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Table A9. Electricity generating capacity
(gigawatts)

Net summer capacity ¹	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Electric power sector²								
Power only³								
Coal.....	307.9	301.9	254.9	254.0	254.0	254.0	254.1	-0.6%
Oil and natural gas steam ⁴	103.4	99.2	84.9	77.2	70.9	68.7	68.5	-1.3%
Combined cycle.....	178.8	186.2	205.1	224.1	259.6	291.0	316.2	1.9%
Combustion turbine/diesel.....	135.4	136.4	146.3	166.1	180.6	199.5	220.4	1.7%
Nuclear power ⁵	101.5	102.1	97.8	97.8	98.2	98.8	102.0	0.0%
Pumped storage.....	22.3	22.4	22.4	22.4	22.4	22.4	22.4	0.0%
Fuel cells.....	0.0	0.0	0.1	0.1	0.1	0.1	0.1	1.9%
Renewable sources ⁶	133.0	147.6	173.1	175.0	178.2	184.2	199.2	1.1%
Distributed generation (natural gas) ⁷	0.0	0.0	1.6	3.3	4.6	6.2	8.9	--
Total.....	982.4	996.0	986.1	1,020.0	1,068.6	1,124.7	1,191.7	0.6%
Combined heat and power⁸								
Coal.....	4.8	4.7	4.4	4.4	4.4	4.4	4.3	-0.3%
Oil and natural gas steam ⁴	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.0%
Combined cycle.....	25.6	25.7	26.0	26.0	26.0	26.0	26.0	0.0%
Combustion turbine/diesel.....	3.3	3.3	3.3	3.3	3.3	3.3	3.3	0.0%
Renewable sources ⁶	1.3	1.3	1.4	1.4	1.4	1.4	1.4	0.1%
Total.....	36.1	36.1	36.2	36.2	36.2	36.2	36.1	0.0%
Cumulative planned additions⁹								
Coal.....	--	--	2.2	2.2	2.2	2.2	2.2	--
Oil and natural gas steam ⁴	--	--	0.0	0.0	0.0	0.0	0.0	--
Combined cycle.....	--	--	9.7	9.7	9.7	9.7	9.7	--
Combustion turbine/diesel.....	--	--	3.7	3.7	3.7	3.7	3.7	--
Nuclear power.....	--	--	5.5	5.5	5.5	5.5	5.5	--
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 ⁶	--	--	9.0	9.0	9.0	9.0	9.0	--
Distributed generation ⁷	--	--	0.0	0.0	0.0	0.0	0.0	--
Total.....	--	--	30.1	30.1	30.1	30.1	30.1	--
Cumulative unplanned additions⁹								
Coal.....	--	--	0.3	0.3	0.3	0.3	0.5	--
Oil and natural gas steam ⁴	--	--	0.0	0.0	0.0	0.0	0.0	--
Combined cycle.....	--	--	9.8	28.8	64.3	95.7	120.9	--
Combustion turbine/diesel.....	--	--	14.1	34.5	49.2	68.5	89.4	--
Nuclear power.....	--	--	0.0	0.0	0.3	0.9	4.2	--
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 ⁶	--	--	17.4	19.3	22.5	28.5	43.5	--
Distributed generation ⁷	--	--	1.6	3.3	4.6	6.2	8.9	--
Total.....	--	--	43.2	86.3	141.4	200.2	267.4	--
Cumulative electric power sector additions⁹	--	--	73.3	116.4	171.5	230.3	297.5	--
Cumulative retirements¹⁰								
Coal.....	--	--	49.9	50.7	50.7	50.7	50.8	--
Oil and natural gas steam ⁴	--	--	14.4	22.1	28.3	30.6	30.8	--
Combined cycle.....	--	--	0.3	0.3	0.3	0.3	0.3	--
Combustion turbine/diesel.....	--	--	7.8	8.5	8.7	9.1	9.2	--
Nuclear power.....	--	--	4.8	4.8	4.8	4.8	4.8	--
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 ⁶	--	--	0.9	0.9	0.9	0.9	0.9	--
Total.....	--	--	78.0	87.3	93.8	96.4	96.7	--
Total electric power sector capacity.....	1,018.5	1,032.0	1,022.2	1,056.2	1,104.8	1,160.9	1,227.8	0.6%

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

Net summer capacity ¹	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
End-use generators¹¹								
Coal	3.6	3.4	3.4	3.4	3.4	3.4	3.4	0.0%
Petroleum	0.7	0.9	0.9	0.9	0.9	0.9	0.9	-0.3%
Natural gas	14.9	16.3	19.2	22.3	27.3	33.7	38.9	3.2%
Other gaseous fuels ¹²	2.0	2.1	2.8	2.8	2.8	2.8	2.8	1.0%
Renewable sources ⁸	8.6	10.5	20.5	23.8	28.5	34.3	41.3	5.0%
Other ¹³	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.1%
Total	30.2	33.8	47.2	53.7	63.4	75.6	87.7	3.5%
Cumulative capacity additions⁹	--	--	13.5	20.0	29.7	41.8	53.9	--

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.

⁴Includes oil-, gas-, and dual-fired capacity.

⁵Nuclear capacity includes 0.7 gigawatts of uprates and 5.7 gigawatts of derates through 2020.

⁶Includes 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.

⁷Primarily peak load capacity fueled by natural gas.

⁸Includes 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).

⁹Cumulative additions after December 31, 2012.

¹⁰Cumulative retirements after December 31, 2012.

¹¹Includes 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.

¹²Includes refinery gas and still gas.

¹³Includes 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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 capacity and projected planned additions: U.S. Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report" (preliminary). Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Electricity trade	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	

Interregional electricity trade								
Gross domestic sales								
Firm power.....	161.5	155.8	129.7	65.9	27.6	27.6	27.6	-6.0%
Economy.....	157.3	174.0	134.7	141.4	194.5	164.9	182.6	0.2%
Total	318.8	329.9	264.4	207.3	222.1	192.5	210.2	-1.6%
Gross domestic sales (million 2012 dollars)								
Firm power.....	10,069.9	9,716.3	8,088.6	4,109.8	1,722.5	1,722.5	1,722.5	-6.0%
Economy.....	7,446.1	6,053.8	6,421.1	7,674.7	11,497.7	10,617.5	12,851.8	2.7%
Total	17,516.0	15,770.1	14,509.7	11,784.5	13,220.2	12,340.0	14,574.2	-0.3%
International electricity trade								
Imports from Canada and Mexico								
Firm power.....	15.0	15.9	20.4	16.4	14.0	14.0	14.0	-0.5%
Economy.....	37.4	43.1	27.9	34.2	35.4	31.0	35.0	-0.7%
Total	52.4	59.0	48.3	50.6	49.3	44.9	49.0	-0.7%
Exports to Canada and Mexico								
Firm power.....	2.6	2.7	1.5	0.5	0.0	0.0	0.0	-
Economy.....	12.8	8.8	13.9	14.6	14.6	14.3	14.3	1.8%
Total	15.4	11.5	15.3	15.1	14.6	14.3	14.3	0.8%

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2011 and 2012 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: 2011 and 2012 interregional firm electricity trade data: 2012 seasonal reliability assessments from North American Electric Reliability Council regional entities and Independent System Operators. 2011 and 2012 interregional economy electricity trade are model results. 2011 and 2012 Mexican electricity trade data: U.S. Energy Information Administration (EIA), *Electric Power Annual 2011*, DOE/EIA-0348(2011) (Washington, DC, January 2013). 2011 Canadian international electricity trade data: National Energy Board, *Electricity Exports and Imports Statistics, 2011*. 2012 Canadian international electricity trade data: National Energy Board, *Electricity Exports and Imports Statistics, 2012*. Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Supply and disposition	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Crude oil								
Domestic crude production ¹	5.66	6.49	9.55	9.00	8.30	7.87	7.48	0.5%
Alaska	0.57	0.53	0.44	0.33	0.24	0.38	0.26	-2.5%
Lower 48 states	5.09	5.96	9.12	8.68	8.06	7.49	7.22	0.7%
Net imports	8.89	8.43	5.79	6.05	6.64	7.15	7.74	-0.3%
Gross imports	8.94	8.49	5.94	6.18	6.77	7.27	7.87	-0.3%
Exports	0.05	0.06	0.15	0.13	0.13	0.12	0.12	2.6%
Other crude supply ²	0.27	0.09	0.00	0.00	0.00	0.00	0.00	--
Total crude supply	14.81	15.01	15.34	15.06	14.94	15.02	15.22	0.0%
Other petroleum supply	0.85	0.10	0.23	-0.01	-0.34	-0.67	-0.86	--
Net product imports	-0.25	-0.92	-0.86	-1.01	-1.29	-1.61	-1.82	--
Gross refined product imports ³	1.15	0.85	0.98	1.06	1.06	1.08	1.10	0.9%
Unfinished oil imports	0.69	0.60	0.52	0.50	0.49	0.47	0.45	-1.0%
Blending component imports	0.72	0.62	0.62	0.55	0.50	0.45	0.40	-1.5%
Exports	2.81	2.98	2.97	3.12	3.33	3.61	3.76	0.8%
Refinery processing gain ⁴	1.08	1.08	1.08	1.00	0.96	0.94	0.95	-0.4%
Product stock withdrawal	0.03	-0.06	0.00	0.00	0.00	0.00	0.00	--
Other non-petroleum supply	3.27	3.48	3.96	4.21	4.32	4.40	4.36	0.8%
Supply from renewable sources	0.87	0.89	1.01	1.04	1.04	1.04	1.07	0.7%
Ethanol	0.82	0.83	0.90	0.92	0.91	0.91	0.95	0.5%
Domestic production	0.89	0.84	0.84	0.85	0.86	0.85	0.86	0.1%
Net imports	-0.07	-0.02	0.06	0.06	0.06	0.06	0.08	--
Stock withdrawal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Biodiesel	0.06	0.06	0.09	0.09	0.09	0.09	0.09	--
Domestic production	0.06	0.06	0.08	0.08	0.08	0.08	0.08	0.7%
Net imports	0.00	0.00	0.01	0.01	0.01	0.01	0.01	--
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	0.03	0.04	0.04	0.04	0.03	--
Domestic production	0.00	0.00	0.03	0.04	0.04	0.04	0.03	--
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	2.22	2.40	2.65	2.87	2.98	3.05	2.98	0.8%
Natural gas plant liquids	2.22	2.40	2.65	2.87	2.98	3.05	2.98	0.8%
Gas-to-liquids	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	0.18	0.19	0.30	0.30	0.30	0.31	0.31	1.8%
Total primary supply⁷	18.94	18.59	19.52	19.26	18.93	18.75	18.72	0.0%
Product supplied by fuel								
Liquefied petroleum gases and other ⁸	2.30	2.32	2.73	2.84	2.84	2.78	2.73	0.6%
Motor gasoline ⁹	8.75	8.71	8.35	7.67	7.15	6.91	6.84	-0.9%
of which: E85 ¹⁰	0.00	0.01	0.13	0.26	0.32	0.30	0.23	11.9%
Jet fuel ¹¹	1.43	1.40	1.49	1.52	1.55	1.57	1.59	0.5%
Distillate fuel oil ¹²	3.90	3.74	4.30	4.44	4.52	4.59	4.62	0.8%
of which: Diesel	3.51	3.45	3.94	4.11	4.21	4.30	4.34	0.8%
Residual fuel oil	0.46	0.35	0.39	0.39	0.40	0.40	0.40	0.6%
Other ¹³	2.08	1.97	2.28	2.40	2.49	2.51	2.55	0.9%
by sector								
Residential and commercial	0.97	0.94	0.88	0.84	0.81	0.78	0.76	-0.8%
Industrial ¹⁴	4.45	4.42	5.37	5.64	5.72	5.70	5.68	0.9%
Transportation	13.65	13.44	13.19	12.71	12.32	12.20	12.20	-0.3%
Electric power ¹⁵	0.14	0.10	0.08	0.08	0.08	0.08	0.08	-0.7%
Total	18.92	18.49	19.53	19.27	18.94	18.76	18.73	0.0%
Discrepancy ¹⁶	0.02	0.11	-0.01	-0.01	-0.01	-0.01	-0.01	--

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

Supply and disposition	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Domestic refinery distillation capacity ¹⁷	17.7	17.3	18.1	18.1	18.1	18.1	18.1	0.2%
Capacity utilization rate (percent) ¹⁸	86.0	89.0	84.6	83.1	82.4	82.9	84.0	-0.2%
Net import share of product supplied (percent).....	45.2	40.3	25.6	26.6	28.6	29.9	32.2	-0.8%
Net expenditures for imported crude oil and petroleum products (billion 2012 dollars).....	494.73	313.70	198.85	234.27	278.60	327.33	385.39	0.7%

¹Includes lease condensate.

