

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 2015-2040 (percent) |
|--|----------------|-------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Production | | | | | | | | |
| Crude oil and lease condensate | 18.4 | 19.7 | 19.6 | 19.7 | 21.0 | 22.3 | 23.5 | 0.7% |
| Natural gas plant liquids | 4.1 | 4.4 | 6.1 | 6.4 | 6.5 | 6.6 | 6.7 | 1.6% |
| Dry natural gas | 26.5 | 28.0 | 31.4 | 35.9 | 38.9 | 41.2 | 43.4 | 1.8% |
| Coal ¹ | 20.6 | 17.2 | 17.5 | 15.4 | 13.3 | 13.4 | 13.1 | -1.1% |
| Nuclear / uranium ² | 8.3 | 8.3 | 8.1 | 8.2 | 8.2 | 8.2 | 8.2 | 0.0% |
| Conventional hydroelectric power | 2.5 | 2.3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 0.8% |
| Biomass ³ | 4.4 | 4.1 | 4.2 | 4.3 | 4.4 | 4.4 | 4.6 | 0.4% |
| Other renewable energy ⁴ | 2.5 | 2.6 | 4.6 | 6.1 | 6.6 | 7.8 | 8.8 | 5.0% |
| Other ⁵ | 1.0 | 0.5 | 0.9 | 1.0 | 0.9 | 0.9 | 1.0 | 2.8% |
| Total | 88.4 | 87.3 | 95.4 | 99.8 | 102.7 | 107.7 | 112.2 | 1.0% |
| Imports | | | | | | | | |
| Crude oil | 16.3 | 16.1 | 16.8 | 16.8 | 16.0 | 15.8 | 15.9 | -0.1% |
| Petroleum and other liquids ⁶ | 3.9 | 3.9 | 4.5 | 4.5 | 4.3 | 4.2 | 4.3 | 0.4% |
| Natural gas ⁷ | 2.8 | 2.8 | 2.1 | 1.8 | 1.6 | 1.4 | 1.4 | -2.6% |
| Other imports ⁸ | 0.4 | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | -3.9% |
| Total | 23.3 | 23.2 | 23.6 | 23.2 | 22.0 | 21.5 | 21.8 | -0.3% |
| Exports | | | | | | | | |
| Petroleum and other liquids ⁹ | 8.2 | 9.0 | 11.6 | 12.5 | 13.5 | 14.4 | 15.2 | 2.1% |
| Natural gas ¹⁰ | 1.5 | 1.8 | 5.0 | 7.1 | 7.6 | 8.6 | 9.0 | 6.7% |
| Coal | 2.5 | 2.0 | 1.9 | 1.8 | 1.9 | 2.2 | 2.3 | 0.7% |
| Total | 12.2 | 12.8 | 18.5 | 21.4 | 23.0 | 25.2 | 26.6 | 3.0% |
| Discrepancy¹¹ | 1.4 | 1.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.3 | -- |
| Consumption | | | | | | | | |
| Petroleum and other liquids ¹² | 36.0 | 36.5 | 37.8 | 37.3 | 36.6 | 36.8 | 37.5 | 0.1% |
| Natural gas | 27.5 | 28.3 | 28.3 | 30.2 | 32.5 | 33.5 | 35.4 | 0.9% |
| Coal ¹³ | 17.9 | 15.5 | 15.6 | 13.5 | 11.3 | 11.2 | 10.7 | -1.4% |
| Nuclear / uranium ² | 8.3 | 8.3 | 8.1 | 8.2 | 8.2 | 8.2 | 8.2 | 0.0% |
| Conventional hydroelectric power | 2.5 | 2.3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 0.8% |
| Biomass ¹⁴ | 3.0 | 2.8 | 2.8 | 2.9 | 3.0 | 3.0 | 3.1 | 0.5% |
| Other renewable energy ⁴ | 2.5 | 2.6 | 4.6 | 6.1 | 6.6 | 7.8 | 8.8 | 5.0% |
| Other ¹⁵ | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.1% |
| Total | 98.1 | 96.7 | 100.5 | 101.6 | 101.5 | 103.9 | 107.1 | 0.4% |
| Prices (2015 dollars per unit) | | | | | | | | |
| Crude oil spot prices (dollars per barrel) | | | | | | | | |
| Brent | 100 | 52 | 77 | 92 | 104 | 120 | 136 | 3.9% |
| West Texas Intermediate | 94 | 49 | 71 | 85 | 97 | 112 | 129 | 4.0% |
| Natural gas at Henry Hub (dollars per million Btu) | | | | | | | | |
| Coal (dollars per ton) | | | | | | | | |
| at the minemouth ¹⁶ | 35.2 | 33.8 | 33.6 | 34.0 | 33.8 | 37.6 | 38.7 | 0.5% |
| Coal (dollars per million Btu) | | | | | | | | |
| at the minemouth ¹⁶ | 1.73 | 1.69 | 1.68 | 1.71 | 1.71 | 1.86 | 1.91 | 0.5% |
| Average end-use ¹⁷ | 2.52 | 2.37 | 2.43 | 2.49 | 2.55 | 2.61 | 2.68 | 0.5% |
| Average electricity (cents per kilowatthour) | 10.5 | 10.3 | 10.5 | 10.7 | 10.9 | 10.6 | 10.5 | 0.1% |

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 2015-2040 (percent) |
|--|----------------|------|------|------|------|------|------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Prices (nominal dollars per unit) | | | | | | | | |
| Crude oil spot prices (dollars per barrel) | | | | | | | | |
| Brent | 99 | 52 | 85 | 112 | 141 | 181 | 229 | 6.1% |
| West Texas Intermediate | 93 | 49 | 79 | 105 | 131 | 170 | 217 | 6.2% |
| Natural gas at Henry Hub (dollars per million Btu) | 4.39 | 2.62 | 4.90 | 6.27 | 6.84 | 7.42 | 8.17 | 4.7% |
| Coal (dollars per ton) | | | | | | | | |
| at the minemouth ¹⁶ | 34.9 | 33.8 | 37.1 | 41.6 | 45.8 | 56.8 | 65.1 | 2.7% |
| Coal (dollars per million Btu) | | | | | | | | |
| at the minemouth ¹⁶ | 1.71 | 1.69 | 1.86 | 2.09 | 2.31 | 2.81 | 3.21 | 2.6% |
| Average end-use ¹⁷ | 2.49 | 2.37 | 2.69 | 3.05 | 3.45 | 3.94 | 4.50 | 2.6% |
| Average electricity (cents per kilowatthour) | 10.4 | 10.3 | 11.6 | 13.1 | 14.7 | 16.1 | 17.6 | 2.2% |

¹Includes waste coal.

²These 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.

³Includes 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.

⁴Includes 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.

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

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

⁷Includes imports of liquefied natural gas that are later re-exported.

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

⁹Includes crude oil, petroleum products, ethanol, and biodiesel.

¹⁰Includes re-exported liquefied natural gas.

¹¹Balancing item. Includes unaccounted for supply, losses, gains, and net storage withdrawals.

¹²Estimated consumption. 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 hydrocarbon gas liquids and crude oil consumed as a fuel. Refer to Table A17 for detailed renewable liquid fuels consumption.

¹³Excludes coal converted to coal-based synthetic liquids and natural gas.

¹⁴Includes 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.

¹⁵Includes non-biogenic municipal waste, liquid hydrogen, and net electricity imports.

¹⁶Includes 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.

¹⁷Prices weighted by consumption; weighted average excludes 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 natural gas supply values: EIA, *Natural Gas Monthly*, July 2015. 2014 coal minemouth and delivered coal prices: EIA, *Annual Coal Report 2013*. 2014 petroleum supply values: EIA, *Petroleum Supply Annual 2014*. 2014 crude oil spot prices and natural gas spot price at Henry Hub: Thomson Reuters. Other 2014 coal values: *Quarterly Coal Report, October-December 2014*. Other 2014: EIA, *Monthly Energy Review*, February 2016. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Energy consumption | | | | | | | | |
| Residential | | | | | | | | |
| Propane | 0.50 | 0.43 | 0.42 | 0.40 | 0.38 | 0.36 | 0.34 | -0.9% |
| Kerosene | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | -2.6% |
| Distillate fuel oil | 0.55 | 0.50 | 0.43 | 0.38 | 0.34 | 0.30 | 0.27 | -2.4% |
| Petroleum and other liquids subtotal | 1.05 | 0.93 | 0.86 | 0.78 | 0.72 | 0.66 | 0.61 | -1.7% |
| Natural gas | 5.25 | 4.77 | 4.87 | 4.82 | 4.80 | 4.77 | 4.73 | 0.0% |
| Renewable energy ¹ | 0.59 | 0.44 | 0.42 | 0.41 | 0.39 | 0.38 | 0.37 | -0.7% |
| Electricity | 4.80 | 4.78 | 4.76 | 4.75 | 4.83 | 4.97 | 5.20 | 0.3% |
| Delivered energy | 11.70 | 10.92 | 10.90 | 10.77 | 10.74 | 10.78 | 10.91 | 0.0% |
| Electricity related losses | 9.72 | 9.44 | 9.37 | 9.03 | 8.77 | 8.93 | 9.15 | -0.1% |
| Total | 21.42 | 20.37 | 20.27 | 19.79 | 19.50 | 19.71 | 20.05 | -0.1% |
| Commercial | | | | | | | | |
| Propane | 0.15 | 0.17 | 0.18 | 0.19 | 0.19 | 0.20 | 0.20 | 0.7% |
| Motor gasoline ² | 0.04 | 0.04 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 | 2.1% |
| Kerosene | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 5.0% |
| Distillate fuel oil | 0.36 | 0.37 | 0.36 | 0.34 | 0.32 | 0.30 | 0.29 | -1.0% |
| Residual fuel oil | 0.02 | 0.07 | 0.11 | 0.10 | 0.10 | 0.10 | 0.10 | 1.2% |
| Petroleum and other liquids subtotal | 0.57 | 0.66 | 0.70 | 0.69 | 0.68 | 0.67 | 0.67 | 0.1% |
| Natural gas | 3.58 | 3.32 | 3.45 | 3.46 | 3.53 | 3.66 | 3.81 | 0.5% |
| Coal | 0.05 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | -0.4% |
| Renewable energy ³ | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.0% |
| Electricity | 4.61 | 4.64 | 4.69 | 4.86 | 5.09 | 5.33 | 5.62 | 0.8% |
| Delivered energy | 8.95 | 8.81 | 9.03 | 9.20 | 9.49 | 9.86 | 10.28 | 0.6% |
| Electricity related losses | 9.34 | 9.16 | 9.23 | 9.23 | 9.23 | 9.57 | 9.89 | 0.3% |
| Total | 18.29 | 17.97 | 18.26 | 18.43 | 18.72 | 19.43 | 20.17 | 0.5% |
| Industrial⁴ | | | | | | | | |
| Liquefied petroleum gases and other ⁵ | 2.44 | 2.38 | 3.10 | 3.50 | 3.66 | 3.92 | 4.22 | 2.3% |
| Motor gasoline ² | 0.27 | 0.27 | 0.28 | 0.27 | 0.27 | 0.27 | 0.27 | 0.0% |
| Distillate fuel oil | 1.36 | 1.34 | 1.44 | 1.45 | 1.44 | 1.45 | 1.47 | 0.4% |
| Residual fuel oil | 0.03 | 0.04 | 0.04 | 0.06 | 0.06 | 0.05 | 0.05 | 1.6% |
| Petrochemical feedstocks | 0.70 | 0.66 | 0.96 | 1.21 | 1.31 | 1.47 | 1.66 | 3.8% |
| Other petroleum ⁶ | 3.19 | 3.38 | 3.59 | 3.71 | 3.82 | 3.95 | 4.15 | 0.8% |
| Petroleum and other liquids subtotal | 7.99 | 8.07 | 9.40 | 10.19 | 10.55 | 11.13 | 11.82 | 1.5% |
| Natural gas | 7.84 | 7.75 | 8.55 | 8.93 | 9.13 | 9.49 | 9.89 | 1.0% |
| Natural-gas-to-liquids heat and power | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Lease and plant fuel ⁷ | 1.55 | 1.63 | 1.76 | 1.94 | 2.06 | 2.19 | 2.31 | 1.4% |
| Natural gas liquefaction for export ⁸ | 0.00 | 0.00 | 0.26 | 0.48 | 0.53 | 0.64 | 0.69 | -- |
| Natural gas subtotal | 9.40 | 9.38 | 10.57 | 11.34 | 11.72 | 12.32 | 12.89 | 1.3% |
| Metallurgical coal | 0.58 | 0.54 | 0.41 | 0.45 | 0.47 | 0.43 | 0.40 | -1.2% |
| Other industrial coal | 0.87 | 0.82 | 0.82 | 0.86 | 0.88 | 0.89 | 0.93 | 0.5% |
| Coal-to-liquids heat and power | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Net coal coke imports | -0.02 | -0.02 | -0.01 | 0.00 | 0.00 | 0.01 | 0.01 | -- |
| Coal subtotal | 1.43 | 1.34 | 1.23 | 1.31 | 1.35 | 1.33 | 1.34 | 0.0% |
| Biofuels heat and coproducts | 0.75 | 0.78 | 0.83 | 0.80 | 0.81 | 0.81 | 0.84 | 0.3% |
| Renewable energy ⁹ | 1.52 | 1.48 | 1.48 | 1.59 | 1.67 | 1.70 | 1.79 | 0.8% |
| Electricity | 3.40 | 3.27 | 3.61 | 3.91 | 3.98 | 4.08 | 4.26 | 1.1% |
| Delivered energy | 24.49 | 24.33 | 27.11 | 29.14 | 30.07 | 31.38 | 32.94 | 1.2% |
| Electricity related losses | 6.89 | 6.46 | 7.11 | 7.42 | 7.22 | 7.34 | 7.50 | 0.6% |
| Total | 31.38 | 30.79 | 34.22 | 36.56 | 37.29 | 38.72 | 40.44 | 1.1% |

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

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|---------------|---------------|---------------|---------------|---------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Transportation | | | | | | | | |
| Propane..... | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 3.3% |
| Motor gasoline ² | 16.78 | 17.01 | 16.79 | 15.05 | 13.62 | 12.84 | 12.55 | -1.2% |
| of which: E85 ¹⁰ | 0.03 | 0.05 | 0.04 | 0.12 | 0.22 | 0.27 | 0.28 | 7.3% |
| Jet fuel ¹¹ | 2.82 | 2.84 | 2.99 | 3.14 | 3.32 | 3.46 | 3.56 | 0.9% |
| Distillate fuel oil ¹² | 6.40 | 6.67 | 6.99 | 7.28 | 7.49 | 7.77 | 8.01 | 0.7% |
| Residual fuel oil..... | 0.44 | 0.45 | 0.37 | 0.40 | 0.42 | 0.44 | 0.45 | 0.1% |
| Other petroleum ¹³ | 0.15 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.1% |
| Petroleum and other liquids subtotal..... | 26.61 | 27.14 | 27.32 | 26.04 | 25.01 | 24.68 | 24.75 | -0.4% |
| Pipeline fuel natural gas..... | 0.87 | 0.89 | 0.83 | 0.89 | 0.94 | 1.00 | 1.07 | 0.7% |
| Compressed / liquefied natural gas..... | 0.06 | 0.07 | 0.08 | 0.10 | 0.17 | 0.31 | 0.59 | 9.2% |
| Liquid hydrogen..... | 0.00 | 0.00 | 0.01 | 0.03 | 0.04 | 0.05 | 0.06 | 22.9% |
| Electricity..... | 0.03 | 0.03 | 0.05 | 0.08 | 0.11 | 0.14 | 0.15 | 6.7% |
| Delivered energy | 27.56 | 28.13 | 28.29 | 27.13 | 26.28 | 26.18 | 26.63 | -0.2% |
| Electricity related losses..... | 0.05 | 0.06 | 0.09 | 0.15 | 0.20 | 0.24 | 0.27 | 6.2% |
| Total | 27.61 | 28.19 | 28.38 | 27.28 | 26.48 | 26.42 | 26.90 | -0.2% |
| Unspecified sector¹⁴ | -0.57 | -0.58 | -0.58 | -0.52 | -0.46 | -0.43 | -0.42 | -1.3% |
| Delivered energy consumption for all sectors | | | | | | | | |
| Liquefied petroleum gases and other ⁵ | 3.09 | 2.99 | 3.71 | 4.09 | 4.24 | 4.49 | 4.79 | 1.9% |
| Motor gasoline ² | 16.51 | 16.96 | 16.55 | 14.87 | 13.49 | 12.74 | 12.47 | -1.2% |
| of which: E85 ¹⁰ | 0.03 | 0.05 | 0.04 | 0.12 | 0.22 | 0.27 | 0.28 | 7.3% |
| Jet fuel ¹¹ | 3.04 | 3.18 | 3.22 | 3.38 | 3.58 | 3.72 | 3.83 | 0.7% |
| Kerosene..... | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.3% |
| Distillate fuel oil..... | 8.45 | 8.33 | 8.98 | 9.19 | 9.33 | 9.56 | 9.77 | 0.6% |
| Residual fuel oil..... | 0.50 | 0.56 | 0.52 | 0.56 | 0.57 | 0.59 | 0.60 | 0.3% |
| Petrochemical feedstocks..... | 0.70 | 0.66 | 0.96 | 1.21 | 1.31 | 1.47 | 1.66 | 3.8% |
| Other petroleum ¹⁵ | 3.35 | 3.54 | 3.75 | 3.87 | 3.98 | 4.12 | 4.31 | 0.8% |
| Petroleum and other liquids subtotal..... | 35.65 | 36.23 | 37.70 | 37.18 | 36.51 | 36.71 | 37.44 | 0.1% |
| Natural gas..... | 16.73 | 15.90 | 16.95 | 17.31 | 17.63 | 18.23 | 19.02 | 0.7% |
| Natural-gas-to-liquids heat and power..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Lease and plant fuel ⁷ | 1.55 | 1.63 | 1.76 | 1.94 | 2.06 | 2.19 | 2.31 | 1.4% |
| Natural gas liquefaction for export ⁸ | 0.00 | 0.00 | 0.26 | 0.48 | 0.53 | 0.64 | 0.69 | -- |
| Pipeline fuel natural gas..... | 0.87 | 0.89 | 0.83 | 0.89 | 0.94 | 1.00 | 1.07 | 0.7% |
| Natural gas subtotal..... | 19.15 | 18.43 | 19.80 | 20.61 | 21.16 | 22.06 | 23.09 | 0.9% |
| Metallurgical coal..... | 0.58 | 0.54 | 0.41 | 0.45 | 0.47 | 0.43 | 0.40 | -1.2% |
| Other coal..... | 0.92 | 0.88 | 0.88 | 0.92 | 0.93 | 0.95 | 0.98 | 0.5% |
| Coal-to-liquids heat and power..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Net coal coke imports..... | -0.02 | -0.02 | -0.01 | 0.00 | 0.00 | 0.01 | 0.01 | -- |
| Coal subtotal..... | 1.48 | 1.40 | 1.28 | 1.36 | 1.40 | 1.39 | 1.39 | 0.0% |
| Biofuels heat and coproducts..... | 0.75 | 0.78 | 0.83 | 0.80 | 0.81 | 0.81 | 0.84 | 0.3% |
| Renewable energy ¹⁶ | 2.24 | 2.06 | 2.03 | 2.13 | 2.19 | 2.22 | 2.29 | 0.4% |
| Liquid hydrogen..... | 0.00 | 0.00 | 0.01 | 0.03 | 0.04 | 0.05 | 0.06 | 22.9% |
| Electricity..... | 12.84 | 12.72 | 13.11 | 13.60 | 14.01 | 14.52 | 15.23 | 0.7% |
| Delivered energy | 72.12 | 71.62 | 74.75 | 75.73 | 76.12 | 77.77 | 80.34 | 0.5% |
| Electricity related losses..... | 26.01 | 25.12 | 25.80 | 25.83 | 25.41 | 26.09 | 26.81 | 0.3% |
| Total | 98.13 | 96.74 | 100.55 | 101.56 | 101.54 | 103.85 | 107.15 | 0.4% |
| Electric power¹⁷ | | | | | | | | |
| Distillate fuel oil..... | 0.09 | 0.09 | 0.09 | 0.08 | 0.06 | 0.06 | 0.05 | -2.0% |
| Residual fuel oil..... | 0.22 | 0.17 | 0.06 | 0.05 | 0.04 | 0.04 | 0.03 | -6.6% |
| Petroleum and other liquids subtotal..... | 0.31 | 0.26 | 0.15 | 0.13 | 0.11 | 0.10 | 0.09 | -4.4% |
| Natural gas..... | 8.38 | 9.89 | 8.50 | 9.60 | 11.34 | 11.46 | 12.31 | 0.9% |
| Steam coal..... | 16.42 | 14.08 | 14.34 | 12.12 | 9.92 | 9.82 | 9.36 | -1.6% |
| Nuclear / uranium ¹⁸ | 8.33 | 8.34 | 8.12 | 8.25 | 8.25 | 8.25 | 8.25 | 0.0% |
| Renewable energy ¹⁹ | 5.01 | 4.86 | 7.37 | 8.91 | 9.41 | 10.60 | 11.67 | 3.6% |
| Non-biogenic municipal waste..... | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.0% |
| Electricity imports..... | 0.18 | 0.19 | 0.19 | 0.20 | 0.17 | 0.16 | 0.15 | -1.1% |
| Total | 38.86 | 37.85 | 38.90 | 39.43 | 39.42 | 40.61 | 42.04 | 0.4% |

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

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|---------------|---------------|---------------|---------------|---------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Total energy consumption | | | | | | | | |
| Liquefied petroleum gases and other ⁵ | 3.09 | 2.99 | 3.71 | 4.09 | 4.24 | 4.49 | 4.79 | 1.9% |
| Motor gasoline ² | 16.51 | 16.96 | 16.55 | 14.87 | 13.49 | 12.74 | 12.47 | -1.2% |
| of which: E85 ¹⁰ | 0.03 | 0.05 | 0.04 | 0.12 | 0.22 | 0.27 | 0.28 | 7.3% |
| Jet fuel ¹¹ | 3.04 | 3.18 | 3.22 | 3.38 | 3.58 | 3.72 | 3.83 | 0.7% |
| Kerosene | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.3% |
| Distillate fuel oil | 8.54 | 8.42 | 9.07 | 9.27 | 9.40 | 9.62 | 9.82 | 0.6% |
| Residual fuel oil | 0.72 | 0.73 | 0.58 | 0.61 | 0.62 | 0.63 | 0.64 | -0.5% |
| Petrochemical feedstocks | 0.70 | 0.66 | 0.96 | 1.21 | 1.31 | 1.47 | 1.66 | 3.8% |
| Other petroleum ¹⁵ | 3.35 | 3.54 | 3.75 | 3.87 | 3.98 | 4.12 | 4.31 | 0.8% |
| Petroleum and other liquids subtotal | 35.96 | 36.49 | 37.85 | 37.31 | 36.62 | 36.81 | 37.52 | 0.1% |
| Natural gas | 25.11 | 25.79 | 25.45 | 26.91 | 28.97 | 29.69 | 31.33 | 0.8% |
| Natural-gas-to-liquids heat and power | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Lease and plant fuel ⁷ | 1.55 | 1.63 | 1.76 | 1.94 | 2.06 | 2.19 | 2.31 | 1.4% |
| Natural gas liquefaction for export ⁸ | 0.00 | 0.00 | 0.26 | 0.48 | 0.53 | 0.64 | 0.69 | -- |
| Pipeline fuel natural gas | 0.87 | 0.89 | 0.83 | 0.89 | 0.94 | 1.00 | 1.07 | 0.7% |
| Natural gas subtotal | 27.53 | 28.31 | 28.30 | 30.22 | 32.51 | 33.52 | 35.39 | 0.9% |
| Metallurgical coal | 0.58 | 0.54 | 0.41 | 0.45 | 0.47 | 0.43 | 0.40 | -1.2% |
| Other coal | 17.34 | 14.96 | 15.22 | 13.04 | 10.86 | 10.77 | 10.34 | -1.5% |
| Coal-to-liquids heat and power | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Net coal coke imports | -0.02 | -0.02 | -0.01 | 0.00 | 0.00 | 0.01 | 0.01 | -- |
| Coal subtotal | 17.90 | 15.48 | 15.62 | 13.49 | 11.32 | 11.21 | 10.75 | -1.4% |
| Nuclear / uranium ¹⁸ | 8.33 | 8.34 | 8.12 | 8.25 | 8.25 | 8.25 | 8.25 | 0.0% |
| Biofuels heat and coproducts | 0.75 | 0.78 | 0.83 | 0.80 | 0.81 | 0.81 | 0.84 | 0.3% |
| Renewable energy ²⁰ | 7.26 | 6.92 | 9.40 | 11.04 | 11.60 | 12.82 | 13.96 | 2.8% |
| Liquid hydrogen | 0.00 | 0.00 | 0.01 | 0.03 | 0.04 | 0.05 | 0.06 | 22.9% |
| Non-biogenic municipal waste | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.0% |
| Electricity imports | 0.18 | 0.19 | 0.19 | 0.20 | 0.17 | 0.16 | 0.15 | -1.1% |
| Total | 98.13 | 96.74 | 100.55 | 101.56 | 101.54 | 103.85 | 107.15 | 0.4% |
| Energy use and related statistics | | | | | | | | |
| Delivered energy use | 72.12 | 71.62 | 74.75 | 75.73 | 76.12 | 77.77 | 80.34 | 0.5% |
| Total energy use | 98.13 | 96.74 | 100.55 | 101.56 | 101.54 | 103.85 | 107.15 | 0.4% |
| Ethanol consumed in motor gasoline and E85 | 1.14 | 1.18 | 1.19 | 1.13 | 1.12 | 1.14 | 1.24 | 0.2% |
| Population (millions) | 319 | 322 | 335 | 348 | 360 | 371 | 381 | 0.7% |
| Gross domestic product (billion 2009 dollars) | 15,962 | 16,349 | 18,555 | 20,765 | 23,113 | 25,598 | 28,397 | 2.2% |
| Carbon dioxide emissions (million metric tons) | 5,406 | 5,273 | 5,289 | 5,115 | 4,961 | 4,980 | 5,044 | -0.2% |

¹Includes 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.

