,842	377,144
1997	320,646	138,120	86,605	320,710	31,422	28,766	–	56,485	352,068	166,886	86,605	377,195
1998	321,082	139,082	87,783	321,353	30,708	27,814	–	55,764	351,790	166,896	87,783	377,117
1999	324,109	146,377	89,666	331,379	29,371	29,142	–	55,812	353,480	175,520	89,666	387,192
2000	321,636	146,093	89,675	328,741	31,090	29,427	–	57,697	352,727	175,520	89,675	386,438
2001 <sup>3</sup>	329,187	154,747	97,804	329,187	31,575	34,649	184	61,634	360,762	189,396	97,988	390,821
2002	329,459	154,750	98,363	329,459	29,879	45,920	310	72,008	359,338	200,670	98,673	401,341
2003	328,587	155,158	99,257	328,587	29,422	55,770	310	81,493	358,009	210,928	99,567	409,954
2004	328,506	157,968	101,182	328,506	27,402	57,082	310	81,450	355,782	214,989	101,492	409,769
2005	328,720	158,493	101,338	328,720	27,005	59,214	310	83,307	355,599	217,646	101,648	411,840
2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2007	328,029	159,388	118,739	328,336	26,496	69,497	285	93,066	354,407	228,704	119,024	421,120
2008	329,099	161,234	139,877	329,513	26,565	73,315	346	96,984	355,517	234,254	140,223	426,073
2009	332,546	165,795	167,172	332,546	25,925	75,770	346	98,756	358,342	241,347	167,517	430,956
2010	329,248	165,030	185,217	329,608	26,289	75,444	1,049	98,946	355,407	240,257	186,266	428,207

<sup>1</sup> Totals may not equal sum of components due to independent rounding.

<sup>2</sup> Components are not additive because some generators are included in more than one category.

<sup>3</sup> Through 2000, data are for electric utility plants with fossil-fueled steam-electric capacity of 100 megawatts or greater. Beginning in 2001, data are for electric utility and unregulated generating plants (independent power producers, commercial plants, and industrial plants) in operating or standby status, with fossil-fueled steam-electric capacity of 10 megawatts or greater.

NA=Not available. – =No data reported.

Note: See "Cooling Tower," "Flue Gas Desulfurization," and "Particulate Collectors" in Glossary.

Web Page: For related information, see <http://www.eia.gov/electricity/>.

Sources: • 1985-1996—U.S. Energy Information Administration (EIA), Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1997-2005—EIA, *Electric Power Annual 2008* (January 2010), Table 3.10, and Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 2007 forward—EIA, *Electric Power Annual 2010* (November 2011), Table 3.10, and Form EIA-860, "Annual Electric Generator Report."

## Environment

**Note. Accounting for Carbon Dioxide Emissions From Biomass Energy Combustion.** Carbon dioxide (CO<sub>2</sub>) emissions from the combustion of biomass to produce energy are excluded from the total energy-related CO<sub>2</sub> emissions reported in the *Annual Energy Review* Section 11, but appear separately in Tables 11.1–11.2e. According to current international convention (see the Intergovernmental Panel on Climate Change’s “2006 IPCC Guidelines for National Greenhouse Gas Inventories”), carbon released through biomass combustion is excluded from reported energy-related emissions. The release of carbon from biomass combustion is assumed to be balanced by the uptake of carbon when the feedstock is grown, resulting in zero net emissions over some period of time. (This is not to say that biomass energy is carbon-neutral. Energy inputs are required in order to grow, fertilize, and harvest the feedstock and to produce and process the biomass into fuels.)

However, analysts have debated whether increased use of biomass energy may result in a decline in terrestrial carbon stocks, leading to a net positive release of carbon rather than the zero net release assumed by its exclusion from reported

energy-related emissions. For example, the clearing of forests for biofuel crops could result in an initial release of carbon that is not fully recaptured in subsequent use of the land for agriculture.

To reflect the potential net emissions, the international convention for greenhouse gas inventories is to report biomass emissions in the category “agriculture, forestry, and other land use,” usually based on estimates of net changes in carbon stocks over time.

This indirect accounting of CO<sub>2</sub> emissions from biomass can potentially lead to confusion in accounting for and understanding the flow of CO<sub>2</sub> emissions within energy and non-energy systems. In recognition of this issue, reporting of CO<sub>2</sub> emissions from biomass combustion alongside other energy-related CO<sub>2</sub> emissions offers an alternative accounting treatment. It is important, however, to avoid misinterpreting emissions from fossil energy and biomass energy sources as necessarily additive. Instead, the combined total of direct CO<sub>2</sub> emissions from biomass and energy-related CO<sub>2</sub> emissions implicitly assumes that none of the carbon emitted was previously or subsequently reabsorbed in terrestrial sinks or that other emissions sources offset any such sequestration.

# Appendix A

## British Thermal Unit Conversion Factors

### Using Thermal Conversion Factors

The thermal conversion factors presented in the following tables can be used to estimate the heat content in British thermal units (Btu) of a given amount of energy measured in physical units, such as barrels or cubic feet. For example, 10 barrels of asphalt has a heat content of approximately 66.36 million Btu (10 barrels x 6.636 million Btu per barrel = 66.36 million Btu).

The heat content rates (i.e., thermal conversion factors) provided in this section represent the gross (or higher or upper) energy content of the fuels. Gross heat content rates are applied in all Btu calculations for the *Annual Energy Review* and are commonly used in energy calculations in the United States; net (or lower) heat content rates are typically used in European energy calculations. The difference between the two rates is the amount of energy that is consumed to vaporize water that is created during the combustion process. Generally, the difference ranges from 2 percent to 10 percent, depending on the specific fuel and its hydrogen content. Some fuels, such as unseasoned wood, can be more than 40 percent different in their gross and net heat content rates. See “Heat Content” and “British thermal unit (Btu)” in the Glossary for more information.

Thermal conversion factors for hydrocarbon mixes (Table A1) are weighted averages of the thermal conversion factors for each hydrocarbon included in the mix. For example, in calculating the thermal conversion factor for a 60-40 butane-propane mixture, the thermal conversion factor for butane is weighted 1.5 times the thermal conversion factor for propane.

In general, the annual thermal conversion factors presented in Tables A2 through A6 are computed from final annual data, or are from the best available data and labeled “preliminary.” Often, the previous year’s factor is used as the preliminary value until data become available to calculate the factor appropriate to the year. The source of each factor is described in the section entitled “Thermal Conversion Factor Source Documentation,” which follows Table A6 in this appendix.

**Table A1. Approximate Heat Content of Petroleum Products**  
(Million Btu per Barrel)

Asphalt	6.636
Aviation Gasoline	5.048
Butane	4.326
Butane-Propane Mixture (60 percent-40 percent)	4.130
Distillate Fuel Oil <sup>1</sup>	5.825
Ethane	3.082
Ethane-Propane Mixture (70 percent-30 percent)	3.308
Isobutane	3.974
Jet Fuel, Kerosene-Type	5.670
Jet Fuel, Naphtha-Type	5.355
Kerosene	5.670
Lubricants	6.065
Motor Gasoline <sup>2</sup>	
Conventional	5.253
Oxygenated	5.150
Reformulated	5.150
Natural Gasoline	4.620
Pentanes Plus	4.620
Petrochemical Feedstocks	
Naphtha less than 401° F	5.248
Other Oils equal to or greater than 401° F	5.825
Still Gas	6.000
Petroleum Coke	6.024
Plant Condensate	5.418
Propane	3.836
Residual Fuel Oil	6.287
Road Oil	6.636
Special Naphthas	5.248
Still Gas	6.000
Unfinished Oils	5.825
Unfractionated Stream	5.418
Waxes	5.537
Miscellaneous	5.796

<sup>1</sup> Does not include biodiesel. See Table A3 for biodiesel heat contents.

<sup>2</sup> See Table A3 for motor gasoline weighted heat contents beginning in 1994, and for fuel ethanol heat contents.

Web Page: For related information, see <http://www.eia.gov/totalenergy/data/annual/#appendices>.

Note: The values in this table are for gross heat contents. See “Heat Content” in Glossary.

Sources: See “Thermal Conversion Factor Source Documentation,” which follows Table A6.

**Table A2. Approximate Heat Content of Petroleum Production, Imports, and Exports, Selected Years, 1949-2011**  
(Million Btu per Barrel)

Year	Production		Imports			Exports		
	Crude Oil <sup>1</sup>	Natural Gas Plant Liquids	Crude Oil <sup>1</sup>	Petroleum Products	Total	Crude Oil <sup>1</sup>	Petroleum Products	Total
1949	5.800	4.544	5.952	6.261	6.059	5.800	5.651	5.692
1950	5.800	4.522	5.943	6.263	6.080	5.800	5.751	5.766
1955	5.800	4.406	5.924	6.234	6.040	5.800	5.765	5.768
1960	5.800	4.295	5.911	6.161	6.021	5.800	5.835	5.834
1965	5.800	4.264	5.872	6.123	5.997	5.800	5.742	5.743
1970	5.800	4.146	5.822	6.088	5.985	5.800	5.811	5.810
1975	5.800	3.984	5.821	5.935	5.858	5.800	5.747	5.748
1976	5.800	3.964	5.808	5.980	5.856	5.800	5.743	5.745
1977	5.800	3.941	5.810	5.908	5.834	5.800	5.796	5.797
1978	5.800	3.925	5.802	5.955	5.839	5.800	5.814	5.808
1979	5.800	3.955	5.810	5.811	5.810	5.800	5.864	5.832
1980	5.800	3.914	5.812	5.748	5.796	5.800	5.841	5.820
1981	5.800	3.930	5.818	5.659	5.775	5.800	5.837	5.821
1982	5.800	3.872	5.826	5.664	5.775	5.800	5.829	5.820
1983	5.800	3.839	5.825	5.677	5.774	5.800	5.800	5.800
1984	5.800	3.812	5.823	5.613	5.745	5.800	5.867	5.850
1985	5.800	3.815	5.832	5.572	5.736	5.800	5.819	5.814
1986	5.800	3.797	5.903	5.624	5.808	5.800	5.839	5.832
1987	5.800	3.804	5.901	5.599	5.820	5.800	5.860	5.858
1988	5.800	3.800	5.900	5.618	5.820	5.800	5.842	5.840
1989	5.800	3.826	5.906	5.641	5.833	5.800	5.869	5.857
1990	5.800	3.822	5.934	5.614	5.849	5.800	5.838	5.833
1991	5.800	3.807	5.948	5.636	5.873	5.800	5.827	5.823
1992	5.800	3.804	5.953	5.623	5.877	5.800	5.774	5.777
1993	5.800	3.801	5.954	5.620	5.883	5.800	5.777	5.779
1994	5.800	3.794	5.950	5.534	5.861	5.800	5.777	5.779
1995	5.800	3.796	5.938	5.483	5.855	5.800	5.740	5.746
1996	5.800	3.777	5.947	5.468	5.847	5.800	5.728	5.736
1997	5.800	3.762	5.954	5.469	5.862	5.800	5.726	5.734
1998	5.800	3.769	5.953	5.462	5.861	5.800	5.710	5.720
1999	5.800	3.744	5.942	5.421	5.840	5.800	5.684	5.699
2000	5.800	3.733	5.959	5.432	5.849	5.800	5.651	5.658
2001	5.800	3.735	5.976	5.443	5.862	5.800	5.751	5.752
2002	5.800	3.729	5.971	5.451	5.863	5.800	5.687	5.688
2003	5.800	3.739	5.970	5.438	5.857	5.800	5.739	5.740
2004	5.800	3.724	5.981	5.475	5.863	5.800	5.753	5.754
2005	5.800	3.724	5.977	5.474	5.845	5.800	5.741	5.743
2006	5.800	3.712	5.980	5.454	5.842	5.800	5.723	5.724
2007	5.800	3.701	5.985	5.503	5.862	5.800	5.749	5.750
2008	5.800	3.706	5.990	5.479	5.866	5.800	5.762	5.762
2009	5.800	3.692	5.988	5.525	5.882	5.800	5.737	5.738
2010	5.800	<sup>R</sup> 3.674	5.989	<sup>R</sup> 5.557	<sup>R</sup> 5.894	5.800	<sup>R</sup> 5.670	<sup>R</sup> 5.672
2011 <sup>P</sup>	5.800	3.675	6.007	5.555	5.910	5.800	5.619	5.622

<sup>1</sup> Includes lease condensate.

R=Revised. P=Preliminary.

Note: The values in this table are for gross heat contents. See "Heat Content" in Glossary.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#appendices> for updated annual

conversion factors. • See <http://www.eia.gov/totalenergy/data/annual/#appendices> for all annual data beginning in 1949.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

**Table A3. Approximate Heat Content of Petroleum Consumption and Biofuels Production, Selected Years, 1949-2011**  
(Million Btu per Barrel)

Year	Total Petroleum <sup>1</sup> Consumption by Sector						Liquefied Petroleum Gases Consumption <sup>6</sup>	Motor Gasoline Consumption <sup>7</sup>	Fuel Ethanol <sup>8</sup>	Fuel Ethanol Feedstock Factor <sup>9</sup>	Biodiesel	Biodiesel Feedstock Factor <sup>10</sup>
	Residential	Commercial <sup>2</sup>	Industrial <sup>2</sup>	Transportation <sup>2,3</sup>	Electric Power <sup>4,5</sup>	Total <sup>2</sup>						
1949	5.484	5.813	5.957	5.465	6.254	5.649	4.011	5.253	NA	NA	NA	NA
1950	5.473	5.817	5.953	5.461	6.254	5.649	4.011	5.253	NA	NA	NA	NA
1955	5.469	5.781	5.881	5.407	6.254	5.591	4.011	5.253	NA	NA	NA	NA
1960	5.417	5.781	5.818	5.387	6.267	5.555	4.011	5.253	NA	NA	NA	NA
1965	5.364	5.760	5.748	5.386	6.267	5.532	4.011	5.253	NA	NA	NA	NA
1970	5.260	5.708	5.595	5.393	6.252	5.503	63,779	5.253	NA	NA	NA	NA
1975	5.253	5.649	5.513	5.392	6.250	5.494	3.715	5.253	NA	NA	NA	NA
1976	5.277	5.672	5.523	5.396	6.251	5.504	3.711	5.253	NA	NA	NA	NA
1977	5.285	5.682	5.539	5.401	6.249	5.518	3.677	5.253	NA	NA	NA	NA
1978	5.287	5.665	5.536	5.405	6.251	5.519	3.669	5.253	NA	NA	NA	NA
1979	5.365	5.717	5.409	5.429	6.258	5.494	3.680	5.253	NA	NA	NA	NA
1980	5.321	5.751	5.366	5.441	6.254	5.479	3.674	5.253	3.563	6.586	NA	NA
1981	5.283	5.693	5.299	5.433	6.258	5.448	3.643	5.253	3.563	6.562	NA	NA
1982	5.266	5.698	5.247	5.423	6.258	5.415	3.615	5.253	3.563	6.539	NA	NA
1983	5.140	5.591	5.254	5.416	6.255	5.406	3.614	5.253	3.563	6.515	NA	NA
1984	5.307	5.657	5.207	5.418	6.251	5.395	3.599	5.253	3.563	6.492	NA	NA
1985	5.263	5.598	5.199	5.423	6.247	5.387	3.603	5.253	3.563	6.469	NA	NA
1986	5.268	5.632	5.269	5.426	6.257	5.418	3.640	5.253	3.563	6.446	NA	NA
1987	5.239	5.594	5.233	5.429	6.249	5.403	3.659	5.253	3.563	6.423	NA	NA
1988	5.257	5.597	5.228	5.433	6.250	5.410	3.652	5.253	3.563	6.400	NA	NA
1989	5.194	5.549	5.219	5.438	6,240	5.410	3.683	5.253	3.563	6.377	NA	NA
1990	5.145	5.553	5.253	5.442	6.244	5.411	3.625	5.253	3.563	6.355	NA	NA
1991	5.094	5.528	5.167	5.441	6.246	5.384	3.614	5.253	3.563	6.332	NA	NA
1992	5.124	5.513	5.168	5.443	6.238	5.378	3.624	5.253	3.563	6.309	NA	NA
1993	5.102	<sup>2</sup> 5.505	<sup>2</sup> 5.178	<sup>2</sup> 5.436	6.230	<sup>2</sup> 5.379	3.606	5.253	3.563	6.287	NA	NA
1994	5.098	5.515	5.150	5.424	6.213	5.361	3.635	<sup>7</sup> 5.230	3.563	6.264	NA	NA
1995	5.063	5.478	5.121	5.417	6.188	5.341	3.623	5.215	3.563	6.242	NA	NA
1996	4.998	5.433	5.114	5.420	6.195	5.336	3.613	5.216	3.563	6.220	NA	NA
1997	4.989	5.391	5.120	5.416	6.199	5.336	3.616	5.213	3.563	6.198	NA	NA
1998	4.975	5.365	5.137	5.413	6.210	5.349	3.614	5.212	3.563	6.176	NA	NA
1999	4.902	5.291	5.092	5.413	6.205	5.328	3.616	5.211	3.563	6.167	NA	NA
2000	4.908	5.316	5.057	5.422	6.189	5.326	3.607	5.210	3.563	6.159	NA	NA
2001	4.937	5.325	5.142	5.412	6.199	5.345	3.614	5.210	3.563	6.151	5.359	5.433
2002	4.886	5.293	5.093	5.411	6.173	5.324	3.613	5.208	3.563	6.143	5.359	5.433
2003	4.907	5.307	5.142	5.409	6.182	5.340	3.629	5.207	3.563	6.116	5.359	5.433
2004	4.953	5.328	5.144	5.421	6.192	5.350	3.618	5.215	3.563	6.089	5.359	5.433
2005	4.916	5.364	5.178	5.427	6.188	5.365	3.620	5.218	3.563	6.063	5.359	5.433
2006	4.894	5.310	5.160	5.431	6.143	5.353	3.605	5.218	3.563	6.036	5.359	5.433
2007	4.850	5.298	5.127	5.434	6.151	5.346	3.591	5.219	3.563	6.009	5.359	5.433
2008	4.732	5.175	5.149	5.426	6.123	5.339	3.600	5.218	3.563	5.983	5.359	5.433
2009	4.691	5.266	5.018	<sup>3</sup> 5.414	6.105	<sup>3</sup> 5.301	3.558	5.218	3.563	5.957	5.359	5.433
2010	<sup>R</sup> 4.692	<sup>R</sup> 5.263	<sup>R</sup> 4.988	<sup>R</sup> 5.421	<sup>R</sup> 6.084	<sup>R</sup> 5.297	<sup>R</sup> 3.557	5.218	3.561	<sup>R</sup> 5.931	5.359	5.433
2011	<sup>E</sup> 4.692	<sup>E</sup> 5.261	<sup>E</sup> 4.964	<sup>E</sup> 5.425	<sup>P</sup> 6.062	<sup>P</sup> 5.291	<sup>P</sup> 3.529	<sup>P</sup> 5.218	<sup>P</sup> 3.560	5.905	5.359	5.433

<sup>1</sup> Petroleum products supplied, including natural gas plant liquids and crude oil burned directly as fuel. Quantity-weighted averages of the petroleum products included in each category are calculated by using heat content values shown in Table A1.

<sup>2</sup> Beginning in 1993, includes fuel ethanol blended into motor gasoline.

<sup>3</sup> Beginning in 2009, includes renewable diesel fuel (including biodiesel) blended into distillate fuel oil.

<sup>4</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

<sup>5</sup> Electric power sector factors are weighted average heat contents for distillate fuel oil, petroleum coke, and residual fuel oil; they exclude other liquids.

<sup>6</sup> There is a discontinuity in this time series between 1966 and 1967; beginning in 1967, the single constant factor is replaced by a quantity-weighted factor—quantity-weighted averages of the major components of liquefied petroleum gases are calculated by using heat content values shown in Table A1.

<sup>7</sup> There is a discontinuity in this time series between 1993 and 1994; beginning in 1994, the single constant factor is replaced by a quantity-weighted factor—quantity-weighted averages of the major components of motor gasoline, including fuel ethanol, are calculated by using heat content values shown in Table A1.

<sup>8</sup> Includes denaturant (petroleum added to ethanol to make it undrinkable). Fuel ethanol factors are weighted average heat contents for undenatured ethanol (3.539 million Btu per barrel), pentanes plus used as denaturant (4.620 million Btu per barrel), and conventional motor gasoline and motor gasoline blending components used as denaturant (5.253 million Btu per barrel). The factor for 2009 is used as the estimated

factor for 1980–2008.

<sup>9</sup> Corn input to the production of undenatured ethanol (million Btu corn per barrel undenatured ethanol), used as the factor to estimate total biomass inputs to the production of undenatured ethanol. Observed ethanol yields (gallons undenatured ethanol per bushel of corn) are 2.5 in 1980, 2.666 in 1998, 2.68 in 2002, and 2.764 in 2009; yields in other years are estimated. Corn is assumed to have a gross heat content of 0.392 million Btu per bushel. Undenatured ethanol is assumed to have a gross heat content of 3.539 million Btu per barrel.

<sup>10</sup> Soybean oil input to the production of biodiesel (million Btu soybean oil per barrel biodiesel), used as the factor to estimate total biomass inputs to the production of biodiesel. It is assumed that 7.65 pounds of soybean oil are needed to produce one gallon of biodiesel, and 5.433 million Btu of soybean oil are needed to produce one barrel of biodiesel. Soybean oil is assumed to have a gross heat content of 16,909 Btu per pound, or 5.483 million Btu per barrel. Biodiesel is assumed to have a gross heat content of 17,253 Btu per pound, or 5.359 million Btu per barrel.

R=Revised. P=Preliminary. E=Estimate. NA=Not available.

Notes: • Residential, commercial, industrial, and transportation petroleum heat contents are revised beginning in 1949 due to a change in the estimation methodology. • The heat content values in this table are for gross heat contents. See "Heat Content" in Glossary.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#appendices> for updated annual conversion factors. • See <http://www.eia.gov/totalenergy/data/annual/#appendices> for all annual data beginning in 1949.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

**Table A4. Approximate Heat Content of Natural Gas, Selected Years, 1949-2011**  
(Btu per Cubic Foot)

Year	Production		Consumption <sup>1</sup>			Imports	Exports
	Marketed	Dry	End-Use Sectors <sup>2</sup>	Electric Power Sector <sup>3</sup>	Total		
1949	1,120	1,035	1,035	1,035	1,035	--	1,035
1950	1,119	1,035	1,035	1,035	1,035	--	1,035
1955	1,120	1,035	1,035	1,035	1,035	1,035	1,035
1960	1,107	1,035	1,035	1,035	1,035	1,035	1,035
1965	1,101	1,032	1,032	1,032	1,032	1,032	1,032
1970	1,102	1,031	1,031	1,031	1,031	1,031	1,031
1975	1,095	1,021	1,020	1,026	1,021	1,026	1,014
1976	1,093	1,020	1,019	1,023	1,020	1,025	1,013
1977	1,093	1,021	1,019	1,029	1,021	1,026	1,013
1978	1,088	1,019	1,016	1,034	1,019	1,030	1,013
1979	1,092	1,021	1,018	1,035	1,021	1,037	1,013
1980	1,098	1,026	1,024	1,035	1,026	1,022	1,013
1981	1,103	1,027	1,025	1,035	1,027	1,014	1,011
1982	1,107	1,028	1,026	1,036	1,028	1,018	1,011
1983	1,115	1,031	1,031	1,030	1,031	1,024	1,010
1984	1,109	1,031	1,030	1,035	1,031	1,005	1,010
1985	1,112	1,032	1,031	1,038	1,032	1,002	1,011
1986	1,110	1,030	1,029	1,034	1,030	997	1,008
1987	1,112	1,031	1,031	1,032	1,031	999	1,011
1988	1,109	1,029	1,029	1,028	1,029	1,002	1,018
1989	1,107	1,031	1,031	<sup>3</sup> 1,028	1,031	1,004	1,019
1990	1,105	1,029	1,030	1,027	1,029	1,012	1,018
1991	1,108	1,030	1,031	1,025	1,030	1,014	1,022
1992	1,110	1,030	1,031	1,025	1,030	1,011	1,018
1993	1,106	1,027	1,028	1,025	1,027	1,020	1,016
1994	1,105	1,028	1,029	1,025	1,028	1,022	1,011
1995	1,106	1,026	1,027	1,021	1,026	1,021	1,011
1996	1,109	1,026	1,027	1,020	1,026	1,022	1,011
1997	1,107	1,026	1,027	1,020	1,026	1,023	1,011
1998	1,109	1,031	1,033	1,024	1,031	1,023	1,011
1999	1,107	1,027	1,028	1,022	1,027	1,022	1,006
2000	1,107	1,025	1,026	1,021	1,025	1,023	1,006
2001	1,105	1,028	1,029	1,026	1,028	1,023	1,010
2002	<sup>R</sup> 1,103	<sup>R</sup> 1,024	<sup>R</sup> 1,025	1,020	<sup>R</sup> 1,024	1,022	1,008
2003	<sup>R</sup> 1,103	1,028	1,029	1,025	1,028	1,025	1,009
2004	1,104	1,026	1,026	1,027	1,026	1,025	1,009
2005	1,104	1,028	1,028	1,028	1,028	1,025	1,009
2006	1,103	1,028	1,028	1,028	1,028	1,025	1,009
2007	<sup>R</sup> 1,102	<sup>R</sup> 1,027	<sup>R</sup> 1,027	1,027	<sup>R</sup> 1,027	1,025	1,009
2008	1,100	1,027	1,027	1,027	1,027	1,025	1,009
2009	1,101	1,025	1,025	1,025	1,025	1,025	1,009
2010	<sup>R</sup> 1,097	<sup>R</sup> 1,023	<sup>R</sup> 1,023	1,022	<sup>R</sup> 1,023	1,025	1,009
2011	<sup>E</sup> 1,097	<sup>E</sup> 1,022	<sup>E</sup> 1,023	<sup>P</sup> 1,021	<sup>E</sup> 1,022	<sup>E</sup> 1,025	<sup>E</sup> 1,009

<sup>1</sup> Consumption factors are for natural gas, plus a small amount of supplemental gaseous fuels.