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

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, 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 plus other petroleum supply plus other non-petroleum 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.

¹⁶Balancing item. Includes unaccounted for supply, losses, and gains.

¹⁷End-of-year operable capacity.

¹⁸Rate 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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 product supplied based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). Other 2011 data: EIA, *Petroleum Supply Annual 2011*, DOE/EIA-0340(2011)/1 (Washington, DC, August 2012). Other 2012 data: EIA, *Petroleum Supply Annual 2012*, DOE/EIA-0340(2012)/1 (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

Table A12. Petroleum and other liquids prices
(2012 dollars per gallon, unless otherwise noted)

Sector and fuel	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Crude oil prices (2012 dollars per barrel)								
Brent spot	113.24	111.65	96.57	108.99	118.99	129.77	141.46	0.8%
West Texas Intermediate spot	96.55	94.12	94.57	106.99	116.99	127.77	139.46	1.4%
Average imported refiners acquisition cost ¹	104.47	101.10	88.07	100.01	109.22	119.80	130.80	0.9%
Delivered sector product prices								
Residential								
Propane	2.31	2.20	2.17	2.27	2.35	2.45	2.52	0.5%
Distillate fuel oil	3.73	3.79	3.42	3.74	3.97	4.24	4.53	0.6%
Commercial								
Distillate fuel oil	3.64	3.70	3.00	3.31	3.54	3.82	4.10	0.4%
Residual fuel oil	2.91	3.42	2.16	2.41	2.68	2.90	3.14	-0.3%
Residual fuel oil (2012 dollars per barrel)	122.01	143.59	90.53	101.42	112.66	121.75	131.97	-0.3%
Industrial²								
Propane	2.07	1.93	1.89	2.02	2.13	2.26	2.36	0.7%
Distillate fuel oil	3.71	3.76	3.05	3.36	3.58	3.84	4.11	0.3%
Residual fuel oil	2.87	3.13	2.23	2.49	2.74	2.96	3.22	0.1%
Residual fuel oil (2012 dollars per barrel)	120.55	131.40	93.56	104.67	115.00	124.42	135.04	0.1%
Transportation								
Propane	2.40	2.30	2.27	2.37	2.45	2.56	2.63	0.5%
Ethanol (E85) ³	4.19	3.33	2.43	2.62	2.65	2.92	3.37	0.0%
Ethanol wholesale price	2.58	2.58	2.66	2.61	2.52	2.43	2.65	0.1%
Motor gasoline ⁴	3.65	3.69	3.08	3.29	3.43	3.65	3.90	0.2%
Jet fuel ⁵	3.11	3.10	2.63	2.96	3.20	3.49	3.79	0.7%
Diesel fuel (distillate fuel oil) ⁶	3.89	3.95	3.67	3.98	4.20	4.47	4.73	0.7%
Residual fuel oil	2.70	3.00	1.86	2.12	2.32	2.54	2.78	-0.3%
Residual fuel oil (2012 dollars per barrel)	113.46	126.17	78.31	89.03	97.43	106.50	116.65	-0.3%
Electric power⁷								
Distillate fuel oil	3.30	3.35	2.87	3.18	3.42	3.70	4.00	0.6%
Residual fuel oil	2.39	3.10	2.07	2.33	2.57	2.81	3.06	0.0%
Residual fuel oil (2012 dollars per barrel)	100.25	130.00	87.12	98.04	107.77	117.85	128.40	0.0%
Average prices, all sectors⁸								
Propane	2.23	2.12	2.06	2.16	2.25	2.36	2.45	0.5%
Motor gasoline ⁴	3.63	3.66	3.08	3.29	3.43	3.65	3.90	0.2%
Jet fuel ⁵	3.11	3.10	2.63	2.96	3.20	3.49	3.79	0.7%
Distillate fuel oil	3.83	3.89	3.53	3.84	4.07	4.33	4.60	0.6%
Residual fuel oil	2.66	3.05	1.97	2.23	2.44	2.66	2.91	-0.2%
Residual fuel oil (2012 dollars per barrel)	111.89	128.30	82.69	93.53	102.60	111.83	122.12	-0.2%
Average	3.28	3.28	2.80	3.02	3.19	3.43	3.69	0.4%

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

Sector and fuel	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Crude oil spot prices (nominal dollars per barrel)								
Brent spot	111.26	111.65	109.37	134.25	160.19	193.27	234.53	2.7%
West Texas Intermediate spot	94.86	94.12	107.11	131.78	157.49	190.30	231.22	3.3%
Average imported refiners acquisition cost ¹	102.64	101.10	99.75	123.19	147.02	178.43	216.87	2.8%
Delivered sector product prices								
Residential								
Propane	2.27	2.20	2.46	2.80	3.17	3.65	4.19	2.3%
Distillate fuel oil	3.67	3.79	3.88	4.60	5.34	6.31	7.51	2.5%
Commercial								
Distillate fuel oil	3.58	3.70	3.40	4.08	4.76	5.69	6.79	2.2%
Residual fuel oil	2.85	3.42	2.44	2.97	3.61	4.32	5.21	1.5%
Residual fuel oil (nominal dollars per barrel)	119.88	143.59	102.54	124.92	151.65	181.33	218.81	1.5%
Industrial²								
Propane	2.03	1.93	2.14	2.48	2.86	3.36	3.91	2.6%
Distillate fuel oil	3.65	3.76	3.46	4.13	4.82	5.72	6.81	2.1%
Residual fuel oil	2.82	3.13	2.52	3.07	3.69	4.41	5.33	1.9%
Residual fuel oil (nominal dollars per barrel)	118.44	131.40	105.96	128.93	154.81	185.30	223.89	1.9%
Transportation								
Propane	2.36	2.30	2.57	2.92	3.30	3.81	4.36	2.3%
Ethanol (E85) ³	4.11	3.33	2.76	3.22	3.57	4.34	5.59	1.9%
Ethanol wholesale price	2.54	2.58	3.02	3.21	3.39	3.63	4.39	1.9%
Motor gasoline ⁴	3.58	3.69	3.49	4.05	4.61	5.43	6.47	2.0%
Jet fuel ⁵	3.05	3.10	2.98	3.65	4.31	5.19	6.28	2.5%
Diesel fuel (distillate fuel oil) ⁶	3.82	3.95	4.16	4.90	5.66	6.65	7.84	2.5%
Residual fuel oil	2.65	3.00	2.11	2.61	3.12	3.78	4.60	1.5%
Residual fuel oil (nominal dollars per barrel)	111.48	126.17	88.69	109.66	131.15	158.62	193.40	1.5%
Electric power⁷								
Distillate fuel oil	3.24	3.35	3.25	3.92	4.60	5.51	6.62	2.5%
Residual fuel oil	2.35	3.10	2.35	2.88	3.45	4.18	5.07	1.8%
Residual fuel oil (nominal dollars per barrel)	98.49	130.00	98.67	120.77	145.08	175.52	212.89	1.8%
Average prices, all sectors⁸								
Propane	2.19	2.12	2.33	2.66	3.03	3.52	4.06	2.3%
Motor gasoline ⁴	3.57	3.66	3.49	4.05	4.61	5.43	6.47	2.1%
Jet fuel ⁵	3.05	3.10	2.98	3.65	4.31	5.19	6.28	2.5%
Distillate fuel oil	3.77	3.89	3.99	4.73	5.48	6.45	7.63	2.4%
Residual fuel oil	2.62	3.05	2.23	2.74	3.29	3.97	4.82	1.6%
Residual fuel oil (nominal dollars per barrel)	109.93	128.30	93.65	115.20	138.12	166.56	202.47	1.6%
Average	3.22	3.28	3.17	3.72	4.30	5.11	6.11	2.2%

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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 Brent and West Texas Intermediate crude oil spot prices: Thomson Reuters. 2011 and 2012 average imported crude oil cost: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2011 and 2012 prices for motor gasoline, distillate fuel oil, and jet fuel are based on: EIA, *Petroleum Marketing Monthly*, DOE/EIA-0380(2013/08) (Washington, DC, August 2013). 2011 and 2012 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." 2011 and 2012 electric power prices based on: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2011 and 2012 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. 2011 and 2012 wholesale ethanol prices derived from Bloomberg U.S. average rack price. Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Supply, disposition, and prices	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Supply								
Dry gas production ¹	22.55	24.06	29.09	31.86	34.43	36.09	37.54	1.6%
Supplemental natural gas ²	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.1%
Net imports	1.96	1.51	-1.93	-3.41	-4.94	-5.53	-5.80	--
Pipeline ³	1.68	1.37	0.00	-0.84	-1.57	-2.16	-2.43	--
Liquefied natural gas	0.28	0.15	-1.93	-2.57	-3.37	-3.37	-3.37	--
Total supply	24.57	25.64	27.23	28.52	29.56	30.63	31.81	0.8%
Consumption by sector								
Residential	4.71	4.17	4.46	4.40	4.33	4.23	4.12	0.0%
Commercial	3.16	2.90	3.16	3.22	3.28	3.40	3.57	0.7%
Industrial ⁴	6.90	7.14	8.09	8.41	8.52	8.59	8.68	0.7%
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	7.56	9.25	8.81	9.49	10.06	10.67	11.23	0.7%
Transportation ⁸	0.04	0.04	0.08	0.14	0.28	0.48	0.85	11.3%
Pipeline fuel	0.68	0.72	0.73	0.75	0.80	0.82	0.83	0.5%
Lease and plant fuel ⁹	1.32	1.42	1.74	1.95	2.11	2.24	2.35	1.8%
Total consumption	24.38	25.64	27.06	28.35	29.39	30.44	31.63	0.8%
Discrepancy¹⁰	0.19	0.00	0.17	0.17	0.17	0.19	0.18	--
Natural gas spot price at Henry Hub								
(2012 dollars per million Btu)	4.07	2.75	4.38	5.23	6.03	6.92	7.65	3.7%
(nominal dollars per million Btu)	4.00	2.75	4.96	6.45	8.12	10.31	12.69	5.6%
Delivered natural gas prices								
(2012 dollars per thousand cubic feet)								
Residential	11.22	10.69	11.85	12.75	13.80	14.93	16.33	1.5%
Commercial	9.16	8.29	9.70	10.51	11.44	12.22	13.37	1.7%
Industrial ⁴	5.21	3.85	5.92	6.46	7.14	7.93	8.78	3.0%
Electric power ⁷	4.98	3.51	5.19	5.88	6.64	7.45	8.34	3.1%
Transportation ¹¹	16.25	14.96	15.96	15.91	16.99	18.49	20.10	1.1%
Average¹²	6.98	5.50	7.25	7.89	8.68	9.54	10.61	2.4%
(nominal dollars per thousand cubic feet)								
Residential	11.02	10.69	13.42	15.70	18.58	22.23	27.07	3.4%
Commercial	9.00	8.29	10.99	12.95	15.40	18.20	22.16	3.6%
Industrial ⁴	5.11	3.85	6.70	7.96	9.62	11.81	14.56	4.9%
Electric power ⁷	4.90	3.51	5.87	7.25	8.93	11.09	13.82	5.0%
Transportation ¹¹	15.97	14.96	18.08	19.60	22.87	27.54	33.33	2.9%
Average¹²	6.86	5.50	8.21	9.71	11.68	14.21	17.59	4.2%

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.

