

Appendix A  
Reference case

**Table A1. Total energy supply, disposition, and price summary**  
(quadrillion Btu per year, unless otherwise noted)

Supply, disposition, and prices	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Production</b>								
Crude oil and lease condensate .....	11.59	12.16	15.95	14.50	13.47	13.40	13.12	0.3%
Natural gas plant liquids .....	2.78	2.88	4.14	4.20	3.85	3.87	3.89	1.0%
Dry natural gas .....	21.82	23.51	27.19	29.22	30.44	32.04	33.87	1.3%
Coal <sup>1</sup> .....	22.04	22.21	21.74	22.54	23.25	23.60	23.54	0.2%
Nuclear / uranium <sup>2</sup> .....	8.43	8.26	9.25	9.54	9.49	9.14	9.44	0.5%
Hydropower .....	2.54	3.17	2.83	2.86	2.87	2.90	2.92	-0.3%
Biomass <sup>3</sup> .....	4.05	4.05	5.00	5.27	5.42	5.83	6.96	1.9%
Other renewable energy <sup>4</sup> .....	1.31	1.58	2.22	2.32	2.50	2.91	3.84	3.1%
Other <sup>5</sup> .....	0.76	1.20	0.83	0.85	0.88	0.90	0.89	-1.0%
<b>Total</b> .....	<b>75.31</b>	<b>79.02</b>	<b>89.16</b>	<b>91.29</b>	<b>92.18</b>	<b>94.59</b>	<b>98.46</b>	<b>0.8%</b>
<b>Imports</b>								
Crude oil .....	20.14	19.46	15.02	15.57	16.33	16.43	16.89	-0.5%
Liquid fuels and other petroleum <sup>6</sup> .....	5.26	5.24	5.55	5.47	5.33	5.13	4.82	-0.3%
Natural gas <sup>7</sup> .....	3.83	3.54	2.58	2.36	2.63	2.53	2.01	-1.9%
Other imports <sup>8</sup> .....	0.52	0.43	0.11	0.17	0.13	0.48	0.84	2.4%
<b>Total</b> .....	<b>29.75</b>	<b>28.66</b>	<b>23.26</b>	<b>23.57</b>	<b>24.41</b>	<b>24.57</b>	<b>24.55</b>	<b>-0.5%</b>
<b>Exports</b>								
Liquid fuels and other petroleum <sup>9</sup> .....	4.86	6.08	5.37	5.14	5.25	5.55	5.71	-0.2%
Natural gas <sup>10</sup> .....	1.15	1.52	2.67	3.92	4.71	5.07	5.56	4.6%
Coal .....	2.10	2.75	3.13	3.18	3.51	3.80	3.79	1.1%
<b>Total</b> .....	<b>8.11</b>	<b>10.35</b>	<b>11.17</b>	<b>12.25</b>	<b>13.47</b>	<b>14.42</b>	<b>15.06</b>	<b>1.3%</b>
<b>Discrepancy<sup>11</sup></b> .....	<b>-1.40</b>	<b>-0.36</b>	<b>0.21</b>	<b>0.27</b>	<b>0.30</b>	<b>0.32</b>	<b>0.32</b>	<b>--</b>
<b>Consumption</b>								
Liquid fuels and other petroleum <sup>12</sup> .....	37.76	37.02	37.54	36.87	36.08	35.82	36.07	-0.1%
Natural gas .....	24.32	24.91	26.77	27.28	27.95	29.06	29.83	0.6%
Coal <sup>13</sup> .....	20.81	19.66	18.59	19.35	19.70	20.09	20.35	0.1%
Nuclear / uranium <sup>2</sup> .....	8.43	8.26	9.25	9.54	9.49	9.14	9.44	0.5%
Hydropower .....	2.54	3.17	2.83	2.86	2.87	2.90	2.92	-0.3%
Biomass <sup>14</sup> .....	2.87	2.74	3.53	3.82	3.94	4.23	4.91	2.0%
Other renewable energy <sup>4</sup> .....	1.31	1.58	2.22	2.32	2.50	2.91	3.84	3.1%
Other <sup>15</sup> .....	0.31	0.35	0.31	0.30	0.28	0.26	0.29	-0.6%
<b>Total</b> .....	<b>98.35</b>	<b>97.70</b>	<b>101.04</b>	<b>102.34</b>	<b>102.81</b>	<b>104.41</b>	<b>107.64</b>	<b>0.3%</b>
<b>Prices (2011 dollars per unit)</b>								
Crude oil spot prices (dollars per barrel)								
Brent .....	81.31	111.26	105.57	117.36	130.47	145.41	162.68	1.3%
West Texas Intermediate .....	81.08	94.86	103.57	115.36	128.47	143.41	160.68	1.8%
Natural gas at Henry Hub (dollars per million Btu).								
Coal (dollars per ton)	4.46	3.98	4.13	4.87	5.40	6.32	7.83	2.4%
at the minemouth <sup>16</sup>								
Coal (dollars per million Btu)	36.37	41.16	49.26	52.02	55.64	58.57	61.28	1.4%
at the minemouth <sup>16</sup>								
Average end-use <sup>17</sup> .....	1.80	2.04	2.45	2.60	2.79	2.94	3.08	1.4%
Average electricity (cents per kilowatthour) .....	2.42	2.57	2.77	2.94	3.10	3.25	3.42	1.0%
Average electricity (cents per kilowatthour) .....	10.0	9.9	9.4	9.5	9.7	10.1	10.8	0.3%

**Table A1. Total energy supply, disposition, and price summary (continued)**  
(quadrillion Btu per year, unless otherwise noted)

Supply, disposition, and prices	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Prices (nominal dollars per unit)</b>								
Crude oil spot prices (dollars per barrel)								
Brent .....	79.61	111.26	121.73	147.90	180.04	219.73	268.50	3.1%
West Texas Intermediate .....	79.39	94.86	119.43	145.38	177.28	216.70	265.20	3.6%
Natural gas at Henry Hub (dollars per million Btu).	4.37	3.98	4.77	6.14	7.45	9.55	12.92	4.1%
Coal (dollars per ton)								
at the minemouth <sup>16</sup> .....	35.61	41.16	56.81	65.55	76.78	88.51	101.14	3.1%
Coal (dollars per million Btu)								
at the minemouth <sup>16</sup> .....	1.76	2.04	2.83	3.27	3.85	4.44	5.08	3.2%
Average end-use <sup>17</sup> .....	2.37	2.57	3.19	3.70	4.28	4.92	5.65	2.8%
Average electricity (cents per kilowatthour) .....	9.8	9.9	10.8	12.0	13.4	15.2	17.8	2.0%

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

<sup>2</sup>These values represent the energy obtained from uranium when it is used in light water reactors. The total energy content of uranium is much larger, but alternative processes are required to take advantage of it.

<sup>3</sup>Includes grid-connected electricity from wood and wood waste; biomass, such as corn, used for liquid fuels production; and non-electric energy demand from wood. Refer to Table A17 for details.

<sup>4</sup>Includes grid-connected electricity from landfill gas; biogenic municipal waste; wind; photovoltaic and solar thermal sources; and non-electric energy from renewable sources, such as active and passive solar systems. Excludes electricity imports using renewable sources and nonmarketed renewable energy. See Table A17 for selected nonmarketed residential and commercial renewable energy data.

<sup>5</sup>Includes non-biogenic municipal waste, liquid hydrogen, methanol, and some domestic inputs to refineries.

<sup>6</sup>Includes imports of finished petroleum products, unfinished oils, alcohols, ethers, blending components, and renewable fuels such as ethanol.

<sup>7</sup>Includes imports of liquefied natural gas that are later re-exported.

<sup>8</sup>Includes coal, coal coke (net), and electricity (net). Excludes imports of fuel used in nuclear power plants.

<sup>9</sup>Includes crude oil, petroleum products, ethanol, and biodiesel.

<sup>10</sup>Includes re-exported liquefied natural gas.

<sup>11</sup>Balancing item. Includes unaccounted for supply, losses, gains, and net storage withdrawals.

<sup>12</sup>Includes petroleum-derived fuels and non-petroleum derived fuels, such as ethanol and biodiesel, and coal-based synthetic liquids. Petroleum coke, which is a solid, is included. Also included are natural gas plant liquids and crude oil consumed as a fuel. Refer to Table A17 for detailed renewable liquid fuels consumption.

<sup>13</sup>Excludes coal converted to coal-based synthetic liquids and natural gas.

<sup>14</sup>Includes grid-connected electricity from wood and wood waste, non-electric energy from wood, and biofuels heat and coproducts used in the production of liquid fuels, but excludes the energy content of the liquid fuels.

<sup>15</sup>Includes non-biogenic municipal waste, liquid hydrogen, and net electricity imports.

<sup>16</sup>Includes reported prices for both open market and captive mines. Prices weighted by production, which differs from average minemouth prices published in EIA data reports where it is weighted by reported sales.

<sup>17</sup>Prices weighted by consumption; weighted average excludes residential and commercial prices, and export free-alongside-ship (f.a.s.) prices.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 natural gas supply values: U.S. Energy Information Administration (EIA), *Natural Gas Annual 2010*, DOE/EIA-0131(2010) (Washington, DC, December 2011). 2011 natural gas supply values: EIA, *Natural Gas Monthly*, DOE/EIA-0130/Natural Gas Monthly, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). 2010 and 2011 natural gas spot price at Henry Hub based on daily data from Natural Gas Intelligence. 2010 and 2011 coal minemouth and delivered coal prices: EIA, *Annual Coal Report 2011*, DOE/EIA-0584(2011) (Washington, DC, November 2012). 2011 petroleum supply values and 2010 crude oil and lease condensate production: EIA, *Petroleum Supply Annual 2011*, DOE/EIA-0340(2011)/1 (Washington, DC, August 2012). Other 2010 petroleum supply values: EIA, *Petroleum Supply Annual 2010*, DOE/EIA-0340(2010)/1 (Washington, DC, July 2011). 2010 and 2011 crude oil spot prices: Thomson Reuters. Other 2010 and 2011 coal values: *Quarterly Coal Report, October-December 2011*, DOE/EIA-0121(2011/4Q) (Washington, DC, March 2012). Other 2010 and 2011 values: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A2. Energy consumption by sector and source**  
(quadrillion Btu per year, unless otherwise noted)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Energy consumption</b>								
<b>Residential</b>								
Propane .....	0.53	0.53	0.52	0.52	0.52	0.52	0.52	-0.0%
Kerosene .....	0.03	0.02	0.01	0.01	0.01	0.01	0.01	-1.8%
Distillate fuel oil .....	0.58	0.59	0.51	0.45	0.40	0.36	0.32	-2.1%
Liquid fuels and other petroleum subtotal .....	1.14	1.14	1.05	0.98	0.93	0.89	0.86	-1.0%
Natural gas .....	4.89	4.83	4.62	4.54	4.46	4.34	4.23	-0.5%
Coal .....	0.01	0.01	0.01	0.01	0.01	0.01	0.00	-0.9%
Renewable energy <sup>1</sup> .....	0.44	0.45	0.44	0.44	0.45	0.45	0.45	0.1%
Electricity .....	4.93	4.86	4.84	5.08	5.36	5.67	6.03	0.7%
<b>Delivered energy</b> .....	<b>11.41</b>	<b>11.28</b>	<b>10.95</b>	<b>11.04</b>	<b>11.20</b>	<b>11.35</b>	<b>11.57</b>	<b>0.1%</b>
Electricity related losses .....	10.35	10.20	9.66	10.04	10.45	10.90	11.50	0.4%
<b>Total</b> .....	<b>21.76</b>	<b>21.48</b>	<b>20.62</b>	<b>21.08</b>	<b>21.65</b>	<b>22.25</b>	<b>23.08</b>	<b>0.2%</b>
<b>Commercial</b>								
Propane .....	0.14	0.14	0.16	0.16	0.16	0.17	0.17	0.7%
Motor gasoline <sup>2</sup> .....	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.5%
Kerosene .....	0.00	0.00	0.00	0.00	0.00	0.00	0.01	2.1%
Distillate fuel oil .....	0.41	0.42	0.34	0.33	0.32	0.31	0.30	-1.1%
Residual fuel oil .....	0.08	0.07	0.09	0.09	0.09	0.09	0.09	0.6%
Liquid fuels and other petroleum subtotal .....	0.69	0.69	0.65	0.64	0.64	0.63	0.63	-0.3%
Natural gas .....	3.17	3.23	3.40	3.43	3.50	3.59	3.68	0.4%
Coal .....	0.06	0.05	0.05	0.05	0.05	0.05	0.05	-0.0%
Renewable energy <sup>3</sup> .....	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.0%
Electricity .....	4.54	4.50	4.72	4.97	5.22	5.47	5.72	0.8%
<b>Delivered energy</b> .....	<b>8.57</b>	<b>8.60</b>	<b>8.95</b>	<b>9.22</b>	<b>9.54</b>	<b>9.86</b>	<b>10.21</b>	<b>0.6%</b>
Electricity related losses .....	9.52	9.45	9.42	9.82	10.18	10.51	10.92	0.5%
<b>Total</b> .....	<b>18.09</b>	<b>18.05</b>	<b>18.37</b>	<b>19.04</b>	<b>19.72</b>	<b>20.37</b>	<b>21.13</b>	<b>0.5%</b>
<b>Industrial<sup>4</sup></b>								
Liquefied petroleum gases .....	2.12	2.10	2.46	2.54	2.47	2.40	2.30	0.3%
Propylene .....	0.41	0.40	0.56	0.56	0.52	0.49	0.46	0.6%
Motor gasoline <sup>2</sup> .....	0.28	0.27	0.32	0.32	0.32	0.32	0.32	0.6%
Distillate fuel oil .....	1.19	1.21	1.22	1.19	1.18	1.19	1.22	0.0%
Residual fuel oil .....	0.12	0.11	0.11	0.11	0.11	0.11	0.11	-0.1%
Petrochemical feedstocks .....	0.94	0.88	1.03	1.08	1.08	1.08	1.09	0.7%
Other petroleum <sup>5</sup> .....	3.70	3.61	3.54	3.48	3.46	3.53	3.65	0.0%
Liquid fuels and other petroleum subtotal .....	8.76	8.57	9.25	9.28	9.14	9.11	9.16	0.2%
Natural gas .....	6.67	6.92	7.86	8.00	7.97	8.02	8.08	0.5%
Natural-gas-to-liquids heat and power .....	0.00	0.00	0.13	0.16	0.21	0.27	0.33	--
Lease and plant fuel <sup>6</sup> .....	1.31	1.42	1.57	1.68	1.73	1.84	1.97	1.1%
Natural gas subtotal .....	7.98	8.34	9.56	9.84	9.91	10.13	10.38	0.8%
Metallurgical coal .....	0.55	0.56	0.60	0.58	0.52	0.48	0.46	-0.7%
Other industrial coal .....	1.06	1.04	1.00	1.00	1.00	1.02	1.05	0.0%
Coal-to-liquids heat and power .....	0.00	0.00	0.00	0.07	0.09	0.12	0.15	--
Net coal coke imports .....	-0.01	0.01	-0.01	-0.03	-0.04	-0.06	-0.05	--
Coal subtotal .....	1.60	1.62	1.58	1.63	1.57	1.56	1.61	-0.0%
Biofuels heat and coproducts .....	0.85	0.67	0.82	0.82	0.85	0.97	1.37	2.5%
Renewable energy <sup>7</sup> .....	1.47	1.51	1.72	1.85	1.97	2.11	2.28	1.4%
Electricity .....	3.31	3.33	3.95	4.05	3.96	3.90	3.91	0.6%
<b>Delivered energy</b> .....	<b>23.98</b>	<b>24.04</b>	<b>26.87</b>	<b>27.46</b>	<b>27.40</b>	<b>27.77</b>	<b>28.71</b>	<b>0.6%</b>
Electricity related losses .....	6.95	6.99	7.89	8.00	7.72	7.49	7.45	0.2%
<b>Total</b> .....	<b>30.93</b>	<b>31.03</b>	<b>34.76</b>	<b>35.46</b>	<b>35.11</b>	<b>35.26</b>	<b>36.16</b>	<b>0.5%</b>

**Table A2. Energy consumption by sector and source (continued)**  
(quadrillion Btu per year, unless otherwise noted)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Transportation</b>								
Propane .....	0.04	0.06	0.06	0.06	0.07	0.08	0.08	1.3%
E85 <sup>8</sup> .....	0.01	0.05	0.08	0.14	0.16	0.15	0.17	4.3%
Motor gasoline <sup>2</sup> .....	16.79	16.31	14.88	13.86	13.06	12.69	12.64	-0.9%
Jet fuel <sup>9</sup> .....	3.07	3.01	3.11	3.20	3.28	3.35	3.42	0.4%
Distillate fuel oil <sup>10</sup> .....	5.82	5.91	7.28	7.52	7.61	7.73	7.90	1.0%
Residual fuel oil .....	0.88	0.82	0.84	0.85	0.86	0.86	0.87	0.2%
Other petroleum <sup>11</sup> .....	0.17	0.17	0.15	0.15	0.16	0.16	0.16	-0.1%
Liquid fuels and other petroleum subtotal .....	26.78	26.32	26.42	25.79	25.20	25.01	25.24	-0.1%
Pipeline fuel natural gas .....	0.68	0.70	0.71	0.73	0.74	0.76	0.78	0.4%
Compressed / liquefied natural gas .....	0.04	0.04	0.08	0.12	0.26	0.60	1.05	11.9%
Liquid hydrogen .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Electricity .....	0.02	0.02	0.03	0.04	0.04	0.06	0.07	3.9%
<b>Delivered energy</b> .....	<b>27.52</b>	<b>27.09</b>	<b>27.24</b>	<b>26.68</b>	<b>26.25</b>	<b>26.43</b>	<b>27.14</b>	<b>0.0%</b>
Electricity related losses .....	0.05	0.05	0.06	0.07	0.09	0.11	0.13	3.5%
<b>Total</b> .....	<b>27.57</b>	<b>27.13</b>	<b>27.30</b>	<b>26.75</b>	<b>26.33</b>	<b>26.54</b>	<b>27.27</b>	<b>0.0%</b>
<b>Delivered energy consumption for all sectors</b>								
Liquefied petroleum gases .....	2.83	2.82	3.21	3.29	3.23	3.16	3.08	0.3%
Propylene .....	0.41	0.40	0.56	0.56	0.52	0.49	0.46	0.6%
E85 <sup>8</sup> .....	0.01	0.05	0.08	0.14	0.16	0.15	0.17	4.3%
Motor gasoline <sup>2</sup> .....	17.13	16.64	15.26	14.24	13.43	13.07	13.03	-0.8%
Jet fuel <sup>9</sup> .....	3.07	3.01	3.11	3.20	3.28	3.35	3.42	0.4%
Kerosene .....	0.04	0.03	0.03	0.03	0.02	0.02	0.02	-0.3%
Distillate fuel oil .....	8.00	8.12	9.35	9.49	9.51	9.58	9.74	0.6%
Residual fuel oil .....	1.08	1.01	1.05	1.05	1.05	1.06	1.07	0.2%
Petrochemical feedstocks .....	0.94	0.88	1.03	1.08	1.08	1.08	1.09	0.7%
Other petroleum <sup>12</sup> .....	3.86	3.77	3.69	3.63	3.61	3.68	3.80	0.0%
Liquid fuels and other petroleum subtotal .....	37.37	36.72	37.37	36.69	35.90	35.64	35.88	-0.1%
Natural gas .....	14.77	15.03	15.95	16.08	16.19	16.54	17.05	0.4%
Natural-gas-to-liquids heat and power .....	0.00	0.00	0.13	0.16	0.21	0.27	0.33	--
Lease and plant fuel <sup>6</sup> .....	1.31	1.42	1.57	1.68	1.73	1.84	1.97	1.1%
Pipeline natural gas .....	0.68	0.70	0.71	0.73	0.74	0.76	0.78	0.4%
Natural gas subtotal .....	16.77	17.15	18.36	18.66	18.87	19.42	20.13	0.6%
Metallurgical coal .....	0.55	0.56	0.60	0.58	0.52	0.48	0.46	-0.7%
Other coal .....	1.12	1.10	1.06	1.06	1.06	1.07	1.11	0.0%
Coal-to-liquids heat and power .....	0.00	0.00	0.00	0.07	0.09	0.12	0.15	--
Net coal coke imports .....	-0.01	0.01	-0.01	-0.03	-0.04	-0.06	-0.05	--
Coal subtotal .....	1.67	1.67	1.64	1.69	1.63	1.61	1.67	-0.0%
Biofuels heat and coproducts .....	0.85	0.67	0.82	0.82	0.85	0.97	1.37	2.5%
Renewable energy <sup>13</sup> .....	2.01	2.08	2.28	2.42	2.54	2.68	2.86	1.1%
Liquid hydrogen .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Electricity .....	12.81	12.71	13.54	14.13	14.59	15.08	15.72	0.7%
<b>Delivered energy</b> .....	<b>71.49</b>	<b>71.01</b>	<b>74.01</b>	<b>74.40</b>	<b>74.38</b>	<b>75.41</b>	<b>77.63</b>	<b>0.3%</b>
Electricity related losses .....	26.86	26.69	27.03	27.94	28.43	29.00	30.00	0.4%
<b>Total</b> .....	<b>98.35</b>	<b>97.70</b>	<b>101.04</b>	<b>102.34</b>	<b>102.81</b>	<b>104.41</b>	<b>107.64</b>	<b>0.3%</b>
<b>Electric power<sup>14</sup></b>								
Distillate fuel oil .....	0.08	0.06	0.08	0.08	0.08	0.08	0.08	0.9%
Residual fuel oil .....	0.31	0.23	0.10	0.10	0.10	0.10	0.11	-2.6%
Liquid fuels and other petroleum subtotal .....	0.39	0.30	0.18	0.18	0.18	0.18	0.19	-1.6%
Natural gas .....	7.55	7.76	8.40	8.63	9.08	9.64	9.70	0.8%
Steam coal .....	19.13	17.99	16.95	17.66	18.07	18.48	18.68	0.1%
Nuclear / uranium <sup>15</sup> .....	8.43	8.26	9.25	9.54	9.49	9.14	9.44	0.5%
Renewable energy <sup>16</sup> .....	3.85	4.74	5.49	5.77	5.93	6.38	7.44	1.6%
Electricity imports .....	0.09	0.13	0.08	0.07	0.05	0.03	0.06	-2.4%
<b>Total<sup>17</sup></b> .....	<b>39.67</b>	<b>39.40</b>	<b>40.57</b>	<b>42.07</b>	<b>43.02</b>	<b>44.08</b>	<b>45.73</b>	<b>0.5%</b>

**Table A2. Energy consumption by sector and source (continued)**  
(quadrillion Btu per year, unless otherwise noted)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Total energy consumption</b>								
Liquefied petroleum gases.....	2.83	2.82	3.21	3.29	3.23	3.16	3.08	0.3%
Propylene.....	0.41	0.40	0.56	0.56	0.52	0.49	0.46	0.6%
E85 <sup>8</sup> .....	0.01	0.05	0.08	0.14	0.16	0.15	0.17	4.3%
Motor gasoline <sup>2</sup> .....	17.13	16.64	15.26	14.24	13.43	13.07	13.03	-0.8%
Jet fuel <sup>9</sup> .....	3.07	3.01	3.11	3.20	3.28	3.35	3.42	0.4%
Kerosene.....	0.04	0.03	0.03	0.03	0.02	0.02	0.02	-0.3%
Distillate fuel oil.....	8.08	8.18	9.43	9.57	9.59	9.66	9.82	0.6%
Residual fuel oil.....	1.38	1.24	1.15	1.15	1.15	1.16	1.17	-0.2%
Petrochemical feedstocks.....	0.94	0.88	1.03	1.08	1.08	1.08	1.09	0.7%
Other petroleum <sup>12</sup> .....	3.86	3.77	3.69	3.63	3.61	3.68	3.80	0.0%
Liquid fuels and other petroleum subtotal.....	37.76	37.02	37.54	36.87	36.08	35.82	36.07	-0.1%
Natural gas.....	22.32	22.79	24.36	24.71	25.27	26.18	26.75	0.6%
Natural-gas-to-liquids heat and power.....	0.00	0.00	0.13	0.16	0.21	0.27	0.33	--
Lease and plant fuel <sup>6</sup> .....	1.31	1.42	1.57	1.68	1.73	1.84	1.97	1.1%
Pipeline natural gas.....	0.68	0.70	0.71	0.73	0.74	0.76	0.78	0.4%
Natural gas subtotal.....	24.32	24.91	26.77	27.28	27.95	29.06	29.83	0.6%
Metallurgical coal.....	0.55	0.56	0.60	0.58	0.52	0.48	0.46	-0.7%
Other coal.....	20.26	19.09	18.01	18.72	19.12	19.55	19.79	0.1%
Coal-to-liquids heat and power.....	0.00	0.00	0.00	0.07	0.09	0.12	0.15	--
Net coal coke imports.....	-0.01	0.01	-0.01	-0.03	-0.04	-0.06	-0.05	--
Coal subtotal.....	20.81	19.66	18.59	19.35	19.70	20.09	20.35	0.1%
Nuclear / uranium <sup>15</sup> .....	8.43	8.26	9.25	9.54	9.49	9.14	9.44	0.5%
Biofuels heat and coproducts.....	0.85	0.67	0.82	0.82	0.85	0.97	1.37	2.5%
Renewable energy <sup>18</sup> .....	5.86	6.82	7.77	8.18	8.47	9.07	10.30	1.4%
Liquid hydrogen.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Electricity imports.....	0.09	0.13	0.08	0.07	0.05	0.03	0.06	-2.4%
<b>Total</b> .....	<b>98.35</b>	<b>97.70</b>	<b>101.04</b>	<b>102.34</b>	<b>102.81</b>	<b>104.41</b>	<b>107.64</b>	<b>0.3%</b>
<b>Energy use and related statistics</b>								
Delivered energy use.....	71.49	71.01	74.01	74.40	74.38	75.41	77.63	0.3%
Total energy use.....	98.35	97.70	101.04	102.34	102.81	104.41	107.64	0.3%
Ethanol consumed in motor gasoline and E85.....	1.11	1.17	1.34	1.29	1.24	1.20	1.21	0.1%
Population (millions).....	310.06	312.38	340.45	356.46	372.41	388.35	404.39	0.9%
Gross domestic product (billion 2005 dollars).....	13,063	13,299	16,859	18,985	21,355	24,095	27,277	2.5%
Carbon dioxide emissions (million metric tons).....	5,633.6	5,470.7	5,454.6	5,501.4	5,522.8	5,606.7	5,691.1	0.1%

<sup>1</sup>Includes wood used for residential heating. See Table A4 and/or Table A17 for estimates of nonmarketed renewable energy consumption for geothermal heat pumps, solar thermal water heating, and electricity generation from wind and solar photovoltaic sources.