<sup>2</sup> Residential, commercial, industrial, and transportation sectors.

<sup>3</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

R=Revised. P=Preliminary. E=Estimate. -- =Not applicable.

Note: The values in this table are for gross heat contents. See "Heat Content" in Glossary.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#appendices> for updated annual conversion factors. • See <http://www.eia.gov/totalenergy/data/annual/#appendices> for all annual data beginning in 1949.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A6.



**Table A5. Approximate Heat Content of Coal and Coal Coke, Selected Years, 1949-2011**  
(Million Btu per Short Ton)

Year	Coal								Coal Coke	
	Production <sup>1</sup>	Waste Coal Supplied <sup>2</sup>	Consumption				Imports	Exports	Imports and Exports	
			Residential and Commercial Sectors	Industrial Sector		Electric Power Sector <sup>4,5</sup>				Total
			Coke Plants	Other <sup>3</sup>						
1949	24.916	NA	24.263	26.797	24.612	23.761	24.793	25.000	26.759	24.800
1950	25.090	NA	24.461	26.798	24.820	23.937	24.989	25.020	26.788	24.800
1955	25.201	NA	24.373	26.794	24.821	24.056	24.982	25.000	26.907	24.800
1960	24.906	NA	24.226	26.791	24.609	23.927	24.713	25.003	26.939	24.800
1965	24.775	NA	24.028	26.787	24.385	23.780	24.537	25.000	26.973	24.800
1970	23.842	NA	23.203	26.784	22.983	22.573	23.440	25.000	26.982	24.800
1975	22.897	NA	22.261	26.782	22.436	21.642	22.506	25.000	26.562	24.800
1976	22.855	NA	22.774	26.781	22.530	21.679	22.498	25.000	26.601	24.800
1977	22.597	NA	22.919	26.787	22.322	21.508	22.265	25.000	26.548	24.800
1978	22.248	NA	22.466	26.789	22.207	21.275	22.017	25.000	26.478	24.800
1979	22.454	NA	22.242	26.788	22.452	21.364	22.100	25.000	26.548	24.800
1980	22.415	NA	22.543	26.790	22.690	21.295	21.947	25.000	26.384	24.800
1981	22.308	NA	22.474	26.794	22.585	21.085	21.713	25.000	26.160	24.800
1982	22.239	NA	22.695	26.797	22.712	21.194	21.674	25.000	26.223	24.800
1983	22.052	NA	22.775	26.798	22.691	21.133	21.576	25.000	26.291	24.800
1984	22.010	NA	22.844	26.799	22.543	21.101	21.573	25.000	26.402	24.800
1985	21.870	NA	22.646	26.798	22.020	20.959	21.366	25.000	26.307	24.800
1986	21.913	NA	22.947	26.798	22.198	21.084	21.462	25.000	26.292	24.800
1987	21.922	NA	23.404	26.799	22.381	21.136	21.517	25.000	26.291	24.800
1988	21.823	NA	23.571	26.799	22.360	20.900	21.328	25.000	26.299	24.800
1989	21.765	<sup>2</sup> 10.391	23.650	26.800	22.347	<sup>4</sup> 20.898	21.307	25.000	26.160	24.800
1990	21.822	9.303	23.137	26.799	22.457	20.779	21.197	25.000	26.202	24.800
1991	21.681	10.758	23.114	26.799	22.460	20.730	21.120	25.000	26.188	24.800
1992	21.682	10.396	23.105	26.799	22.250	20.709	21.068	25.000	26.161	24.800
1993	21.418	10.638	22.994	26.800	22.123	20.677	21.010	25.000	26.335	24.800
1994	21.394	11.097	23.112	26.800	22.068	20.589	20.929	25.000	26.329	24.800
1995	21.326	11.722	23.118	26.800	21.950	20.543	20.880	25.000	26.180	24.800
1996	21.322	12.147	23.011	26.800	22.105	20.547	20.870	25.000	26.174	24.800
1997	21.296	12.158	22.494	26.800	22.172	20.518	20.830	25.000	26.251	24.800
1998	21.418	12.639	21.620	27.426	23.164	20.516	20.881	25.000	26.800	24.800
1999	21.070	12.552	23.880	27.426	22.489	20.490	20.818	25.000	26.081	24.800
2000	21.072	12.360	25.020	27.426	22.433	20.511	20.828	25.000	26.117	24.800
2001	<sup>1</sup> 20.772	12.169	24.909	27.426	22.622	20.337	20.671	25.000	25.998	24.800
2002	20.673	12.165	22.962	27.426	22.562	20.238	20.541	25.000	26.062	24.800
2003	20.499	12.360	22.242	27.425	22.468	20.082	20.387	25.000	25.972	24.800
2004	20.424	12.266	22.324	27.426	22.473	19.980	20.290	25.000	26.108	24.800
2005	20.348	12.093	22.342	26.279	22.178	19.988	20.246	25.000	25.494	24.800
2006	20.310	12.080	22.066	26.271	22.050	19.931	20.181	25.000	25.453	24.800
2007	20.340	12.090	22.069	26.329	22.371	19.909	20.168	25.000	25.466	24.800
2008	20.208	12.121	21.887	26.281	22.348	19.713	19.977	25.000	25.399	24.800
2009	<sup>R</sup> 19.963	<sup>R</sup> 12.076	22.059	26.334	21.893	19.521	19.742	25.000	25.633	24.800
2010	<sup>R</sup> 20.173	<sup>R</sup> 11.960	<sup>R</sup> 21.826	26.296	<sup>R</sup> 21.005	<sup>R</sup> 19.623	<sup>R</sup> 19.832	25.000	25.713	24.800
2011 <sup>P</sup>	20.136	11.604	20.724	26.300	20.588	19.370	19.583	25.000	25.645	24.800

<sup>1</sup> Beginning in 2001, includes a small amount of refuse recovery (coal recaptured from a refuse mine, and cleaned to reduce the concentration of noncombustible materials).

<sup>2</sup> Waste coal (including fine coal, coal obtained from a refuse bank or slurry dam, anthracite culm, bituminous gob, and lignite waste) consumed by the electric power and industrial sectors. Beginning in 1989, waste coal supplied is counted as a supply-side item to balance the same amount of waste coal included in "Consumption."

<sup>3</sup> Includes transportation. Excludes coal synfuel plants.

<sup>4</sup> Electricity-only and combined-heat-and-power (CHP) plants within the NAICS 22 category whose primary business is to sell electricity, or electricity and heat, to the public. Through 1988, data are for

electric utilities only; beginning in 1989, data are for electric utilities and independent power producers.

<sup>5</sup> Electric power sector factors are for anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and, beginning in 1998, coal synfuel.

R=Revised. P=Preliminary. NA=Not available.

Note: The values in this table are for gross heat contents. See "Heat Content" in Glossary.

Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#appendices> for updated annual conversion factors. • See <http://www.eia.gov/totalenergy/data/annual/#appendices> for all annual data beginning in 1949.

Sources: See "Thermal Conversion Factor Source Documentation," which follows Table A6.

**Table A6. Approximate Heat Rates for Electricity, and Heat Content of Electricity, Selected Years, 1949-2011**  
(Btu per Kilowatthour)

Year	Approximate Heat Rates <sup>1</sup> for Electricity Net Generation					Nuclear <sup>8</sup>	Noncombustible Renewable Energy <sup>7,9</sup>	Heat Content <sup>10</sup> of Electricity <sup>11</sup>
	Fossil Fuels <sup>2</sup>				Total Fossil Fuels <sup>6,7</sup>			
	Coal <sup>3</sup>	Petroleum <sup>4</sup>	Natural Gas <sup>5</sup>	Total Fossil Fuels <sup>6,7</sup>				
1949	NA	NA	NA	15,033	--	15,033	3,412	
1950	NA	NA	NA	14,030	--	14,030	3,412	
1955	NA	NA	NA	11,699	--	11,699	3,412	
1960	NA	NA	NA	10,760	11,629	10,760	3,412	
1965	NA	NA	NA	10,453	11,804	10,453	3,412	
1970	NA	NA	NA	10,494	10,977	10,494	3,412	
1975	NA	NA	NA	10,406	11,013	10,406	3,412	
1976	NA	NA	NA	10,373	11,047	10,373	3,412	
1977	NA	NA	NA	10,435	10,769	10,435	3,412	
1978	NA	NA	NA	10,361	10,941	10,361	3,412	
1979	NA	NA	NA	10,353	10,879	10,353	3,412	
1980	NA	NA	NA	10,388	10,908	10,388	3,412	
1981	NA	NA	NA	10,453	11,030	10,453	3,412	
1982	NA	NA	NA	10,454	11,073	10,454	3,412	
1983	NA	NA	NA	10,520	10,905	10,520	3,412	
1984	NA	NA	NA	10,440	10,843	10,440	3,412	
1985	NA	NA	NA	10,447	10,622	10,447	3,412	
1986	NA	NA	NA	10,446	10,579	10,446	3,412	
1987	NA	NA	NA	10,419	10,442	10,419	3,412	
1988	NA	NA	NA	10,324	10,602	10,324	3,412	
1989	NA	NA	NA	10,432	10,583	10,432	3,412	
1990	NA	NA	NA	10,402	10,582	10,402	3,412	
1991	NA	NA	NA	10,436	10,484	10,436	3,412	
1992	NA	NA	NA	10,342	10,471	10,342	3,412	
1993	NA	NA	NA	10,309	10,504	10,309	3,412	
1994	NA	NA	NA	10,316	10,452	10,316	3,412	
1995	NA	NA	NA	10,312	10,507	10,312	3,412	
1996	NA	NA	NA	10,340	10,503	10,340	3,412	
1997	NA	NA	NA	10,213	10,494	10,213	3,412	
1998	NA	NA	NA	10,197	10,491	10,197	3,412	
1999	NA	NA	NA	10,226	10,450	10,226	3,412	
2000	NA	NA	NA	10,201	10,429	10,201	3,412	
2001	10,378	10,742	10,051	10,333	10,443	10,333	3,412	
2002	10,314	10,641	9,533	10,173	10,442	10,173	3,412	
2003	10,297	10,610	9,207	10,241	10,421	10,241	3,412	
2004	10,331	10,571	8,647	10,022	10,427	10,022	3,412	
2005	10,373	10,631	8,551	9,999	10,436	9,999	3,412	
2006	10,351	10,809	8,471	9,919	10,436	9,919	3,412	
2007	10,375	10,794	8,403	9,884	10,485	9,884	3,412	
2008	10,378	11,015	8,305	9,854	10,453	9,854	3,412	
2009	10,414	10,923	8,160	9,760	10,460	9,760	3,412	
2010	10,415	10,984	8,185	<sup>R</sup> 9,756	<sup>R</sup> 10,452	<sup>R</sup> 9,756	3,412	
2011	<sup>E</sup> 10,415	<sup>E</sup> 10,984	<sup>E</sup> 8,185	<sup>E</sup> 9,756	<sup>E</sup> 10,452	<sup>E</sup> 9,756	3,412	

<sup>1</sup> The values in columns 1-6 of this table are for net heat rates. See "Heat Rate" in Glossary.  
<sup>2</sup> Through 2000, heat rates are for fossil-fueled steam-electric plants at electric utilities. Beginning in 2001, heat rates are for all fossil-fueled plants at electric utilities and electricity-only independent power producers.  
<sup>3</sup> Includes anthracite, bituminous coal, subbituminous coal, lignite, and, beginning in 2002, waste coal and coal synfuel.  
<sup>4</sup> Includes distillate fuel oil, residual fuel oil, jet fuel, kerosene, petroleum coke, and waste oil.  
<sup>5</sup> Includes natural gas and supplemental gaseous fuels.  
<sup>6</sup> Includes coal, petroleum, natural gas, and, beginning in 2001, other gases (blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels).  
<sup>7</sup> The fossil-fuels heat rate is used as the thermal conversion factor for electricity net generation from noncombustible renewable energy (hydro, geothermal, solar thermal, photovoltaic, and wind) to approximate the quantity of fossil fuels replaced by these sources. Through 2000, also used as the thermal

conversion factor for wood and waste electricity net generation at electric utilities; beginning in 2001, Btu data for wood and waste at electric utilities are available from surveys.  
<sup>8</sup> Used as the thermal conversion factor for nuclear electricity net generation.  
<sup>9</sup> Technology-based geothermal heat rates are no longer used in Btu calculations in this report. For technology-based geothermal heat rates for 1960-2010, see the *Annual Energy Review 2010*, Table A6.  
<sup>10</sup> See "Heat Content" in Glossary.  
<sup>11</sup> The value of 3,412 Btu per kilowatthour is a constant. It is used as the thermal conversion factor for electricity retail sales, and electricity imports and exports.  
R=Revised. E=Estimate. NA=Not available. -- =Not applicable.  
Web Pages: • See <http://www.eia.gov/totalenergy/data/monthly/#appendices> for updated annual conversion factors. • See <http://www.eia.gov/totalenergy/data/annual/#appendices> for all annual data beginning in 1949.  
Sources: See "Thermal Conversion Factor Source Documentation," which follows this table.

# Thermal Conversion Factor Source Documentation

## Approximate Heat Content of Petroleum and Natural Gas Plant Liquids

**Asphalt.** The U.S. Energy Information Administration (EIA) adopted the thermal conversion factor of 6.636 million British thermal units (Btu) per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Aviation Gasoline.** EIA adopted the thermal conversion factor of 5.048 million Btu per barrel as adopted by the Bureau of Mines from the Texas Eastern Transmission Corporation publication *Competition and Growth in American Energy Markets 1947–1985*, a 1968 release of historical and projected statistics.

**Butane.** EIA adopted the Bureau of Mines thermal conversion factor of 4.326 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Butane-Propane Mixture.** EIA adopted the Bureau of Mines calculation of 4.130 million Btu per barrel based on an assumed mixture of 60 percent butane and 40 percent propane. See **Butane** and **Propane**.

**Crude Oil Exports.** Assumed by EIA to be 5.800 million Btu per barrel or equal to the thermal conversion factor for crude oil produced in the United States. See **Crude Oil Production**.

**Crude Oil Imports.** Calculated annually by EIA as the average of the thermal conversion factors for each type of crude oil imported weighted by the quantities imported. Thermal conversion factors for each type were calculated on a foreign country basis, by determining the average American Petroleum Institute (API) gravity of crude oil imported from each foreign country from Form ERA-60 in 1977 and converting average API gravity to average Btu content by using National Bureau of Standards, Miscellaneous Publication No. 97, *Thermal Properties of Petroleum Products*, 1933.

**Crude Oil Production.** EIA adopted the thermal conversion factor of 5.800 million Btu per barrel as reported in a Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950.”

**Distillate Fuel Oil.** EIA adopted the Bureau of Mines thermal conversion factor of 5.825 million Btu per barrel as reported in a Bureau of Mines internal

memorandum, “Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950.”

**Ethane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.082 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Ethane-Propane Mixture.** EIA calculation of 3.308 million Btu per barrel based on an assumed mixture of 70 percent ethane and 30 percent propane. See **Ethane** and **Propane**.

**Isobutane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.974 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Jet Fuel, Kerosene-Type.** EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel for “Jet Fuel, Commercial” as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947–1985*, a 1968 release of historical and projected statistics.

**Jet Fuel, Naphtha-Type.** EIA adopted the Bureau of Mines thermal conversion factor of 5.355 million Btu per barrel for “Jet Fuel, Military” as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947–1985*, a 1968 release of historical and projected statistics.

**Kerosene.** EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel as reported in a Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950.”

**Liquefied Petroleum Gases Consumption.** • 1949–1966: U.S. Department of the Interior, Bureau of Mines, Mineral Industry Surveys, “Crude Petroleum and Petroleum Products, 1956,” Table 4 footnote, constant value of 4.011 million Btu per barrel. • 1967 forward: Calculated annually by EIA as the average of the thermal conversion factors for all liquefied petroleum gases consumed (see Table A1) weighted by the quantities consumed. The component products of liquefied petroleum gases are ethane (including ethylene), propane (including propylene), normal butane (including butylene), butane-propane mixtures, ethane-propane mixtures, and isobutane. For 1967–1980, quantities consumed are from EIA, Energy Data Reports, “Petroleum Statement, Annual,” Table 1. For 1981 forward, quantities consumed are from EIA, *Petroleum Supply Annual*, Table 2.

**Lubricants.** EIA adopted the thermal conversion factor of 6.065 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Miscellaneous Products.** EIA adopted the thermal conversion factor of 5.796 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Motor Gasoline Consumption.** • 1949–1993: EIA adopted the Bureau of Mines thermal conversion factor of 5.253 million Btu per barrel for “Gasoline, Motor Fuel” as published by the Texas Eastern Transmission Corporation in Appendix V of *Competition and Growth in American Energy Markets 1947–1985*, a 1968 release of historical and projected statistics. • 1994 forward: EIA calculated national annual quantity-weighted average conversion factors for conventional, reformulated, and oxygenated motor gasolines (see Table A3). The factor for conventional motor gasoline is 5.253 million Btu per barrel, as used for previous years. The factors for reformulated and oxygenated gasolines, both currently 5.150 million Btu per barrel, are based on data published in Environmental Protection Agency, Office of Mobile Sources, National Vehicle and Fuel Emissions Laboratory report EPA 420-F-95-003, “Fuel Economy Impact Analysis of Reformulated Gasoline.” See **Fuel Ethanol (Denatured)**.

**Natural Gas Plant Liquids Production.** Calculated annually by EIA as the average of the thermal conversion factors for each natural gas plant liquid produced weighted by the quantities produced.

**Natural Gasoline.** EIA adopted the thermal conversion factor of 4.620 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

**Pentanes Plus.** EIA assumed the thermal conversion factor to be 4.620 million Btu or equal to that for natural gasoline. See **Natural Gasoline**.

**Petrochemical Feedstocks, Naphtha less than 401° F.** Assumed by EIA to be 5.248 million Btu per barrel or equal to the thermal conversion factor for special naphthas. See **Special Naphthas**.

**Petrochemical Feedstocks, Other Oils equal to or greater than 401° F.** Assumed by EIA to be 5.825 million Btu per barrel or equal to the thermal conversion factor for distillate fuel oil. See **Distillate Fuel Oil**.

**Petrochemical Feedstocks, Still Gas.** Assumed by EIA to be 6.000 million Btu per barrel or equal to the thermal conversion factor for still gas. See **Still Gas**.

**Petroleum Coke.** EIA adopted the thermal conversion factor of 6.024 million Btu per barrel as reported in Btu per short ton in the Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950.” The Bureau of Mines calculated this factor by dividing 30.120 million Btu per short ton, as given in the referenced Bureau of Mines internal memorandum, by 5.0 barrels per short ton, as given in the Bureau of Mines Form 6-1300-M and successor EIA forms.

**Petroleum Consumption, Commercial Sector.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed by the commercial sector weighted by the estimated quantities consumed by the commercial sector. The quantities of petroleum products consumed by the commercial sector are estimated in the State Energy Data System—see documentation at [http://www.eia.gov/emeu/states/sep\\_use/notes/use\\_petrol.pdf](http://www.eia.gov/emeu/states/sep_use/notes/use_petrol.pdf).

**Petroleum Consumption, Electric Power Sector.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed by the electric power sector weighted by the quantities consumed by the electric power sector. Data are from Form EIA-923, “Power Plant Operations Report,” and predecessor forms.

**Petroleum Consumption, Industrial Sector.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed by the industrial sector weighted by the estimated quantities consumed by the industrial sector. The quantities of petroleum products consumed by the industrial sector are estimated in the State Energy Data System—see documentation at [http://www.eia.gov/emeu/states/sep\\_use/notes/use\\_petrol.pdf](http://www.eia.gov/emeu/states/sep_use/notes/use_petrol.pdf).

**Petroleum Consumption, Residential Sector.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed by the residential sector weighted by the estimated quantities consumed by the residential sector. The quantities of petroleum products consumed by the residential sector are estimated in the State Energy Data System—see documentation at [http://www.eia.gov/emeu/states/sep\\_use/notes/use\\_petrol.pdf](http://www.eia.gov/emeu/states/sep_use/notes/use_petrol.pdf).

**Petroleum Consumption, Total.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed weighted by the quantities consumed.

**Petroleum Consumption, Transportation Sector.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed by the transportation sector weighted by the estimated quantities consumed by the transportation sector. The quantities of petroleum products consumed by the

transportation sector are estimated in the State Energy Data System—see documentation at [http://www.eia.gov/emeu/states/sep\\_use/notes/use\\_petrol.pdf](http://www.eia.gov/emeu/states/sep_use/notes/use_petrol.pdf).

**Petroleum Products Exports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product exported weighted by the quantities exported.

**Petroleum Products Imports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product imported weighted by the quantities imported.

**Plant Condensate.** Estimated to be 5.418 million Btu per barrel by EIA from data provided by McClanahan Consultants, Inc., Houston, Texas.

**Propane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.836 million Btu per barrel as published in the *California Oil World and Petroleum Industry, First Issue*, April 1942.

**Residual Fuel Oil.** EIA adopted the thermal conversion factor of 6.287 million Btu per barrel as reported in the Bureau of Mines internal memorandum, “Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950.”

**Road Oil.** EIA adopted the Bureau of Mines thermal conversion factor of 6.636 million Btu per barrel, which was assumed to be equal to that of asphalt (see **Asphalt**) and was first published by the Bureau of Mines in the *Petroleum Statement, Annual, 1970*.

**Special Naphthas.** EIA adopted the Bureau of Mines thermal conversion factor of 5.248 million Btu per barrel, which was assumed to be equal to that of the total gasoline (aviation and motor) factor and was first published in the *Petroleum Statement, Annual, 1970*.

**Still Gas.** EIA adopted the Bureau of Mines estimated thermal conversion factor of 6.000 million Btu per barrel, first published in the *Petroleum Statement, Annual, 1970*.

**Total Petroleum Exports.** Calculated annually by EIA as the average of the thermal conversion factors for crude oil and each petroleum product exported weighted by the quantities exported. See **Crude Oil Exports** and **Petroleum Products Exports**.

**Total Petroleum Imports.** Calculated annually by EIA as the average of the thermal conversion factors for each type of crude oil and petroleum product imported weighted by the quantities imported. See **Crude Oil Imports** and **Petroleum Products Imports**.

**Unfinished Oils.** EIA assumed the thermal conversion factor to be 5.825 million Btu per barrel or equal to that for distillate fuel oil (see **Distillate Fuel Oil**) and first published it in EIA’s *Annual Report to Congress, Volume 3, 1977*.

**Unfractionated Stream.** EIA assumed the thermal conversion factor to be 5.418 million Btu per barrel or equal to that for plant condensate (see **Plant Condensate**) and first published it in EIA’s *Annual Report to Congress, Volume 2, 1981*.

**Waxes.** EIA adopted the thermal conversion factor of 5.537 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*.

## Approximate Heat Content of Biofuels

**Biodiesel.** EIA estimated the thermal conversion factor for biodiesel to be 5.359 million Btu per barrel, or 17,253 Btu per pound.

**Biodiesel Feedstock.** EIA used soybean oil input to the production of biodiesel (million Btu soybean oil per barrel biodiesel) as the factor to estimate total biomass inputs to the production of biodiesel. EIA assumed that 7.65 pounds of soybean oil are needed to produce one gallon of biodiesel, and 5.433 million Btu of soybean oil are needed to produce one barrel of biodiesel. EIA also assumed that soybean oil has a gross heat content of 16,909 Btu per pound, or 5.483 million Btu per barrel.

**Ethanol (Undenatured).** EIA adopted the thermal conversion factor of 3.539 million Btu per barrel published in “Oxygenate Flexibility for Future Fuels,” a paper presented by William J. Piel of the ARCO Chemical Company at the National Conference on Reformulated Gasolines and Clean Air Act Implementation, Washington, D.C., October 1991.