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, in natural gas processing plant machinery, and for liquefaction in export facilities.

¹⁰Balancing 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, 2011 and 2012 values include net storage injections.

¹¹Natural gas used as fuel in motor vehicles, trains, and ships. Price includes estimated motor vehicle fuel taxes and estimated dispensing costs or charges.

¹²Weighted 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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 supply values; lease, plant, and pipeline fuel consumption; and residential, commercial, and industrial delivered prices: U.S. Energy Information Administration (EIA), *Natural Gas Annual 2011*, DOE/EIA-0131(2011) (Washington, DC, December 2012). 2012 supply values; lease, plant, and pipeline fuel consumption; and residential, commercial, and industrial delivered prices: EIA, *Natural Gas Monthly*, DOE/EIA-0130(2013/06) (Washington, DC, June 2013). Other 2011 and 2012 consumption based on: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2011 and 2012 natural gas spot price at Henry Hub: Thomson Reuters. 2011 and 2012 electric power prices: EIA, *Electric Power Monthly*, DOE/EIA-0226, April 2012 and April 2013, Table 4.2, and EIA, *State Energy Data Report 2011*, DOE/EIA-0214(2011) (Washington, DC, June 2013). 2011 transportation sector delivered prices are based on: EIA, *Natural Gas Annual 2011*, DOE/EIA-0131(2011) (Washington, DC, December 2012) and estimated state taxes, federal taxes, and dispensing costs or charges. 2012 transportation sector delivered prices are model results. Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

Table A14. Oil and gas supply

Production and supply	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Crude oil								
Lower 48 average wellhead price ¹ (2012 dollars per barrel).....	98.12	94.94	92.93	104.90	114.69	125.59	137.63	1.3%
Production (million barrels per day) ²								
United States total	5.66	6.49	9.55	9.00	8.30	7.87	7.48	0.5%
Lower 48 onshore	3.66	4.60	7.21	7.04	6.38	5.79	5.23	0.5%
Tight oil ³	1.31	2.25	4.79	4.54	4.17	3.69	3.20	1.3%
Carbon dioxide enhanced oil recovery	0.28	0.28	0.36	0.47	0.58	0.66	0.74	3.6%
Other	2.07	2.07	2.06	2.03	1.63	1.44	1.29	-1.7%
Lower 48 offshore	1.43	1.37	1.90	1.64	1.68	1.70	1.99	1.4%
Alaska	0.57	0.53	0.44	0.33	0.24	0.38	0.26	-2.5%
Lower 48 end of year reserves ² (billion barrels).....	25.10	24.71	31.78	33.01	34.42	34.58	35.45	1.3%
Natural gas plant liquids production (million barrels per day)								
United States total	2.22	2.40	2.65	2.87	2.98	3.05	2.98	0.8%
Lower 48 onshore	0.00	2.31	2.42	2.66	2.75	2.81	2.71	0.6%
Lower 48 offshore	0.15	0.14	0.20	0.19	0.22	0.22	0.26	2.3%
Alaska	0.05	0.05	0.03	0.02	0.01	0.02	0.02	-4.1%
Natural gas								
Natural gas spot price at Henry Hub (2012 dollars per million Btu).....	4.07	2.75	4.38	5.23	6.03	6.92	7.65	3.7%
Dry production (trillion cubic feet) ⁴								
United States total	22.55	24.06	29.09	31.86	34.43	36.09	37.54	1.6%
Lower 48 onshore	20.35	22.07	26.65	29.52	30.82	32.46	33.43	1.5%
Associated-dissolved ⁵	1.67	2.06	2.65	2.60	2.25	2.06	1.91	-0.3%
Non-associated	18.68	20.02	24.00	26.92	28.57	30.39	31.52	1.6%
Tight gas	5.01	4.86	6.48	7.06	8.06	8.53	8.41	2.0%
Shale gas	7.94	9.72	13.33	15.99	16.92	18.50	19.82	2.6%
Coalbed methane	1.73	1.58	1.66	1.61	1.61	1.64	1.71	0.3%
Other	4.00	3.86	2.53	2.25	1.98	1.72	1.58	-3.1%
Lower 48 offshore	1.86	1.66	2.16	2.09	2.42	2.46	2.95	2.1%
Associated-dissolved ⁵	0.51	0.48	0.68	0.56	0.58	0.59	0.71	1.4%
Non-associated	1.35	1.18	1.48	1.53	1.84	1.87	2.24	2.3%
Alaska	0.33	0.33	0.28	0.26	1.19	1.17	1.17	4.6%
Lower 48 end of year dry reserves ⁴ (trillion cubic feet).....	324.64	320.09	352.47	368.52	382.58	393.60	402.59	0.8%
Supplemental gas supplies (trillion cubic feet) ⁶	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.1%
Total lower 48 wells drilled (thousands).....	41.81	42.49	50.46	60.06	59.28	61.73	61.57	1.3%

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.⁵Gas which occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with crude oil (dissolved).⁶Synthetic 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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 crude oil lower 48 average wellhead price: U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, DOE/EIA-0380(2013/08) (Washington, DC, August 2013). 2011 and 2012 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: EIA, *Petroleum Supply Annual 2012*, DOE/EIA-0340(2012)/1 (Washington, DC, September 2013). 2011 U.S. crude oil and natural gas reserves: EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves*, DOE/EIA-0216(2010) (Washington, DC, August 2012). 2011 Alaska and total natural gas production, and supplemental gas supplies: EIA, *Natural Gas Annual 2011*, DOE/EIA-0131(2011) (Washington, DC, December 2012). 2011 and 2012 natural gas spot price at Henry Hub: Thomson Reuters. 2012 Alaska and total natural gas production, and supplemental gas supplies: EIA, *Natural Gas Monthly*, DOE/EIA-0130(2013/06) (Washington, DC, June 2013). Other 2011 and 2012 values: EIA, Office of Energy Analysis. Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Supply, disposition, and prices	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Production¹								
Appalachia.....	337	293	261	259	253	253	247	-0.6%
Interior	171	180	228	244	266	279	289	1.7%
West	588	543	587	611	607	594	584	0.3%
East of the Mississippi	456	423	438	446	459	471	475	0.4%
West of the Mississippi	639	593	639	668	668	655	645	0.3%
Total	1,096	1,016	1,077	1,114	1,127	1,126	1,121	0.3%
Waste coal supplied²	13	11	14	14	15	17	19	1.9%
Net imports								
Imports ³	11	8	2	2	1	2	1	-6.6%
Exports	107	126	128	136	148	160	161	0.9%
Total	-96	-118	-126	-135	-147	-158	-160	1.1%
Total supply⁴	1,013	909	965	993	995	985	979	0.3%
Consumption by sector								
Commercial and institutional.....	3	2	2	2	2	2	2	-0.1%
Coke plants.....	21	21	22	22	21	19	18	-0.5%
Other industrial ⁵	46	43	49	49	49	49	50	0.5%
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	932	825	892	919	923	915	909	0.3%
Total	1,003	891	965	993	995	985	979	0.3%
Discrepancy and stock change⁷	10	19	0	0	0	0	0	--
Average minemouth price⁸								
(2012 dollars per short ton).....	41.74	39.94	46.52	49.67	53.15	56.37	59.16	1.4%
(2012 dollars per million Btu)	2.07	1.98	2.33	2.49	2.67	2.82	2.96	1.4%
Delivered prices⁹								
(2012 dollars per short ton)								
Commercial and institutional.....	93.58	90.76	95.19	97.75	101.39	104.53	108.37	0.6%
Coke plants.....	187.72	190.55	221.01	234.75	249.43	260.42	267.23	1.2%
Other industrial ⁵	71.87	70.32	76.39	79.29	82.64	85.75	89.22	0.9%
Coal to liquids	--	--	--	--	--	--	--	--
Electric power ⁶								
(2012 dollars per short ton).....	47.06	46.13	49.63	52.56	55.32	57.76	60.61	1.0%
(2012 dollars per million Btu)	2.42	2.39	2.61	2.77	2.93	3.05	3.19	1.0%
Average.....	51.36	50.85	54.99	58.06	60.85	63.22	65.97	0.9%
Exports ¹⁰	151.51	118.43	136.76	142.74	145.97	148.56	150.13	0.9%

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

Supply, disposition, and prices	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Average minemouth price^a								
(nominal dollars per short ton)	41.01	39.94	52.69	61.18	71.55	83.96	98.08	3.3%
(nominal dollars per million Btu).....	2.04	1.98	2.63	3.07	3.59	4.21	4.91	3.3%
Delivered prices^a								
(nominal dollars per short ton)								
Commercial and institutional.....	91.94	90.76	107.81	120.40	136.49	155.69	179.68	2.5%
Coke plants.....	184.44	190.55	250.32	289.16	335.77	387.86	443.06	3.1%
Other industrial ^b	70.61	70.32	86.52	97.66	111.25	127.72	147.92	2.7%
Coal to liquids	--	--	--	--	--	--	--	--
Electric power ^c								
(nominal dollars per short ton)	46.24	46.13	56.21	64.74	74.47	86.03	100.48	2.8%
(nominal dollars per million Btu).....	2.38	2.39	2.96	3.42	3.94	4.54	5.29	2.9%
Average.....	50.46	50.85	62.28	71.52	81.91	94.16	109.37	2.8%
Exports ¹⁰	148.86	118.43	154.90	175.82	196.51	221.27	248.92	2.7%