<sup>2</sup>Includes ethanol (blends of 15 percent or less) and ethers blended into gasoline.

<sup>3</sup>Excludes ethanol. Includes commercial sector consumption of wood and wood waste, landfill gas, municipal waste, and other biomass for combined heat and power. See Table A5 and/or Table A17 for estimates of nonmarketed renewable energy consumption for solar thermal water heating and electricity generation from wind and solar photovoltaic sources.

<sup>4</sup>Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

<sup>5</sup>Includes petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.

<sup>6</sup>Represents natural gas used in well, field, and lease operations, in natural gas processing plant machinery, and for liquefaction in export facilities.

<sup>7</sup>Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources. Excludes ethanol blends (15 percent or less) in motor gasoline.

<sup>8</sup>E85 refers to a blend of 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable). To address cold starting issues, the percentage of ethanol varies seasonally. The annual average ethanol content of 74 percent is used for this forecast.

<sup>9</sup>Includes only kerosene type.

<sup>10</sup>Diesel fuel for on- and off- road use.

<sup>11</sup>Includes aviation gasoline and lubricants.

<sup>12</sup>Includes unfinished oils, natural gasoline, motor gasoline blending components, aviation gasoline, lubricants, still gas, asphalt, road oil, petroleum coke, and miscellaneous petroleum products.

<sup>13</sup>Includes electricity generated for sale to the grid and for own use from renewable sources, and non-electric energy from renewable sources. Excludes ethanol and nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.

<sup>14</sup>Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.

<sup>15</sup>These values represent the energy obtained from uranium when it is used in light water reactors. The total energy content of uranium is much larger, but alternative processes are required to take advantage of it.

<sup>16</sup>Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes net electricity imports.

<sup>17</sup>Includes non-biogenic municipal waste not included above.

<sup>18</sup>Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes ethanol, net electricity imports, and nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 consumption based on: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 and 2011 population and gross domestic product: IHS Global Insight Industry and Employment models, August 2012. 2010 and 2011 carbon dioxide emissions: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 carbon dioxide emissions: EIA, *Monthly Energy Review*, DOE/EIA-0035(2011/10) (Washington, DC, October 2011). 2011 carbon dioxide emissions: EIA, *Monthly Energy Review*, DOE/EIA-0035(2012/08) (Washington, DC, August 2012). Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A3. Energy prices by sector and source**  
(2011 dollars per million Btu, unless otherwise noted)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Residential</b>								
Propane .....	27.61	25.06	23.41	24.77	25.73	26.70	27.99	0.4%
Distillate fuel oil.....	21.77	26.38	26.91	29.08	31.26	33.71	36.54	1.1%
Natural gas .....	11.36	10.80	11.78	12.67	13.37	14.60	16.36	1.4%
Electricity .....	34.52	34.34	33.62	33.96	34.56	35.42	37.10	0.3%
<b>Commercial</b>								
Propane .....	24.10	22.10	20.04	21.74	22.97	24.23	25.94	0.6%
Distillate fuel oil.....	21.35	25.87	24.26	26.51	28.51	30.91	33.74	0.9%
Residual fuel oil .....	11.39	19.17	14.82	16.60	18.77	20.89	23.41	0.7%
Natural gas .....	9.40	8.84	9.47	10.19	10.70	11.68	13.21	1.4%
Electricity .....	30.49	29.98	28.57	28.49	28.65	29.66	31.75	0.2%
<b>Industrial<sup>1</sup></b>								
Propane .....	23.73	22.54	20.51	22.33	23.64	24.97	26.78	0.6%
Distillate fuel oil.....	21.87	26.50	24.67	27.02	28.91	31.31	34.16	0.9%
Residual fuel oil .....	11.30	18.86	17.19	18.96	21.09	23.25	25.78	1.1%
Natural gas <sup>2</sup> .....	5.48	4.89	5.53	6.15	6.56	7.45	8.88	2.1%
Metallurgical coal.....	5.96	7.01	8.75	9.36	10.09	10.69	11.11	1.6%
Other industrial coal.....	2.77	3.43	3.44	3.56	3.71	3.88	4.06	0.6%
Coal to liquids.....	--	--	--	2.30	2.55	2.76	2.95	--
Electricity .....	20.26	19.98	18.72	19.18	19.73	20.80	22.74	0.4%
<b>Transportation</b>								
Propane .....	27.52	26.06	24.48	25.83	26.80	27.77	29.07	0.4%
E85 <sup>3</sup> .....	25.56	25.30	29.64	27.27	26.94	29.19	30.58	0.7%
Motor gasoline <sup>4</sup> .....	23.18	28.70	27.84	29.26	30.73	32.99	36.18	0.8%
Jet fuel <sup>5</sup> .....	16.57	22.49	21.50	23.73	26.03	28.52	31.07	1.1%
Diesel fuel (distillate fuel oil) <sup>6</sup> .....	22.38	26.15	26.61	28.98	30.81	33.19	36.05	1.1%
Residual fuel oil .....	10.62	17.83	14.91	16.58	18.34	20.25	22.45	0.8%
Natural gas <sup>7</sup> .....	16.51	16.14	16.87	17.97	18.90	19.86	21.20	0.9%
Electricity .....	33.91	32.77	29.60	30.40	31.53	32.84	35.07	0.2%
<b>Electric power<sup>8</sup></b>								
Distillate fuel oil.....	19.22	23.30	22.45	24.61	26.80	29.23	32.03	1.1%
Residual fuel oil .....	12.11	15.97	24.94	27.29	29.36	31.85	34.54	2.7%
Natural gas .....	5.26	4.77	4.90	5.58	6.05	6.98	8.38	2.0%
Steam coal.....	2.30	2.38	2.52	2.69	2.87	3.03	3.20	1.0%
<b>Average price to all users<sup>9</sup></b>								
Propane .....	16.23	17.13	13.69	16.07	18.14	20.43	23.79	1.1%
E85 <sup>3</sup> .....	25.56	25.30	29.64	27.27	26.94	29.19	30.58	0.7%
Motor gasoline <sup>4</sup> .....	23.06	28.47	27.84	29.26	30.72	32.99	36.17	0.8%
Jet fuel <sup>5</sup> .....	16.57	22.49	21.50	23.73	26.03	28.52	31.07	1.1%
Distillate fuel oil.....	22.17	26.18	26.25	28.62	30.48	32.88	35.73	1.1%
Residual fuel oil .....	11.06	17.65	15.97	17.72	19.59	21.61	23.95	1.1%
Natural gas .....	7.27	6.68	7.07	7.76	8.27	9.31	10.94	1.7%
Metallurgical coal.....	5.96	7.01	8.75	9.36	10.09	10.69	11.11	1.6%
Other coal.....	2.33	2.45	2.57	2.74	2.92	3.08	3.25	1.0%
Coal to liquids.....	--	--	--	2.30	2.55	2.76	2.95	--
Electricity .....	29.40	29.03	27.50	27.79	28.41	29.55	31.58	0.3%
<b>Non-renewable energy expenditures by sector (billion 2011 dollars)</b>								
Residential .....	253.56	248.08	243.44	256.13	271.05	290.43	319.63	0.9%
Commercial.....	182.47	179.97	181.68	192.15	203.80	221.86	249.60	1.1%
Industrial .....	210.38	225.18	259.03	283.62	294.99	316.87	353.70	1.6%
Transportation.....	584.31	718.25	694.73	722.24	749.40	808.74	900.68	0.8%
Total non-renewable expenditures.....	1,230.73	1,371.48	1,378.87	1,454.13	1,519.24	1,637.91	1,823.61	1.0%
Transportation renewable expenditures.....	0.16	1.24	2.44	3.92	4.39	4.43	5.05	5.0%
<b>Total expenditures.....</b>	<b>1,230.88</b>	<b>1,372.71</b>	<b>1,381.31</b>	<b>1,458.06</b>	<b>1,523.63</b>	<b>1,642.34</b>	<b>1,828.66</b>	<b>1.0%</b>

**Table A3. Energy prices by sector and source (continued)**  
(nominal dollars per million Btu, unless otherwise noted)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Residential</b>								
Propane .....	27.04	25.06	27.00	31.21	35.51	40.35	46.20	2.1%
Distillate fuel oil.....	21.31	26.38	31.03	36.64	43.14	50.93	60.31	2.9%
Natural gas .....	11.12	10.80	13.58	15.97	18.45	22.06	27.01	3.2%
Electricity .....	33.80	34.34	38.76	42.80	47.69	53.52	61.23	2.0%
<b>Commercial</b>								
Propane .....	23.60	22.10	23.11	27.39	31.70	36.62	42.82	2.3%
Distillate fuel oil.....	20.91	25.87	27.97	33.41	39.34	46.71	55.68	2.7%
Residual fuel oil .....	11.15	19.17	17.09	20.92	25.90	31.56	38.64	2.4%
Natural gas .....	9.20	8.84	10.92	12.85	14.76	17.65	21.81	3.2%
Electricity .....	29.86	29.98	32.94	35.90	39.54	44.82	52.40	1.9%
<b>Industrial<sup>1</sup></b>								
Propane .....	23.23	22.54	23.65	28.14	32.62	37.74	44.20	2.3%
Distillate fuel oil.....	21.42	26.50	28.45	34.05	39.89	47.31	56.39	2.6%
Residual fuel oil .....	11.06	18.86	19.82	23.89	29.10	35.13	42.55	2.8%
Natural gas <sup>2</sup> .....	5.37	4.89	6.38	7.75	9.05	11.25	14.66	3.9%
Metallurgical coal.....	5.84	7.01	10.09	11.79	13.92	16.15	18.34	3.4%
Other industrial coal.....	2.71	3.43	3.97	4.48	5.12	5.86	6.70	2.3%
Coal to liquids .....	--	--	--	2.90	3.52	4.17	4.87	--
Electricity .....	19.84	19.98	21.59	24.17	27.22	31.42	37.54	2.2%
<b>Transportation</b>								
Propane .....	26.95	26.06	28.22	32.56	36.98	41.97	47.97	2.1%
E85 <sup>3</sup> .....	25.03	25.30	34.18	34.37	37.18	44.10	50.46	2.4%
Motor gasoline <sup>4</sup> .....	22.70	28.70	32.10	36.88	42.41	49.85	59.72	2.6%
Jet fuel <sup>5</sup> .....	16.22	22.49	24.79	29.90	35.92	43.09	51.27	2.9%
Diesel fuel (distillate fuel oil) <sup>6</sup> .....	21.91	26.15	30.68	36.52	42.52	50.16	59.50	2.9%
Residual fuel oil .....	10.40	17.83	17.19	20.89	25.31	30.60	37.06	2.6%
Natural gas <sup>7</sup> .....	16.17	16.14	19.46	22.65	26.08	30.01	34.98	2.7%
Electricity .....	33.20	32.77	34.13	38.31	43.51	49.63	57.88	2.0%
<b>Electric power<sup>8</sup></b>								
Distillate fuel oil.....	18.82	23.30	25.89	31.02	36.98	44.17	52.87	2.9%
Residual fuel oil .....	11.86	15.97	28.76	34.39	40.52	48.13	57.01	4.5%
Natural gas .....	5.15	4.77	5.65	7.03	8.35	10.55	13.83	3.7%
Steam coal.....	2.25	2.38	2.90	3.39	3.96	4.58	5.28	2.8%



**Table A3. Energy prices by sector and source (continued)**  
(nominal dollars per million Btu, unless otherwise noted)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Average price to all users<sup>9</sup></b>								
Propane.....	15.89	17.13	15.78	20.26	25.03	30.86	39.26	2.9%
E85 <sup>3</sup> .....	25.03	25.30	34.18	34.37	37.18	44.10	50.46	2.4%
Motor gasoline <sup>4</sup> .....	22.58	28.47	32.10	36.87	42.40	49.84	59.70	2.6%
Jet fuel <sup>5</sup> .....	16.22	22.49	24.79	29.90	35.92	43.09	51.27	2.9%
Distillate fuel oil.....	21.71	26.18	30.27	36.06	42.07	49.68	58.97	2.8%
Residual fuel oil.....	10.83	17.65	18.41	22.33	27.03	32.66	39.53	2.8%
Natural gas.....	7.12	6.68	8.16	9.78	11.41	14.06	18.06	3.5%
Metallurgical coal.....	5.84	7.01	10.09	11.79	13.92	16.15	18.34	3.4%
Other coal.....	2.28	2.45	2.97	3.46	4.03	4.65	5.37	2.7%
Coal to liquids.....	--	--	--	2.90	3.52	4.17	4.87	--
Electricity.....	28.79	29.03	31.71	35.02	39.20	44.65	52.12	2.0%
<b>Non-renewable energy expenditures by sector (billion nominal dollars)</b>								
Residential.....	248.27	248.08	280.71	322.77	374.04	438.86	527.54	2.6%
Commercial.....	178.66	179.97	209.48	242.14	281.23	335.25	411.95	2.9%
Industrial.....	205.99	225.18	298.68	357.41	407.07	478.81	583.76	3.3%
Transportation.....	572.11	718.25	801.07	910.16	1,034.13	1,222.05	1,486.52	2.5%
Total non-renewable expenditures.....	1,205.03	1,371.48	1,589.94	1,832.48	2,096.47	2,474.97	3,009.77	2.7%
Transportation renewable expenditures.....	0.15	1.24	2.81	4.95	6.06	6.70	8.33	6.8%
<b>Total expenditures.....</b>	<b>1,205.18</b>	<b>1,372.71</b>	<b>1,592.75</b>	<b>1,837.43</b>	<b>2,102.52</b>	<b>2,481.67</b>	<b>3,018.11</b>	<b>2.8%</b>

<sup>1</sup>Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

<sup>2</sup>Excludes use for lease and plant fuel.

<sup>3</sup>E85 refers to a blend of 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable). To address cold starting issues, the percentage of ethanol varies seasonally. The annual average ethanol content of 74 percent is used for this forecast.

<sup>4</sup>Sales weighted-average price for all grades. Includes Federal, State and local taxes.

<sup>5</sup>Kerosene-type jet fuel. Includes Federal and State taxes while excluding county and local taxes.

<sup>6</sup>Diesel fuel for on-road use. Includes Federal and State taxes while excluding county and local taxes.

<sup>7</sup>Natural gas used as a vehicle fuel. Includes estimated motor vehicle fuel taxes and estimated dispensing costs or charges.

<sup>8</sup>Includes electricity-only and combined heat and power plants that have a regulatory status.

<sup>9</sup>Weighted averages of end-use fuel prices are derived from the prices shown in each sector and the corresponding sectoral consumption.

Btu = British thermal unit.

-- = Not applicable.

Note: Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

**Sources:** 2010 and 2011 prices for motor gasoline, distillate fuel oil, and jet fuel are based on prices in the U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, DOE/EIA-0380(2012/08) (Washington, DC, August 2012). 2010 residential, commercial, and industrial natural gas delivered prices: EIA, *Natural Gas Annual 2010*, DOE/EIA-0131(2010) (Washington, DC, December 2011). 2011 residential, commercial, and industrial natural gas delivered prices: EIA, *Natural Gas Monthly*, DOE/EIA-0130Natural Gas Monthly, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). 2010 transportation sector natural gas delivered prices are based on: EIA, *Natural Gas Annual 2010*, DOE/EIA-0131(2010) (Washington, DC, December 2011) and estimated State taxes, Federal taxes, and dispensing costs or charges. 2011 transportation sector natural gas delivered prices are model results. 2010 and 2011 electric power sector distillate and residual fuel oil prices: EIA, *Monthly Energy Review*, DOE/EIA-0035(2012/09) (Washington, DC, September 2012). 2010 and 2011 electric power sector natural gas prices: EIA, *Electric Power Monthly*, DOE/EIA-0226, *Electric Power Monthly*, DOE/EIA-0226, April 2011 and April 2012, Table 4.2, and EIA, *State Energy Data Report 2010*, DOE/EIA-0214(2010) (Washington, DC, June 2012). 2010 and 2011 coal prices based on: EIA, *Quarterly Coal Report, October-December 2011*, DOE/EIA-0121(2011/4Q) (Washington, DC, March 2012) and EIA, AEO2013 National Energy Modeling System run REF2013.D102312A. 2010 and 2011 electricity prices: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 and 2011 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. **Projections:** EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.



**Table A4. Residential sector key indicators and consumption**  
(quadrillion Btu per year, unless otherwise noted)

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Key indicators</b>								
<b>Households (millions)</b>								
Single-family .....	82.85	83.56	91.25	95.37	99.34	103.03	106.77	0.8%
Multifamily .....	25.78	26.07	29.82	32.05	34.54	37.05	39.53	1.4%
Mobile homes .....	6.60	6.54	6.45	6.60	6.75	6.88	7.02	0.2%
<b>Total .....</b>	<b>115.23</b>	<b>116.17</b>	<b>127.52</b>	<b>134.02</b>	<b>140.63</b>	<b>146.96</b>	<b>153.32</b>	<b>1.0%</b>
<b>Average house square footage .....</b>	<b>1,653</b>	<b>1,659</b>	<b>1,704</b>	<b>1,724</b>	<b>1,740</b>	<b>1,754</b>	<b>1,767</b>	<b>0.2%</b>
<b>Energy intensity</b>								
<b>(million Btu per household)</b>								
Delivered energy consumption .....	99.2	97.2	86.0	82.5	79.7	77.3	75.5	-0.9%
Total energy consumption .....	189.0	185.0	161.7	157.4	154.0	151.4	150.6	-0.7%
<b>(thousand Btu per square foot)</b>								
Delivered energy consumption .....	60.0	58.6	50.4	47.8	45.8	44.1	42.7	-1.1%
Total energy consumption .....	114.3	111.5	94.9	91.3	88.5	86.3	85.2	-0.9%
<b>Delivered energy consumption by fuel</b>								
<b>Electricity</b>								
Space heating .....	0.30	0.27	0.29	0.30	0.31	0.32	0.32	0.6%
Space cooling .....	0.92	0.93	0.95	1.04	1.14	1.23	1.32	1.2%
Water heating .....	0.45	0.45	0.50	0.52	0.53	0.54	0.55	0.7%
Refrigeration .....	0.38	0.38	0.38	0.39	0.41	0.43	0.45	0.6%
Cooking .....	0.11	0.11	0.12	0.13	0.14	0.15	0.16	1.3%
Clothes dryers .....	0.20	0.20	0.22	0.23	0.24	0.25	0.26	1.0%
Freezers .....	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.1%
Lighting .....	0.65	0.63	0.45	0.40	0.38	0.37	0.38	-1.8%
Clothes washers <sup>1</sup> .....	0.03	0.03	0.03	0.02	0.02	0.02	0.03	-0.8%
Dishwashers <sup>1</sup> .....	0.10	0.10	0.10	0.10	0.11	0.12	0.13	0.8%
Televisions and related equipment <sup>2</sup> .....	0.32	0.32	0.35	0.37	0.40	0.43	0.45	1.2%
Computers and related equipment <sup>3</sup> .....	0.16	0.16	0.13	0.12	0.12	0.12	0.13	-0.8%
Furnace fans and boiler circulation pumps .....	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.2%
Other uses <sup>4</sup> .....	1.11	1.07	1.08	1.21	1.33	1.46	1.62	1.4%
<b>Delivered energy .....</b>	<b>4.93</b>	<b>4.86</b>	<b>4.84</b>	<b>5.08</b>	<b>5.36</b>	<b>5.67</b>	<b>6.03</b>	<b>0.7%</b>
<b>Natural gas</b>								
Space heating .....	3.32	3.25	3.02	2.92	2.85	2.77	2.67	-0.7%
Space cooling .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1%
Water heating .....	1.30	1.30	1.33	1.33	1.31	1.27	1.26	-0.1%
Cooking .....	0.22	0.22	0.22	0.22	0.23	0.23	0.24	0.3%
Clothes dryers .....	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.7%
<b>Delivered energy .....</b>	<b>4.89</b>	<b>4.83</b>	<b>4.62</b>	<b>4.54</b>	<b>4.46</b>	<b>4.34</b>	<b>4.23</b>	<b>-0.5%</b>
<b>Distillate fuel oil</b>								
Space heating .....	0.49	0.50	0.45	0.40	0.36	0.32	0.29	-1.9%
Water heating .....	0.10	0.09	0.06	0.05	0.04	0.04	0.03	-3.3%
<b>Delivered energy .....</b>	<b>0.58</b>	<b>0.59</b>	<b>0.51</b>	<b>0.45</b>	<b>0.40</b>	<b>0.36</b>	<b>0.32</b>	<b>-2.1%</b>
<b>Propane</b>								
Space heating .....	0.28	0.27	0.25	0.24	0.23	0.22	0.21	-0.8%
Water heating .....	0.07	0.07	0.05	0.05	0.05	0.04	0.04	-1.8%
Cooking .....	0.03	0.03	0.03	0.03	0.03	0.03	0.02	-0.7%
Other uses <sup>5</sup> .....	0.15	0.16	0.19	0.21	0.22	0.23	0.25	1.5%
<b>Delivered energy .....</b>	<b>0.53</b>	<b>0.53</b>	<b>0.52</b>	<b>0.52</b>	<b>0.52</b>	<b>0.52</b>	<b>0.52</b>	<b>-0.0%</b>
Marketed renewables (wood) <sup>6</sup> .....	0.44	0.45	0.44	0.44	0.45	0.45	0.45	0.1%
Other fuels <sup>7</sup> .....	0.04	0.02	0.02	0.02	0.02	0.02	0.02	-1.5%

**Table A4. Residential sector key indicators and consumption (continued)**  
**Table A4. Residential sector key indicators and consumption (continued)**  
 (quadrillion Btu per year, unless otherwise noted)