**Fuel Ethanol (Denatured).** • 1981–2008: EIA used the 2009 factor. • 2009 forward: Calculated by EIA as the annual quantity-weighted average of the thermal conversion factors for undenatured ethanol (3.539 million Btu per barrel), pentanes plus used as denaturant (4.620 million Btu per barrel), and conventional motor gasoline used as denaturant (5.253 million Btu per barrel). The quantity of ethanol consumed is from EIA’s *Petroleum Supply Annual (PSA)* and *Petroleum Supply Monthly (PSM)*, Table 1, data for renewable fuels and oxygenate plant net production of fuel ethanol. The quantity of pentanes plus used as denaturant is from PSA/PSM, Table 1, data for renewable fuels and oxygenate plant net production of pentanes plus, multiplied by -1. The quantity of conventional motor gasoline and motor gasoline blending components used as denaturant is from PSA/PSM, Table 1, data for renewable fuels and oxygenate plant net production of conventional motor gasoline and motor gasoline blending components, multiplied by -1.

**Fuel Ethanol Feedstock.** EIA used corn input to the production of undenatured ethanol (million Btu corn per barrel undenatured ethanol) as the annual factor to estimate total biomass inputs to the production of undenatured ethanol. U.S. Department of Agriculture observed ethanol yields (gallons undenatured ethanol per bushel of corn) were 2.5 in 1980, 2.666 in 1998, 2.68 in 2002, and 2.764 in 2009; EIA estimated the ethanol yields in other years. EIA also assumed that corn has a gross heat content of 0.392 million Btu per bushel.

## Approximate Heat Content of Natural Gas

**Natural Gas Consumption, Electric Power Sector.** Calculated annually by EIA by dividing the heat content of natural gas consumed by the electric power sector by the quantity consumed. Data are from Form EIA-923, “Power Plant Operations Report,” and predecessor forms.

**Natural Gas Consumption, End-Use Sectors.** Calculated annually by EIA by dividing the heat content of natural gas consumed by the end-use sectors (residential, commercial, industrial, and transportation) by the quantity consumed. Data are from Form EIA-176, “Annual Report of Natural and Supplemental Gas Supply and Disposition.”

**Natural Gas Consumption, Total.** • 1949–1962: EIA adopted the thermal conversion factor of 1,035 Btu per cubic foot as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956*. • 1963–1979: EIA adopted the thermal conversion factor calculated annually by the American Gas Association (AGA) and published in *Gas Facts*, an AGA annual publication. • 1980 forward: Calculated annually by EIA by dividing the total heat content of natural gas consumed by the total quantity consumed.

**Natural Gas Exports.** • 1949–1972: Assumed by EIA to be equal to the thermal conversion factor for dry natural gas consumed (see **Natural Gas Consumption, Total**). • 1973 forward: Calculated annually by EIA by dividing the heat content of natural gas exported by the quantity exported. For 1973–1995, data are from Form FPC-14, “Annual Report for Importers and Exporters of Natural Gas.” Beginning in 1996, data are from U.S. Department of Energy, Office of Fossil Energy, *Natural Gas Imports and Exports*.

**Natural Gas Imports.** • 1949–1972: Assumed by EIA to be equal to the thermal conversion factor for dry natural gas consumed (see **Natural Gas Consumption, Total**). • 1973 forward: Calculated annually by EIA by dividing the heat content of natural gas imported by the quantity imported. For 1973–1995, data

are from Form FPC-14, “Annual Report for Importers and Exporters of Natural Gas.” Beginning in 1996, data are from U.S. Department of Energy, Office of Fossil Energy, *Natural Gas Imports and Exports*.

**Natural Gas Production, Dry.** Assumed by EIA to be equal to the thermal conversion factor for dry natural gas consumed. See **Natural Gas Consumption, Total**.

**Natural Gas Production, Marketed.** Calculated annually by EIA by dividing the heat content of dry natural gas produced (see **Natural Gas Production, Dry**) and natural gas plant liquids produced (see **Natural Gas Plant Liquids Production**) by the total quantity of marketed natural gas produced.

## Approximate Heat Content of Coal and Coal Coke

**Coal Coke Imports and Exports.** EIA adopted the Bureau of Mines estimate of 24.800 million Btu per short ton.

**Coal Consumption, Electric Power Sector.** Calculated annually by EIA by dividing the heat content of coal consumed by the electric power sector by the quantity consumed. Data are from Form EIA-923, “Power Plant Operations Report,” and predecessor forms.

**Coal Consumption, Industrial Sector, Coke Plants.** Calculated annually by EIA by dividing the heat content of coal consumed by coke plants by the quantity consumed. Data are from Form EIA-5, “Quarterly Coal Consumption and Quality Report—Coke Plants.”

**Coal Consumption, Industrial Sector, Other.** Calculated annually by EIA by dividing the heat content of coal consumed by manufacturing plants by the quantity consumed. Data are from Form EIA-3, “Quarterly Coal Consumption and Quality Report—Manufacturing Plants.”

**Coal Consumption, Residential and Commercial Sectors.** Calculated annually by EIA by dividing the heat content of coal consumed by the residential and commercial sectors by the quantity consumed. Through 1999, data are from Form EIA-6, “Coal Distribution Report.” Beginning in 2000, data are for commercial combined-heat-and-power (CHP) plants from Form EIA-923, “Power Plant Operations Report,” and predecessor forms.

**Coal Consumption, Total.** Calculated annually by EIA by dividing the total heat content of coal consumed by all sectors by the total quantity consumed.

**Coal Exports.** Calculated annually by EIA by dividing the heat content of steam coal and metallurgical coal exported by the quantity exported. Data are from U.S. Department of Commerce, Bureau of the Census, “Monthly Report EM 545.”

**Coal Imports.** • 1949–1963: Calculated annually by EIA by dividing the heat content of coal imported by the quantity imported. • 1963 forward: Assumed by EIA to be 25.000 million Btu per short ton.

**Coal Production.** Calculated annually by EIA to balance the heat content of coal supply (production and imports) and the heat content of coal disposition (exports, stock change, and consumption).

**Waste Coal Supplied.** Calculated annually by EIA by dividing the total heat content of waste coal supplied by the quantity supplied. For 1989–1997, data are from Form EIA-867, “Annual Nonutility Power Producer Report.” For 1998–2000, data are from Form EIA-860B, “Annual Electric Generator Report—Nonutility.” For 2001 forward, data are from Form EIA-3, “Quarterly Coal Consumption and Quality Report—Manufacturing Plants”; Form EIA-923, “Power Plant Operations Report”; and predecessor forms.

## Approximate Heat Rates for Electricity

**Electricity Net Generation, Coal.** 2001 forward: Calculated annually by EIA by using fuel consumption and net generation data reported on Form EIA-923, “Power Plant Operations Report,” and predecessor forms. The computation includes data for all electric utilities and electricity-only independent power producers using anthracite, bituminous coal, subbituminous coal, lignite, and beginning in 2002, waste coal and coal synfuel.

**Electricity Net Generation, Natural Gas.** 2001 forward: Calculated annually by EIA by using fuel consumption and net generation data reported on Form EIA-923, “Power Plant Operations Report,” and predecessor forms. The computation includes data for all electric utilities and electricity-only independent power producers using natural gas and supplemental gaseous fuels.

**Electricity Net Generation, Noncombustible Renewable Energy.** There is no generally accepted practice for measuring the thermal conversion rates for power plants that generate electricity from hydro, geothermal, solar thermal, photovoltaic, and wind energy sources. Therefore, EIA calculates a rate factor that is equal to the

annual average heat rate factor for fossil-fueled power plants in the United States. (see “Electricity Net Generation, Total Fossil Fuels”). By using that factor it is possible to evaluate fossil fuel requirements for replacing those sources during periods of interruption, such as droughts.

**Electricity Net Generation, Nuclear.** • 1957–1984: Calculated annually by dividing the total heat content consumed in nuclear generating units by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation were reported on Form FERC-1, “Annual Report of Major Electric Utilities, Licensees, and Others”; Form EIA-412, “Annual Report of Public Electric Utilities”; and predecessor forms. For 1982, the factors were published in EIA, *Historical Plant Cost and Annual Production Expenses for Selected Electric Plants 1982*, page 215. For 1983 and 1984, the factors were published in EIA, *Electric Plant Cost and Power Production Expenses 1991*, Table 13. • 1985 forward: Calculated annually by EIA by using the heat rate data reported on Form EIA-860, “Annual Electric Generator Report,” and predecessor forms.

**Electricity Net Generation, Petroleum.** 2001 forward: Calculated annually by EIA by using fuel consumption and net generation data reported on Form EIA-923, “Power Plant Operations Report,” and predecessor forms. The computation includes data for all electric utilities and electricity-only independent power producers using distillate fuel oil, residual fuel oil, jet fuel, kerosene, petroleum coke, and waste oil.

**Electricity Net Generation, Total Fossil Fuels.** • 1949–1955: The weighted annual average heat rate for fossil-fueled steam-electric power plants in the United States, as published by EIA in *Thermal-Electric Plant Construction Cost and Annual Production Expenses—1981* and *Steam-Electric Plant Construction Cost and Annual Production Expenses—1978*. • 1956–1988: The weighted annual average heat rate for fossil-fueled steam-electric power plants in the United States, as published in EIA, *Electric Plant Cost and Power Production Expenses 1991*, Table 9. • 1989–2000: Calculated annually by EIA by using heat rate data reported on Form EIA-860, “Annual Electric Generator Report,” and predecessor forms; and net generation data reported on Form EIA-759, “Monthly Power Plant Report.” The computation includes data for all electric utility steam-electric plants using fossil fuels. • 2001 forward: Calculated annually by EIA by using fuel consumption and net generation data reported on Form EIA-923, “Power Plant Operations Report,” and predecessor forms. The computation includes data for all electric utilities and electricity-only independent power producers using coal, petroleum, natural gas, and other gases (blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels).

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## Appendix B. Metric Conversion Factors, Metric Prefixes, and Other Physical Conversion Factors

Data presented in the *Annual Energy Review* and in other U.S. Energy Information Administration publications are expressed predominately in units that historically have been used in the United States, such as British thermal units, barrels, cubic feet, and short tons.

The metric conversion factors presented in Table B1 can be used to calculate the metric-unit equivalents of values expressed in U.S. customary units. For example, 500 short tons are the equivalent of 453.6 metric tons (500 short tons x 0.9071847 metric tons/short ton = 453.6 metric tons).

In the metric system of weights and measures, the names of multiples and subdivisions of any unit may be derived by combining the name of the unit with prefixes, such as deka, hecto, and kilo, meaning, respectively, 10, 100, 1,000, and deci, centi, and milli, meaning, respectively, one-tenth, one-hundredth, and one-thousandth. Common metric prefixes can be found in Table B2.

The conversion factors presented in Table B3 can be used to calculate equivalents in various physical units commonly used in energy analyses. For example, 10 barrels are the equivalent of 420 U.S. gallons (10 barrels x 42 gallons/barrel = 420 gallons).

**Table B1. Metric Conversion Factors**

Type of Unit	U.S. Unit		Equivalent in	Metric Units
<b>Mass</b>	1 short ton (2,000 lb)	=	0.907 184 7	metric tons (t)
	1 long ton	=	1.016 047	metric tons (t)
	1 pound (lb)	=	0.453 592 37 <sup>a</sup>	kilograms (kg)
	1 pound uranium oxide (lb U <sub>3</sub> O <sub>8</sub> )	=	0.384 647 <sup>b</sup>	kilograms uranium (kgU)
	1 ounce, avoirdupois (avdp oz)	=	28.349 52	grams (g)
<b>Volume</b>	1 barrel of oil (bbl)	=	0.158 987 3	cubic meters (m <sup>3</sup> )
	1 cubic yard (yd <sup>3</sup> )	=	0.764 555	cubic meters (m <sup>3</sup> )
	1 cubic foot (ft <sup>3</sup> )	=	0.028 316 85	cubic meters (m <sup>3</sup> )
	1 U.S. gallon (gal)	=	3.785 412	liters (L)
	1 ounce, fluid (fl oz)	=	29.573 53	milliliters (mL)
	1 cubic inch (in <sup>3</sup> )	=	16.387 06	milliliters (mL)
<b>Length</b>	1 mile (mi)	=	1.609 344 <sup>a</sup>	kilometers (km)
	1 yard (yd)	=	0.914 4 <sup>a</sup>	meters (m)
	1 foot (ft)	=	0.304 8 <sup>a</sup>	meters (m)
	1 inch (in)	=	2.54 <sup>a</sup>	centimeters (cm)
<b>Area</b>	1 acre	=	0.404 69	hectares (ha)
	1 square mile (mi <sup>2</sup> )	=	2.589 988	square kilometers (km <sup>2</sup> )
	1 square yard (yd <sup>2</sup> )	=	0.836 127 4	square meters (m <sup>2</sup> )
	1 square foot (ft <sup>2</sup> )	=	0.092 903 04 <sup>a</sup>	square meters (m <sup>2</sup> )
	1 square inch (in <sup>2</sup> )	=	6.451 6 <sup>a</sup>	square centimeters (cm <sup>2</sup> )
<b>Energy</b>	1 British thermal unit (Btu) <sup>c</sup>	=	1,055.055 852 62 <sup>a</sup>	joules (J)
	1 calorie (cal)	=	4.186 8 <sup>a</sup>	joules (J)
	1 kilowatthour (kWh)	=	3.6 <sup>a</sup>	megajoules (MJ)
<b>Temperature<sup>d</sup></b>	32 degrees Fahrenheit (°F)	=	0 <sup>a</sup>	degrees Celsius (°C)
	212 degrees Fahrenheit (°F)	=	100 <sup>a</sup>	degrees Celsius (°C)

<sup>a</sup>Exact conversion.

<sup>b</sup>Calculated by the U.S. Energy Information Administration.

<sup>c</sup>The Btu used in this table is the International Table Btu adopted by the Fifth International Conference on Properties of Steam, London, 1956.

<sup>d</sup>To convert degrees Fahrenheit (°F) to degrees Celsius (°C) exactly, subtract 32, then multiply by 5/9.

Notes: • Spaces have been inserted after every third digit to the right of the decimal for ease of reading. • Most metric units belong to the International System of Units (SI), and the liter, hectare, and metric ton are accepted for use with the SI units. For more information about the SI units, see <http://physics.nist.gov/cuu/Units/index.html>.

Web Page: For related information, see <http://www.eia.gov/totalenergy/data/annual/#appendices>.

Sources: • General Services Administration, Federal Standard 376B, *Preferred Metric Units for General Use by the Federal Government* (Washington, DC, January 1993), pp. 9-11, 13, and 16. • U.S. Department of Commerce, National Institute of Standards and Technology, Special Publications 330, 811, and 814. • American National Standards Institute/Institute of Electrical and Electronic Engineers, ANSI/IEEE Std 268-1992, pp. 28 and 29.

**Table B2. Metric Prefixes**

Unit Multiple	Prefix	Symbol	Unit Subdivision	Prefix	Symbol
10 <sup>1</sup>	deka	da	10 <sup>-1</sup>	deci	d
10 <sup>2</sup>	hecto	h	10 <sup>-2</sup>	centi	c
10 <sup>3</sup>	kilo	k	10 <sup>-3</sup>	milli	m
10 <sup>6</sup>	mega	M	10 <sup>-6</sup>	micro	μ
10 <sup>9</sup>	giga	G	10 <sup>-9</sup>	nano	n
10 <sup>12</sup>	tera	T	10 <sup>-12</sup>	pico	p
10 <sup>15</sup>	peta	P	10 <sup>-15</sup>	femto	f
10 <sup>18</sup>	exa	E	10 <sup>-18</sup>	atto	a
10 <sup>21</sup>	zetta	Z	10 <sup>-21</sup>	zepto	z
10 <sup>24</sup>	yotta	Y	10 <sup>-24</sup>	yocto	y

Web Page: For related information, see <http://www.eia.gov/totalenergy/data/annual/#appendices>.

Source: U.S. Department of Commerce, National Institute of Standards and Technology, *The International System of Units (SI)*, NIST Special Publication 330, 1991 Edition (Washington, DC, August 1991), p.10.

**Table B3. Other Physical Conversion Factors**

Energy Source	Original Unit		Equivalent in Final Units	
<b>Petroleum</b>	1 barrel (bbl)	=	42 <sup>a</sup>	U.S. gallons (gal)
<b>Coal</b>	1 short ton	=	2,000 <sup>a</sup>	pounds (lb)
	1 long ton	=	2,240 <sup>a</sup>	pounds (lb)
	1 metric ton (t)	=	1,000 <sup>a</sup>	kilograms (kg)
<b>Wood</b>	1 cord (cd)	=	1.25 <sup>b</sup>	shorts tons
	1 cord (cd)	=	128 <sup>a</sup>	cubic feet (ft <sup>3</sup> )

<sup>a</sup>Exact conversion.

<sup>b</sup>Calculated by the U.S. Energy Information Administration.

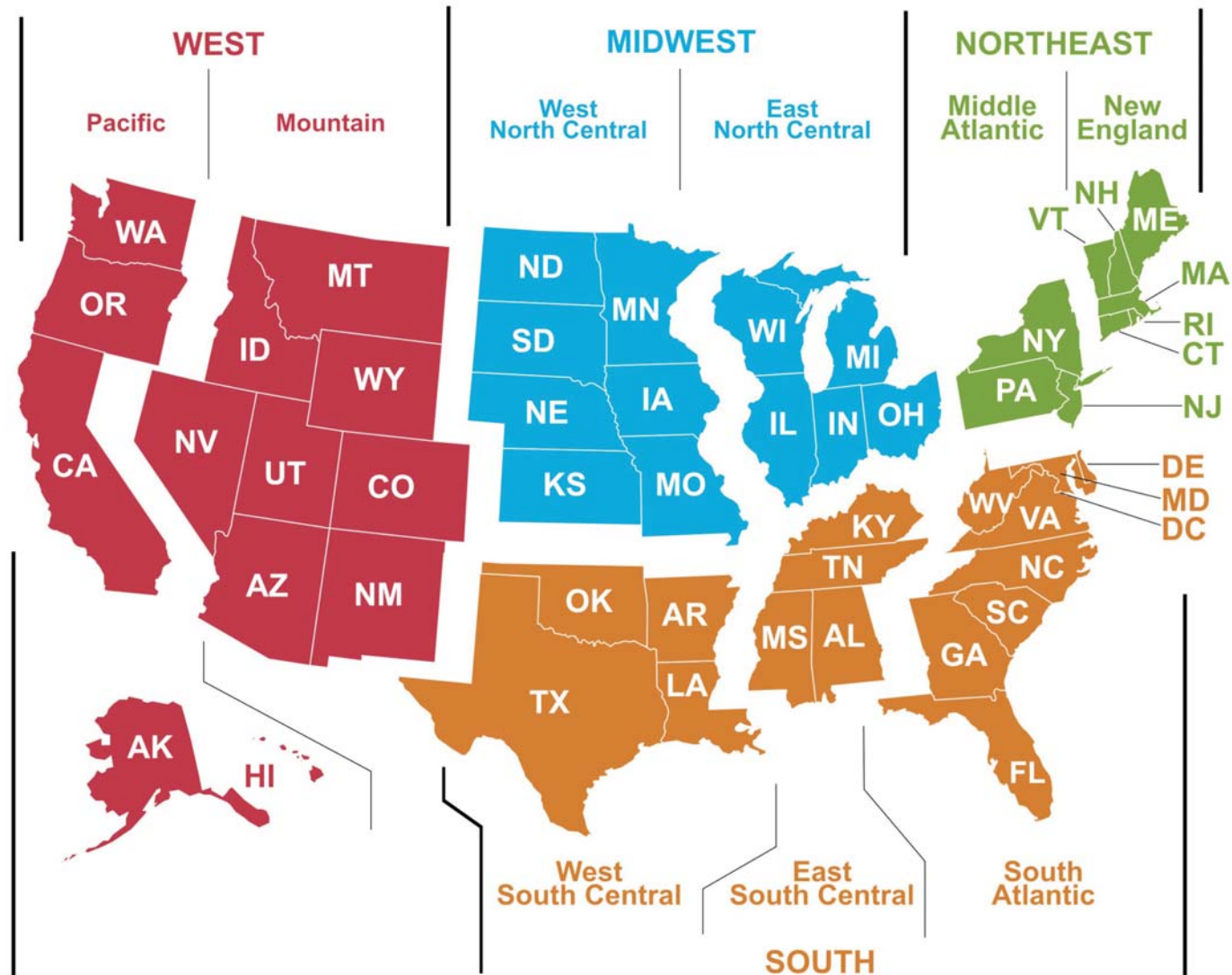
Web Page: For related information, see <http://www.eia.gov/totalenergy/data/annual/#appendices>.

Source: U.S. Department of Commerce, National Institute of Standards and Technology, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, NIST Handbook 44, 1994 Edition (Washington, DC, October 1993), pp. B-10, C-17 and C-21.

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## Appendix C

### Figure C1. U.S. Census Regions and Divisions



Note: Map not to scale.  
Web Page: See [www.census.gov/geo/www/us\\_regdiv.pdf](http://www.census.gov/geo/www/us_regdiv.pdf).

Source: U.S. Department of Commerce, Bureau of the Census.

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# Appendix D

**Table D1. Population, U.S. Gross Domestic Product, and Implicit Price Deflator, Selected Years, 1949-2011**

Year	Population			U.S. Gross Domestic Product		
	United States <sup>1</sup>	World	United States as Share of World	Billion Nominal Dollars <sup>2</sup>	Billion Real (2005) Dollars <sup>3</sup>	Implicit Price Deflator <sup>4</sup> (2005 = 1.00000)
	Million People		Percent			
1949	149.2	NA	NA	267.2	R1,843.1	R0.14499
1950	152.3	2,556.5	6.0	293.7	R2,004.2	R.14656
1955	165.9	2,781.2	6.0	414.7	R2,498.2	R.16601
1960	180.7	3,042.4	5.9	526.4	R2,828.5	R.18612
1965	194.3	R3,350.3	5.8	719.1	R3,607.0	R.19936
1970	205.1	3,713.0	5.5	1,038.3	R4,266.3	R.24338
1975	216.0	R4,090.6	5.3	1,637.7	R4,875.4	R.33591
1976	218.0	R4,161.9	5.2	1,824.6	R5,136.9	R.35519
1977	220.2	R4,233.9	5.2	2,030.1	R5,373.1	R.37783
1978	222.6	R4,306.1	5.2	2,293.8	R5,672.8	R.40435
1979	225.1	R4,381.1	5.1	2,562.2	R5,850.1	R.43798
1980	227.2	R4,453.5	5.1	2,788.1	R5,834.0	R.47791
1981	229.5	R4,536.3	5.1	3,126.8	R5,982.1	R.52270
1982	231.7	R4,616.4	5.0	3,253.2	R5,865.9	R.55459
1983	233.8	R4,697.6	5.0	3,534.6	R6,130.9	R.57652
1984	235.8	R4,777.8	4.9	3,930.9	R6,571.5	R.59817
1985	237.9	R4,859.5	4.9	4,217.5	R6,843.4	R.61628
1986	240.1	R4,943.4	4.9	4,460.1	R7,080.5	R.62991
1987	242.3	R5,029.9	4.8	4,736.4	R7,307.0	R.64819
1988	244.5	R5,117.0	4.8	5,100.4	R7,607.4	R.67046
1989	246.8	R5,203.7	4.7	5,482.1	R7,879.2	R.69577
1990	249.6	R5,291.1	4.7	5,800.5	R8,027.1	R.72262
1991	253.0	R5,374.1	4.7	5,992.1	R8,008.3	R.74824
1992	256.5	R5,459.0	4.7	6,342.3	R8,280.0	R.76598
1993	259.9	R5,541.4	4.7	6,667.4	R8,516.2	R.78290
1994	263.1	R5,622.4	4.7	7,085.2	R8,863.1	R.79940
1995	266.3	R5,703.5	4.7	7,414.7	R9,086.0	R.81606
1996	269.4	R5,783.8	4.7	7,838.5	R9,425.8	R.83159
1997	272.6	R5,862.7	4.7	8,332.4	R9,845.9	R.84628
1998	275.9	R5,940.6	4.6	8,793.5	R10,274.7	R.85584
1999	279.0	R6,017.9	4.6	9,353.5	R10,770.7	R.86842
2000	282.2	R6,094.7	4.6	9,951.5	R11,216.4	R.88723
2001	285.0	R6,171.9	4.6	10,286.2	R11,337.5	R.90727
2002	R287.6	R6,249.1	4.6	10,642.3	R11,543.1	R.92196
2003	R290.1	R6,325.7	4.6	R11,142.2	R11,836.4	R.94135
2004	R292.8	R6,402.7	4.6	R11,853.3	R12,246.9	R.96786
2005	R295.5	R6,480.0	4.6	R12,623.0	R12,623.0	1.00000
2006	298.4	R6,558.1	R4.5	R13,377.2	R12,958.5	R1.03231
2007	R301.2	R6,636.8	R4.5	R14,028.7	R13,206.4	R1.06227
2008	R304.1	R6,715.2	4.5	R14,291.5	R13,161.9	R1.08582
2009	R306.8	R6,792.9	4.5	R13,939.0	R12,703.1	R1.09729
2010	R309.3	R6,868.5	4.5	R14,526.5	R13,088.0	R1.10992
2011	311.6	6,946.0	4.5	15,094.0	13,315.1	1.13361

<sup>1</sup> Resident population of the 50 States and the District of Columbia estimated for July 1 of each year.

<sup>2</sup> See "Nominal Dollars" in Glossary.

<sup>3</sup> In chained (2005) dollars. See "Chained Dollars" in Glossary.