²Includes ethanol and ethers blended into gasoline.

³Excludes 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.

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

⁵Includes ethane, natural gasoline, and refinery olefins.

⁶Includes petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.

⁷Represents natural gas used in well, field, and lease operations, and in natural gas processing plant machinery.

⁸Fuel used in facilities that liquefy natural gas for export.

⁹Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources. Excludes ethanol in motor gasoline.

¹⁰E85 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.

¹¹Includes only kerosene type.

¹²Diesel fuel for on- and off- road use.

¹³Includes aviation gasoline and lubricants.

¹⁴Represents consumption unattributed to the sectors above.

¹⁵Includes aviation gasoline, petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.

¹⁶Includes 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.

¹⁷Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.

¹⁸These 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.

¹⁹Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes net electricity imports.

²⁰Includes 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: Includes estimated consumption for petroleum and other liquids. Totals may not equal sum of components due to independent rounding. Data for 2014 are model results and may differ from official EIA data reports.

Sources: 2014 consumption, carbon dioxide emissions, and emission factors based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016. 2014 population and gross domestic product: IHS Economics, Industry and Employment models, November 2015. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A3. Energy prices by sector and source
(2015 dollars per million Btu, unless otherwise noted)

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Residential | | | | | | | | |
| Propane | 23.3 | 16.9 | 20.2 | 21.4 | 22.4 | 24.0 | 25.6 | 1.7% |
| Distillate fuel oil | 26.9 | 19.3 | 22.4 | 25.5 | 27.8 | 30.8 | 33.8 | 2.3% |
| Natural gas | 10.7 | 10.1 | 10.7 | 11.6 | 12.0 | 12.1 | 12.3 | 0.8% |
| Electricity | 37.1 | 36.3 | 37.7 | 38.8 | 39.4 | 38.7 | 38.1 | 0.2% |
| Commercial | | | | | | | | |
| Propane | 20.6 | 15.1 | 17.9 | 18.9 | 19.8 | 21.2 | 22.5 | 1.6% |
| Distillate fuel oil | 26.4 | 17.0 | 19.7 | 22.2 | 24.4 | 27.4 | 30.5 | 2.4% |
| Residual fuel oil | 16.7 | 6.9 | 11.0 | 13.5 | 15.3 | 17.6 | 19.9 | 4.3% |
| Natural gas | 9.0 | 7.7 | 9.3 | 10.1 | 10.4 | 10.3 | 10.4 | 1.2% |
| Electricity | 31.8 | 30.6 | 31.5 | 32.0 | 32.3 | 31.4 | 30.7 | 0.0% |
| Industrial¹ | | | | | | | | |
| Propane | 18.8 | 12.2 | 15.6 | 16.8 | 17.8 | 19.5 | 21.1 | 2.2% |
| Distillate fuel oil | 27.1 | 17.0 | 19.7 | 22.2 | 24.4 | 27.4 | 30.5 | 2.4% |
| Residual fuel oil | 15.0 | 6.8 | 11.3 | 14.2 | 15.9 | 18.2 | 20.6 | 4.6% |
| Natural gas ² | 5.4 | 3.7 | 5.4 | 6.0 | 6.0 | 5.8 | 5.7 | 1.7% |
| Metallurgical coal | 5.3 | 5.4 | 6.0 | 6.5 | 7.0 | 7.2 | 7.3 | 1.2% |
| Other industrial coal | 3.2 | 3.4 | 3.4 | 3.4 | 3.4 | 3.5 | 3.6 | 0.2% |
| Coal to liquids | -- | -- | -- | -- | -- | -- | -- | -- |
| Electricity | 21.0 | 20.3 | 20.9 | 21.5 | 22.1 | 21.5 | 21.2 | 0.2% |
| Transportation | | | | | | | | |
| Propane | 24.4 | 18.0 | 21.2 | 22.4 | 23.4 | 25.0 | 26.6 | 1.6% |
| E85 ³ | 33.3 | 23.3 | 32.0 | 31.2 | 30.8 | 32.3 | 35.0 | 1.6% |
| Motor gasoline ⁴ | 28.4 | 20.9 | 22.7 | 24.7 | 26.5 | 28.9 | 31.8 | 1.7% |
| Jet fuel ⁵ | 20.8 | 12.0 | 16.2 | 19.0 | 21.3 | 24.5 | 27.7 | 3.4% |
| Diesel fuel (distillate fuel oil) ⁶ | 27.8 | 19.8 | 23.1 | 25.8 | 28.0 | 31.0 | 34.1 | 2.2% |
| Residual fuel oil | 14.6 | 8.1 | 11.7 | 13.4 | 15.0 | 17.0 | 19.2 | 3.5% |
| Natural gas ⁷ | 18.4 | 16.6 | 16.6 | 16.4 | 15.5 | 15.4 | 15.9 | -0.2% |
| Electricity | 32.2 | 29.5 | 33.0 | 36.0 | 37.4 | 36.4 | 35.5 | 0.7% |
| Electric power⁸ | | | | | | | | |
| Distillate fuel oil | 23.8 | 15.0 | 18.4 | 21.2 | 23.5 | 26.4 | 29.4 | 2.7% |
| Residual fuel oil | 18.3 | 10.2 | 13.8 | 16.3 | 18.1 | 20.2 | 22.4 | 3.2% |
| Natural gas | 5.1 | 3.3 | 4.7 | 5.4 | 5.6 | 5.4 | 5.4 | 2.0% |
| Steam coal | 2.4 | 2.2 | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 0.3% |
| Average price to all users⁹ | | | | | | | | |
| Propane | 21.2 | 14.9 | 18.0 | 19.2 | 20.1 | 21.6 | 23.2 | 1.8% |
| E85 ³ | 33.3 | 23.3 | 32.0 | 31.2 | 30.8 | 32.3 | 35.0 | 1.6% |
| Motor gasoline ⁴ | 28.4 | 20.9 | 22.7 | 24.7 | 26.5 | 28.9 | 31.8 | 1.7% |
| Jet fuel ⁵ | 20.8 | 12.0 | 16.2 | 19.0 | 21.3 | 24.5 | 27.7 | 3.4% |
| Distillate fuel oil | 27.5 | 19.1 | 22.3 | 25.1 | 27.3 | 30.3 | 33.3 | 2.2% |
| Residual fuel oil | 15.8 | 8.4 | 11.7 | 13.8 | 15.4 | 17.4 | 19.6 | 3.4% |
| Natural gas | 6.9 | 5.3 | 6.7 | 7.4 | 7.4 | 7.3 | 7.4 | 1.4% |
| Metallurgical coal | 5.3 | 5.4 | 6.0 | 6.5 | 7.0 | 7.2 | 7.3 | 1.2% |
| Other coal | 2.4 | 2.3 | 2.3 | 2.4 | 2.4 | 2.4 | 2.5 | 0.4% |
| Coal to liquids | -- | -- | -- | -- | -- | -- | -- | -- |
| Electricity | 30.9 | 30.1 | 30.8 | 31.4 | 31.9 | 31.2 | 30.6 | 0.1% |
| Non-renewable energy expenditures by sector (billion 2015 dollars) | | | | | | | | |
| Residential | 261 | 239 | 250 | 259 | 266 | 268 | 274 | 0.6% |
| Commercial | 193 | 178 | 193 | 205 | 216 | 221 | 230 | 1.0% |
| Industrial ¹ | 231 | 168 | 232 | 276 | 301 | 330 | 369 | 3.2% |
| Transportation | 707 | 514 | 586 | 615 | 640 | 698 | 777 | 1.7% |
| Total non-renewable expenditures | 1,391 | 1,099 | 1,260 | 1,355 | 1,423 | 1,517 | 1,650 | 1.6% |
| Transportation renewable expenditures | 1 | 1 | 1 | 4 | 7 | 9 | 10 | 9.1% |
| Total expenditures | 1,393 | 1,100 | 1,262 | 1,359 | 1,430 | 1,526 | 1,660 | 1.7% |

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

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|------|------|------|------|------|------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Residential | | | | | | | | |
| Propane | 23.1 | 16.9 | 22.3 | 26.2 | 30.3 | 36.2 | 43.0 | 3.8% |
| Distillate fuel oil | 26.7 | 19.3 | 24.7 | 31.2 | 37.6 | 46.5 | 56.9 | 4.4% |
| Natural gas | 10.6 | 10.1 | 11.9 | 14.2 | 16.3 | 18.3 | 20.8 | 2.9% |
| Electricity | 36.7 | 36.3 | 41.7 | 47.5 | 53.3 | 58.4 | 64.2 | 2.3% |
| Commercial | | | | | | | | |
| Propane | 20.4 | 15.1 | 19.8 | 23.2 | 26.8 | 31.9 | 37.9 | 3.8% |
| Distillate fuel oil | 26.1 | 17.0 | 21.8 | 27.2 | 33.1 | 41.4 | 51.2 | 4.5% |
| Residual fuel oil | 16.5 | 6.9 | 12.1 | 16.5 | 20.7 | 26.5 | 33.6 | 6.5% |
| Natural gas | 8.9 | 7.7 | 10.3 | 12.3 | 14.1 | 15.6 | 17.5 | 3.4% |
| Electricity | 31.5 | 30.6 | 34.8 | 39.2 | 43.7 | 47.4 | 51.7 | 2.1% |
| Industrial¹ | | | | | | | | |
| Propane | 18.7 | 12.2 | 17.2 | 20.6 | 24.1 | 29.4 | 35.6 | 4.4% |
| Distillate fuel oil | 26.8 | 17.0 | 21.8 | 27.2 | 33.1 | 41.4 | 51.3 | 4.5% |
| Residual fuel oil | 14.8 | 6.8 | 12.4 | 17.4 | 21.6 | 27.5 | 34.7 | 6.8% |
| Natural gas ² | 5.3 | 3.7 | 5.9 | 7.3 | 8.1 | 8.7 | 9.6 | 3.9% |
| Metallurgical coal | 5.3 | 5.4 | 6.7 | 8.0 | 9.4 | 10.9 | 12.2 | 3.3% |
| Other industrial coal | 3.2 | 3.4 | 3.7 | 4.2 | 4.6 | 5.2 | 6.0 | 2.4% |
| Coal to liquids | -- | -- | -- | -- | -- | -- | -- | -- |
| Electricity | 20.8 | 20.3 | 23.1 | 26.3 | 29.9 | 32.5 | 35.7 | 2.3% |
| Transportation | | | | | | | | |
| Propane | 24.1 | 18.0 | 23.4 | 27.5 | 31.7 | 37.8 | 44.8 | 3.7% |
| E85 ³ | 32.9 | 23.3 | 35.4 | 38.2 | 41.7 | 48.8 | 58.8 | 3.8% |
| Motor gasoline ⁴ | 28.1 | 20.9 | 25.1 | 30.2 | 35.9 | 43.7 | 53.6 | 3.8% |
| Jet fuel ⁵ | 20.6 | 12.0 | 17.9 | 23.2 | 28.8 | 37.0 | 46.6 | 5.6% |
| Diesel fuel (distillate fuel oil) ⁶ | 27.5 | 19.8 | 25.5 | 31.6 | 37.9 | 46.7 | 57.3 | 4.3% |
| Residual fuel oil | 14.5 | 8.1 | 12.9 | 16.5 | 20.3 | 25.7 | 32.3 | 5.7% |
| Natural gas ⁷ | 18.2 | 16.6 | 18.4 | 20.0 | 21.0 | 23.2 | 26.7 | 1.9% |
| Electricity | 31.8 | 29.5 | 36.5 | 44.1 | 50.5 | 55.0 | 59.8 | 2.9% |
| Electric power⁸ | | | | | | | | |
| Distillate fuel oil | 23.5 | 15.0 | 20.4 | 26.0 | 31.8 | 39.9 | 49.4 | 4.9% |
| Residual fuel oil | 18.1 | 10.2 | 15.2 | 19.9 | 24.4 | 30.5 | 37.8 | 5.4% |
| Natural gas | 5.0 | 3.3 | 5.2 | 6.6 | 7.5 | 8.1 | 9.0 | 4.2% |
| Steam coal | 2.4 | 2.2 | 2.5 | 2.8 | 3.1 | 3.5 | 4.0 | 2.5% |

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

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Average price to all users⁹ | | | | | | | | |
| Propane | 21.0 | 14.9 | 19.9 | 23.5 | 27.2 | 32.6 | 39.0 | 3.9% |
| E85 ³ | 32.9 | 23.3 | 35.4 | 38.2 | 41.7 | 48.8 | 58.8 | 3.8% |
| Motor gasoline ⁴ | 28.1 | 20.9 | 25.1 | 30.2 | 35.9 | 43.7 | 53.6 | 3.8% |
| Jet fuel ⁵ | 20.6 | 12.0 | 17.9 | 23.2 | 28.8 | 37.0 | 46.6 | 5.6% |
| Distillate fuel oil | 27.2 | 19.1 | 24.7 | 30.7 | 36.9 | 45.7 | 56.1 | 4.4% |
| Residual fuel oil | 15.7 | 8.4 | 13.0 | 16.8 | 20.8 | 26.2 | 32.9 | 5.6% |
| Natural gas | 6.9 | 5.3 | 7.4 | 9.0 | 10.0 | 11.1 | 12.4 | 3.5% |
| Metallurgical coal | 5.3 | 5.4 | 6.7 | 8.0 | 9.4 | 10.9 | 12.2 | 3.3% |
| Other coal | 2.4 | 2.3 | 2.6 | 2.9 | 3.2 | 3.7 | 4.2 | 2.5% |
| Coal to liquids | -- | -- | -- | -- | -- | -- | -- | -- |
| Electricity | 30.6 | 30.1 | 34.1 | 38.4 | 43.1 | 47.0 | 51.6 | 2.2% |
| Non-renewable energy expenditures by sector (billion nominal dollars) | | | | | | | | |
| Residential | 258 | 239 | 276 | 317 | 360 | 405 | 462 | 2.7% |
| Commercial | 191 | 178 | 213 | 251 | 292 | 334 | 387 | 3.2% |
| Industrial ¹ | 229 | 168 | 256 | 338 | 407 | 498 | 620 | 5.4% |
| Transportation | 699 | 514 | 647 | 753 | 866 | 1,054 | 1,307 | 3.8% |
| Total non-renewable expenditures | 1,377 | 1,099 | 1,392 | 1,659 | 1,925 | 2,291 | 2,776 | 3.8% |
| Transportation renewable expenditures | 1 | 1 | 1 | 5 | 9 | 13 | 17 | 11.4% |
| Total expenditures | 1,378 | 1,100 | 1,394 | 1,663 | 1,934 | 2,304 | 2,793 | 3.8% |

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

²Excludes use for lease and plant fuel.

³E85 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.

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

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

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

⁷Natural gas used as fuel in motor vehicles, trains, and ships. Includes estimated motor vehicle fuel taxes and estimated dispensing costs or charges.

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

⁹Weighted 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 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*, January 2015-December 2015. 2014 residential, commercial, and industrial natural gas delivered prices: EIA, *Natural Gas Monthly*, July 2015. 2015 transportation sector natural gas delivered prices derived from: U.S. Department of Energy, Clean Cities Alternative Fuel Price Report. 2014 electric power sector distillate and residual fuel oil prices: EIA, *Monthly Energy Review*, February 2016. 2014 electric power sector natural gas prices: EIA, *Electric Power Monthly*, April 2014 and April 2015, Table 4.2, and EIA, *State Energy Data Report 2013*. 2014 coal prices based on: EIA, *Quarterly Coal Report, October-December 2014* and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. 2014 electricity prices: EIA, *Monthly Energy Review*, February 2016. 2014 E85 prices derived from: U.S. Department of Energy, Clean Cities Alternative Fuel Price Report. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. **Projections:** EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Key indicators and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Key indicators | | | | | | | | |
| Households (millions) | | | | | | | | |
| Single-family | 80.1 | 80.6 | 84.4 | 88.5 | 92.2 | 95.5 | 99.0 | 0.8% |
| Multifamily..... | 28.6 | 28.9 | 30.5 | 32.3 | 34.0 | 35.8 | 37.5 | 1.1% |
| Mobile homes | 6.1 | 6.0 | 5.5 | 5.3 | 5.1 | 4.9 | 4.8 | -0.9% |
| Total | 114.8 | 115.4 | 120.4 | 126.0 | 131.3 | 136.3 | 141.4 | 0.8% |
| Average house square footage | 1,686 | 1,694 | 1,733 | 1,768 | 1,799 | 1,828 | 1,857 | 0.4% |
| Energy intensity | | | | | | | | |
| (million Btu per household) | | | | | | | | |
| Delivered energy consumption | 101.9 | 94.6 | 90.5 | 85.4 | 81.8 | 79.1 | 77.1 | -0.8% |
| Total energy consumption | 186.6 | 176.5 | 168.3 | 157.1 | 148.5 | 144.6 | 141.8 | -0.9% |
| (thousand Btu per square foot) | | | | | | | | |
| Delivered energy consumption | 60.4 | 55.9 | 52.3 | 48.3 | 45.5 | 43.2 | 41.6 | -1.2% |
| Total energy consumption | 110.7 | 104.2 | 97.1 | 88.9 | 82.6 | 79.1 | 76.4 | -1.2% |
| Delivered energy consumption by fuel | | | | | | | | |
| Purchased electricity | | | | | | | | |
| Space heating..... | 0.43 | 0.33 | 0.36 | 0.35 | 0.34 | 0.34 | 0.33 | 0.0% |
| Space cooling | 0.65 | 0.80 | 0.74 | 0.75 | 0.79 | 0.84 | 0.89 | 0.4% |
| Water heating | 0.45 | 0.45 | 0.46 | 0.47 | 0.47 | 0.48 | 0.48 | 0.2% |
| Refrigeration | 0.36 | 0.36 | 0.34 | 0.33 | 0.33 | 0.34 | 0.36 | 0.0% |
| Cooking | 0.11 | 0.11 | 0.11 | 0.12 | 0.13 | 0.14 | 0.14 | 1.1% |
| Clothes dryers..... | 0.20 | 0.21 | 0.21 | 0.22 | 0.23 | 0.24 | 0.26 | 0.9% |
| Freezers | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | -0.7% |
| Lighting | 0.51 | 0.50 | 0.43 | 0.37 | 0.30 | 0.25 | 0.23 | -3.0% |
| Clothes washers ¹ | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | -2.0% |
| Dishwashers ¹ | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 | 0.12 | 0.13 | 1.2% |
| Televisions and related equipment ² | 0.30 | 0.29 | 0.26 | 0.25 | 0.26 | 0.29 | 0.32 | 0.4% |
| Computers and related equipment ³ | 0.11 | 0.11 | 0.09 | 0.08 | 0.07 | 0.06 | 0.05 | -3.0% |
| Furnace fans and boiler circulation pumps | 0.14 | 0.11 | 0.12 | 0.12 | 0.11 | 0.11 | 0.10 | -0.5% |
| Other uses ⁴ | 1.34 | 1.32 | 1.43 | 1.50 | 1.60 | 1.70 | 1.82 | 1.3% |
| Delivered energy..... | 4.80 | 4.78 | 4.76 | 4.75 | 4.83 | 4.97 | 5.20 | 0.3% |
| Natural gas | | | | | | | | |
| Space heating..... | 3.52 | 3.03 | 3.11 | 3.04 | 3.01 | 2.98 | 2.95 | -0.1% |
| Space cooling | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | -0.9% |
| Water heating | 1.21 | 1.21 | 1.23 | 1.25 | 1.27 | 1.27 | 1.25 | 0.1% |
| Cooking | 0.21 | 0.21 | 0.21 | 0.21 | 0.22 | 0.22 | 0.22 | 0.3% |
| Clothes dryers..... | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 | 0.06 | 0.7% |
| Other uses ⁵ | 0.25 | 0.25 | 0.24 | 0.24 | 0.23 | 0.23 | 0.22 | -0.5% |
| Delivered energy..... | 5.25 | 4.77 | 4.87 | 4.82 | 4.80 | 4.77 | 4.73 | 0.0% |
| Distillate fuel oil | | | | | | | | |
| Space heating..... | 0.49 | 0.45 | 0.40 | 0.35 | 0.31 | 0.28 | 0.25 | -2.3% |
| Water heating | 0.05 | 0.04 | 0.03 | 0.02 | 0.02 | 0.02 | 0.01 | -4.7% |
| Other uses ⁶ | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | -0.6% |
| Delivered energy..... | 0.55 | 0.50 | 0.43 | 0.38 | 0.34 | 0.30 | 0.27 | -2.4% |
| Propane | | | | | | | | |
| Space heating..... | 0.37 | 0.29 | 0.30 | 0.27 | 0.26 | 0.24 | 0.22 | -1.1% |
| Water heating | 0.06 | 0.06 | 0.05 | 0.05 | 0.04 | 0.03 | 0.03 | -2.7% |
| Cooking | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | -0.8% |
| Other uses ⁶ | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 | 1.4% |
| Delivered energy..... | 0.50 | 0.43 | 0.42 | 0.40 | 0.38 | 0.36 | 0.34 | -0.9% |
| Marketed renewables (wood) ⁷ | 0.59 | 0.44 | 0.42 | 0.41 | 0.39 | 0.38 | 0.37 | -0.7% |
| Kerosene | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | -2.6% |