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 residential and commercial 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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 data based on: U.S. Energy Information Administration (EIA), *Annual Coal Report 2012*, DOE/EIA-0584(2012) (Washington, DC, December 2013); EIA, *Quarterly Coal Report, October-December 2012*, DOE/EIA-0121(2012/4Q) (Washington, DC, March 2013); and EIA, AEO2014 National Energy Modeling System run REF2014.D102413A. Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Net summer capacity and generation	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Electric power sector¹								
Net summer capacity								
Conventional hydropower	77.96	78.10	78.41	79.10	79.75	80.07	80.35	0.1%
Geothermal ²	2.45	2.58	4.02	5.15	6.58	7.99	8.80	4.5%
Municipal waste ³	3.45	3.57	3.63	3.63	3.63	3.63	3.63	0.1%
Wood and other biomass ⁴	2.56	2.70	3.14	3.14	3.14	3.17	3.46	0.9%
Solar thermal	0.48	0.48	1.73	1.73	1.73	1.73	1.73	4.7%
Solar photovoltaic ⁵	1.05	2.49	7.90	7.96	8.62	10.33	17.07	7.1%
Wind	46.33	59.01	75.59	75.62	76.12	78.61	85.48	1.3%
Offshore wind	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Total electric power sector capacity	134.28	148.92	174.43	176.32	179.56	185.54	200.52	1.1%
Generation (billion kilowatthours)								
Conventional hydropower	316.65	273.89	287.67	291.17	294.35	296.14	297.34	0.3%
Geothermal ²	15.32	15.56	28.24	37.44	49.04	60.60	67.26	5.4%
Biogenic municipal waste ⁶	16.20	16.79	19.05	18.19	18.15	18.66	19.21	0.5%
Wood and other biomass	10.73	11.04	36.71	58.87	67.50	70.39	72.22	6.9%
Dedicated plants	9.55	9.84	15.31	15.95	16.17	16.80	18.99	2.4%
Cofiring	1.19	1.20	21.40	42.92	51.33	53.59	53.23	14.5%
Solar thermal	0.81	0.90	3.52	3.53	3.53	3.53	3.53	5.0%
Solar photovoltaic ⁵	0.92	3.25	14.54	14.65	16.07	19.86	35.24	8.9%
Wind	120.12	141.87	217.53	217.62	219.06	225.11	248.02	2.0%
Offshore wind	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Total electric power sector generation	480.74	463.29	607.26	641.47	667.71	694.30	742.82	1.7%
End-use sectors⁷								
Net summer capacity								
Conventional hydropower	0.33	0.29	0.29	0.29	0.29	0.29	0.29	0.0%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Municipal waste ⁸	0.37	0.47	0.47	0.47	0.47	0.47	0.47	0.0%
Biomass	4.85	4.89	6.27	7.17	7.95	8.74	9.62	2.4%
Solar photovoltaic ⁵	2.89	4.71	12.75	15.18	18.93	23.73	29.47	6.8%
Wind	0.14	0.15	0.70	0.74	0.90	1.09	1.42	8.3%
Total end-use sector capacity	8.58	10.51	20.48	23.84	28.53	34.31	41.26	5.0%
Generation (billion kilowatthours)								
Conventional hydropower	1.82	1.38	1.38	1.38	1.38	1.38	1.38	0.0%
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--
Municipal waste ⁸	2.91	3.65	3.63	3.63	3.63	3.63	3.63	0.0%
Biomass	26.69	26.53	34.10	39.18	43.75	48.37	53.50	2.5%
Solar photovoltaic ⁵	4.51	7.35	19.91	23.92	30.09	38.00	47.46	6.9%
Wind	0.18	0.20	0.96	1.03	1.25	1.53	2.01	8.6%
Total end-use sector generation	36.11	39.11	59.98	69.14	80.10	92.91	107.99	3.7%

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

Net summer capacity and generation	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Total, all sectors								
Net summer capacity								
Conventional hydropower	78.29	78.39	78.70	79.39	80.03	80.36	80.63	0.1%
Geothermal	2.45	2.58	4.02	5.15	6.58	7.99	8.80	4.5%
Municipal waste	3.82	4.04	4.10	4.10	4.10	4.10	4.10	0.1%
Wood and other biomass ⁴	7.42	7.59	9.41	10.30	11.08	11.91	13.08	2.0%
Solar ⁵	4.42	7.68	22.38	24.86	29.27	35.78	48.26	6.8%
Wind	46.47	59.16	76.29	76.37	77.02	79.70	86.91	1.4%
Total capacity, all sectors	142.86	159.43	194.91	200.17	208.09	219.85	241.78	1.5%
Generation (billion kilowatthours)								
Conventional hydropower	318.47	275.27	289.05	292.55	295.73	297.52	298.72	0.3%
Geothermal	15.32	15.56	28.24	37.44	49.04	60.60	67.26	5.4%
Municipal waste	19.11	20.44	22.68	21.82	21.78	22.29	22.84	0.4%
Wood and other biomass	37.42	37.57	70.81	98.06	111.25	118.76	125.72	4.4%
Solar ⁵	6.24	11.50	37.98	42.09	49.69	61.40	86.23	7.5%
Wind	120.30	142.06	218.49	218.64	220.32	226.65	250.03	2.0%
Total generation, all sectors	516.85	502.41	667.24	710.61	747.81	787.22	850.80	1.9%

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 2012, EIA estimates that as much as 274 megawatts of remote electricity generation PV applications (i.e., off-grid power systems) were in service in 2012, 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 2012 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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 capacity: U.S. Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report" (preliminary). 2011 and 2012 generation: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Sector and source	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Marketed renewable energy ¹								
Residential (wood).....	0.54	0.45	0.46	0.45	0.44	0.43	0.42	-0.3%
Commercial (biomass)	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.0%
Industrial ²	1.95	2.00	2.50	2.67	2.79	2.92	3.07	1.5%
Conventional hydroelectric	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.0%
Municipal waste ³	0.17	0.19	0.20	0.20	0.20	0.20	0.20	0.2%
Biomass.....	1.30	1.28	1.53	1.67	1.80	1.92	2.07	1.7%
Biofuels heat and coproducts.....	0.46	0.52	0.76	0.79	0.79	0.79	0.79	1.5%
Transportation	1.21	1.22	1.42	1.45	1.45	1.45	1.49	0.7%
Ethanol used in E85 ⁴	0.00	0.01	0.13	0.25	0.31	0.29	0.22	11.9%
Ethanol used in gasoline blending	1.09	1.09	1.07	0.97	0.91	0.93	1.04	-0.2%
Biodiesel used in distillate blending	0.12	0.12	0.17	0.17	0.17	0.17	0.17	1.5%
Biobutanol.....	0.00	0.00	0.03	0.04	0.04	0.04	0.03	--
Liquids from biomass.....	0.00	0.00	0.01	0.01	0.01	0.01	0.01	--
Renewable diesel and gasoline ⁵	0.00	0.00	0.01	0.01	0.01	0.01	0.01	--
Electric power ⁶	4.80	4.59	6.08	6.42	6.68	6.95	7.44	1.7%
Conventional hydroelectric	3.09	2.66	2.79	2.83	2.86	2.88	2.89	0.3%
Geothermal.....	0.15	0.15	0.28	0.36	0.48	0.59	0.65	5.4%
Biogenic municipal waste ⁷	0.19	0.21	0.25	0.23	0.23	0.24	0.25	0.6%
Biomass.....	0.18	0.15	0.47	0.70	0.79	0.83	0.86	6.5%
Dedicated plants	0.16	0.16	0.24	0.25	0.26	0.27	0.30	2.3%
Cofiring	0.03	-0.01	0.23	0.45	0.54	0.56	0.56	--
Solar thermal	0.01	0.01	0.03	0.03	0.03	0.03	0.03	5.0%
Solar photovoltaic.....	0.01	0.03	0.14	0.14	0.16	0.19	0.34	8.9%
Wind	1.17	1.38	2.11	2.11	2.13	2.19	2.41	2.0%
Total marketed renewable energy	8.62	8.39	10.58	11.12	11.50	11.89	12.54	1.4%
Sources of ethanol								
from corn and other starch.....	1.18	1.12	1.11	1.12	1.12	1.12	1.13	0.0%
from cellulose.....	0.00	0.00	0.01	0.02	0.02	0.02	0.02	--
Net imports	-0.09	-0.02	0.07	0.08	0.08	0.08	0.11	--
Total	1.09	1.10	1.19	1.22	1.22	1.22	1.26	0.5%

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

Sector and source	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Nonmarketed renewable energy ⁸								
Selected consumption								
Residential.....	0.03	0.04	0.14	0.16	0.19	0.23	0.27	6.9%
Solar hot water heating.....	0.00	0.01	0.01	0.01	0.01	0.01	0.01	2.4%
Geothermal heat pumps.....	0.01	0.01	0.02	0.02	0.02	0.02	0.03	3.2%
Solar photovoltaic.....	0.02	0.02	0.10	0.12	0.14	0.18	0.22	8.3%
Wind.....	0.00	0.00	0.01	0.01	0.01	0.01	0.01	9.1%
Commercial.....	0.11	0.13	0.18	0.21	0.24	0.29	0.35	3.7%
Solar thermal.....	0.08	0.08	0.09	0.09	0.09	0.10	0.11	1.0%
Solar photovoltaic.....	0.03	0.05	0.10	0.12	0.15	0.19	0.24	5.9%
Wind.....	0.00	0.00	0.00	0.00	0.00	0.01	0.01	8.3%

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 hydropower, geothermal, solar, and wind. Consumption at hydroelectric, geothermal, solar, and wind facilities is determined by using the fossil fuel equivalent of 9,716 Btu per kilowatt-hour.

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 2012 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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 ethanol: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2011 and 2012 electric power sector: EIA, Form EIA-860, "Annual Electric Generator Report" (preliminary). Other 2011 and 2012 values: EIA, Office of Energy Analysis. Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Sector and source	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Residential								
Petroleum	72	69	60	55	51	48	45	-1.6%
Natural gas	255	226	242	239	235	229	223	0.0%
Electricity ¹	824	760	751	770	785	800	814	0.2%
Total residential	1,150	1,056	1,054	1,064	1,071	1,077	1,082	0.1%
Commercial								
Petroleum	47	45	49	48	48	48	48	0.2%
Natural gas	171	157	172	174	178	185	194	0.7%
Coal	6	4	4	4	4	4	4	0.0%
Electricity ¹	769	732	728	760	781	801	823	0.4%
Total commercial	992	939	952	987	1,011	1,038	1,069	0.5%
Industrial²								
Petroleum	347	350	395	402	405	404	406	0.5%
Natural gas ³	432	449	512	540	556	567	578	0.9%
Coal	148	139	152	152	147	140	139	0.0%
Electricity ¹	574	543	628	658	654	638	625	0.5%
Total industrial	1,501	1,480	1,688	1,752	1,761	1,750	1,748	0.6%
Transportation								
Petroleum ⁴	1,812	1,771	1,734	1,669	1,618	1,603	1,600	-0.4%
Natural gas ⁵	39	41	44	48	58	70	91	2.9%
Electricity ¹	4	4	5	6	7	8	9	3.1%
Total transportation	1,854	1,815	1,782	1,723	1,683	1,681	1,700	-0.2%
Electric power⁶								
Petroleum	27	19	13	14	14	14	14	-1.0%
Natural gas	409	494	478	514	545	578	608	0.7%
Coal	1,723	1,514	1,609	1,654	1,656	1,643	1,637	0.3%
Other ⁷	12	12	12	12	12	12	12	0.0%
Total electric power	2,171	2,039	2,112	2,194	2,227	2,247	2,271	0.4%
Total by fuel								
Petroleum ⁴	2,304	2,254	2,252	2,188	2,136	2,117	2,113	-0.2%
Natural gas	1,306	1,366	1,447	1,516	1,572	1,629	1,694	0.8%
Coal	1,876	1,657	1,766	1,810	1,807	1,788	1,780	0.3%
Other ⁷	12	12	12	12	12	12	12	0.0%
Total	5,498	5,290	5,476	5,526	5,527	5,546	5,599	0.2%
Carbon dioxide emissions (tons per person)	17.6	16.8	16.4	15.9	15.4	15.0	14.7	-0.5%

