Section 7. Consumption Adjustments for Calculating Expenditures

Expenditures developed in the EIA State Energy Data System (SEDS) are calculated by multiplying the price estimates by the SEDS consumption estimates. The consumption estimates are adjusted to remove process fuel, intermediate petroleum products, electricity exports, and other consumption that has no direct fuel costs, i.e., hydroelectric, geothermal, wind, solar and photovoltaic energy sources, and some wood and waste.

Almost all aspects of energy production, processing, and distribution consume energy as an inherent part of those activities. SEDS industrial and transportation sector consumption estimates include energy consumed in the process of providing energy to the end-use consumer and are called "process fuel." Familiar examples include energy sources used in drilling for oil and gas and transporting natural gas and petroleum by pipeline. Another "process fuel" is the energy used in generating and delivering electricity to end users. Energy products that are subsequently incorporated into another energy product for end-use consumption are called "intermediate products." Motor gasoline blending components are familiar examples of intermediate products that are consumed as part of the finished motor gasoline sold at service stations and other outlets.

Process fuel and intermediate products are not purchased by the end user and, therefore, do not have prices. Although the end user does not consume either process fuel or intermediate products directly, he does pay for them, because the cost to the processor or distributor is passed on to the end user in the price of the final end-user product. If their use was left in the consumption estimates and was assigned prices, the expenditures would be counted twice, first as paid by the "processor" (producer, processor, or transporter) and again as included in the price to the end user.

Some renewable energy sources are not purchased. These include hydroelectric, geothermal, wind, photovoltaic, and solar thermal energy. The consumption of these sources, which are measured in SEDS as kilowatthours of electricity produced, are not included in the State energy expenditure estimates since there are no "fuel costs" involved. Wood and waste can be purchased or obtained at no cost. Wood consumption estimates in the residential sector, and wood and waste in the commercial and industrial sectors are adjusted in SEDS to remove estimated quantities that were obtained at no cost.

To estimate energy expenditures in the price and expenditure tables, the consumption of process fuel, intermediate products, and some of the renewable energy sources are subtracted from the end-use sector in which they are included in SEDS, either the residential, commercial, industrial, or transportation sector, and there are no prices associated with them.

Process fuel consumption adjustments include:

1. Fuel (petroleum, natural gas, steam coal) and electricity consumed at refineries
2. Crude oil lease, plant, and pipeline fuel
3. Natural gas lease and plant fuel
4. Natural gas pipeline fuel
5. Electrical system energy losses (i.e., energy consumed in the generation, transmission, and distribution of electricity)
6. Energy losses and co-products from the production of fuel ethanol

Intermediate product consumption adjustments include:

1. Aviation gasoline blending components
2. Motor gasoline blending components
3. Natural gasoline (1970 through 1983)
4. Pentanes plus (1984 forward)
5. Plant condensate (1970 through 1983)
6. Unfinished oils
7. Unfractionated streams (1970 through 1983)

Starting in 1984, natural gasoline (including isopentane) and plant condensate are reported together as the new product, pentanes plus, and the components of unfractionated streams are reported separately under liquefied petroleum gases.

Renewable energy consumption adjustments include:

1. Photovoltaic and solar thermal energy in the residential (including commercial) sector and electric power sector;
2. Geothermal energy in the residential, commercial, industrial, and electric power sectors;
3. Electricity generated from hydropower in the commercial, industrial, and electric power sectors; and
4. Electricity generated from wind energy in the electric power sector; and
5. Estimated portions of wood consumed in the residential sector, and wood and waste in the commercial and industrial sectors that were obtained at no cost.

In addition, while consumption of supplemental gaseous fuels (SGF) are removed from SEDS total consumption estimates to prevent double-counting in both natural gas and the fossil fuels from which they are derived, prices and expenditures of SGF cannot be separately identified and are therefore not adjusted for double-counting in total energy average prices and total energy expenditure calculations.

Table TN56 shows the quantities of energy, by State, removed from SEDS consumption to calculate expenditures for 2010. Table TN57 shows the adjustments made to SEDS national consumption estimates for 1970 through 2010 to derive the net consumption data used to calculate expenditures.

State adjustment estimates from 1970 forward are available in the SEDS Internet data file, http://www.eia.gov/state/seds/sep_fuel/html/csv/fuel_adjust_consum.csv.