<sup>4</sup> The gross domestic product implicit price deflator is used to convert nominal dollars to chained (2005) dollars.

R=Revised. NA=Not available.

Web Pages: • See <http://www.eia.gov/totalenergy/data/annual/#appendices> for all data beginning in 1949. • For related information, see <http://www.census.gov/> and <http://www.bea.gov/>.

Sources: **U.S. Population:** • 1949-1989—U.S. Department of Commerce (DOC), U.S. Bureau of the

Census, Current Population Reports Series P-25 (release date: June 2000). • 1990-1999—DOC, U.S. Bureau of the Census, "Time Series of Intercensal State Population Estimates" (release date: April 11, 2002). • 2000-2009—DOC, U.S. Bureau of the Census, "Intercensal Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico" (release date: September 2011). • 2010 and 2011—DOC, U.S. Bureau of the Census, "Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico" (release date: December 2011). **World Population:** • 1950 forward—DOC, U.S. Bureau of the Census, International Database (release date: March 29, 2012). **U.S. Gross Domestic Product:** • 1949 forward—DOC, Bureau of Economic Analysis, National Income and Product Accounts (release date: March 29, 2012), Tables 1.1.5, 1.1.6, and 1.1.9.

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# Appendix E

**Table E1. Estimated Primary Energy Consumption in the United States, Selected Years, 1635-1945**  
(Quadrillion Btu)

Year	Fossil Fuels				Renewable Energy			Electricity Net Imports	Total
	Coal	Natural Gas	Petroleum	Total	Conventional Hydroelectric Power	Biomass	Total		
						Wood <sup>1</sup>			
1635	NA	--	--	NA	--	(s)	(s)	--	(s)
1645	NA	--	--	NA	--	0.001	0.001	--	0.001
1655	NA	--	--	NA	--	.002	.002	--	.002
1665	NA	--	--	NA	--	.005	.005	--	.005
1675	NA	--	--	NA	--	.007	.007	--	.007
1685	NA	--	--	NA	--	.009	.009	--	.009
1695	NA	--	--	NA	--	.014	.014	--	.014
1705	NA	--	--	NA	--	.022	.022	--	.022
1715	NA	--	--	NA	--	.037	.037	--	.037
1725	NA	--	--	NA	--	.056	.056	--	.056
1735	NA	--	--	NA	--	.080	.080	--	.080
1745	NA	--	--	NA	--	.112	.112	--	.112
1755	NA	--	--	NA	--	.155	.155	--	.155
1765	NA	--	--	NA	--	.200	.200	--	.200
1775	NA	--	--	NA	--	.249	.249	--	.249
1785	NA	--	--	NA	--	.310	.310	--	.310
1795	NA	--	--	NA	--	.402	.402	--	.402
1805	NA	--	--	NA	--	.537	.537	--	.537
1815	NA	--	--	NA	--	.714	.714	--	.714
1825	NA	--	--	NA	--	.960	.960	--	.960
1835	NA	--	--	NA	--	1.305	1.305	--	1.305
1845	NA	--	--	NA	--	1.757	1.757	--	1.757
1850	0.219	--	--	0.219	--	2.138	2.138	--	2.357
1855	.421	--	--	.421	--	2.389	2.389	--	2.810
1860	.518	--	0.003	.521	--	2.641	2.641	--	3.162
1865	.632	--	.010	.642	--	2.767	2.767	--	3.409
1870	1.048	--	.011	1.059	--	2.893	2.893	--	3.952
1875	1.440	--	.011	1.451	--	2.872	2.872	--	4.323
1880	2.054	--	.096	2.150	--	2.851	2.851	--	5.001
1885	2.840	0.082	.040	2.962	--	2.683	2.683	--	5.645
1890	4.062	.257	.156	4.475	0.022	2.515	2.537	--	7.012
1895	4.950	.147	.168	5.265	.090	2.306	2.396	--	7.661
1900	6.841	.252	.229	7.322	.250	2.015	2.265	--	9.587
1905	10.001	.372	.610	10.983	.386	1.843	2.229	--	13.212
1910	12.714	.540	1.007	14.261	.539	1.765	2.304	--	16.565
1915	13.294	.673	1.418	15.385	.659	1.688	2.347	0.002	17.734
1920	15.504	.813	2.676	18.993	.738	1.610	2.348	.003	21.344
1925	14.706	1.191	4.280	20.177	.668	1.533	2.201	.004	22.382
1930	13.639	1.932	5.897	21.468	.752	1.455	2.207	.005	23.680
1935	10.634	1.919	5.675	18.228	.806	1.397	2.203	.005	20.436
1940	12.535	2.665	7.760	22.960	.880	1.358	2.238	.007	25.205
1945	15.972	3.871	10.110	29.953	1.442	<sup>1</sup> 1.261	2.703	.009	32.665

<sup>1</sup> There is a discontinuity in the "Wood" time series between 1945 and 1949. Through 1945, data are for fuelwood only; beginning in 1949, data are for wood and wood-derived fuels (see Table 10.1).

NA=Not available. --=Not applicable. (s)=Less than 0.0005 quadrillion Btu.

Notes: • For years not shown, there are no data available. • See Tables 1.3 and 10.1 for continuation of these data series from 1949 forward. • See Note, "Geographic Coverage of Statistics for 1635-1945," at end of section.

Sources: **Coal, Natural Gas, and Petroleum:** *Energy in the American Economy, 1850-1975*, Table VII.

**Conventional Hydroelectric Power:** *Energy in the American Economy, 1850-1975*, Table II. **Wood:**

• 1635-1845: U.S. Department of Agriculture Circular No. 641, *Fuel Wood Used in the United States*

1630-1930, February 1942. This source estimates fuelwood consumption in cords per decade, which were converted to Btu using the conversion factor of 20 million Btu per cord. The annual average value for each decade was assigned to the fifth year of the decade on the assumption that annual use was likely to increase during any given decade and the average annual value was more likely to reflect mid-decade yearly consumption than use at either the beginning or end of the decade. Values thus begin in 1635 and are plotted at 10-year intervals. • 1850-1945: *Energy in the American Economy, 1850-1975*, Table VII. **Electricity Net Imports:** *Energy in the American Economy, 1850-1975*, Tables I and VI. Calculated as the difference between hydroelectric consumption and hydroelectric production times 3,412 Btu per kilowatthour.

## Appendix E

**Note: Geographic Coverage of Statistics for 1635-1945.** Table E1 presents estimates of U.S. energy consumption by energy source for a period that begins a century and a half before the original 13 colonies formed a political union and continues through the decades during which the United States was still expanding territorially. The question thus arises, what exactly is meant by “U.S. consumption” of an energy source for those years when the United States did not formally exist or consisted of less territory than is now encompassed by the 50 States and the District of Columbia?

The documents used to assemble the estimates, and (as far as possible) the sources of those documents, were reviewed carefully for clues to geographic coverage. For most energy sources, the extent of coverage expanded more rapidly than the Nation, defined as all the official States and the District of Columbia. Estimates or measurements of consumption of each energy source generally appear to follow settlement patterns. That is, they were made for areas of the continent that were settled enough to have economically significant consumption even though those areas were not to become States for years. The wood data series, for example, begins in 1635 and includes 12 of the original colonies (excepting Georgia), as well

as Maine, Vermont, and the area that would become the District of Columbia. By the time the series reaches 1810, the rest of the continental States are all included, although the last of the 48 States to achieve statehood did not do so until 1912. Likewise, the coal data series begins in 1850 but includes consumption in areas, such as Utah and Washington (State), which were significant coal-producing regions but had not yet attained statehood. (Note: No data were available on State-level historical coal consumption. The coal data shown in Table E1 through 1945 describe *apparent* consumption, i.e., production plus imports minus exports. The geographic coverage for coal was therefore based on a tally of coal-*producing* States listed in various historical issues of *Minerals Yearbook*. It is likely that coal was consumed in States where it was not mined in significant quantities.)

By energy source, the extent of coverage can be summarized as follows: • **Coal**—35 coal-producing States by 1885. • **Natural Gas**—All 48 contiguous States, the District of Columbia, and Alaska by 1885. • **Petroleum**—All 48 contiguous States, the District of Columbia, and Alaska by 1885. • **Conventional Hydroelectric Power**—Coverage for 1890 and 1895 is uncertain, but probably the 48 contiguous States and the District of Columbia. Coverage for 1900 through 1945 is the 48 contiguous States, and the District of Columbia. • **Wood**—All 48 contiguous States and the District of Columbia by 1810.

# Appendix F

## Alternatives for Estimating Energy Consumption

This appendix is reprinted from the *Annual Energy Review 2010*. EIA continues to review alternative options for accounting for energy consumption and related losses, such as those associated with the generation and distribution of electricity.

### I. Introduction

This year, the U.S. Energy Information Administration (EIA) has examined different ways to represent energy consumption in the *Annual Energy Review (AER)*. This examination centered on two methods for representing related aspects of energy consumption and losses. The first is an alternative method for deriving the energy content of noncombustible renewable resources, which has been implemented in AER 2010 (Table 1.3). The second is a new representation of delivered total energy and energy losses.

This appendix provides an explanation of these alternative methods. Section II provides a background discussion of the alternatives and the reasons for considering these changes to the energy balance presentation. Section III identifies the specific changes incorporated in AER 2010.

### II. Background

#### Alternative Approaches for Deriving Energy Contents for Noncombustible Renewables

EIA compiles data on most energy sources in physical units, such as barrels and cubic feet, in order to calculate total primary energy consumption. Before aggregation, EIA converts data for these energy sources to the common unit of British thermal units (Btu), a measure that is based on the thermal conversion of energy resources to heat and power.

Noncombustible renewables are resources from which energy is extracted without the burning or combustion of a fuel. They include hydroelectric, geothermal, solar, and wind energy. Because power from noncombustible renewables is produced

without fuel combustion, there are no set Btu conversion factors for these energy sources.

In the past, EIA has represented hydroelectric, solar, and wind energy consumed for electric generation as the amount of energy it would require, on average, to produce an equivalent number of kilowatthours (kWh) of electricity using fossil fuels. In this appendix, this approach is referred to as the "fossil-fuel equivalency" approach. For the remaining noncombustible renewable resource, geothermal energy, energy consumed for electricity generation has been based on estimates of plant efficiencies in converting geothermal energy to electricity.

The fossil-fuel equivalency approach evolved in an era when the primary goal of U.S. energy policy was reducing dependence on imported petroleum and when a significant amount of electricity was generated using fuel oil. It was intended to indicate the amount of fossil energy displaced by the renewable energy source. But fuel oil is no longer used to generate electricity to a substantial degree and the international community largely uses a different approach, applying the constant conversion factor of 3,412 Btu/kWh. In addition, using a separate approach for geothermal generation may distort the analysis of the relative share of this generation resource. EIA also has a desire to better account for energy losses and efficiency. For these reasons, EIA considered three alternative methods for deriving the energy contents for noncombustible renewables, designated here as the fossil-fuel equivalency, captured energy, and incident energy approaches.

#### *Fossil-Fuel Equivalency Approach*

With this approach, EIA would continue to apply the fossil-fuel equivalent conversion factor to hydroelectric, solar, and wind energy and would begin applying it to geothermal energy. This approach would eliminate the inconsistency between geothermal and other noncombustibles, enable fuel displacement analysis, and

maintain the continuity of a data series with which users are familiar. However, the fossil-fuel equivalency approach does not represent any real market quantity. It measures neither primary energy consumed nor fossil fuel actually displaced. Additionally, its use will likely become increasingly problematic if renewables begin to displace other renewables instead of fossil fuels.

### *Captured Energy Approach*

With this approach, EIA would apply the fixed factor of 3,412 Btu/kWh (the Btu value of electric energy generated) to measure the renewable energy consumed for electric generation for all noncombustible renewables. Using this approach would effectively count as primary energy only that noncombustible renewable energy that is captured for economic use.

EIA will use the term captured energy in referring to the energy actually "captured" by a noncombustible renewable energy system for final use. Thus, it is the net energy available for consumption after transformation of a noncombustible renewable resource into a usable energy carrier (such as electricity) or energy that is directly used. Another way of stating it is that captured energy is the energy measured as the "output" of the device, such as electricity from a wind turbine or solar plant.

This approach would not require EIA to make generalized assumptions regarding the actual conversion of these resources (wind, sunshine, falling water) into electricity. It would move U.S. reporting standards closer to international norms, which have been vetted by the International Energy Agency (IEA) and the international energy statistical community through years of actual use. Additionally, this approach better shows the economically significant energy transformations in the United States because the "lost" noncombustible renewable energy does not incur any significant economic cost (there is no market for the resource-specific energy apart from its immediate, site-specific energy conversion, and there is no substantive opportunity cost to its continued exploitation.<sup>1</sup>) On the other hand, this approach implies that conversion of noncombustible renewable energy is 100-percent efficient. In other words, it implies that there is no physical energy loss from the conversion of noncombustible renewables to electricity. In fact, renewable energy conversion can be very inefficient (largely because of the lack of alternative economic uses discussed above). Thus, this approach does not provide an accurate measure of the physical consumption of energy to produce electricity from these resources.

### *Incident Energy Approach*

With this approach, EIA would use actual or estimated energy efficiencies of renewable conversion technologies to determine the Btu value of the input energy used to produce reported renewable generation. For example, rather than treating the electricity generated at a solar plant as primary energy, an empirical estimate of the actual portion of solar radiation incident on the solar panel that is converted to electricity would be used.

EIA will define "incident energy" for noncombustible renewable resources as the gross energy that first strikes an energy conversion device. In contrast to captured energy, incident energy is the mechanical, radiation, or thermal energy that is measurable at the "input" of the device. For wind, this would be the energy contained in the wind that passes through the rotor disc; for solar, the energy contained in the sunlight that strikes the panel or collector mirror; for hydroelectric, the energy contained in the water passing through the penstock (a closed conduit for carrying water to the turbines); and, for geothermal, the energy contained in the hot fluid at the surface of the wellbore.

This approach lends itself to a view of showing the physical reality of energy transformations in the United States. However, few renewable energy plants track cumulative input energy because of its lack of economic significance. Therefore, it would be difficult to obtain accurate estimates of efficiency without creating undue burden on survey respondents. Furthermore, this approach has not been vetted in the energy statistics community and its use would be inconsistent with IEA and other international statistics.

Table F1 shows factors that could be used to estimate the energy incident on the primary energy collection device of a noncombustible renewable power plant. These factors represent energy output as a percent of energy input. The conversion efficiency of renewable generation equipment is generally specified by the manufacturer, although this specification may differ from realized efficiencies for several reasons, including: the effects of balance-of-plant factors; environmental conditions that are different than conditions that the equipment was rated for; and variability in operating conditions for equipment that is rated under fixed conditions. The efficiencies shown in this table are not estimates of the actual, operational efficiency of the technologies indicated. Rather they are notional indications of the efficiencies that each technology may be able to achieve with typical equipment operating within the normal operating range for that technology.

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<sup>1</sup> There is an initial opportunity cost when first building such a facility: the water behind a dam might inundate land with alternative uses or a solar panel might shade some area that could otherwise use the sunlight. But that is a "fixed" opportunity cost that does not effectively change by normal operation of the plant.

**Table F1. Conversion Efficiencies of Noncombustible Renewable Energy Sources**  
(Percent)

Source	Notional Efficiency <sup>1</sup>
Geothermal	16
Conventional Hydroelectric	90
Solar Photovoltaic	12
Solar Thermal Power	21
Wind	26

<sup>1</sup> Efficiencies may vary significantly for each technology based on site-specific technology and environmental factors. Factors shown represent engineering estimates for typical equipment under specific operational conditions.

Sources: **Geothermal:** Estimated by EIA on the basis of an informal survey of relevant plants. **Conventional Hydroelectric:** Based on published estimates for the efficiency of large-scale hydroelectric plants. See <http://www.usbr.gov/power/edu/pamphlet.pdf>. **Solar Photovoltaic:** Based on the average rated efficiency for a sample of commercially available modules. Rated efficiency is the conversion efficiency under standard test conditions, which represents a fixed, controlled operating point for the equipment; efficiency can vary with temperature and the strength of incident sunlight. Rated efficiencies are based on the direct current (DC) output of the module; since grid-tied applications require alternating current (AC) output, efficiencies are adjusted to account for a 20 percent reduction in output when converting from DC to AC. **Solar Thermal Power:** Estimated by dividing the rated maximum power available from the generator by the power available under standard solar conditions (1,000 W/m<sup>2</sup>) from the aperture area of solar collectors. **Wind:** Based on the average efficiency at rated wind speed for a sample of commercially available wind turbines. The rated wind speed is the minimum wind speed at which a turbine achieves its nameplate rated output under standard atmospheric conditions. Efficiency is calculated by dividing the nameplate rated power by the power available from the wind stream intercepted by the rotor disc at the rated wind speed.

## Conclusion

After review of the three options, EIA has elected to follow a hybrid of the first two approaches for the AER 2010. The primary energy value of noncombustible renewables consumed for electricity generation will be measured using the fossil-fuel equivalent factor. However, this value will be reported as the sum of captured energy and an "Adjustment for Fossil Fuel Equivalence," which is the difference between the fossil-fuel equivalent value and the value obtained using the 3,412 Btu/kWh factor. This adjustment value represents the energy loss that would have been incurred if the electricity had been generated by fossil fuels. For solar and geothermal energy used directly, EIA will continue to use the factors currently employed.

This method will not cause a change to total primary energy consumption of hydro, solar, or wind energy, but it will allow users to easily distinguish actual economic energy consumption from the imputed displacement value, which is retained both to provide backward compatibility for data users accustomed to this measure and to allow for easier analysis of certain energy efficiency and production trends. The separate reporting of captured energy will also facilitate comparisons with international data sets.

For geothermal energy consumed to generate electricity, EIA will recalculate current and historical values using the fossil-fuel equivalent factor. This recalculation will change the following values presented in the AER 2010: the primary consumption of total energy (Tables 1.1 and 1.3); the consumption of geothermal for electricity generation (Tables 8.4a and b); and the consumption of renewable energy (Tables 10.1 and 10.2c).

## New Representation of Delivered Total Energy and Energy Losses

The examination of heat rates for noncombustible fuels led EIA to also consider alternative methods of accounting for final energy consumption and energy losses. Final energy consumption differs from primary energy consumption in that it represents the amount (in terms of Btu) of energy actually consumed, in its final form, by an end user. For example, primary energy consumption of coal includes all the heat content in the coal consumed, while final energy consumption will include only the heat content of any coal consumed in its original form and the heat content of any products transformed from coal, such as electricity generated from coal.

EIA analyzed energy transformation in the United States. In all transformation processes, some useful energy is lost in achieving the conversion from one energy form to another. The most significant losses, by far, occur when electricity is generated from primary energy resources. Figure F1 illustrates an alternate method of accounting for energy consumption, based on the concept of delivered total energy.

In the AER 2010, as in previous AERs, the electric power sector is viewed as an energy-consuming sector. For each of the end-use sectors – residential, commercial, industrial, and transportation – total energy consumption is made up of the primary energy source consumed plus electricity retail sales and electrical system energy losses. Electrical system energy losses include transformation losses, the adjustment for fossil fuel equivalence (as discussed above), power plant use of electricity, transmission and distribution losses, and unaccounted for electricity. They are allocated to the end-use demand sectors in proportion to each sector's share of total electricity sales.

In the alternative representation (Figure F1), the electric power sector is not treated as an energy-consuming sector but as a sector that transforms and redistributes energy to final users. In order to better represent the amount of energy actually consumed by the final user, this method eliminates the allocation of electrical system energy losses to consuming sectors. Electricity retail sales to each sector, as reported by energy service providers, continue to be viewed as end-use consumption and, thus, are included in Delivered Total Energy. In Figure F1, delivered total energy represents the gross energy that enters an end-use facility (home, business, factory, and so forth). In some cases, there are conversion or transformation processes within the facility that create additional losses before the final consumption of the energy, so that the net energy consumed for useful application will be less than shown in the figure. For example, natural gas furnaces typically lose some amount of heat in the chimney, energy which then does not go toward heating the building.

Table F2 provides a comparison of Primary Energy Consumption and Delivered Total Energy by energy-use sector. Sources for Primary Energy Consumption by sector are AER Tables 5.14, 6.5, 7.3, 8.9, and 10.2. Data from those tables are converted from physical units to Btu using heat contents given in Appendix A. Sources for Delivered Total Energy are AER Tables 2.1 b through e.

### III. Changes to the AER 2010

The major change to AER 2010 is the modification of Table 1.3 to incorporate the new treatment of noncombustible renewable energy consumption. The value of geothermal energy consumption and, consequently, total primary energy consumption is slightly lower than previously published for all years due to the use of a new geothermal conversion factor (the fossil-fuels heat rate from Table A6). See Section II of this appendix for further explanation.

The sum of hydroelectric, geothermal, solar, and wind primary consumption is now shown as total primary energy consumption for noncombustible renewables. That total includes: geothermal heat pump and direct use of geothermal energy; solar thermal direct use energy; and noncombustible resources that are transformed into electricity. Noncombustible resources transformed into electricity are equal to electricity generation from all noncombustible renewables converted to Btu using the fossil-fuels heat rate. Direct final consumption of geothermal and solar energy is obtained from AER Tables 10.2a and 10.2b.

Total primary consumption for noncombustible renewables is the sum of captured energy (or energy produced) and the "adjustment for fossil fuel equivalence." Like total primary consumption, captured energy includes: geothermal heat pump and direct use of geothermal energy; solar thermal direct use energy; and noncombustible resources that are transformed into electricity. However, electricity generation for all noncombustible renewables is converted to Btu using the energy content of electricity, 3,412 Btu per kWh.

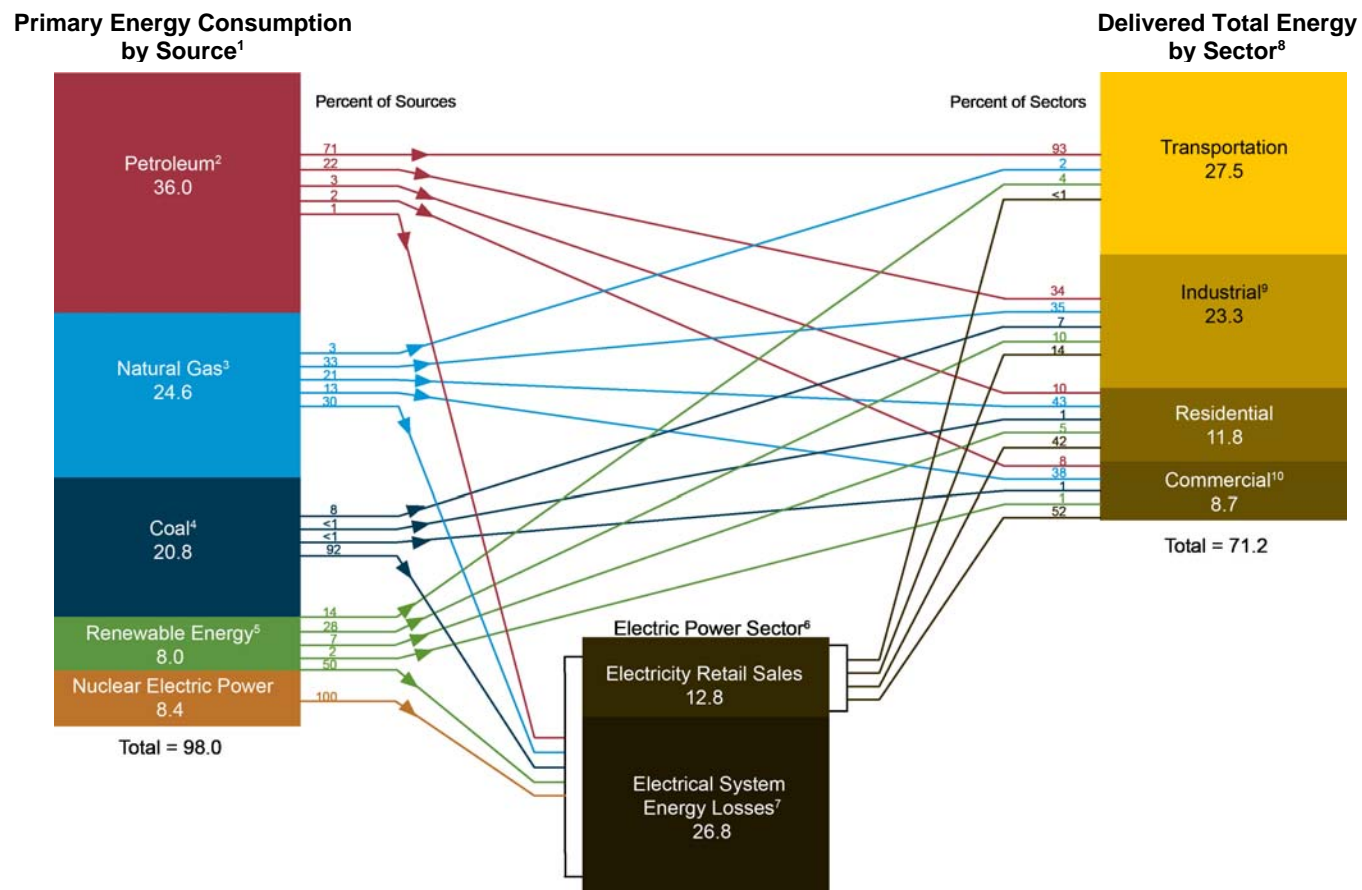
The "adjustment for fossil fuel equivalence" is equal to the difference between total primary consumption of noncombustibles in Btu (calculated using the fossil-fuels heat rate) and captured energy. There is no adjustment for fossil fuel equivalence associated with direct consumption of geothermal and solar energy.