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 2012, 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 "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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 emissions and emission factors: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0384(2013/09) (Washington, DC, September 2013). 2011 emissions: EIA, *Monthly Energy Review*, DOE/EIA-0035(2011/10) (Washington, DC, October 2011). 2012 emissions and emission factors: EIA, *Monthly Energy Review*, DOE/EIA-0035(2012/08) (Washington, DC, August 2012). Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Sector and end use	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Residential								
Space heating.....	285.2	235.7	254.0	245.4	236.2	226.7	217.3	-0.3%
Space cooling.....	141.5	139.7	139.1	151.3	162.1	172.5	181.4	0.9%
Water heating.....	146.6	145.2	143.4	144.9	144.1	140.7	137.0	-0.2%
Refrigeration.....	64.1	61.5	58.3	58.0	57.9	58.7	59.6	-0.1%
Cooking.....	30.8	30.1	31.0	31.9	32.7	33.5	34.1	0.4%
Clothes dryers.....	36.3	35.1	35.7	36.9	37.8	38.8	39.5	0.4%
Freezers.....	13.5	13.0	12.4	12.1	11.8	11.5	11.3	-0.5%
Lighting.....	108.3	103.0	67.7	60.1	52.8	44.2	39.8	-3.3%
Clothes washers ¹	5.4	5.1	4.0	3.4	3.2	3.2	3.2	-1.6%
Dishwashers ¹	16.9	16.2	15.2	15.0	15.7	16.5	17.2	0.2%
Televisions and related equipment ²	56.7	54.0	50.8	51.5	52.8	54.9	55.9	0.1%
Computers and related equipment ³	21.7	20.2	15.2	12.9	10.8	9.2	7.6	-3.4%
Furnace fans and boiler circulation pumps.....	20.0	15.3	17.9	17.9	17.8	17.5	17.0	0.4%
Other uses ⁴	203.6	181.4	209.0	222.8	235.9	248.7	260.7	1.3%
Discrepancy ⁵	-0.4	0.3	0.0	0.0	0.0	0.0	0.0	--
Total residential.....	1,150.4	1,055.9	1,053.7	1,064.2	1,071.5	1,076.6	1,081.7	0.1%
Commercial								
Space heating ⁶	131.4	115.4	125.8	122.9	118.7	114.6	110.2	-0.2%
Space cooling ⁶	95.2	92.1	81.5	82.9	82.6	82.9	83.4	-0.4%
Water heating ⁶	42.7	42.8	43.5	44.4	44.5	44.3	44.1	0.1%
Ventilation.....	86.7	83.8	85.1	87.9	88.3	88.5	88.8	0.2%
Cooking.....	14.1	14.2	14.5	14.9	15.3	15.6	15.9	0.4%
Lighting.....	162.2	151.8	136.3	135.4	131.3	125.3	121.2	-0.8%
Refrigeration.....	65.7	62.0	57.0	57.1	57.2	57.8	58.4	-0.2%
Office equipment (PC).....	21.3	18.7	10.5	7.8	5.7	4.3	3.4	-6.0%
Office equipment (non-PC).....	37.8	35.3	37.3	41.7	46.5	51.1	55.1	1.6%
Other uses ⁷	335.4	322.6	360.6	392.2	420.7	453.4	488.2	1.5%
Total commercial.....	992.3	938.6	952.2	987.2	1,010.8	1,037.9	1,068.7	0.5%
Industrial⁸								
Manufacturing								
Refining.....								-0.2%
Food products.....	252.4	257.5	254.7	248.9	245.1	244.6	246.7	0.9%
Paper products.....	96.4	96.8	106.4	111.9	116.2	119.8	123.7	0.1%
Bulk chemicals.....	74.5	71.0	69.9	70.9	70.9	71.6	73.2	0.5%
Glass.....	254.8	247.7	295.6	313.5	310.4	295.8	282.2	0.2%
Cement and lime.....	15.5	15.4	16.1	16.3	17.1	16.7	16.1	1.8%
Iron and steel.....	29.0	29.1	42.2	43.6	45.0	45.7	47.3	-0.4%
Aluminum.....	126.9	124.8	136.5	142.4	133.7	120.9	110.4	-0.8%
Fabricated metal products.....	45.3	45.6	50.3	54.2	49.7	41.2	36.3	0.4%
Machinery.....	37.8	38.2	42.3	44.3	43.8	43.0	42.2	0.9%
Computers and electronics.....	21.4	21.8	25.0	27.1	28.2	28.2	28.2	1.3%
Transportation equipment.....	46.3	46.4	50.5	57.4	61.7	64.6	65.8	1.4%
Electrical equipment.....	41.7	44.3	50.5	53.2	58.2	62.1	65.0	1.1%
Wood products.....	8.3	8.2	9.1	9.9	10.5	10.9	11.1	0.5%
Plastics.....	15.6	15.4	20.7	20.3	19.4	18.2	17.5	0.4%
Balance of manufacturing.....	39.7	38.7	42.4	44.3	44.6	44.0	43.6	0.9%
Total manufacturing.....	159.7	154.0	166.2	174.3	179.4	185.8	195.5	0.4%
Nonmanufacturing	1,265.2	1,254.9	1,378.4	1,432.6	1,433.9	1,413.3	1,404.8	
Agriculture.....								0.6%
Construction.....	71.0	65.5	75.7	76.7	77.3	77.4	77.7	1.5%
Mining.....	59.7	61.0	81.1	83.9	86.6	88.7	91.7	0.0%
Total nonmanufacturing.....	100.5	101.0	113.3	111.5	107.4	103.9	100.1	0.6%
Discrepancy⁹.....	231.1	227.5	270.1	272.1	271.3	270.0	269.5	--
Total industrial.....	4.9	-2.6	39.1	47.5	56.2	66.6	74.1	0.6%

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

Sector and end use	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Transportation								
Light-duty vehicles.....	1,037.7	1,030.7	934.9	845.5	780.7	753.9	743.8	-1.2%
Commercial light trucks ⁹	35.9	35.6	36.1	34.9	34.1	34.4	35.6	0.0%
Bus transportation.....	16.8	16.1	16.0	16.1	16.0	15.9	15.8	-0.1%
Freight trucks.....	369.7	357.7	415.3	438.4	457.1	478.1	502.2	1.2%
Rail, passenger.....	5.5	5.4	5.6	5.9	6.1	6.2	6.5	0.7%
Rail, freight.....	36.9	34.7	31.7	32.0	30.5	28.8	27.2	-0.9%
Shipping, domestic.....	8.1	7.0	6.8	6.3	5.9	5.6	5.5	-0.9%
Shipping, international.....	60.0	45.3	46.0	46.6	47.1	47.5	47.9	0.2%
Recreational boats.....	16.1	16.1	17.0	17.7	18.2	18.6	18.8	0.6%
Air.....	174.4	175.2	184.1	188.1	190.3	190.8	191.4	0.3%
Military use.....	52.5	50.1	45.4	46.1	48.6	51.4	54.4	0.3%
Lubricants.....	5.0	4.4	4.5	4.5	4.5	4.5	4.6	0.1%
Pipeline fuel.....	37.1	38.8	39.3	40.6	43.5	44.3	44.9	0.5%
Discrepancy ⁶	-1.4	-1.7	-0.4	0.1	0.6	1.2	1.7	--
Total transportation.....	1,854.1	1,815.4	1,782.4	1,722.6	1,683.2	1,681.3	1,700.4	-0.2%
Biogenic energy combustion¹⁰								
Biomass.....	200.6	188.7	242.7	277.4	297.0	311.1	326.0	2.0%
Electric power sector.....	17.3	13.7	44.0	65.6	74.5	77.9	80.3	6.5%
Other sectors.....	183.3	175.0	198.7	211.8	222.5	233.2	245.7	1.2%
Biogenic waste.....	17.6	19.1	22.5	21.1	21.1	21.9	22.8	0.6%
Biofuels heat and coproducts.....	43.3	48.6	71.6	73.8	73.9	73.8	73.8	1.5%
Ethanol.....	74.8	75.5	81.6	83.3	83.3	83.2	86.1	0.5%
Biodiesel.....	8.5	8.4	12.6	12.5	12.5	12.7	12.7	1.5%
Liquids from biomass.....	0.0	0.0	1.0	1.0	1.0	1.0	1.0	--
Renewable diesel and gasoline.....	0.0	0.0	0.9	0.9	0.9	0.9	0.9	--
Total.....	344.8	340.3	432.9	470.1	489.7	504.6	523.3	1.5%

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 (but is not limited to) miscellaneous uses such as transformers, medical imaging and other medical equipment, elevators, escalators, off-road electric vehicles, laboratory fume hoods, laundry equipment, coffee brewers, water services, pumps, emergency generators, combined heat and power in commercial buildings, manufacturing performed in commercial buildings, and cooking (distillate), plus residual fuel oil, 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 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 emissions and emission factors: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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

Indicators	Reference case							Annual growth 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Real gross domestic product	13,299	13,593	16,753	18,769	21,139	23,751	26,670	2.4%
Components of real gross domestic product								
Real consumption	9,429	9,603	11,592	12,773	14,220	15,828	17,635	2.2%
Real investment	1,744	1,914	2,876	3,269	3,740	4,274	4,925	3.4%
Real government spending	2,524	2,481	2,443	2,495	2,623	2,754	2,917	0.6%
Real exports	1,777	1,837	2,863	3,857	5,056	6,516	8,186	5.5%
Real imports	2,185	2,238	2,925	3,453	4,213	5,167	6,328	3.8%
Energy intensity (thousand Btu per 2005 dollar of GDP)								
Delivered energy	5.29	5.08	4.40	3.97	3.54	3.18	2.88	-2.0%
Total energy	7.30	6.99	6.01	5.46	4.89	4.39	3.99	-2.0%
Price indices								
GDP chain-type price index (2005=1.000)	1.134	1.154	1.307	1.421	1.553	1.719	1.913	1.8%
Consumer price index (1982-4=1.00)								
All-urban	2.25	2.30	2.63	2.90	3.20	3.59	4.05	2.1%
Energy commodities and services	2.44	2.46	2.55	2.91	3.33	3.86	4.56	2.2%
Wholesale price index (1982=1.00)								
All commodities	2.01	2.02	2.22	2.40	2.62	2.89	3.21	1.7%
Fuel and power	2.16	2.12	2.42	2.82	3.30	3.92	4.73	2.9%
Metals and metal products	2.26	2.20	2.43	2.56	2.77	2.99	3.22	1.4%
Industrial commodities excluding energy	1.93	1.94	2.14	2.26	2.41	2.59	2.78	1.3%
Interest rates (percent, nominal)								
Federal funds rate	0.10	0.14	3.85	3.99	4.14	4.20	4.22	--
10-year treasury note	2.79	1.80	4.14	4.24	4.36	4.45	4.52	--
AA utility bond rate	4.78	3.83	6.60	6.74	6.88	7.05	7.22	--
Value of shipments (billion 2005 dollars)								
Non-industrial and service sectors	21,240	21,359	26,033	28,947	31,782	34,480	37,135	2.0%
Total industrial	5,926	6,147	7,960	8,778	9,537	10,241	10,994	2.1%
Agriculture, mining, and construction	1,556	1,623	2,226	2,311	2,389	2,457	2,551	1.6%
Manufacturing	4,370	4,525	5,735	6,467	7,148	7,784	8,443	2.3%
Energy-intensive	1,599	1,616	1,931	2,081	2,171	2,238	2,303	1.3%
Non-energy-intensive	2,772	2,909	3,803	4,386	4,977	5,547	6,140	2.7%
Total shipments	27,166	27,506	33,994	37,725	41,319	44,721	48,129	2.0%
Population and employment (millions)								
Population, with armed forces overseas	312.3	314.6	334.5	347.0	359.0	370.2	380.5	0.7%
Population, aged 16 and over	247.0	249.2	266.7	277.2	287.6	297.9	307.3	0.8%
Population, over age 65	41.7	43.4	56.2	65.3	73.0	77.5	79.8	2.2%
Employment, nonfarm	131.5	133.7	148.4	152.2	158.6	163.7	169.2	0.8%
Employment, manufacturing	11.7	11.9	12.8	12.9	12.5	11.8	11.0	-0.3%
Key labor indicators								
Labor force (millions)	153.6	155.0	163.5	166.9	170.9	175.8	181.2	0.6%
Nonfarm labor productivity (2005=1.00)	1.10	1.11	1.25	1.39	1.53	1.68	1.85	1.8%
Unemployment rate (percent)	8.93	8.08	5.49	5.29	5.10	5.08	5.12	--
Key indicators for energy demand								
Real disposable personal income	10,150	10,304	12,710	14,162	15,926	17,749	19,724	2.3%
Housing starts (millions)	0.66	0.84	1.75	1.72	1.71	1.67	1.66	2.5%
Commercial floorspace (billion square feet)	81.7	82.4	89.1	93.9	98.2	103.1	108.9	1.0%
Unit sales of light-duty vehicles (millions)	12.73	14.43	16.23	16.55	17.23	17.45	17.93	0.8%

GDP = Gross domestic product.