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

| Key indicators and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Delivered energy consumption by end use | | | | | | | | |
| Space heating..... | 5.40 | 4.55 | 4.58 | 4.43 | 4.31 | 4.22 | 4.13 | -0.4% |
| Space cooling..... | 0.67 | 0.83 | 0.76 | 0.77 | 0.81 | 0.86 | 0.91 | 0.4% |
| Water heating..... | 1.76 | 1.77 | 1.78 | 1.79 | 1.81 | 1.79 | 1.78 | 0.0% |
| Refrigeration..... | 0.36 | 0.36 | 0.34 | 0.33 | 0.33 | 0.34 | 0.36 | 0.0% |
| Cooking..... | 0.34 | 0.34 | 0.35 | 0.36 | 0.37 | 0.38 | 0.39 | 0.5% |
| Clothes dryers..... | 0.25 | 0.26 | 0.27 | 0.28 | 0.29 | 0.30 | 0.32 | 0.9% |
| Freezers..... | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | -0.7% |
| Lighting..... | 0.51 | 0.50 | 0.43 | 0.37 | 0.30 | 0.25 | 0.23 | -3.0% |
| Clothes washers ¹ | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | -2.0% |
| Dishwashers ¹ | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 | 0.12 | 0.13 | 1.2% |
| Televisions and related equipment ² | 0.30 | 0.29 | 0.26 | 0.25 | 0.26 | 0.29 | 0.32 | 0.4% |
| Computers and related equipment ³ | 0.11 | 0.11 | 0.09 | 0.08 | 0.07 | 0.06 | 0.05 | -3.0% |
| Furnace fans and boiler circulation pumps..... | 0.14 | 0.11 | 0.12 | 0.12 | 0.11 | 0.11 | 0.10 | -0.5% |
| Other uses ⁸ | 1.64 | 1.62 | 1.73 | 1.80 | 1.89 | 1.99 | 2.11 | 1.1% |
| Delivered energy..... | 11.70 | 10.92 | 10.90 | 10.77 | 10.74 | 10.78 | 10.91 | 0.0% |
| Electricity related losses..... | 9.72 | 9.44 | 9.37 | 9.03 | 8.77 | 8.93 | 9.15 | -0.1% |
| Total energy consumption by end use | | | | | | | | |
| Space heating..... | 6.27 | 5.20 | 5.29 | 5.10 | 4.94 | 4.83 | 4.72 | -0.4% |
| Space cooling..... | 1.98 | 2.41 | 2.21 | 2.20 | 2.24 | 2.36 | 2.48 | 0.1% |
| Water heating..... | 2.67 | 2.66 | 2.69 | 2.69 | 2.67 | 2.65 | 2.62 | -0.1% |
| Refrigeration..... | 1.09 | 1.06 | 1.01 | 0.96 | 0.93 | 0.95 | 0.98 | -0.3% |
| Cooking..... | 0.56 | 0.56 | 0.58 | 0.59 | 0.60 | 0.62 | 0.64 | 0.5% |
| Clothes dryers..... | 0.67 | 0.66 | 0.69 | 0.70 | 0.71 | 0.74 | 0.77 | 0.6% |
| Freezers..... | 0.23 | 0.22 | 0.21 | 0.20 | 0.18 | 0.18 | 0.18 | -1.0% |
| Lighting..... | 1.54 | 1.47 | 1.29 | 1.07 | 0.85 | 0.69 | 0.64 | -3.3% |
| Clothes washers ¹ | 0.08 | 0.08 | 0.07 | 0.05 | 0.05 | 0.04 | 0.05 | -2.3% |
| Dishwashers ¹ | 0.29 | 0.28 | 0.29 | 0.29 | 0.31 | 0.33 | 0.35 | 0.9% |
| Televisions and related equipment ² | 0.91 | 0.85 | 0.77 | 0.73 | 0.74 | 0.81 | 0.88 | 0.1% |
| Computers and related equipment ³ | 0.35 | 0.33 | 0.28 | 0.23 | 0.20 | 0.17 | 0.14 | -3.3% |
| Furnace fans and boiler circulation pumps..... | 0.43 | 0.34 | 0.36 | 0.34 | 0.31 | 0.29 | 0.28 | -0.8% |
| Other uses ⁸ | 4.36 | 4.23 | 4.55 | 4.65 | 4.79 | 5.05 | 5.32 | 0.9% |
| Total..... | 21.42 | 20.37 | 20.27 | 19.79 | 19.50 | 19.71 | 20.05 | -0.1% |
| Nonmarketed renewables⁹ | | | | | | | | |
| Geothermal heat pumps..... | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 2.8% |
| Solar hot water heating..... | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 3.4% |
| Solar photovoltaic..... | 0.05 | 0.08 | 0.30 | 0.43 | 0.57 | 0.71 | 0.86 | 10.2% |
| Wind..... | 0.01 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 2.0% |
| Total..... | 0.08 | 0.11 | 0.35 | 0.50 | 0.63 | 0.78 | 0.94 | 8.8% |
| Heating degree days¹⁰..... | 4,549 | 4,084 | 4,173 | 4,106 | 4,041 | 3,977 | 3,914 | -0.2% |
| Cooling degree days¹⁰..... | 1,299 | 1,488 | 1,456 | 1,503 | 1,551 | 1,599 | 1,648 | 0.4% |

¹Does not include water heating portion of load.

²Includes televisions, set-top boxes, home theater systems, DVD players, and video game consoles.

³Includes desktop and laptop computers, monitors, and networking equipment.

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

⁵Includes such appliances as outdoor grills, exterior lights, pool heaters, spa heaters, and backup electricity generators.

⁶Includes such appliances as pool heaters, spa heaters, and backup electricity generators.

⁷Includes wood used for primary and secondary heating in wood stoves or fireplaces as reported in the *Residential Energy Consumption Survey 2009*.

⁸Includes small electric devices, heating elements, outdoor grills, exterior lights, pool heaters, spa heaters, backup electricity generators, and motors not listed above. Electric vehicles are included in the transportation sector.

⁹Consumption determined by using the fossil fuel equivalent of 9,541 Btu per kilowatt-hour.

¹⁰See 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 consumption based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016. 2014 degree days based on state-level data from the National Oceanic and Atmospheric Administration's Climatic Data Center and Climate Prediction Center. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Key indicators and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|-------------|-------------|-------------|-------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Key indicators | | | | | | | | |
| Total floorspace (billion square feet) | | | | | | | | |
| Surviving..... | 81.6 | 82.2 | 86.7 | 91.9 | 97.1 | 102.3 | 107.5 | 1.1% |
| New additions..... | 1.5 | 1.7 | 2.1 | 2.1 | 2.2 | 2.3 | 2.3 | 1.4% |
| Total..... | 83.1 | 83.8 | 88.7 | 94.0 | 99.3 | 104.6 | 109.8 | 1.1% |
| Energy consumption intensity (thousand Btu per square foot) | | | | | | | | |
| Delivered energy consumption..... | 107.6 | 105.1 | 101.8 | 97.8 | 95.6 | 94.3 | 93.6 | -0.5% |
| Electricity related losses..... | 112.4 | 109.3 | 104.0 | 98.2 | 92.9 | 91.5 | 90.0 | -0.8% |
| Total energy consumption..... | 220.0 | 214.3 | 205.8 | 196.0 | 188.5 | 185.8 | 183.7 | -0.6% |
| Delivered energy consumption by fuel | | | | | | | | |
| Purchased electricity | | | | | | | | |
| Space heating ¹ | 0.16 | 0.14 | 0.14 | 0.13 | 0.13 | 0.13 | 0.13 | -0.4% |
| Space cooling ¹ | 0.48 | 0.55 | 0.52 | 0.52 | 0.53 | 0.55 | 0.57 | 0.1% |
| Water heating ¹ | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | -0.3% |
| Ventilation..... | 0.51 | 0.52 | 0.54 | 0.56 | 0.57 | 0.58 | 0.61 | 0.6% |
| Cooking..... | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | -0.1% |
| Lighting..... | 0.89 | 0.88 | 0.87 | 0.83 | 0.81 | 0.76 | 0.74 | -0.7% |
| Refrigeration..... | 0.37 | 0.36 | 0.33 | 0.31 | 0.30 | 0.30 | 0.31 | -0.6% |
| Office equipment (PC)..... | 0.09 | 0.08 | 0.06 | 0.05 | 0.04 | 0.03 | 0.02 | -4.8% |
| Office equipment (non-PC)..... | 0.22 | 0.22 | 0.24 | 0.26 | 0.30 | 0.34 | 0.38 | 2.2% |
| Other uses ² | 1.79 | 1.76 | 1.88 | 2.08 | 2.30 | 2.53 | 2.76 | 1.8% |
| Delivered energy..... | 4.61 | 4.64 | 4.69 | 4.86 | 5.09 | 5.33 | 5.62 | 0.8% |
| Natural gas | | | | | | | | |
| Space heating ¹ | 1.92 | 1.74 | 1.75 | 1.70 | 1.66 | 1.64 | 1.62 | -0.3% |
| Space cooling ¹ | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | -0.6% |
| Water heating ¹ | 0.54 | 0.55 | 0.56 | 0.57 | 0.60 | 0.63 | 0.66 | 0.8% |
| Cooking..... | 0.20 | 0.21 | 0.22 | 0.22 | 0.23 | 0.25 | 0.26 | 0.9% |
| Other uses ³ | 0.89 | 0.79 | 0.89 | 0.93 | 1.01 | 1.11 | 1.22 | 1.8% |
| Delivered energy..... | 3.58 | 3.32 | 3.45 | 3.46 | 3.53 | 3.66 | 3.81 | 0.5% |
| Distillate fuel oil | | | | | | | | |
| Space heating ¹ | 0.16 | 0.16 | 0.15 | 0.14 | 0.13 | 0.11 | 0.10 | -1.6% |
| Water heating ¹ | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | -0.1% |
| Other uses ⁴ | 0.18 | 0.19 | 0.18 | 0.18 | 0.18 | 0.17 | 0.17 | -0.6% |
| Delivered energy..... | 0.36 | 0.37 | 0.36 | 0.34 | 0.32 | 0.30 | 0.29 | -1.0% |
| Marketed renewables (biomass)..... | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.0% |
| Other fuels ⁵ | 0.26 | 0.34 | 0.40 | 0.41 | 0.42 | 0.42 | 0.43 | 0.9% |
| Delivered energy consumption by end use | | | | | | | | |
| Space heating ¹ | 2.24 | 2.03 | 2.04 | 1.97 | 1.92 | 1.89 | 1.85 | -0.4% |
| Space cooling ¹ | 0.51 | 0.60 | 0.56 | 0.56 | 0.57 | 0.58 | 0.60 | 0.0% |
| Water heating ¹ | 0.64 | 0.66 | 0.67 | 0.68 | 0.70 | 0.73 | 0.77 | 0.6% |
| Ventilation..... | 0.51 | 0.52 | 0.54 | 0.56 | 0.57 | 0.58 | 0.61 | 0.6% |
| Cooking..... | 0.23 | 0.23 | 0.24 | 0.25 | 0.26 | 0.27 | 0.28 | 0.8% |
| Lighting..... | 0.89 | 0.88 | 0.87 | 0.83 | 0.81 | 0.76 | 0.74 | -0.7% |
| Refrigeration..... | 0.37 | 0.36 | 0.33 | 0.31 | 0.30 | 0.30 | 0.31 | -0.6% |
| Office equipment (PC)..... | 0.09 | 0.08 | 0.06 | 0.05 | 0.04 | 0.03 | 0.02 | -4.8% |
| Office equipment (non-PC)..... | 0.22 | 0.22 | 0.24 | 0.26 | 0.30 | 0.34 | 0.38 | 2.2% |
| Other uses ⁶ | 3.26 | 3.23 | 3.49 | 3.74 | 4.03 | 4.36 | 4.72 | 1.5% |
| Delivered energy..... | 8.95 | 8.81 | 9.03 | 9.20 | 9.49 | 9.86 | 10.28 | 0.6% |

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

| Key indicators and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Electricity related losses | 9.34 | 9.16 | 9.23 | 9.23 | 9.23 | 9.57 | 9.89 | 0.3% |
| Total energy consumption by end use | | | | | | | | |
| Space heating ¹ | 2.57 | 2.32 | 2.32 | 2.22 | 2.16 | 2.12 | 2.08 | -0.4% |
| Space cooling ¹ | 1.47 | 1.69 | 1.59 | 1.56 | 1.53 | 1.57 | 1.60 | -0.2% |
| Water heating ¹ | 0.83 | 0.83 | 0.84 | 0.84 | 0.86 | 0.89 | 0.91 | 0.4% |
| Ventilation | 1.55 | 1.54 | 1.61 | 1.62 | 1.60 | 1.63 | 1.67 | 0.3% |
| Cooking | 0.27 | 0.28 | 0.28 | 0.29 | 0.30 | 0.31 | 0.32 | 0.6% |
| Lighting | 2.68 | 2.62 | 2.58 | 2.41 | 2.27 | 2.12 | 2.04 | -1.0% |
| Refrigeration | 1.11 | 1.08 | 0.97 | 0.89 | 0.84 | 0.85 | 0.85 | -0.9% |
| Office equipment (PC) | 0.27 | 0.25 | 0.18 | 0.14 | 0.10 | 0.08 | 0.07 | -5.1% |
| Office equipment (non-PC) | 0.65 | 0.65 | 0.70 | 0.76 | 0.85 | 0.96 | 1.05 | 1.9% |
| Other uses ⁶ | 6.88 | 6.71 | 7.19 | 7.70 | 8.20 | 8.90 | 9.57 | 1.4% |
| Total | 18.29 | 17.97 | 18.26 | 18.43 | 18.72 | 19.43 | 20.17 | 0.5% |
| Nonmarketed renewable fuels⁷ | | | | | | | | |
| Solar thermal | 0.08 | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 | 0.11 | 1.0% |
| Solar photovoltaic | 0.06 | 0.07 | 0.09 | 0.12 | 0.19 | 0.27 | 0.35 | 6.5% |
| Wind | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 9.0% |
| Total | 0.15 | 0.16 | 0.18 | 0.22 | 0.29 | 0.38 | 0.47 | 4.4% |
| Heating degree days | | | | | | | | |
| New England | 6,674 | 6,526 | 6,099 | 6,004 | 5,909 | 5,813 | 5,716 | -0.5% |
| Middle Atlantic | 6,203 | 5,781 | 5,533 | 5,459 | 5,385 | 5,312 | 5,240 | -0.4% |
| East North Central | 7,194 | 6,168 | 6,207 | 6,182 | 6,158 | 6,133 | 6,109 | 0.0% |
| West North Central | 7,304 | 6,090 | 6,521 | 6,508 | 6,492 | 6,476 | 6,459 | 0.2% |
| South Atlantic | 2,952 | 2,492 | 2,628 | 2,593 | 2,559 | 2,526 | 2,494 | 0.0% |
| East South Central | 3,931 | 3,227 | 3,440 | 3,433 | 3,426 | 3,419 | 3,411 | 0.2% |
| West South Central | 2,422 | 2,087 | 2,031 | 1,995 | 1,959 | 1,923 | 1,888 | -0.4% |
| Mountain | 4,742 | 4,593 | 4,877 | 4,819 | 4,757 | 4,691 | 4,622 | 0.0% |
| Pacific | 2,772 | 2,867 | 3,366 | 3,334 | 3,302 | 3,271 | 3,240 | 0.5% |
| United States | 4,549 | 4,084 | 4,173 | 4,106 | 4,041 | 3,977 | 3,914 | -0.2% |
| Cooling degree days | | | | | | | | |
| New England | 419 | 557 | 561 | 589 | 618 | 647 | 676 | 0.8% |
| Middle Atlantic | 596 | 799 | 778 | 810 | 843 | 875 | 906 | 0.5% |
| East North Central | 610 | 728 | 790 | 804 | 818 | 832 | 846 | 0.6% |
| West North Central | 814 | 942 | 985 | 999 | 1,014 | 1,028 | 1,043 | 0.4% |
| South Atlantic | 2,008 | 2,390 | 2,169 | 2,205 | 2,241 | 2,278 | 2,313 | -0.1% |
| East South Central | 1,493 | 1,717 | 1,686 | 1,709 | 1,731 | 1,754 | 1,777 | 0.1% |
| West South Central | 2,474 | 2,741 | 2,809 | 2,875 | 2,941 | 3,007 | 3,073 | 0.5% |
| Mountain | 1,432 | 1,484 | 1,547 | 1,594 | 1,644 | 1,697 | 1,751 | 0.7% |
| Pacific | 1,068 | 1,095 | 956 | 994 | 1,032 | 1,069 | 1,107 | 0.0% |
| United States | 1,299 | 1,488 | 1,456 | 1,503 | 1,551 | 1,599 | 1,648 | 0.4% |

¹Includes fuel consumption for district services.

²Includes (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.

³Includes miscellaneous uses, such as emergency generators, combined heat and power in commercial buildings, and manufacturing performed in commercial buildings.

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

⁵Includes residual fuel oil, propane, coal, motor gasoline, and kerosene.

⁶Includes (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, emergency generators, combined heat and power in commercial buildings, manufacturing performed in commercial buildings, and cooking (distillate), plus residual fuel oil, propane, coal, motor gasoline, kerosene, and marketed renewable fuels (biomass).

⁷Consumption determined by using the fossil fuel equivalent of 9,541 Btu per kilowatthour.

Btu = British thermal unit.

PC = Personal computer.

Note: Totals may not equal sum of components due to independent rounding. Data for 2014 are model results and may differ from official EIA data reports.

Sources: 2014 consumption based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016. 2014 degree days based on state-level data from the National Oceanic and Atmospheric Administration's Climatic Data Center and Climate Prediction Center. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A6. Industrial sector key indicators and consumption

| Shipments, prices, and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|---------------|---------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Key indicators | | | | | | | | |
| Value of shipments (billion 2009 dollars) | | | | | | | | |
| Manufacturing | 5,208 | 5,299 | 5,858 | 6,527 | 7,066 | 7,734 | 8,528 | 1.9% |
| Agriculture, mining, and construction | 1,957 | 1,931 | 2,493 | 2,620 | 2,710 | 2,828 | 2,955 | 1.7% |
| Total | 7,165 | 7,229 | 8,351 | 9,146 | 9,776 | 10,562 | 11,483 | 1.9% |
| Energy prices | | | | | | | | |
| (2015 dollars per million Btu) | | | | | | | | |
| Propane | 18.8 | 12.2 | 15.6 | 16.8 | 17.8 | 19.5 | 21.1 | 2.2% |
| Motor gasoline | 27.5 | 20.4 | 22.5 | 24.7 | 26.6 | 28.9 | 31.8 | 1.8% |
| Distillate fuel oil | 27.1 | 17.0 | 19.7 | 22.2 | 24.4 | 27.4 | 30.5 | 2.4% |
| Residual fuel oil | 15.0 | 6.8 | 11.3 | 14.2 | 15.9 | 18.2 | 20.6 | 4.6% |
| Asphalt and road oil | 9.0 | 3.3 | 7.7 | 10.3 | 11.7 | 13.5 | 15.3 | 6.3% |
| Natural gas heat and power | 5.2 | 3.5 | 5.2 | 5.8 | 5.8 | 5.6 | 5.6 | 1.8% |
| Natural gas feedstocks | 5.6 | 3.9 | 5.5 | 6.1 | 6.1 | 5.9 | 5.8 | 1.6% |
| Metallurgical coal | 5.3 | 5.4 | 6.0 | 6.5 | 7.0 | 7.2 | 7.3 | 1.2% |
| Other industrial coal | 3.2 | 3.4 | 3.4 | 3.4 | 3.4 | 3.5 | 3.6 | 0.2% |
| Coal to liquids | -- | -- | -- | -- | -- | -- | -- | -- |
| Electricity | 21.0 | 20.3 | 20.9 | 21.5 | 22.1 | 21.5 | 21.2 | 0.2% |
| (nominal dollars per million Btu) | | | | | | | | |
| Propane | 18.7 | 12.2 | 17.2 | 20.6 | 24.1 | 29.4 | 35.6 | 4.4% |
| Motor gasoline | 27.2 | 20.4 | 24.9 | 30.2 | 35.9 | 43.7 | 53.6 | 3.9% |
| Distillate fuel oil | 26.8 | 17.0 | 21.8 | 27.2 | 33.1 | 41.4 | 51.3 | 4.5% |
| Residual fuel oil | 14.8 | 6.8 | 12.4 | 17.4 | 21.6 | 27.5 | 34.7 | 6.8% |
| Asphalt and road oil | 8.9 | 3.3 | 8.5 | 12.6 | 15.9 | 20.4 | 25.8 | 8.5% |
| Natural gas heat and power | 5.1 | 3.5 | 5.7 | 7.1 | 7.8 | 8.5 | 9.4 | 4.0% |
| Natural gas feedstocks | 5.5 | 3.9 | 6.1 | 7.5 | 8.2 | 8.9 | 9.8 | 3.8% |
| Metallurgical coal | 5.3 | 5.4 | 6.7 | 8.0 | 9.4 | 10.9 | 12.2 | 3.3% |
| Other industrial coal | 3.2 | 3.4 | 3.7 | 4.2 | 4.6 | 5.2 | 6.0 | 2.4% |
| Coal to liquids | -- | -- | -- | -- | -- | -- | -- | -- |
| Electricity | 20.8 | 20.3 | 23.1 | 26.3 | 29.9 | 32.5 | 35.7 | 2.3% |
| Energy consumption (quadrillion Btu)¹ | | | | | | | | |
| Industrial consumption excluding refining | | | | | | | | |
| Propane heat and power | 0.42 | 0.35 | 0.37 | 0.38 | 0.37 | 0.37 | 0.38 | 0.3% |
| Liquefied petroleum gas and other feedstocks ² .. | 2.00 | 2.02 | 2.73 | 3.13 | 3.29 | 3.55 | 3.85 | 2.6% |
| Motor gasoline | 0.27 | 0.27 | 0.28 | 0.27 | 0.27 | 0.27 | 0.27 | 0.0% |
| Distillate fuel oil | 1.36 | 1.34 | 1.44 | 1.45 | 1.44 | 1.45 | 1.47 | 0.4% |
| Residual fuel oil | 0.03 | 0.03 | 0.04 | 0.06 | 0.06 | 0.05 | 0.05 | 1.9% |
| Petrochemical feedstocks | 0.70 | 0.66 | 0.96 | 1.21 | 1.31 | 1.47 | 1.66 | 3.8% |
| Petroleum coke | 0.12 | 0.16 | 0.22 | 0.23 | 0.23 | 0.23 | 0.23 | 1.4% |
| Asphalt and road oil | 0.79 | 0.83 | 0.89 | 0.93 | 1.05 | 1.18 | 1.31 | 1.8% |
| Miscellaneous petroleum ³ | 0.30 | 0.40 | 0.42 | 0.50 | 0.52 | 0.53 | 0.55 | 1.3% |
| Petroleum and other liquids subtotal | 5.99 | 6.08 | 7.34 | 8.15 | 8.53 | 9.11 | 9.76 | 1.9% |
| Natural gas heat and power | 5.74 | 5.61 | 5.94 | 6.19 | 6.33 | 6.59 | 6.87 | 0.8% |
| Natural gas feedstocks | 0.63 | 0.68 | 1.22 | 1.41 | 1.45 | 1.52 | 1.59 | 3.5% |
| Lease and plant fuel ⁴ | 1.55 | 1.63 | 1.76 | 1.94 | 2.06 | 2.19 | 2.31 | 1.4% |
| Natural gas liquefaction for export ⁵ | 0.00 | 0.00 | 0.26 | 0.48 | 0.53 | 0.64 | 0.69 | -- |
| Natural gas subtotal | 7.92 | 7.92 | 9.17 | 10.01 | 10.38 | 10.94 | 11.45 | 1.5% |
| Metallurgical coal and coke ⁶ | 0.56 | 0.52 | 0.40 | 0.45 | 0.47 | 0.44 | 0.41 | -1.0% |
| Other industrial coal | 0.85 | 0.79 | 0.82 | 0.86 | 0.88 | 0.89 | 0.93 | 0.6% |
| Coal subtotal | 1.41 | 1.31 | 1.23 | 1.31 | 1.35 | 1.33 | 1.34 | 0.1% |
| Renewables ⁷ | 1.52 | 1.48 | 1.48 | 1.59 | 1.67 | 1.70 | 1.79 | 0.8% |
| Purchased electricity | 3.21 | 3.07 | 3.42 | 3.73 | 3.81 | 3.91 | 4.08 | 1.1% |
| Delivered energy | 20.04 | 19.87 | 22.65 | 24.79 | 25.73 | 26.99 | 28.42 | 1.4% |
| Electricity related losses | 6.49 | 6.07 | 6.74 | 7.09 | 6.91 | 7.03 | 7.18 | 0.7% |
| Total | 26.53 | 25.94 | 29.38 | 31.87 | 32.64 | 34.02 | 35.60 | 1.3% |