Adjustment Procedures

Hydroelectricity, Geothermal, Wind, Photovoltaic, and Solar Thermal Energy. Electricity generated from hydropower and geothermal, wind, photovoltaic, and solar thermal energy has no fuel cost. Operation and maintenance costs associated with these energy sources are included indirectly in the prices of the electricity sold by power producers. Therefore, use of these renewable sources for electricity generation is removed from the expenditure calculations. Direct use of geothermal and solar energy also has no fuel cost and is omitted from SEDS energy expenditure calculations.

Residential Wood. Some residential wood is purchased and some acquired at no cost. Based on responses to the Form EIA-457, "1980 Residential Energy Consumption Survey," Census division percentages of wood purchased were developed and applied to the residential wood consumption in each State in the divisions in 1970 through 1989. Based on responses to the Form EIA-457, "1993 Residential Energy Consumption Survey," Census region percentages were developed and applied to the residential wood consumption of the States in each region in 1990 forward. Table TN58 shows the percentage of purchased wood for each Census division or region.

Commercial Wood and Waste. Some commercial wood and waste is purchased and some acquired at no cost. Conventional commercial wood purchased was estimated using the same percentages used for the residential sector (see Table TN58). Wood and waste acquired at no cost by commercial combined heat-and-power facilities was estimated using the U.S. annual average percentages of wood and percentages of waste acquired at no cost by the electric power sector.

Industrial Wood and Waste. The cost of wood and waste products used for energy vary widely from more expensive woods to free industrial waste products. Industrial consumption is broken into two segments, manufacturing industries and combined heat and power (CHP) facilities in order to estimate quantities received at no cost.

Adjustments to manufacturing wood and waste consumption in 1994 forward are based on information gathered on the Form EIA-846, "1994 Manufacturing Energy Survey (MECS)." Adjustments to manufacturing consumption in 1980 through 1993 are based on information gathered on the Form EIA-846, "1991 Manufacturing Energy Survey." Adjustments to industrial wood and waste consumption in 1970 through 1979 are based on the 1980 average ratios for each State. The 1991 and 1994 MECS report the quantities consumed and quantities purchased of five types of wood and waste in each of four (MECS 1991) or five (MECS 1994) SIC categories of industries. The two quantity series are used to calculate SIC category average percentages of wood and waste obtained at

Table TN56. Energy Consumption Adjustments for Calculating Expenditures by State, 2010
(Billion Btu)

State	Refinery Use							
	Distillate Fuel Oil	Residual Fuel Oil	LPG	Other Petroleum [a]	Natural Gas [b]	Coal	Electricity [c]	Total
AK	167	37	22	26,121	35,171	—	238	61,756
AL	63	5	2	10,633	22,940	—	13,725	47,368
AR	87	—	2	9,037	12,257	—	7,117	28,499
AZ	—	—	—	—	—	—	—	—
CA	834	104	2,527	217,184	107,803	—	8,873	337,326
CO	2	—	257	12,126	13,767	—	2,670	28,822
CT	—	—	—	—	—	—	—	—
DC	—	—	—	—	—	—	—	—
DE	—	—	—	6,727	—	—	—	6,727
FL	—	—	—	—	—	—	—	—
GA	55	150	24	1,239	8,644	205	3,947	14,265
HI	22	4,593	21	14,603	48	—	661	19,948
IA	—	—	—	—	—	—	—	—
ID	—	—	—	—	—	—	—	—
IL	14	1	1,039	105,503	19,628	—	5,068	131,254
IN	9	33	129	52,456	21,151	—	5,340	79,118
KS	12	17	1,274	37,688	9,485	—	1,222	49,698
KY	14	18	546	26,539	8,344	—	5,164	40,625
LA	185	196	128	398,798	146,379	—	11,958	557,644
MA	—	—	—	—	—	—	—	—
MD	—	—	—	—	—	—	—	—
ME	—	—	—	—	—	—	—	—
MI	8	66	78	11,813	11,566	—	3,537	27,068
MN	16	52	195	38,376	12,009	—	2,615	53,263
MO	—	—	—	—	—	—	—	—
MS	40	1	2	39,488	16,792	—	6,664	62,987
MT	1	55	21	22,622	1,503	—	685	24,887
NC	—	—	—	—	—	—	—	—
ND	14	50	61	7,421	2,518	—	442	10,506
NE	—	—	—	—	—	—	—	—
NH	—	—	—	—	—	—	—	—
NJ	19	33	4	56,749	2,859	—	1,072	60,735
NM	26	2	11	14,877	14,123	—	2,826	31,865
NV	245	—	120	177	1,524	—	2,372	4,438
NY	—	—	—	—	—	—	—	—
OH	14	142	133	61,368	20,870	—	6,092	88,620
OK	6	199	35	56,039	19,224	—	1,738	77,241
OR	—	—	—	—	—	—	—	—
PA	64	266	119	93,901	12,050	331	5,780	112,510
RI	—	—	—	—	—	—	—	—
SC	—	—	—	—	—	—	—	—
SD	—	—	—	—	—	—	—	—
TN	5	3	24	21,166	7,026	—	3,318	31,541
TX	367	66	1,054	697,715	214,647	—	42,321	956,170
UT	1	1	32	20,758	3,844	—	1,550	26,186
VA	—	—	—	2,417	—	—	—	2,417
VT	—	—	—	—	—	—	—	—
WA	205	—	377	66,130	10,078	—	4,793	81,584
WI	9	54	100	3,858	9,201	—	2,690	15,912
WV	55	17	2	1,771	2,373	152	1,478	5,847
WY	2	1	13	19,544	6,799	—	1,772	28,132
US	2,563	6,161	8,350	2,154,847	774,623	688	157,727	3,104,959