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Delivered energy consumption by end use</b>								
Space heating .....	4.86	4.76	4.47	4.32	4.22	4.09	3.96	-0.6%
Space cooling .....	0.92	0.93	0.95	1.04	1.14	1.23	1.32	1.2%
Water heating .....	1.91	1.91	1.94	1.95	1.93	1.89	1.89	-0.0%
Refrigeration .....	0.38	0.38	0.38	0.39	0.41	0.43	0.45	0.6%
Cooking .....	0.36	0.36	0.37	0.38	0.40	0.41	0.42	0.6%
Clothes dryers.....	0.25	0.25	0.28	0.29	0.30	0.32	0.33	0.9%
Freezers .....	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.1%
Lighting .....	0.65	0.63	0.45	0.40	0.38	0.37	0.38	-1.8%
Clothes washers <sup>1</sup> .....	0.03	0.03	0.03	0.02	0.02	0.02	0.03	-0.8%
Dishwashers <sup>1</sup> .....	0.10	0.10	0.10	0.10	0.11	0.12	0.13	0.8%
Televisions and related equipment <sup>2</sup> .....	0.32	0.32	0.35	0.37	0.40	0.43	0.45	1.2%
Computers and related equipment <sup>3</sup> .....	0.16	0.16	0.13	0.12	0.12	0.12	0.13	-0.8%
Furnace fans and boiler circulation pumps .....	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.2%
Other uses <sup>8</sup> .....	1.26	1.23	1.28	1.41	1.55	1.69	1.87	1.5%
<b>Delivered energy.....</b>	<b>11.41</b>	<b>11.28</b>	<b>10.95</b>	<b>11.04</b>	<b>11.20</b>	<b>11.35</b>	<b>11.57</b>	<b>0.1%</b>
<b>Electricity related losses .....</b>	<b>10.35</b>	<b>10.20</b>	<b>9.66</b>	<b>10.04</b>	<b>10.45</b>	<b>10.90</b>	<b>11.50</b>	<b>0.4%</b>
<b>Total energy consumption by end use</b>								
Space heating.....	5.49	5.33	5.05	4.93	4.83	4.71	4.57	-0.5%
Space cooling .....	2.84	2.88	2.86	3.10	3.35	3.60	3.84	1.0%
Water heating .....	2.85	2.85	2.95	2.99	2.97	2.92	2.94	0.1%
Refrigeration .....	1.16	1.16	1.14	1.16	1.21	1.25	1.31	0.4%
Cooking .....	0.58	0.59	0.62	0.65	0.67	0.70	0.72	0.7%
Clothes dryers.....	0.66	0.66	0.71	0.74	0.77	0.80	0.83	0.8%
Freezers .....	0.25	0.26	0.25	0.25	0.25	0.24	0.25	-0.1%
Lighting .....	2.02	1.97	1.35	1.19	1.11	1.09	1.10	-2.0%
Clothes washers <sup>1</sup> .....	0.10	0.10	0.08	0.07	0.07	0.07	0.07	-1.0%
Dishwashers <sup>1</sup> .....	0.32	0.32	0.31	0.31	0.33	0.35	0.37	0.5%
Televisions and related equipment <sup>2</sup> .....	0.98	0.98	1.05	1.12	1.18	1.25	1.32	1.0%
Computers and related equipment <sup>3</sup> .....	0.49	0.49	0.39	0.37	0.36	0.36	0.36	-1.0%
Furnace fans and boiler circulation pumps .....	0.42	0.42	0.42	0.42	0.42	0.42	0.41	-0.0%
Other uses <sup>8</sup> .....	3.60	3.48	3.44	3.80	4.14	4.49	4.97	1.2%
<b>Total .....</b>	<b>21.76</b>	<b>21.48</b>	<b>20.62</b>	<b>21.08</b>	<b>21.65</b>	<b>22.25</b>	<b>23.08</b>	<b>0.2%</b>
<b>Nonmarketed renewables<sup>9</sup></b>								
Geothermal heat pumps .....	0.01	0.01	0.02	0.02	0.02	0.03	0.03	4.3%
Solar hot water heating .....	0.01	0.01	0.02	0.02	0.02	0.02	0.02	1.6%
Solar photovoltaic .....	0.01	0.02	0.14	0.15	0.17	0.18	0.21	9.1%
Wind .....	0.00	0.00	0.01	0.01	0.01	0.01	0.01	7.0%
<b>Total .....</b>	<b>0.03</b>	<b>0.04</b>	<b>0.20</b>	<b>0.21</b>	<b>0.22</b>	<b>0.24</b>	<b>0.27</b>	<b>6.9%</b>
<b>Heating degree days<sup>10</sup> .....</b>	<b>4,388</b>	<b>4,240</b>	<b>4,054</b>	<b>3,978</b>	<b>3,903</b>	<b>3,829</b>	<b>3,756</b>	<b>-0.4%</b>
<b>Cooling degree days<sup>10</sup> .....</b>	<b>1,498</b>	<b>1,528</b>	<b>1,499</b>	<b>1,545</b>	<b>1,591</b>	<b>1,638</b>	<b>1,685</b>	<b>0.3%</b>

<sup>1</sup>Does not include water heating portion of load.

<sup>2</sup>Includes televisions, set-top boxes, and video game consoles.

<sup>3</sup>Includes desktop and laptop computers, monitors, printers, speakers, networking equipment, and uninterruptible power supplies.

<sup>4</sup>Includes small electric devices, heating elements, and motors not listed above. Electric vehicles are included in the transportation sector.

<sup>5</sup>Includes such appliances as outdoor grills and mosquito traps.

<sup>6</sup>Includes wood used for primary and secondary heating in wood stoves or fireplaces as reported in the *Residential Energy Consumption Survey 2005*.

<sup>7</sup>Includes kerosene and coal.

<sup>8</sup>Includes all others not listed above.

<sup>9</sup>Consumption determined by using the fossil fuel equivalent of 9,756 Btu per kilowatthour.

<sup>10</sup>See Table A5 for regional detail.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 consumption based on: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 and 2011 degree days based on state-level data from the National Oceanic and Atmospheric Administration's Climatic Data Center and Climate Prediction Center. Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A5. Commercial sector key indicators and consumption**  
(quadrillion Btu per year, unless otherwise noted)

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Key indicators</b>								
<b>Total floorspace (billion square feet)</b>								
Surviving .....	79.3	80.2	87.0	91.9	96.2	100.7	106.4	1.0%
New additions .....	1.8	1.5	2.1	2.0	2.0	2.3	2.4	1.6%
<b>Total .....</b>	<b>81.1</b>	<b>81.7</b>	<b>89.1</b>	<b>93.9</b>	<b>98.1</b>	<b>103.0</b>	<b>108.8</b>	<b>1.0%</b>
<b>Energy consumption intensity (thousand Btu per square foot)</b>								
Delivered energy consumption .....	105.6	105.2	100.4	98.1	97.2	95.8	93.8	-0.4%
Electricity related losses .....	117.3	115.7	105.7	104.6	103.7	102.0	100.4	-0.5%
Total energy consumption .....	222.9	220.9	206.2	202.7	200.9	197.8	194.2	-0.4%
<b>Delivered energy consumption by fuel</b>								
<b>Purchased electricity</b>								
Space heating <sup>1</sup> .....	0.18	0.17	0.16	0.15	0.15	0.15	0.15	-0.5%
Space cooling <sup>1</sup> .....	0.56	0.57	0.53	0.54	0.56	0.58	0.59	0.1%
Water heating <sup>1</sup> .....	0.09	0.09	0.09	0.09	0.09	0.08	0.08	-0.4%
Ventilation .....	0.49	0.49	0.54	0.56	0.58	0.59	0.60	0.6%
Cooking .....	0.02	0.02	0.02	0.02	0.02	0.02	0.02	-0.3%
Lighting .....	0.96	0.94	0.89	0.90	0.90	0.88	0.87	-0.3%
Refrigeration .....	0.39	0.38	0.35	0.35	0.36	0.37	0.38	0.0%
Office equipment (PC) .....	0.21	0.20	0.19	0.20	0.20	0.21	0.22	0.2%
Office equipment (non-PC) .....	0.23	0.22	0.25	0.27	0.28	0.30	0.31	1.1%
Other uses <sup>2</sup> .....	1.42	1.41	1.70	1.88	2.08	2.29	2.51	2.0%
<b>Delivered energy .....</b>	<b>4.54</b>	<b>4.50</b>	<b>4.72</b>	<b>4.97</b>	<b>5.22</b>	<b>5.47</b>	<b>5.72</b>	<b>0.8%</b>
<b>Natural gas</b>								
Space heating <sup>1</sup> .....	1.65	1.64	1.66	1.62	1.58	1.53	1.45	-0.4%
Space cooling <sup>1</sup> .....	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-0.3%
Water heating <sup>1</sup> .....	0.44	0.45	0.50	0.52	0.53	0.54	0.53	0.6%
Cooking .....	0.18	0.18	0.20	0.21	0.22	0.22	0.23	0.7%
Other uses <sup>3</sup> .....	0.86	0.91	1.00	1.05	1.13	1.26	1.43	1.6%
<b>Delivered energy .....</b>	<b>3.17</b>	<b>3.23</b>	<b>3.40</b>	<b>3.43</b>	<b>3.50</b>	<b>3.59</b>	<b>3.68</b>	<b>0.4%</b>
<b>Distillate fuel oil</b>								
Space heating <sup>1</sup> .....	0.14	0.13	0.11	0.10	0.09	0.09	0.08	-1.7%
Water heating <sup>1</sup> .....	0.03	0.03	0.03	0.03	0.03	0.03	0.04	1.0%
Other uses <sup>4</sup> .....	0.24	0.26	0.20	0.20	0.19	0.19	0.19	-1.1%
<b>Delivered energy .....</b>	<b>0.41</b>	<b>0.42</b>	<b>0.34</b>	<b>0.33</b>	<b>0.32</b>	<b>0.31</b>	<b>0.30</b>	<b>-1.1%</b>
Marketed renewables (biomass) .....	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.0%
Other fuels <sup>5</sup> .....	0.34	0.32	0.36	0.37	0.37	0.37	0.38	0.6%
<b>Delivered energy consumption by end use</b>								
Space heating <sup>1</sup> .....	1.97	1.94	1.93	1.88	1.83	1.76	1.68	-0.5%
Space cooling <sup>1</sup> .....	0.60	0.61	0.57	0.58	0.59	0.61	0.63	0.1%
Water heating <sup>1</sup> .....	0.56	0.57	0.62	0.64	0.65	0.66	0.65	0.5%
Ventilation .....	0.49	0.49	0.54	0.56	0.58	0.59	0.60	0.6%
Cooking .....	0.20	0.21	0.22	0.23	0.24	0.25	0.25	0.6%
Lighting .....	0.96	0.94	0.89	0.90	0.90	0.88	0.87	-0.3%
Refrigeration .....	0.39	0.38	0.35	0.35	0.36	0.37	0.38	0.0%
Office equipment (PC) .....	0.21	0.20	0.19	0.20	0.20	0.21	0.22	0.2%
Office equipment (non-PC) .....	0.23	0.22	0.25	0.27	0.28	0.30	0.31	1.1%
Other uses <sup>6</sup> .....	2.97	3.03	3.38	3.62	3.90	4.23	4.63	1.5%
<b>Delivered energy .....</b>	<b>8.57</b>	<b>8.60</b>	<b>8.95</b>	<b>9.22</b>	<b>9.54</b>	<b>9.86</b>	<b>10.21</b>	<b>0.6%</b>

**Table A5. Commercial sector key indicators and consumption (continued)**  
(quadrillion Btu per year, unless otherwise noted)

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Electricity related losses</b> .....	<b>9.52</b>	<b>9.45</b>	<b>9.42</b>	<b>9.82</b>	<b>10.18</b>	<b>10.51</b>	<b>10.92</b>	<b>0.5%</b>
<b>Total energy consumption by end use</b>								
Space heating <sup>1</sup> .....	2.34	2.29	2.24	2.18	2.12	2.05	1.95	-0.5%
Space cooling <sup>1</sup> .....	1.77	1.81	1.62	1.65	1.68	1.72	1.77	-0.1%
Water heating <sup>1</sup> .....	0.75	0.76	0.80	0.81	0.82	0.82	0.81	0.2%
Ventilation .....	1.52	1.53	1.62	1.66	1.70	1.72	1.73	0.4%
Cooking .....	0.25	0.25	0.27	0.27	0.28	0.29	0.29	0.4%
Lighting .....	2.97	2.91	2.68	2.68	2.66	2.58	2.52	-0.5%
Refrigeration .....	1.20	1.18	1.06	1.06	1.07	1.09	1.12	-0.2%
Office equipment (PC) .....	0.65	0.63	0.57	0.58	0.60	0.61	0.63	-0.0%
Office equipment (non-PC) .....	0.70	0.70	0.74	0.79	0.84	0.87	0.89	0.9%
Other uses <sup>6</sup> .....	5.95	5.99	6.77	7.35	7.94	8.63	9.42	1.6%
<b>Total</b> .....	<b>18.09</b>	<b>18.05</b>	<b>18.37</b>	<b>19.04</b>	<b>19.72</b>	<b>20.37</b>	<b>21.13</b>	<b>0.5%</b>
<b>Nonmarketed renewable fuels<sup>7</sup></b>								
Solar thermal .....	0.08	0.08	0.09	0.10	0.10	0.11	0.12	1.4%
Solar photovoltaic .....	0.02	0.03	0.10	0.12	0.13	0.16	0.19	6.6%
Wind .....	0.00	0.00	0.00	0.00	0.00	0.01	0.01	7.7%
<b>Total</b> .....	<b>0.10</b>	<b>0.11</b>	<b>0.20</b>	<b>0.22</b>	<b>0.24</b>	<b>0.28</b>	<b>0.32</b>	<b>3.7%</b>
<b>Heating Degree Days</b>								
New England .....	5,944	6,138	6,131	6,062	5,992	5,922	5,850	-0.2%
Middle Atlantic .....	5,453	5,413	5,362	5,281	5,201	5,121	5,042	-0.2%
East North Central .....	6,209	6,187	6,073	6,019	5,965	5,911	5,856	-0.2%
West North Central .....	6,585	6,646	6,297	6,230	6,161	6,091	6,020	-0.3%
South Atlantic.....	3,183	2,555	2,660	2,627	2,596	2,566	2,538	-0.0%
East South Central.....	4,003	3,397	3,417	3,400	3,382	3,364	3,345	-0.1%
West South Central.....	2,503	2,203	2,036	1,996	1,956	1,916	1,876	-0.6%
Mountain.....	4,882	5,054	4,545	4,430	4,312	4,192	4,071	-0.7%
Pacific.....	3,202	3,411	3,094	3,076	3,057	3,039	3,022	-0.4%
<b>United States</b> .....	<b>4,388</b>	<b>4,240</b>	<b>4,054</b>	<b>3,978</b>	<b>3,903</b>	<b>3,829</b>	<b>3,756</b>	<b>-0.4%</b>
<b>Cooling Degree Days</b>								
New England .....	655	607	588	611	635	659	683	0.4%
Middle Atlantic .....	997	887	875	909	944	978	1,011	0.5%
East North Central .....	978	898	805	815	824	834	844	-0.2%
West North Central .....	1,123	1,116	995	1,003	1,012	1,021	1,030	-0.3%
South Atlantic.....	2,289	2,357	2,228	2,271	2,313	2,356	2,397	0.1%
East South Central.....	1,999	1,811	1,779	1,812	1,845	1,877	1,910	0.2%
West South Central.....	2,755	3,194	2,847	2,911	2,974	3,037	3,099	-0.1%
Mountain.....	1,490	1,396	1,698	1,766	1,837	1,910	1,985	1.2%
Pacific.....	746	809	913	925	938	950	961	0.6%
<b>United States</b> .....	<b>1,498</b>	<b>1,528</b>	<b>1,499</b>	<b>1,545</b>	<b>1,591</b>	<b>1,638</b>	<b>1,685</b>	<b>0.3%</b>

<sup>1</sup>Includes fuel consumption for district services.

<sup>2</sup>Includes (but is not limited to) miscellaneous uses such as transformers, medical imaging and other medical equipment, elevators, escalators, off-road electric vehicles, laboratory fume hoods, laundry equipment, coffee brewers, and water services.

<sup>3</sup>Includes miscellaneous uses, such as pumps, emergency generators, combined heat and power in commercial buildings, and manufacturing performed in commercial buildings.

<sup>4</sup>Includes miscellaneous uses, such as cooking, emergency generators, and combined heat and power in commercial buildings.

<sup>5</sup>Includes residual fuel oil, liquefied petroleum gases, coal, motor gasoline, and kerosene.

<sup>6</sup>Includes (but is not limited to) miscellaneous uses such as transformers, medical imaging and other medical equipment, elevators, escalators, off-road electric vehicles, laboratory fume hoods, laundry equipment, coffee brewers, water services, pumps, emergency generators, combined heat and power in commercial buildings, manufacturing performed in commercial buildings, and cooking (distillate), plus residual fuel oil, liquefied petroleum gases, coal, motor gasoline, kerosene, and marketed renewable fuels (biomass).

<sup>7</sup>Consumption determined by using the fossil fuel equivalent of 9,756 Btu per kilowatt-hour.

Btu = British thermal unit.

PC = Personal computer.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 consumption based on: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 and 2011 degree days based on state-level data from the National Oceanic and Atmospheric Administration's Climatic Data Center and Climate Prediction Center. Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

Table A6. Industrial sector key indicators and consumption

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Key indicators</b>								
<b>Value of shipments (billion 2005 dollars)</b>								
Manufacturing .....	4,257	4,438	5,683	6,253	6,712	7,285	7,972	2.0%
Nonmanufacturing .....	1,585	1,582	2,211	2,295	2,375	2,494	2,644	1.8%
<b>Total .....</b>	<b>5,842</b>	<b>6,019</b>	<b>7,894</b>	<b>8,548</b>	<b>9,087</b>	<b>9,779</b>	<b>10,616</b>	<b>2.0%</b>
<b>Energy prices</b>								
(2011 dollars per million Btu)								
Liquefied petroleum gases .....	23.73	22.54	20.51	22.33	23.64	24.97	26.78	0.6%
Motor gasoline .....	17.16	17.14	27.71	29.11	30.56	32.80	35.98	2.6%
Distillate fuel oil .....	21.87	26.50	24.67	27.02	28.91	31.31	34.16	0.9%
Residual fuel oil .....	11.30	18.86	17.19	18.96	21.09	23.25	25.78	1.1%
Asphalt and road oil .....	5.74	9.66	11.94	13.28	14.64	16.19	18.05	2.2%
Natural gas heat and power .....	5.18	4.54	5.19	5.84	6.28	7.18	8.64	2.2%
Natural gas feedstocks .....	5.81	5.28	5.87	6.47	6.86	7.73	9.15	1.9%
Metallurgical coal .....	5.96	7.01	8.75	9.36	10.09	10.69	11.11	1.6%
Other industrial coal .....	2.77	3.43	3.44	3.56	3.71	3.88	4.06	0.6%
Coal to liquids .....	--	--	--	2.30	2.55	2.76	2.95	--
Electricity .....	20.26	19.98	18.72	19.18	19.73	20.80	22.74	0.4%
(nominal dollars per million Btu)								
Liquefied petroleum gases .....	23.23	22.54	23.65	28.14	32.62	37.74	44.20	2.3%
Motor gasoline .....	16.80	17.14	31.95	36.69	42.17	49.57	59.39	4.4%
Distillate fuel oil .....	21.42	26.50	28.45	34.05	39.89	47.31	56.39	2.6%
Residual fuel oil .....	11.06	18.86	19.82	23.89	29.10	35.13	42.55	2.8%
Asphalt and road oil .....	5.62	9.66	13.77	16.73	20.20	24.46	29.78	4.0%
Natural gas heat and power .....	5.07	4.54	5.99	7.36	8.66	10.85	14.25	4.0%
Natural gas feedstocks .....	5.69	5.28	6.77	8.15	9.46	11.68	15.10	3.7%
Metallurgical coal .....	5.84	7.01	10.09	11.79	13.92	16.15	18.34	3.4%
Other industrial coal .....	2.71	3.43	3.97	4.48	5.12	5.86	6.70	2.3%
Coal to liquids .....	--	--	--	2.90	3.52	4.17	4.87	--
Electricity .....	19.84	19.98	21.59	24.17	27.22	31.42	37.54	2.2%
<b>Energy consumption (quadrillion Btu)<sup>1</sup></b>								
<b>Industrial consumption excluding refining</b>								
Liquefied petroleum gases heat and power .....	0.09	0.07	0.06	0.06	0.06	0.06	0.07	-0.2%
Liquefied petroleum gases feedstocks .....	2.02	2.02	2.40	2.48	2.41	2.34	2.24	0.4%
Propylene .....	0.41	0.40	0.56	0.56	0.52	0.49	0.46	0.6%
Motor gasoline .....	0.28	0.27	0.32	0.32	0.32	0.32	0.32	0.6%
Distillate fuel oil .....	1.19	1.20	1.22	1.19	1.18	1.19	1.22	0.0%
Residual fuel oil .....	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.0%
Petrochemical feedstocks .....	0.94	0.88	1.03	1.08	1.08	1.08	1.09	0.7%
Petroleum coke .....	0.16	0.15	0.33	0.35	0.34	0.34	0.34	3.0%
Asphalt and road oil .....	0.88	0.86	1.11	1.13	1.16	1.21	1.30	1.4%
Miscellaneous petroleum <sup>2</sup> .....	0.71	0.67	0.43	0.41	0.37	0.36	0.37	-2.0%
Petroleum subtotal .....	6.80	6.62	7.57	7.69	7.55	7.50	7.52	0.4%
Natural gas heat and power .....	4.81	5.03	5.74	5.84	5.84	5.93	6.04	0.6%
Natural gas feedstocks .....	0.48	0.46	0.55	0.55	0.51	0.48	0.45	-0.1%
Lease and plant fuel <sup>3</sup> .....	1.31	1.42	1.57	1.68	1.73	1.84	1.97	1.1%
Natural gas subtotal .....	6.60	6.91	7.86	8.07	8.09	8.25	8.45	0.7%
Metallurgical coal and coke <sup>4</sup> .....	0.55	0.57	0.59	0.55	0.48	0.42	0.41	-1.1%
Other industrial coal .....	1.00	1.04	1.00	1.00	1.00	1.02	1.05	0.0%
Coal subtotal .....	1.54	1.62	1.58	1.56	1.48	1.44	1.46	-0.3%
Renewables <sup>5</sup> .....	1.47	1.51	1.72	1.85	1.97	2.11	2.28	1.4%
Purchased electricity .....	3.10	3.12	3.74	3.84	3.75	3.68	3.68	0.6%
<b>Delivered energy .....</b>	<b>19.52</b>	<b>19.78</b>	<b>22.47</b>	<b>23.00</b>	<b>22.83</b>	<b>22.97</b>	<b>23.39</b>	<b>0.6%</b>
Electricity related losses .....	6.51	6.55	7.46	7.59	7.30	7.07	7.02	0.2%
<b>Total .....</b>	<b>26.03</b>	<b>26.33</b>	<b>29.93</b>	<b>30.59</b>	<b>30.14</b>	<b>30.05</b>	<b>30.41</b>	<b>0.5%</b>

Table A6. Industrial sector key indicators and consumption (continued)