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

| Shipments, prices, and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Refining consumption | | | | | | | | |
| Liquefied petroleum gas heat and power ² | 0.01 | 0.01 | 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Petroleum coke | 0.53 | 0.50 | 0.36 | 0.36 | 0.35 | 0.35 | 0.36 | -1.3% |
| Still gas | 1.45 | 1.48 | 1.70 | 1.68 | 1.67 | 1.67 | 1.69 | 0.6% |
| Miscellaneous petroleum ³ | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 1.9% |
| Petroleum and other liquids subtotal | 2.00 | 2.00 | 2.06 | 2.04 | 2.02 | 2.02 | 2.06 | 0.1% |
| Natural gas heat and power | 1.29 | 1.25 | 1.09 | 1.04 | 1.04 | 1.06 | 1.10 | -0.5% |
| Natural gas feedstocks | 0.19 | 0.22 | 0.31 | 0.30 | 0.31 | 0.32 | 0.34 | 1.8% |
| Natural-gas-to-liquids heat and power | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Natural gas subtotal | 1.48 | 1.46 | 1.39 | 1.33 | 1.35 | 1.39 | 1.44 | -0.1% |
| Other industrial coal | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Coal-to-liquids heat and power | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Coal subtotal | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Biofuels heat and coproducts | 0.75 | 0.78 | 0.83 | 0.80 | 0.81 | 0.81 | 0.84 | 0.3% |
| Purchased electricity | 0.20 | 0.20 | 0.19 | 0.18 | 0.17 | 0.17 | 0.18 | -0.4% |
| Delivered energy | 4.45 | 4.47 | 4.46 | 4.36 | 4.34 | 4.39 | 4.52 | 0.0% |
| Electricity related losses | 0.40 | 0.39 | 0.37 | 0.33 | 0.31 | 0.31 | 0.32 | -0.8% |
| Total | 4.85 | 4.86 | 4.84 | 4.69 | 4.65 | 4.70 | 4.84 | 0.0% |
| Total industrial sector consumption | | | | | | | | |
| Liquefied petroleum gas heat and power ² | 0.43 | 0.36 | 0.37 | 0.38 | 0.37 | 0.37 | 0.38 | 0.2% |
| Liquefied petroleum gas and other feedstocks ² .. | 2.00 | 2.02 | 2.73 | 3.13 | 3.29 | 3.55 | 3.85 | 2.6% |
| Motor gasoline | 0.27 | 0.27 | 0.28 | 0.27 | 0.27 | 0.27 | 0.27 | 0.0% |
| Distillate fuel oil | 1.36 | 1.34 | 1.44 | 1.45 | 1.44 | 1.45 | 1.47 | 0.4% |
| Residual fuel oil | 0.03 | 0.04 | 0.04 | 0.06 | 0.06 | 0.05 | 0.05 | 1.6% |
| Petrochemical feedstocks | 0.70 | 0.66 | 0.96 | 1.21 | 1.31 | 1.47 | 1.66 | 3.8% |
| Petroleum coke | 0.65 | 0.67 | 0.57 | 0.59 | 0.58 | 0.58 | 0.59 | -0.5% |
| Asphalt and road oil | 0.79 | 0.83 | 0.89 | 0.93 | 1.05 | 1.18 | 1.31 | 1.8% |
| Still gas | 1.45 | 1.48 | 1.70 | 1.68 | 1.67 | 1.67 | 1.69 | 0.6% |
| Miscellaneous petroleum ³ | 0.30 | 0.41 | 0.42 | 0.50 | 0.52 | 0.53 | 0.56 | 1.3% |
| Petroleum and other liquids subtotal | 7.99 | 8.07 | 9.40 | 10.19 | 10.55 | 11.13 | 11.82 | 1.5% |
| Natural gas heat and power | 7.03 | 6.85 | 7.03 | 7.23 | 7.37 | 7.65 | 7.96 | 0.6% |
| Natural gas feedstocks | 0.81 | 0.90 | 1.52 | 1.70 | 1.76 | 1.84 | 1.93 | 3.1% |
| Natural-gas-to-liquids heat and power | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Lease and plant fuel ⁴ | 1.55 | 1.63 | 1.76 | 1.94 | 2.06 | 2.19 | 2.31 | 1.4% |
| Natural gas liquefaction for export ⁵ | 0.00 | 0.00 | 0.26 | 0.48 | 0.53 | 0.64 | 0.69 | -- |
| Natural gas subtotal | 9.40 | 9.38 | 10.57 | 11.34 | 11.72 | 12.32 | 12.89 | 1.3% |
| Metallurgical coal and coke ⁶ | 0.56 | 0.52 | 0.40 | 0.45 | 0.47 | 0.44 | 0.41 | -1.0% |
| Other industrial coal | 0.87 | 0.82 | 0.82 | 0.86 | 0.88 | 0.89 | 0.93 | 0.5% |
| Coal-to-liquids heat and power | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Coal subtotal | 1.43 | 1.34 | 1.23 | 1.31 | 1.35 | 1.33 | 1.34 | 0.0% |
| Biofuels heat and coproducts | 0.75 | 0.78 | 0.83 | 0.80 | 0.81 | 0.81 | 0.84 | 0.3% |
| Renewables ⁷ | 1.52 | 1.48 | 1.48 | 1.59 | 1.67 | 1.70 | 1.79 | 0.8% |
| Purchased electricity | 3.40 | 3.27 | 3.61 | 3.91 | 3.98 | 4.08 | 4.26 | 1.1% |
| Delivered energy | 24.49 | 24.33 | 27.11 | 29.14 | 30.07 | 31.38 | 32.94 | 1.2% |
| Electricity related losses | 6.89 | 6.46 | 7.11 | 7.42 | 7.22 | 7.34 | 7.50 | 0.6% |
| Total | 31.38 | 30.79 | 34.22 | 36.56 | 37.29 | 38.72 | 40.44 | 1.1% |

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

| Key indicators and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Energy consumption per dollar of shipments (thousand Btu per 2009 dollar) | | | | | | | | |
| Petroleum and other liquids | 1.12 | 1.12 | 1.13 | 1.11 | 1.08 | 1.05 | 1.03 | -0.3% |
| Natural gas | 1.31 | 1.30 | 1.27 | 1.24 | 1.20 | 1.17 | 1.12 | -0.6% |
| Coal | 0.20 | 0.19 | 0.15 | 0.14 | 0.14 | 0.13 | 0.12 | -1.8% |
| Renewable fuels ⁷ | 0.32 | 0.31 | 0.28 | 0.26 | 0.25 | 0.24 | 0.23 | -1.2% |
| Purchased electricity | 0.48 | 0.45 | 0.43 | 0.43 | 0.41 | 0.39 | 0.37 | -0.8% |
| Delivered energy | 3.42 | 3.37 | 3.25 | 3.19 | 3.08 | 2.97 | 2.87 | -0.6% |
| Industrial combined heat and power¹ | | | | | | | | |
| Capacity (gigawatts) | 25.7 | 25.8 | 27.0 | 28.9 | 31.5 | 34.3 | 36.0 | 1.3% |
| Generation (billion kilowatthours) | 138 | 139 | 158 | 168 | 182 | 196 | 206 | 1.6% |

¹Includes combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

²Includes ethane, natural gasoline, and refinery olefins.

³Includes lubricants and miscellaneous petroleum products.

⁴Represents natural gas used in well, field, and lease operations, and in natural gas processing plant machinery.

⁵Fuel used in facilities that liquefy natural gas for export.

⁶Includes net coal coke imports.

⁷Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources.

Btu = British thermal unit.

-- = Not applicable.

Note: Includes estimated consumption for petroleum and other liquids. Totals may not equal sum of components due to independent rounding. Data for 2014 are model results and may differ from official EIA data reports.

Sources: 2014 prices for motor gasoline and distillate fuel oil are based on: U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, January 2015-December 2015. 2014 petrochemical feedstock and asphalt and road oil prices are based on: EIA, *State Energy Data Report 2013*. 2014 coal prices are based on: EIA, *Quarterly Coal Report, October-December 2014* and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. 2014 electricity prices: EIA, *Monthly Energy Review*, February 2016. 2014 natural gas prices: *Natural Gas Monthly*, July 2015. 2014 refining consumption based on: *Petroleum Supply Annual 2014*. Other 2014 consumption values are based on: EIA, *Monthly Energy Review*, February 2016. 2014 shipments: IHS Economics, Industry model, November 2015. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A7. Transportation sector key indicators and delivered energy consumption

| Key indicators and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Key indicators | | | | | | | | |
| Travel indicators | | | | | | | | |
| (billion vehicle miles traveled) | | | | | | | | |
| Light-duty vehicles less than 8,501 pounds | 2,665 | 2,752 | 3,031 | 3,126 | 3,232 | 3,336 | 3,438 | 0.9% |
| Commercial light trucks ¹ | 94 | 96 | 110 | 118 | 125 | 133 | 143 | 1.6% |
| Freight trucks greater than 10,000 pounds | 270 | 280 | 304 | 329 | 349 | 375 | 407 | 1.5% |
| (billion seat miles available) | | | | | | | | |
| Air | 1,053 | 1,070 | 1,168 | 1,261 | 1,364 | 1,452 | 1,531 | 1.4% |
| (billion ton miles traveled) | | | | | | | | |
| Rail | 1,690 | 1,690 | 1,810 | 1,956 | 2,006 | 2,054 | 2,128 | 0.9% |
| Domestic shipping | 497 | 482 | 453 | 423 | 404 | 402 | 407 | -0.7% |
| Energy efficiency indicators | | | | | | | | |
| (miles per gallon) | | | | | | | | |
| New light-duty vehicle CAFE standard ² | 30.9 | 31.5 | 36.2 | 46.1 | 46.4 | 46.6 | 46.9 | 1.6% |
| New car ² | 34.9 | 36.0 | 43.7 | 54.3 | 54.3 | 54.3 | 54.3 | 1.7% |
| New light truck ² | 26.9 | 27.9 | 30.9 | 39.5 | 39.5 | 39.5 | 39.5 | 1.4% |
| Compliance new light-duty vehicle ³ | 31.6 | 31.7 | 37.0 | 46.5 | 47.2 | 47.6 | 47.8 | 1.7% |
| New car ³ | 36.0 | 36.3 | 44.2 | 54.6 | 55.1 | 55.2 | 55.1 | 1.7% |
| New light truck ³ | 27.3 | 28.0 | 31.8 | 40.1 | 40.4 | 40.5 | 40.4 | 1.5% |
| Tested new light-duty vehicle ⁴ | 30.8 | 30.9 | 36.9 | 46.5 | 47.2 | 47.6 | 47.8 | 1.8% |
| New car ⁴ | 35.6 | 35.9 | 44.2 | 54.6 | 55.1 | 55.2 | 55.1 | 1.7% |
| New light truck ⁴ | 26.1 | 27.0 | 31.7 | 40.0 | 40.4 | 40.5 | 40.4 | 1.6% |
| On-road new light-duty vehicle ⁵ | 24.9 | 25.0 | 29.8 | 37.6 | 38.2 | 38.5 | 38.6 | 1.8% |
| New car ⁵ | 29.1 | 29.3 | 36.1 | 44.6 | 45.0 | 45.1 | 45.0 | 1.7% |
| New light truck ⁵ | 20.9 | 21.6 | 25.4 | 32.1 | 32.3 | 32.4 | 32.3 | 1.6% |
| Light-duty stock ⁶ | 21.4 | 21.7 | 24.1 | 27.6 | 31.5 | 34.4 | 36.3 | 2.1% |
| New commercial light truck ¹ | 17.0 | 17.3 | 19.5 | 23.7 | 24.0 | 24.1 | 24.0 | 1.3% |
| Stock commercial light truck ¹ | 14.8 | 15.0 | 16.6 | 18.7 | 20.8 | 22.2 | 23.2 | 1.7% |
| Freight truck | 6.9 | 6.9 | 7.3 | 7.6 | 7.8 | 7.9 | 8.0 | 0.6% |
| (seat miles per gallon) | | | | | | | | |
| Aircraft | 65.9 | 66.1 | 67.5 | 68.7 | 70.1 | 71.9 | 74.1 | 0.5% |
| (ton miles per thousand Btu) | | | | | | | | |
| Rail | 3.5 | 3.5 | 3.6 | 3.8 | 3.9 | 4.1 | 4.2 | 0.7% |
| Domestic shipping | 4.8 | 4.8 | 5.0 | 5.2 | 5.4 | 5.6 | 5.8 | 0.8% |
| Energy use by mode | | | | | | | | |
| (quadrillion Btu) | | | | | | | | |
| Light-duty vehicles | 15.60 | 15.86 | 15.73 | 14.12 | 12.82 | 12.10 | 11.83 | -1.2% |
| Commercial light trucks ¹ | 0.80 | 0.80 | 0.82 | 0.79 | 0.75 | 0.75 | 0.77 | -0.1% |
| Bus transportation | 0.26 | 0.26 | 0.27 | 0.28 | 0.29 | 0.30 | 0.31 | 0.6% |
| Freight trucks | 5.39 | 5.57 | 5.76 | 5.96 | 6.16 | 6.52 | 6.98 | 0.9% |
| Rail, passenger | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 | 0.06 | 0.06 | 0.9% |
| Rail, freight | 0.49 | 0.48 | 0.50 | 0.52 | 0.51 | 0.51 | 0.51 | 0.2% |
| Shipping, domestic | 0.11 | 0.10 | 0.09 | 0.08 | 0.08 | 0.07 | 0.07 | -1.4% |
| Shipping, international | 0.64 | 0.73 | 0.64 | 0.68 | 0.70 | 0.73 | 0.74 | 0.1% |
| Recreational boats | 0.24 | 0.25 | 0.27 | 0.28 | 0.29 | 0.29 | 0.30 | 0.8% |
| Air | 2.35 | 2.37 | 2.52 | 2.66 | 2.82 | 2.93 | 3.00 | 0.9% |
| Military use | 0.65 | 0.65 | 0.65 | 0.66 | 0.69 | 0.73 | 0.78 | 0.8% |
| Lubricants | 0.13 | 0.13 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.2% |
| Pipeline fuel | 0.87 | 0.89 | 0.83 | 0.89 | 0.94 | 1.00 | 1.07 | 0.7% |
| Total | 27.56 | 28.14 | 28.28 | 27.11 | 26.24 | 26.13 | 26.57 | -0.2% |

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

| Key indicators and consumption | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Energy use by mode | | | | | | | | |
| (million barrels per day oil equivalent) | | | | | | | | |
| Light-duty vehicles | 8.45 | 8.60 | 8.52 | 7.66 | 6.98 | 6.60 | 6.47 | -1.1% |
| Commercial light trucks ¹ | 0.42 | 0.42 | 0.43 | 0.41 | 0.39 | 0.39 | 0.40 | -0.2% |
| Bus transportation | 0.13 | 0.13 | 0.13 | 0.14 | 0.14 | 0.14 | 0.15 | 0.6% |
| Freight trucks | 2.59 | 2.67 | 2.77 | 2.87 | 2.96 | 3.14 | 3.36 | 0.9% |
| Rail, passenger | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.9% |
| Rail, freight | 0.23 | 0.23 | 0.24 | 0.25 | 0.24 | 0.24 | 0.24 | 0.2% |
| Shipping, domestic | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 | 0.03 | 0.03 | -1.4% |
| Shipping, international | 0.29 | 0.33 | 0.29 | 0.31 | 0.31 | 0.33 | 0.34 | 0.1% |
| Recreational boats | 0.13 | 0.13 | 0.14 | 0.15 | 0.16 | 0.16 | 0.16 | 0.8% |
| Air | 1.14 | 1.15 | 1.22 | 1.29 | 1.36 | 1.42 | 1.45 | 0.9% |
| Military use | 0.31 | 0.31 | 0.31 | 0.31 | 0.33 | 0.35 | 0.38 | 0.8% |
| Lubricants | 0.06 | 0.06 | 0.07 | 0.06 | 0.07 | 0.07 | 0.07 | 0.2% |
| Pipeline fuel | 0.41 | 0.42 | 0.39 | 0.42 | 0.44 | 0.47 | 0.51 | 0.7% |
| Total | 14.23 | 14.52 | 14.57 | 13.92 | 13.45 | 13.36 | 13.58 | -0.3% |

¹Commercial trucks 8,501 to 10,000 pounds gross vehicle weight rating.

²CAFE standard based on projected new vehicle sales.

³Includes CAFE credits for alternative fueled vehicle sales and credit banking.

⁴Environmental Protection Agency rated miles per gallon.

⁵Tested new vehicle efficiency revised for on-road performance.

⁶Combined "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 2014 are model results and may differ from official EIA data reports.

Sources: 2014: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016; EIA, Alternatives to Traditional Transportation Fuels 2009 (Part II - User and Fuel Data), April 2011; Federal Highway Administration, *Highway Statistics 2012*; Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 34*; National Highway Traffic and Safety Administration, *Summary of Fuel Economy Performance* June 2015; U.S. Department of Commerce, Bureau of the Census, "Vehicle Inventory and Use Survey," EC02TV; EIA, U.S. Department of Transportation, Research and Special Programs Administration, *Air Carrier Statistics Monthly, December 2010/2009*; and United States Department of Defense, Defense Fuel Supply Center, Factbook January, 2010. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Supply, disposition, prices, and emissions | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Net generation by fuel type | | | | | | | | |
| Electric power sector¹ | | | | | | | | |
| Power only² | | | | | | | | |
| Coal | 1,549 | 1,320 | 1,355 | 1,145 | 938 | 928 | 884 | -1.6% |
| Petroleum | 26 | 23 | 13 | 11 | 9 | 8 | 7 | -4.6% |
| Natural gas ³ | 911 | 1,114 | 947 | 1,129 | 1,412 | 1,460 | 1,618 | 1.5% |
| Nuclear power | 797 | 798 | 777 | 789 | 789 | 789 | 789 | 0.0% |
| Pumped storage/other ⁴ | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 0.1% |
| Renewable sources ⁵ | 505 | 493 | 757 | 918 | 969 | 1,094 | 1,205 | 3.6% |
| Distributed generation (natural gas) | 0 | 0 | 0 | 1 | 1 | 1 | 2 | -- |
| Total | 3,790 | 3,751 | 3,853 | 3,996 | 4,121 | 4,284 | 4,508 | 0.7% |
| Combined heat and power⁶ | | | | | | | | |
| Coal | 20 | 23 | 21 | 21 | 21 | 21 | 21 | -0.4% |
| Petroleum | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0.0% |
| Natural gas | 120 | 136 | 143 | 143 | 147 | 142 | 139 | 0.1% |
| Renewable sources | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0.1% |
| Total | 150 | 164 | 168 | 169 | 173 | 169 | 165 | 0.0% |
| Total net electric power sector generation..... | 3,939 | 3,915 | 4,021 | 4,165 | 4,294 | 4,452 | 4,673 | 0.7% |
| Less direct use | 16 | 18 | 18 | 17 | 17 | 17 | 17 | -0.1% |
| Net available to the grid | 3,924 | 3,897 | 4,004 | 4,148 | 4,276 | 4,435 | 4,656 | 0.7% |
| End-use sector⁷ | | | | | | | | |
| Coal | 12 | 12 | 12 | 13 | 13 | 13 | 14 | 0.6% |
| Petroleum | 2 | 2 | 1 | 1 | 1 | 1 | 2 | -0.4% |
| Natural gas | 97 | 99 | 111 | 124 | 143 | 165 | 183 | 2.5% |
| Other gaseous fuels ⁸ | 11 | 11 | 21 | 21 | 21 | 21 | 21 | 2.5% |
| Renewable sources ⁹ | 45 | 49 | 75 | 93 | 115 | 139 | 165 | 5.0% |
| Other ¹⁰ | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0.0% |
| Total end-use sector net generation | 170 | 176 | 223 | 255 | 296 | 343 | 387 | 3.2% |
| Less direct use | 121 | 127 | 181 | 210 | 246 | 286 | 324 | 3.8% |
| Total sales to the grid | 49 | 49 | 42 | 45 | 51 | 57 | 63 | 1.0% |
| Total net electricity generation by fuel | | | | | | | | |
| Coal | 1,582 | 1,355 | 1,388 | 1,179 | 972 | 962 | 919 | -1.5% |
| Petroleum | 30 | 26 | 15 | 13 | 11 | 10 | 9 | -4.0% |
| Natural gas | 1,129 | 1,348 | 1,201 | 1,396 | 1,702 | 1,768 | 1,942 | 1.5% |
| Nuclear power | 797 | 798 | 777 | 789 | 789 | 789 | 789 | 0.0% |
| Renewable sources ^{5,9} | 554 | 546 | 836 | 1,015 | 1,088 | 1,238 | 1,374 | 3.8% |
| Other ¹¹ | 18 | 17 | 27 | 27 | 27 | 27 | 27 | 1.8% |
| Total net electricity generation | 4,109 | 4,090 | 4,244 | 4,420 | 4,590 | 4,795 | 5,060 | 0.9% |
| Net generation to the grid | 3,972 | 3,946 | 4,046 | 4,193 | 4,327 | 4,492 | 4,719 | 0.7% |
| Net imports | 52 | 57 | 57 | 58 | 50 | 46 | 43 | -1.1% |
| Electricity sales by sector | | | | | | | | |
| Residential | 1,407 | 1,402 | 1,395 | 1,393 | 1,416 | 1,457 | 1,523 | 0.3% |
| Commercial | 1,352 | 1,360 | 1,374 | 1,425 | 1,491 | 1,562 | 1,647 | 0.8% |
| Industrial | 998 | 959 | 1,059 | 1,145 | 1,166 | 1,197 | 1,249 | 1.1% |
| Transportation | 8 | 9 | 13 | 23 | 32 | 40 | 45 | 6.7% |
| Total | 3,765 | 3,729 | 3,841 | 3,986 | 4,105 | 4,256 | 4,464 | 0.7% |
| Direct use | 137 | 144 | 199 | 227 | 263 | 303 | 341 | 3.5% |
| Total electricity use | 3,902 | 3,873 | 4,039 | 4,213 | 4,368 | 4,559 | 4,805 | 0.9% |

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

| Supply, disposition, prices, and emissions | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| End-use prices | | | | | | | | |
| (2015 cents per kilowatthour) | | | | | | | | |
| Residential..... | 12.7 | 12.4 | 12.9 | 13.2 | 13.4 | 13.2 | 13.0 | 0.2% |
| Commercial..... | 10.9 | 10.5 | 10.7 | 10.9 | 11.0 | 10.7 | 10.5 | 0.0% |
| Industrial..... | 7.2 | 6.9 | 7.1 | 7.3 | 7.5 | 7.3 | 7.2 | 0.2% |
| Transportation..... | 11.0 | 10.1 | 11.3 | 12.3 | 12.7 | 12.4 | 12.1 | 0.7% |
| All sectors average..... | 10.5 | 10.3 | 10.5 | 10.7 | 10.9 | 10.6 | 10.5 | 0.1% |
| (nominal cents per kilowatthour) | | | | | | | | |
| Residential..... | 12.5 | 12.4 | 14.2 | 16.2 | 18.2 | 19.9 | 21.9 | 2.3% |
| Commercial..... | 10.7 | 10.5 | 11.9 | 13.4 | 14.9 | 16.2 | 17.6 | 2.1% |
| Industrial..... | 7.1 | 6.9 | 7.9 | 9.0 | 10.2 | 11.1 | 12.2 | 2.3% |
| Transportation..... | 10.9 | 10.1 | 12.5 | 15.1 | 17.2 | 18.8 | 20.4 | 2.9% |
| All sectors average..... | 10.4 | 10.3 | 11.6 | 13.1 | 14.7 | 16.1 | 17.6 | 2.2% |
| Prices by service category | | | | | | | | |
| (2015 cents per kilowatthour) | | | | | | | | |
| Generation..... | 6.8 | 6.4 | 6.4 | 6.8 | 7.3 | 6.8 | 6.6 | 0.1% |
| Transmission..... | 1.0 | 1.1 | 1.2 | 1.2 | 1.3 | 1.3 | 1.3 | 0.7% |
| Distribution..... | 2.7 | 2.8 | 3.0 | 2.7 | 2.3 | 2.6 | 2.6 | -0.3% |
| (nominal cents per kilowatthour) | | | | | | | | |
| Generation..... | 6.7 | 6.4 | 7.0 | 8.4 | 9.9 | 10.3 | 11.1 | 2.2% |
| Transmission..... | 1.0 | 1.1 | 1.3 | 1.5 | 1.7 | 1.9 | 2.2 | 2.8% |
| Distribution..... | 2.7 | 2.8 | 3.3 | 3.3 | 3.2 | 3.9 | 4.4 | 1.8% |
| Electric power sector emissions¹ | | | | | | | | |
| Sulfur dioxide (million short tons)..... | 4.05 | 3.57 | 1.20 | 1.07 | 0.77 | 0.84 | 0.79 | -5.9% |
| Nitrogen oxide (million short tons)..... | 1.63 | 1.41 | 1.16 | 1.00 | 0.91 | 0.90 | 0.88 | -1.9% |
| Mercury (short tons)..... | 26.77 | 23.74 | 5.55 | 4.62 | 3.76 | 3.82 | 3.57 | -7.3% |

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

²Includes plants that only produce electricity and that have a regulatory status.