Btu = British thermal unit.

-- = Not applicable.

Sources: 2011 and 2012: IHS Global Insight, Global Insight Industry and Employment models, May 2013. Projections: U.S. Energy Information Administration, AEO2014 National Energy Modeling System run REF2014.D102413A.

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 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	
Crude oil spot prices								
(2012 dollars per barrel)								
Brent	113.24	111.65	96.57	108.99	118.99	129.77	141.46	0.8%
West Texas Intermediate	96.55	94.12	94.57	106.99	116.99	127.77	139.46	1.4%
(nominal dollars per barrel)								
Brent	111.26	111.65	109.37	134.25	160.19	193.27	234.53	2.7%
West Texas Intermediate	94.86	94.12	107.11	131.78	157.49	190.30	231.22	3.3%
Petroleum and other liquids consumption¹								
OECD								
United States (50 states)	18.65	18.21	19.23	18.97	18.63	18.46	18.42	0.0%
United States territories	0.25	0.25	0.29	0.31	0.33	0.35	0.37	1.5%
Canada	2.25	2.26	2.24	2.17	2.18	2.22	2.30	0.1%
Mexico and Chile	2.45	2.51	2.71	2.85	3.08	3.33	3.63	1.3%
OECD Europe ²	14.81	14.21	13.85	13.83	13.94	14.12	14.32	0.0%
Japan	4.51	4.75	4.50	4.38	4.29	4.19	4.05	-0.6%
South Korea	2.62	2.65	2.76	2.67	2.68	2.71	2.76	0.2%
Australia and New Zealand	1.24	1.28	1.23	1.19	1.21	1.25	1.30	0.0%
Total OECD consumption	46.79	46.13	46.82	46.37	46.37	46.63	47.15	0.1%
Non-OECD								
Russia	3.12	3.20	3.55	3.64	3.81	3.91	3.92	0.7%
Other Europe and Eurasia ³	1.91	1.99	2.32	2.43	2.62	2.82	3.08	1.6%
China	9.94	10.36	13.91	15.70	17.04	18.72	20.48	2.5%
India	3.47	3.68	4.50	5.19	6.11	7.14	8.33	3.0%
Other Asia ⁴	7.15	6.97	7.99	8.60	9.35	10.21	11.16	1.7%
Middle East	7.60	7.67	8.81	8.85	9.22	9.75	10.38	1.1%
Africa	3.40	3.47	3.70	3.84	4.03	4.28	4.58	1.0%
Brazil	2.74	2.83	3.12	3.10	3.32	3.52	3.85	1.1%
Other Central and South America	2.76	2.77	3.29	3.51	3.76	3.97	4.13	1.4%
Total non-OECD consumption	42.10	42.94	51.19	54.84	59.24	64.32	69.90	1.8%
Total consumption	88.88	89.07	98.01	101.21	105.61	110.96	117.05	1.0%
Petroleum and other liquids production								
OPEC⁵								
Middle East	25.50	25.84	28.28	29.62	32.35	35.77	38.85	1.5%
North Africa	2.37	3.36	3.19	3.20	3.43	3.75	3.96	0.6%
West Africa	4.39	4.40	4.99	5.13	5.26	5.39	5.52	0.8%
South America	2.99	2.99	3.10	3.03	3.01	3.10	3.31	0.4%
Total OPEC production	35.25	36.59	39.57	40.97	44.04	48.00	51.64	1.2%
Non-OPEC								
OECD								
United States (50 states)	10.11	10.84	14.25	13.86	13.23	12.86	12.42	0.5%
Canada	3.71	4.00	5.10	5.61	5.92	6.12	6.21	1.6%
Mexico and Chile	2.99	2.97	2.13	1.97	2.11	2.18	2.27	-1.0%
OECD Europe ²	4.20	3.93	3.26	2.94	2.78	2.98	3.63	-0.3%
Japan and South Korea	0.18	0.18	0.16	0.17	0.18	0.18	0.19	0.2%
Australia and New Zealand	0.58	0.57	0.54	0.53	0.56	0.80	0.92	1.7%
Total OECD production	21.77	22.48	25.44	25.07	24.78	25.11	25.64	0.5%
Non-OECD								
Russia	10.24	10.40	10.74	10.93	11.44	12.01	11.68	0.4%
Other Europe and Eurasia ³	3.26	3.19	3.73	4.35	4.44	4.62	5.44	1.9%
China	4.32	4.37	4.91	5.35	5.50	5.59	5.62	0.9%
Other Asia ⁴	3.81	3.82	3.63	3.42	3.20	3.03	3.31	-0.5%
Middle East	1.51	1.31	0.98	0.86	0.77	0.67	0.71	-2.2%
Africa	2.67	2.34	2.61	2.63	2.57	2.52	2.91	0.8%
Brazil	2.53	2.49	4.00	5.14	6.36	6.81	7.03	3.8%
Other Central and South America	2.16	2.16	2.38	2.42	2.44	2.56	3.06	1.3%
Total non-OECD production	30.51	30.08	32.98	35.11	36.73	37.83	39.75	1.0%
Total petroleum and other liquids production	87.53	89.15	97.99	101.15	105.55	110.94	117.03	1.0%
OPEC market share (percent)	40.3	41.0	40.4	40.5	41.7	43.3	44.1	-

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 2012-2040 (percent)
	2011	2012	2020	2025	2030	2035	2040	

Selected world production subtotals:								
Petroleum								
Crude oil and equivalents ⁵	74.37	75.78	82.35	84.40	87.58	91.09	96.56	0.9%
Tight oil	1.36	2.40	5.81	6.43	6.88	7.17	7.28	4.0%
Bitumen ⁷	1.74	1.94	3.00	3.52	3.95	4.21	4.26	2.8%
Refinery processing gain ⁸	2.37	2.37	2.26	2.33	2.52	2.71	2.86	0.7%
Liquids from renewable sources ⁹	1.31	1.34	1.68	1.89	2.09	2.28	2.48	2.2%
Liquids from coal ¹⁰	0.18	0.19	0.40	0.65	0.91	1.12	1.12	6.6%
Liquids from natural gas	8.73	9.21	10.78	11.61	12.19	12.88	13.29	1.3%
Natural gas plant liquids	8.61	9.05	10.46	11.26	11.84	12.53	12.93	1.3%
Gas-to-liquids ¹¹	0.12	0.16	0.31	0.35	0.35	0.35	0.35	2.9%
Liquids from kerogen ¹²	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.6%
Petroleum production ¹³								
OPEC ⁵								
Middle East	25.44	25.74	28.07	29.38	32.10	35.52	38.61	1.5%
North Africa	2.37	3.36	3.19	3.20	3.43	3.75	3.96	0.6%
West Africa	4.39	4.40	4.96	5.09	5.22	5.35	5.49	0.8%
South America	2.99	2.99	3.10	3.03	3.01	3.10	3.31	0.4%
Total OPEC production	35.20	36.50	39.33	40.70	43.77	47.73	51.37	1.2%
Non-OPEC								
OECD								
United States (50 states)	9.25	10.00	13.28	12.87	12.24	11.87	11.42	0.5%
Canada	3.69	3.97	5.08	5.58	5.88	6.08	6.17	1.6%
Mexico and Chile	2.99	2.97	2.13	1.97	2.11	2.18	2.27	-1.0%
OECD Europe ²	3.98	3.71	3.03	2.70	2.53	2.71	3.35	-0.4%
Japan and South Korea	0.17	0.17	0.15	0.16	0.17	0.18	0.18	0.1%
Australia and New Zealand	0.58	0.56	0.53	0.52	0.55	0.79	0.91	1.7%
Total OECD production	20.65	21.39	24.21	23.80	23.49	23.80	24.30	0.5%
Non-OECD								
Russia	10.24	10.40	10.74	10.93	11.44	12.01	11.68	0.4%
Other Europe and Eurasia ³	3.26	3.19	3.73	4.34	4.44	4.62	5.43	1.9%
China	4.28	4.32	4.77	4.98	4.82	4.69	4.72	0.3%
Other Asia ⁴	3.74	3.75	3.51	3.22	2.99	2.82	3.10	-0.7%
Middle East	1.51	1.31	0.98	0.86	0.77	0.67	0.71	-2.2%
Africa	2.45	2.13	2.28	2.29	2.22	2.17	2.55	0.6%
Brazil	2.25	2.20	3.50	4.55	5.65	5.96	6.00	3.6%
Other Central and South America	2.08	2.06	2.30	2.34	2.36	2.47	2.97	1.3%
Total non-OECD production	29.81	29.35	31.81	33.51	34.69	35.40	37.15	0.8%
Total petroleum production ¹³	85.66	87.24	95.34	98.01	101.95	106.94	112.82	0.9%
OPEC market share (percent)	41.1	41.8	41.2	41.5	42.9	44.6	45.5	- -

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, 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, 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)).

¹³Includes production of crude oil (including lease condensate, tight oil (shale oil), extra-heavy oil, and bitumen (oil sands)), natural gas plant liquids, refinery gains, and other hydrogen and hydrocarbons for refinery feedstocks.

OECD = Organization for Economic Cooperation and Development.

-- = Not applicable.

Note: Ethanol is represented in motor gasoline equivalent barrels. Totals may not equal sum of components due to independent rounding. Data for 2011 and 2012 are model results and may differ from official EIA data reports.

Sources: 2011 and 2012 Brent and West Texas Intermediate crude oil spot prices: Thomson Reuters. 2011 quantities derived from: Energy Information Administration (EIA), International Energy Statistics database as of September 2013. 2012 quantities and projections: EIA, AEO2014 National Energy Modeling System run REF2014.D102413A and EIA, Generate World Oil Balance Model.