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Refining consumption</b>								
Liquefied petroleum gases heat and power .....	0.01	0.00	0.00	0.00	0.00	0.00	0.00	--
Distillate fuel oil .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Residual fuel oil .....	0.01	0.00	0.00	0.00	0.00	0.00	0.00	--
Petroleum coke .....	0.52	0.53	0.42	0.40	0.40	0.40	0.41	-0.9%
Still gas .....	1.41	1.40	1.25	1.19	1.19	1.21	1.23	-0.4%
Miscellaneous petroleum <sup>2</sup> .....	0.01	0.01	0.00	0.00	0.00	0.00	0.00	-22.9%
Petroleum subtotal .....	1.96	1.95	1.67	1.59	1.59	1.61	1.64	-0.6%
Natural gas heat and power .....	1.38	1.43	1.57	1.60	1.62	1.61	1.60	0.4%
Natural-gas-to-liquids heat and power .....	0.00	0.00	0.13	0.16	0.21	0.27	0.33	--
Natural gas subtotal .....	1.38	1.43	1.70	1.77	1.83	1.88	1.93	1.0%
Other industrial coal .....	0.06	0.00	0.00	0.00	0.00	0.00	0.00	--
Coal-to-liquids heat and power .....	0.00	0.00	0.00	0.07	0.09	0.12	0.15	--
Coal subtotal .....	0.06	0.00	0.00	0.07	0.09	0.12	0.15	--
Biofuels heat and coproducts .....	0.85	0.67	0.82	0.82	0.85	0.97	1.37	2.5%
Purchased electricity .....	0.21	0.21	0.21	0.21	0.21	0.22	0.23	0.3%
<b>Delivered energy</b> .....	<b>4.46</b>	<b>4.26</b>	<b>4.40</b>	<b>4.46</b>	<b>4.57</b>	<b>4.80</b>	<b>5.31</b>	<b>0.8%</b>
Electricity related losses .....	0.44	0.44	0.42	0.41	0.41	0.41	0.43	-0.0%
<b>Total</b> .....	<b>4.90</b>	<b>4.70</b>	<b>4.82</b>	<b>4.87</b>	<b>4.98</b>	<b>5.21</b>	<b>5.75</b>	<b>0.7%</b>
<b>Total industrial sector consumption</b>								
Liquefied petroleum gases heat and power .....	0.10	0.08	0.06	0.06	0.06	0.06	0.07	-0.5%
Liquefied petroleum gases feedstocks .....	2.02	2.02	2.40	2.48	2.41	2.34	2.24	0.4%
Propylene .....	0.41	0.40	0.56	0.56	0.52	0.49	0.46	0.6%
Motor gasoline .....	0.28	0.27	0.32	0.32	0.32	0.32	0.32	0.6%
Distillate fuel oil .....	1.19	1.21	1.22	1.19	1.18	1.19	1.22	0.0%
Residual fuel oil .....	0.12	0.11	0.11	0.11	0.11	0.11	0.11	-0.1%
Petrochemical feedstocks .....	0.94	0.88	1.03	1.08	1.08	1.08	1.09	0.7%
Petroleum coke .....	0.68	0.67	0.75	0.75	0.73	0.74	0.75	0.4%
Asphalt and road oil .....	0.88	0.86	1.11	1.13	1.16	1.21	1.30	1.4%
Still gas .....	1.41	1.40	1.25	1.19	1.19	1.21	1.23	-0.4%
Miscellaneous petroleum <sup>2</sup> .....	0.73	0.68	0.43	0.41	0.37	0.36	0.37	-2.1%
Petroleum subtotal .....	8.76	8.57	9.25	9.28	9.14	9.11	9.16	0.2%
Natural gas heat and power .....	6.19	6.46	7.31	7.44	7.46	7.54	7.63	0.6%
Natural-gas-to-liquids heat and power .....	0.00	0.00	0.13	0.16	0.21	0.27	0.33	--
Natural gas feedstocks .....	0.48	0.46	0.55	0.55	0.51	0.48	0.45	-0.1%
Lease and plant fuel <sup>3</sup> .....	1.31	1.42	1.57	1.68	1.73	1.84	1.97	1.1%
Natural gas subtotal .....	7.98	8.34	9.56	9.84	9.91	10.13	10.38	0.8%
Metallurgical coal and coke <sup>4</sup> .....	0.55	0.57	0.59	0.55	0.48	0.42	0.41	-1.1%
Other industrial coal .....	1.06	1.04	1.00	1.00	1.00	1.02	1.05	0.0%
Coal-to-liquids heat and power .....	0.00	0.00	0.00	0.07	0.09	0.12	0.15	--
Coal subtotal .....	1.60	1.62	1.58	1.63	1.57	1.56	1.61	-0.0%
Biofuels heat and coproducts .....	0.85	0.67	0.82	0.82	0.85	0.97	1.37	2.5%
Renewables <sup>5</sup> .....	1.47	1.51	1.72	1.85	1.97	2.11	2.28	1.4%
Purchased electricity .....	3.31	3.33	3.95	4.05	3.96	3.90	3.91	0.6%
<b>Delivered energy</b> .....	<b>23.98</b>	<b>24.04</b>	<b>26.87</b>	<b>27.46</b>	<b>27.40</b>	<b>27.77</b>	<b>28.71</b>	<b>0.6%</b>
Electricity related losses .....	6.95	6.99	7.89	8.00	7.72	7.49	7.45	0.2%
<b>Total</b> .....	<b>30.93</b>	<b>31.03</b>	<b>34.76</b>	<b>35.46</b>	<b>35.11</b>	<b>35.26</b>	<b>36.16</b>	<b>0.5%</b>

Table A6. Industrial sector key indicators and consumption (continued)

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Energy consumption per dollar of shipments (thousand Btu per 2005 dollar)</b>								
Liquid fuels and other petroleum.....	1.50	1.42	1.17	1.09	1.01	0.93	0.86	-1.7%
Natural gas .....	1.37	1.39	1.23	1.17	1.11	1.06	1.01	-1.1%
Coal .....	0.27	0.27	0.20	0.19	0.17	0.16	0.15	-1.9%
Renewable fuels <sup>5</sup> .....	0.40	0.36	0.32	0.31	0.31	0.32	0.34	-0.2%
Purchased electricity.....	0.57	0.55	0.50	0.47	0.44	0.40	0.37	-1.4%
<b>Delivered energy.....</b>	<b>4.11</b>	<b>3.99</b>	<b>3.42</b>	<b>3.23</b>	<b>3.04</b>	<b>2.87</b>	<b>2.74</b>	<b>-1.3%</b>
<b>Industrial combined heat and power<sup>1</sup></b>								
Capacity (gigawatts) .....	25.07	25.63	29.47	32.44	36.48	41.55	45.07	2.0%
Generation (billion kilowatthours).....	123.76	122.05	164.19	182.40	206.62	237.92	260.03	2.6%

<sup>1</sup>Includes energy for combined heat and power plants that have a regulatory status, and small on-site generating systems.

<sup>2</sup>Includes lubricants and miscellaneous petroleum products.

<sup>3</sup>Represents natural gas used in well, field, and lease operations, in natural gas processing plant machinery, and for liquefaction in export facilities.

<sup>4</sup>Includes net coal coke imports.

<sup>5</sup>Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

**Sources:** 2010 and 2011 prices for motor gasoline and distillate fuel oil are based on: U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, DOE/EIA-0380(2012/08) (Washington, DC, August 2012). 2010 and 2011 petrochemical feedstock and asphalt and road oil prices are based on: EIA, *State Energy Data Report 2010*, DOE/EIA-0214(2010) (Washington, DC, June 2012). 2010 and 2011 coal prices are based on: EIA, *Quarterly Coal Report, October-December 2011*, DOE/EIA-0121(2011/4Q) (Washington, DC, March 2012) and EIA, AEO2013 National Energy Modeling System run REF2013.D102312A. 2010 and 2011 electricity prices: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 natural gas prices: EIA, *Natural Gas Annual 2010*, DOE/EIA-0131(2010) (Washington, DC, December 2011). 2011 natural gas prices: *Natural Gas Monthly*, DOE/EIA-0130 Natural Gas Monthly, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). 2010 refining consumption values are based on: *Petroleum Supply Annual 2010*, DOE/EIA-0340(2010)/1 (Washington, DC, July 2011). 2011 refining consumption based on: *Petroleum Supply Annual 2011*, DOE/EIA-0340(2011)/1 (Washington, DC, August 2012). Other 2010 and 2011 consumption values are based on: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 and 2011 shipments: IHS Global Insight, Global Insight Industry model, August 2012. **Projections:** EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.



**Table A7. Transportation sector key indicators and delivered energy consumption**

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Key indicators</b>								
<b>Travel indicators</b>								
(billion vehicle miles traveled)								
Light-duty vehicles less than 8,501 pounds ....	2,654	2,629	2,870	3,089	3,323	3,532	3,719	1.2%
Commercial light trucks <sup>1</sup> .....	65	65	80	87	94	102	110	1.8%
Freight trucks greater than 10,000 pounds .....	235	240	323	350	371	401	438	2.1%
(billion seat miles available)								
Air .....	999	982	1,082	1,131	1,177	1,222	1,274	0.9%
(billion ton miles traveled)								
Rail .....	1,581	1,557	1,719	1,833	1,910	1,969	2,017	0.9%
Domestic shipping .....	508	514	612	600	578	584	591	0.5%
<b>Energy efficiency indicators</b>								
(miles per gallon)								
New light-duty vehicle CAFE standard <sup>2</sup> .....	25.5	27.6	37.0	46.8	47.2	47.5	47.8	1.9%
New car <sup>2</sup> .....	27.7	30.9	43.9	54.6	54.6	54.7	54.7	2.0%
New light truck <sup>2</sup> .....	23.4	24.6	30.9	39.5	39.5	39.5	39.5	1.6%
Compliance new light-duty vehicle <sup>3</sup> .....	31.8	32.6	37.9	47.3	48.2	48.6	49.0	1.4%
New car <sup>3</sup> .....	36.1	37.4	44.4	55.0	55.6	55.9	56.1	1.4%
New light truck <sup>3</sup> .....	28.1	28.5	32.0	40.0	40.3	40.4	40.5	1.2%
Tested new light-duty vehicle <sup>4</sup> .....	30.8	31.5	37.9	47.3	48.1	48.6	49.0	1.5%
New car <sup>4</sup> .....	35.7	36.4	44.4	55.0	55.6	55.8	56.1	1.5%
New light truck <sup>4</sup> .....	26.9	27.3	32.0	40.0	40.3	40.4	40.4	1.4%
On-road new light-duty vehicle <sup>5</sup> .....	24.9	25.5	30.6	38.2	38.9	39.3	39.7	1.5%
New car <sup>5</sup> .....	29.1	29.8	36.3	44.9	45.4	45.6	45.8	1.5%
New light truck <sup>5</sup> .....	21.5	21.8	25.6	32.0	32.3	32.3	32.3	1.4%
Light-duty stock <sup>5</sup> .....	20.9	20.6	24.1	27.6	31.3	34.2	36.1	2.0%
New commercial light truck <sup>1</sup> .....	18.2	18.1	20.0	23.9	24.1	24.2	24.2	1.0%
Stock commercial light truck <sup>1</sup> .....	14.6	14.9	17.9	20.1	22.2	23.5	24.1	1.7%
Freight truck .....	6.7	6.7	7.3	7.7	8.0	8.1	8.2	0.7%
(seat miles per gallon)								
Aircraft .....	62.3	62.3	63.9	65.2	67.0	69.2	71.5	0.5%
(ton miles per thousand Btu)								
Rail .....	3.4	3.4	3.5	3.5	3.5	3.5	3.5	0.1%
Domestic shipping .....	2.4	2.4	2.5	2.5	2.5	2.5	2.6	0.2%
<b>Energy use by mode</b>								
<b>(quadrillion Btu)</b>								
Light-duty vehicles .....	15.94	15.56	14.35	13.48	12.77	12.44	12.43	-0.8%
Commercial light trucks <sup>1</sup> .....	0.55	0.54	0.56	0.54	0.53	0.54	0.57	0.2%
Bus transportation .....	0.25	0.25	0.27	0.28	0.29	0.31	0.32	0.9%
Freight trucks .....	4.86	4.95	6.07	6.24	6.39	6.76	7.31	1.4%
Rail, passenger .....	0.05	0.05	0.05	0.06	0.06	0.06	0.06	1.1%
Rail, freight .....	0.46	0.45	0.49	0.53	0.54	0.56	0.57	0.8%
Shipping, domestic .....	0.21	0.21	0.25	0.24	0.23	0.23	0.23	0.3%
Shipping, international .....	0.85	0.80	0.81	0.82	0.82	0.83	0.84	0.2%
Recreational boats .....	0.25	0.24	0.26	0.27	0.28	0.28	0.29	0.6%
Air .....	2.52	2.46	2.65	2.73	2.78	2.82	2.86	0.5%
Military use .....	0.76	0.74	0.63	0.65	0.68	0.72	0.77	0.1%
Lubricants .....	0.14	0.13	0.12	0.12	0.12	0.13	0.13	-0.1%
Pipeline fuel .....	0.68	0.70	0.71	0.73	0.74	0.76	0.78	0.4%
<b>Total .....</b>	<b>27.52</b>	<b>27.09</b>	<b>27.24</b>	<b>26.68</b>	<b>26.24</b>	<b>26.43</b>	<b>27.14</b>	<b>0.0%</b>

Table A7. Transportation sector key indicators and delivered energy consumption (continued)

Key indicators and consumption	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Energy use by mode</b>								
<b>(million barrels per day oil equivalent)</b>								
Light-duty vehicles .....	8.37	8.46	7.85	7.38	6.99	6.80	6.80	-0.7%
Commercial light trucks <sup>1</sup> .....	0.28	0.28	0.29	0.28	0.27	0.28	0.29	0.2%
Bus transportation .....	0.12	0.12	0.13	0.14	0.14	0.15	0.15	0.9%
Freight trucks .....	2.34	2.39	2.92	3.01	3.08	3.25	3.52	1.3%
Rail, passenger .....	0.02	0.02	0.02	0.03	0.03	0.03	0.03	1.1%
Rail, freight .....	0.22	0.22	0.24	0.25	0.26	0.27	0.27	0.8%
Shipping, domestic .....	0.10	0.10	0.12	0.11	0.11	0.11	0.11	0.3%
Shipping, international .....	0.37	0.35	0.35	0.36	0.36	0.36	0.37	0.2%
Recreational boats .....	0.13	0.13	0.14	0.15	0.15	0.15	0.16	0.6%
Air .....	1.22	1.19	1.28	1.32	1.35	1.36	1.38	0.5%
Military use .....	0.37	0.36	0.30	0.31	0.33	0.35	0.37	0.1%
Lubricants .....	0.07	0.06	0.06	0.06	0.06	0.06	0.06	-0.1%
Pipeline fuel .....	0.32	0.33	0.34	0.34	0.35	0.36	0.37	0.4%
<b>Total .....</b>	<b>13.93</b>	<b>14.00</b>	<b>14.05</b>	<b>13.73</b>	<b>13.47</b>	<b>13.53</b>	<b>13.87</b>	<b>-0.0%</b>

<sup>1</sup>Commercial trucks 8,501 to 10,000 pounds gross vehicle weight rating.

<sup>2</sup>CAFE standard based on projected new vehicle sales.

<sup>3</sup>Includes CAFE credits for alternative fueled vehicle sales and credit banking.

<sup>4</sup>Environmental Protection Agency rated miles per gallon.

<sup>5</sup>Tested new vehicle efficiency revised for on-road performance.

<sup>6</sup>Combined "on-the-road" estimate for all cars and light trucks.

CAFE = Corporate average fuel economy.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012); Federal Highway Administration, *Highway Statistics 2010* (Washington, DC, February 2012); Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 31* (Oak Ridge, TN, July 2012); National Highway Traffic and Safety Administration, *Summary of Fuel Economy Performance* (Washington, DC, October 28, 2010); U.S. Department of Commerce, Bureau of the Census, "Vehicle Inventory and Use Survey," EC02TV (Washington, DC, December 2004); EIA, *Alternatives to Traditional Transportation Fuels 2009 (Part II - User and Fuel Data)*, April 2011; EIA, *State Energy Data Report 2010*, DOE/EIA-0214(2010) (Washington, DC, June 2012); U.S. Department of Transportation, Research and Special Programs Administration, *Air Carrier Statistics Monthly, December 2010/2009* (Washington, DC, December 2010); and United States Department of Defense, Defense Fuel Supply Center, *Factbook* (January, 2010). Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A8. Electricity supply, disposition, prices, and emissions**  
(billion kilowatthours, unless otherwise noted)

Supply, disposition, prices, and emissions	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Generation by fuel type</b>								
<b>Electric power sector<sup>1</sup></b>								
<b>Power only<sup>2</sup></b>								
Coal .....	1,797	1,688	1,613	1,680	1,718	1,756	1,776	0.2%
Petroleum .....	32	24	15	15	15	15	16	-1.5%
Natural gas <sup>3</sup> .....	779	809	948	996	1,093	1,193	1,224	1.4%
Nuclear power.....	807	790	885	912	908	875	903	0.5%
Pumped storage/other <sup>4</sup> .....	2	1	2	2	3	3	3	2.2%
Renewable sources <sup>5</sup> .....	392	484	555	582	598	644	750	1.5%
Distributed generation (natural gas).....	0	0	3	6	10	12	13	--
<b>Total .....</b>	<b>3,809</b>	<b>3,797</b>	<b>4,021</b>	<b>4,194</b>	<b>4,345</b>	<b>4,497</b>	<b>4,684</b>	<b>0.7%</b>
<b>Combined heat and power<sup>6</sup></b>								
Coal .....	31	27	27	27	27	28	28	0.2%
Petroleum .....	2	2	1	1	1	1	1	-4.1%
Natural gas .....	123	121	130	131	128	127	125	0.1%
Renewable sources .....	5	4	4	4	4	4	4	-0.2%
<b>Total .....</b>	<b>163</b>	<b>157</b>	<b>161</b>	<b>162</b>	<b>161</b>	<b>160</b>	<b>158</b>	<b>0.0%</b>
<b>Total electric power sector generation .....</b>	<b>3,972</b>	<b>3,954</b>	<b>4,182</b>	<b>4,356</b>	<b>4,506</b>	<b>4,658</b>	<b>4,842</b>	<b>0.7%</b>
Less direct use.....	17	12	13	13	13	13	13	0.0%
<b>Net available to the grid .....</b>	<b>3,956</b>	<b>3,942</b>	<b>4,169</b>	<b>4,343</b>	<b>4,493</b>	<b>4,645</b>	<b>4,830</b>	<b>0.7%</b>
<b>End-use sector<sup>7</sup></b>								
Coal .....	20	15	16	20	21	23	25	1.7%
Petroleum .....	2	2	2	2	2	2	2	0.2%
Natural gas .....	69	70	104	120	148	187	221	4.0%
Other gaseous fuels <sup>8</sup> .....	10	11	14	14	14	14	14	0.9%
Renewable sources <sup>9</sup> .....	32	36	68	75	82	92	104	3.7%
Other <sup>10</sup> .....	4	4	4	4	4	4	4	-0.3%
<b>Total end-use sector generation .....</b>	<b>138</b>	<b>139</b>	<b>208</b>	<b>235</b>	<b>271</b>	<b>322</b>	<b>370</b>	<b>3.4%</b>
Less direct use.....	99	102	169	192	225	269	310	3.9%
<b>Total sales to the grid.....</b>	<b>39</b>	<b>37</b>	<b>39</b>	<b>43</b>	<b>47</b>	<b>53</b>	<b>60</b>	<b>1.7%</b>
<b>Total electricity generation by fuel</b>								
Coal .....	1847	1730	1656	1727	1766	1807	1829	0.2%
Petroleum .....	37	28	17	18	18	18	18	-1.5%
Natural gas .....	970	1000	1184	1252	1379	1519	1582	1.6%
Nuclear power.....	807	790	885	912	908	875	903	0.5%
Renewable sources <sup>5,9</sup> .....	429	524	627	661	685	740	858	1.7%
Other <sup>11</sup> .....	19	20	20	20	20	21	21	0.1%
<b>Total electricity generation .....</b>	<b>4110</b>	<b>4093</b>	<b>4389</b>	<b>4591</b>	<b>4777</b>	<b>4979</b>	<b>5212</b>	<b>0.8%</b>
<b>Net generation to the grid .....</b>	<b>3994</b>	<b>3979</b>	<b>4208</b>	<b>4386</b>	<b>4540</b>	<b>4698</b>	<b>4890</b>	<b>0.7%</b>
<b>Net imports.....</b>	<b>26</b>	<b>37</b>	<b>24</b>	<b>22</b>	<b>14</b>	<b>10</b>	<b>18</b>	<b>-2.4%</b>
<b>Electricity sales by sector</b>								
Residential.....	1446	1424	1419	1488	1572	1661	1767	0.7%
Commercial.....	1330	1319	1384	1455	1531	1602	1677	0.8%
Industrial.....	971	976	1158	1186	1161	1142	1145	0.6%
Transportation.....	6	6	9	11	13	16	19	3.9%
<b>Total .....</b>	<b>3753</b>	<b>3725</b>	<b>3969</b>	<b>4140</b>	<b>4276</b>	<b>4421</b>	<b>4608</b>	<b>0.7%</b>
Direct use .....	116	114	181	204	237	281	322	3.6%
<b>Total electricity use .....</b>	<b>3,870</b>	<b>3,841</b>	<b>4,151</b>	<b>4,344</b>	<b>4,513</b>	<b>4,702</b>	<b>4,930</b>	<b>0.9%</b>

**Table A8. Electricity supply, disposition, prices, and emissions (continued)**  
(billion kilowatthours, unless otherwise noted)

Supply, disposition, prices, and emissions	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>End-use prices</b>								
(2011 cents per kilowatthour)								
Residential.....	11.8	11.7	11.5	11.6	11.8	12.1	12.7	0.3%
Commercial.....	10.4	10.2	9.7	9.7	9.8	10.1	10.8	0.2%
Industrial.....	6.9	6.8	6.4	6.5	6.7	7.1	7.8	0.4%
Transportation.....	11.6	11.2	10.1	10.4	10.8	11.2	12.0	0.2%
<b>All sectors average.....</b>	<b>10.0</b>	<b>9.9</b>	<b>9.4</b>	<b>9.5</b>	<b>9.7</b>	<b>10.1</b>	<b>10.8</b>	<b>0.3%</b>
(nominal cents per kilowatthour)								
Residential.....	11.5	11.7	13.2	14.6	16.3	18.3	20.9	2.0%
Commercial.....	10.2	10.2	11.2	12.2	13.5	15.3	17.9	1.9%
Industrial.....	6.8	6.8	7.4	8.2	9.3	10.7	12.8	2.2%
Transportation.....	11.3	11.2	11.6	13.1	14.8	16.9	19.7	2.0%
<b>All sectors average.....</b>	<b>9.8</b>	<b>9.9</b>	<b>10.8</b>	<b>12.0</b>	<b>13.4</b>	<b>15.2</b>	<b>17.8</b>	<b>2.0%</b>
<b>Prices by service category</b>								
(2011 cents per kilowatthour)								
Generation.....	6.0	5.8	5.6	5.8	6.0	6.4	7.1	0.7%
Transmission.....	1.0	1.1	1.1	1.1	1.1	1.1	1.1	0.3%
Distribution.....	3.0	3.1	2.8	2.6	2.6	2.6	2.6	-0.5%
(nominal cents per kilowatthour)								
Generation.....	5.9	5.8	6.4	7.3	8.3	9.6	11.6	2.5%
Transmission.....	1.0	1.1	1.2	1.4	1.5	1.7	1.9	2.0%
Distribution.....	2.9	3.1	3.2	3.3	3.6	4.0	4.3	1.2%
<b>Electric power sector emissions<sup>1</sup></b>								
Sulfur dioxide (million short tons).....	5.00	4.42	1.35	1.43	1.50	1.60	1.66	-3.3%
Nitrogen oxide (million short tons).....	2.07	1.94	1.72	1.80	1.82	1.85	1.87	-0.1%
Mercury (short tons).....	33.14	31.49	6.84	7.19	7.33	7.55	7.75	-4.7%

<sup>1</sup>Includes electricity-only and combined heat and power plants that have a regulatory status.

<sup>2</sup>Includes plants that only produce electricity and have a regulatory status.

<sup>3</sup>Includes electricity generation from fuel cells.

<sup>4</sup>Includes non-biogenic municipal waste. The U.S. Energy Information Administration estimates that in 2011 approximately 6 billion kilowatthours of electricity were generated from a municipal waste stream containing petroleum-derived plastics and other non-renewable sources. See U.S. Energy Information Administration, *Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy*, (Washington, DC, May 2007).

<sup>5</sup>Includes conventional hydroelectric, geothermal, wood, wood waste, biogenic municipal waste, landfill gas, other biomass, solar, and wind power.

<sup>6</sup>Includes combined heat and power plants whose primary business is to sell electricity and heat to the public (i.e., those that report North American Industry Classification System code 22 or have a regulatory status).

<sup>7</sup>Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors that have a non-regulatory status; and small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.

<sup>8</sup>Includes refinery gas and still gas.

<sup>9</sup>Includes conventional hydroelectric, geothermal, wood, wood waste, all municipal waste, landfill gas, other biomass, solar, and wind power.