³Includes electricity generation from fuel cells.

⁴Includes non-biogenic municipal waste. The U.S. Energy Information Administration estimates that in 2015 approximately 7 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).

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

⁶Includes 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 that have a regulatory status).

⁷Includes 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.

⁸Includes refinery gas and still gas.

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

¹⁰Includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.

¹¹Includes 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 electric power sector generation; sales to the grid; net imports; electricity sales; and electricity end-use prices: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016, and supporting databases. 2014 emissions: U.S. Environmental Protection Agency, Clean Air Markets Database. 2014 electricity prices by service category: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A9. Electricity generating capacity
(gigawatts)

| Net summer capacity ¹ | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Electric power sector² | | | | | | | | |
| Power only³ | | | | | | | | |
| Coal ⁴ | 290.8 | 277.7 | 208.4 | 189.3 | 177.0 | 172.2 | 169.5 | -2.0% |
| Oil and natural gas steam ^{4,5} | 91.9 | 91.0 | 89.9 | 65.6 | 54.0 | 52.4 | 52.4 | -2.2% |
| Combined cycle..... | 198.1 | 202.3 | 220.6 | 231.5 | 267.7 | 287.9 | 318.7 | 1.8% |
| Combustion turbine/diesel..... | 138.7 | 138.3 | 140.1 | 137.4 | 134.2 | 136.8 | 141.8 | 0.1% |
| Nuclear power ⁶ | 99.1 | 99.8 | 99.1 | 99.1 | 99.1 | 99.1 | 99.1 | 0.0% |
| Pumped storage..... | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 0.0% |
| Fuel cells..... | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0% |
| Renewable sources ⁷ | 162.1 | 176.2 | 237.7 | 287.3 | 304.3 | 356.1 | 398.4 | 3.3% |
| Distributed generation (natural gas) ⁸ | 0.0 | 0.0 | 0.2 | 0.5 | 1.0 | 1.8 | 2.9 | -- |
| Total | 1,003.4 | 1,007.8 | 1,018.7 | 1,033.4 | 1,060.0 | 1,128.9 | 1,205.3 | 0.7% |
| Combined heat and power⁹ | | | | | | | | |
| Coal..... | 3.8 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | -0.4% |
| Oil and natural gas steam ⁵ | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.0% |
| Combined cycle..... | 25.1 | 25.0 | 26.8 | 26.7 | 26.7 | 26.7 | 26.7 | 0.3% |
| Combustion turbine/diesel..... | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 | 0.0% |
| Renewable sources ⁷ | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.0% |
| Total | 33.1 | 32.9 | 34.4 | 34.3 | 34.3 | 34.3 | 34.3 | 0.2% |
| Cumulative planned additions¹⁰ | | | | | | | | |
| Coal..... | -- | -- | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | -- |
| Oil and natural gas steam ⁵ | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Combined cycle..... | -- | -- | 21.5 | 21.5 | 21.5 | 21.5 | 21.5 | -- |
| Combustion turbine/diesel..... | -- | -- | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | -- |
| Nuclear power..... | -- | -- | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | -- |
| Pumped storage..... | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Fuel cells..... | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Renewable sources ⁷ | -- | -- | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | -- |
| Distributed generation ⁸ | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Total | -- | -- | 50.8 | 50.8 | 50.8 | 50.8 | 50.8 | -- |
| Cumulative unplanned additions¹⁰ | | | | | | | | |
| Coal..... | -- | -- | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | -- |
| Oil and natural gas steam ⁵ | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Combined cycle..... | -- | -- | 5.2 | 26.0 | 63.4 | 85.1 | 117.2 | -- |
| Combustion turbine/diesel..... | -- | -- | 2.3 | 2.4 | 3.0 | 7.0 | 14.5 | -- |
| Nuclear power..... | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Pumped storage..... | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Fuel cells..... | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Renewable sources ⁷ | -- | -- | 42.3 | 91.8 | 108.9 | 160.7 | 203.1 | -- |
| Distributed generation ⁸ | -- | -- | 0.2 | 0.5 | 1.0 | 1.8 | 2.9 | -- |
| Total | -- | -- | 50.3 | 121.0 | 176.6 | 254.8 | 337.8 | -- |
| Cumulative electric power sector additions¹⁰ .. | -- | -- | 101.1 | 171.8 | 227.4 | 305.6 | 388.6 | -- |
| Cumulative retirements¹¹ | | | | | | | | |
| Coal..... | -- | -- | 61.6 | 79.7 | 92.1 | 96.9 | 99.6 | -- |
| Oil and natural gas steam ⁵ | -- | -- | 9.7 | 34.9 | 46.4 | 48.1 | 48.1 | -- |
| Combined cycle..... | -- | -- | 6.5 | 16.5 | 17.7 | 19.2 | 20.5 | -- |
| Combustion turbine/diesel..... | -- | -- | 5.5 | 8.3 | 12.2 | 13.5 | 16.0 | -- |
| Nuclear power..... | -- | -- | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | -- |
| Pumped storage..... | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Fuel cells..... | -- | -- | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Renewable sources ⁷ | -- | -- | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | -- |
| Total | -- | -- | 88.9 | 144.9 | 174.0 | 183.3 | 189.8 | -- |
| Total electric power sector capacity | 1,037 | 1,041 | 1,053 | 1,068 | 1,094 | 1,163 | 1,240 | 0.7% |

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

| Net summer capacity ¹ | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|-------------|-------------|-------------|-------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| End-use generators¹² | | | | | | | | |
| Coal | 2.9 | 2.9 | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 | 0.5% |
| Petroleum | 0.6 | 0.6 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0% |
| Natural gas | 16.2 | 16.5 | 17.4 | 19.7 | 22.9 | 26.6 | 29.5 | 2.4% |
| Other gaseous fuels ¹³ | 2.4 | 2.4 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 1.0% |
| Renewable sources ⁷ | 15.0 | 18.4 | 36.6 | 49.1 | 63.6 | 80.3 | 97.4 | 6.9% |
| Other ¹⁴ | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.0% |
| Total | 37.8 | 41.3 | 61.1 | 76.0 | 93.9 | 114.4 | 134.5 | 4.8% |
| Cumulative capacity additions¹⁰ | -- | -- | 21.0 | 35.9 | 53.8 | 74.2 | 94.3 | -- |

¹Net 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.

²Includes electricity-only and combined heat and power plants that have a regulatory status.

³Includes plants that only produce electricity and that have a regulatory status. Includes capacity increases (uprates) at existing units.

⁴Total coal and oil and natural gas steam capacity account for the conversion of coal capacity to gas steam capacity, but the conversions are not included explicitly as additions or retirements. The totals reflect 8.8 gigawatts of planned conversions as well as additional model-projected conversions.

⁵Includes oil-, gas-, and dual-fired capacity.

⁶Nuclear capacity includes 0.1 gigawatts of uprates.

⁷Includes 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.

⁸Primarily peak load capacity fueled by natural gas.

⁹Includes 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 that have a regulatory status).

¹⁰Cumulative additions after December 31, 2015.

¹¹Cumulative retirements after December 31, 2015.

¹²Includes 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.

¹³Includes refinery gas and still gas.

¹⁴Includes 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 capacity and projected planned additions: U.S. Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report" (preliminary). 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Electricity trade | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Interregional electricity trade | | | | | | | | |
| Gross domestic sales | | | | | | | | |
| Firm power..... | 105 | 102 | 95 | 92 | 73 | 53 | 49 | -2.9% |
| Economy..... | 165 | 233 | 216 | 257 | 239 | 226 | 222 | -0.2% |
| Total..... | 271 | 336 | 311 | 349 | 312 | 278 | 270 | -0.9% |
| Gross domestic sales (million 2015 dollars) | | | | | | | | |
| Firm power..... | 6,761 | 6,568 | 6,088 | 5,871 | 4,683 | 3,375 | 3,120 | -2.9% |
| Economy..... | 8,385 | 7,704 | 9,139 | 12,921 | 13,756 | 11,896 | 11,460 | 1.6% |
| Total..... | 15,147 | 14,273 | 15,227 | 18,792 | 18,439 | 15,270 | 14,580 | 0.1% |
| International electricity trade | | | | | | | | |
| Imports from Canada and Mexico | | | | | | | | |
| Firm power..... | 20.3 | 28.3 | 29.5 | 28.5 | 26.6 | 23.2 | 20.2 | -1.4% |
| Economy..... | 45.3 | 37.5 | 41.0 | 43.8 | 37.6 | 36.0 | 35.9 | -0.2% |
| Total..... | 65.6 | 65.9 | 70.5 | 72.4 | 64.2 | 59.2 | 56.1 | -0.6% |
| Exports to Canada and Mexico | | | | | | | | |
| Firm power..... | 2.6 | 1.8 | 1.8 | 1.8 | 0.9 | 0.0 | 0.0 | -- |
| Economy..... | 10.6 | 7.5 | 11.9 | 12.7 | 13.0 | 13.2 | 13.2 | 2.3% |
| Total..... | 13.3 | 9.3 | 13.7 | 14.5 | 13.9 | 13.2 | 13.2 | 1.4% |

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2014 are model results and may differ 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: 2014 interregional firm electricity trade data: Federal Energy Regulatory Commission, Form 1, "Electric Utility Annual Report", and 2014 seasonal reliability assessments from North American Electric Reliability Council regional entities and Independent System Operators, and Federal Energy Regulatory Commission, Form 1. 2014 interregional economy electricity trade are model results. 2014 Mexican electricity trade data: U.S. Energy Information Administration (EIA), *Electric Power Annual 2014*. 2014 Canadian international electricity trade data: National Energy Board, *Electricity Exports and Imports Statistics, 2014*. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A11. Petroleum and other liquids supply and disposition
(million barrels per day, unless otherwise noted)

| Supply and disposition | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Crude oil | | | | | | | | |
| Domestic crude production ¹ | 8.71 | 9.42 | 9.38 | 9.43 | 10.06 | 10.66 | 11.26 | 0.7% |
| Alaska..... | 0.50 | 0.48 | 0.41 | 0.32 | 0.24 | 0.19 | 0.15 | -4.7% |
| Lower 48 states..... | 8.21 | 8.94 | 8.96 | 9.12 | 9.82 | 10.48 | 11.11 | 0.9% |
| Net imports..... | 6.99 | 6.88 | 6.97 | 6.95 | 6.57 | 6.24 | 6.10 | -0.5% |
| Gross imports..... | 7.35 | 7.28 | 7.60 | 7.58 | 7.20 | 7.07 | 7.12 | -0.1% |
| Exports..... | 0.35 | 0.40 | 0.63 | 0.63 | 0.63 | 0.83 | 1.02 | 3.8% |
| Other crude supply ² | 0.15 | -0.11 | 0.01 | 0.07 | 0.00 | 0.00 | 0.00 | -- |
| Total crude supply | 15.85 | 16.19 | 16.36 | 16.46 | 16.63 | 16.91 | 17.36 | 0.3% |
| Net product imports..... | -1.90 | -2.24 | -3.26 | -3.69 | -4.32 | -4.52 | -4.66 | 3.0% |
| Gross refined product imports ³ | 0.78 | 0.66 | 1.11 | 1.24 | 1.30 | 1.44 | 1.63 | 3.7% |
| Unfinished oil imports..... | 0.55 | 0.55 | 0.53 | 0.50 | 0.46 | 0.43 | 0.39 | -1.4% |
| Blending component imports..... | 0.55 | 0.67 | 0.58 | 0.52 | 0.45 | 0.35 | 0.30 | -3.2% |
| Exports..... | 3.76 | 4.12 | 5.48 | 5.95 | 6.52 | 6.74 | 6.98 | 2.1% |
| Refinery processing gain ⁴ | 1.08 | 1.03 | 1.05 | 1.01 | 0.98 | 0.97 | 0.99 | -0.2% |
| Product stock withdrawal..... | -0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Natural gas plant liquids..... | 3.02 | 3.25 | 4.57 | 4.77 | 4.90 | 4.95 | 4.99 | 1.7% |
| Supply from renewable sources..... | 0.96 | 1.01 | 1.08 | 1.03 | 1.03 | 1.05 | 1.12 | 0.4% |
| Ethanol..... | 0.86 | 0.89 | 0.89 | 0.85 | 0.84 | 0.86 | 0.93 | 0.2% |
| Domestic production..... | 0.91 | 0.94 | 0.90 | 0.87 | 0.87 | 0.88 | 0.91 | -0.1% |
| Net imports..... | -0.05 | -0.05 | -0.01 | -0.03 | -0.03 | -0.03 | 0.02 | -- |
| Stock withdrawal..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Biodiesel..... | 0.10 | 0.11 | 0.15 | 0.10 | 0.10 | 0.10 | 0.10 | -0.5% |
| Domestic production..... | 0.08 | 0.08 | 0.11 | 0.06 | 0.06 | 0.06 | 0.06 | -1.6% |
| Net imports..... | 0.02 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 1.7% |
| Stock withdrawal..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Other biomass-derived liquids ⁵ | 0.00 | 0.00 | 0.04 | 0.09 | 0.09 | 0.09 | 0.09 | 18.1% |
| Domestic production..... | 0.00 | 0.00 | 0.04 | 0.09 | 0.09 | 0.09 | 0.09 | 18.1% |
| Net imports..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Stock withdrawal..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Liquids from gas..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Liquids from coal..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Other ⁶ | 0.21 | 0.21 | 0.28 | 0.28 | 0.30 | 0.31 | 0.32 | 1.7% |
| Total primary supply ⁷ | 19.04 | 19.46 | 20.08 | 19.87 | 19.52 | 19.66 | 20.12 | 0.1% |
| Product supplied | | | | | | | | |
| by fuel | | | | | | | | |
| Liquefied petroleum gases and other ⁸ | 2.45 | 2.46 | 2.90 | 3.22 | 3.34 | 3.55 | 3.80 | 1.8% |
| Motor gasoline ⁹ | 8.94 | 9.18 | 8.97 | 8.08 | 7.35 | 6.96 | 6.84 | -1.2% |
| of which: E85 ¹⁰ | 0.02 | 0.03 | 0.03 | 0.09 | 0.15 | 0.18 | 0.19 | 7.3% |
| Jet fuel ¹¹ | 1.47 | 1.54 | 1.56 | 1.64 | 1.73 | 1.80 | 1.86 | 0.8% |
| Distillate fuel oil ¹² | 4.04 | 3.96 | 4.31 | 4.40 | 4.46 | 4.57 | 4.67 | 0.7% |
| of which: Diesel..... | 3.83 | 3.76 | 3.97 | 4.10 | 4.19 | 4.32 | 4.43 | 0.7% |
| Residual fuel oil..... | 0.26 | 0.26 | 0.25 | 0.27 | 0.27 | 0.28 | 0.28 | 0.2% |
| Other ¹³ | 2.01 | 2.02 | 2.11 | 2.29 | 2.39 | 2.53 | 2.70 | 1.2% |
| by sector | | | | | | | | |
| Residential and commercial..... | 0.93 | 0.90 | 0.89 | 0.84 | 0.80 | 0.77 | 0.74 | -0.8% |
| Industrial ¹⁴ | 4.46 | 4.47 | 5.35 | 5.88 | 6.10 | 6.46 | 6.89 | 1.8% |
| Transportation..... | 13.76 | 14.04 | 14.11 | 13.40 | 12.84 | 12.65 | 12.69 | -0.4% |
| Electric power ¹⁵ | 0.14 | 0.12 | 0.07 | 0.06 | 0.05 | 0.04 | 0.04 | -4.3% |
| Unspecified sector ¹⁶ | -0.31 | -0.30 | -0.31 | -0.28 | -0.25 | -0.23 | -0.23 | -1.1% |
| Total product supplied | 19.16 | 19.42 | 20.11 | 19.90 | 19.54 | 19.69 | 20.14 | 0.1% |
| Discrepancy ¹⁷ | -0.12 | 0.04 | -0.03 | -0.03 | -0.03 | -0.03 | -0.03 | -- |

Table A11. Petroleum and other liquids supply and disposition (continued)
(million barrels per day, unless otherwise noted)

| Supply and disposition | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|------|------|------|------|------|------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Domestic refinery distillation capacity ¹⁸ | 17.9 | 18.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 0.2% |
| Capacity utilization rate (percent) ¹⁹ | 90.4 | 91.1 | 87.7 | 88.2 | 88.9 | 90.2 | 92.5 | 0.1% |
| Net import share of product supplied (percent)..... | 26.6 | 23.7 | 18.6 | 16.5 | 11.6 | 8.8 | 7.4 | -4.5% |
| Net expenditures for imported crude oil and petroleum products (billion 2015 dollars) | 262 | 128 | 207 | 250 | 268 | 303 | 348 | 4.1% |

¹Includes lease condensate.

²Strategic petroleum reserve stock additions plus unaccounted for crude oil and crude oil stock withdrawals.

³Includes other hydrocarbons and alcohols.

⁴The 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.

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

⁶Includes domestic sources of other blending components, other hydrocarbons, and ethers.

⁷Total crude supply, net product imports, refinery processing gain, product stock withdrawal, natural gas plant liquids, supply from renewable sources, liquids from gas, liquids from coal, and other supply.

⁸Includes ethane, natural gasoline, and refinery olefins.

⁹Includes ethanol and ethers blended into gasoline.

¹⁰E85 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.

¹¹Includes only kerosene type.

¹²Includes distillate fuel oil from petroleum and biomass feedstocks.

¹³Includes kerosene, aviation gasoline, petrochemical feedstocks, lubricants, waxes, asphalt, road oil, still gas, special naphthas, petroleum coke, crude oil product supplied, methanol, and miscellaneous petroleum products.

¹⁴Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

¹⁵Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.

¹⁶Represents consumption unattributed to the sectors above.

¹⁷Balancing item. Includes unaccounted for supply, losses, and gains.

¹⁸End-of-year operable capacity.