See footnotes at end of table.

Table TN56. Energy Consumption Adjustments for Calculating Expenditures by State, 2010 (Continued)

(Billion Btu)

State	Residential		Commercial		Industrial						Transportation	Electrical System Energy Losses	Total
	Geothermal and Solar/PV [d]	Wood	Geothermal and Hydro-electricity	Wood and Waste	Crude Oil Lease, Plant, and Pipeline Fuel	Natural Gas Lease and Plant Fuel	Hydro-electricity	Geothermal	Wood and Waste	Ethanol Production Losses [e]	Natural Gas Pipeline Fuel		
AK	85	522	74	87	—	250,453	—	—	13	—	3,300	43,488	359,779
AL	225	2,739	—	458	—	22,960	—	42	20,538	—	22,468	613,448	730,246
AR	884	3,345	—	566	—	5,912	—	7	8,230	—	9,615	348,868	405,927
AZ	5,934	4,734	42	798	—	19	—	249	1,058	3,218	15,705	478,384	510,142
CA	32,405	14,688	621	3,134	—	68,748	—	1,226	7,566	3,949	9,950	1,682,837	2,162,449
CO	770	3,878	194	648	—	92,728	—	268	265	7,313	14,472	399,892	549,248
CT	1,719	956	—	160	—	—	—	—	3,153	—	6,910	186,170	199,069
DC	9	21	—	4	—	—	—	—	—	—	216	92,067	92,316
DE	484	352	—	59	—	—	—	—	15	—	143	90,860	98,641
FL	55,852	1,318	1,840	292	—	4,621	—	—	13,027	—	23,350	1,503,677	1,603,977
GA	877	3,879	3	674	—	—	219	4	15,547	5,873	8,656	1,027,343	1,077,339
HI	3,549	100	5	391	—	—	408	2	1,108	—	2	64,607	90,119
IA	515	2,901	722	559	—	—	—	—	10,065	203,320	11,106	340,464	569,652
ID	158	4,609	538	770	—	—	—	764	3,603	3,159	7,846	171,131	192,578
IL	4,189	4,241	—	709	—	50	—	—	7,584	72,488	20,016	1,088,245	1,328,775
IN	3,952	8,545	722	2,025	—	287	—	—	5,951	45,177	8,787	864,090	1,018,654
KS	202	2,660	754	445	—	15,863	—	—	526	25,414	24,773	342,009	462,343
KY	1,914	6,070	754	1,014	—	6,594	—	—	3,854	2,071	14,032	734,751	811,679
LA	1,077	886	754	148	—	187,304	—	42	19,462	88	48,016	577,279	1,392,701
MA	583	1,382	765	231	—	—	46	—	3,832	—	3,955	334,768	345,561
MD	753	2,733	—	588	—	—	—	—	1,783	—	2,845	515,315	524,017
ME	334	2,332	—	656	—	—	6,883	—	7,730	—	1,821	52,146	71,902
MI	5,047	17,030	741	3,426	—	8,440	274	—	9,471	15,015	25,311	790,553	902,376
MN	1,412	7,149	—	1,274	—	—	1,241	—	10,063	64,766	15,619	472,056	626,843
MO	396	12,393	—	2,071	—	—	—	—	3,488	15,269	5,851	654,895	694,364
MS	55	2,888	783	483	—	11,771	—	42	2,641	3,159	28,622	326,859	440,289
MT	98	3,424	126	572	—	4,113	—	71	1,225	—	7,531	101,684	143,731
NC	1,410	9,191	113	1,536	—	—	15	—	6,633	—	8,118	1,026,794	1,053,810
ND	520	243	393	41	—	8,490	—	—	622	20,334	14,501	99,562	155,213