<sup>10</sup>Includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

<sup>11</sup>Includes pumped storage, non-biogenic municipal waste, refinery gas, still gas, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 electric power sector generation; sales to the grid; net imports; electricity sales; and electricity end-use prices: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012), and supporting databases. 2010 and 2011 emissions: U.S. Environmental Protection Agency, Clean Air Markets Database. 2010 and 2011 electricity prices by service category: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A. Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A9. Electricity generating capacity**  
(gigawatts)

Net summer capacity <sup>1</sup>	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Electric power sector<sup>2</sup></b>								
<b>Power only<sup>3</sup></b>								
Coal .....	308.0	309.5	268.7	267.9	267.9	267.9	269.0	-0.5%
Oil and natural gas steam <sup>4</sup> .....	105.6	101.9	86.4	78.3	69.1	66.6	64.0	-1.6%
Combined cycle .....	171.8	179.5	193.2	207.6	238.3	265.8	288.4	1.6%
Combustion turbine/diesel .....	134.5	136.1	149.9	162.1	177.2	190.2	208.9	1.5%
Nuclear power <sup>5</sup> .....	101.2	101.1	110.6	114.1	113.6	109.3	113.1	0.4%
Pumped storage .....	22.3	22.3	22.3	22.3	22.3	22.3	22.3	0.0%
Fuel cells .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8%
Renewable sources <sup>6</sup> .....	125.3	132.3	152.9	155.6	159.7	174.3	206.8	1.6%
Distributed generation <sup>7</sup> .....	0.0	0.0	0.9	1.9	3.1	4.1	5.1	--
<b>Total .....</b>	<b>968.7</b>	<b>982.8</b>	<b>985.0</b>	<b>1,009.8</b>	<b>1,051.2</b>	<b>1,100.7</b>	<b>1,177.7</b>	<b>0.6%</b>
<b>Combined heat and power<sup>8</sup></b>								
Coal .....	4.9	4.9	4.3	4.2	4.2	4.2	4.2	-0.5%
Oil and natural gas steam <sup>4</sup> .....	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0%
Combined cycle .....	26.0	26.0	26.0	26.0	26.0	26.0	26.0	0.0%
Combustion turbine/diesel .....	2.8	2.8	2.8	2.8	2.8	2.8	2.8	-0.1%
Renewable sources <sup>6</sup> .....	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.2%
<b>Total .....</b>	<b>35.3</b>	<b>35.3</b>	<b>34.6</b>	<b>34.6</b>	<b>34.6</b>	<b>34.6</b>	<b>34.6</b>	<b>-0.1%</b>
<b>Cumulative planned additions<sup>9</sup></b>								
Coal .....	0.0	0.0	6.1	6.1	6.1	6.1	6.1	--
Oil and natural gas steam <sup>4</sup> .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Combined cycle .....	0.0	0.0	10.9	10.9	10.9	10.9	10.9	--
Combustion turbine/diesel .....	0.0	0.0	5.6	5.6	5.6	5.6	5.6	--
Nuclear power .....	0.0	0.0	5.5	5.5	5.5	5.5	5.5	--
Pumped storage .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Fuel cells .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Renewable sources <sup>6</sup> .....	0.0	0.0	18.1	18.1	18.1	18.1	18.1	--
Distributed generation <sup>7</sup> .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
<b>Total .....</b>	<b>0.0</b>	<b>0.0</b>	<b>46.3</b>	<b>46.3</b>	<b>46.3</b>	<b>46.3</b>	<b>46.3</b>	<b>--</b>
<b>Cumulative unplanned additions<sup>9</sup></b>								
Coal .....	0.0	0.0	0.3	0.3	0.3	0.4	1.5	--
Oil and natural gas steam <sup>4</sup> .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Combined cycle .....	0.0	0.0	3.1	17.4	48.2	75.7	98.3	--
Combustion turbine/diesel .....	0.0	0.0	15.4	28.0	43.3	56.4	75.3	--
Nuclear power .....	0.0	0.0	0.0	0.0	0.0	0.8	5.5	--
Pumped storage .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Fuel cells .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Renewable sources <sup>6</sup> .....	0.0	0.0	3.7	6.4	10.5	25.2	57.6	--
Distributed generation <sup>7</sup> .....	0.0	0.0	0.9	1.9	3.1	4.1	5.1	--
<b>Total .....</b>	<b>0.0</b>	<b>0.0</b>	<b>23.4</b>	<b>54.1</b>	<b>105.4</b>	<b>162.4</b>	<b>243.3</b>	<b>--</b>
<b>Cumulative electric power sector additions.....</b>	<b>0.0</b>	<b>0.0</b>	<b>69.7</b>	<b>100.4</b>	<b>151.7</b>	<b>208.7</b>	<b>289.5</b>	<b>--</b>
<b>Cumulative retirements<sup>10</sup></b>								
Coal .....	0.0	0.0	47.9	48.8	48.8	48.8	48.8	--
Oil and natural gas steam <sup>4</sup> .....	0.0	0.0	15.5	23.6	32.8	35.3	37.9	--
Combined cycle .....	0.0	0.0	0.2	0.2	0.2	0.2	0.2	--
Combustion turbine/diesel .....	0.0	0.0	7.3	7.7	7.9	7.9	8.2	--
Nuclear power .....	0.0	0.0	0.6	0.6	1.1	6.1	7.1	--
Pumped storage .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Fuel cells .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--
Renewable sources <sup>6</sup> .....	0.0	0.0	1.2	1.2	1.2	1.2	1.2	--
<b>Total .....</b>	<b>0.0</b>	<b>0.0</b>	<b>72.7</b>	<b>82.1</b>	<b>92.0</b>	<b>99.6</b>	<b>103.4</b>	<b>--</b>
<b>Total electric power sector capacity .....</b>	<b>1,004.1</b>	<b>1,018.1</b>	<b>1,019.6</b>	<b>1,044.4</b>	<b>1,085.8</b>	<b>1,135.3</b>	<b>1,212.3</b>	<b>0.6%</b>

**Table A9. Electricity generating capacity (continued)**  
(gigawatts)

Net summer capacity <sup>1</sup>	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>End-use generators<sup>11</sup></b>								
Coal .....	3.6	3.6	3.6	4.2	4.4	4.6	4.9	1.1%
Petroleum .....	0.7	0.7	1.0	1.0	1.0	1.0	1.0	1.0%
Natural gas .....	15.1	15.0	17.2	19.7	24.1	30.1	35.1	3.0%
Other gaseous fuels <sup>12</sup> .....	1.6	2.0	2.1	2.1	2.1	2.1	2.1	0.1%
Renewable sources <sup>6</sup> .....	7.2	8.9	24.2	26.3	29.1	32.7	37.5	5.1%
Other <sup>13</sup> .....	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.8%
<b>Total .....</b>	<b>28.7</b>	<b>30.6</b>	<b>48.5</b>	<b>53.7</b>	<b>61.1</b>	<b>71.0</b>	<b>81.0</b>	<b>3.4%</b>
<b>Cumulative capacity additions<sup>9</sup> .....</b>	<b>0.0</b>	<b>0.0</b>	<b>17.9</b>	<b>23.1</b>	<b>30.5</b>	<b>40.3</b>	<b>50.4</b>	<b>--</b>

<sup>1</sup>Net summer capacity is the steady hourly output that generating equipment is expected to supply to system load (exclusive of auxiliary power), as demonstrated by tests during summer peak demand.

<sup>2</sup>Includes electricity-only and combined heat and power plants whose primary business is to sell electricity, or electricity and heat, to the public.

<sup>3</sup>Includes plants that only produce electricity. Includes capacity increases (uprates) at existing units.

<sup>4</sup>Includes oil-, gas-, and dual-fired capacity.

<sup>5</sup>Nuclear capacity includes 8.0 gigawatts of uprates through 2040.

<sup>6</sup>Includes conventional hydroelectric, geothermal, wood, wood waste, all municipal waste, landfill gas, other biomass, solar, and wind power. Facilities co-firing biomass and coal are classified as coal.

<sup>7</sup>Primarily peak load capacity fueled by natural gas.

<sup>8</sup>Includes combined heat and power plants whose primary business is to sell electricity and heat to the public (i.e., those that report North American Industry Classification System code 22).

<sup>9</sup>Cumulative additions after December 31, 2011.

<sup>10</sup>Cumulative retirements after December 31, 2011.

<sup>11</sup>Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors; and small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.

<sup>12</sup>Includes refinery gas and still gas.

<sup>13</sup>Includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 capacity and projected planned additions: U.S. Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report" (preliminary). Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A10. Electricity trade**  
(billion kilowatthours, unless otherwise noted)

Electricity trade	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Interregional electricity trade</b>								
Gross domestic sales								
Firm power.....	237.5	173.8	104.4	47.1	24.2	24.2	24.2	-6.6%
Economy.....	150.1	158.1	162.7	167.5	189.9	186.3	220.2	1.1%
<b>Total.....</b>	<b>387.6</b>	<b>332.0</b>	<b>267.1</b>	<b>214.6</b>	<b>214.1</b>	<b>210.5</b>	<b>244.4</b>	<b>-1.1%</b>
Gross domestic sales (million 2011 dollars)								
Firm power.....	14,548.9	10,648.8	6,393.5	2,884.8	1,481.3	1,481.3	1,481.3	-6.6%
Economy.....	7,192.7	6,457.3	8,615.5	9,945.5	10,174.8	11,041.2	15,088.4	3.0%
<b>Total.....</b>	<b>21,741.6</b>	<b>17,106.2</b>	<b>15,008.9</b>	<b>12,830.3</b>	<b>11,656.1</b>	<b>12,522.5</b>	<b>16,569.7</b>	<b>-0.1%</b>
<b>International electricity trade</b>								
Imports from Canada and Mexico								
Firm power.....	13.7	15.0	17.1	5.2	0.4	0.4	0.4	-11.9%
Economy.....	31.4	37.4	25.6	34.8	31.3	27.5	35.5	-0.2%
<b>Total.....</b>	<b>45.1</b>	<b>52.4</b>	<b>42.7</b>	<b>40.0</b>	<b>31.7</b>	<b>27.8</b>	<b>35.8</b>	<b>-1.3%</b>
Exports to Canada and Mexico								
Firm power.....	3.7	2.6	1.3	0.4	0.0	0.0	0.0	--
Economy.....	15.7	12.8	17.3	18.0	18.0	17.8	17.8	1.1%
<b>Total.....</b>	<b>19.4</b>	<b>15.4</b>	<b>18.6</b>	<b>18.4</b>	<b>18.0</b>	<b>17.8</b>	<b>17.8</b>	<b>0.5%</b>

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports. Firm power sales are capacity sales, meaning the delivery of the power is scheduled as part of the normal operating conditions of the affected electric systems. Economy sales are subject to curtailment or cessation of delivery by the supplier in accordance with prior agreements or under specified conditions.

Sources: 2010 and 2011 interregional firm electricity trade data: North American Electric Reliability Council (NERC), Electricity Sales and Demand Database 2007; NERC, 2011 Summer Reliability Assessment (May 2011); and NERC, Winter Reliability Assessment 2011/2012 (November 2011). 2010 and 2011 Mexican electricity trade data: U.S. Energy Information Administration (EIA), *Electric Power Annual 2010*, DOE/EIA-0348(2010) (Washington, DC, November 2011). 2010 Canadian international electricity trade data: National Energy Board, *Electricity Exports and Imports Statistics, 2010*. 2011 Canadian international electricity trade data: National Energy Board, *Electricity Exports and Imports Statistics, 2011*. Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.



**Table A11. Liquid fuels supply and disposition**  
(million barrels per day, unless otherwise noted)

Supply and disposition	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Crude oil</b>								
Domestic crude production <sup>1</sup> .....	5.47	5.67	7.47	6.79	6.30	6.26	6.13	0.3%
Alaska.....	0.60	0.57	0.49	0.35	0.38	0.35	0.41	-1.1%
Lower 48 states.....	4.88	5.10	6.98	6.44	5.92	5.91	5.72	0.4%
Net imports.....	9.17	8.89	6.82	7.05	7.36	7.37	7.57	-0.6%
Gross imports.....	9.21	8.94	6.82	7.05	7.36	7.37	7.57	-0.6%
Exports.....	0.04	0.05	0.00	0.00	0.00	0.00	0.00	--
Other crude supply <sup>2</sup> .....	0.07	0.26	0.00	0.00	0.00	0.00	0.00	--
<b>Total crude supply</b> .....	<b>14.72</b>	<b>14.81</b>	<b>14.29</b>	<b>13.84</b>	<b>13.66</b>	<b>13.63</b>	<b>13.70</b>	<b>-0.3%</b>
<b>Other petroleum supply</b> .....								
Natural gas plant liquids.....	2.07	2.22	3.13	3.17	2.90	2.91	2.92	1.0%
Net product imports.....	0.29	-0.30	-0.13	-0.04	-0.08	-0.37	-0.67	2.7%
Gross refined product imports <sup>3</sup> .....	1.23	1.15	1.47	1.50	1.53	1.50	1.42	0.7%
Unfinished oil imports.....	0.61	0.69	0.56	0.53	0.51	0.48	0.45	-1.5%
Blending component imports.....	0.74	0.72	0.63	0.59	0.54	0.48	0.40	-2.0%
Exports.....	2.29	2.86	2.79	2.66	2.67	2.84	2.94	0.1%
Refinery processing gain <sup>4</sup> .....	1.07	1.08	1.04	0.99	1.00	1.02	1.03	-0.1%
Product stock withdrawal.....	-0.03	0.03	0.00	0.00	0.00	0.00	0.00	--
<b>Other non-petroleum supply</b> .....	<b>1.03</b>	<b>1.09</b>	<b>1.51</b>	<b>1.55</b>	<b>1.58</b>	<b>1.68</b>	<b>1.97</b>	<b>2.1%</b>
Supply from renewable sources.....	0.86	0.90	1.18	1.15	1.14	1.19	1.43	1.6%
Ethanol.....	0.84	0.84	1.08	1.04	0.99	0.96	0.97	0.5%
Domestic production.....	0.87	0.91	1.01	0.98	0.95	0.91	0.89	-0.1%
Net imports.....	-0.02	-0.07	0.07	0.06	0.04	0.05	0.08	--
Biodiesel.....	0.02	0.06	0.08	0.08	0.08	0.08	0.08	1.0%
Domestic production.....	0.02	0.06	0.07	0.07	0.07	0.07	0.07	0.4%
Net imports.....	-0.01	-0.00	0.01	0.01	0.01	0.01	0.01	--
Other biomass-derived liquids <sup>5</sup> .....	0.00	0.00	0.02	0.03	0.06	0.14	0.38	21.6%
Liquids from gas.....	0.00	0.00	0.08	0.10	0.13	0.16	0.20	--
Liquids from coal.....	0.00	0.00	0.00	0.03	0.04	0.05	0.06	--
Other <sup>6</sup> .....	0.17	0.18	0.25	0.26	0.28	0.28	0.28	1.5%
<b>Total primary supply</b> <sup>7</sup> .....	<b>19.16</b>	<b>18.92</b>	<b>19.84</b>	<b>19.50</b>	<b>19.06</b>	<b>18.88</b>	<b>18.96</b>	<b>0.0%</b>
<b>Liquid fuels consumption</b>								
<b>by fuel</b>								
Liquefied petroleum gases.....	2.27	2.30	2.90	2.97	2.90	2.83	2.75	0.6%
E85 <sup>8</sup> .....	0.00	0.03	0.06	0.10	0.11	0.10	0.11	4.3%
Motor gasoline <sup>9</sup> .....	8.99	8.74	8.34	7.78	7.34	7.14	7.12	-0.7%
Jet fuel <sup>10</sup> .....	1.43	1.42	1.52	1.56	1.60	1.63	1.66	0.5%
Distillate fuel oil <sup>11</sup> .....	3.80	3.90	4.48	4.55	4.56	4.59	4.67	0.6%
Diesel.....	3.32	3.51	4.04	4.14	4.18	4.23	4.33	0.7%
Residual fuel oil.....	0.54	0.46	0.50	0.50	0.50	0.51	0.51	0.4%
Other <sup>12</sup> .....	2.14	2.08	2.04	2.04	2.03	2.06	2.11	0.1%
<b>by sector</b>								
Residential and commercial.....	1.06	1.06	1.01	0.97	0.95	0.93	0.91	-0.5%
Industrial <sup>13</sup> .....	4.48	4.43	5.10	5.15	5.05	5.01	5.00	0.4%
Transportation.....	13.57	13.63	13.65	13.29	12.95	12.84	12.95	-0.2%
Electric power <sup>14</sup> .....	0.17	0.13	0.08	0.08	0.08	0.08	0.08	-1.5%
<b>Total</b> .....	<b>19.17</b>	<b>18.95</b>	<b>19.84</b>	<b>19.50</b>	<b>19.04</b>	<b>18.86</b>	<b>18.95</b>	<b>0.0%</b>
<b>Discrepancy</b> <sup>15</sup> .....	<b>-0.01</b>	<b>-0.03</b>	<b>0.01</b>	<b>0.01</b>	<b>0.02</b>	<b>0.02</b>	<b>0.01</b>	<b>--</b>

**Table A11. Liquid fuels supply and disposition (continued)**  
(million barrels per day, unless otherwise noted)

Supply and disposition	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
Domestic refinery distillation capacity <sup>16</sup> .....	17.6	17.7	17.5	17.5	17.5	17.5	17.5	-0.0%
Capacity utilization rate (percent) <sup>17</sup> .....	86.0	86.0	90.7	87.8	86.7	86.5	86.9	0.0%
Net import share of product supplied (percent).....	49.3	45.0	34.1	36.3	38.5	37.4	36.9	-0.7%
Net expenditures for imported crude oil and petroleum products (billion 2011 dollars).....	248.26	362.66	259.66	296.86	342.67	378.36	433.65	0.6%

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

<sup>2</sup>Strategic petroleum reserve stock additions plus unaccounted for crude oil and crude stock withdrawals minus crude product supplied.

<sup>3</sup>Includes other hydrocarbons and alcohols.

<sup>4</sup>The volumetric amount by which total output is greater than input due to the processing of crude oil into products which, in total, have a lower specific gravity than the crude oil processed.

<sup>5</sup>Includes pyrolysis oils, biomass-derived Fischer-Tropsch liquids, and renewable feedstocks used for the on-site production of diesel and gasoline.

<sup>6</sup>Includes domestic sources of other blending components, other hydrocarbons, and ethers.

<sup>7</sup>Total crude supply plus other petroleum supply plus other non-petroleum supply.

<sup>8</sup>E85 refers to a blend of 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable). To address cold starting issues, the percentage of ethanol varies seasonally. The annual average ethanol content of 74 percent is used for this forecast.

<sup>9</sup>Includes ethanol and ethers blended into gasoline.

<sup>10</sup>Includes only kerosene type.

<sup>11</sup>Includes distillate fuel oil and kerosene from petroleum and biomass feedstocks.

<sup>12</sup>Includes aviation gasoline, petrochemical feedstocks, lubricants, waxes, asphalt, road oil, still gas, special naphthas, petroleum coke, crude oil product supplied, methanol, and miscellaneous petroleum products.

<sup>13</sup>Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

<sup>14</sup>Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.

<sup>15</sup>Balancing item. Includes unaccounted for supply, losses, and gains.

<sup>16</sup>End-of-year operable capacity.

<sup>17</sup>Rate is calculated by dividing the gross annual input to atmospheric crude oil distillation units by their operable refining capacity in barrels per calendar day.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 product supplied based on: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). Other 2010 data: EIA, *Petroleum Supply Annual 2010*, DOE/EIA-0340(2010)/1 (Washington, DC, July 2011). Other 2011 data: EIA, *Petroleum Supply Annual 2011*, DOE/EIA-0340(2011)/1 (Washington, DC, August 2012). Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A12. Petroleum product prices**  
(2011 dollars per gallon, unless otherwise noted)

Sector and fuel	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Crude oil prices (2011 dollars per barrel)</b>								
Brent spot .....	81.31	111.26	105.57	117.36	130.47	145.41	162.68	1.3%
West Texas Intermediate spot .....	81.08	94.86	103.57	115.36	128.47	143.41	160.68	1.8%
Average imported refiners acquisition cost <sup>1</sup> .....	77.49	102.65	102.19	113.48	125.64	138.70	154.96	1.4%
<b>Delivered sector product prices</b>								
<b>Residential</b>								
Propane .....	2.34	2.13	1.98	2.09	2.17	2.25	2.35	0.3%
Distillate fuel oil .....	3.02	3.66	3.73	4.03	4.34	4.67	5.07	1.1%
<b>Commercial</b>								
Distillate fuel oil .....	2.94	3.57	3.34	3.65	3.93	4.26	4.65	0.9%
Residual fuel oil .....	1.70	2.87	2.22	2.49	2.81	3.13	3.50	0.7%
Residual fuel oil (2011 dollars per barrel) .....	71.59	120.49	93.20	104.39	117.99	131.32	147.19	0.7%
<b>Industrial<sup>2</sup></b>								
Propane .....	2.01	1.92	1.74	1.88	1.99	2.10	2.25	0.5%
Distillate fuel oil .....	3.01	3.64	3.39	3.71	3.97	4.30	4.69	0.9%
Residual fuel oil .....	1.69	2.82	2.57	2.84	3.16	3.48	3.86	1.1%
Residual fuel oil (2011 dollars per barrel) .....	71.03	118.58	108.07	119.19	132.58	146.16	162.10	1.1%
<b>Transportation</b>								
Propane .....	2.33	2.22	2.07	2.18	2.26	2.34	2.44	0.3%
Ethanol (E85) <sup>3</sup> .....	2.44	2.42	2.83	2.60	2.57	2.79	2.92	0.7%
Ethanol wholesale price .....	1.75	2.54	3.00	2.66	2.28	2.32	2.48	-0.1%
Motor gasoline <sup>4</sup> .....	2.88	3.45	3.32	3.49	3.67	3.94	4.32	0.8%
Jet fuel <sup>5</sup> .....	2.24	3.04	2.90	3.20	3.51	3.85	4.19	1.1%
Diesel fuel (distillate fuel oil) <sup>6</sup> .....	3.07	3.58	3.65	3.97	4.22	4.55	4.94	1.1%
Residual fuel oil .....	1.59	2.67	2.23	2.48	2.75	3.03	3.36	0.8%
Residual fuel oil (2011 dollars per barrel) .....	66.79	112.11	93.74	104.23	115.30	127.30	141.16	0.8%
<b>Electric power<sup>7</sup></b>								
Distillate fuel oil .....	2.67	3.23	3.11	3.41	3.72	4.05	4.44	1.1%
Residual fuel oil .....	1.81	2.39	3.73	4.09	4.39	4.77	5.17	2.7%
Residual fuel oil (2011 dollars per barrel) .....	76.16	100.43	156.82	171.59	184.59	200.24	217.18	2.7%
<b>Refined petroleum product prices<sup>8</sup></b>								
Propane .....	1.37	1.46	1.16	1.36	1.53	1.72	2.00	1.1%
Motor gasoline <sup>4</sup> .....	2.86	3.42	3.32	3.49	3.67	3.94	4.32	0.8%
Jet fuel <sup>5</sup> .....	2.24	3.04	2.90	3.20	3.51	3.85	4.19	1.1%
Distillate fuel oil .....	3.04	3.59	3.60	3.93	4.18	4.51	4.90	1.1%
Residual fuel oil .....	1.66	2.64	2.39	2.65	2.93	3.24	3.59	1.1%
Residual fuel oil (2011 dollars per barrel) .....	69.52	110.98	100.39	111.40	123.16	135.88	150.58	1.1%
<b>Average</b> .....	<b>2.59</b>	<b>3.11</b>	<b>3.01</b>	<b>3.22</b>	<b>3.43</b>	<b>3.72</b>	<b>4.10</b>	<b>1.0%</b>

**Table A12. Petroleum product prices (continued)**  
(nominal dollars per gallon, unless otherwise noted)

Sector and fuel	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Crude oil spot prices</b>								
<b>(nominal dollars per barrel)</b>								
Brent spot .....	79.61	111.26	121.73	147.90	180.04	219.73	268.50	3.1%
West Texas Intermediate spot .....	79.39	94.86	119.43	145.38	177.28	216.70	265.20	3.6%
Average imported refiners acquisition cost <sup>1</sup> .....	75.87	102.65	117.84	143.00	173.38	209.59	255.76	3.2%
<b>Delivered sector product prices</b>								
<b>Residential</b>								
Propane .....	2.29	2.13	2.29	2.63	2.99	3.40	3.88	2.1%
Distillate fuel oil .....	2.96	3.66	4.30	5.08	5.98	7.06	8.37	2.9%
<b>Commercial</b>								
Distillate fuel oil .....	2.88	3.57	3.86	4.61	5.42	6.44	7.68	2.7%
Residual fuel oil .....	1.67	2.87	2.56	3.13	3.88	4.72	5.78	2.4%
Residual fuel oil (nominal dollars per barrel) .....	70.09	120.49	107.46	131.55	162.83	198.44	242.92	2.4%
<b>Industrial<sup>2</sup></b>								
Propane .....	1.97	1.92	2.00	2.38	2.75	3.18	3.71	2.3%
Distillate fuel oil .....	2.95	3.64	3.91	4.67	5.48	6.49	7.74	2.6%
Residual fuel oil .....	1.66	2.82	2.97	3.58	4.36	5.26	6.37	2.8%
Residual fuel oil (nominal dollars per barrel) .....	69.54	118.58	124.61	150.20	182.96	220.86	267.54	2.8%
<b>Transportation</b>								
Propane .....	2.28	2.22	2.39	2.75	3.12	3.53	4.03	2.1%
Ethanol (E85) <sup>3</sup> .....	2.39	2.42	3.26	3.28	3.55	4.21	4.82	2.4%
Ethanol wholesale price .....	1.71	2.54	3.46	3.36	3.14	3.51	4.09	1.7%
Motor gasoline <sup>4</sup> .....	2.82	3.45	3.83	4.40	5.06	5.95	7.13	2.5%
Jet fuel <sup>5</sup> .....	2.19	3.04	3.35	4.04	4.85	5.82	6.92	2.9%
Diesel fuel (distillate fuel oil) <sup>6</sup> .....	3.00	3.58	4.20	5.00	5.83	6.87	8.15	2.9%
Residual fuel oil .....	1.56	2.67	2.57	3.13	3.79	4.58	5.55	2.6%
Residual fuel oil (nominal dollars per barrel) .....	65.40	112.11	108.09	131.35	159.10	192.35	232.98	2.6%
<b>Electric power<sup>7</sup></b>								
Distillate fuel oil .....	2.61	3.23	3.59	4.30	5.13	6.13	7.33	2.9%
Residual fuel oil .....	1.78	2.39	4.31	5.15	6.06	7.20	8.53	4.5%
Residual fuel oil (nominal dollars per barrel) .....	74.57	100.43	180.83	216.23	254.72	302.58	358.45	4.5%
<b>Refined petroleum product prices<sup>8</sup></b>								
Propane .....	1.35	1.46	1.34	1.71	2.11	2.60	3.30	2.9%
Motor gasoline <sup>4</sup> .....	2.81	3.42	3.83	4.40	5.06	5.95	7.13	2.6%
Jet fuel <sup>5</sup> .....	2.19	3.04	3.35	4.04	4.85	5.82	6.92	2.9%
Distillate fuel oil .....	2.98	3.59	4.15	4.95	5.77	6.81	8.09	2.8%
Residual fuel oil .....	1.62	2.64	2.76	3.34	4.05	4.89	5.92	2.8%
Residual fuel oil (nominal dollars per barrel) .....	68.06	110.98	115.76	140.38	169.95	205.33	248.53	2.8%
<b>Average</b> .....	<b>2.54</b>	<b>3.11</b>	<b>3.47</b>	<b>4.06</b>	<b>4.74</b>	<b>5.62</b>	<b>6.76</b>	<b>2.7%</b>

<sup>1</sup>Weighted average price delivered to U.S. refiners.