Economic growth case comparisons

Table B1. Total energy supply, disposition, and price summary
(quadrillion Btu per year, unless otherwise noted)

Supply, disposition, and prices	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Production										
Crude oil and lease condensate.....	13.87	20.31	20.36	20.39	17.40	17.71	17.82	16.04	16.00	16.40
Natural gas plant liquids.....	3.21	3.53	3.54	3.55	3.92	3.98	4.09	3.92	3.99	4.05
Dry natural gas.....	24.59	29.02	29.73	30.59	33.37	35.19	36.94	36.09	38.37	40.33
Coal ¹	20.60	21.18	21.70	22.24	21.67	22.61	23.28	21.67	22.61	23.50
Nuclear / uranium ²	8.05	8.15	8.15	8.15	8.15	8.18	8.30	8.15	8.49	9.65
Hydropower.....	2.67	2.84	2.81	2.83	2.84	2.87	2.90	2.86	2.90	2.92
Biomass ³	3.78	4.52	4.66	4.77	5.02	5.29	5.48	5.24	5.61	6.02
Other renewable energy ⁴	1.97	3.09	3.01	3.04	3.25	3.23	3.71	3.42	3.89	5.13
Other ⁵	0.41	0.24	0.24	0.23	0.24	0.24	0.23	0.24	0.24	0.23
Total.....	79.15	92.88	94.19	95.80	95.87	99.30	102.74	97.63	102.09	108.23
Imports										
Crude oil.....	18.57	12.31	13.15	14.08	12.98	15.00	16.49	14.11	17.43	19.26
Petroleum and other liquids ⁶	4.26	4.20	4.21	4.25	4.06	4.08	4.12	3.92	3.93	4.45
Natural gas ⁷	3.21	2.38	2.39	2.46	1.87	2.01	2.12	2.21	2.28	2.41
Other imports ⁸	0.36	0.14	0.17	0.16	0.11	0.12	0.12	0.09	0.10	0.19
Total.....	26.40	19.03	19.92	20.95	19.02	21.22	22.84	20.34	23.73	26.30
Exports										
Petroleum and other liquids ⁹	6.29	6.32	6.30	6.29	6.85	6.91	7.00	7.63	7.70	7.75
Natural gas ¹⁰	1.63	4.49	4.30	4.28	6.96	6.96	6.93	8.26	8.09	7.90
Coal.....	3.22	3.13	3.13	3.11	3.53	3.55	3.57	3.77	3.79	3.73
Total.....	11.14	13.95	13.73	13.68	17.35	17.42	17.50	19.66	19.58	19.38
Discrepancy¹¹.....	-0.61	-0.35	-0.35	-0.30	-0.17	-0.17	-0.15	-0.03	-0.07	-0.07
Consumption										
Petroleum and other liquids ¹²	35.87	35.93	36.86	37.82	33.28	35.65	37.27	32.04	35.35	38.13
Natural gas.....	26.20	26.73	27.65	28.60	28.08	30.03	31.92	29.78	32.32	34.62
Coal ¹³	17.34	18.01	18.56	19.11	18.08	19.01	19.66	17.83	18.75	19.75
Nuclear / uranium ²	8.05	8.15	8.15	8.15	8.15	8.18	8.30	8.15	8.49	9.65
Hydropower.....	2.67	2.84	2.81	2.83	2.84	2.87	2.90	2.86	2.90	2.92
Biomass ¹⁴	2.53	3.22	3.35	3.46	3.69	3.95	4.13	3.92	4.26	4.63
Other renewable energy ⁴	1.97	3.09	3.01	3.04	3.25	3.23	3.71	3.42	3.89	5.13
Other ¹⁵	0.39	0.34	0.34	0.34	0.33	0.35	0.35	0.34	0.35	0.38
Total.....	95.02	98.31	100.73	103.36	97.71	103.27	108.23	98.34	106.31	115.22
Prices (2012 dollars per unit)										
Crude oil spot prices (dollars per barrel)										
Brent.....	111.65	95.51	96.57	97.79	116.23	118.99	121.23	136.52	141.46	145.21
West Texas Intermediate.....	94.12	93.53	94.57	95.77	114.28	116.99	119.19	134.59	139.46	143.15
Natural gas at Henry Hub										
(dollars per million Btu).....	2.75	4.51	4.38	4.59	5.65	6.03	6.39	7.19	7.65	8.15
Coal (dollars per ton)										
at the minemouth ¹⁶	39.94	46.31	46.52	46.68	52.85	53.15	53.94	58.57	59.16	60.20
Coal (dollars per million Btu)										
at the minemouth ¹⁶	1.98	2.32	2.33	2.34	2.66	2.67	2.71	2.94	2.96	3.02
Average end-use ¹⁷	2.60	2.83	2.85	2.89	3.13	3.17	3.23	3.38	3.43	3.54
Average electricity (cents per kilowatthour)...	9.8	10.1	10.1	10.1	10.3	10.4	10.6	10.8	11.1	11.6

Table B1. Total energy supply, disposition, and price summary (continued)
(quadrillion Btu per year, unless otherwise noted)

Supply, disposition, and prices	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Prices (nominal dollars per unit)										
Crude oil spot prices (dollars per barrel)										
Brent.....	111.65	114.20	109.37	108.50	195.53	160.19	154.87	335.90	234.53	222.72
West Texas Intermediate	94.12	111.84	107.11	106.25	192.24	157.49	152.27	331.15	231.22	219.57
Natural gas at Henry Hub										
(dollars per million Btu)	2.75	5.40	4.96	5.10	9.50	8.12	8.16	17.69	12.69	12.49
Coal (dollars per ton)										
at the minemouth ¹⁶	39.94	55.37	52.69	51.79	88.91	71.55	68.91	144.11	98.08	92.34
Coal (dollars per million Btu)										
at the minemouth ¹⁶	1.98	2.77	2.63	2.59	4.47	3.59	3.46	7.23	4.91	4.63
Average end-use ¹⁷	2.60	3.38	3.23	3.21	5.27	4.27	4.13	8.31	5.68	5.43
Average electricity (cents per kilowatthour)...	9.8	12.1	11.5	11.2	17.4	14.0	13.6	26.6	18.5	17.7

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 natural gas plant 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.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 natural gas supply values: U.S. Energy Information Administration (EIA), *Natural Gas Monthly*, DOE/EIA-0130(2013/06) (Washington, DC, June 2013). 2012 coal minemouth and delivered coal prices: EIA, *Annual Coal Report 2012*, DOE/EIA-0584(2012) (Washington, DC, December 2013). 2012 petroleum supply values: EIA, *Petroleum Supply Annual 2012*, DOE/EIA-0340(2012)/1 (Washington, DC, September 2013). 2012 crude oil spot prices and natural gas spot price at Henry Hub: Thomson Reuters. Other 2012 coal values: *Quarterly Coal Report, October-December 2012*, DOE/EIA-0121(2012/4Q) (Washington, DC, March 2013). Other 2012 values: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System runs LOWMACRO.D112913A, REF2014.D102413A, and HIGHMACRO.D112913A.

Table B2. Energy consumption by sector and source
(quadrillion Btu per year, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Energy consumption										
Residential										
Propane	0.51	0.42	0.42	0.43	0.37	0.38	0.40	0.33	0.35	0.38
Kerosene	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Distillate fuel oil	0.51	0.46	0.46	0.46	0.37	0.37	0.37	0.31	0.31	0.31
Petroleum and other liquids subtotal.....	1.02	0.88	0.89	0.89	0.74	0.75	0.77	0.64	0.66	0.69
Natural gas	4.26	4.50	4.56	4.61	4.25	4.43	4.64	3.91	4.21	4.55
Renewable energy ¹	0.45	0.45	0.46	0.47	0.43	0.44	0.45	0.40	0.42	0.44
Electricity	4.69	4.73	4.84	4.99	4.86	5.21	5.61	5.07	5.65	6.31
Delivered energy.....	10.42	10.56	10.74	10.96	10.28	10.83	11.48	10.01	10.94	11.99
Electricity related losses	9.68	9.43	9.64	9.85	9.53	10.00	10.61	9.60	10.55	11.71
Total	20.10	19.99	20.38	20.81	19.81	20.83	22.09	19.62	21.48	23.70
Commercial										
Propane	0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.18	0.18
Motor gasoline ²	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.06
Kerosene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Distillate fuel oil.....	0.40	0.40	0.40	0.39	0.38	0.38	0.38	0.37	0.37	0.37
Residual fuel oil.....	0.04	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Petroleum and other liquids subtotal.....	0.63	0.68	0.68	0.68	0.67	0.67	0.68	0.67	0.68	0.68
Natural gas	2.96	3.22	3.23	3.22	3.33	3.35	3.37	3.60	3.65	3.70
Coal	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Renewable energy ³	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Electricity	4.52	4.68	4.69	4.71	5.11	5.18	5.24	5.60	5.72	5.81
Delivered energy.....	8.29	8.75	8.78	8.80	9.29	9.38	9.46	10.05	10.22	10.38
Electricity related losses	9.32	9.34	9.34	9.31	10.01	9.94	9.91	10.61	10.66	10.80
Total	17.61	18.09	18.12	18.11	19.30	19.32	19.38	20.66	20.88	21.17
Industrial ⁴										
Liquefied petroleum gases and other ⁵	2.25	2.85	2.90	2.93	2.95	3.05	3.06	2.82	2.90	2.93
Motor gasoline ²	0.26	0.29	0.30	0.31	0.28	0.30	0.31	0.27	0.29	0.31
Distillate fuel oil.....	1.20	1.32	1.40	1.48	1.28	1.41	1.52	1.28	1.42	1.56
Residual fuel oil.....	0.10	0.14	0.14	0.15	0.13	0.15	0.16	0.13	0.15	0.17
Petrochemical feedstocks	0.75	1.22	1.27	1.31	1.47	1.62	1.68	1.49	1.59	1.67
Other petroleum ⁶	3.50	3.35	3.56	3.80	3.17	3.58	3.91	3.22	3.75	4.19
Petroleum and other liquids subtotal.....	8.06	9.17	9.56	9.97	9.29	10.10	10.64	9.21	10.10	10.82
Natural gas	7.29	7.99	8.26	8.50	8.10	8.71	9.20	8.11	8.87	9.73
Natural-gas-to-liquids heat and power	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lease and plant fuel ⁷	1.45	1.77	1.77	1.81	2.07	2.16	2.25	2.30	2.41	2.52
Natural gas subtotal.....	8.75	9.75	10.04	10.31	10.17	10.87	11.44	10.41	11.28	12.25
Metallurgical coal.....	0.55	0.54	0.58	0.65	0.49	0.55	0.65	0.41	0.47	0.64
Other industrial coal.....	0.93	0.95	0.99	1.04	0.92	1.00	1.10	0.92	1.01	1.20
Coal-to-liquids heat and power	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net coal coke imports	0.00	0.00	0.00	0.01	-0.02	-0.03	-0.03	-0.04	-0.05	-0.06
Coal subtotal.....	1.48	1.50	1.57	1.70	1.38	1.52	1.72	1.28	1.44	1.78
Biofuels heat and coproducts.....	0.52	0.76	0.76	0.76	0.78	0.79	0.79	0.77	0.79	0.81
Renewable energy ⁸	1.48	1.65	1.74	1.82	1.81	2.01	2.14	2.03	2.28	2.50
Electricity	3.35	3.83	4.04	4.32	3.91	4.33	4.76	3.87	4.34	5.01
Delivered energy.....	23.63	26.67	27.71	28.87	27.35	29.62	31.49	27.58	30.22	33.17
Electricity related losses	6.91	7.65	8.05	8.53	7.66	8.33	8.99	7.33	8.10	9.31
Total	30.54	34.32	35.76	37.40	35.02	37.94	40.48	34.90	38.33	42.47