NE	352	1,526	851	271	—	332	—	—	2,214	98,745	7,358	234,861	346,511
NH	156	1,283	—	214	—	—	50	—	1,303	—	255	73,195	76,456
NJ	3,611	546	—	471	—	—	—	—	3,458	—	5,499	587,071	661,391
NM	380	5,110	63	854	—	86,104	—	243	595	1,755	8,775	161,102	296,846
NV	2,207	1,106	690	185	—	4	—	419	441	—	3,103	188,174	200,766
NY	2,647	19,452	821	3,550	—	586	562	—	7,294	6,260	15,477	982,420	1,039,068
OH	2,987	14,045	742	2,347	—	800	—	—	10,182	22,123	16,360	1,161,251	1,319,457
OK	74	1,895	—	317	—	64,653	—	—	5,259	—	31,551	413,943	594,933
OR	2,796	5,622	596	972	—	31	—	167	7,499	2,340	6,445	283,966	310,434
PA	2,613	5,957	722	1,268	—	21,447	—	—	14,438	5,899	49,217	1,055,516	1,269,588
RI	94	234	—	39	—	—	—	—	29	—	1,502	35,731	37,628
SC	686	2,291	10	383	—	—	—	—	14,442	—	3,530	616,076	637,418
SD	459	777	1,013	130	—	565	—	253	48	59,437	5,835	86,611	155,128
TN	255	6,859	—	1,146	—	370	—	—	9,882	10,477	10,243	807,263	878,035
TX	2,578	10,927	788	1,896	—	341,565	—	—	9,681	14,625	82,366	2,472,341	3,892,937
UT	149	1,094	366	183	—	24,748	—	337	238	—	10,833	199,393	263,528
VA	1,739	9,078	783	2,140	—	6,277	117	—	8,710	—	10,348	883,547	925,157
VT	192	1,512	—	253	—	—	247	—	1,317	—	16	31,713	35,250
WA	328	6,438	1,423	1,076	—	—	28	—	12,612	—	7,835	661,227	772,551
WI	1,019	16,758	6	2,858	—	—	1,318	—	25,967	29,133	3,003	524,733	620,707
WV	121	5,554	3	928	—	13,087	4,862	—	737	—	23,226	223,299	277,664
WY	72	1,105	463	185	—	63,482	—	66	16	380	19,915	127,110	240,926
US	150,922	244,378	19,285	45,483	—	1,312,405	16,270	4,200	305,415	741,786	686,231	26,834,784	33,466,119

[a] In this table, "other petroleum" consists of: still gas and petroleum coke consumed as process fuel; and aviation gasoline blending components, motor gasoline blending components, pentanes plus, and unfinished oils used as intermediate products.
[b] Natural gas including supplemental gaseous fuels.
[c] Electricity is converted at the rate of 3,412 Btu per kilowatthour.
[d] Solar thermal and photovoltaic energy. Includes small amounts consumed by the commercial sector that cannot be separately identified.
[e] Energy losses and co-products from the production of fuel ethanol without denaturant.
— = No consumption. NA = Not available.
Source: EIA, State Energy Data System.

Table TN57. Energy Consumption Adjustments for Calculating Expenditures, 1970 Through 2010
(Trillion Btu)