<sup>2</sup>Includes combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

<sup>3</sup>E85 refers to a blend of 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable). To address cold starting issues, the percentage of ethanol varies seasonally. The annual average ethanol content of 74 percent is used for this forecast.

<sup>4</sup>Sales weighted-average price for all grades. Includes Federal, State and local taxes.

<sup>5</sup>Includes only kerosene type.

<sup>6</sup>Diesel fuel for on-road use. Includes Federal and State taxes while excluding county and local taxes.

<sup>7</sup>Includes electricity-only and combined heat and power plants that have a regulatory status.

<sup>8</sup>Weighted averages of end-use fuel prices are derived from the prices in each sector and the corresponding sectoral consumption.

Note: Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

**Sources:** 2010 and 2011 prices for motor gasoline, distillate fuel oil, and jet fuel are based on: U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, DOE/EIA-0380(2012/08) (Washington, DC, August 2012). 2010 and 2011 crude oil spot prices: Thomson Reuters. 2010 and 2011 residential, commercial, industrial, and transportation sector petroleum product prices are derived from: EIA, Form EIA-782A, "Refiners/Gas Plant Operators' Monthly Petroleum Product Sales Report." 2010 and 2011 electric power prices based on: EIA, *Monthly Energy Review*, DOE/EIA-0035(2012/09) (Washington, DC, September 2012). 2010 and 2011 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. 2010 and 2011 wholesale ethanol prices derived from Bloomberg U.S. average rack price. **Projections:** EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A13. Natural gas supply, disposition, and prices**  
(trillion cubic feet per year, unless otherwise noted)

Supply, disposition, and prices	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Supply</b>								
Dry gas production <sup>1</sup> .....	21.33	23.00	26.61	28.59	29.79	31.35	33.14	1.3%
Supplemental natural gas <sup>2</sup> .....	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.2%
Net imports .....	2.60	1.95	-0.14	-1.58	-2.10	-2.55	-3.55	--
Pipeline <sup>3</sup> .....	2.24	1.67	0.13	-0.52	-0.67	-1.09	-2.09	--
Liquefied natural gas .....	0.37	0.28	-0.26	-1.06	-1.43	-1.46	-1.46	--
<b>Total supply</b> .....	<b>24.00</b>	<b>25.01</b>	<b>26.54</b>	<b>27.07</b>	<b>27.75</b>	<b>28.86</b>	<b>29.65</b>	<b>0.6%</b>
<b>Consumption by sector</b>								
Residential .....	4.78	4.72	4.52	4.44	4.36	4.24	4.14	-0.5%
Commercial .....	3.10	3.16	3.32	3.35	3.42	3.51	3.60	0.4%
Industrial <sup>4</sup> .....	6.52	6.77	7.68	7.82	7.79	7.84	7.90	0.5%
Natural-gas-to-liquids heat and power <sup>5</sup> .....	0.00	0.00	0.13	0.16	0.21	0.26	0.33	--
Natural gas to liquids production <sup>6</sup> .....	0.00	0.00	0.14	0.17	0.22	0.28	0.35	--
Electric power <sup>7</sup> .....	7.39	7.60	8.23	8.45	8.89	9.44	9.50	0.8%
Transportation <sup>8</sup> .....	0.04	0.04	0.08	0.12	0.26	0.59	1.04	11.9%
Pipeline fuel .....	0.67	0.68	0.70	0.71	0.73	0.74	0.76	0.4%
Lease and plant fuel <sup>9</sup> .....	1.28	1.39	1.54	1.64	1.70	1.81	1.93	1.1%
<b>Total consumption</b> .....	<b>23.78</b>	<b>24.37</b>	<b>26.32</b>	<b>26.87</b>	<b>27.57</b>	<b>28.71</b>	<b>29.54</b>	<b>0.7%</b>
<b>Discrepancy</b> <sup>10</sup> .....	<b>0.22</b>	<b>0.64</b>	<b>0.22</b>	<b>0.20</b>	<b>0.18</b>	<b>0.15</b>	<b>0.12</b>	<b>--</b>
<b>Natural gas spot price at Henry Hub</b>								
(2011 dollars per million Btu) .....	4.46	3.98	4.13	4.87	5.40	6.32	7.83	2.4%
(nominal dollars per million Btu) .....	4.37	3.98	4.77	6.14	7.45	9.55	12.92	4.1%
<b>Delivered natural gas prices</b>								
<b>(2011 dollars per thousand cubic feet)</b>								
Residential .....	11.62	11.05	12.05	12.97	13.68	14.93	16.74	1.4%
Commercial .....	9.61	9.04	9.69	10.43	10.94	11.95	13.52	1.4%
Industrial <sup>4</sup> .....	5.61	5.00	5.66	6.29	6.71	7.62	9.09	2.1%
Electric power <sup>7</sup> .....	5.37	4.87	5.00	5.70	6.18	7.13	8.55	2.0%
Transportation <sup>11</sup> .....	16.89	16.51	17.26	18.39	19.34	20.31	21.68	0.9%
<b>Average</b> <sup>12</sup> .....	<b>7.44</b>	<b>6.83</b>	<b>7.23</b>	<b>7.93</b>	<b>8.45</b>	<b>9.51</b>	<b>11.18</b>	<b>1.7%</b>
<b>(nominal dollars per thousand cubic feet)</b>								
Residential .....	11.38	11.05	13.89	16.34	18.87	22.57	27.63	3.2%
Commercial .....	9.41	9.04	11.17	13.14	15.10	18.06	22.31	3.2%
Industrial <sup>4</sup> .....	5.49	5.00	6.52	7.93	9.26	11.51	14.99	3.9%
Electric power <sup>7</sup> .....	5.26	4.87	5.76	7.18	8.53	10.77	14.12	3.7%
Transportation <sup>11</sup> .....	16.54	16.51	19.90	23.17	26.68	30.70	35.79	2.7%
<b>Average</b> <sup>12</sup> .....	<b>7.28</b>	<b>6.83</b>	<b>8.34</b>	<b>9.99</b>	<b>11.66</b>	<b>14.37</b>	<b>18.46</b>	<b>3.5%</b>

<sup>1</sup>Marketed production (wet) minus extraction losses.

<sup>2</sup>Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

<sup>3</sup>Includes any natural gas regasified in the Bahamas and transported via pipeline to Florida, as well as gas from Canada and Mexico.

<sup>4</sup>Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

<sup>5</sup>Includes any natural gas used in the process of converting natural gas to liquid fuel that is not actually converted.

<sup>6</sup>Includes any natural gas converted into liquid fuel.

<sup>7</sup>Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.

<sup>8</sup>Natural gas used as vehicle fuel.

<sup>9</sup>Represents natural gas used in well, field, and lease operations, in natural gas processing plant machinery, and for liquefaction in export facilities.

<sup>10</sup>Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2010 and 2011 values include net storage injections.

<sup>11</sup>Natural gas used as a vehicle fuel. Price includes estimated motor vehicle fuel taxes and estimated dispensing costs or charges.

<sup>12</sup>Weighted average prices. Weights used are the sectoral consumption values excluding lease, plant, and pipeline fuel.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 supply values; lease, plant, and pipeline fuel consumption; and residential, commercial, and industrial delivered prices: U.S. Energy Information Administration (EIA), *Natural Gas Annual 2010*, DOE/EIA-0131(2010) (Washington, DC, December 2011). 2011 supply values; lease, plant, and pipeline fuel consumption; and residential, commercial, and industrial delivered prices: EIA, *Natural Gas Monthly*, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). Other 2010 and 2011 consumption based on: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 and 2011 natural gas price at Henry Hub based on daily spot prices published in Natural Gas Intelligence. 2010 and 2011 electric power prices: EIA, *Electric Power Monthly*, DOE/EIA-0226, April 2011 and April 2012, Table 4.2, and EIA, *State Energy Data Report 2010*, DOE/EIA-0214(2010) (Washington, DC, June 2012). 2010 transportation sector delivered prices are based on: EIA, *Natural Gas Annual 2010*, DOE/EIA-0131(2010) (Washington, DC, December 2011) and estimated state taxes, federal taxes, and dispensing costs or charges. 2011 transportation sector delivered prices are model results. Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A14. Oil and gas supply**

Production and supply	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Crude oil</b>								
<b>Lower 48 average wellhead price<sup>1</sup></b> (2011 dollars per barrel) .....	<b>76.78</b>	<b>96.55</b>	<b>103.49</b>	<b>115.61</b>	<b>129.26</b>	<b>143.31</b>	<b>160.38</b>	<b>1.8%</b>
<b>Production (million barrels per day)<sup>2</sup></b>								
United States total .....	5.47	5.67	7.47	6.79	6.30	6.26	6.13	0.3%
Lower 48 onshore .....	3.21	3.67	5.29	4.99	4.48	4.19	3.97	0.3%
Tight oil <sup>3</sup> .....	0.82	1.22	2.81	2.63	2.19	2.06	2.02	1.7%
Carbon dioxide enhanced oil recovery .....	0.28	0.24	0.29	0.43	0.56	0.65	0.66	3.5%
Other .....	2.11	2.20	2.19	1.93	1.72	1.48	1.30	-1.8%
Lower 48 offshore .....	1.67	1.43	1.69	1.46	1.44	1.72	1.75	0.7%
Alaska .....	0.60	0.57	0.49	0.35	0.38	0.35	0.41	-1.1%
<b>Lower 48 end of year reserves<sup>2</sup></b> (billion barrels).....	<b>21.46</b>	<b>21.36</b>	<b>24.63</b>	<b>24.37</b>	<b>24.92</b>	<b>26.19</b>	<b>26.72</b>	<b>0.8%</b>
<b>Natural gas</b>								
<b>Natural gas spot price at Henry Hub</b> (2011 dollars per million Btu) .....	<b>4.46</b>	<b>3.98</b>	<b>4.13</b>	<b>4.87</b>	<b>5.40</b>	<b>6.32</b>	<b>7.83</b>	<b>2.4%</b>
<b>Dry production (trillion cubic feet)<sup>4</sup></b>								
United States total .....	21.33	23.00	26.61	28.59	29.79	31.35	33.14	1.3%
Lower 48 onshore .....	18.54	20.54	24.27	25.67	26.26	27.35	29.12	1.2%
Associated-dissolved <sup>5</sup> .....	1.47	1.54	2.14	1.99	1.43	1.26	1.09	-1.2%
Non-associated .....	17.07	19.00	22.13	23.67	24.83	26.10	28.03	1.4%
Tight gas .....	6.34	5.86	6.40	6.56	6.67	6.96	7.34	0.8%
Shale gas .....	4.86	7.85	11.05	12.84	14.17	15.33	16.70	2.6%
Coalbed methane .....	1.69	1.71	1.71	1.66	1.69	1.73	2.11	0.7%
Other .....	4.18	3.58	2.97	2.61	2.31	2.07	1.87	-2.2%
Lower 48 offshore .....	2.44	2.11	2.07	2.19	2.34	2.81	2.85	1.0%
Associated-dissolved <sup>5</sup> .....	0.59	0.54	0.66	0.64	0.60	0.74	0.74	1.1%
Non-associated .....	1.85	1.58	1.41	1.55	1.73	2.07	2.11	1.0%
Alaska .....	0.35	0.35	0.28	0.73	1.19	1.18	1.18	4.3%
<b>Lower 48 end of year dry reserves<sup>4</sup></b> (trillion cubic feet).....	<b>295.79</b>	<b>298.96</b>	<b>332.51</b>	<b>342.08</b>	<b>350.65</b>	<b>356.26</b>	<b>359.97</b>	<b>0.6%</b>
<b>Supplemental gas supplies (trillion cubic feet)<sup>6</sup></b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.2%</b>
<b>Total lower 48 wells drilled (thousands) .....</b>	<b>43.27</b>	<b>41.10</b>	<b>48.84</b>	<b>54.26</b>	<b>57.91</b>	<b>63.76</b>	<b>76.65</b>	<b>2.2%</b>

<sup>1</sup>Represents lower 48 onshore and offshore supplies.

<sup>2</sup>Includes lease condensate.

<sup>3</sup>Tight oil represents resources in low-permeability reservoirs, including shale and chalk formations. The specific plays included in the tight oil category are Bakken/Three Forks/Sanish, Eagle Ford, Woodford, Austin Chalk, Spraberry, Niobrara, Avalon/Bone Springs, and Monterey.

<sup>4</sup>Marketed production (wet) minus extraction losses.

<sup>5</sup>Gas which occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with crude oil (dissolved).

<sup>6</sup>Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 crude oil lower 48 average wellhead price: U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, DOE/EIA-0380(2012/08) (Washington, DC, August 2012). 2010 and 2011 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: EIA, *Petroleum Supply Annual 2011*, DOE/EIA-0340(2011)/1 (Washington, DC, August 2012). 2010 U.S. crude oil and natural gas reserves: EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, DOE/EIA-0216(2010) (Washington, DC, August 2012). 2010 Alaska and total natural gas production, and supplemental gas supplies: EIA, *Natural Gas Annual 2010*, DOE/EIA-0131(2010) (Washington, DC, December 2011). 2010 and 2011 natural gas spot price at Henry Hub based on daily data from Natural Gas Intelligence. 2011 Alaska and total natural gas production, and supplemental gas supplies: EIA, *Natural Gas Monthly*, DOE/EIA-0130Natural Gas Monthly, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). Other 2010 and 2011 values: EIA, Office of Energy Analysis. Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A15. Coal supply, disposition, and prices**  
(million short tons per year, unless otherwise noted)

Supply, disposition, and prices	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Production<sup>1</sup></b>								
Appalachia .....	336	337	288	295	295	289	283	-0.6%
Interior .....	156	171	198	203	212	217	226	1.0%
West .....	592	588	585	616	646	664	658	0.4%
East of the Mississippi .....	446	456	438	447	456	455	453	-0.0%
West of the Mississippi .....	638	639	633	666	697	716	714	0.4%
<b>Total .....</b>	<b>1,084</b>	<b>1,096</b>	<b>1,071</b>	<b>1,113</b>	<b>1,153</b>	<b>1,171</b>	<b>1,167</b>	<b>0.2%</b>
<b>Waste coal supplied<sup>2</sup> .....</b>	<b>14</b>	<b>13</b>	<b>19</b>	<b>21</b>	<b>20</b>	<b>23</b>	<b>27</b>	<b>2.7%</b>
<b>Net imports</b>								
Imports <sup>3</sup> .....	18	11	2	5	5	22	36	4.0%
Exports .....	82	107	127	129	144	158	159	1.4%
<b>Total .....</b>	<b>-64</b>	<b>-96</b>	<b>-125</b>	<b>-124</b>	<b>-139</b>	<b>-136</b>	<b>-123</b>	<b>0.9%</b>
<b>Total supply<sup>4</sup> .....</b>	<b>1,034</b>	<b>1,012</b>	<b>966</b>	<b>1,010</b>	<b>1,034</b>	<b>1,058</b>	<b>1,071</b>	<b>0.2%</b>
<b>Consumption by sector</b>								
Residential and commercial .....	3	3	3	3	3	3	3	-0.3%
Coke plants .....	21	21	23	22	20	18	18	-0.7%
Other industrial <sup>5</sup> .....	49	46	50	50	50	51	52	0.4%
Coal-to-liquids heat and power .....	0	0	0	3	5	6	8	--
Coal to liquids production .....	0	0	0	3	4	5	6	--
Electric power <sup>6</sup> .....	975	929	890	929	953	975	984	0.2%
<b>Total .....</b>	<b>1,049</b>	<b>999</b>	<b>966</b>	<b>1,010</b>	<b>1,034</b>	<b>1,058</b>	<b>1,071</b>	<b>0.2%</b>
<b>Discrepancy and stock change<sup>7</sup> .....</b>	<b>-14</b>	<b>13</b>	<b>0</b>	<b>-0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>--</b>
<b>Average minemouth price<sup>8</sup></b>								
(2011 dollars per short ton) .....	36.37	41.16	49.26	52.02	55.64	58.57	61.28	1.4%
(2011 dollars per million Btu) .....	1.80	2.04	2.45	2.60	2.79	2.94	3.08	1.4%
<b>Delivered prices<sup>9</sup></b>								
<b>(2011 dollars per short ton)</b>								
Coke plants .....	156.87	184.44	229.19	245.15	264.13	279.68	290.84	1.6%
Other industrial <sup>5</sup> .....	65.76	70.68	72.44	74.98	78.25	81.84	85.63	0.7%
Coal to liquids .....	--	--	--	49.54	47.71	53.07	55.60	--
Electric power <sup>6</sup>								
(2011 dollars per short ton) .....	45.21	46.38	47.91	51.14	54.37	57.39	60.77	0.9%
(2011 dollars per million Btu) .....	2.30	2.38	2.52	2.69	2.87	3.03	3.20	1.0%
<b>Average .....</b>	<b>48.40</b>	<b>50.64</b>	<b>53.47</b>	<b>56.58</b>	<b>59.53</b>	<b>62.37</b>	<b>65.70</b>	<b>0.9%</b>
Exports <sup>10</sup> .....	122.98	148.86	168.73	172.99	177.76	177.60	176.05	0.6%



**Table A15. Coal supply, disposition, and prices (continued)**  
(million short tons per year, unless otherwise noted)

Supply, disposition, and prices	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Average minemouth price<sup>8</sup></b>								
(nominal dollars per short ton) .....	35.61	41.16	56.81	65.55	76.78	88.51	101.14	3.1%
(nominal dollars per million Btu).....	1.76	2.04	2.83	3.27	3.85	4.44	5.08	3.2%
<b>Delivered prices<sup>9</sup></b>								
<b>(nominal dollars per short ton)</b>								
Coke plants .....	153.59	184.44	264.27	308.93	364.48	422.61	480.01	3.4%
Other industrial <sup>5</sup> .....	64.38	70.68	83.52	94.49	107.97	123.66	141.33	2.4%
Coal to liquids .....	--	--	--	62.44	65.84	80.19	91.77	--
Electric power <sup>6</sup>								
(nominal dollars per short ton) .....	44.27	46.38	55.24	64.45	75.02	86.73	100.29	2.7%
(nominal dollars per million Btu).....	2.25	2.38	2.90	3.39	3.96	4.58	5.28	2.8%
<b>Average.....</b>	<b>47.39</b>	<b>50.64</b>	<b>61.66</b>	<b>71.30</b>	<b>82.14</b>	<b>94.24</b>	<b>108.43</b>	<b>2.7%</b>
Exports <sup>10</sup> .....	120.41	148.86	194.56	217.99	245.30	268.37	290.56	2.3%

<sup>1</sup>Includes anthracite, bituminous coal, subbituminous coal, and lignite.

<sup>2</sup>Includes waste coal consumed by the electric power and industrial sectors. Waste coal supplied is counted as a supply-side item to balance the same amount of waste coal included in the consumption data.

<sup>3</sup>Excludes imports to Puerto Rico and the U.S. Virgin Islands.

<sup>4</sup>Production plus waste coal supplied plus net imports.

<sup>5</sup>Includes consumption for combined heat and power plants that have a non-regulatory status, and small on-site generating systems. Excludes all coal use in the coal-to-liquids process.

<sup>6</sup>Includes all electricity-only and combined heat and power plants that have a regulatory status.

<sup>7</sup>Balancing item: the sum of production, net imports, and waste coal supplied minus total consumption.

<sup>8</sup>Includes reported prices for both open market and captive mines. Prices weighted by production, which differs from average minemouth prices published in EIA data reports where it is weighted by reported sales.

<sup>9</sup>Prices weighted by consumption; weighted average excludes residential and commercial prices, and export free-alongside-ship (f.a.s.) prices.

<sup>10</sup>F.a.s. price at U.S. port of exit.