¹⁹Rate 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 product supplied based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016. Other 2014 data: EIA, *Petroleum Supply Annual 2014*. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A12. Petroleum and other liquids prices
(2015 dollars per gallon, unless otherwise noted)

| Sector and fuel | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|-------------|-------------|-------------|-------------|-------------|-------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Crude oil prices (2015 dollars per barrel) | | | | | | | | |
| Brent spot | 100 | 52 | 77 | 92 | 104 | 120 | 136 | 3.9% |
| West Texas Intermediate spot | 94 | 49 | 71 | 85 | 97 | 112 | 129 | 4.0% |
| Average imported refiners acquisition cost ¹ | 91 | 46 | 69 | 83 | 95 | 110 | 126 | 4.1% |
| Brent / West Texas Intermediate spread | 5.8 | 3.7 | 5.4 | 6.2 | 6.9 | 7.2 | 7.1 | 2.7% |
| Delivered sector product prices | | | | | | | | |
| Residential | | | | | | | | |
| Propane | 2.13 | 1.55 | 1.84 | 1.95 | 2.04 | 2.19 | 2.33 | 1.7% |
| Distillate fuel oil | 3.71 | 2.66 | 3.08 | 3.51 | 3.82 | 4.23 | 4.65 | 2.3% |
| Commercial | | | | | | | | |
| Distillate fuel oil | 3.63 | 2.34 | 2.71 | 3.05 | 3.36 | 3.77 | 4.19 | 2.4% |
| Residual fuel oil | 2.50 | 1.04 | 1.64 | 2.02 | 2.29 | 2.63 | 2.98 | 4.3% |
| Residual fuel oil (2015 dollars per barrel) | 105 | 44 | 69 | 85 | 96 | 110 | 125 | 4.3% |
| Industrial² | | | | | | | | |
| Propane | 1.72 | 1.12 | 1.42 | 1.54 | 1.63 | 1.78 | 1.93 | 2.2% |
| Distillate fuel oil | 3.72 | 2.34 | 2.71 | 3.05 | 3.36 | 3.76 | 4.19 | 2.4% |
| Residual fuel oil | 2.24 | 1.01 | 1.68 | 2.13 | 2.39 | 2.73 | 3.08 | 4.6% |
| Residual fuel oil (2015 dollars per barrel) | 94 | 42 | 71 | 89 | 100 | 115 | 130 | 4.6% |
| Transportation | | | | | | | | |
| Propane | 2.23 | 1.64 | 1.94 | 2.05 | 2.14 | 2.28 | 2.43 | 1.6% |
| E85 ³ | 3.15 | 2.21 | 3.05 | 2.97 | 2.93 | 3.08 | 3.33 | 1.6% |
| Ethanol wholesale price | 2.25 | 2.22 | 2.77 | 2.38 | 2.28 | 2.39 | 2.60 | 0.6% |
| Motor gasoline ⁴ | 3.42 | 2.52 | 2.74 | 2.97 | 3.19 | 3.47 | 3.81 | 1.7% |
| Jet fuel ⁵ | 2.81 | 1.62 | 2.18 | 2.56 | 2.87 | 3.30 | 3.74 | 3.4% |
| Diesel fuel (distillate fuel oil) ⁶ | 3.82 | 2.72 | 3.18 | 3.55 | 3.85 | 4.25 | 4.68 | 2.2% |
| Residual fuel oil | 2.19 | 1.21 | 1.75 | 2.01 | 2.25 | 2.54 | 2.87 | 3.5% |
| Residual fuel oil (2015 dollars per barrel) | 92 | 51 | 73 | 85 | 94 | 107 | 121 | 3.5% |
| Electric power⁷ | | | | | | | | |
| Distillate fuel oil | 3.27 | 2.07 | 2.53 | 2.92 | 3.23 | 3.63 | 4.04 | 2.7% |
| Residual fuel oil | 2.73 | 1.53 | 2.06 | 2.43 | 2.70 | 3.03 | 3.36 | 3.2% |
| Residual fuel oil (2015 dollars per barrel) | 115 | 64 | 87 | 102 | 114 | 127 | 141 | 3.2% |
| Average prices, all sectors⁸ | | | | | | | | |
| Propane | 1.94 | 1.36 | 1.65 | 1.75 | 1.83 | 1.97 | 2.12 | 1.8% |
| Motor gasoline ⁴ | 3.42 | 2.52 | 2.74 | 2.97 | 3.19 | 3.47 | 3.81 | 1.7% |
| Jet fuel ⁵ | 2.81 | 1.62 | 2.18 | 2.56 | 2.87 | 3.30 | 3.74 | 3.4% |
| Distillate fuel oil | 3.78 | 2.63 | 3.07 | 3.44 | 3.75 | 4.16 | 4.58 | 2.2% |
| Residual fuel oil | 2.37 | 1.26 | 1.76 | 2.06 | 2.30 | 2.60 | 2.93 | 3.4% |
| Residual fuel oil (2015 dollars per barrel) | 99 | 53 | 74 | 87 | 97 | 109 | 123 | 3.4% |
| Average | 3.12 | 2.18 | 2.44 | 2.65 | 2.85 | 3.13 | 3.42 | 1.8% |

Table A12. Petroleum and other liquids prices (continued)
(nominal dollars per gallon, unless otherwise noted)

| Sector and fuel | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|-------------|-------------|-------------|-------------|-------------|-------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Crude oil prices (nominal dollars per barrel) | | | | | | | | |
| Brent spot | 99 | 52 | 85 | 112 | 141 | 181 | 229 | 6.1% |
| West Texas Intermediate spot | 93 | 49 | 79 | 105 | 131 | 170 | 217 | 6.2% |
| Average imported refiners acquisition cost ¹ | 90 | 46 | 76 | 102 | 128 | 166 | 212 | 6.3% |
| Delivered sector product prices | | | | | | | | |
| Residential | | | | | | | | |
| Propane | 2.11 | 1.55 | 2.03 | 2.39 | 2.76 | 3.30 | 3.93 | 3.8% |
| Distillate fuel oil | 3.67 | 2.66 | 3.40 | 4.29 | 5.16 | 6.39 | 7.83 | 4.4% |
| Commercial | | | | | | | | |
| Distillate fuel oil | 3.59 | 2.34 | 2.99 | 3.74 | 4.54 | 5.69 | 7.04 | 4.5% |
| Residual fuel oil | 2.47 | 1.04 | 1.81 | 2.47 | 3.09 | 3.97 | 5.02 | 6.5% |
| Residual fuel oil (nominal dollars per barrel) | 104 | 44 | 76 | 104 | 130 | 167 | 211 | 6.5% |
| Industrial² | | | | | | | | |
| Propane | 1.70 | 1.12 | 1.57 | 1.88 | 2.20 | 2.69 | 3.25 | 4.4% |
| Distillate fuel oil | 3.68 | 2.34 | 2.99 | 3.74 | 4.54 | 5.69 | 7.04 | 4.5% |
| Residual fuel oil | 2.22 | 1.01 | 1.86 | 2.60 | 3.23 | 4.12 | 5.19 | 6.8% |
| Residual fuel oil (nominal dollars per barrel) | 93 | 42 | 78 | 109 | 136 | 173 | 218 | 6.8% |
| Transportation | | | | | | | | |
| Propane | 2.21 | 1.64 | 2.14 | 2.51 | 2.89 | 3.45 | 4.09 | 3.7% |
| E85 ³ | 3.12 | 2.21 | 3.37 | 3.63 | 3.97 | 4.65 | 5.60 | 3.8% |
| Ethanol wholesale price | 2.23 | 2.22 | 3.06 | 2.91 | 3.09 | 3.62 | 4.38 | 2.8% |
| Motor gasoline ⁴ | 3.38 | 2.52 | 3.02 | 3.64 | 4.32 | 5.25 | 6.40 | 3.8% |
| Jet fuel ⁵ | 2.78 | 1.62 | 2.41 | 3.14 | 3.89 | 4.99 | 6.29 | 5.6% |
| Diesel fuel (distillate fuel oil) ⁶ | 3.78 | 2.72 | 3.51 | 4.34 | 5.21 | 6.43 | 7.88 | 4.3% |
| Residual fuel oil | 2.17 | 1.21 | 1.93 | 2.46 | 3.04 | 3.84 | 4.83 | 5.7% |
| Residual fuel oil (nominal dollars per barrel) | 91 | 51 | 81 | 103 | 128 | 161 | 203 | 5.7% |
| Electric power⁷ | | | | | | | | |
| Distillate fuel oil | 3.24 | 2.07 | 2.80 | 3.57 | 4.37 | 5.48 | 6.79 | 4.9% |
| Residual fuel oil | 2.71 | 1.53 | 2.28 | 2.98 | 3.66 | 4.57 | 5.65 | 5.4% |
| Residual fuel oil (nominal dollars per barrel) | 114 | 64 | 96 | 125 | 154 | 192 | 237 | 5.4% |
| Average prices, all sectors⁸ | | | | | | | | |
| Propane | 1.92 | 1.36 | 1.82 | 2.14 | 2.48 | 2.98 | 3.56 | 3.9% |
| Motor gasoline ⁴ | 3.38 | 2.52 | 3.02 | 3.64 | 4.32 | 5.24 | 6.40 | 3.8% |
| Jet fuel ⁵ | 2.78 | 1.62 | 2.41 | 3.14 | 3.89 | 4.99 | 6.29 | 5.6% |
| Distillate fuel oil | 3.75 | 2.63 | 3.39 | 4.22 | 5.08 | 6.28 | 7.71 | 4.4% |
| Residual fuel oil | 2.34 | 1.26 | 1.94 | 2.52 | 3.11 | 3.93 | 4.93 | 5.6% |
| Residual fuel oil (nominal dollars per barrel) | 98 | 53 | 81 | 106 | 131 | 165 | 207 | 5.6% |
| Average | 3.09 | 2.18 | 2.70 | 3.25 | 3.86 | 4.72 | 5.76 | 4.0% |

¹Weighted average price delivered to U.S. refiners.

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

³E85 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.

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

⁵Includes only kerosene type.

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

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

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

Note: Data for 2014 are model results and may differ from official EIA data reports.

Sources: 2014 Brent and West Texas Intermediate crude oil spot prices: Thomson Reuters. 2014 average imported crude oil price: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016. 2014 prices for motor gasoline, distillate fuel oil, and jet fuel are based on: EIA, *Petroleum Marketing Monthly*, January 2105-December 2015. 2014 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." 2014 electric power prices based on: EIA, *Monthly Energy Review*, February 2016. 2014 E85 prices derived from: U.S. Department of Energy, Clean Cities Alternative Fuel Price Report. 2014 wholesale ethanol prices derived from Bloomberg U.S. average rack price. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Supply, disposition, and prices | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Supply | | | | | | | | |
| Dry gas production ¹ | 25.73 | 27.19 | 30.50 | 34.81 | 37.76 | 39.92 | 42.12 | 1.8% |
| Supplemental natural gas ² | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.3% |
| Net imports | 1.18 | 0.95 | -2.89 | -5.32 | -6.02 | -7.18 | -7.55 | -- |
| Pipeline ³ | 1.14 | 0.89 | -0.48 | -0.76 | -0.97 | -0.99 | -0.89 | -- |
| Liquefied natural gas | 0.04 | 0.06 | -2.42 | -4.56 | -5.06 | -6.19 | -6.66 | -- |
| Total supply | 26.97 | 28.20 | 27.67 | 29.55 | 31.80 | 32.80 | 34.63 | 0.8% |
| Consumption by sector | | | | | | | | |
| Residential | 5.09 | 4.62 | 4.71 | 4.67 | 4.65 | 4.62 | 4.58 | 0.0% |
| Commercial | 3.47 | 3.22 | 3.34 | 3.35 | 3.42 | 3.55 | 3.69 | 0.5% |
| Industrial ⁴ | 7.60 | 7.51 | 8.29 | 8.65 | 8.85 | 9.19 | 9.58 | 1.0% |
| Natural-gas-to-liquids heat and power ⁵ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Natural gas to liquids production ⁶ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Electric power ⁷ | 8.14 | 9.61 | 8.26 | 9.33 | 11.02 | 11.13 | 11.96 | 0.9% |
| Transportation ⁸ | 0.06 | 0.06 | 0.09 | 0.14 | 0.22 | 0.38 | 0.66 | 9.8% |
| Pipeline fuel | 0.84 | 0.86 | 0.81 | 0.86 | 0.91 | 0.97 | 1.04 | 0.7% |
| Lease and plant fuel ⁹ | 1.50 | 1.58 | 1.71 | 1.88 | 2.00 | 2.12 | 2.24 | 1.4% |
| Liquefaction for export ¹⁰ | 0.00 | 0.00 | 0.25 | 0.46 | 0.51 | 0.63 | 0.67 | -- |
| Total consumption | 26.70 | 27.47 | 27.46 | 29.35 | 31.59 | 32.59 | 34.42 | 0.9% |
| Discrepancy ¹¹ | 0.27 | 0.73 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | -- |
| Natural gas spot price at Henry Hub | | | | | | | | |
| (2015 dollars per million Btu) | 4.44 | 2.62 | 4.43 | 5.12 | 5.06 | 4.91 | 4.86 | 2.5% |
| (nominal dollars per million Btu) | 4.39 | 2.62 | 4.90 | 6.27 | 6.84 | 7.42 | 8.17 | 4.7% |
| Delivered prices | | | | | | | | |
| (2015 dollars per thousand cubic feet) | | | | | | | | |
| Residential | 11.08 | 10.40 | 11.08 | 11.99 | 12.41 | 12.50 | 12.74 | 0.8% |
| Commercial | 9.24 | 7.92 | 9.58 | 10.39 | 10.72 | 10.66 | 10.73 | 1.2% |
| Industrial ⁴ | 5.57 | 3.84 | 5.53 | 6.15 | 6.14 | 5.95 | 5.89 | 1.7% |
| Electric power ⁷ | 5.20 | 3.35 | 4.83 | 5.55 | 5.74 | 5.54 | 5.52 | 2.0% |
| Transportation ¹² | 19.03 | 17.18 | 17.18 | 16.90 | 16.05 | 15.87 | 16.37 | -0.2% |
| Average ¹³ | 7.15 | 5.42 | 6.95 | 7.58 | 7.65 | 7.55 | 7.59 | 1.4% |
| (nominal dollars per thousand cubic feet) | | | | | | | | |
| Residential | 10.96 | 10.40 | 12.24 | 14.67 | 16.78 | 18.87 | 21.44 | 2.9% |
| Commercial | 9.15 | 7.92 | 10.59 | 12.72 | 14.51 | 16.09 | 18.05 | 3.4% |
| Industrial ⁴ | 5.51 | 3.84 | 6.11 | 7.53 | 8.31 | 8.98 | 9.91 | 3.9% |
| Electric power ⁷ | 5.15 | 3.35 | 5.33 | 6.80 | 7.76 | 8.36 | 9.29 | 4.2% |
| Transportation ¹² | 18.83 | 17.18 | 18.98 | 20.68 | 21.71 | 23.96 | 27.54 | 1.9% |
| Average ¹³ | 7.08 | 5.42 | 7.67 | 9.28 | 10.35 | 11.40 | 12.77 | 3.5% |

¹Marketed production (wet) minus extraction losses.

²Synthetic 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.

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

⁴Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems. Excludes use for lease and plant fuel.

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

⁶Includes any natural gas converted into liquid fuel.

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

⁸Natural gas used as fuel in motor vehicles, trains, and ships.

⁹Represents natural gas used in well, field, and lease operations, and in natural gas processing plant machinery.

¹⁰Fuel used in facilities that liquefy natural gas for export.

¹¹Balancing 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, 2014 and 2015 values include net storage injections.

¹²Natural gas used as fuel in motor vehicles, trains, and ships. Price includes estimated motor vehicle fuel taxes and estimated dispensing costs or charges.

¹³Weighted 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 supply values; lease, plant, and pipeline fuel consumption; and residential, commercial, and industrial delivered prices: U.S. Energy Information Administration (EIA), *Natural Gas Monthly*, July 2015. Other 2014 consumption based on: EIA, *Monthly Energy Review*, February 2016. 2014 natural gas spot price at Henry Hub: Thomson Reuters. 2014 electric power prices: EIA, *Electric Power Monthly*, April 2014 and April 2015, Table 4.2, and EIA, *State Energy Data Report 2013*. 2014 transportation sector delivered prices derived from: U.S. Department of Energy, Clean Cities Alternative Fuel Price Report. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A14. Oil and gas supply

| Production and supply | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|-------------|-------------|-------------|-------------|-------------|-------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Crude oil | | | | | | | | |
| Lower 48 average wellhead price¹ (2015 dollars per barrel)..... | 88 | 49 | 74 | 88 | 99 | 114 | 130 | 4.0% |
| Production (million barrels per day)² | | | | | | | | |
| United States total | 8.71 | 9.42 | 9.38 | 9.43 | 10.06 | 10.66 | 11.26 | 0.7% |
| Lower 48 onshore | 6.71 | 7.30 | 6.99 | 7.38 | 8.22 | 8.85 | 9.53 | 1.1% |
| Tight oil ³ | 4.28 | 4.89 | 5.08 | 5.51 | 6.25 | 6.72 | 7.08 | 1.5% |
| Carbon dioxide enhanced oil recovery..... | 0.28 | 0.28 | 0.32 | 0.43 | 0.55 | 0.63 | 0.72 | 3.8% |
| Other..... | 2.15 | 2.13 | 1.59 | 1.44 | 1.41 | 1.50 | 1.73 | -0.8% |
| Lower 48 offshore..... | 1.50 | 1.64 | 1.98 | 1.74 | 1.60 | 1.63 | 1.58 | -0.2% |
| State | 0.07 | 0.07 | 0.05 | 0.04 | 0.04 | 0.03 | 0.03 | -3.6% |
| Federal | 1.43 | 1.57 | 1.92 | 1.69 | 1.57 | 1.60 | 1.55 | 0.0% |
| Alaska..... | 0.50 | 0.48 | 0.41 | 0.32 | 0.24 | 0.19 | 0.15 | -4.7% |
| Onshore..... | 0.40 | 0.41 | 0.28 | 0.22 | 0.17 | 0.14 | 0.11 | -5.0% |
| State offshore | 0.10 | 0.07 | 0.13 | 0.10 | 0.07 | 0.05 | 0.03 | -3.2% |
| Federal offshore..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -10.7% |
| Natural gas plant liquids production (million barrels per day) | | | | | | | | |
| United States total | 3.02 | 3.25 | 4.57 | 4.77 | 4.90 | 4.96 | 4.99 | 1.7% |
| Lower 48 onshore | 2.65 | 2.86 | 4.15 | 4.39 | 4.50 | 4.51 | 4.54 | 1.9% |
| Lower 48 offshore | 0.34 | 0.37 | 0.40 | 0.36 | 0.39 | 0.44 | 0.44 | 0.8% |
| Alaska..... | 0.03 | 0.03 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | -4.9% |
| Natural gas | | | | | | | | |
| Natural gas spot price at Henry Hub (2015 dollars per million Btu)..... | 4.44 | 2.62 | 4.43 | 5.12 | 5.06 | 4.91 | 4.86 | 2.5% |
| Dry production (trillion cubic feet)⁴ | | | | | | | | |
| United States total | 25.73 | 27.19 | 30.50 | 34.81 | 37.76 | 39.92 | 42.12 | 1.8% |
| Lower 48 onshore | 24.05 | 25.20 | 28.82 | 33.31 | 36.15 | 37.99 | 40.18 | 1.9% |
| Tight gas..... | 4.81 | 5.00 | 4.92 | 5.43 | 6.08 | 6.30 | 6.55 | 1.1% |
| Shale gas and tight oil plays ³ | 12.29 | 13.64 | 17.96 | 22.50 | 25.16 | 27.04 | 29.00 | 3.1% |
| Coalbed methane | 1.16 | 1.24 | 1.04 | 1.02 | 0.94 | 0.85 | 0.78 | -1.9% |
| Other..... | 5.79 | 5.32 | 4.90 | 4.36 | 3.97 | 3.79 | 3.85 | -1.3% |
| Lower 48 offshore..... | 1.36 | 1.70 | 1.39 | 1.21 | 1.33 | 1.65 | 1.67 | -0.1% |
| State | 0.10 | 0.14 | 0.07 | 0.04 | 0.03 | 0.02 | 0.02 | -7.3% |
| Federal | 1.25 | 1.56 | 1.32 | 1.17 | 1.30 | 1.63 | 1.64 | 0.2% |
| Alaska..... | 0.32 | 0.29 | 0.29 | 0.29 | 0.28 | 0.28 | 0.28 | -0.2% |
| Onshore..... | 0.32 | 0.29 | 0.29 | 0.29 | 0.28 | 0.28 | 0.28 | -0.2% |
| State offshore | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Federal offshore..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Supplemental gas supplies (trillion cubic feet)⁵ | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.3% |
| Total lower 48 wells drilled (thousands)..... | 47.4 | 32.3 | 32.3 | 36.8 | 41.8 | 44.6 | 47.4 | 1.5% |

¹Represents lower 48 onshore and offshore supplies.

²Includes lease condensate.

³Tight 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.

⁴Marketed production (wet) minus extraction losses.

⁵Synthetic 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 crude oil lower 48 average wellhead price: U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, January 2105-December 2015. 2014 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: EIA, *Petroleum Supply Annual 2014*. 2014 natural gas spot price at Henry Hub: Thomson Reuters. 2014 Alaska and total natural gas production, and supplemental gas supplies: EIA, *Natural Gas Monthly*, July 2015. Other 2014: EIA, Office of Energy Analysis. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. **Projections:** EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Supply, disposition, and prices | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|-------------|-------------|-------------|-------------|-------------|-------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Production¹ | | | | | | | | |
| Appalachia | 270 | 223 | 202 | 165 | 138 | 154 | 144 | -1.7% |
| Interior | 190 | 165 | 197 | 193 | 148 | 172 | 170 | 0.1% |
| West | 542 | 484 | 473 | 408 | 378 | 335 | 329 | -1.5% |
| East of the Mississippi | 413 | 346 | 351 | 307 | 243 | 281 | 276 | -0.9% |
| West of the Mississippi | 590 | 526 | 521 | 460 | 422 | 380 | 367 | -1.4% |
| Total | 1,002 | 873 | 872 | 766 | 664 | 661 | 643 | -1.2% |
| Waste coal supplied² | 9 | 9 | 11 | 9 | 9 | 8 | 9 | -0.3% |
| Net imports | | | | | | | | |
| Imports ³ | 11 | 11 | 0 | 0 | 0 | 0 | 0 | -19.2% |
| Exports | 97 | 75 | 70 | 70 | 74 | 87 | 94 | 0.9% |
| Total | -86 | -63 | -70 | -70 | -74 | -87 | -94 | 1.6% |
| Total supply⁴ | 925 | 819 | 813 | 705 | 599 | 583 | 557 | -1.5% |
| Consumption by sector | | | | | | | | |
| Commercial and institutional | 2 | 3 | 2 | 2 | 2 | 2 | 2 | -0.4% |
| Coke plants | 20 | 19 | 14 | 16 | 16 | 15 | 14 | -1.2% |
| Other industrial ⁵ | 43 | 40 | 42 | 44 | 45 | 45 | 47 | 0.6% |
| Coal-to-liquids heat and power | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -- |
| Coal to liquids production | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -- |
| Electric power ⁶ | 852 | 739 | 754 | 643 | 536 | 520 | 494 | -1.6% |
| Total | 917 | 801 | 813 | 705 | 599 | 583 | 557 | -1.4% |
| Discrepancy and stock change⁷ | 8 | 17 | 0 | 0 | 0 | 0 | 0 | -- |
| Average minemouth price⁸ | | | | | | | | |
| (2015 dollars per short ton) | 35.2 | 33.8 | 33.6 | 34.0 | 33.8 | 37.6 | 38.7 | 0.5% |
| (2015 dollars per million Btu) | 1.73 | 1.69 | 1.68 | 1.71 | 1.71 | 1.86 | 1.91 | 0.5% |
| Delivered prices⁹ | | | | | | | | |
| (2015 dollars per short ton) | | | | | | | | |
| Commercial and institutional | 91.2 | 85.6 | 85.0 | 86.0 | 85.7 | 87.2 | 89.2 | 0.2% |
| Coke plants | 153.0 | 153.7 | 173.4 | 186.8 | 200.2 | 207.3 | 208.1 | 1.2% |
| Other industrial ⁵ | 68.9 | 69.7 | 70.6 | 71.5 | 71.2 | 72.3 | 74.9 | 0.3% |
| Coal to liquids | -- | -- | -- | -- | -- | -- | -- | -- |
| Electric power ⁶ | | | | | | | | |
| (2015 dollars per short ton) | 46.1 | 41.6 | 43.1 | 42.7 | 41.8 | 43.8 | 45.2 | 0.3% |
| (2015 dollars per million Btu) | 2.38 | 2.19 | 2.26 | 2.26 | 2.26 | 2.32 | 2.38 | 0.3% |
| Average | 49.7 | 45.8 | 47.0 | 47.8 | 48.5 | 50.4 | 51.9 | 0.5% |
| Exports ¹⁰ | 85.3 | 86.7 | 84.0 | 81.7 | 81.2 | 84.8 | 83.9 | -0.1% |

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

| Supply, disposition, and prices | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Average minemouth price⁸ | | | | | | | | |
| (nominal dollars per short ton) | 34.9 | 33.8 | 37.1 | 41.6 | 45.8 | 56.8 | 65.1 | 2.7% |
| (nominal dollars per million Btu)..... | 1.71 | 1.69 | 1.86 | 2.09 | 2.31 | 2.81 | 3.21 | 2.6% |
| Delivered prices⁹ | | | | | | | | |
| (nominal dollars per short ton) | | | | | | | | |
| Commercial and institutional..... | 90.3 | 85.6 | 93.9 | 105.2 | 116.0 | 131.6 | 150.0 | 2.3% |
| Coke plants..... | 151.4 | 153.7 | 191.6 | 228.7 | 270.9 | 313.1 | 350.2 | 3.3% |
| Other industrial ⁵ | 68.2 | 69.7 | 78.0 | 87.5 | 96.3 | 109.2 | 126.0 | 2.4% |
| Coal to liquids..... | -- | -- | -- | -- | -- | -- | -- | -- |
| Electric power ⁶ | | | | | | | | |
| (nominal dollars per short ton)..... | 45.7 | 41.6 | 47.6 | 52.3 | 56.5 | 66.1 | 76.0 | 2.4% |
| (nominal dollars per million Btu)..... | 2.35 | 2.19 | 2.50 | 2.77 | 3.05 | 3.50 | 4.01 | 2.5% |
| Average..... | 49.2 | 45.8 | 51.9 | 58.6 | 65.5 | 76.1 | 87.3 | 2.6% |
| Exports ¹⁰ | 84.4 | 86.7 | 92.8 | 100.0 | 109.8 | 128.0 | 141.2 | 2.0% |

¹Includes anthracite, bituminous coal, subbituminous coal, and lignite.