Year	Total (Gross) Consumption	Adjustments														Consumption used in Expenditure Calculations [c]
		Residential		Commercial		Industrial							Transportation	Electrical System Energy Losses	Total	
		Geothermal and Solar/PV [a]	Wood	Geothermal and Hydroelectricity	Wood and Waste	Refinery Use	Crude Oil Lease, Plant, and Pipeline Fuel	Natural Gas Lease and Plant Fuel	Hydroelectricity	Geothermal	Wood and Waste	Ethanol Production Losses [b]	Natural Gas Pipeline Fuel			
1970	67,742	—	298	—	6	2,714	—	1,442	34	—	788	—	740	11,497	R 17,519	50,222
1971	69,187	—	284	—	5	R 2,693	—	1,456	34	—	804	—	761	12,096	R 18,133	51,053
1972	72,705	—	282	—	5	R 2,846	—	1,497	34	—	859	—	786	13,040	R 19,349	R 53,356
1973	75,755	—	263	—	5	R 3,009	—	1,539	35	—	900	—	745	13,877	R 20,372	R 55,383
1974	73,948	—	275	—	5	R 2,982	—	1,520	33	—	896	—	684	14,082	20,478	53,470
1975	R 71,987	—	316	—	6	R 2,883	—	1,434	32	—	822	—	595	14,304	R 20,392	R 51,594
1976	76,002	—	357	—	7	R 2,906	—	1,679	33	—	942	—	559	15,154	R 21,638	R 54,365
1977	77,988	—	402	—	8	R 3,007	—	1,706	33	—	989	—	544	15,898	R 22,586	R 55,402
1978	80,022	—	462	—	9	R 2,937	—	1,694	32	—	1,081	—	541	16,680	R 23,436	R 56,586
1979	80,882	—	543	—	10	R 3,077	—	1,534	34	—	1,086	—	613	16,879	23,775	R 57,108
1980	R 78,093	—	627	—	16	3,052	—	1,058	33	—	1,283	—	650	17,178	23,897	54,347
1981	76,142	—	651	—	16	R 2,203	—	959	33	—	1,354	6	660	17,161	23,043	53,272
1982	73,059	—	724	—	16	R 2,088	—	1,144	33	—	1,310	16	614	16,835	22,780	R 50,423
1983	72,934	—	722	—	16	2,121	140	1,010	33	—	1,480	29	505	17,262	R 23,319	R 49,746
1984	76,571	—	733	—	16	2,254	135	1,113	33	—	1,510	35	545	17,790	24,165	52,515
1985	76,464	—	755	—	18	R 2,045	128	1,001	33	—	1,503	42	521	18,164	R 24,211	R 52,378
1986	76,639	—	688	—	20	2,285	103	954	33	—	1,478	48	501	18,135	24,247	R 52,506
1987	79,006	—	634	—	22	2,485	72	1,194	33	—	1,472	55	538	18,558	R 25,063	54,041
1988	R 82,760	—	676	—	24	2,696	85	1,134	33	—	1,531	55	633	19,478	26,346	R 56,514
1989	84,777	57	684	3	73	2,710	59	1,103	28	2	684	56	650	20,850	R 26,958	57,923
1990	84,507	61	337	4	59	R 2,802	51	1,269	31	2	716	49	682	21,255	27,319	R 57,306
1991	R 84,436	63	353	4	60	2,668	39	1,164	30	2	685	56	621	21,444	27,190	57,352
1992	85,788	66	371	4	66	2,954	27	1,208	31	2	689	64	608	21,309	R 27,399	58,502
1993	87,451	68	308	4	68	R 2,877	21	1,199	30	2	642	74	643	22,097	28,034	59,531
1994	89,118	69	292	5	66	2,991	19	1,153	62	3	662	82	706	22,400	R 28,511	60,712
1995	91,092	71	292	6	66	R 2,914	15	1,253	55	3	445	86	723	23,214	29,142	62,055
1996	94,091	72	303	7	77	3,203	14	1,280	61	3	495	61	734	23,916	30,226	63,970
1997	94,750	72	233	7	80	3,196	5	1,251	58	3	493	80	781	24,167	30,426	64,423
1998	95,030	72	207	8	71	3,042	—	1,212	55	3	493	86	657	25,103	R 31,008	R 64,118
1999	R 96,632	71	R 213	9	66	R 3,050	—	1,103	49	4	495	90	663	25,689	R 31,501	R 65,224
2000	R 98,806	69	R 229	9	67	R 2,950	—	R 1,181	42	4	459	99	R 661	26,405	R 32,175	R 66,716
2001	96,142	68	210	9	46	3,152	—	1,139	33	5	437	108	641	25,664	31,510	64,713
2002	R 97,650	68	213	9	43	3,027	—	1,135	39	5	312	130	683	26,210	31,874	R 65,840
2003	97,977	70	225	12	46	R 3,141	—	1,147	43	3	315	169	609	26,151	31,931	66,112
2004	R 100,170	71	230	13	46	3,099	—	1,123	33	4	536	203	582	26,620	32,558	R 67,670
2005	R 100,277	74	249	14	49	R 3,106	—	1,138	32	4	335	230	601	27,162	32,996	R 67,341
2006	R 99,593	82	R 221	15	R 46	3,187	—	1,171	29	4	R 277	285	602	26,919	R 32,837	R 66,818
2007	R 101,273	92	R 239	15	R 46	3,157	—	R 1,257	16	5	R 285	376	R 640	27,548	R 33,674	R 67,672
2008	R 99,248	R 107	262	15	47	2,961	—	1,249	17	5	R 283	531	667	27,257	R 33,401	R 65,931
2009	R 94,531	122	250	17	49	R 2,900	—	1,304	18	4	R 481	616	R 689	25,822	R 32,273	R 62,348
2010	97,711	151	244	19	45	3,105	—	1,312	16	4	305	742	686	26,835	33,466	64,336