In order to prevent any inconsistency between data presented in the modified Table 1.3 and the AER Section 10, "Renewable Energy," EIA will show data for the individual noncombustible renewables (hydroelectricity, wind, etc.) in Section 10 only. In the AER 2010, total primary energy consumed for individual noncombustible renewables can be found in Table 10.1. A detailed breakout of the noncombustible renewable consumption components summarized in Table 1.3 is provided in Table F3. Table F3 shows the components of captured energy and the adjustment for fossil fuel equivalence (regarded as a loss), by individual energy source, for 2010. The columns labeled "Transformed into Electricity" represent the energy value of electricity generated from each type of noncombustible renewable resource. These values are calculated by multiplying net generation in Table 8.2 by 3,412 Btu/kWh.

For each noncombustible renewable, the adjustment for fossil fuel equivalence is calculated as the difference between the fossil fuel equivalent value of electricity generated and the value of "Transformed into Electricity."<sup>2</sup> For geothermal, direct consumption is the heat either captured and used directly from thermal ground water sources or extracted by ground-source heat pump. Values are from Tables 10.2a and 10.2b. Solar/PV direct consumption includes solar thermal energy used directly in the residential and electric power sectors. These values are from Tables 10.2a and 10.2c. Captured energy is equal to energy "transformed into electricity" for conventional hydroelectricity and wind. For geothermal and solar/PV, captured energy equals the sum of direct consumption and energy transformed into electricity.

<sup>2</sup> The fossil fuel equivalent value of electricity generated is equal to electricity in kWh times the average heat content of the fossil fuel mix actually consumed in generating electricity for a given year.

# Figure F1. Primary Energy Consumption and Delivered Total Energy, 2010 (Quadrillion Btu)



<sup>1</sup> Includes electricity net imports, not shown separately.

<sup>2</sup> Does not include biofuels that have been blended with petroleum—biofuels are included in “Renewable Energy.”

<sup>3</sup> Excludes supplemental gaseous fuels.

<sup>4</sup> Includes less than 0.1 quadrillion Btu of coal coke net exports.

<sup>5</sup> Conventional hydroelectric power, geothermal, solar/PV, wind, and biomass.

<sup>6</sup> Electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.

<sup>7</sup> Calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales. See Note, “Electrical System Energy Losses,” at end of Section 2.

<sup>8</sup> Includes transformation losses other than electrical system energy losses. For example, see notes 9 and 10 on this page.

<sup>9</sup> Includes industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

<sup>10</sup> Includes commercial combined-heat-and-power (CHP) and commercial electricity-only plants.

Note: Sum of components may not equal total due to independent rounding.

Sources: U.S. Energy Information Administration, *Annual Energy Review 2010*, Tables 1.3, 2.1b-f, 10.3, and 10.4.

**Table F2. Energy Consumption by Sector, 2010**  
(Quadrillion Btu)

Year	Primary Energy Consumption <sup>1</sup>						Delivered Total Energy <sup>2</sup>					Electrical System Energy Losses <sup>4</sup>
	Residential	Commercial	Industrial <sup>3</sup>	Transportation <sup>3</sup>	Electric Power	Total	Residential	Commercial	Industrial	Transportation	Total	
	2010	6,841	4,175	19,984	27,425	39,579	98,004	11,791	8,711	23,267	27,451	

<sup>1</sup> Includes Adjustment for Fossil Fuel Equivalence. See "Primary Energy Consumption" in Glossary.

<sup>2</sup> Includes electricity sales to each sector in addition to Primary Energy consumed in the sector.

<sup>3</sup> Small amounts of coal consumed for transportation are reported as industrial sector consumption. Includes net imports of supplemental liquids and coal coke.

<sup>4</sup> Calculated as the primary energy consumed by the electric power sector minus the energy content of electricity retail sales.

**Table F3. Noncombustible Renewable Primary Energy Consumption by Energy Source, 2010**  
(Trillion Btu)

Year	Noncombustible Renewables														
	Conventional Hydroelectric Power <sup>1</sup>			Geothermal <sup>2</sup>				Solar/PV <sup>3</sup>				Wind			
	Transformed into Electricity <sup>4</sup>	Adjustment for Fossil Fuel Equivalence <sup>5</sup>	Total Primary Energy <sup>6</sup>	Direct Consumption <sup>7</sup>	Transformed into Electricity <sup>4</sup>	Adjustment for Fossil Fuel Equivalence <sup>5</sup>	Total Primary Energy <sup>8</sup>	Direct Consumption <sup>9</sup>	Transformed into Electricity <sup>4</sup>	Adjustment for Fossil Fuel Equivalence <sup>5</sup>	Total Primary Energy <sup>8</sup>	Transformed into Electricity <sup>4</sup>	Adjustment for Fossil Fuel Equivalence <sup>5</sup>	Total Primary Energy <sup>6</sup>	
	2010	877	1,632	2,509	60	53	99	212	97	4	8	109	323	601	924

<sup>1</sup> Excludes pumped storage.

<sup>2</sup> Geothermal heat pump energy and geothermal heat used to generate electricity.

<sup>3</sup> Solar thermal and photovoltaic energy.

<sup>4</sup> Equals generation in kilowatthours (kWh) multiplied by the energy conversion factor of 3,412 Btu/kWh.

<sup>5</sup> Equal to the difference between the fossil fuel-equivalent value of electricity and the energy content of the final consumed electricity. The fossil fuel-equivalent value of electricity equals generation in kilowatthours multiplied by the average heat rate of fossil-fueled plants. The energy content of final consumed electricity equals generation in kilowatthours multiplied by the energy conversion factor of 3,412 Btu/KWh.

<sup>6</sup> Equal to generation in kilowatthours multiplied by the average heat rate of fossil-fueled plants.

<sup>7</sup> Reported Btu of geothermal heat pump and direct use energy.

<sup>8</sup> Includes direct consumption of resources and resources transformed to electricity. Resources transformed to electricity are equal to generation in kilowatthours (kWh) multiplied by the average heat rate of fossil-fueled plants.

<sup>9</sup> Residential sector direct use of solar thermal and photovoltaic (PV) electricity net generation (converted to Btu using the average heat rate of fossil-fueled plants).



## Glossary

**Alcohol:** The family name of a group of organic chemical compounds composed of carbon, **hydrogen**, and oxygen. The series of molecules vary in chain length and are composed of a **hydrocarbon** plus a hydroxyl group:  $\text{CH}_3\text{-(CH}_2\text{)}_n\text{-OH}$  (e.g., **methanol**, **ethanol**, and tertiary butyl alcohol). See **Fuel Ethanol**.

**Alternative Fuel:** Alternative fuels, for transportation applications, include the following: **methanol**; denatured **ethanol**, and other **alcohols**; fuel mixtures containing 85 percent or more by volume of methanol, denatured ethanol, and other alcohols with **motor gasoline** or other fuels; **natural gas**; **liquefied petroleum gas (propane)**; **hydrogen**; **coal-derived liquid fuels**; fuels (other than alcohol) derived from biological materials (**biofuels** such as soy **diesel fuel**); **electricity** (including electricity from **solar energy**); and "... any other fuel the Secretary determines, by rule, is substantially not **petroleum** and would yield substantial energy security benefits and substantial environmental benefits." The term "alternative fuel" does not include alcohol or other blended portions of primarily petroleum-based fuels used as **oxygenates** or extenders, i.e. **MTBE**, **ETBE**, other ethers, and the 10-percent ethanol portion of **gasohol**.

**Alternative-Fuel Vehicle (AFV):** A vehicle designed to operate on an **alternative fuel** (e.g., compressed **natural gas**, **methane** blend, or **electricity**). The vehicle could be either a dedicated vehicle designed to operate exclusively on alternative fuel or a nondedicated vehicle designed to operate on alternative fuel and/or a traditional fuel.

**Anthracite:** The highest rank of **coal**; used primarily for residential and commercial **space heating**. It is a hard, brittle, and black lustrous coal, often referred to as hard coal, containing a high percentage of fixed carbon and a low percentage of volatile matter. The moisture content of fresh-mined anthracite generally is less than 15 percent. The heat content of anthracite ranges from 22 to 28 million **Btu per short ton** on a moist, mineral-matter-free basis. The heat content of anthracite consumed in the United States averages 25 million Btu per short ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

*Note:* Since the 1980's, anthracite refuse or mine waste has been used for steam-electric power generation. This fuel typically has a heat content of 15 million Btu per short ton or less. See **Coal Rank**.

**Anthracite Culm:** Waste from Pennsylvania **anthracite** preparation plants, consisting of coarse rock fragments containing as much as 30 percent small-sized **coal**; sometimes defined as including very fine coal particles called silt. Its heat value ranges from 8 to 17 million **Btu per short ton**.

**Anthropogenic:** Made or generated by a human or caused by human activity. The term is used in the context of global **climate change** to refer to gaseous emissions that are the result of human activities, as well as other potentially climate-altering activities, such as deforestation.

**API:** The American Petroleum Institute, a trade association.

**API Gravity:** American Petroleum Institute measure of specific gravity of **crude oil** or condensate in degrees. An arbitrary scale expressing the gravity or density of liquid **petroleum products**. The measuring scale is calibrated in terms of degrees API; it is calculated as follows:  $\text{Degrees API} = (141.5 / \text{sp.gr.60 deg.F/60 deg.F}) - 131.5$ .

**Asphalt:** A dark-brown to black cement-like material obtained by **petroleum** processing and containing bitumens as the predominant component; used primarily for road construction. It includes crude asphalt as well as the following finished products: cements, fluxes, the asphalt content of emulsions (exclusive of water), and petroleum distillates blended with asphalt to make cutback asphalts. *Note:* The conversion factor for asphalt is 5.5 **barrels per short ton**.

**ASTM:** The American Society for Testing and Materials.

**Aviation Gasoline Blending Components:** **Naphthas** that will be used for blending or compounding into finished **aviation gasoline** (e.g., straight run gasoline, alkylate, reformate, benzene, toluene, and xylene). Excludes **oxygenates (alcohols, ethers)**, **butane**, and **pentanes plus**. Oxygenates are reported as other hydrocarbons, **hydrogen**, and **oxygenates**.

**Aviation Gasoline, Finished:** A complex mixture of relatively volatile **hydrocarbons** with or without small quantities of additives, blended to form a fuel suitable for use in aviation reciprocating engines. Fuel specifications are provided in ASTM Specification D910 and Military Specification MIL-G-5572. *Note:* Data on blending components are not counted in data on finished aviation gasoline. See **Jet Fuel**; **Jet Fuel, Kerosene-Type**; and **Jet Fuel, Naphtha-Type**.

**Barrel (Petroleum):** A unit of volume equal to 42 U.S. Gallons.

**Barrels per Calendar Day:** The amount of input that a distillation facility can process under usual operating conditions. The amount is expressed in terms of capacity during a 24-hour period and reduces the maximum processing capability of

all units at the facility under continuous operation to account for the following limitations that may delay, interrupt, or slow down production: 1) the capability of downstream processing units to absorb the output of **crude oil** processing facilities of a given refinery (no reduction is necessary for intermediate streams that are distributed to other than downstream facilities as part of a refinery's normal operation); 2) the types and grades of inputs to be processed; 3) the types and grades of products expected to be manufactured; 4) the environmental constraints associated with refinery operations; 5) the reduction of capacity for scheduled downtime due to such conditions as routine inspection, maintenance, repairs, and turnaround; and 6) the reduction of capacity for unscheduled downtime due to such conditions as mechanical problems, repairs, and slowdowns.

**Base Gas:** The volume of gas needed as a permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates throughout the withdrawal season. All native gas is included in the base gas volume.

**Biodiesel:** A fuel typically made from soybean, canola, or other vegetable oils; animal fats; and recycled grease. It can serve as a substitute for **petroleum-derived diesel fuel** or **distillate fuel oil**. For U.S. Energy Information Administration reporting, it is a fuel composed of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100, and meeting the requirements of ASTM (American Society for Testing & Materials) D 6751.

**Biofuels:** Liquid fuels and blending components produced from **biomass** (plant) feedstocks, used primarily for transportation. See **Biodiesel** and **Fuel Ethanol**.

**Biogenic:** Produced by biological processes of living organisms. *Note:* EIA uses the term "biogenic" to refer only to organic nonfossil material of biological origin.

**Biomass:** Organic nonfossil material of biological origin constituting a **renewable energy** source. See **Biodiesel**, **Biofuels**, **Biomass Waste**, **Fuel Ethanol**, and **Wood and Wood-Derived Fuels**.

**Biomass Waste:** Organic nonfossil material of biological origin that is a byproduct or a discarded product. "Biomass waste" includes municipal solid waste from **biogenic** sources, landfill gas, sludge waste, agricultural crop byproducts, straw, and other **biomass** solids, liquids, and gases; but excludes **wood and wood-derived fuels** (including **black liquor**), **biofuels** feedstock, **biodiesel**, and **fuel ethanol**. *Note:* EIA "biomass waste" data also include energy crops grown specifically for energy production, which would not normally constitute waste.

**Bituminous Coal:** A dense **coal**, usually black, sometimes dark brown, often with well-defined bands of bright and dull material, used primarily as fuel in

steam-electric power generation, with substantial quantities also used for heat and power applications in manufacturing and making **coke**. Bituminous coal is the most abundant coal in active U.S. mining regions. Its moisture content usually is less than 20 percent. The heat content of bituminous coal ranges from 21 to 30 million **Btu** per **short ton** on a moist, mineral-matter-free basis. The heat content of bituminous coal consumed in the United States averages 24 million Btu per short ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter). See **Coal Rank**.

**Black Liquor:** A byproduct of the paper production process, alkaline spent liquor, that can be used as a source of energy. Alkaline spent liquor is removed from the digesters in the process of chemically pulping wood. After evaporation, the residual "black" liquor is burned as a fuel in a recovery furnace that permits the recovery of certain basic chemicals.

**Breeze:** The fine screenings from crushed coke. Usually breeze will pass through a 1/2-inch or 3/4-inch screen opening. It is most often used as a fuel source in the process of agglomerating iron ore.

**British Thermal Unit (Btu):** The quantity of heat required to raise the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit). See **Heat Content**.

**Btu:** See **British Thermal Unit**.

**Btu Conversion Factor:** A factor for converting **energy** data between one unit of measurement and **British thermal units (Btu)**. Btu conversion factors are generally used to convert energy data from physical units of measure (such as **barrels**, **cubic feet**, or **short tons**) into the energy-equivalent measure of Btu. (See [http://www.eia.gov/emeu/mer/append\\_a.html](http://www.eia.gov/emeu/mer/append_a.html) for further information on Btu conversion factors.)

**Bunker Fuels:** Fuel supplied to ships and aircraft, both domestic and foreign, consisting primarily of **residual fuel oil** and **distillate fuel oil** for ships and **kerosene-type jet fuel** for aircraft. The term "international bunker fuels" is used to denote the consumption of fuel for international transport activities. *Note:* For the purposes of **greenhouse gas** emissions inventories, data on emissions from combustion of international bunker fuels are subtracted from national emissions totals. Historically, bunker fuels have meant only ship fuel.

**Butane:** A normally gaseous straight-chain or branched-chain **hydrocarbon** (C<sub>4</sub>H<sub>10</sub>) extracted from **natural gas** or **refinery gas** streams. It includes isobutane and normal butane and is designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial butane.

*Isobutane:* A normally gaseous branched-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of 10.9 degrees Fahrenheit. It is extracted from natural gas or refinery gas streams.

*Normal Butane:* A normally gaseous straight-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of 31.1 degrees Fahrenheit. It is extracted from natural gas or refinery gas streams.

**Butylene:** An olefinic hydrocarbon (C<sub>4</sub>H<sub>8</sub>) recovered from refinery processes.

**Capacity:** See **Generator Capacity**.

**Capacity Factor:** See **Generator Capacity Factor**.

**Captured Energy:** The net energy available for consumption after transformation of a noncombustible renewable resource into electricity and noncombustible renewable energy that is directly used. For example, it is the energy measured at the “output” of a conversion device, such as electricity from a wind turbine or solar plant.

**Captive Coal:** Coal produced to satisfy the needs of the mine owner, or of a parent, subsidiary, or other affiliate of the mine owner (for example, steel companies and electricity generators), rather than for open market sale. See **Open Market Coal**.

**Carbon Dioxide:** A colorless, odorless, non-poisonous gas (CO<sub>2</sub>) that is a normal part of Earth’s atmosphere. Carbon dioxide is a product of **fossil-fuel** combustion as well as other processes. It is considered a **greenhouse gas** as it traps heat (infrared energy) radiated by the Earth into the atmosphere and thereby contributes to the potential for **global warming**. The **global warming potential** (GWP) of other greenhouse gases is measured in relation to that of carbon dioxide, which by international scientific convention is assigned a value of one (1).

**Carbon Dioxide Equivalent:** The amount of **carbon dioxide** by weight emitted into the atmosphere that would produce the same estimated radiative forcing as a given weight of another radiatively active gas. Carbon dioxide equivalents are computed by multiplying the weight of the gas being measured (for example, **methane**) by its estimated **global warming potential** (which is 21 for methane). “Carbon equivalent units” are defined as carbon dioxide equivalents multiplied by the carbon content of carbon dioxide (i.e., 12/44).

**Chained Dollars:** A measure used to express **real prices**. Real prices are those that have been adjusted to remove the effect of changes in the purchasing power of the dollar; they usually reflect buying power relative to a reference year. Prior to 1996, real prices were expressed in constant dollars, a measure based on the weights of goods and services in a single year, usually a recent year. In 1996, the

U.S. Department of Commerce introduced the chained-dollar measure. The new measure is based on the average weights of goods and services in successive pairs of years. It is “chained” because the second year in each pair, with its weights, becomes the first year of the next pair. The advantage of using the chained-dollar measure is that it is more closely related to any given period covered and is therefore subject to less distortion over time.

**Chlorofluorocarbon (CFC):** Any of various compounds consisting of carbon, **hydrogen**, chlorine, and fluorine used as refrigerants. CFCs are now thought to be harmful to the Earth’s atmosphere.

**Citygate:** A point or measuring station at which a distribution gas utility receives gas from a **natural gas pipeline** company or transmission system.

**Climate Change:** A term used to refer to all forms of climatic inconsistency, but especially to significant change from one prevailing climatic condition to another. In some cases, “climate change” has been used synonymously with the term “**global warming**”; scientists, however, tend to use the term in a wider sense to include natural changes in climate as well as climatic cooling.

**Coal:** A readily combustible black or brownish-black rock whose composition, including inherent moisture, consists of more than 50 percent by weight and more than 70 percent by volume of carbonaceous material. It is formed from plant remains that have been compacted, hardened, chemically altered, and metamorphosed by heat and pressure over geologic time. See **Coal Rank**.

**Coalbed methane:** **Methane** is generated during **coal** formation and is contained in the coal microstructure. Typical recovery entails pumping water out of the coal to allow the gas to escape. Methane is the principal component of natural gas. Coalbed methane can be added to **natural gas pipelines** without any special treatment.

**Coal Coke:** See **Coke, Coal**.

**Coal Rank:** The classification of **coals** according to their degree of progressive alteration from lignite to anthracite. In the United States, the standard ranks of coal include **lignite**, **subbituminous coal**, **bituminous coal**, and **anthracite** and are based on fixed carbon, volatile matter, heating value, and agglomerating (or caking) properties.

**Coal Stocks:** **Coal** quantities that are held in storage for future use and disposition. *Note:* When coal data are collected for a particular reporting period (month, quarter, or year), coal stocks are commonly measured as of the last day of this period.

**Coal Synfuel:** Coal-based solid fuel that has been processed by a **coal synfuel plant**; and coal-based fuels such as briquettes, pellets, or extrusions, which are formed from fresh or recycled coal and binding materials.

**Coal Synfuel Plant:** A plant engaged in the chemical transformation of **coal** into **coal synfuel**.

**Coke, Coal:** A solid carbonaceous residue derived from low-ash, low-sulfur **bituminous coal** from which the volatile constituents are driven off by baking in an oven at temperatures as high as 2,000 degrees Fahrenheit so that the fixed carbon and residual ash are fused together. Coke is used as a fuel and as a reducing agent in smelting iron ore in a blast furnace. Coke from coal is gray, hard, and porous and has a heating value of 24.8 million **Btu** per **short ton**.

**Coke, Petroleum:** A residue high in carbon content and low in **hydrogen** that is the final product of thermal decomposition in the condensation process in cracking. This product is reported as marketable coke or catalyst coke. The conversion is 5 **barrels** (of 42 U.S. gallons each) per **short ton**. Coke from **petroleum** has a heating value of 6.024 million **Btu** per barrel.

**Combined-Heat-and-Power (CHP) Plant:** A plant designed to produce both heat and **electricity** from a single heat source. *Note:* This term is being used in place of the term “cogenerator” that was used by EIA in the past. CHP better describes the facilities because some of the plants included do not produce heat and power in a sequential fashion and, as a result, do not meet the legal definition of cogeneration specified in the Public Utility Regulatory Policies Act (PURPA). See **Electricity-Only Plant**.

**Commercial Building:** A building with more than 50 percent of its floorspace used for commercial activities. Commercial buildings include, but are not limited to, stores, offices, schools, churches, gymnasiums, libraries, museums, hospitals, clinics, warehouses, and jails. Government buildings are included, except buildings on military bases or reservations.

**Commercial Sector:** An **energy**-consuming sector that consists of service-providing facilities and equipment of: businesses; Federal, State, and local governments; and other private and public organizations, such as religious, social, or fraternal groups. The commercial sector includes institutional living quarters. It also includes sewage treatment facilities. Common uses of energy associated with this sector include **space heating**, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment. *Note:* This sector includes **generators** that produce **electricity** and/or **useful thermal output** primarily to support the activities of the above-mentioned commercial establishments. Various EIA programs differ in sectoral coverage—for more information see

<http://www.eia.gov/neic/datadefinitions/Guideforwebcom.htm>. See **End-Use Sectors** and **Energy-Use Sectors**.

**Completion (Crude Oil/Natural Gas Production):** The term refers to the installation of permanent equipment for the production of **crude oil** or **natural gas**. If a **well** is equipped to produce only crude oil or natural gas from one zone or reservoir, the definition of a “well” (classified as a **crude oil well** or **natural gas well**) and the definition of a “completion” are identical. However, if a well is equipped to produce crude oil and/or natural gas separately from more than one reservoir, a “well” is not synonymous with a “completion.”

**Compressed Natural Gas (CNG):** **Natural gas** compressed to a pressure at or above 200-248 bar (i.e., 2900-3600 pounds per square inch) and stored in high-pressure containers. It is used as a fuel for natural gas-powered vehicles.

**Conventional Hydroelectric Power:** See **Hydroelectric Power, Conventional**.

**Conventional Motor Gasoline:** See **Motor Gasoline, Conventional**.

**Conversion Factor:** A factor for converting data between one unit of measurement and another (such as between **short tons** and **British thermal units**, or between **barrels** and gallons). (See [http://www.eia.gov/emeu/mer/append\\_a.html](http://www.eia.gov/emeu/mer/append_a.html) and [http://www.eia.gov/emeu/mer/append\\_b.html](http://www.eia.gov/emeu/mer/append_b.html) for further information on conversion factors.) See **Btu Conversion Factor** and **Thermal Conversion Factor**.

**Cooling Tower:** A common type of environmental equipment installed at **electric power plants** used to transfer heat, produced by burning fuel, to the atmosphere. Cooling towers are installed where there is insufficient cooling water available or where waste heat discharged into cooling water would affect marine life.

**Criteria Pollutant:** A pollutant determined to be hazardous to human health and regulated under the Environmental Protection Agency’s (EPA) National Ambient Air Quality Standards. The 1970 amendments to the Clean Air Act require EPA to describe the health and welfare impacts of a pollutant as the “criteria” for inclusion in the regulatory regime.

**Crude Oil:** A mixture of **hydrocarbons** that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Depending upon the characteristics of the crude stream, it may also include: 1) small amounts of hydrocarbons that exist in gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (casinghead) gas in lease separators and are subsequently commingled with the crude stream without being separately measured. Lease condensate recovered as a liquid from

**natural gas wells** in lease or field separation facilities and later mixed into the crude stream is also included; 2) small amounts of nonhydrocarbons produced with the oil, such as sulfur and various metals; and 3) drip gases, and liquid hydrocarbons produced from tar sands, oil sands, gilsonite, and oil shale. Liquids produced at natural gas processing plants are excluded. Crude oil is refined to produce a wide array of **petroleum products**, including heating oils; gasoline, **diesel** and **jet fuels**; **lubricants**; **asphalt**; **ethane**, **propane**, and **butane**; and many other products used for their **energy** or chemical content.