²Includes 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.

³Excludes imports to Puerto Rico and the U.S. Virgin Islands.

⁴Production plus waste coal supplied plus net imports.

⁵Includes 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.

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

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

⁸Includes 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.

⁹Prices weighted by consumption; weighted average excludes commercial and institutional prices, and export free-alongside-ship prices.

¹⁰Free-alongside-ship 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 data based on: U.S. Energy Information Administration (EIA), *Annual Coal Report 2013*; EIA, *Quarterly Coal Report, October-December 2014*; and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Net summer capacity and generation | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|----------------|----------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Electric power sector¹ | | | | | | | | |
| Net summer capacity | | | | | | | | |
| Conventional hydroelectric power..... | 79.0 | 79.2 | 79.8 | 80.0 | 80.1 | 80.1 | 80.4 | 0.1% |
| Geothermal ² | 2.5 | 2.5 | 3.1 | 4.5 | 5.6 | 6.7 | 7.2 | 4.3% |
| Municipal waste ³ | 3.7 | 3.8 | 3.9 | 3.9 | 3.9 | 3.9 | 3.9 | 0.0% |
| Wood and other biomass ⁴ | 3.4 | 3.4 | 3.6 | 3.6 | 3.6 | 3.7 | 4.1 | 0.7% |
| Solar thermal..... | 1.9 | 2.0 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 0.8% |
| Solar photovoltaic ⁵ | 8.4 | 11.7 | 25.5 | 52.5 | 67.6 | 117.6 | 155.6 | 10.9% |
| Wind..... | 64.1 | 74.4 | 120.4 | 141.3 | 142.0 | 142.6 | 145.7 | 2.7% |
| Offshore wind..... | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Total electric power sector capacity..... | 163.0 | 177.1 | 238.7 | 288.2 | 305.2 | 357.0 | 399.4 | 3.3% |
| Generation (billion kilowatthours) | | | | | | | | |
| Conventional hydroelectric power..... | 262.3 | 245.5 | 292.7 | 293.7 | 294.2 | 294.8 | 296.3 | 0.8% |
| Geothermal ² | 15.9 | 16.7 | 21.5 | 32.6 | 42.3 | 51.4 | 55.5 | 4.9% |
| Biogenic municipal waste ⁶ | 17.6 | 19.4 | 20.9 | 20.8 | 20.8 | 21.7 | 21.9 | 0.5% |
| Wood and other biomass..... | 15.1 | 6.2 | 9.4 | 13.1 | 14.8 | 13.8 | 17.7 | 4.3% |
| Dedicated plants..... | 14.0 | 5.4 | 8.7 | 12.4 | 14.1 | 13.1 | 17.0 | 4.7% |
| Cofiring..... | 1.1 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | -0.3% |
| Solar thermal..... | 2.5 | 3.3 | 4.5 | 4.6 | 4.6 | 4.7 | 4.8 | 1.5% |
| Solar photovoltaic ⁵ | 15.0 | 18.8 | 47.8 | 107.5 | 143.5 | 256.2 | 345.0 | 12.3% |
| Wind..... | 180.9 | 187.5 | 364.5 | 449.9 | 453.1 | 456.0 | 468.3 | 3.7% |
| Offshore wind..... | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | -- |
| Total electric power sector generation..... | 509.2 | 497.4 | 761.4 | 922.2 | 973.4 | 1,098.6 | 1,209.5 | 3.6% |
| End-use sectors⁷ | | | | | | | | |
| Net summer capacity | | | | | | | | |
| Conventional hydroelectric power..... | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.0% |
| Geothermal..... | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Municipal waste ⁸ | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.0% |
| Biomass..... | 4.7 | 4.7 | 4.7 | 4.9 | 5.0 | 5.0 | 5.0 | 0.3% |
| Solar photovoltaic ⁵ | 8.6 | 11.2 | 28.7 | 41.0 | 55.1 | 71.5 | 88.3 | 8.6% |
| Wind..... | 0.9 | 1.6 | 2.3 | 2.4 | 2.6 | 2.9 | 3.2 | 2.8% |
| Total end-use sector capacity..... | 15.0 | 18.4 | 36.6 | 49.1 | 63.6 | 80.3 | 97.4 | 6.9% |
| Generation (billion kilowatthours) | | | | | | | | |
| Conventional hydroelectric power..... | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 0.0% |
| Geothermal..... | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -- |
| Municipal waste ⁸ | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 0.0% |
| Biomass..... | 26.1 | 26.0 | 25.9 | 26.6 | 27.4 | 27.4 | 27.6 | 0.2% |
| Solar photovoltaic ⁵ | 11.8 | 15.5 | 40.2 | 58.1 | 78.7 | 102.7 | 127.2 | 8.8% |
| Wind..... | 1.2 | 2.1 | 3.1 | 3.1 | 3.5 | 3.9 | 4.3 | 3.0% |
| Total end-use sector generation..... | 44.5 | 49.0 | 74.6 | 93.2 | 115.0 | 139.4 | 164.6 | 5.0% |

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

| Net summer capacity and generation | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|--------------|--------------|----------------|----------------|----------------|----------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Total, all sectors | | | | | | | | |
| Net summer capacity | | | | | | | | |
| Conventional hydroelectric power..... | 79.3 | 79.5 | 80.1 | 80.3 | 80.3 | 80.4 | 80.7 | 0.1% |
| Geothermal..... | 2.5 | 2.5 | 3.1 | 4.5 | 5.6 | 6.7 | 7.2 | 4.3% |
| Municipal waste..... | 4.3 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 0.0% |
| Wood and other biomass ⁴ | 8.1 | 8.1 | 8.3 | 8.4 | 8.6 | 8.7 | 9.1 | 0.5% |
| Solar ⁵ | 18.9 | 24.9 | 56.6 | 95.9 | 125.3 | 191.6 | 246.4 | 9.6% |
| Wind..... | 65.0 | 76.0 | 122.7 | 143.7 | 144.6 | 145.5 | 149.0 | 2.7% |
| Total capacity, all sectors..... | 178.1 | 195.4 | 275.3 | 337.3 | 368.8 | 437.3 | 496.8 | 3.8% |
| Generation (billion kilowatthours) | | | | | | | | |
| Conventional hydroelectric power..... | 263.6 | 246.8 | 294.1 | 295.0 | 295.6 | 296.1 | 297.6 | 0.8% |
| Geothermal..... | 15.9 | 16.7 | 21.5 | 32.6 | 42.3 | 51.4 | 55.5 | 4.9% |
| Municipal waste..... | 21.7 | 23.5 | 25.0 | 24.9 | 24.9 | 25.8 | 26.0 | 0.4% |
| Wood and other biomass..... | 41.2 | 32.1 | 35.3 | 39.7 | 42.2 | 41.2 | 45.2 | 1.4% |
| Solar ⁵ | 29.3 | 37.6 | 92.5 | 170.1 | 226.8 | 363.6 | 477.1 | 10.7% |
| Wind..... | 182.1 | 189.6 | 367.6 | 453.2 | 456.7 | 459.9 | 472.8 | 3.7% |
| Total generation, all sectors..... | 553.7 | 546.4 | 836.0 | 1,015.5 | 1,088.4 | 1,238.1 | 1,374.1 | 3.8% |

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

²Includes 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.

³Includes 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.

⁴Facilities co-firing biomass and coal are classified as coal.

⁵Does not include off-grid photovoltaics (PV). Based on annual PV shipments from 1989 through 2015, EIA estimates that as much as 274 megawatts of remote electricity generation PV applications (i.e., off-grid power systems) were in service in 2015, plus an additional 573 megawatts in communications, transportation, and assorted other non-grid-connected, specialized applications. See U.S. Energy Information Administration, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012), Table 10.9 (annual PV shipments, 1989-2010), and Table 12 (U.S. photovoltaic module shipments by end use, sector, and type) in U.S. Energy Information Administration, *Solar Photovoltaic Cell/Module Shipments Report, 2011* (Washington, DC, September 2012) and U.S. Energy Information Administration, *Solar Photovoltaic Cell/Module Shipments Report, 2012* (Washington, DC, December 2013). 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.

⁶Includes 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 2015 approximately 7 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).

⁷Includes 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.

⁸Includes 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 capacity: U.S. Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report" (preliminary). 2014 generation: EIA, *Monthly Energy Review*, February 2016. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|-------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Marketed renewable energy¹ | | | | | | | | |
| Residential (wood) | 0.59 | 0.44 | 0.42 | 0.41 | 0.39 | 0.38 | 0.37 | -0.7% |
| Commercial (biomass) | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.0% |
| Industrial² | 2.26 | 2.26 | 2.30 | 2.39 | 2.47 | 2.52 | 2.63 | 0.6% |
| Conventional hydroelectric power..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0% |
| Municipal waste ³ | 0.19 | 0.20 | 0.22 | 0.23 | 0.23 | 0.24 | 0.26 | 1.1% |
| Biomass..... | 1.32 | 1.29 | 1.25 | 1.35 | 1.43 | 1.46 | 1.53 | 0.7% |
| Biofuels heat and coproducts..... | 0.75 | 0.78 | 0.83 | 0.80 | 0.81 | 0.81 | 0.84 | 0.3% |
| Transportation | 1.30 | 1.38 | 1.53 | 1.48 | 1.47 | 1.50 | 1.59 | 0.6% |
| Ethanol used in E85 ⁴ | 0.02 | 0.03 | 0.03 | 0.08 | 0.14 | 0.18 | 0.18 | 7.3% |
| Ethanol used in gasoline blending..... | 1.09 | 1.12 | 1.12 | 1.01 | 0.94 | 0.93 | 1.01 | -0.4% |
| Biodiesel used in distillate blending..... | 0.19 | 0.22 | 0.30 | 0.19 | 0.19 | 0.19 | 0.19 | -0.5% |
| Biobutanol..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| Liquids from biomass..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | -- |
| Renewable diesel and gasoline ⁵ | 0.00 | 0.00 | 0.08 | 0.19 | 0.19 | 0.19 | 0.19 | 17.9% |
| Electric power⁶ | 5.01 | 4.86 | 7.37 | 8.91 | 9.41 | 10.60 | 11.67 | 3.6% |
| Conventional hydroelectric power..... | 2.50 | 2.34 | 2.79 | 2.80 | 2.81 | 2.81 | 2.83 | 0.8% |
| Geothermal..... | 0.15 | 0.16 | 0.21 | 0.31 | 0.41 | 0.49 | 0.53 | 4.9% |
| Biogenic municipal waste ⁷ | 0.24 | 0.25 | 0.28 | 0.28 | 0.28 | 0.29 | 0.29 | 0.6% |
| Biomass..... | 0.23 | 0.10 | 0.15 | 0.21 | 0.24 | 0.22 | 0.27 | 3.9% |
| Dedicated plants..... | 0.15 | 0.06 | 0.09 | 0.13 | 0.15 | 0.14 | 0.18 | 4.7% |
| Cofiring..... | 0.08 | 0.05 | 0.06 | 0.08 | 0.09 | 0.08 | 0.09 | 2.7% |
| Solar thermal..... | 0.02 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 | 1.5% |
| Solar photovoltaic..... | 0.14 | 0.18 | 0.46 | 1.03 | 1.37 | 2.44 | 3.29 | 12.3% |
| Wind..... | 1.73 | 1.79 | 3.43 | 4.24 | 4.27 | 4.30 | 4.41 | 3.7% |
| Total marketed renewable energy | 9.31 | 9.08 | 11.76 | 13.32 | 13.88 | 15.13 | 16.40 | 2.4% |
| Sources of ethanol | | | | | | | | |
| from corn and other starch..... | 1.18 | 1.21 | 1.16 | 1.12 | 1.12 | 1.13 | 1.17 | -0.1% |
| from cellulose..... | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.4% |
| Net imports..... | -0.07 | -0.06 | -0.01 | -0.04 | -0.04 | -0.03 | 0.02 | -- |
| Total | 1.11 | 1.15 | 1.15 | 1.09 | 1.09 | 1.11 | 1.20 | 0.2% |

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

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Nonmarketed renewable energy⁸ | | | | | | | | |
| Selected consumption | | | | | | | | |
| Residential | 0.08 | 0.11 | 0.35 | 0.50 | 0.63 | 0.78 | 0.94 | 8.8% |
| Solar hot water heating..... | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 3.4% |
| Geothermal heat pumps | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 2.8% |
| Solar photovoltaic | 0.05 | 0.08 | 0.30 | 0.43 | 0.57 | 0.71 | 0.86 | 10.2% |
| Wind | 0.01 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 2.0% |
| Commercial | 0.15 | 0.16 | 0.18 | 0.22 | 0.29 | 0.38 | 0.47 | 4.4% |
| Solar thermal | 0.08 | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 | 0.11 | 1.0% |
| Solar photovoltaic | 0.06 | 0.07 | 0.09 | 0.12 | 0.19 | 0.27 | 0.35 | 6.5% |
| Wind | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 9.0% |

¹Includes 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. Actual heat rates used to determine fuel consumption for all renewable fuels except hydroelectric, geothermal, solar, and wind. Consumption at hydroelectric, solar, and wind facilities is determined by using the fossil fuel equivalent of 9,541 Btu per kilowatthour.

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

³Includes 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.

⁴Excludes motor gasoline component of E85.

⁵Renewable feedstocks for the on-site production of diesel and gasoline.

⁶Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.

⁷Includes 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 2015 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).

⁸Includes 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 ethanol: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016. 2014 electric power sector: EIA, Form EIA-860, "Annual Electric Generator Report" (preliminary). Other 2014 values: EIA, Office of Energy Analysis. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Sector and source | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|-----------------------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Residential | | | | | | | | |
| Petroleum | 69 | 64 | 59 | 53 | 49 | 45 | 41 | -1.7% |
| Natural gas | 278 | 253 | 258 | 256 | 255 | 253 | 251 | 0.0% |
| Electricity ¹ | 765 | 711 | 664 | 586 | 538 | 531 | 529 | -1.2% |
| Total residential | 1,112 | 1,028 | 981 | 895 | 841 | 829 | 821 | -0.9% |
| Commercial | | | | | | | | |
| Petroleum | 39 | 47 | 50 | 49 | 49 | 48 | 47 | 0.0% |
| Natural gas | 189 | 176 | 183 | 184 | 188 | 194 | 202 | 0.5% |
| Coal | 5 | 6 | 5 | 5 | 5 | 5 | 5 | -0.4% |
| Electricity ¹ | 735 | 690 | 654 | 599 | 566 | 569 | 572 | -0.7% |
| Total commercial | 968 | 918 | 893 | 836 | 807 | 817 | 826 | -0.4% |
| Industrial² | | | | | | | | |
| Petroleum | 341 | 378 | 410 | 431 | 434 | 443 | 458 | 0.8% |
| Natural gas ³ | 476 | 478 | 524 | 560 | 579 | 609 | 636 | 1.2% |
| Coal | 138 | 130 | 120 | 128 | 131 | 130 | 131 | 0.0% |
| Electricity ¹ | 542 | 486 | 504 | 481 | 443 | 436 | 434 | -0.5% |
| Total industrial | 1,497 | 1,472 | 1,558 | 1,600 | 1,587 | 1,618 | 1,660 | 0.5% |
| Transportation | | | | | | | | |
| Petroleum ⁴ | 1,777 | 1,800 | 1,802 | 1,720 | 1,652 | 1,629 | 1,628 | -0.4% |
| Natural gas ⁵ | 48 | 51 | 49 | 55 | 62 | 74 | 93 | 2.4% |
| Electricity ¹ | 4 | 5 | 6 | 10 | 12 | 15 | 16 | 5.1% |
| Total transportation | 1,829 | 1,855 | 1,857 | 1,784 | 1,726 | 1,717 | 1,737 | -0.3% |
| Electric power⁶ | | | | | | | | |
| Petroleum | 26 | 20 | 11 | 10 | 8 | 7 | 6 | -4.4% |
| Natural gas | 444 | 524 | 451 | 509 | 602 | 608 | 653 | 0.9% |
| Coal | 1,570 | 1,340 | 1,360 | 1,150 | 943 | 930 | 885 | -1.6% |
| Other ⁷ | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0.0% |
| Total electric power | 2,046 | 1,891 | 1,829 | 1,675 | 1,559 | 1,551 | 1,551 | -0.8% |
| Total by fuel | | | | | | | | |
| Petroleum ⁴ | 2,252 | 2,309 | 2,332 | 2,262 | 2,191 | 2,171 | 2,181 | -0.2% |
| Natural gas | 1,434 | 1,482 | 1,466 | 1,563 | 1,685 | 1,737 | 1,835 | 0.9% |
| Coal | 1,713 | 1,476 | 1,485 | 1,283 | 1,079 | 1,065 | 1,021 | -1.5% |
| Other ⁷ | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0.0% |
| Total | 5,406 | 5,273 | 5,289 | 5,115 | 4,961 | 4,980 | 5,044 | -0.2% |
| Carbon dioxide emissions | | | | | | | | |
| (tons per person) | 16.9 | 16.4 | 15.8 | 14.7 | 13.8 | 13.4 | 13.3 | -0.8% |

¹Emissions from the electric power sector are distributed to the end-use sectors.

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

³Includes lease and plant fuel.

⁴This 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 2015, international bunker fuels accounted for 90 to 126 million metric tons annually.

⁵Includes pipeline fuel natural gas and natural gas used as fuel in motor vehicles, trains, and ships.

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

⁷Includes 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 Table A19, "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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 emissions and emission factors: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

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

| Sector and end use | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|---|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Residential | | | | | | | | |
| Space heating..... | 314 | 262 | 263 | 248 | 237 | 230 | 223 | -0.6% |
| Space cooling..... | 104 | 120 | 104 | 94 | 89 | 90 | 92 | -1.1% |
| Water heating..... | 143 | 139 | 136 | 129 | 124 | 121 | 118 | -0.6% |
| Refrigeration..... | 57 | 53 | 47 | 41 | 37 | 36 | 36 | -1.5% |
| Cooking..... | 30 | 29 | 29 | 28 | 27 | 28 | 28 | -0.1% |
| Clothes dryers..... | 35 | 33 | 33 | 30 | 29 | 29 | 29 | -0.5% |
| Freezers..... | 12 | 11 | 10 | 8 | 7 | 7 | 6 | -2.2% |
| Lighting..... | 81 | 74 | 60 | 45 | 33 | 26 | 24 | -4.4% |
| Clothes washers ¹ | 4 | 4 | 3 | 2 | 2 | 2 | 2 | -3.4% |
| Dishwashers ¹ | 15 | 14 | 13 | 12 | 12 | 13 | 13 | -0.3% |
| Televisions and related equipment ² | 48 | 42 | 36 | 31 | 29 | 31 | 32 | -1.1% |
| Computers and related equipment ³ | 18 | 17 | 13 | 10 | 8 | 7 | 5 | -4.4% |
| Furnace fans and boiler circulation pumps..... | 23 | 17 | 17 | 14 | 12 | 11 | 10 | -2.0% |
| Other uses ⁴ | 230 | 213 | 216 | 201 | 194 | 198 | 202 | -0.2% |
| Discrepancy ⁵ | -3 | 0 | 0 | 0 | 0 | 0 | 0 | -0.9% |
| Total residential..... | 1,112 | 1,028 | 981 | 895 | 841 | 829 | 821 | -0.9% |
| Commercial | | | | | | | | |
| Space heating ⁶ | 139 | 125 | 124 | 117 | 112 | 109 | 107 | -0.6% |
| Space cooling ⁶ | 78 | 85 | 75 | 67 | 61 | 60 | 60 | -1.4% |
| Water heating ⁶ | 44 | 44 | 43 | 42 | 43 | 44 | 45 | 0.1% |
| Ventilation..... | 82 | 77 | 76 | 69 | 63 | 62 | 62 | -0.9% |
| Cooking..... | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 0.5% |
| Lighting..... | 141 | 131 | 121 | 103 | 90 | 81 | 75 | -2.2% |
| Refrigeration..... | 58 | 54 | 46 | 38 | 33 | 32 | 32 | -2.1% |
| Office equipment (PC)..... | 14 | 12 | 9 | 6 | 4 | 3 | 2 | -6.3% |
| Office equipment (non-PC)..... | 34 | 33 | 33 | 32 | 34 | 37 | 39 | 0.7% |
| Other uses ⁷ | 362 | 343 | 352 | 349 | 352 | 372 | 389 | 0.5% |
| Total commercial..... | 968 | 918 | 893 | 836 | 807 | 817 | 826 | -0.4% |
| Industrial⁸ | | | | | | | | |
| Manufacturing | | | | | | | | |
| Refining..... | 261 | 257 | 247 | 238 | 233 | 235 | 241 | -0.3% |
| Food products..... | 99 | 94 | 97 | 96 | 97 | 100 | 104 | 0.4% |
| Paper products..... | 79 | 72 | 65 | 65 | 64 | 61 | 60 | -0.7% |
| Bulk chemicals..... | 249 | 238 | 300 | 326 | 325 | 338 | 351 | 1.6% |
| Glass..... | 15 | 16 | 17 | 17 | 17 | 17 | 17 | 0.1% |
| Cement and lime..... | 24 | 24 | 30 | 32 | 32 | 34 | 38 | 1.8% |
| Iron and steel..... | 115 | 108 | 94 | 106 | 105 | 104 | 107 | 0.0% |
| Aluminum..... | 42 | 40 | 44 | 42 | 40 | 38 | 35 | -0.5% |
| Fabricated metal products..... | 33 | 33 | 31 | 29 | 27 | 28 | 29 | -0.5% |
| Machinery..... | 19 | 19 | 19 | 21 | 20 | 21 | 22 | 0.6% |
| Computers and electronics..... | 19 | 18 | 18 | 17 | 17 | 18 | 19 | 0.3% |
| Transportation equipment..... | 40 | 40 | 38 | 36 | 34 | 35 | 36 | -0.4% |
| Electrical equipment..... | 9 | 9 | 10 | 11 | 11 | 11 | 11 | 1.0% |
| Wood products..... | 14 | 13 | 15 | 15 | 14 | 14 | 15 | 0.5% |
| Plastics..... | 34 | 33 | 34 | 33 | 31 | 32 | 32 | 0.0% |
| Balance of manufacturing..... | 137 | 131 | 127 | 122 | 117 | 116 | 116 | -0.5% |
| Total manufacturing..... | 1,190 | 1,144 | 1,186 | 1,205 | 1,186 | 1,202 | 1,233 | 0.3% |
| Nonmanufacturing | | | | | | | | |
| Agriculture..... | 86 | 85 | 82 | 79 | 76 | 74 | 72 | -0.7% |
| Construction..... | 69 | 64 | 83 | 83 | 81 | 82 | 82 | 1.0% |
| Mining..... | 123 | 111 | 115 | 115 | 114 | 117 | 120 | 0.3% |
| Total nonmanufacturing..... | 277 | 261 | 281 | 277 | 271 | 272 | 274 | 0.2% |
| Discrepancy ⁵ | 29 | 67 | 92 | 117 | 130 | 144 | 153 | 3.3% |
| Total industrial..... | 1,497 | 1,472 | 1,558 | 1,600 | 1,587 | 1,618 | 1,660 | 0.5% |

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

| Sector and end use | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Transportation | | | | | | | | |
| Light-duty vehicles | 1,043 | 1,050 | 1,040 | 929 | 837 | 785 | 759 | -1.3% |
| Commercial light trucks ⁹ | 54 | 54 | 55 | 53 | 51 | 51 | 52 | -0.2% |
| Bus transportation | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 0.1% |
| Freight trucks | 379 | 389 | 396 | 410 | 424 | 448 | 477 | 0.8% |
| Rail, passenger | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 0.0% |
| Rail, freight | 34 | 34 | 34 | 36 | 35 | 33 | 33 | -0.2% |
| Shipping, domestic | 8 | 7 | 6 | 6 | 5 | 5 | 5 | -1.5% |
| Shipping, international | 49 | 55 | 48 | 50 | 52 | 54 | 56 | 0.1% |
| Recreational boats | 16 | 17 | 18 | 19 | 19 | 20 | 20 | 0.7% |
| Air | 166 | 168 | 178 | 189 | 200 | 207 | 212 | 0.9% |
| Military use | 46 | 46 | 46 | 46 | 49 | 52 | 56 | 0.8% |
| Lubricants | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0.2% |
| Pipeline fuel | 46 | 47 | 44 | 47 | 50 | 53 | 57 | 0.7% |
| Discrepancy ⁵ | -40 | -40 | -37 | -30 | -24 | -20 | -17 | -3.4% |
| Total transportation | 1,829 | 1,855 | 1,857 | 1,784 | 1,726 | 1,717 | 1,737 | -0.3% |
| Biogenic energy combustion¹⁰ | | | | | | | | |
| Biomass | 214 | 185 | 184 | 198 | 206 | 205 | 216 | 0.6% |
| Electric power sector | 21 | 10 | 14 | 19 | 22 | 20 | 25 | 3.9% |
| Other sectors | 193 | 175 | 169 | 178 | 184 | 185 | 191 | 0.3% |
| Biogenic waste | 22 | 23 | 25 | 25 | 25 | 26 | 27 | 0.6% |
| Biofuels heat and coproducts | 70 | 73 | 77 | 75 | 76 | 76 | 79 | 0.3% |
| Ethanol | 76 | 79 | 79 | 75 | 74 | 76 | 82 | 0.2% |
| Biodiesel | 14 | 16 | 22 | 14 | 14 | 14 | 14 | -0.5% |
| Liquids from biomass | 0 | 0 | 0 | 0 | 0 | 1 | 1 | -- |
| Renewable diesel and gasoline | 0 | 0 | 6 | 14 | 14 | 14 | 14 | 17.9% |
| Total | 396 | 376 | 393 | 401 | 409 | 413 | 432 | 0.6% |

¹Does not include water heating portion of load.