[a] Solar thermal and photovoltaic energy. Includes small amounts consumed by the commercial sector that cannot be separately identified. See Section 5 of the Technical Notes for explanation of estimation methodology.

[b] Energy losses and co-products from the production of fuel ethanol without denaturant.

[c] Includes adjustments of supplemental gaseous fuels and processed fuels not shown on this table.

— = No consumption. R = Revised data.

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

Sources: EIA, State Energy Data System. All data are available via the full-precision data file (CSV) at http://www.eia.gov/state/seds/sep_fuel/html/csv/fuel_adjust_consum.csv.

Table TN58. Percentage of Purchased Wood in Residential Wood Consumption

1960–1989		1990 Forward	
Census Division	**Percent**	**Census Region**	**Percent**
New England	40%	Northeast	61%
MIddle Atlantic	29%	Midwest	32%
East North Central	18%	South	39%
West North Central	17%	West	42%
South Atlantic	30%		
East South Central	18%		
West South Central	38%		
Mountain	12%		
Pacific	31%		

no cost. These percentages are applied to the estimated consumption in those SIC categories in each State to estimate the State's manufacturing uncosted wood and waste.

Estimates of wood and waste obtained at no charge by industrial CHP facilities for 1989 forward are estimated using the U.S. annual average percentages of wood and percentages of waste acquired at no cost by the electric power sector.

Each State's industrial wood and waste consumption quantities acquired at no cost are the sum of the estimated manufacturing and CHP facilities' quantities for each year.

Refinery Fuel. Petroleum refinery consumption of distillate fuel, residual fuel, liquefied petroleum gases, petroleum coke, still gas, natural gas, steam coal, and electricity is estimated for each State and subtracted from the State's industrial sector total of each energy source.

Refineries' consumption of each fuel is available in the data sources by State or group of States (1970 through 1980) and by Petroleum Administration for Defense (PAD) districts or subdistricts (1981 forward). Where State-level data for the individual fuels are not available, they are estimated by allocating the group or district's values to the States with operating refineries within that group or district. The refining States' industrial sector consumption of each fuel is added together for each group or district to derive that group or district's industrial sector consumption subtotal. Then each State's portion of the group or district's refinery fuel consumption is calculated in proportion to its share of the group or district's industrial sector consumption subtotal.

In some cases, the estimated State refinery fuel consumption of residual fuel or LPG exceeds the estimate of the total industrial sector consumption of that fuel for that State. For 1970 through 2006, the refinery fuel consumption for the PAD district or subdistrict, group of States, or individual State is reduced until each State has positive industrial consumption. The excess refinery fuel is reallocated to a different PAD district or subdistrict, group of States or individual State as shown in Table TN59. When this adjustment involves a PAD district or subdistrict or group value, the refineries' consumption estimates for all States within the PAD district or subdistrict or group are recalculated using these new values. From 2007 forward, this adjustment is no longer made.

Because crude oil consumption is not an individual fuel in SEDS for 1970 through 1980, the small amounts of crude oil that were used at refineries during those years were allocated to residual and distillate fuels consumed at refineries. The allocation from crude oil refinery use to residual and distillate fuels refinery use was made according to each fuel's share of the total crude oil used directly (including losses) as residual and distillate fuels from the EIA *Petroleum Supply Annual, Volume 1,* of each year, Table 2.