**Crude Oil Domestic First Purchase Price:** The price for domestic **crude oil** reported by the company that owns the crude oil the first time it is removed from the lease boundary.

**Crude Oil Landed Cost:** The price of **crude oil** at the port of discharge, including charges associated with purchasing, transporting, and insuring a cargo from the purchase point to the port of discharge. The cost does not include charges incurred at the discharge port (e.g., import tariffs or fees, wharfage charges, and demurrage).

**Crude Oil Refiner Acquisition Cost:** The cost of **crude oil** to the refiner, including transportation and other fees. The composite cost is the weighted average of domestic and imported crude oil costs. The refiner acquisition cost does not include the cost of crude oil purchased for the **Strategic Petroleum Reserve**.

**Crude Oil Refinery Input:** The total **crude oil** put into processing units at refineries.

**Crude Oil Stocks:** Stocks of **crude oil** and **lease condensate** held at refineries, in **petroleum pipelines**, at pipeline terminals, and on leases.

**Crude Oil Used Directly:** **Crude oil** consumed as fuel by **petroleum pipelines** and on crude oil leases.

**Crude Oil Well:** A **well** completed for the production of **crude oil** from one or more crude oil zones or reservoirs. Wells producing both crude oil and **natural gas** are classified as crude oil wells.

**Cubic Foot (Natural Gas)** The amount of **natural gas** contained at standard temperature and pressure (60 degrees Fahrenheit and 14.73 pounds standard per square inch) in a cube whose edges are one foot long.

**Degree-Day Normal:** Simple arithmetic averages of monthly or annual **degree-days** over a long period of time (usually the 30-year period 1971–2000). The averages may be simple degree-day normals or population-weighted degree-day normals.

**Degree-Days, Cooling (CDD):** A measure of how warm a location is over a period of time relative to a base temperature, most commonly specified as 65 degrees Fahrenheit. The measure is computed for each day by subtracting the base temperature (65 degrees) from the average of the day's high and low temperatures, with negative values set equal to zero. Each day's cooling degree-days are summed to create a cooling degree-day measure for a specified reference period. Cooling degree-days are used in energy analysis as an indicator of air conditioning energy requirements or use.

**Degree-Days, Heating (HDD):** A measure of how cold a location is over a period of time relative to a base temperature, most commonly specified as 65 degrees Fahrenheit. The measure is computed for each day by subtracting the average of the day's high and low temperatures from the base temperature (65 degrees), with negative values set equal to zero. Each day's heating degree-days are summed to create a heating degree-day measure for a specified reference period. Heating degree-days are used in energy analysis as an indicator of space heating energy requirements or use.

**Degree-Days, Population-Weighted:** Heating or cooling **degree-days** weighted by the population of the area in which the degree-days are recorded. To compute State population-weighted degree-days, each State is divided into from one to nine climatically homogeneous divisions, which are assigned weights based on the ratio of the population of the division to the total population of the State. Degree-day readings for each division are multiplied by the corresponding population weight for each division and those products are then summed to arrive at the State population-weighted degree-day figure. To compute national population-weighted degree-days, the Nation is divided into nine Census regions, each comprising from three to eight States, which are assigned weights based on the ratio of the population of the region to the total population of the Nation. Degree-day readings for each region are multiplied by the corresponding population weight for each region and those products are then summed to arrive at the national population-weighted degree-day figure.

**Demand-Side Management:** The planning, implementation, and monitoring of **electric utility** activities designed to encourage consumers to modify patterns of **electricity** usage, including the timing and level of electricity demand.

**Demonstrated Reserve Base (Coal):** A collective term for the sum of **coal** in both measured and indicated resource categories of reliability, representing 100 percent of the in-place coal in those categories as of a certain date. Includes beds of **bituminous coal** and **anthracite** 28 or more inches thick and beds of **subbituminous coal** 60 or more inches thick that can occur at depths of as much as 1,000 feet. Includes beds of **lignite** 60 or more inches thick that can be surface mined. Includes also thinner and/or deeper beds that currently are being mined or for

which there is evidence that they could be mined commercially at a given time. Represents that portion of the identified coal resource from which reserves are calculated.

**Denaturant:** **Petroleum**, typically **pentanes plus** or **conventional motor gasoline**, added to **fuel ethanol** to make it unfit for human consumption. Fuel ethanol is denatured, usually prior to transport from the ethanol production facility, by adding 2 to 5 volume percent denaturant. See **Fuel Ethanol** and **Fuel Ethanol Minus Denaturant**.

**Development Well:** A well drilled within the proved area of a **crude oil** or **natural gas** reservoir to the depth of a stratigraphic horizon known to be productive.

**Diesel Fuel:** A fuel composed of **distillate fuel oils** obtained in **petroleum** refining operation or blends of such distillate fuel oils with **residual fuel oil** used in motor vehicles. The boiling point and specific gravity are higher for diesel fuels than for gasoline.

**Direct Use:** Use of **electricity** that 1) is self-generated, 2) is produced by either the same entity that consumes the power or an affiliate, and 3) is used in direct support of a service or industrial process located within the same facility or group of facilities that house the generating equipment. Direct use is exclusive of **station use**.

**Distillate Fuel Oil:** A general classification for one of the **petroleum** fractions produced in conventional distillation operations. It includes **diesel fuels** and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those found in cars and trucks, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for **space heating** and **electricity generation**.

**Distillation Unit (Atmospheric):** The primary distillation unit that processes **crude oil** (including mixtures of other hydrocarbons) at approximately atmospheric conditions. It includes a pipe still for vaporizing the crude oil and a **fractionation** tower for separating the vaporized hydrocarbon components in the crude oil into fractions with different boiling ranges. This is done by continuously vaporizing and condensing the components to separate higher boiling point material. The selected boiling ranges are set by the processing scheme, the properties of the crude oil, and the product specifications.

**District Heat:** Steam or hot water from an outside source used as an **energy source** in a building. The steam or hot water is produced in a central plant and is piped into the building. District heat may be purchased from a utility or provided by a physical plant in a separate building that is part of the same facility (for example, a hospital complex or university).

**Dry Hole:** An **exploratory well** or **development well** found to be incapable of producing either **crude oil** or **natural gas** in sufficient quantities to justify completion as a **crude oil well** or **natural gas well**.

**Dry Natural Gas:** See **Natural Gas, Dry**.

**Dry Natural Gas Production:** See **Natural Gas (Dry) Production**.

**E85:** A fuel containing a mixture of 85 percent **ethanol** and 15 percent **motor gasoline**.

**Electric Energy:** The ability of an electric current to produce work, heat, light, or other forms of **energy**. It is measured in **kilowatthours**.

**Electric Non-Utility:** Any entity that generates, transmits, or sells **electricity**, or sells or trades electricity services and products, where costs are not established and recovered by regulatory authority. Examples of these entities include, but are not limited to, **independent power producers**, power marketers and aggregators (both wholesale and retail), merchant transmission service providers, self-generation entities, and cogeneration firms with Qualifying Facility Status. See **Electric Utility**.

**Electric Power Grid:** A system of synchronized power providers and consumers connected by transmission and distribution lines and operated by one or more control centers. In the continental United States, the electric power grid consists of three systems: the Eastern Interconnect, the Western Interconnect, and the Texas Interconnect. In Alaska and Hawaii, several systems encompass areas smaller than the State (e.g., the interconnect serving Anchorage, Fairbanks, and the Kenai Peninsula; and individual islands).

**Electric Power Plant:** A station containing **prime movers**, electric **generators**, and auxiliary equipment for converting mechanical, chemical, and/or fission **energy** into **electric energy**.

**Electric Power Sector:** An **energy-consuming** sector that consists of **electricity-only** and **combined-heat-and-power (CHP)** plants within the **NAICS** (North American Industry Classification System) 22 category whose primary business is to sell **electricity**, or electricity and heat, to the public. *Note:* This sector includes **electric utilities** and **independent power producers**. See **Energy-Use Sectors**.

**Electric Utility:** Any entity that generates, transmits, or distributes **electricity** and recovers the cost of its generation, transmission or distribution assets and

operations, either directly or indirectly, through cost-based rates set by a separate regulatory authority (e.g., State Public Service Commission), or is owned by a governmental unit or the consumers that the entity serves. Examples of these entities include: investor-owned entities, public power districts, public utility districts, municipalities, rural electric cooperatives, and State and Federal agencies. Electric utilities may have Federal Energy Regulatory Commission approval for interconnection agreements and wholesale trade tariffs covering either cost-of-service and/or market-based rates under the authority of the Federal Power Act. See **Electric Non-Utility**.

**Electrical System Energy Losses:** The amount of **energy** lost during generation, transmission, and distribution of **electricity**, including plant and unaccounted-for uses.

**Electricity:** A form of **energy** characterized by the presence and motion of elementary charged particles generated by friction, induction, or chemical change.

**Electricity Generation:** The process of producing **electric energy**, or the amount of electric energy produced by transforming other forms of **energy**; commonly expressed in **kilowatthours** (kWh) or megawatthours (MWh). See **Electricity Generation, Gross** and **Electricity Generation, Net**.

**Electricity Generation, Gross:** The total amount of **electric energy** produced by **generating units** and measured at the generating terminal.

**Electricity Generation, Net:** The amount of **gross electricity generation** less **station use** (the **electric energy** consumed at the generating station(s) for station service or auxiliaries). *Note:* Electricity required for pumping at **hydroelectric pumped-storage** plants is regarded as electricity for station service and is deducted from gross generation.

**Electricity Retail Sales:** The amount of **electricity** sold by **electric utilities** and other **energy service providers** to customers purchasing electricity for their own use and not for resale.

**Emissions:** **Anthropogenic** releases of gases to the atmosphere. In the context of global **climate change**, they consist of radiatively important **greenhouse gases** (e.g., the release of **carbon dioxide** during fuel combustion).

**End-Use Sectors:** The **residential, commercial, industrial, and transportation** sectors of the economy. See **Energy-Use Sectors**.

**Energy:** The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can

be changed to another form useful for work. Most of the world's convertible energy comes from **fossil fuels** that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. **Electric energy** is usually measured in **kilowatthours**, while heat energy is usually measured in **British thermal units**.

**Energy Consumption:** The use of **energy** as a source of heat or power or as an input in the manufacturing process.

**Energy Expenditures:** The money spent directly by consumers to purchase **energy**. Expenditures equal the amount of energy used by the consumer times the price per unit paid by the consumer.

**Energy Service Provider:** An **energy** entity that provides service to a retail or end-use customer.

**Energy Source:** Any substance or natural phenomenon that can be consumed or transformed to supply heat or power. Examples include **petroleum, coal, natural gas, nuclear, wood, waste, electricity, wind, geothermal, sunlight (solar energy), water movement, and hydrogen** in fuel cells.

**Energy-Use Sectors:** A group of major **energy**-consuming components of U.S. society developed to measure and analyze energy use. The sectors most commonly referred to in EIA are: **residential, commercial, industrial, transportation, and electric power**.

**Ethane:** A normally gaseous straight-chain **hydrocarbon** (C<sub>2</sub>H<sub>6</sub>). It is a colorless, paraffinic gas that boils at a temperature of -127.48 degrees Fahrenheit. It is extracted from **natural gas** and **refinery gas** streams.

**Ether:** The family name applied to a group of organic chemical compounds composed of carbon, **hydrogen**, and oxygen, and which are characterized by an oxygen atom attached to two carbon atoms (for example, **methyl tertiary butyl ether**).

**Ethanol (C<sub>2</sub>H<sub>5</sub>OH):** A clear, colorless, flammable **alcohol**. Ethanol is typically produced biologically from **biomass** feedstocks such as agricultural crops and cellulosic residues from agricultural crops or wood. Ethanol can also be produced chemically from **ethylene**. See **Biomass, Fuel Ethanol, and Fuel Ethanol Minus Denaturant**.

**Ethyl Tertiary Butyl Ether (ETBE):** A colorless, flammable, oxygenated hydrocarbon blend stock, (CH<sub>3</sub>)<sub>3</sub>COC<sub>2</sub>H<sub>5</sub>, formed by the catalytic etherification of **isobutylene** with **ethanol**. See **Oxygenates**.

**Ethylene:** An olefinic **hydrocarbon** recovered from refinery processes or petrochemical processes. Ethylene is used as a **petrochemical feedstock** for numerous chemical applications and the production of consumer goods.

**Eurasia:** The physical land mass containing the continents of Europe and Asia. For U.S. Energy Information Administration reporting, it includes the former parts of the

**Union of Soviet Socialist Republics (U.S.S.R.):** Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

**Exploratory Well:** A well drilled to find and produce **crude oil** or **natural gas** in an area previously considered unproductive, to find a new reservoir in a known field (i.e., one previously producing crude oil or natural gas in another reservoir), or to extend the limit of a known crude oil or natural gas reservoir.

**Exports:** Shipments of goods from within the 50 States and the District of Columbia to U.S. possessions and territories or to foreign countries.

**Extraction Loss:** The reduction in volume of **natural gas** due to the removal of **natural gas liquid** constituents such as **ethane**, **propane**, and **butane** at natural gas processing plants.

**Federal Energy Administration (FEA):** A predecessor of the U.S. Energy Information Administration.

**Federal Energy Regulatory Commission (FERC):** The Federal agency with jurisdiction over interstate **electricity** sales, wholesale electric rates, hydroelectric licensing, **natural gas** pricing, **petroleum pipeline** rates, and **natural gas pipeline** certification. FERC is an independent regulatory agency within the U.S. Department of Energy and is the successor to the Federal Power Commission.

**Federal Power Commission (FPC):** The predecessor agency of the **Federal Energy Regulatory Commission**. The Federal Power Commission was created by an Act of Congress under the Federal Water Power Act on June 10, 1920. It was charged originally with regulating the electric power and **natural gas** industries. It was abolished on September 30, 1977, when the U.S. Department of Energy was created. Its functions were divided between the U.S. Department of Energy and the Federal Energy Regulatory Commission, an independent regulatory agency.

**Financial Reporting System (FRS):** The U.S. Energy Information Administration's statutory requirement to identify major **energy**-producing companies and develop and implement a data-reporting program for energy financial and operating information

from these companies. Companies are selected if they are within the top 50 publicly-owned U.S. **crude oil** producers that have at least 1 percent of either production or reserves of crude oil, **natural gas**, **coal**, or **uranium** in the United States, or 1 percent of either refining capacity or **petroleum product** sales in the United States.

**Finished Motor Gasoline:** See **Motor Gasoline, Finished**.

**First Purchase Price:** See **Crude Oil Domestic First Purchase Price**.

**First Use:** Manufacturing establishments' consumption of the **energy** that was originally produced offsite or was produced onsite from input materials not classified as energy.

**Fiscal Year:** The U.S. Government's fiscal year runs from October 1 through September 30. The fiscal year is designated by the calendar year in which it ends; e.g., fiscal year 2002 began on October 1, 2001, and ended on September 30, 2002.

**Flared Natural Gas:** See **Natural Gas, Flared**.

**Flue Gas Desulfurization:** Equipment used to remove sulfur oxides from the combustion gases of a boiler plant before discharge to the atmosphere. Also referred to as scrubbers. Chemicals such as lime are used as scrubbing media.

**F.O.B.:** See **Free on Board**.

**Footage Drilled:** Total footage for **wells** in various categories, as reported for any specified period, includes (1) the deepest total depth (length of well bores) of all wells drilled from the surface, (2) the total of all bypassed footage drilled in connection with reported wells, and (3) all new footage drilled for directional sidetrack wells. Footage reported for directional sidetrack wells does not include footage in the common bore, which is reported as footage for the original well. In the case of old wells drilled deeper, the reported footage is that which was drilled below the total depth of the old well.

**Former U.S.S.R.:** See **Union of Soviet Socialist Republics (U.S.S.R.)**.

**Forward Costs (Uranium):** The operating and capital costs that will be incurred in any future production of **uranium** from in-place reserves. Included are costs for labor, materials, power and fuel, royalties, payroll taxes, insurance, and general and administrative costs that are dependent upon the quantity of production and, thus, applicable as variable costs of production. Excluded from forward costs are prior expenditures, if any, incurred for property acquisition, exploration, mine development, and mill construction, as well as income taxes, profit, and the cost of money.



*Note:* By use of forward costing, estimates of reserves for **uranium ore** deposits in differing geological settings can be aggregated and reported as the maximum amount that can theoretically be extracted to recover the specified costs of **uranium oxide** production under the listed forward cost categories.

**Fossil Fuel:** An **energy source** formed in the Earth's crust from decayed organic material, such as **petroleum, coal, and natural gas**.

**Fossil-Fueled Steam-Electric Power Plant:** An **electric power plant** in which the **prime mover** is a turbine rotated by high-pressure steam produced in a boiler by heat from burning **fossil fuels**.

**Fractionation:** The process by which saturated **hydrocarbons** are removed from **natural gas** and separated into distinct parts, or "fractions" such as **propane, butane, and ethane**.

**Free Alongside Ship (F.A.S.):** The value of a commodity at the port of exportation, generally including the purchase price plus all charges incurred in placing the commodity alongside the carrier at the port of exportation.

**Free on Board (F.O.B.):** A sales transaction in which the seller makes the product available for pick up at a specified port or terminal at a specified price and the buyer pays for the subsequent transportation and insurance.

**Free on Board (F.O.B.) Rail/Barge Price:** The **free on board** price of coal at the point of first sale. It excludes freight or shipping and insurance costs.

**Fuel Ethanol:** **Ethanol** intended for fuel use. Fuel ethanol in the United States must be anhydrous (less than 1 percent water). Fuel ethanol is denatured (made unfit for human consumption), usually prior to transport from the ethanol production facility, by adding 2 to 5 volume percent petroleum, typically **pentanes plus** or **conventional motor gasoline**. Fuel ethanol is used principally for blending in low concentrations with **motor gasoline** as an **oxygenate** or octane enhancer. In high concentrations, it is used to fuel **alternative-fuel vehicles** specially designed for its use. See **Alternative-Fuel Vehicle, Denaturant, E85, Ethanol, Fuel Ethanol Minus Denaturant, and Oxygenates**.

**Fuel Ethanol Minus Denaturant:** An unobserved quantity of anhydrous, **biomass-derived, undenatured ethanol** for fuel use. The quantity is obtained by subtracting the estimated **denaturant** volume from **fuel ethanol** volume. Fuel ethanol minus denaturant is counted as **renewable energy**, while denaturant is

counted as **nonrenewable fuel**. See **Denaturant, Ethanol, Fuel Ethanol, Nonrenewable Fuels, Oxygenates, and Renewable Energy**.

**Full-Power Operation:** Operation of a nuclear **generating unit** at 100 percent of its design capacity. Full-power operation precedes commercial operation.

**Gasohol:** A blend of **finished motor gasoline** containing **alcohol** (generally **ethanol** but sometimes **methanol**) at a concentration between 5.7 percent and 10 percent by volume. See **Oxygenates**.

**Generating Unit:** Any combination of physically connected **generators**, reactors, boilers, combustion turbines, or other **prime movers** operated together to produce electric power.

**Generator:** A machine that converts mechanical **energy** into **electric energy**.

**Generator Capacity:** The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, adjusted for ambient conditions. See **Generator Nameplate (Installed) Capacity** and **Generator Net Summer Capacity**.

**Generator Capacity Factor:** The ratio of the **electric energy** produced by a **generating unit** for a given period of time to the electric energy that could have been produced at continuous full-power operation during the same period.

**Generator Nameplate (Installed) Capacity:** The maximum rated output of a **generator, prime mover, or other electric power production equipment** under specific conditions designated by the manufacturer. Installed generator nameplate capacity is commonly expressed in megawatts (MW) and is usually indicated on a nameplate physically attached to the generator.

**Generator Net Summer Capacity:** The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, as demonstrated by a multi-hour test, at the time of summer peak demand (period of June 1 through September 30). This output reflects a reduction in capacity due to electricity use for station service or auxiliaries.

**Geothermal Energy:** Hot water or steam extracted from geothermal reservoirs in the Earth's crust and used for geothermal heat pumps, water heating, or **electricity generation**.

**Global Warming:** An increase in the near-surface temperature of the Earth. Global warming has occurred in the distant past as the result of natural influences, but the term is today most often used to refer to the warming some scientists

predict will occur as a result of increased **anthropogenic** emissions of **greenhouse gases**. See **Climate Change**.

**Global Warming Potential (GWP):** An index used to compare the relative radiative forcing of different gases without directly calculating the changes in atmospheric concentrations. GWPs are calculated as the ratio of the radiative forcing that would result from the emission of one kilogram of a **greenhouse gas** to that from the emission of one kilogram of **carbon dioxide** over a period of time, such as 100 years.

**Greenhouse Gases:** Those gases, such as water vapor, **carbon dioxide**, nitrous oxide, **methane**, **hydrofluorocarbons** (HFCs), **perfluorocarbons** (PFCs), and **sulfur hexafluoride**, that are transparent to solar (short-wave) radiation but opaque to long-wave radiation, thus preventing long-wave radiant energy from leaving the Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.

**Gross Domestic Product (GDP):** The total value of goods and services produced by labor and property located in the United States. As long as the labor and property are located in the United States, the supplier (that is, the workers and, for property, the owners) may be either U.S. residents or residents of foreign countries.

**Gross Domestic Product (GDP) Implicit Price Deflator:** A measure used to convert **nominal prices** to **real prices**. See **Chained Dollars**.

**Gross Electricity Generation:** See **Electricity Generation, Gross**.

**Gross Withdrawals:** See **Natural Gas Gross Withdrawals**.

**Gross Input to Atmospheric Crude Oil Distillation Units:** Total input to atmospheric crude oil distillation units. Includes all **crude oil**, **lease condensate**, **natural gas plant liquids**, **unfinished oils**, **liquefied refinery gases**, slop oils, and other liquid **hydrocarbons** produced from tar sands, gilsonite, and oil shale.

**Heat Content:** The amount of heat **energy** available to be released by the transformation or use of a specified physical unit of an energy form (e.g., a **short ton** of **coal**, a **barrel** of **crude oil**, a **kilowatthour** of **electricity**, a **cubic foot** of **natural gas**, or a pound of steam). The amount of heat energy is commonly expressed in **British thermal units (Btu)**. *Note:* Heat content of combustible energy forms can be expressed in terms of either gross heat content (higher or upper heating value) or net heat content (lower heating value), depending upon whether or not the available heat energy includes or excludes the energy used to vaporize water (contained in the

original energy form or created during the combustion process). The U.S. Energy Information Administration typically uses gross heat content values.

**Heat Rate:** A measure of generating station thermal efficiency commonly stated as **Btu per kilowatthour**. *Note:* Heat rates can be expressed as either gross or net heat rates, depending whether the electricity output is gross or net generation. Heat rates are typically expressed as net heat rates.

**Household:** A family, an individual, or a group of up to nine unrelated persons occupying the same housing unit. "Occupy" means the housing unit was the person's usual or permanent place of residence.

**Housing Unit:** A house, an apartment, a group of rooms, or a single room if it is either occupied or intended for occupancy as separate living quarters by a family, an individual, or a group of one to nine unrelated persons. Separate living quarters means the occupants (1) live and eat separately from other persons in the house or apartment and (2) have direct access from the outside of the buildings or through a common hall—that is, they can get to it without going through someone else's living quarters. Housing units do not include group quarters such as prisons or nursing homes where ten or more unrelated persons live. A common dining area used by residents is an indication of group quarters. Hotel and motel rooms are considered housing units if occupied as the usual or permanent place of residence.

**Hydrocarbon:** An organic chemical compound of **hydrogen** and carbon in the gaseous, liquid, or solid phase. The molecular structure of hydrocarbon compounds varies from the simplest (**methane**, a constituent of **natural gas**) to the very heavy and very complex.

**Hydroelectric Power:** The production of **electricity** from the kinetic **energy** of falling water. See **Hydroelectric Power, Conventional** and **Hydroelectric Pumped Storage**.

**Hydroelectric Power, Conventional:** **Hydroelectric power** generated from flowing water that is not created by **hydroelectric pumped storage**.

**Hydroelectric Pumped Storage:** **Hydroelectric power** that is generated during peak load periods by using water previously pumped into an elevated storage reservoir during off-peak periods when excess generating capacity is available to do so. When additional generating capacity is needed, the water can be released from the reservoir through a conduit to turbine **generators** located in an **electric power plant** at a lower level.

**Hydrofluorocarbons (HFCs):** A group of man-made chemicals composed of one

or two carbon atoms and varying numbers of **hydrogen** and fluorine atoms. Most HFCs have 100-year **global warming potentials** in the thousands.

**Hydrogen (H):** The lightest of all gases, hydrogen occurs chiefly in combination with oxygen in water. It also exists in acids, bases, **alcohols**, **petroleum**, and other **hydrocarbons**.

**Implicit Price Deflator:** The implicit price deflator, published by the U.S. Department of Commerce, Bureau of Economic Analysis, is used to convert **nominal prices** to **real prices**.

**Imports:** Receipts of goods into the 50 States and the District of Columbia from U.S. possessions and territories or from foreign countries.

**Independent Power Producer:** A corporation, person, agency, authority, or other legal entity or instrumentality that owns or operates facilities for the generation of electricity for use primarily by the public, and that is not an **electric utility**. Independent power producers are included in the **electric power sector**.