-- = Not applicable.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 data based on: U.S. Energy Information Administration (EIA), *Annual Coal Report 2011*, DOE/EIA-0584(2011) (Washington, DC, November 2012); EIA, *Quarterly Coal Report, October-December 2011*, DOE/EIA-0121(2011/4Q) (Washington, DC, March 2012); and EIA, AEO2013 National Energy Modeling System run REF2013.D102312A. Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A16. Renewable energy generating capacity and generation**  
(gigawatts, unless otherwise noted)

Net summer capacity and generation	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Electric power sector<sup>1</sup></b>								
<b>Net summer capacity</b>								
Conventional hydropower .....	77.82	77.87	78.34	78.94	79.11	79.63	80.31	0.1%
Geothermal <sup>2</sup> .....	2.38	2.38	3.63	4.34	5.70	6.60	7.46	4.0%
Municipal waste <sup>3</sup> .....	3.26	3.34	3.44	3.44	3.44	3.44	3.44	0.1%
Wood and other biomass <sup>4</sup> .....	2.38	2.37	2.82	2.83	2.85	3.16	3.70	1.6%
Solar thermal .....	0.49	0.49	1.35	1.35	1.35	1.35	1.35	3.6%
Solar photovoltaic <sup>5</sup> .....	0.37	1.01	5.37	5.91	6.80	11.84	24.54	11.6%
Wind .....	39.40	45.68	58.81	59.62	61.30	69.14	86.83	2.2%
Offshore wind .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
<b>Total electric power sector capacity .....</b>	<b>126.09</b>	<b>133.14</b>	<b>153.75</b>	<b>156.43</b>	<b>160.54</b>	<b>175.17</b>	<b>207.63</b>	<b>1.5%</b>
<b>Generation (billion kilowatthours)</b>								
Conventional hydropower .....	258.46	323.14	288.54	291.38	292.39	295.18	297.28	-0.3%
Geothermal <sup>2</sup> .....	15.22	16.70	25.28	30.98	42.02	49.36	56.40	4.3%
Biogenic municipal waste <sup>6</sup> .....	15.78	16.62	14.09	14.09	14.09	14.09	14.10	-0.6%
Wood and other biomass .....	11.45	10.50	54.45	68.99	65.48	66.41	75.64	7.0%
Dedicated plants .....	10.37	9.35	14.85	15.12	15.30	17.62	21.59	2.9%
Cofiring .....	1.07	1.16	39.60	53.87	50.18	48.79	54.05	14.2%
Solar thermal .....	0.79	0.81	2.74	2.74	2.73	2.73	2.73	4.3%
Solar photovoltaic <sup>5</sup> .....	0.42	0.97	9.83	10.99	13.40	24.81	56.22	15.0%
Wind .....	94.62	119.63	163.48	166.73	172.11	195.46	251.94	2.6%
Offshore wind .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
<b>Total electric power sector generation .....</b>	<b>396.73</b>	<b>488.38</b>	<b>558.41</b>	<b>585.90</b>	<b>602.22</b>	<b>648.05</b>	<b>754.32</b>	<b>1.5%</b>
<b>End-use sectors<sup>7</sup></b>								
<b>Net summer capacity</b>								
Conventional hydropower .....	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.0%
Geothermal .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Municipal waste <sup>8</sup> .....	0.35	0.46	0.46	0.46	0.46	0.46	0.46	0.0%
Biomass .....	4.57	4.92	6.87	7.62	8.34	9.16	10.18	2.5%
Solar photovoltaic <sup>5</sup> .....	1.82	3.02	15.63	16.95	18.94	21.53	25.08	7.6%
Wind .....	0.17	0.21	0.87	0.92	1.05	1.23	1.51	7.1%
<b>Total end-use sector capacity .....</b>	<b>7.24</b>	<b>8.93</b>	<b>24.15</b>	<b>26.28</b>	<b>29.12</b>	<b>32.71</b>	<b>37.55</b>	<b>5.1%</b>
<b>Generation (billion kilowatthours)</b>								
Conventional hydropower .....	1.75	1.89	1.82	1.82	1.82	1.82	1.82	-0.1%
Geothermal .....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Municipal waste <sup>8</sup> .....	1.94	2.04	3.55	3.55	3.55	3.55	3.55	1.9%
Biomass .....	25.73	26.75	36.95	41.35	45.55	50.32	56.25	2.6%
Solar photovoltaic <sup>5</sup> .....	2.85	4.71	24.53	26.69	29.91	34.10	39.97	7.7%
Wind .....	0.22	0.28	1.23	1.31	1.50	1.76	2.15	7.4%
<b>Total end-use sector generation .....</b>	<b>32.48</b>	<b>35.68</b>	<b>68.09</b>	<b>74.72</b>	<b>82.33</b>	<b>91.56</b>	<b>103.74</b>	<b>3.7%</b>

**Table A16. Renewable energy generating capacity and generation (continued)**  
(gigawatts, unless otherwise noted)

Net summer capacity and generation	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Total, all sectors</b>								
<b>Net summer capacity</b>								
Conventional hydropower .....	78.15	78.20	78.66	79.27	79.43	79.96	80.64	0.1%
Geothermal.....	2.38	2.38	3.63	4.34	5.70	6.60	7.46	4.0%
Municipal waste .....	3.61	3.80	3.89	3.89	3.89	3.89	3.89	0.1%
Wood and other biomass <sup>4</sup> .....	6.95	7.29	9.69	10.45	11.19	12.32	13.88	2.2%
Solar <sup>5</sup> .....	2.67	4.52	22.35	24.22	27.09	34.73	50.96	8.7%
Wind .....	39.57	45.88	59.68	60.54	62.35	70.37	88.35	2.3%
<b>Total capacity, all sectors .....</b>	<b>133.33</b>	<b>142.06</b>	<b>177.90</b>	<b>182.71</b>	<b>189.66</b>	<b>207.88</b>	<b>245.17</b>	<b>1.9%</b>
<b>Generation (billion kilowatthours)</b>								
Conventional hydropower .....	260.20	325.03	290.37	293.20	294.21	297.01	299.11	-0.3%
Geothermal.....	15.22	16.70	25.28	30.98	42.02	49.36	56.40	4.3%
Municipal waste .....	17.71	18.66	17.63	17.64	17.64	17.64	17.64	-0.2%
Wood and other biomass.....	37.17	37.26	91.40	110.34	111.03	116.73	131.89	4.5%
Solar <sup>5</sup> .....	4.05	6.50	37.10	40.42	46.04	61.65	98.92	9.8%
Wind .....	94.85	119.91	164.71	168.04	173.61	197.22	254.10	2.6%
<b>Total generation, all sectors .....</b>	<b>429.21</b>	<b>524.06</b>	<b>626.49</b>	<b>660.62</b>	<b>684.55</b>	<b>739.61</b>	<b>858.06</b>	<b>1.7%</b>

<sup>1</sup>Includes electricity-only and combined heat and power plants that have a regulatory status.

<sup>2</sup>Includes both hydrothermal resources (hot water and steam) and near-field enhanced geothermal systems (EGS). Near-field EGS potential occurs on known hydrothermal sites, however this potential requires the addition of external fluids for electricity generation and is only available after 2025.

<sup>3</sup>Includes municipal waste, landfill gas, and municipal sewage sludge. Incremental growth is assumed to be for landfill gas facilities. All municipal waste is included, although a portion of the municipal waste stream contains petroleum-derived plastics and other non-renewable sources.

<sup>4</sup>Facilities co-firing biomass and coal are classified as coal.

<sup>5</sup>Does not include off-grid photovoltaics (PV). Based on annual PV shipments from 1989 through 2010, EIA estimates that as much as 245 megawatts of remote electricity generation PV applications (i.e., off-grid power systems) were in service in 2010, plus an additional 558 megawatts in communications, transportation, and assorted other non-grid-connected, specialized applications. See U.S. Energy Information Administration, DOE/EIA-0384(2011) (Washington, DC, September 2012), Table 10.9 (annual PV shipments, 1989-2010). The approach used to develop the estimate, based on shipment data, provides an upper estimate of the size of the PV stock, including both grid-based and off-grid PV. It will overestimate the size of the stock, because shipments include a substantial number of units that are exported, and each year some of the PV units installed earlier will be retired from service or abandoned.

<sup>6</sup>Includes biogenic municipal waste, landfill gas, and municipal sewage sludge. Incremental growth is assumed to be for landfill gas facilities. Only biogenic municipal waste is included. The U.S. Energy Information Administration estimates that in 2011 approximately 6 billion kilowatthours of electricity were generated from a municipal waste stream containing petroleum-derived plastics and other non-renewable sources. See U.S. Energy Information Administration, *Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy* (Washington, DC, May 2007).

<sup>7</sup>Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors that have a non-regulatory status; and small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.

<sup>8</sup>Includes municipal waste, landfill gas, and municipal sewage sludge. All municipal waste is included, although a portion of the municipal waste stream contains petroleum-derived plastics and other non-renewable sources.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 capacity: U.S. Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report" (preliminary). 2010 and 2011 generation: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A17. Renewable energy consumption by sector and source**  
(quadrillion Btu per year)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Marketed renewable energy<sup>1</sup></b>								
<b>Residential (wood)</b> .....	<b>0.44</b>	<b>0.45</b>	<b>0.44</b>	<b>0.44</b>	<b>0.45</b>	<b>0.45</b>	<b>0.45</b>	<b>0.1%</b>
<b>Commercial (biomass)</b> .....	<b>0.11</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.0%</b>
<b>Industrial<sup>2</sup></b> .....	<b>2.32</b>	<b>2.18</b>	<b>2.53</b>	<b>2.67</b>	<b>2.82</b>	<b>3.08</b>	<b>3.65</b>	<b>1.8%</b>
Conventional hydroelectric .....	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.0%
Municipal waste <sup>3</sup> .....	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.1%
Biomass.....	1.27	1.31	1.51	1.65	1.77	1.91	2.08	1.6%
Biofuels heat and coproducts.....	0.85	0.67	0.82	0.82	0.85	0.97	1.37	2.5%
<b>Transportation</b> .....	<b>1.14</b>	<b>1.22</b>	<b>1.60</b>	<b>1.58</b>	<b>1.58</b>	<b>1.71</b>	<b>2.21</b>	<b>2.1%</b>
Ethanol used in E85 <sup>4</sup> .....	0.00	0.03	0.05	0.09	0.11	0.10	0.11	4.3%
Ethanol used in gasoline blending .....	1.09	1.06	1.35	1.26	1.19	1.15	1.15	0.3%
Biodiesel used in distillate blending .....	0.03	0.12	0.16	0.16	0.16	0.16	0.16	1.0%
Liquids from biomass.....	0.00	0.00	0.02	0.04	0.10	0.27	0.76	--
Renewable diesel and gasoline <sup>5</sup> .....	0.01	0.00	0.02	0.02	0.02	0.02	0.02	7.9%
<b>Electric power<sup>6</sup></b> .....	<b>3.85</b>	<b>4.74</b>	<b>5.49</b>	<b>5.77</b>	<b>5.93</b>	<b>6.38</b>	<b>7.44</b>	<b>1.6%</b>
Conventional hydroelectric .....	2.52	3.15	2.82	2.84	2.85	2.88	2.90	-0.3%
Geothermal.....	0.15	0.16	0.25	0.30	0.41	0.48	0.55	4.3%
Biogenic municipal waste <sup>7</sup> .....	0.05	0.05	0.07	0.07	0.07	0.07	0.07	0.8%
Biomass.....	0.20	0.19	0.64	0.79	0.76	0.78	0.88	5.4%
Dedicated plants.....	0.17	0.15	0.24	0.24	0.24	0.28	0.33	2.7%
Cofiring .....	0.02	0.04	0.40	0.55	0.51	0.50	0.55	9.9%
Solar thermal .....	0.01	0.01	0.03	0.03	0.03	0.03	0.03	4.3%
Solar photovoltaic .....	0.00	0.01	0.10	0.11	0.13	0.24	0.55	15.0%
Wind .....	0.92	1.17	1.59	1.63	1.68	1.91	2.46	2.6%
<b>Total marketed renewable energy</b> .....	<b>7.85</b>	<b>8.71</b>	<b>10.19</b>	<b>10.58</b>	<b>10.89</b>	<b>11.75</b>	<b>13.87</b>	<b>1.6%</b>
<b>Sources of ethanol</b>								
from corn and other starch.....	1.13	1.18	1.29	1.25	1.22	1.17	1.13	-0.1%
from cellulose.....	0.00	0.00	0.02	0.02	0.02	0.02	0.02	13.8%
Net imports .....	-0.03	-0.09	0.09	0.08	0.06	0.06	0.11	--
<b>Total</b> .....	<b>1.09</b>	<b>1.09</b>	<b>1.40</b>	<b>1.35</b>	<b>1.29</b>	<b>1.25</b>	<b>1.26</b>	<b>0.5%</b>

**Table A17. Renewable energy consumption by sector and source (continued)**  
(quadrillion Btu per year)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Nonmarketed renewable energy<sup>8</sup></b>								
<b>Selected consumption</b>								
<b>Residential.....</b>	<b>0.03</b>	<b>0.04</b>	<b>0.20</b>	<b>0.21</b>	<b>0.22</b>	<b>0.24</b>	<b>0.27</b>	<b>6.9%</b>
Solar hot water heating .....	0.01	0.01	0.02	0.02	0.02	0.02	0.02	1.6%
Geothermal heat pumps .....	0.01	0.01	0.02	0.02	0.02	0.03	0.03	4.3%
Solar photovoltaic .....	0.01	0.02	0.14	0.15	0.17	0.18	0.21	9.1%
Wind .....	0.00	0.00	0.01	0.01	0.01	0.01	0.01	7.0%
<b>Commercial .....</b>	<b>0.10</b>	<b>0.11</b>	<b>0.20</b>	<b>0.22</b>	<b>0.24</b>	<b>0.28</b>	<b>0.32</b>	<b>3.7%</b>
Solar thermal .....	0.08	0.08	0.09	0.10	0.10	0.11	0.12	1.4%
Solar photovoltaic .....	0.02	0.03	0.10	0.12	0.13	0.16	0.19	6.6%
Wind .....	0.00	0.00	0.00	0.00	0.00	0.01	0.01	7.7%

<sup>1</sup>Includes nonelectric renewable energy groups for which the energy source is bought and sold in the marketplace, although all transactions may not necessarily be marketed, and marketed renewable energy inputs for electricity entering the marketplace on the electric power grid. Excludes electricity imports; see Table A2.

<sup>2</sup>Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

<sup>3</sup>Includes municipal waste, landfill gas, and municipal sewage sludge. All municipal waste is included, although a portion of the municipal waste stream contains petroleum-derived plastics and other non-renewable sources.

<sup>4</sup>Excludes motor gasoline component of E85.

<sup>5</sup>Renewable feedstocks for the on-site production of diesel and gasoline.

<sup>6</sup>Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status. Actual heat rates used to determine fuel consumption for all renewable fuels except hydropower, geothermal, solar, and wind. Consumption at hydroelectric, geothermal, solar, and wind facilities determined by using the fossil fuel equivalent of 9,756 Btu per kilowatthour.

<sup>7</sup>Includes biogenic municipal waste, landfill gas, and municipal sewage sludge. Incremental growth is assumed to be for landfill gas facilities. Only biogenic municipal waste is included. The U.S. Energy Information Administration estimates that in 2011 approximately 0.3 quadrillion Btus were consumed from a municipal waste stream containing petroleum-derived plastics and other non-renewable sources. See U.S. Energy Information Administration, *Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy* (Washington, DC, May 2007).

<sup>8</sup>Includes selected renewable energy consumption data for which the energy is not bought or sold, either directly or indirectly as an input to marketed energy. The U.S. Energy Information Administration does not estimate or project total consumption of nonmarketed renewable energy.

-- = Not applicable.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 ethanol: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 and 2011 electric power sector: EIA, Form EIA-860, "Annual Electric Generator Report" (preliminary). Other 2010 and 2011 values: EIA, Office of Energy Analysis. Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A18. Energy-related carbon dioxide emissions by sector and source**  
(million metric tons, unless otherwise noted)

Sector and source	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Residential</b>								
Petroleum .....	85	78	71	66	62	59	57	-1.1%
Natural gas .....	267	256	245	241	236	230	225	-0.5%
Coal .....	1	1	1	1	1	0	0	-0.8%
Electricity <sup>1</sup> .....	875	828	744	776	817	862	888	0.2%
<b>Total residential .....</b>	<b>1,228</b>	<b>1,162</b>	<b>1,061</b>	<b>1,084</b>	<b>1,117</b>	<b>1,152</b>	<b>1,170</b>	<b>0.0%</b>
<b>Commercial</b>								
Petroleum .....	51	49	47	46	45	45	44	-0.3%
Natural gas .....	173	171	180	182	186	191	195	0.5%
Coal .....	6	5	5	5	5	5	5	0.0%
Electricity <sup>1</sup> .....	805	767	725	760	796	831	843	0.3%
<b>Total commercial .....</b>	<b>1,034</b>	<b>992</b>	<b>957</b>	<b>992</b>	<b>1,032</b>	<b>1,071</b>	<b>1,087</b>	<b>0.3%</b>
<b>Industrial<sup>2</sup></b>								
Petroleum .....	344	345	355	349	342	342	347	0.0%
Natural gas <sup>3</sup> .....	408	417	491	506	511	523	538	0.9%
Coal .....	157	143	154	157	152	150	155	0.3%
Electricity <sup>1</sup> .....	587	567	607	619	604	592	575	0.0%
<b>Total industrial .....</b>	<b>1,496</b>	<b>1,472</b>	<b>1,606</b>	<b>1,631</b>	<b>1,608</b>	<b>1,607</b>	<b>1,615</b>	<b>0.3%</b>
<b>Transportation</b>								
Petroleum <sup>4</sup> .....	1,836	1,802	1,785	1,744	1,705	1,695	1,712	-0.2%
Natural gas <sup>5</sup> .....	36	39	42	45	53	72	97	3.2%
Electricity <sup>1</sup> .....	4	4	5	6	7	8	10	3.3%
<b>Total transportation .....</b>	<b>1,876</b>	<b>1,845</b>	<b>1,831</b>	<b>1,794</b>	<b>1,766</b>	<b>1,776</b>	<b>1,819</b>	<b>-0.0%</b>
<b>Electric power<sup>6</sup></b>								
Petroleum .....	33	25	13	14	14	14	14	-2.0%
Natural gas .....	399	411	446	458	482	511	514	0.8%
Coal .....	1,828	1,718	1,610	1,678	1,717	1,757	1,775	0.1%
Other <sup>7</sup> .....	12	11	11	11	11	11	11	0.0%
<b>Total electric power .....</b>	<b>2,271</b>	<b>2,166</b>	<b>2,081</b>	<b>2,161</b>	<b>2,224</b>	<b>2,293</b>	<b>2,315</b>	<b>0.2%</b>
<b>Total by fuel</b>								
Petroleum <sup>4</sup> .....	2,349	2,299	2,270	2,218	2,169	2,156	2,175	-0.2%
Natural gas .....	1,283	1,294	1,404	1,431	1,468	1,528	1,569	0.7%
Coal .....	1,990	1,867	1,769	1,841	1,874	1,912	1,936	0.1%
Other <sup>7</sup> .....	12	11	11	11	11	11	11	0.0%
<b>Total .....</b>	<b>5,634</b>	<b>5,471</b>	<b>5,455</b>	<b>5,501</b>	<b>5,523</b>	<b>5,607</b>	<b>5,691</b>	<b>0.1%</b>
<b>Carbon dioxide emissions</b>								
<b>(tons per person) .....</b>	<b>18.2</b>	<b>17.5</b>	<b>16.0</b>	<b>15.4</b>	<b>14.8</b>	<b>14.4</b>	<b>14.1</b>	<b>-0.8%</b>

<sup>1</sup>Emissions from the electric power sector are distributed to the end-use sectors.

<sup>2</sup>Includes combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

<sup>3</sup>Includes lease and plant fuel.

<sup>4</sup>This includes carbon dioxide from international bunker fuels, both civilian and military, which are excluded from the accounting of carbon dioxide emissions under the United Nations convention. From 1990 through 2009, international bunker fuels accounted for 90 to 126 million metric tons annually.

<sup>5</sup>Includes pipeline fuel natural gas and natural gas used as vehicle fuel.

<sup>6</sup>Includes electricity-only and combined heat and power plants that have a regulatory status.

<sup>7</sup>Includes emissions from geothermal power and nonbiogenic emissions from municipal waste.

Note: By convention, the direct emissions from biogenic energy sources are excluded from energy-related carbon dioxide emissions. The release of carbon from these sources 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. If, however, increased use of biomass energy results in a decline in terrestrial carbon stocks, a net positive release of carbon may occur. See "Energy-Related Carbon Dioxide Emissions by End Use" for the emissions from biogenic energy sources as an indication of the potential net release of carbon dioxide in the absence of offsetting sequestration. Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 emissions and emission factors: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 emissions: EIA, *Monthly Energy Review*, DOE/EIA-0035(2011/10) (Washington, DC, October 2011). 2011 emissions and emission factors: EIA, *Monthly Energy Review*, DOE/EIA-0035(2012/08) (Washington, DC, August 2012). Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A19. Energy-related carbon dioxide emissions by end use**  
(million metric tons)

Sector and end use	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Residential</b>								
Space heating .....	285.69	274.74	255.95	247.75	241.43	234.50	224.88	-0.7%
Space cooling .....	162.29	158.49	146.49	159.05	173.02	187.28	194.44	0.7%
Water heating .....	159.50	156.30	155.23	157.27	156.47	154.26	153.31	-0.1%
Refrigeration .....	66.67	63.92	58.33	59.80	62.44	65.23	66.18	0.1%
Cooking .....	32.50	31.97	32.51	33.82	35.31	36.76	37.50	0.6%
Clothes dryers.....	37.70	36.32	36.43	38.02	39.80	41.64	42.10	0.5%
Freezers .....	14.58	14.07	12.72	12.69	12.67	12.72	12.53	-0.4%
Lighting .....	115.65	108.10	69.37	61.08	57.56	56.74	55.83	-2.3%
Clothes washers <sup>1</sup> .....	5.81	5.54	4.19	3.82	3.62	3.70	3.76	-1.3%
Dishwashers <sup>1</sup> .....	18.27	17.62	15.99	16.02	16.94	18.21	18.93	0.2%
Televisions and related equipment <sup>2</sup> .....	56.31	54.02	53.97	57.27	60.97	64.92	66.79	0.7%
Computers and related equipment <sup>3</sup> .....	28.12	26.74	20.20	18.98	18.84	18.91	18.42	-1.3%
Furnace fans and boiler circulation pumps .....	23.83	22.95	21.43	21.52	21.61	21.64	20.96	-0.3%
Other uses .....	206.69	192.29	178.57	197.45	216.66	235.95	254.42	1.0%
Discrepancy <sup>4</sup> .....	13.90	-0.72	-0.66	-0.60	-0.55	-0.49	-0.45	-1.6%
<b>Total residential .....</b>	<b>1,227.53</b>	<b>1,162.33</b>	<b>1,060.73</b>	<b>1,083.95</b>	<b>1,116.78</b>	<b>1,151.98</b>	<b>1,169.60</b>	<b>0.0%</b>
<b>Commercial</b>								
Space heating <sup>5</sup> .....	129.14	125.16	120.43	116.90	113.92	110.05	104.21	-0.6%
Space cooling <sup>5</sup> .....	100.98	99.43	83.32	85.01	86.89	89.61	89.71	-0.4%
Water heating <sup>5</sup> .....	41.26	41.42	42.51	43.21	43.77	43.83	42.91	0.1%
Ventilation.....	86.72	84.34	82.87	85.39	87.72	89.24	87.81	0.1%
Cooking .....	13.53	13.60	14.12	14.39	14.79	15.11	15.10	0.4%
Lighting .....	170.14	159.77	137.50	137.62	137.71	134.23	127.51	-0.8%
Refrigeration .....	68.65	64.87	54.38	54.23	55.14	56.54	56.50	-0.5%
Office equipment (PC) .....	37.41	34.69	29.46	29.97	31.21	31.99	31.91	-0.3%
Office equipment (non-PC).....	40.15	38.30	37.97	40.72	43.33	45.18	45.13	0.6%
Other uses <sup>6</sup> .....	346.27	330.16	354.48	384.84	417.63	455.24	486.52	1.3%
<b>Total commercial .....</b>	<b>1,034.26</b>	<b>991.74</b>	<b>957.03</b>	<b>992.28</b>	<b>1,032.11</b>	<b>1,071.02</b>	<b>1,087.30</b>	<b>0.3%</b>
<b>Industrial<sup>7</sup></b>								
<b>Manufacturing</b>								
Refining .....	261.87	256.26	245.90	249.79	254.75	261.90	270.14	0.2%
Food products.....	99.97	99.13	103.10	107.71	110.82	113.57	115.35	0.5%
Paper products .....	77.52	71.94	69.45	70.41	70.83	71.37	72.28	0.0%
Bulk chemicals.....	259.35	246.50	257.53	256.29	241.10	227.51	214.99	-0.5%
Glass .....	19.21	18.88	22.35	24.03	24.70	24.88	25.48	1.0%
Cement manufacturing .....	26.02	26.85	39.05	39.26	39.72	41.88	44.97	1.8%
Iron and steel.....	118.17	123.07	147.83	143.48	125.21	111.79	106.29	-0.5%
Aluminum.....	44.84	46.19	56.02	57.93	50.38	43.21	34.05	-1.0%
Fabricated metal products .....	37.67	39.72	39.70	39.25	37.79	37.42	37.35	-0.2%
Machinery .....	23.70	25.44	28.77	29.63	29.82	30.32	31.47	0.7%
Computers and electronics .....	31.55	29.96	32.14	33.80	34.77	36.31	37.13	0.7%
Transportation equipment .....	47.09	50.85	61.43	65.04	68.29	72.17	73.71	1.3%
Electrical equipment .....	8.02	7.98	8.86	9.07	9.17	9.73	10.47	0.9%
Wood products.....	17.11	16.80	21.91	22.06	21.26	20.68	19.87	0.6%
Plastics .....	39.27	40.00	38.28	38.25	38.44	37.97	36.39	-0.3%
Balance of manufacturing .....	141.86	139.34	146.13	155.71	162.73	171.45	180.33	0.9%
<b>Total manufacturing .....</b>	<b>1,253.22</b>	<b>1,238.92</b>	<b>1,318.46</b>	<b>1,341.71</b>	<b>1,319.77</b>	<b>1,312.15</b>	<b>1,310.27</b>	<b>0.2%</b>
<b>Nonmanufacturing</b>								
Agriculture.....	72.17	68.36	68.84	68.02	67.75	67.61	67.44	-0.0%
Construction.....	69.98	66.71	92.16	92.34	93.37	95.63	99.14	1.4%
Mining .....	55.72	55.52	57.67	55.57	53.64	53.07	51.75	-0.2%
<b>Total nonmanufacturing .....</b>	<b>197.87</b>	<b>190.59</b>	<b>218.67</b>	<b>215.93</b>	<b>214.76</b>	<b>216.31</b>	<b>218.33</b>	<b>0.5%</b>
Discrepancy <sup>4</sup> .....	45.06	42.57	68.69	73.07	73.73	78.98	86.73	2.5%
<b>Total industrial .....</b>	<b>1,496.14</b>	<b>1,472.08</b>	<b>1,605.81</b>	<b>1,630.71</b>	<b>1,608.26</b>	<b>1,607.44</b>	<b>1,615.33</b>	<b>0.3%</b>