Refinery consumption of still gas, excluding still gas consumed as petrochemical feedstocks, is subtracted from the SEDS industrial sector total for 1970 through 1985. Beginning in 1986, EIA data series no longer report refinery fuel and feedstock use separately, and all industrial still gas consumption is removed.

Refineries' consumption of coal is withheld in the data source for 1999 and 2000 and unpublished estimates developed by the data source office are used for 1999 and 2000. For 2001 and 2002, the U.S. values for refinery consumption of coal are published although the PAD district values are withheld. The PAD district values for 2001 and 2002 are estimated by applying the PAD districts' percentages of the U.S. total in 2000 to the U.S. totals for 2001 and 2002.

Intermediate Products. Aviation gasoline blending components, motor gasoline blending components, natural gasoline (1970 through 1983), pentanes plus (1984 forward), plant condensate (1970 through 1983), unfinished oils, and unfractionated streams (1970 through 1983) are used at

Table TN59. Reallocations of Excess Refinery Fuel Consumption, 1970 Through 2006

Year	Fuel	Thousand Barrels	Excess in:	Reallocated to:
1971	Residual Fuel Oil	294	Kansas	Oklahoma
1973	Residual Fuel Oil	45	Group 4: Kentucky, Tennessee	Illinois
1979	LPG	173	Montana	Wyoming
1985	Residual Fuel Oil	212	PAD District 4	PAD District 5
1986	Residual Fuel Oil	403	PAD District 4	PAD District 5
1987	Residual Fuel Oil	497	PAD District 4	PAD District 5
1988	Residual Fuel Oil	305	PAD District 4	PAD District 5
1989	Residual Fuel Oil	381	PAD District 4	PAD District 5
1990	Residual Fuel Oil	336	PAD District 4	PAD District 5
1991	Residual Fuel Oil	378	PAD District 4	PAD District 5
1992	Residual Fuel Oil	361	PAD District 4	PAD District 5
1996	Residual Fuel Oil	184	PAD District 4	PAD District 5
1997	Residual Fuel Oil	100	PAD District 4	PAD District 5
1998	Residual Fuel Oil	82	PAD District 4	PAD District 5
1999	Residual Fuel Oil	142	PAD District 4	PAD District 5
2000	Residual Fuel Oil	224	PAD District 4	PAD District 5
2001	Residual Fuel Oil	149	PAD District 4	PAD District 2
2001	Residual Fuel Oil	95	PAD District 5	PAD District 2
2001	Residual Fuel Oil	281	PAD District 5	PAD District 1
2002	Residual Fuel Oil	33	PAD District 5	PAD District 3
2002	Residual Fuel Oil	67	PAD District 5	PAD District 4
2003	Residual Fuel Oil	228	PAD District 5	PAD District 3
2004	Residual Fuel Oil	296	PAD District 5	PAD District 3
2005	LPG	198	PAD District 5	PAD District 4

Source: EIA calculations based on data from the State Energy Data System and the *Petroleum Supply Annual*.

refineries and blending plants to make end-use petroleum products, particularly motor gasoline. Accordingly, consumption of these products is completely removed.

Crude Oil Lease, Plant, and Pipeline Fuel. Industrial crude oil is assumed to be used as lease, plant, and pipeline fuel. Because these are process fuel uses, this crude oil is removed from SEDS industrial sector consumption.

Natural Gas Lease and Plant Fuel. Natural gas consumed as lease and plant fuel is process fuel and is subtracted from SEDS industrial sector natural gas totals by State and year.

Natural Gas Pipeline Fuel. Most of the natural gas consumed in the transportation sector is used to power pipelines. As such, it is a process fuel and is subtracted from SEDS consumption in order to calculate expenditures.

Electricity Exports. Electricity exported to Canada and Mexico are excluded from the calculations of U.S. domestic energy expenditures and U.S. average energy prices.

Electrical System Energy Losses. The amount of energy lost during generation, transmission, and distribution of electricity (including plant use and unaccounted for electrical energy) is process fuel and is subtracted from sectoral energy consumption estimates used in the price and expenditure tables. The energy losses are "paid for" when residential, commercial, industrial, and transportation sector consumers buy the electricity produced by the electric power sector.

Energy Losses and Co-products from the Production of Fuel Ethanol. Fuel ethanol is produced from corn and other biomass inputs that are not included elsewhere as energy sources. The difference in heat content of the feedstock and the fuel ethanol is considered process fuel and is subtracted from sector energy consumption estimates used in the price and expenditure tables.