**Indicated Resources, Coal:** **Coal** for which estimates of the **coal rank**, quality, and quantity are based partly on sample analyses and measurements and partly on reasonable geologic projections. Indicated resources are computed partly from specified measurements and partly from projection of visible data for a reasonable distance on the basis of geologic evidence. The points of observation are ½ to 1½ miles apart. Indicated coal is projected to extend as a ½-mile-wide belt that lies more than ¼ mile from the outcrop or points of observation or measurement.

**Industrial Sector:** An **energy**-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing (NAICS codes 31-33); agriculture, forestry, fishing and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); and construction (NAICS code 23). Overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Fossil fuels are also used as raw material inputs to manufactured products. *Note:* This sector includes **generators** that produce **electricity** and/or **useful thermal output** primarily to support the above-mentioned industrial activities. Various EIA programs differ in sectoral coverage—for more information see <http://www.eia.gov/naic/datadefinitions/Guideforwebind.htm>. See **End-Use Sectors** and **Energy-Use Sectors**.

**Isobutane:** See **Butane**.

**Isobutylene:** An olefinic **hydrocarbon** recovered from refinery processes or petrochemical processes.

**Isopentane:** A saturated branched-chain **hydrocarbon** obtained by **fractionation** of **natural gasoline** or isomerization of normal pentane.

**Jet Fuel:** A refined petroleum product used in jet aircraft engines. See **Jet Fuel, Kerosene-Type** and **Jet Fuel, Naphtha-Type**.

**Jet Fuel, Kerosene-Type:** A **kerosene**-based product with a maximum distillation temperature of 400 degrees Fahrenheit at the 10-percent recovery point and a final maximum boiling point of 572 degrees Fahrenheit and meeting ASTM Specification 1655 and Military Specifications MIL-T-5624P and MIL-T-83133D (Grades JP-5 and JP-8). It is used for commercial and military turbojet and turboprop aircraft engines.

**Jet Fuel, Naphtha-Type:** A fuel in the heavy **naphtha** boiling range, with an average gravity of 52.8 degrees API, 20 to 90 percent distillation temperature of 290 to 470 degrees Fahrenheit, and meeting Military Specification MIL-T-5624L (Grade JP-4). It is used primarily for military turbojet and turboprop aircraft engines because it has a lower freeze point than other aviation fuels and meets engine requirements at high altitudes and speeds.

**Kerosene:** A light **petroleum** distillate that is used in space heaters, cook stoves, and water heaters and is suitable for use as a light source when burned in wick-fed lamps. Kerosene has a maximum distillation temperature of 400 degrees Fahrenheit at the 10-percent recovery point, a final boiling point of 572 degrees Fahrenheit, and a minimum flash point of 100 degrees Fahrenheit. Included are No. 1-K and No. 2-K, the two grades recognized by ASTM Specification D3699 as well as all other grades of kerosene called range or stove oil, which have properties similar to those of No. 1 fuel oil. See **Jet Fuel, Kerosene-Type**.

**Kerosene-Type Jet Fuel:** See **Jet Fuel, Kerosene-Type**.

**Kilowatt:** A unit of electrical power equal to 1,000 **watts**.

**Kilowatthour (kWh):** A measure of **electricity** defined as a unit of work or **energy**, measured as 1 **kilowatt** (1,000 **watts**) of power expended for 1 hour. One kilowatthour is equivalent to 3,412 **Btu**. See **Watthour**.

**Landed Cost:** See **Crude Oil Landed Cost**.

**Lease and Plant Fuel:** **Natural gas** used in **well**, field, and lease operations (such as natural gas used in drilling operations, heaters, dehydrators, and field

compressors) and used as fuel in natural gas processing plants.

**Lease Condensate:** A mixture consisting primarily of pentanes and heavier **hydrocarbons** which is recovered as a liquid from **natural gas** in lease separation facilities. This category excludes **natural gas plant liquids**, such as **butane** and **propane**, which are recovered at downstream natural gas processing plants or facilities.

**Lignite:** The lowest rank of **coal**, often referred to as brown coal, used almost exclusively as fuel for steam-electric power generation. It is brownish-black and has a high inherent moisture content, sometimes as high as 45 percent. The heat content of lignite ranges from 9 to 17 million **Btu** per **short ton** on a moist, mineral-matter-free basis. The heat content of lignite consumed in the United States averages 13 million Btu per short ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter). See **Coal Rank**.

**Liquefied Natural Gas (LNG):** **Natural gas** (primarily **methane**) that has been liquefied by reducing its temperature to -260 degrees Fahrenheit at atmospheric pressure.

**Liquefied Petroleum Gases (LPG):** A group of **hydrocarbon**-based gases derived from **crude oil** refining or **natural gas fractionation**. They include **ethane**, **ethylene**, **propane**, **propylene**, **normal butane**, **butylene**, **isobutane**, and **isobutylene**. For convenience of transportation, these gases are liquefied through pressurization.

**Liquefied Refinery Gases (LRG):** **Liquefied petroleum gases** fractionated from refinery or **still gases**. Through compression and/or refrigeration, they are retained in the liquid state. The reported categories are **ethane/ethylene**, **propane/propylene**, **normal butane/butylene**, and **isobutane**. Excludes still gas.

**Losses:** See **Electrical System Energy Losses**.

**Low-Power Testing:** The period of time between a nuclear **generating unit's** initial fuel loading date and the issuance of its operating (full-power) license. The maximum level of operation during that period is 5 percent of the unit's design thermal rating.

**Lubricants:** Substances used to reduce friction between bearing surfaces or incorporated into other materials used as processing aids in the manufacture of other products, or used as carriers of other materials. **Petroleum** lubricants may be produced either from distillates or residues. Lubricants include all grades of lubricating oils, from spindle oil to cylinder oil, and those used in greases.

**Manufacturing:** An energy-consuming subsector of the **industrial sector** that consists of all facilities and equipment engaged in the mechanical, physical,

chemical, or electronic transformation of materials, substances, or components into new products. Assembly of component parts of products is included, except for that which is included in construction.

**Marketed Production (Natural Gas):** See **Natural Gas Marketed Production**.

**Measured Resources, Coal:** **Coal** resources for which estimates of the **coal rank**, quality, and quantity have been computed, within a margin of error of less than 20 percent, from sample analyses and measurements from closely spaced and geologically well known sample sites. Measured resources are computed from dimensions revealed in outcrops, trenches, mine workings, and drill holes. The points of observation and measurement are so closely spaced and the thickness and extent of coals are so well defined that the tonnage is judged to be accurate within 20 percent. Although the spacing of the point of observation necessary to demonstrate continuity of the coal differs from region to region, according to the character of the coalbeds, the points of observation are no greater than ½ mile apart. Measured coal is projected to extend as a belt ¼ mile wide from the outcrop or points of observation or measurement.

**Methane:** A colorless, flammable, odorless **hydrocarbon** gas (CH<sub>4</sub>), which is the major component of **natural gas**. It is also an important source of **hydrogen** in various industrial processes.

**Methanol:** A light, volatile **alcohol** (CH<sub>3</sub>OH) eligible for **motor gasoline blending**. See **Oxygenates**.

**Methyl Tertiary Butyl Ether (MTBE):** An ether, (CH<sub>3</sub>)<sub>3</sub>COCH<sub>3</sub>, intended for **motor gasoline blending**. See **Oxygenates**.

**Miscellaneous Petroleum Products:** All finished **petroleum products** not classified elsewhere—for example, petrolatum, lube refining byproducts (aromatic extracts and tars), absorption oils, ram-jet fuel, petroleum rocket fuels, synthetic natural gas feedstocks, and specialty oils.

**Motor Gasoline Blending:** Mechanical mixing of **motor gasoline blending components** and **oxygenates** as required, to produce **finished motor gasoline**. Finished motor gasoline may be further mixed with other motor gasoline blending components or oxygenates, resulting in increased volumes of finished motor gasoline and/or changes in the formulation of finished motor gasoline (e.g., **conventional motor gasoline** mixed with **MTBE** to produce **oxygenated motor gasoline**).

**Motor Gasoline Blending Components:** **Naphthas** (e.g., straight-run gasoline, alkylate, reformate, benzene, toluene, xylene) used for blending or compounding into **finished motor gasoline**. These components include reformulated gasoline blendstock

for oxygenate blending (RBOB) but exclude **oxygenates (alcohols, ethers), butane, and pentanes plus**. *Note:* Oxygenates are reported as individual components and are included in the total for other hydrocarbons, **hydrogen**, and oxygenates.

**Motor Gasoline, Conventional:** **Finished motor gasoline** not included in the **oxygenated** or **reformulated** motor gasoline categories. *Note:* This category excludes reformulated gasoline blendstock for oxygenate blending (RBOB) as well as other blendstock. Conventional motor gasoline can be leaded or unleaded; regular, midgrade, or premium. See **Motor Gasoline Grades**.

**Motor Gasoline, Finished:** A complex mixture of relatively volatile **hydrocarbons** with or without small quantities of additives, blended to form a fuel suitable for use in spark-ignition. Motor gasoline, as defined in ASTM Specification D-4814 or Federal Specification VV-G-1690C, is characterized as having a boiling range of 122 to 158 degrees Fahrenheit at the 10-percent recovery point to 365 to 374 degrees Fahrenheit at the 90-percent recovery point. "Motor gasoline" includes **conventional motor gasoline**, all types of **oxygenated motor gasoline** including **gasohol**, and **reformulated motor gasoline**, but excludes **aviation gasoline**. *Note:* Volumetric data on **motor gasoline blending components**, as well as **oxygenates**, are not counted in data on finished motor gasoline until the blending components are blended into the gasoline.

**Motor Gasoline Grades:** The classification of gasoline by octane ratings. Each type of gasoline (**conventional, oxygenated, and reformulated**; leaded or unleaded) is classified by three grades: regular, midgrade, and premium. *Note:* Motor gasoline sales are reported by grade in accordance with their classification at the time of sale. In general, automotive octane requirements are lower at high altitudes. Therefore, in some areas of the United States, such as the Rocky Mountain States, the octane ratings for the gasoline grades may be 2 or more octane points lower.

*Regular Gasoline:* Gasoline having an antiknock index, i.e., octane rating, greater than or equal to 85 and less than 88.

*Midgrade Gasoline:* Gasoline having an antiknock index, i.e., octane rating, greater than or equal to 88 and less than or equal to 90.

*Premium Gasoline:* Gasoline having an antiknock index, i.e., octane rating, greater than 90.

**Motor Gasoline, Oxygenated:** **Finished motor gasoline** other than **reformulated motor gasoline**, having an oxygen content of 2.7 percent or higher by weight and required by the U.S. Environmental Protection Agency (EPA) to be sold in areas designated by EPA as carbon monoxide (CO) nonattainment areas.

*Note:* Oxygenated gasoline excludes oxygenated fuels program reformulated

gasoline (OPRG) and reformulated gasoline blendstock for oxygenate blending (RBOB). Data on gasohol that has at least 2.7 percent oxygen, by weight, and is intended for sale inside CO nonattainment areas are included in data on oxygenated gasoline. Other data on gasohol (for use outside of nonattainment areas) are included in data on conventional gasoline.

**Motor Gasoline, Reformulated:** **Finished motor gasoline** formulated for use in motor vehicles, the composition and properties of which meet the requirements of the reformulated gasoline regulations promulgated by the U.S. Environmental Protection Agency under Section 211(k) of the Clean Air Act. It includes gasoline produced to meet or exceed emissions performance and benzene content standards of federal-program reformulated gasoline even though the gasoline may not meet all of the composition requirements (e.g. oxygen content) of federal-program reformulated gasoline. *Note:* This category includes oxygenated fuels program reformulated gasoline (OPRG). Reformulated gasoline excludes reformulated blendstock for oxygenate blending (RBOB) and gasoline treated as blendstock (GTAB).

**MTBE:** See **Methyl Tertiary Butyl Ether**.

**NAICS:** See **North American Industry Classification System**.

**Naphtha:** A generic term applied to a **petroleum** fraction with an approximate boiling range between 122 and 400 degrees Fahrenheit.

**Naphtha-Type Jet Fuel:** See **Jet Fuel, Naphtha-Type**.

**Natural Gas:** A gaseous mixture of **hydrocarbon** compounds, primarily **methane**, used as a fuel for **electricity generation** and in a variety of ways in buildings, and as raw material input and fuel for industrial processes.

**Natural Gas, Dry:** **Natural gas** which remains after: 1) the liquefiable **hydrocarbon** portion has been removed from the gas stream (i.e., gas after lease, field, and/or plant separation); and 2) any volumes of **nonhydrocarbon gases** have been removed where they occur in sufficient quantity to render the gas unmarketable. *Note:* Dry natural gas is also known as consumer-grade natural gas. The parameters for measurement are cubic feet at 60 degrees Fahrenheit and 14.73 pounds per square inch absolute.

**Natural Gas (Dry) Production:** The process of producing consumer-grade **natural gas**. Natural gas withdrawn from reservoirs is reduced by volumes used at the production (lease) site and by processing losses. Volumes used at the production site include 1) the volume returned to reservoirs in cycling, repressuring of oil

reservoirs, and conservation operations; and 2) **vented natural gas** and **flared natural gas**. Processing losses include 1) **nonhydrocarbon gases** (e.g., water vapor, **carbon dioxide**, helium, hydrogen sulfide, and nitrogen) removed from the gas stream; and 2) gas converted to liquid form, such as **lease condensate** and **natural gas plant liquids**. Volumes of dry gas withdrawn from gas storage reservoirs are not considered part of production. Dry natural gas production equals **natural gas marketed production** less **extraction loss**.

**Natural Gas, Flared:** **Natural gas** burned in flares on the base site or at gas processing plants.

**Natural Gas Gross Withdrawals:** Full well stream volume of produced **natural gas**, excluding **lease condensate** separated at the lease.

**Natural Gas Liquids (NGL):** Those **hydrocarbons** in **natural gas** that are separated from the gas as liquids through the process of absorption, condensation, adsorption, or other methods in gas processing or cycling plants. Generally such liquids consist of **propane** and heavier hydrocarbons and are commonly referred to as **lease condensate**, **natural gasoline**, and **liquefied petroleum gases**. Natural gas liquids include **natural gas plant liquids** (primarily **ethane**, **propane**, **butane**, and **isobutane**) and lease condensate (primarily pentanes produced from natural gas at lease separators and field facilities).

**Natural Gas Marketed Production:** **Natural gas gross withdrawals** from production reservoirs, less gas used for reservoir repressuring; **nonhydrocarbon gases** removed in treating or processing operations; and quantities of **vented natural gas** and **flared natural gas**. Includes all quantities of natural gas used in field and processing operations.

**Natural Gas Pipeline:** A continuous pipe conduit, complete with such equipment as valves, compressor stations, communications systems, and meters, for transporting **natural gas** and/or **supplemental gaseous fuels** from one point to another, usually from a point in or beyond the producing field or processing plant to another pipeline or to points of utilization. Also refers to a company operating such facilities.

**Natural Gas Plant Liquids (NGPL):** Those **hydrocarbons** in **natural gas** that are separated as liquids at natural gas processing plants, fractionating and cycling plants, and, in some instances, field facilities. **Lease condensate** is excluded. Products obtained include **ethane**; **liquefied petroleum gases** (**propane**, **butanes**, propane-butane mixtures, ethane-propane mixtures); **isopentane**; and other small quantities of finished products, such as **motor gasoline**, **special naphthas**, **jet fuel**, **kerosene**, and **distillate fuel oil**. See **Natural Gas Liquids**.

**Natural Gas Processing Plant:** A surface installation designed to separate and recover **natural gas liquids** from a stream of produced **natural gas** through the processes of condensation, absorption, refrigeration, or other methods, and to control the quality of natural gas marketed or returned to oil or gas reservoirs for pressure maintenance, repressuring, or cycling.

**Natural Gas, Vented:** **Natural gas** released into the air on the production site or at processing plants.

**Natural Gas Well:** A well completed for the production of **natural gas** from one or more natural gas zones or reservoirs. (Wells producing both **crude oil** and natural gas are classified as **crude oil wells**.)

**Natural Gas Wellhead Price:** Price of **natural gas** calculated by dividing the total reported value at the wellhead by the total quantity produced as reported by the appropriate agencies of individual producing States and the U.S. Mineral Management Service. The price includes all costs prior to shipment from the lease, including gathering and compression costs, in addition to State production, severance, and similar charges.

**Natural Gasoline:** A mixture of **hydrocarbons** (mostly pentanes and heavier) extracted from **natural gas** that meets vapor pressure, end-point, and other specifications for natural gasoline set by the Gas Processors Association. Includes **isopentane**, which is a saturated branch-chain hydrocarbon obtained by **fractionation** of natural gasoline or isomerization of normal pentane.

**NERC:** See **North American Electric Reliability Corporation**.

**Net Electricity Generation:** See **Electricity Generation, Net**.

**Net Summer Capacity:** See **Generator Net Summer Capacity**.

**Neutral Zone:** A 6,200 square-mile area shared equally between Kuwait and Saudi Arabia under a 1992 agreement.

**Nitrogen Oxides (NO<sub>x</sub>):** Compounds of nitrogen and oxygen produced by the burning of **fossil fuels**.

**Nominal Dollars:** A measure used to express **nominal price**.

**Nominal Price:** The price paid for a product or service at the time of the transaction. Nominal prices are those that have not been adjusted to remove the

effect of changes in the purchasing power of the dollar; they reflect buying power in the year in which the transaction occurred.

**Non-Biomass Waste:** Material of non-biological origin that is a byproduct or a discarded product. "Non-biomass waste" includes municipal solid waste from non-biogenic sources, such as plastics, and tire-derived fuels.

**Noncoincident Peak Load:** The sum of two or more peak loads on individual systems that do not occur in the same time interval. Meaningful only in the context of loads within a limited period of time, such as day, week, month, a heating or cooling season, and usually for not more than 1 year.

**Nonhydrocarbon Gases:** Typical nonhydrocarbon gases that may be present in reservoir **natural gas**, such as **carbon dioxide**, helium, hydrogen sulfide, and nitrogen.

**Nonrenewable Fuels:** Fuels that cannot be easily made or "renewed," such as **crude oil**, **natural gas**, and **coal**.

**Normal Butane:** See **Butane**.

**North American Electric Reliability Corporation (NERC):** A nonprofit corporation formed in 2006 as the successor to the North American Electric Reliability Council established to develop and maintain mandatory reliability standards for the bulk electric system, with the fundamental goal of maintaining and improving the reliability of that system. NERC consists of regional reliability entities covering the interconnected power regions of the contiguous United States, Canada, and Mexico. See the NERC regions at [http://www.eia.gov/cneaf/electricity/chg\\_str\\_fuel/html/fig02.html](http://www.eia.gov/cneaf/electricity/chg_str_fuel/html/fig02.html).

**North American Industry Classification System (NAICS):** A classification scheme, developed by the Office of Management and Budget to replace the Standard Industrial Classification (SIC) System, that categorizes establishments according to the types of production processes they primarily use.

**Nuclear Electric Power (Nuclear Power):** Electricity generated by the use of the thermal energy released from the fission of nuclear fuel in a reactor.

**Nuclear Electric Power Plant:** A single-unit or multi-unit facility in which heat produced in one or more reactors by the fissioning of nuclear fuel is used to drive one or more steam turbines.

**Nuclear Reactor:** An apparatus in which a nuclear fission chain reaction can be initiated, controlled, and sustained at a specific rate. A reactor includes fuel

(fissionable material), moderating material to control the rate of fission, a heavy-walled pressure vessel to house reactor components, shielding to protect personnel, a system to conduct heat away from the reactor, and instrumentation for monitoring and controlling the reactor's systems.

**Octane Rating:** A number used to indicate gasoline's antiknock performance in motor vehicle engines. The two recognized laboratory engine test methods for determining the antiknock rating, i.e., octane rating, of gasolines are the Research method and the Motor method. To provide a single number as guidance to the consumer, the antiknock index  $(R + M)/2$ , which is the average of the Research and Motor octane numbers, was developed.

**OECD:** See **Organization for Economic Cooperation and Development**.

**Offshore:** That geographic area that lies seaward of the coastline. In general, the coastline is the line of ordinary low water along with that portion of the coast that is in direct contact with the open sea or the line marking the seaward limit of inland water. If a State agency uses a different basis for classifying onshore and offshore areas, the State classification is used (e.g., Cook Inlet in Alaska is classified as offshore; for Louisiana, the coastline is defined as the Chapman Line, as modified by subsequent adjudication).

**Oil:** See **Crude Oil**.

**OPEC:** See **Organization of the Petroleum Exporting Countries**.

**Open Market Coal:** Coal sold in the open market, i.e., coal sold to companies other than the reporting company's parent company or an operating subsidiary of the parent company. See **Captive Coal**.

**Operable Nuclear Unit:** In the United States, a nuclear **generating unit** that has completed low-power testing and is in possession of a full-power operating license issued by the Nuclear Regulatory Commission.

**Operable Refineries:** Refineries that were in one of the following three categories at the beginning of a given year: in operation; not in operation and not under active repair, but capable of being placed into operation within 30 days; or not in operation, but under active repair that could be completed within 90 days.

**Operating Income:** Operating revenues less operating expenses. Excludes items of other revenue and expense, such as equity in earnings of unconsolidated affiliates, dividends, interest income and expense, income taxes, extraordinary items, and cumulative effect of accounting changes.

**Organization for Economic Cooperation and Development (OECD):** An international organization helping governments tackle the economic, social and governance challenges of a globalized economy. Its membership comprises about 30 member countries. With active relationships with some 70 other countries, non-governmental organizations (NGOs) and civil society, it has a global reach. For details about the organization, see <http://www.oecd.org>.

**Organization of the Petroleum Exporting Countries (OPEC):** An intergovernmental organization whose stated objective is to "coordinate and unify the petroleum policies of member countries." It was created at the Baghdad Conference on September 10–14, 1960. Current members (with years of membership) include Algeria (1969–present), Angola (2007–present), Ecuador (1973–1992 and 2007–present), Iran (1960–present), Iraq (1960–present), Kuwait (1960–present), Libya (1962–present), Nigeria (1971–present), Qatar (1961–present), Saudi Arabia (1960–present), United Arab Emirates (1967–present), and Venezuela (1960–present). Countries no longer members of OPEC include Gabon (1975–1994) and Indonesia (1962–2008).

**Oxygenated Motor Gasoline:** See **Motor Gasoline, Oxygenated**.

**Oxygenates:** Substances which, when added to **motor gasoline**, increase the amount of oxygen in that gasoline blend. **Ethanol, methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE),** and **methanol** are common oxygenates. See **Motor Gasoline, Oxygenated**.

**Ozone:** A molecule made up of three atoms of oxygen. Occurs naturally in the stratosphere and provides a protective layer shielding the Earth from harmful ultraviolet radiation. In the troposphere, it is a chemical oxidant, a greenhouse gas, and a major component of photochemical smog.

**PAD Districts:** Petroleum Administration for Defense Districts. Geographic aggregations of the 50 States and the District of Columbia into five districts for the Petroleum Administration for Defense in 1950. The districts were originally instituted for economic and geographic reasons as Petroleum Administration for War (PAW) Districts, which were established in 1942.

**Particulate Collectors:** Equipment used to remove fly ash from the combustion gases of a boiler plant before discharge to the atmosphere. Particulate collectors include electrostatic precipitators, mechanical collectors (cyclones, fabric filters [baghouses]), and wet scrubbers.

**Peak Kilowatt:** Thousand **peak watts**.

**Peak Watt:** A manufacturer's unit indicating the amount of power a photovoltaic cell or module will produce at standard test conditions (normally 1,000 **watts** per square meter and 25 degrees Celsius).

**Pentanes Plus:** A mixture of **hydrocarbons**, mostly pentanes and heavier, extracted from **natural gas**. Includes **isopentane, natural gasoline,** and **plant condensate**.

**Perfluorocarbons (PFCs):** A group of man-made chemicals composed of one or two carbon atoms and four to six fluorine atoms, containing no chlorine. PFCs have no commercial uses and are emitted as a byproduct of aluminum smelting and semiconductor manufacturing. PFCs have very high 100-year **global warming potentials** and are very long-lived in the atmosphere.

**Petrochemical Feedstocks:** Chemical feedstocks derived from **petroleum** principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics.

**Petroleum:** A broadly defined class of liquid **hydrocarbon** mixtures. Included are **crude oil, lease condensate, unfinished oils,** refined products obtained from the processing of crude oil, and **natural gas plant liquids**. *Note:* Volumes of finished **petroleum products** include nonhydrocarbon compounds, such as additives and detergents, after they have been blended into the products.

**Petroleum Coke:** See **Coke, Petroleum**.

**Petroleum Consumption:** See **Products Supplied (Petroleum)**.

**Petroleum Imports:** Imports of **petroleum** into the 50 States and the District of Columbia from foreign countries and from Puerto Rico, the Virgin Islands, and other U.S. territories and possessions. Included are imports for the **Strategic Petroleum Reserve** and withdrawals from bonded warehouses for onshore consumption, offshore bunker use, and military use. Excluded are receipts of foreign petroleum into bonded warehouses and into U.S. territories and U.S. Foreign Trade Zones.