²Includes televisions, set-top boxes, home theater systems, DVD players, and video game consoles.

³Includes desktop and laptop computers, monitors, and networking equipment.

⁴Includes small electric devices, heating elements, outdoor grills, exterior lights, pool heaters, spa heaters, backup electricity generators, and motors not listed above. Electric vehicles are included in the transportation sector.

⁵Represents 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.

⁶Includes emissions related to fuel consumption for district services.

⁷Includes emissions related to (but 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, emergency generators, combined heat and power in commercial buildings, manufacturing performed in commercial buildings, and cooking (distillate), plus residual fuel oil, propane, coal, motor gasoline, kerosene, and marketed renewable fuels (biomass).

⁸Includes combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

⁹Commercial trucks 8,501 to 10,000 pounds gross vehicle weight rating.

¹⁰By 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 2014 are model results and may differ from official EIA data reports.

Sources: 2014 emissions and emission factors: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, February 2016. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A20. Macroeconomic indicators
(billion 2009 chain-weighted dollars, unless otherwise noted)

| Indicators | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Real gross domestic product | 15,962 | 16,349 | 18,555 | 20,765 | 23,113 | 25,598 | 28,397 | 2.2% |
| Components of real gross domestic product | | | | | | | | |
| Real consumption | 10,876 | 11,221 | 12,861 | 14,348 | 16,092 | 17,881 | 19,870 | 2.3% |
| Real investment | 2,718 | 2,842 | 3,513 | 4,068 | 4,520 | 5,051 | 5,661 | 2.8% |
| Real government spending | 2,838 | 2,860 | 2,967 | 3,056 | 3,222 | 3,396 | 3,602 | 0.9% |
| Real exports | 2,086 | 2,119 | 2,615 | 3,374 | 4,178 | 5,105 | 6,113 | 4.3% |
| Real imports | 2,529 | 2,662 | 3,374 | 4,032 | 4,824 | 5,721 | 6,683 | 3.8% |
| Energy intensity (thousand Btu per 2009 dollar of GDP) | | | | | | | | |
| Delivered energy | 4.52 | 4.38 | 4.03 | 3.65 | 3.29 | 3.04 | 2.83 | -1.7% |
| Total energy | 6.15 | 5.92 | 5.42 | 4.89 | 4.39 | 4.06 | 3.77 | -1.8% |
| Price indices | | | | | | | | |
| GDP chain-type price index (2009=1.00) | 1.09 | 1.10 | 1.21 | 1.34 | 1.49 | 1.66 | 1.85 | 2.1% |
| Consumer price index (1982-4=1.00) | | | | | | | | |
| All-urban | 2.37 | 2.37 | 2.65 | 2.99 | 3.35 | 3.78 | 4.27 | 2.4% |
| Energy commodities and services | 2.43 | 2.02 | 2.41 | 2.87 | 3.34 | 3.92 | 4.61 | 3.4% |
| Wholesale price index (1982=1.00) | | | | | | | | |
| All commodities | 2.05 | 1.91 | 2.14 | 2.37 | 2.59 | 2.87 | 3.16 | 2.0% |
| Fuel and power | 2.10 | 1.60 | 2.10 | 2.53 | 2.91 | 3.39 | 3.92 | 3.7% |
| Metals and metal products | 2.15 | 2.01 | 2.15 | 2.35 | 2.55 | 2.80 | 3.06 | 1.7% |
| Industrial commodities excluding energy | 1.98 | 1.94 | 2.13 | 2.33 | 2.53 | 2.76 | 3.01 | 1.8% |
| Interest rates (percent, nominal) | | | | | | | | |
| Federal funds rate | 0.09 | 0.13 | 3.32 | 3.22 | 3.24 | 3.23 | 3.08 | -- |
| 10-year treasury note | 2.54 | 2.14 | 3.83 | 3.66 | 3.77 | 3.82 | 3.72 | -- |
| AA utility bond rate | 4.19 | 4.01 | 5.87 | 5.41 | 5.73 | 5.85 | 5.71 | -- |
| Value of shipments (billion 2009 dollars) | | | | | | | | |
| Non-industrial and service sectors | 23,338 | 24,085 | 26,750 | 29,265 | 32,042 | 34,833 | 37,701 | 1.8% |
| Total industrial | 7,165 | 7,229 | 8,351 | 9,146 | 9,776 | 10,562 | 11,483 | 1.9% |
| Agriculture, mining, and construction | 1,957 | 1,931 | 2,493 | 2,620 | 2,710 | 2,828 | 2,955 | 1.7% |
| Manufacturing | 5,208 | 5,299 | 5,858 | 6,527 | 7,066 | 7,734 | 8,528 | 1.9% |
| Energy-intensive | 1,718 | 1,704 | 1,892 | 2,046 | 2,147 | 2,267 | 2,417 | 1.4% |
| Non-energy-intensive | 3,490 | 3,594 | 3,967 | 4,481 | 4,920 | 5,467 | 6,111 | 2.1% |
| Total shipments | 30,504 | 31,314 | 35,101 | 38,411 | 41,818 | 45,396 | 49,184 | 1.8% |
| Population and employment (millions) | | | | | | | | |
| Population, with armed forces overseas | 319 | 322 | 335 | 348 | 360 | 371 | 381 | 0.7% |
| Population, aged 16 and over | 254 | 257 | 269 | 281 | 292 | 302 | 311 | 0.8% |
| Population, aged 65 and over | 46 | 48 | 57 | 66 | 74 | 79 | 82 | 2.2% |
| Employment, nonfarm | 138 | 142 | 150 | 156 | 161 | 165 | 170 | 0.7% |
| Employment, manufacturing | 12.2 | 12.5 | 13.1 | 13.4 | 13.0 | 12.6 | 12.3 | -0.1% |
| Key labor indicators | | | | | | | | |
| Labor force (millions) | 156 | 157 | 167 | 171 | 177 | 183 | 188 | 0.7% |
| Nonfarm labor productivity (2009=1.00) | 1.05 | 1.06 | 1.15 | 1.25 | 1.37 | 1.50 | 1.63 | 1.7% |
| Unemployment rate (percent) | 6.15 | 5.31 | 4.72 | 4.90 | 4.78 | 4.76 | 4.78 | -- |
| Key indicators for energy demand | | | | | | | | |
| Real disposable personal income | 11,836 | 12,225 | 14,197 | 15,888 | 17,826 | 19,689 | 21,789 | 2.3% |
| Housing starts (millions) | 1.06 | 1.18 | 1.74 | 1.71 | 1.66 | 1.66 | 1.65 | 1.3% |
| Commercial floorspace (billion square feet) | 83.1 | 83.8 | 88.7 | 94.0 | 99.3 | 104.6 | 109.8 | 1.1% |
| Unit sales of light-duty vehicles (millions) | 16.4 | 17.4 | 17.1 | 17.3 | 17.7 | 18.2 | 19.0 | 0.4% |

GDP = Gross domestic product.

Btu = British thermal unit.

-- = Not applicable.

Sources: 2014 and 2015: IHS Economics, Industry and Employment models, November 2015. Projections: U.S. Energy Information Administration, AEO2016 National Energy Modeling System run ref2016.d032416a.

Table A21. International petroleum and other liquids supply, disposition, and prices
(million barrels per day, unless otherwise noted)

| Supply, disposition, and prices | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|--|----------------|--------------|---------------|---------------|---------------|---------------|---------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Crude oil spot prices | | | | | | | | |
| (2015 dollars per barrel) | | | | | | | | |
| Brent..... | 100 | 52 | 77 | 92 | 104 | 120 | 136 | 3.9% |
| West Texas Intermediate..... | 94 | 49 | 71 | 85 | 97 | 112 | 129 | 4.0% |
| (nominal dollars per barrel) | | | | | | | | |
| Brent..... | 99 | 52 | 85 | 112 | 141 | 181 | 229 | 6.1% |
| West Texas Intermediate..... | 93 | 49 | 79 | 105 | 131 | 170 | 217 | 6.2% |
| Petroleum and other liquids consumption¹ | | | | | | | | |
| OECD | | | | | | | | |
| United States (50 states)..... | 19.16 | 19.42 | 20.11 | 19.90 | 19.54 | 19.69 | 20.14 | 0.1% |
| United States territories..... | 0.30 | 0.30 | 0.31 | 0.32 | 0.34 | 0.36 | 0.38 | 1.0% |
| Canada..... | 2.41 | 2.39 | 2.39 | 2.38 | 2.39 | 2.44 | 2.51 | 0.2% |
| Mexico and Chile..... | 2.29 | 2.30 | 2.38 | 2.36 | 2.50 | 2.67 | 2.87 | 0.9% |
| OECD Europe ² | 13.66 | 13.83 | 13.70 | 13.57 | 13.65 | 13.79 | 13.98 | 0.0% |
| Japan..... | 4.30 | 4.14 | 3.91 | 3.75 | 3.66 | 3.56 | 3.40 | -0.8% |
| South Korea..... | 2.35 | 2.38 | 2.41 | 2.42 | 2.44 | 2.48 | 2.55 | 0.3% |
| Australia and New Zealand..... | 1.24 | 1.28 | 1.35 | 1.39 | 1.41 | 1.45 | 1.53 | 0.7% |
| Total OECD consumption..... | 45.71 | 46.03 | 46.56 | 46.08 | 45.93 | 46.44 | 47.35 | 0.1% |
| Non-OECD | | | | | | | | |
| Russia..... | 3.56 | 3.35 | 3.65 | 3.79 | 3.75 | 3.73 | 3.59 | 0.3% |
| Other Europe and Eurasia ³ | 2.04 | 2.07 | 2.18 | 2.34 | 2.43 | 2.48 | 2.53 | 0.8% |
| China..... | 10.85 | 11.18 | 12.71 | 13.81 | 14.81 | 15.65 | 16.36 | 1.5% |
| India..... | 3.78 | 3.97 | 4.54 | 5.19 | 5.94 | 6.97 | 8.26 | 3.0% |
| Other Asia ⁴ | 8.04 | 8.15 | 9.40 | 10.35 | 11.42 | 12.73 | 14.29 | 2.3% |
| Middle East..... | 8.13 | 8.29 | 9.96 | 10.42 | 11.28 | 12.31 | 13.23 | 1.9% |
| Africa..... | 3.71 | 3.86 | 4.54 | 5.06 | 5.50 | 6.08 | 6.93 | 2.4% |
| Brazil..... | 3.15 | 3.15 | 3.41 | 3.74 | 4.06 | 4.39 | 4.71 | 1.6% |
| Other Central and South America..... | 3.83 | 3.85 | 4.11 | 4.28 | 4.41 | 4.60 | 4.89 | 1.0% |
| Total non-OECD consumption..... | 47.08 | 47.87 | 54.49 | 58.99 | 63.60 | 68.93 | 74.79 | 1.8% |
| Total consumption..... | 92.79 | 93.90 | 101.05 | 105.06 | 109.52 | 115.37 | 122.14 | 1.1% |
| Petroleum and other liquids production | | | | | | | | |
| OPEC ⁵ | | | | | | | | |
| Middle East..... | 26.66 | 27.76 | 30.87 | 32.33 | 34.29 | 36.87 | 39.38 | 1.4% |
| North Africa..... | 2.24 | 2.13 | 1.99 | 2.12 | 2.32 | 2.58 | 2.94 | 1.3% |
| West Africa..... | 4.18 | 4.21 | 4.35 | 4.41 | 4.58 | 4.72 | 5.07 | 0.8% |
| South America..... | 3.24 | 3.24 | 2.96 | 3.10 | 3.33 | 3.60 | 3.88 | 0.7% |
| Total OPEC production..... | 36.33 | 37.33 | 40.17 | 41.96 | 44.52 | 47.75 | 51.28 | 1.3% |
| Non-OPEC | | | | | | | | |
| OECD | | | | | | | | |
| United States (50 states)..... | 14.01 | 14.95 | 16.33 | 16.52 | 17.26 | 17.93 | 18.62 | 0.9% |
| Canada..... | 4.39 | 4.54 | 5.43 | 5.39 | 5.55 | 5.73 | 6.01 | 1.1% |
| Mexico and Chile..... | 2.84 | 2.64 | 2.46 | 2.56 | 2.58 | 2.83 | 3.24 | 0.8% |
| OECD Europe ² | 3.66 | 3.79 | 3.44 | 3.32 | 3.10 | 2.92 | 2.78 | -1.2% |
| Japan and South Korea..... | 0.22 | 0.22 | 0.20 | 0.21 | 0.21 | 0.22 | 0.22 | 0.0% |
| Australia and New Zealand..... | 0.52 | 0.51 | 0.66 | 0.63 | 0.61 | 0.69 | 0.76 | 1.7% |
| Total OECD production..... | 25.63 | 26.65 | 28.51 | 28.63 | 29.31 | 30.32 | 31.63 | 0.7% |
| Non-OECD | | | | | | | | |
| Russia..... | 10.85 | 10.95 | 10.62 | 10.99 | 11.22 | 11.51 | 12.21 | 0.4% |
| Other Europe and Eurasia ³ | 3.21 | 3.23 | 3.69 | 4.34 | 4.63 | 4.68 | 4.50 | 1.3% |
| China..... | 4.60 | 4.69 | 4.90 | 5.23 | 5.44 | 5.91 | 6.24 | 1.1% |
| Other Asia ⁴ | 3.94 | 4.03 | 3.92 | 3.75 | 3.65 | 3.61 | 3.62 | -0.4% |
| Middle East..... | 1.17 | 1.14 | 1.02 | 0.91 | 0.83 | 0.76 | 0.69 | -2.0% |
| Africa..... | 2.33 | 2.33 | 2.48 | 2.58 | 2.73 | 2.79 | 2.83 | 0.8% |
| Brazil..... | 2.97 | 3.15 | 3.59 | 4.59 | 5.00 | 5.46 | 6.15 | 2.7% |
| Other Central and South America..... | 2.18 | 2.18 | 2.15 | 2.10 | 2.19 | 2.58 | 2.99 | 1.3% |
| Total non-OECD production..... | 31.25 | 31.70 | 32.37 | 34.48 | 35.69 | 37.30 | 39.23 | 0.9% |
| Total petroleum and other liquids production.... | 93.21 | 95.68 | 101.05 | 105.06 | 109.52 | 115.37 | 122.14 | 1.0% |
| OPEC market share (percent)..... | 39.0 | 39.0 | 39.8 | 39.9 | 40.7 | 41.4 | 42.0 | -- |

Table A21. International petroleum and other liquids supply, disposition, and prices (continued)
(million barrels per day, unless otherwise noted)

| Supply, disposition, and prices | Reference case | | | | | | | Annual growth 2015-2040 (percent) |
|---|----------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------------------|
| | 2014 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | |
| Selected world production subtotals: | | | | | | | | |
| Crude oil and equivalents ⁶ | 77.98 | 80.13 | 82.77 | 85.71 | 89.12 | 93.95 | 99.74 | 0.9% |
| Tight oil | 4.69 | 5.34 | 5.44 | 5.85 | 6.96 | 8.50 | 10.35 | 2.7% |
| Bitumen ⁷ | 2.25 | 2.32 | 3.08 | 3.12 | 3.18 | 3.24 | 3.31 | 1.4% |
| Refinery processing gain ⁸ | 2.50 | 2.45 | 2.53 | 2.62 | 2.73 | 2.84 | 2.94 | 0.7% |
| Natural gas plant liquids | 10.07 | 10.37 | 12.32 | 12.88 | 13.24 | 13.58 | 13.88 | 1.2% |
| Liquids from renewable sources ⁹ | 2.26 | 2.32 | 2.54 | 2.88 | 3.31 | 3.71 | 4.11 | 2.3% |
| Liquids from coal ¹⁰ | 0.20 | 0.25 | 0.27 | 0.16 | 0.26 | 0.36 | 0.50 | 2.8% |
| Liquids from natural gas ¹¹ | 0.27 | 0.29 | 0.32 | 0.52 | 0.57 | 0.62 | 0.65 | 3.3% |
| Liquids from kerogen ¹² | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.7% |
| Crude oil production⁶ | | | | | | | | |
| OPEC ⁵ | | | | | | | | |
| Middle East | 23.32 | 24.38 | 27.07 | 28.31 | 30.10 | 32.42 | 34.74 | 1.4% |
| North Africa | 1.89 | 1.78 | 1.61 | 1.71 | 1.82 | 1.97 | 2.20 | 0.9% |
| West Africa | 4.16 | 4.19 | 4.28 | 4.34 | 4.51 | 4.64 | 4.99 | 0.7% |
| South America | 3.06 | 3.05 | 2.75 | 2.85 | 3.09 | 3.35 | 3.64 | 0.7% |
| Total OPEC production | 32.43 | 33.40 | 35.72 | 37.22 | 39.52 | 42.38 | 45.57 | 1.3% |
| Non-OPEC | | | | | | | | |
| OECD | | | | | | | | |
| United States (50 states) | 8.71 | 9.42 | 9.38 | 9.43 | 10.06 | 10.66 | 11.26 | 0.7% |
| Canada | 3.61 | 3.72 | 4.57 | 4.42 | 4.53 | 4.69 | 4.96 | 1.2% |
| Mexico and Chile | 2.48 | 2.31 | 2.16 | 2.27 | 2.29 | 2.55 | 2.96 | 1.0% |
| OECD Europe ² | 2.82 | 2.95 | 2.31 | 2.15 | 1.88 | 1.65 | 1.47 | -2.7% |
| Japan and South Korea | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -1.2% |
| Australia and New Zealand | 0.39 | 0.39 | 0.53 | 0.51 | 0.49 | 0.56 | 0.64 | 1.9% |
| Total OECD production | 18.01 | 18.81 | 18.96 | 18.78 | 19.24 | 20.12 | 21.29 | 0.5% |
| Non-OECD | | | | | | | | |
| Russia | 10.11 | 10.17 | 9.84 | 10.23 | 10.49 | 10.81 | 11.53 | 0.5% |
| Other Europe and Eurasia ³ | 2.99 | 3.00 | 3.43 | 4.07 | 4.36 | 4.40 | 4.23 | 1.4% |
| China | 4.20 | 4.28 | 4.34 | 4.46 | 4.40 | 4.63 | 4.67 | 0.3% |
| Other Asia ⁴ | 3.10 | 3.18 | 2.98 | 2.73 | 2.52 | 2.38 | 2.25 | -1.4% |
| Middle East | 1.14 | 1.11 | 1.00 | 0.89 | 0.81 | 0.74 | 0.67 | -2.0% |
| Africa | 1.94 | 1.94 | 2.01 | 2.10 | 2.25 | 2.30 | 2.34 | 0.8% |
| Brazil | 2.25 | 2.43 | 2.77 | 3.58 | 3.78 | 4.07 | 4.67 | 2.7% |
| Other Central and South America | 1.80 | 1.81 | 1.72 | 1.65 | 1.75 | 2.12 | 2.52 | 1.3% |
| Total non-OECD production | 27.54 | 27.92 | 28.09 | 29.72 | 30.36 | 31.45 | 32.87 | 0.7% |
| Total crude oil production⁶ | 77.98 | 80.13 | 82.77 | 85.71 | 89.12 | 93.95 | 99.74 | 0.9% |
| OPEC market share (percent) | 41.6 | 41.7 | 43.2 | 43.4 | 44.3 | 45.1 | 45.7 | -- |

¹Estimated consumption. Includes both OPEC and non-OPEC consumers in the regional breakdown.

²OECD Europe = Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

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

⁴Other Asia = Afghanistan, Bangladesh, Bhutan, Brunei, Cambodia (Kampuchea), Fiji, French Polynesia, Guam, Hong Kong, India (for production), 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.

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

⁶Includes crude oil, lease condensate, tight oil (shale oil), extra-heavy oil, and bitumen (oil sands).

⁷Includes diluted and upgraded/synthetic bitumen (syncrude).

⁸The 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.

⁹Includes liquids produced from energy crops.

¹⁰Includes liquids converted from coal via the Fischer-Tropsch coal-to-liquids process.

¹¹Includes liquids converted from natural gas via the Fischer-Tropsch gas-to-liquids process.

¹²Includes liquids produced from kerogen (oil shale, not to be confused with tight oil (shale oil)).

OECD = Organization for Economic Cooperation and Development.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2014 are model results and may differ from official EIA data reports.

Sources: 2014 Brent and West Texas Intermediate crude oil spot prices: Thomson Reuters. 2015: EIA, *Short-Term Energy Outlook*, February 2016 and EIA, AEO2016 National Energy Modeling System run ref2016.d032416a. Projections: EIA, AEO2016 National Energy Modeling System run ref2016.d032416a and EIA, Generate World Oil Balance application.