Data Sources

Capacity of Petroleum Refineries. 1982 forward: EIA, *Petroleum Supply Annual, Volume 1*, http://www.eia.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html tables titled "Number and Capacity of Operable Petroleum Refineries," columns titled, "Crude Capacity, Barrels per Calendar Day, Operating" (1982–1985), and "Atmospheric Crude Oil Distillation Capacity, Barrels per Calendar Day, Operating" (1986 forward).

1979–1981: EIA, Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories*, table titled "Number and Capacity of Petroleum

Refineries," column heading, "Crude Capacity, Barrels per Calendar Day, Operating."

1978: EIA, Energy Data Reports, *Petroleum Refineries in the United States and Puerto Rico*, table titled "Number and Capacity of Petroleum Refineries," column heading, "Crude Capacity, Barrels per Calendar Day, Operating."

1970–1977: Bureau of Mines, U.S. Department of the Interior, Mineral Industry Surveys, *Petroleum Refineries in the United States and Puerto Rico*, table titled "Number and Capacity of Petroleum Refineries," column heading, "Crude Capacity, Barrels per Calendar Day, Operating."

Fuel Consumed at Refineries. 1981–1994, 1996, and 1998 forward: EIA, *Petroleum Supply Annual, Volume 1*, http://www.eia.gov/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/psa_volume1.html table titled "Fuels Consumed at Refineries by PAD District." Data for 1991 are from a separately published EIA *Errata* dated November 10, 1992, GPO Stock No. 061-003-00758-9.

1995, 1997: EIA, *Petroleum Supply Annual, Volume 1*, table titled "Fuels Consumed at Refineries by PAD District." Data for coal, electricity, and natural gas are not published, and values for the previous year are repeated.

1976–1980: EIA, Energy Data Reports, *Crude Petroleum, Petroleum Products, and Natural Gas Liquids*, table titled "Fuels Consumed for All Purposes at Refineries in the United States, by States."

1970–1975: Bureau of Mines, U.S. Department of the Interior, Mineral Industry Surveys, *Crude Petroleum, Petroleum Products, and Natural Gas Liquids*, table titled "Fuels Consumed for All Purposes at Refineries in the United States, by States."

Intermediate Products. 1970 forward: EIA, State Energy Data System, industrial sector consumption estimates for aviation gasoline blending components, crude oil, motor gasoline blending components, natural gasoline (1970–1983), pentanes plus (1984 forward), petroleum coke, plant condensate (1970–1983), still gas (excluding still gas consumed as petrochemical feedstocks, 1970–1985), unfinished oil, and unfractionated streams (1970–1983).

Natural Gas Lease, Plant, and Pipeline Fuel Use. 1997 forward: EIA, *Natural Gas Annual*, Tables 26 through 76. Also available at http://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm.

1993–1996: EIA *Historical Natural Gas Annual 1930 Through 2000,* http://www.eia.gov/oil_gas/natural_gas/data_publications/historical_natural_gas_annual/hnga.html Table 15.

1970–1992: EIA *Natural Gas Annual 1994, Volume II,* Table 14.

Residential Wood. 1990 forward: EIA, unpublished data from the "1993 Residential Energy Consumption Survey," Form EIA-457 http://www.eia.gov/consumption/residential/index.cfm.

1970–1989: EIA, unpublished data from the "1980 Residential Energy Consumption Survey," Form EIA-457.

Commercial Wood and Waste. 1990 forward: EIA, unpublished data from the "1993 Residential Energy Consumption Survey," Form EIA-457 http://www.eia.gov/consumption/residential/index.cfm.

1989 forward: EIA, SEDS, U.S. annual average percentages of wood (WDEISUS) and percentages of waste (WSEISUS) acquired at no cost by the electric power sector.

1970–1989: EIA, unpublished data from the "1980 Residential Energy Consumption Survey," Form EIA-457.

Industrial Wood and Waste. 1994 forward: EIA, unpublished data from the "1994 Manufacturing Energy Consumption Survey" (Form EIA-846) http://www.eia.gov/emeu/mecs/contents.html.

1989 forward: EIA, SEDS, U.S. annual average percentages of wood (WDEISUS) and percentages of waste (WSEISUS) acquired at no cost by the electric power sector.

1970–1993: EIA, unpublished data from the "1991 Manufacturing Energy Consumption Survey" (Form EIA-846).