**Petroleum Pipeline:** Crude oil and product pipelines used to transport **crude oil** and **petroleum products**, respectively (including interstate, intrastate, and intracompany pipelines), within the 50 States and the District of Columbia.

**Petroleum Products:** Petroleum products are obtained from the processing of **crude oil** (including **lease condensate**), **natural gas**, and other **hydrocarbon** compounds. Petroleum products include **unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil,**



**petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous petroleum products.**

**Petroleum Stocks, Primary:** For individual **petroleum products**, quantities that are held at refineries, in **petroleum pipelines**, and at bulk terminals that have a capacity of 50,000 barrels or more, or that are in transit thereto. Stocks held by product retailers and resellers, as well as tertiary stocks held at the point of consumption, are excluded. Stocks of individual products held at gas processing plants are excluded from individual product estimates but are included in other oil estimates and total.

**Photovoltaic Cell (PVC):** An electronic device consisting of layers of semiconductor materials fabricated to form a junction (adjacent layers of materials with different electronic characteristics) and electrical contacts and being capable of converting incident light directly into **electricity** (direct current).

**Photovoltaic Energy:** Direct-current **electricity** generated from sunlight through solid-state semiconductor devices that have no moving parts.

**Photovoltaic Module:** An integrated assembly of interconnected **photovoltaic cells** designed to deliver a selected level of working voltage and current at its output terminals, packaged for protection against environmental degradation, and suited for incorporation in photovoltaic power systems.

**Pipeline Fuel:** **Natural gas** consumed in the operation of pipelines, primarily in compressors.

**Plant Condensate:** One of the **natural gas liquids**, mostly pentanes and heavier **hydrocarbons**, recovered and separated as liquids at gas inlet separators or scrubbers in processing plants.

**Primary Energy:** **Energy** in the form that it is first accounted for in a statistical energy balance, before any transformation to secondary or tertiary forms of energy. For example, **coal** can be converted to synthetic gas, which can be converted to **electricity**; in this example, coal is primary energy, synthetic gas is secondary energy, and electricity is tertiary energy. See **Primary Energy Production** and **Primary Energy Consumption**.

**Primary Energy Consumption:** Consumption of **primary energy**. (Energy sources that are produced from other energy sources, e.g., **coal coke** from **coal**, are included in primary energy consumption only if their energy content has not already been included as part of the original energy source. Thus, U.S. primary energy consumption does include net imports of coal coke, but not the coal coke produced from domestic coal.) The U.S. Energy Information Administration includes the following in U.S. primary energy consumption: coal consumption; coal coke net imports; **petroleum consumption (petroleum products supplied**, including

**natural gas plant liquids** and **crude oil** burned as fuel); **dry natural gas** excluding **supplemental gaseous fuels** consumption; **nuclear electricity net generation** (converted to Btu using the nuclear plants **heat rates**); **conventional hydroelectricity** net generation (converted to Btu using the fossil-fuels plant heat rates); **geothermal** electricity net generation (converted to Btu using the fossil-fuels plant heat rates), and geothermal heat pump energy and geothermal direct use energy; **solar thermal** and **photovoltaic** electricity net generation (converted to Btu using the fossil-fuels plant heat rates), and solar thermal direct use energy; **wind** electricity net generation (converted to Btu using the fossil-fuels plant heat rates); **wood and wood-derived fuels** consumption; biomass waste consumption; **fuel ethanol** and **biodiesel** consumption; losses and co-products from the production of fuel ethanol and biodiesel; and electricity net imports (converted to Btu using the electricity heat content of 3,412 Btu per kilowatt-hour).

**Primary Energy Production:** Production of **primary energy**. The U.S. Energy Information Administration includes the following in U.S. primary energy production: **coal** production, **waste coal** supplied, and coal refuse recovery; **crude oil** and **lease condensate** production; **natural gas plant liquids** production; **dry natural gas** excluding **supplemental gaseous fuels** production; **nuclear electricity net generation** (converted to Btu using the nuclear plant **heat rates**); **conventional hydroelectricity** net generation (converted to Btu using the fossil-fuels plant heat rates); geothermal electricity net generation (converted to Btu using the fossil-fuels plant heat rates), and geothermal heat pump energy and geothermal direct use energy; **solar thermal** and **photovoltaic** electricity net generation (converted to Btu using the fossil-fuels plant heat rates), and solar thermal direct use energy; **wind** electricity net generation (converted to Btu using the fossil-fuels plant heat rates); **wood and wood-derived** fuels consumption; **biomass waste** consumption; and **biofuels** feedstock.

**Prime Mover:** The engine, turbine, water wheel, or similar machine that drives an electric **generator**; or, for reporting purposes, a device that converts **energy** to **electricity** directly.

**Process Fuel:** All **energy** consumed in the acquisition, processing, and transportation of energy. Quantifiable process fuel includes three categories: natural gas lease and plant operations, **natural gas pipeline** operations, and oil refinery operations.

**Processing Gain:** The volumetric amount by which total output is greater than input for a given period of time. This difference is due to the processing of **crude oil** into **petroleum products** which, in total, have a lower specific gravity than the crude oil processed.

**Processing Loss:** The volumetric amount by which total refinery output is less than input for a given period of time. This difference is due to the processing of **crude**

**oil into petroleum products** which, in total, have a higher specific gravity than the crude oil processed.

**Products Supplied (Petroleum):** Approximately represents consumption of **petroleum products** because it measures the disappearance of these products from primary sources, i.e., **refineries, natural gas processing plants**, blending plants, pipelines, and bulk terminals. In general, product supplied of each product in any given period is computed as follows: field production, plus refinery production, plus imports, plus unaccounted-for crude oil (plus net receipts when calculated on a PAD District basis) minus stock change, minus crude oil losses, minus refinery inputs, and minus exports.

**Propane:** A normally gaseous straight-chain **hydrocarbon** (C<sub>3</sub>H<sub>8</sub>). It is a colorless paraffinic gas that boils at a temperature of -43.67 degrees Fahrenheit. It is extracted from **natural gas** or **refinery gas** streams. It includes all products designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial propane and HD-5 propane.

**Propylene:** An olefinic **hydrocarbon** (C<sub>3</sub>H<sub>6</sub>) recovered from refinery processes or petrochemical processes.

**Proved Reserves, Crude Oil:** The estimated quantities of all liquids defined as **crude oil** that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

**Proved Reserves, Lease Condensate:** The volumes of **lease condensate** expected to be recovered in future years in conjunction with the production of proved reserves of **natural gas** based on the recovery efficiency of lease and/or field separation facilities installed.

**Proved Reserves, Natural Gas:** The estimated quantities of **natural gas** that analysis of geological and engineering data demonstrates with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

**Proved Reserves, Natural Gas Liquids:** Those volumes of **natural gas liquids** (including **lease condensate**) demonstrated with reasonable certainty to be separable in the future from proved **natural gas** reserves, under existing economic and operating conditions.

**Pumped Storage:** See **Hydroelectric Pumped Storage**.

**Real Price:** A price that has been adjusted to remove the effect of changes in the purchasing power of the dollar. Real prices, which are expressed in constant dollars, usually reflect buying power relative to a base year. See **Chained Dollars**.

**Refiner Acquisition Cost of Crude Oil:** See **Crude Oil Refiner Acquisition Cost**.

**Refinery Gas:** See **Still Gas**.

**Refinery and Blender Net Inputs:** Raw materials, **unfinished oils**, and blending components processed at refineries, or blended at refineries or petroleum storage terminals to produce finished **petroleum products**. Included are gross inputs of crude oil, natural gas plant liquids, other **hydrocarbon** raw materials, **hydrogen, oxygenates** (excluding **fuel ethanol**), and renewable fuels (including fuel ethanol). Also included are net inputs of unfinished oils, **motor gasoline blending components**, and **aviation gasoline blending components**. Net inputs are calculated as gross inputs minus gross production. Negative net inputs indicate gross inputs are less than gross production. Examples of negative net inputs include reformulated gasoline blendstock for oxygenate blending (RBOB) produced at refineries for shipment to blending terminals, and unfinished oils produced and added to inventory in advance of scheduled maintenance of a refinery crude oil distillation unit.

**Refinery and Blender Net Production:** Liquefied refinery gases, and finished **petroleum products** produced at a **refinery** or petroleum storage terminal blending facility. Net production equals gross production minus gross inputs. Negative net production indicates gross production is less than gross inputs for a finished petroleum product. Examples of negative net production include reclassification of one finished product to another finished product, or reclassification of a finished product to **unfinished oils** or blending components.

**Refinery (Petroleum):** An installation that manufactures finished **petroleum products** from **crude oil, unfinished oils, natural gas liquids**, other hydrocarbons, and **alcohol**.

**Reformulated Motor Gasoline:** See **Motor Gasoline, Reformulated**.

**Refuse Mine:** A surface mine where **coal** is recovered from previously mined coal. It may also be known as a silt bank, culm bank, refuse bank, slurry dam, or dredge operation.

**Refuse Recovery:** The recapture of **coal** from a **refuse mine** or the coal recaptured by that process. The resulting product has been cleaned to reduce the concentration of noncombustible materials.

**Renewable Energy:** Energy obtained from sources that are essentially inexhaustible (unlike, for example, **fossil fuels**, which are in finite supply). Renewable sources of energy include **conventional hydroelectric power, geothermal, solar, wind,** and **biomass**.

**Replacement Fuel:** The portion of any motor fuel that is **methanol, ethanol,** or other **alcohols, natural gas, liquefied petroleum gases, hydrogen,** coal-derived liquid fuels, **electricity** (including electricity from **solar energy**), **ethers, biodiesel,** or any other fuel the Secretary of Energy determines, by rule, is substantially not **petroleum** and would yield substantial energy security benefits and substantial environmental benefits.

**Repressuring:** The injection of gas into **crude oil** or **natural gas** formations to effect greater ultimate recovery.

**Residential Sector:** An **energy-consuming** sector that consists of living quarters for private households. Common uses of energy associated with this sector include **space heating,** water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances. The residential sector excludes institutional living quarters. *Note:* Various EIA programs differ in sectoral coverage—for further explanation see <http://www.eia.gov/neic/datadefinitions/Guideforwebres.htm>. See **End-Use Sectors** and **Energy-Use Sectors**.

**Residual Fuel Oil:** The heavier oils, known as No. 5 and No. 6 fuel oils, that remain after the **distillate fuel oils** and lighter **hydrocarbons** are distilled away in refinery operations. It conforms to ASTM Specifications D396 and D975 and Federal Specification VV-F-815C. No. 5, a residual fuel oil of medium viscosity, is also known as Navy Special and is defined in Military Specification MIL-F-859E, including Amendment 2 (NATO Symbol F-770). It is used in steam-powered vessels in government service and inshore **electric power plants**. No. 6 fuel oil includes Bunker C fuel oil and is used for **electricity generation, space heating, vessel bunkering,** and various industrial purposes.

**Road Oil:** Any heavy **petroleum** oil, including residual asphaltic oil, used as a dust palliative and surface treatment on roads and highways. It is generally produced in six grades, from 0, the most liquid, to 5, the most viscous.

**Rotary Rig:** A machine used for drilling wells that employs a rotating tube attached to a bit for boring holes through rock.

**Royalty Interest:** An interest in a mineral property provided through a royalty contract.

**Shale gas:** **Natural gas** produced from organic (black) shale formations. See **Natural gas**.

**Short Ton (Coal):** A unit of weight equal to 2,000 pounds.

**Solar Energy:** See **Solar Thermal Energy** and **Photovoltaic Energy**.

**Solar Thermal Collector:** A device designed to receive solar radiation and convert it to thermal **energy**. Normally, a solar thermal collector includes a frame, glazing, and an absorber, together with appropriate insulation. The heat collected by the solar thermal collector may be used immediately or stored for later use. Solar collectors are used for **space heating,** domestic hot water heating, and heating swimming pools, hot tubs, or spas.

**Solar Thermal Energy:** The radiant **energy** of the sun that can be converted into other forms of energy, such as heat or **electricity**.

**Space Heating:** The use of **energy** to generate heat for warmth in housing units using space-heating equipment. The equipment could be the main space-heating equipment or secondary space-heating equipment. It does not include the use of energy to operate appliances (such as lights, televisions, and refrigerators) that give off heat as a byproduct.

**Special Naphthas:** All finished **petroleum products** within the **naphtha** boiling range that are used as paint thinners, cleaners, or solvents. Those products are refined to a specified flash point. Special naphthas include all commercial hexane and cleaning solvents conforming to ASTM Specifications D1836 and D484, respectively. Naphthas to be blended or marketed as **motor gasoline** or **aviation gasoline** or that are to be used as **petrochemical feedstocks** or synthetic natural gas (SNG) feedstocks are excluded.

**Spent Liquor:** The liquid residue left after an industrial process; can be a component of waste materials used as fuel.

**Spot Market Price:** See **Spot Price**.

**Spot Price:** The price for a one-time open market transaction for immediate delivery of the specific quantity of product at a specific location where the commodity is purchased “on the spot” at current market rates.

**Station Use:** **Energy** that is used to operate an **electric power plant**. It includes energy consumed for plant lighting, power, and auxiliary facilities, regardless of whether the energy is produced at the plant or comes from another source.

**Steam-Electric Power Plant:** An **electric power plant** in which the **prime mover** is a steam turbine. The steam used to drive the turbine is produced in a boiler where **fossil fuels** are burned.

**Still Gas (Refinery Gas):** Any form or mixture of gases produced in refineries by distillation, cracking, reforming, and other processes. The principal constituents are **methane, ethane, ethylene, normal butane, butylene, propane, propylene**, etc. Still gas is used as a refinery fuel and a **petrochemical feedstock**. The conversion factor is 6 million **Btu** per fuel oil equivalent **barrel**.

**Stocks:** Inventories of fuel stored for future use. See **Crude Oil Stocks, Coal Stocks, and Petroleum Stocks, Primary**.

**Strategic Petroleum Reserve (SPR):** **Petroleum** stocks maintained by the Federal Government for use during periods of major supply interruption.

**Subbituminous Coal:** A **coal** whose properties range from those of **lignite** to those of **bituminous coal** and used primarily as fuel for steam-electric power generation. It may be dull, dark brown to black, soft and crumbly, at the lower end of the range, to bright, jet black, hard, and relatively strong, at the upper end. Subbituminous coal contains 20 to 30 percent inherent moisture by weight. The heat content of subbituminous coal ranges from 17 to 24 million **Btu** per **short ton** on a moist, mineral-matter-free basis. The heat content of subbituminous coal consumed in the United States averages 17 to 18 million Btu per short ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter). See **Coal Rank**.

**Sulfur Dioxide (SO<sub>2</sub>):** A toxic, irritating, colorless gas soluble in water, **alcohol**, and **ether**. Used as a chemical intermediate, in paper pulping and ore refining, and as a solvent.

**Sulfur Hexafluoride (SF<sub>6</sub>):** A colorless gas soluble in **alcohol** and **ether**, and slightly less soluble in water. It is used as a dielectric in electronics. It possesses the highest 100-year **global warming potential** of any gas (23,900).

**Supplemental Gaseous Fuels:** Any gaseous substance introduced into or commingled with **natural gas** that increases the volume available for disposition. Such substances include, but are not limited to, propane-air, **refinery gas**, coke-oven gas, manufactured gas, biomass gas, or air or inerts added for Btu stabilization.

**Synthetic Natural Gas (SNG):** (Also referred to as substitute natural gas.) A manufactured product, chemically similar in most respects to **natural gas**, resulting

from the conversion or reforming of **hydrocarbons** that may easily be substituted for or interchanged with pipeline-quality natural gas.

**Thermal Conversion Factor:** A factor for converting data between physical units of measure (such as **barrels, cubic feet, or short tons**) and thermal units of measure (such as **British thermal units, calories, or joules**); or for converting data between different thermal units of measure. See **Btu Conversion Factor**.

**Total Energy Consumption:** **Primary energy consumption** in the **end-use sectors**, plus **electricity retail sales and electrical system energy losses**.

**Transportation Sector:** An **energy-consuming** sector that consists of all vehicles whose primary purpose is transporting people and/or goods from one physical location to another. Included are automobiles; trucks; buses; motorcycles; trains, subways, and other rail vehicles; aircraft; and ships, barges, and other waterborne vehicles. Vehicles whose primary purpose is not transportation (e.g., construction cranes and bulldozers, farming vehicles, and warehouse tractors and forklifts) are classified in the sector of their primary use. *Note:* Various EIA programs differ in sectoral coverage—for more information see <http://www.eia.gov/neic/datadefinitions/Guideforwebtrans.htm>. See **End-Use Sectors** and **Energy-Use Sectors**.

**Unaccounted-for Crude Oil:** Represents the arithmetic difference between the calculated supply and the calculated disposition of **crude oil**. The calculated supply is the sum of crude oil production plus imports minus changes in crude oil stocks. The calculated disposition of crude oil is the sum of crude oil input to refineries, crude oil exports, crude oil burned as fuel, and crude oil losses.

**Unaccounted-for Natural Gas:** Represents differences between the sum of the components of **natural gas** supply and the sum of components of natural gas disposition. These differences may be due to quantities lost or to the effects of data reporting problems. Reporting problems include differences due to the net result of conversions of flow data metered at varying temperatures and pressure bases and converted to a standard temperature and pressure base; the effect of variations in company accounting and billing practices; differences between billing cycle and calendar-period time frames; and imbalances resulting from the merger of data reporting systems that vary in scope, format, definitions, and type of respondents.

**Underground Natural Gas Storage:** The use of sub-surface facilities for storing **natural gas** that has been transferred from its original location. The facilities are usually hollowed-out salt domes, geological reservoirs (depleted **crude oil** or natural gas fields) or water-bearing sands topped by an impermeable cap rock (aquifer).

**Undiscovered Recoverable Reserves (Crude Oil and Natural Gas):** Those economic resources of **crude oil** and **natural gas**, yet undiscovered, that are estimated to exist in favorable geologic settings.

**Unfinished Oils:** All oils requiring further processing, except those requiring only mechanical blending. Unfinished oils are produced by partial refining of **crude oil** and include **naphthas** and lighter oils, **kerosene** and light gas oils, heavy gas oils, and residuum.

**Unfractionated Stream:** Mixtures of unsegregated **natural gas liquid** components, excluding those in **plant condensate**. This product is extracted from **natural gas**.

**Union of Soviet Socialist Republics (U.S.S.R.):** A political entity that consisted of 15 constituent republics: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. The U.S.S.R. ceased to exist as of December 31, 1991.

**United States:** The 50 States and the District of Columbia. Note: The United States has varying degrees of jurisdiction over a number of territories and other political entities outside the 50 States and the District of Columbia, including Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, Johnston Atoll, Midway Islands, Wake Island, and the Northern Mariana Islands. EIA data programs may include data from some or all of these areas in U.S. totals. For these programs, data products will contain notes explaining the extent of geographic coverage included under the term "United States."

**Uranium:** A heavy, naturally radioactive, metallic element (atomic number 92). Its two principally occurring isotopes are uranium-235 and uranium-238. Uranium-235 is indispensable to the nuclear industry because it is the only isotope existing in nature, to any appreciable extent, that is fissionable by thermal neutrons. Uranium-238 is also important because it absorbs neutrons to produce a radioactive isotope that subsequently decays to the isotope plutonium-239, which also is fissionable by thermal neutrons.

**Uranium Concentrate:** A yellow or brown powder obtained by the milling of **uranium ore**, processing of in situ leach mining solutions, or as a byproduct of phosphoric acid production. See **Uranium Oxide**.

**Uranium Ore:** Rock containing **uranium** mineralization in concentrations that can be mined economically, typically one to four pounds of U<sub>3</sub>O<sub>8</sub> (**uranium oxide**) per ton or 0.05 percent to 0.2 percent U<sub>3</sub>O<sub>8</sub>.

**Uranium Oxide:** **Uranium concentrate** or **yellowcake**. Abbreviated as U<sub>3</sub>O<sub>8</sub>.

**Uranium Resource Categories:** Three categories of uranium resources defined by the international community to reflect differing levels of confidence in the existence of the resources. Reasonably assured resources (RAR), estimated additional resources (EAR), and speculative resources (SR) are described below.

*Reasonably assured resources (RAR):* **Uranium** that occurs in known mineral deposits of such size, grade, and configuration that it could be recovered within the given production cost ranges, with currently proven mining and processing technology. Estimates of tonnage and grade are based on specific sample data and measurements of the deposits and on knowledge of deposit characteristics. *Note:* RAR corresponds to DOE's uranium reserves category.

*Estimated additional resources (EAR):* **Uranium** in addition to RAR that is expected to occur, mostly on the basis of geological evidence, in extensions of well-explored deposits, in little-explored deposits, and in undiscovered deposits believed to exist along well-defined geological trends with known deposits. This uranium can subsequently be recovered within the given cost ranges. Estimates of tonnage and grade are based on available sampling data and on knowledge of the deposit characteristics, as determined in the best-known parts of the deposit or in similar deposits. *Note:* EAR corresponds to DOE's probable potential resources category.

*Speculative resources (SR):* **Uranium** in addition to EAR that is thought to exist, mostly on the basis of indirect evidence and geological extrapolations, in deposits discoverable with existing exploration techniques. The location of deposits in this category can generally be specified only as being somewhere within given regions or geological trends. The estimates in this category are less reliable than estimates of RAR and EAR. *Note:* SR corresponds to the combination of DOE's possible potential resources and speculative potential resources categories.

**Useful Thermal Output:** The thermal **energy** made available in a **combined-heat-and-power** system for use in any industrial or commercial process, heating or cooling application, or delivered to other end users, i.e., total thermal energy made available for processes and applications other than **electricity generation**.

**Vented Natural Gas:** See **Natural Gas, Vented**.

**Vessel Bunkering:** Includes sales for the fueling of commercial or private boats, such as pleasure craft, fishing boats, tugboats, and ocean-going vessels, including vessels operated by oil companies. Excluded are volumes sold to the U.S. Armed Forces.

**Waste:** See **Biomass Waste** and **Non-Biomass Waste**.

**Waste Coal:** Usable material that is a byproduct of previous **coal** processing operations. Waste coal is usually composed of mixed coal, soil, and rock (mine waste). Most waste coal is burned as-is in unconventional fluidized-bed combustors. For some uses, waste coal may be partially cleaned by removing some extraneous noncombustible constituents. Examples of waste coal include fine coal, coal obtained from a refuse bank or slurry dam, **anthracite culm**, bituminous gob, and lignite waste.

**Watt (W):** The unit of electrical power equal to one ampere under a pressure of one volt. A watt is equal to 1/746 horsepower.

**Watt-hour (Wh):** The **electric energy** unit of measure equal to one **watt** of power supplied to, or taken from, an electric circuit steadily for one hour.

**Wax:** A solid or semi-solid material at 77 degrees Fahrenheit consisting of a mixture of **hydrocarbons** obtained or derived from **petroleum** fractions, or through a Fischer-Tropsch type process, in which the straight chained paraffin series predominates. This includes all marketable wax, whether crude or refined, with a congealing point (ASTM D 938) between 80 (or 85) and 240 degrees Fahrenheit and a maximum oil content (ASTM D 3235) of 50 weight percent.

**Well:** A hole drilled in the Earth for the purpose of (1) finding or producing **crude oil** or **natural gas**; or (2) producing services related to the production of crude oil or natural gas. See **Completion (Crude Oil/Natural Gas Production)**, **Crude Oil Well**, **Development Well**, **Dry Hole**, **Exploratory Well**, and **Natural Gas Well**.

**Wellhead:** The point at which the **crude oil** (and/or **natural gas**) exits the ground. Following historical precedent, the volume and price for crude oil production are labeled as “wellhead,” even though the cost and volume are now generally

measured at the lease boundary. In the context of domestic crude price data, the term “wellhead” is the generic term used to reference the production site or lease property.

**Wellhead Price:** The value of **crude oil** or **natural gas** at the mouth of the well. See **Natural Gas Wellhead Price**.

**Western Europe:** Includes Austria, Belgium, Bosnia and Herzegovina, Croatia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Macedonia (The Former Yugoslav Republic of), Malta, Netherlands, Norway, Portugal, Serbia and Montenegro, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

**Wind Energy:** Kinetic **energy** present in wind motion that can be converted to mechanical energy for driving pumps, mills, and electric power **generators**.

**Wood and Wood-Derived Fuels:** Wood and products derived from wood that are used as fuel, including round wood (cord wood), limb wood, wood chips, bark, sawdust, forest residues, charcoal, paper pellets, railroad ties, utility poles, **black liquor**, red liquor, sludge wood, spent sulfite liquor, and other wood-based solids and liquids.

**Working Gas:** The volume of gas in the reservoir that is in addition to the cushion or **base gas**. It may or may not be completely withdrawn during any particular withdrawal season. Conditions permitting, the total working capacity could be used more than once during any season.

**Yellowcake:** A natural **uranium concentrate** that takes its name from its color and texture. Yellowcake typically contains 70 to 90 percent  $U_3O_8$  (**uranium oxide**) by weight. It is used as feedstock for **uranium** fuel enrichment and fuel pellet fabrication.