**Table A19. Energy-related carbon dioxide emissions by end use (continued)**  
(million metric tons)

Sector and end use	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Transportation</b>								
Light-duty vehicles .....	1,059.53	1,036.67	929.21	870.47	824.70	804.78	804.29	-0.9%
Commercial light trucks <sup>8</sup> .....	38.08	37.35	37.93	36.83	35.97	36.60	38.70	0.1%
Bus transportation.....	17.81	17.20	17.55	17.79	17.96	18.08	18.27	0.2%
Freight trucks .....	350.67	352.73	430.98	442.74	450.92	471.42	502.86	1.2%
Rail, passenger.....	5.63	5.54	5.74	6.04	6.33	6.66	6.81	0.7%
Rail, freight.....	33.43	32.40	35.40	37.59	38.96	39.97	40.76	0.8%
Shipping, domestic .....	15.77	15.75	18.43	17.91	17.12	17.12	17.18	0.3%
Shipping, international .....	66.38	62.27	63.27	63.88	64.50	65.06	65.55	0.2%
Recreational boats.....	16.94	16.30	17.08	17.69	18.28	18.78	19.13	0.6%
Air .....	178.28	174.72	187.90	193.68	197.37	199.69	202.49	0.5%
Military use.....	54.58	52.66	45.19	46.04	48.49	51.34	54.59	0.1%
Lubricants .....	5.24	4.95	4.50	4.56	4.62	4.69	4.78	-0.1%
Pipeline fuel.....	36.30	37.11	37.76	38.73	39.33	40.34	41.19	0.4%
Discrepancy <sup>4</sup> .....	-2.97	-1.06	0.04	0.54	1.10	1.69	2.26	--
<b>Total transportation.....</b>	<b>1,875.67</b>	<b>1,844.58</b>	<b>1,830.99</b>	<b>1,794.48</b>	<b>1,765.65</b>	<b>1,776.24</b>	<b>1,818.85</b>	<b>-0.0%</b>
<b>Biogenic energy combustion<sup>9</sup></b>								
Biomass .....	189.40	194.39	254.82	282.24	290.63	305.61	332.19	1.9%
Electric power sector .....	18.52	17.81	60.15	74.35	71.05	72.79	82.99	5.4%
Other sectors .....	170.88	176.57	194.68	207.89	219.58	232.82	249.20	1.2%
Biogenic waste.....	4.37	4.90	6.22	6.22	6.23	6.23	6.23	0.8%
Biofuels heat and coproducts .....	80.21	63.03	76.56	76.49	79.37	91.26	128.24	2.5%
Ethanol .....	74.92	74.85	95.83	92.45	88.48	85.70	86.13	0.5%
Biodiesel .....	2.42	8.63	11.55	11.68	11.66	11.66	11.68	1.0%
Liquids from biomass.....	0.00	0.00	1.47	3.15	7.35	20.07	55.90	--
Renewable diesel and gasoline .....	0.50	0.20	1.81	1.82	1.82	1.82	1.81	7.9%
<b>Total .....</b>	<b>351.81</b>	<b>346.01</b>	<b>448.26</b>	<b>474.05</b>	<b>485.54</b>	<b>522.35</b>	<b>622.19</b>	<b>2.0%</b>

<sup>1</sup>Does not include water heating portion of load.

<sup>2</sup>Includes televisions, set-top boxes, and video game consoles.

<sup>3</sup>Includes desktop and laptop computers, monitors, printers, speakers, networking equipment, and uninterruptible power supplies.

<sup>4</sup>Represents differences between total emissions by end-use and total emissions by fuel as reported in Table A18. Emissions by fuel may reflect benchmarking and other modeling adjustments to energy use and the associated emissions that are not assigned to specific end uses.

<sup>5</sup>Includes emissions related to fuel consumption for district services.

<sup>6</sup>Includes (but is not limited to) miscellaneous uses such as transformers, medical imaging and other medical equipment, elevators, escalators, off-road electric vehicles, laboratory fume hoods, laundry equipment, coffee brewers, water services, pumps, emergency generators, combined heat and power in commercial buildings, manufacturing performed in commercial buildings, and cooking (distillate), plus residual fuel oil, liquefied petroleum gases, coal, motor gasoline, kerosene, and marketed renewable fuels (biomass).

<sup>7</sup>Includes combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

<sup>8</sup>Commercial trucks 8,501 to 10,000 pounds gross vehicle weight rating.

<sup>9</sup>By convention, the direct emissions from biogenic energy sources are excluded from energy-related carbon dioxide emissions. The release of carbon from these sources 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. If, however, increased use of biomass energy results in a decline in terrestrial carbon stocks, a net positive release of carbon may occur. Accordingly, the emissions from biogenic energy sources are reported here as an indication of the potential net release of carbon dioxide in the absence of offsetting sequestration.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 emissions and emission factors: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2010 emissions: EIA, *Monthly Energy Review*, DOE/EIA-0035(2011/10) (Washington, DC, October 2011). 2011 emissions and emission factors: EIA, *Monthly Energy Review*, DOE/EIA-0035(2012/08) (Washington, DC, August 2012). Projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A20. Macroeconomic indicators**  
(billion 2005 chain-weighted dollars, unless otherwise noted)

Indicators	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Real gross domestic product</b> .....	<b>13,063</b>	<b>13,299</b>	<b>16,859</b>	<b>18,985</b>	<b>21,355</b>	<b>24,095</b>	<b>27,277</b>	<b>2.5%</b>
<b>Components of real gross domestic product</b>								
Real consumption .....	9,196	9,429	11,528	12,792	14,243	15,941	17,917	2.2%
Real investment .....	1,658	1,744	2,909	3,363	3,914	4,582	5,409	4.0%
Real government spending .....	2,606	2,524	2,446	2,529	2,659	2,803	2,980	0.6%
Real exports .....	1,666	1,777	3,016	4,026	5,214	6,658	8,357	5.5%
Real imports .....	2,085	2,185	2,927	3,515	4,311	5,308	6,518	3.8%
<b>Energy intensity</b> (thousand Btu per 2005 dollar of GDP)								
Delivered energy .....	5.47	5.34	4.39	3.92	3.48	3.13	2.85	-2.1%
Total energy .....	7.53	7.35	5.99	5.39	4.81	4.33	3.95	-2.1%
<b>Price indices</b>								
GDP chain-type price index (2005=1.00) .....	1.110	1.134	1.307	1.429	1.564	1.713	1.871	1.7%
Consumer price index (1982-4=1.00)								
All-urban .....	2.18	2.25	2.66	2.94	3.27	3.63	4.04	2.0%
Energy commodities and services .....	2.12	2.44	2.70	3.09	3.53	4.11	4.86	2.4%
Wholesale price index (1982=1.00)								
All commodities .....	1.85	2.01	2.22	2.40	2.59	2.82	3.10	1.5%
Fuel and power .....	1.86	2.16	2.48	2.91	3.38	4.02	4.90	2.9%
Metals and metal products .....	2.08	2.26	2.52	2.66	2.83	2.99	3.16	1.2%
Industrial commodities excluding energy .....	1.83	1.93	2.12	2.23	2.34	2.45	2.57	1.0%
<b>Interest rates (percent, nominal)</b>								
Federal funds rate .....	0.17	0.10	4.04	4.09	3.97	3.84	3.74	--
10-year treasury note .....	3.21	2.79	4.88	4.97	4.95	4.91	4.86	--
AA utility bond rate .....	5.23	4.78	6.91	7.10	7.21	7.35	7.39	--
<b>Value of shipments (billion 2005 dollars)</b>								
Service sectors .....	20,771	21,168	26,492	29,715	32,624	35,511	38,529	2.1%
Total industrial .....	5,842	6,019	7,894	8,548	9,087	9,779	10,616	2.0%
Agriculture, mining, and construction .....	1,585	1,582	2,211	2,295	2,375	2,494	2,644	1.8%
Manufacturing .....	4,257	4,438	5,683	6,253	6,712	7,285	7,972	2.0%
Energy-intensive .....	1,592	1,615	1,893	1,993	2,027	2,077	2,144	1.0%
Non-energy-intensive .....	2,665	2,823	3,790	4,261	4,685	5,208	5,828	2.5%
<b>Total shipments</b> .....	<b>26,613</b>	<b>27,187</b>	<b>34,385</b>	<b>38,264</b>	<b>41,711</b>	<b>45,289</b>	<b>49,145</b>	<b>2.1%</b>
<b>Population and employment (millions)</b>								
Population, with armed forces overseas .....	310.1	312.4	340.5	356.5	372.4	388.3	404.4	0.9%
Population, aged 16 and over .....	244.6	247.0	269.5	282.8	296.3	309.8	322.9	0.9%
Population, over age 65 .....	40.6	41.6	55.4	64.5	72.7	78.1	81.8	2.4%
Employment, nonfarm .....	129.8	131.3	149.2	153.7	160.8	166.7	174.0	1.0%
Employment, manufacturing .....	11.5	11.7	12.4	12.2	11.2	10.5	9.9	-0.6%
<b>Key labor indicators</b>								
Labor force (millions) .....	153.9	153.6	164.7	169.3	174.9	182.3	190.7	0.7%
Nonfarm labor productivity (1992=1.00) .....	1.09	1.10	1.25	1.39	1.54	1.70	1.88	1.9%
Unemployment rate (percent) .....	9.62	8.95	5.49	5.27	5.32	5.33	5.24	--
<b>Key indicators for energy demand</b>								
Real disposable personal income .....	10,017	10,150	12,655	14,259	15,948	17,752	19,785	2.3%
Housing starts (millions) .....	0.64	0.66	1.89	1.90	1.89	1.89	1.89	3.7%
Commercial floorspace (billion square feet) .....	81.1	81.7	89.1	93.9	98.1	103.0	108.8	1.0%
Unit sales of light-duty vehicles (millions) .....	11.55	12.73	16.85	17.16	17.74	18.20	19.21	1.4%

GDP = Gross domestic product.

Btu = British thermal unit.

-- = Not applicable.

**Sources:** 2010 and 2011: IHS Global Insight, Global Insight Industry and Employment models, August 2012. **Projections:** U.S. Energy Information Administration, AEO2013 National Energy Modeling System run REF2013.D102312A.

**Table A21. International liquids supply and disposition summary**  
(million barrels per day, unless otherwise noted)

Supply and disposition	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Crude oil spot prices</b>								
<b>(2011 dollars per barrel)</b>								
Brent .....	81.31	111.26	105.57	117.36	130.47	145.41	162.68	1.3%
West Texas Intermediate .....	81.08	94.86	103.57	115.36	128.47	143.41	160.68	1.8%
<b>(nominal dollars per barrel)</b>								
Brent .....	79.61	111.26	121.73	147.90	180.04	219.73	268.50	3.1%
West Texas Intermediate .....	79.39	94.86	119.43	145.38	177.28	216.70	265.20	3.6%
<b>Liquids consumption<sup>1</sup></b>								
OECD								
United States (50 states) .....	18.90	18.68	19.49	19.16	18.72	18.55	18.64	0.0%
United States territories .....	0.25	0.28	0.32	0.34	0.36	0.36	0.37	1.0%
Canada .....	2.22	2.29	2.21	2.18	2.18	2.21	2.30	0.0%
Mexico and Chile .....	2.40	2.41	2.66	2.83	3.05	3.26	3.47	1.3%
OECD Europe <sup>2</sup> .....	14.80	14.28	13.81	13.85	13.96	14.10	14.21	0.0%
Japan .....	4.37	4.46	4.41	4.33	4.25	4.15	3.94	-0.4%
South Korea .....	2.25	2.32	2.56	2.61	2.66	2.69	2.74	0.6%
Australia and New Zealand .....	1.11	1.12	1.19	1.19	1.22	1.25	1.30	0.5%
<b>Total OECD .....</b>	<b>46.28</b>	<b>45.83</b>	<b>46.63</b>	<b>46.48</b>	<b>46.40</b>	<b>46.57</b>	<b>46.96</b>	<b>0.1%</b>
Non-OECD								
Russia .....	2.98	3.13	3.53	3.65	3.83	3.95	3.95	0.8%
Other Europe and Eurasia <sup>3</sup> .....	1.82	2.27	2.38	2.44	2.63	2.84	3.07	1.0%
China .....	9.33	9.85	13.29	14.71	15.58	16.64	17.59	2.0%
India .....	3.26	3.28	4.27	4.92	5.61	6.25	6.81	2.6%
Other Asia <sup>4</sup> .....	7.14	6.87	7.88	8.53	9.30	10.19	11.25	1.7%
Middle East .....	6.74	7.51	8.40	8.57	8.92	9.35	9.78	0.9%
Africa .....	3.37	3.31	3.63	3.82	4.05	4.32	4.49	1.1%
Brazil .....	2.62	2.59	3.01	3.12	3.37	3.62	4.00	1.5%
Other Central and South America .....	3.21	3.37	3.42	3.52	3.71	3.92	4.02	0.6%
<b>Total non-OECD .....</b>	<b>40.46</b>	<b>42.18</b>	<b>49.82</b>	<b>53.27</b>	<b>57.00</b>	<b>61.07</b>	<b>64.97</b>	<b>1.5%</b>
<b>Total liquids consumption .....</b>	<b>86.75</b>	<b>88.01</b>	<b>96.45</b>	<b>99.75</b>	<b>103.41</b>	<b>107.64</b>	<b>111.93</b>	<b>0.8%</b>
<b>Liquids production</b>								
OPEC <sup>5</sup>								
Middle East .....	23.77	25.40	26.65	27.91	29.88	32.63	35.09	1.1%
North Africa .....	3.76	2.39	3.27	3.27	3.48	3.77	3.96	1.8%
West Africa .....	4.45	4.31	5.33	5.47	5.61	5.75	5.89	1.1%
South America .....	2.88	2.99	3.09	3.05	3.01	3.06	3.20	0.2%
<b>Total OPEC .....</b>	<b>34.85</b>	<b>35.08</b>	<b>38.34</b>	<b>39.69</b>	<b>41.98</b>	<b>45.20</b>	<b>48.13</b>	<b>1.1%</b>
Non-OPEC								
OECD								
United States (50 states) .....	9.44	10.11	12.74	12.10	11.42	11.52	11.67	0.5%
Canada .....	3.58	3.66	5.09	5.60	5.91	6.09	6.14	1.8%
Mexico and Chile .....	3.01	2.99	1.96	1.84	1.98	2.04	2.12	-1.2%
OECD Europe <sup>2</sup> .....	4.58	4.19	3.38	3.08	2.84	2.93	3.36	-0.8%
Japan .....	0.18	0.18	0.17	0.18	0.18	0.19	0.19	0.2%
Australia and New Zealand .....	0.66	0.58	0.54	0.53	0.56	0.78	0.87	1.4%
<b>Total OECD .....</b>	<b>21.45</b>	<b>21.71</b>	<b>23.88</b>	<b>23.33</b>	<b>22.90</b>	<b>23.54</b>	<b>24.35</b>	<b>0.4%</b>
Non-OECD								
Russia .....	10.14	10.23	10.75	10.95	11.43	11.94	11.48	0.4%
Other Europe and Eurasia <sup>3</sup> .....	3.24	3.26	4.20	4.85	4.85	4.83	5.24	1.6%
China .....	4.34	4.34	4.59	5.02	5.50	5.54	5.42	0.8%
Other Asia <sup>4</sup> .....	3.82	3.74	3.55	3.34	3.09	2.81	2.87	-0.9%
Middle East .....	1.57	1.43	1.23	1.22	1.09	0.91	0.89	-1.6%
Africa .....	2.68	2.68	3.08	3.14	3.10	2.95	3.18	0.6%
Brazil .....	2.52	2.53	4.35	5.63	6.96	7.43	7.61	3.9%
Other Central and South America .....	2.08	2.17	2.40	2.51	2.46	2.43	2.69	0.7%
<b>Total non-OECD .....</b>	<b>30.39</b>	<b>30.39</b>	<b>34.15</b>	<b>36.65</b>	<b>38.47</b>	<b>38.84</b>	<b>39.37</b>	<b>0.9%</b>
<b>Total liquids production .....</b>	<b>86.70</b>	<b>87.18</b>	<b>96.38</b>	<b>99.68</b>	<b>103.35</b>	<b>107.58</b>	<b>111.85</b>	<b>0.9%</b>
OPEC liquids market share (percent) .....	40.2	40.2	39.8	39.8	40.6	42.0	43.0	--

**Table A21. International liquids supply and disposition summary (continued)**  
(million barrels per day, unless otherwise noted)

Supply and disposition	Reference case							Annual growth 2011-2040 (percent)
	2010	2011	2020	2025	2030	2035	2040	
<b>Selected world liquids production subtotals:</b>								
Petroleum <sup>6</sup>								
Crude oil and equivalents <sup>7</sup> .....	74.11	74.08	80.28	82.51	85.26	87.59	90.90	0.7%
Tight oil.....	0.82	1.27	3.83	4.52	4.91	5.54	6.10	5.6%
Bitumen <sup>8</sup> .....	1.65	1.74	3.00	3.52	3.95	4.21	4.26	3.1%
Natural gas plant liquids.....	8.53	8.66	10.88	11.52	11.75	12.40	12.88	1.4%
Refinery processing gain <sup>9</sup> .....	2.27	2.28	2.20	2.31	2.50	2.69	2.82	0.7%
Liquids from renewable sources <sup>10</sup> .....	1.31	1.33	2.08	2.29	2.49	2.67	2.93	2.8%
Liquids from coal <sup>11</sup> .....	0.17	0.18	0.40	0.68	0.95	1.17	1.19	6.7%
Liquids from natural gas <sup>12</sup> .....	0.07	0.12	0.39	0.45	0.48	0.51	0.55	5.4%
Liquids from kerogen <sup>13</sup> .....	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.6%
<b>Petroleum production<sup>6</sup></b>								
OPEC <sup>5</sup>								
Middle East.....	23.76	25.34	26.44	27.66	29.64	32.38	34.84	1.1%
North Africa.....	3.76	2.39	3.27	3.27	3.48	3.77	3.96	1.8%
West Africa.....	4.45	4.31	5.30	5.44	5.58	5.72	5.86	1.1%
South America.....	2.88	2.99	3.09	3.05	3.01	3.06	3.20	0.2%
<b>Total OPEC.....</b>	<b>34.85</b>	<b>35.03</b>	<b>38.10</b>	<b>39.42</b>	<b>41.71</b>	<b>44.93</b>	<b>47.86</b>	<b>1.1%</b>
Non-OPEC								
OECD								
United States (50 states).....	8.66	9.25	11.64	10.95	10.21	10.20	10.08	0.3%
Canada.....	3.56	3.64	5.07	5.57	5.87	6.05	6.10	1.8%
Mexico and Chile.....	3.01	2.99	1.96	1.84	1.98	2.04	2.12	-1.2%
OECD Europe <sup>2</sup> .....	4.36	3.98	3.16	2.85	2.60	2.67	3.09	-0.9%
Japan.....	0.17	0.17	0.16	0.17	0.18	0.18	0.18	0.1%
Australia and New Zealand.....	0.66	0.57	0.53	0.52	0.55	0.77	0.86	1.4%
<b>Total OECD.....</b>	<b>20.43</b>	<b>20.60</b>	<b>22.52</b>	<b>21.90</b>	<b>21.39</b>	<b>21.90</b>	<b>22.43</b>	<b>0.3%</b>
Non-OECD								
Russia.....	10.14	10.23	10.75	10.94	11.42	11.94	11.47	0.4%
Other Europe and Eurasia <sup>3</sup> .....	3.24	3.25	4.19	4.84	4.84	4.82	5.23	1.7%
China.....	4.30	4.30	4.44	4.65	4.83	4.64	4.52	0.2%
Other Asia <sup>4</sup> .....	3.76	3.67	3.42	3.13	2.88	2.59	2.65	-1.1%
Middle East.....	1.57	1.43	1.23	1.22	1.09	0.91	0.89	-1.6%
Africa.....	2.46	2.47	2.75	2.80	2.74	2.60	2.82	0.5%
Brazil.....	2.19	2.25	3.57	4.70	5.92	6.30	6.48	3.7%
Other Central and South America.....	2.01	2.09	2.33	2.43	2.38	2.34	2.60	0.8%
<b>Total non-OECD.....</b>	<b>29.68</b>	<b>29.69</b>	<b>32.69</b>	<b>34.73</b>	<b>36.11</b>	<b>36.15</b>	<b>36.66</b>	<b>0.7%</b>
<b>Total petroleum production.....</b>	<b>84.96</b>	<b>85.31</b>	<b>93.32</b>	<b>96.05</b>	<b>99.20</b>	<b>102.99</b>	<b>106.96</b>	<b>0.8%</b>
OPEC petroleum market share (percent).....	41.0	41.1	40.8	41.0	42.0	43.6	44.7	--

<sup>1</sup>Includes both OPEC and non-OPEC consumers in the regional breakdown.

<sup>2</sup>OECD Europe = Organization for Economic Cooperation and Development - Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

<sup>3</sup>Other Europe and Eurasia = Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Malta, Moldova, Montenegro, Romania, Serbia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

<sup>4</sup>Other Asia = Afghanistan, Bangladesh, Bhutan, Brunei, Cambodia (Kampuchea), Fiji, French Polynesia, Guam, Hong Kong, Indonesia, Kiribati, Laos, Malaysia, Macau, Maldives, Mongolia, Myanmar (Burma), Nauru, Nepal, New Caledonia, Niue, North Korea, Pakistan, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Sri Lanka, Taiwan, Thailand, Tonga, Vanuatu, and Vietnam.

<sup>5</sup>OPEC = Organization of Petroleum Exporting Countries - Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

<sup>6</sup>Includes production of crude oil (including lease condensate, tight oil (shale oil), extra-heavy oil, and bitumen (oil sands)), natural gas plant liquids, refinery gains, and other hydrogen and hydrocarbons for refinery feedstocks.

<sup>7</sup>Includes crude oil, lease condensate, tight oil (shale oil), extra-heavy oil, and bitumen (oil sands).

<sup>8</sup>Includes diluted and upgraded/synthetic bitumen (syncrude).

<sup>9</sup>The volumetric amount by which total output is greater than input due to the processing of crude oil into products which, in total, have a lower specific gravity than the crude oil processed.

<sup>10</sup>Includes liquids produced from energy crops.

<sup>11</sup>Includes liquids converted from coal via the Fischer-Tropsch coal-to-liquids process.

<sup>12</sup>Includes liquids converted from natural gas via the Fischer-Tropsch natural-gas-to-liquids process.

<sup>13</sup>Includes liquids produced from kerogen (oil shale, not to be confused with tight oil (shale oil)).

-- = Not applicable.

Note: Ethanol is represented in motor gasoline equivalent barrels. Totals may not equal sum of components due to independent rounding. Data for 2010 and 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2010 and 2011 crude oil spot prices: Thomson Reuters. 2010 quantities derived from: Energy Information Administration (EIA), International Energy Statistics database as of October 2012. 2011 quantities and projections: EIA, AEO2013 National Energy Modeling System run REF2013.D102312A and EIA, Generate World Oil Balance Model.