Table B2. Energy consumption by sector and source (continued)
(quadrillion Btu per year, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Transportation										
Propane	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.08
Motor gasoline ²	16.33	14.85	15.00	15.05	11.99	12.69	12.87	10.81	12.09	12.59
of which: E85 ⁹	0.01	0.19	0.19	0.18	0.54	0.46	0.42	0.47	0.33	0.34
Jet fuel ¹⁰	3.00	3.06	3.08	3.10	3.15	3.20	3.25	3.19	3.28	3.37
Distillate fuel oil ¹¹	5.82	6.35	6.70	7.17	6.48	7.25	8.07	6.53	7.54	8.94
Residual fuel oil	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.60	0.60	0.61
Other petroleum ¹²	0.15	0.14	0.15	0.15	0.14	0.15	0.15	0.14	0.15	0.15
Petroleum and other liquids subtotal	25.93	25.02	25.55	26.10	22.40	23.94	24.99	21.34	23.73	25.74
Pipeline fuel natural gas	0.73	0.72	0.74	0.76	0.78	0.82	0.86	0.80	0.85	0.89
Compressed / liquefied natural gas	0.04	0.08	0.08	0.08	0.28	0.28	0.30	0.86	0.86	1.05
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.06	0.06	0.06
Delivered energy	26.72	25.85	26.40	26.98	23.50	25.08	26.20	23.05	25.50	27.75
Electricity related losses	0.05	0.06	0.06	0.06	0.08	0.08	0.08	0.11	0.12	0.12
Total	26.77	25.92	26.47	27.04	23.58	25.17	26.28	23.16	25.62	27.87
Delivered energy consumption for all sectors										
Liquefied petroleum gases and other ⁵	2.96	3.47	3.53	3.56	3.54	3.65	3.69	3.38	3.49	3.57
Motor gasoline ⁸	16.64	15.18	15.34	15.40	12.31	13.04	13.22	11.13	12.44	12.96
of which: E85 ⁹	0.01	0.19	0.19	0.18	0.54	0.46	0.42	0.47	0.33	0.34
Jet fuel ¹⁰	3.00	3.06	3.08	3.10	3.15	3.20	3.25	3.19	3.28	3.37
Kerosene	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Distillate fuel oil	7.93	8.52	8.95	9.51	8.51	9.41	10.34	8.49	9.63	11.17
Residual fuel oil	0.72	0.80	0.80	0.82	0.80	0.82	0.83	0.81	0.83	0.85
Petrochemical feedstocks	0.75	1.22	1.27	1.31	1.47	1.62	1.68	1.49	1.59	1.67
Other petroleum ¹³	3.64	3.49	3.70	3.94	3.31	3.73	4.06	3.36	3.89	4.34
Petroleum and other liquids subtotal	35.64	35.76	36.68	37.64	33.10	35.47	37.09	31.86	35.17	37.93
Natural gas	14.56	15.78	16.14	16.42	15.97	16.77	17.51	16.47	17.59	19.04
Natural-gas-to-liquids heat and power	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lease and plant fuel ⁷	1.45	1.77	1.77	1.81	2.07	2.16	2.25	2.30	2.41	2.52
Pipeline natural gas	0.73	0.72	0.74	0.76	0.78	0.82	0.86	0.80	0.85	0.89
Natural gas subtotal	16.74	18.27	18.65	19.00	18.81	19.75	20.61	19.56	20.84	22.44
Metallurgical coal	0.55	0.54	0.58	0.65	0.49	0.55	0.65	0.41	0.47	0.64
Other coal	0.98	0.99	1.03	1.09	0.97	1.04	1.14	0.96	1.05	1.25
Coal-to-liquids heat and power	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net coal coke imports	0.00	0.00	0.00	0.01	-0.02	-0.03	-0.03	-0.04	-0.05	-0.06
Coal subtotal	1.53	1.54	1.61	1.74	1.43	1.56	1.76	1.33	1.48	1.83
Biofuels heat and coproducts	0.52	0.76	0.76	0.76	0.78	0.79	0.79	0.77	0.79	0.81
Renewable energy ¹⁴	2.06	2.24	2.33	2.41	2.38	2.58	2.72	2.56	2.83	3.07
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	12.58	13.27	13.60	14.05	13.93	14.76	15.65	14.60	15.77	17.20
Delivered energy	69.07	71.83	73.63	75.61	70.43	74.91	78.63	70.69	76.88	83.28
Electricity related losses	25.95	26.48	27.10	27.75	27.28	28.35	29.60	27.65	29.43	31.93
Total	95.02	98.31	100.73	103.36	97.71	103.27	108.23	98.34	106.31	115.22
Electric power¹⁵										
Distillate fuel oil	0.05	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	0.09
Residual fuel oil	0.18	0.09	0.09	0.09	0.09	0.09	0.10	0.09	0.10	0.11
Petroleum and other liquids subtotal	0.23	0.17	0.18	0.18	0.17	0.18	0.19	0.18	0.19	0.20
Natural gas	9.46	8.47	9.00	9.60	9.27	10.28	11.31	10.21	11.48	12.18
Steam coal	15.82	16.48	16.95	17.36	16.65	17.44	17.90	16.51	17.27	17.93
Nuclear / uranium ¹⁶	8.05	8.15	8.15	8.15	8.15	8.18	8.30	8.15	8.49	9.65
Renewable energy ¹⁷	4.59	6.14	6.08	6.16	6.63	6.68	7.22	6.87	7.44	8.81
Non-biogenic municipal waste	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Electricity imports	0.16	0.11	0.11	0.11	0.11	0.12	0.12	0.11	0.12	0.15
Total	38.53	39.75	40.70	41.80	41.21	43.12	45.25	42.25	45.20	49.13

Table B2. Energy consumption by sector and source (continued)
(quadrillion Btu per year, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Total energy consumption										
Liquefied petroleum gases and other ⁵	2.96	3.47	3.53	3.56	3.54	3.65	3.69	3.38	3.49	3.57
Motor gasoline ²	16.64	15.18	15.34	15.40	12.31	13.04	13.22	11.13	12.44	12.96
of which: E85 ⁹	0.01	0.19	0.19	0.18	0.54	0.46	0.42	0.47	0.33	0.34
Jet fuel ¹⁰	3.00	3.06	3.08	3.10	3.15	3.20	3.25	3.19	3.28	3.37
Kerosene.....	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Distillate fuel oil.....	7.98	8.61	9.03	9.60	8.59	9.50	10.43	8.57	9.72	11.26
Residual fuel oil.....	0.90	0.89	0.89	0.91	0.89	0.91	0.93	0.90	0.93	0.96
Petrochemical feedstocks.....	0.75	1.22	1.27	1.31	1.47	1.62	1.68	1.49	1.59	1.67
Other petroleum ¹³	3.64	3.49	3.70	3.94	3.31	3.73	4.06	3.36	3.89	4.34
Petroleum and other liquids subtotal.....	35.87	35.93	36.86	37.82	33.28	35.65	37.27	32.04	35.35	38.13
Natural gas.....	24.02	24.25	25.14	26.03	25.23	27.05	28.82	26.68	29.07	31.21
Natural-gas-to-liquids heat and power.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lease and plant fuel ⁷	1.45	1.77	1.77	1.81	2.07	2.16	2.25	2.30	2.41	2.52
Pipeline natural gas.....	0.73	0.72	0.74	0.76	0.78	0.82	0.86	0.80	0.85	0.89
Natural gas subtotal.....	26.20	26.73	27.65	28.60	28.08	30.03	31.92	29.78	32.32	34.62
Metallurgical coal.....	0.55	0.54	0.58	0.65	0.49	0.55	0.65	0.41	0.47	0.64
Other coal.....	16.79	17.47	17.98	18.45	17.62	18.49	19.04	17.47	18.32	19.18
Coal-to-liquids heat and power.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net coal coke imports.....	0.00	0.00	0.00	0.01	-0.02	-0.03	-0.03	-0.04	-0.05	-0.06
Coal subtotal.....	17.34	18.01	18.56	19.11	18.08	19.01	19.66	17.83	18.75	19.75
Nuclear / uranium ¹⁶	8.05	8.15	8.15	8.15	8.15	8.18	8.30	8.15	8.49	9.65
Biofuels heat and coproducts.....	0.52	0.76	0.76	0.76	0.78	0.79	0.79	0.77	0.79	0.81
Renewable energy ¹⁸	6.65	8.38	8.40	8.58	9.00	9.26	9.95	9.43	10.27	11.88
Liquid hydrogen.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-biogenic municipal waste.....	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Electricity imports.....	0.16	0.11	0.11	0.11	0.11	0.12	0.12	0.11	0.12	0.15
Total.....	95.02	98.31	100.73	103.36	97.71	103.27	108.23	98.34	106.31	115.22
Energy use and related statistics										
Delivered energy use.....	69.07	71.83	73.63	75.61	70.43	74.91	78.63	70.69	76.88	83.28
Total energy use.....	95.02	98.31	100.73	103.36	97.71	103.27	108.23	98.34	106.31	115.22
Ethanol consumed in motor gasoline and E85.....	1.09	1.21	1.22	1.22	1.25	1.25	1.25	1.25	1.29	1.34
Population (millions).....	314.58	332.91	334.47	336.27	354.64	359.03	364.05	372.79	380.53	389.40
Gross domestic product (billion 2005 dollars).....	13,593	15,918	16,753	17,594	18,910	21,139	22,725	23,158	26,670	29,154
Carbon dioxide emissions (million metric tons).....	5,290	5,327	5,476	5,633	5,195	5,527	5,778	5,170	5,599	5,972

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, in natural gas processing plant machinery, and for liquefaction in export facilities.

⁸Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources. Excludes ethanol in motor gasoline.

⁹E85 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.

¹⁰Includes only kerosene type.

¹¹Diesel fuel for on- and off-road use.

¹²Includes aviation gasoline and lubricants.

¹³Includes aviation gasoline, petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.

¹⁴Includes 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.

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

¹⁶These 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.

¹⁷Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes net electricity imports.

¹⁸Includes 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.

Note: Includes estimated consumption for petroleum and other liquids. Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 consumption based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 population and gross domestic product: IHS Global Insight Industry and Employment models, May 2013. 2012 carbon dioxide emissions and emission factors: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System runs LOWMACRO.D112913A, REF2014.D102413A, and HIGHMACRO.D112913A.

Table B3. Energy prices by sector and source
(2012 dollars per million Btu, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Residential										
Propane	24.12	23.76	23.79	24.21	25.45	25.75	26.02	27.09	27.64	27.99
Distillate fuel oil	27.30	24.26	24.67	25.12	27.69	28.60	29.24	31.27	32.64	33.97
Natural gas.....	10.46	11.58	11.59	12.22	12.92	13.50	14.06	14.90	15.98	17.10
Electricity.....	34.83	36.20	36.15	36.03	36.93	36.98	37.33	38.37	38.83	39.81
Commercial										
Propane	20.75	20.29	20.33	20.81	22.40	22.79	23.13	24.51	25.17	25.62
Distillate fuel oil	26.81	21.40	21.77	22.47	24.90	25.66	26.23	28.31	29.72	31.07
Residual fuel oil.....	22.84	14.19	14.40	14.52	17.39	17.92	18.26	20.36	20.99	21.89
Natural gas.....	8.11	9.50	9.49	9.96	10.72	11.19	11.62	12.26	13.08	13.94
Electricity.....	29.55	30.42	30.80	30.98	30.65	31.26	32.26	31.56	33.01	34.76
Industrial¹										
Propane	21.09	20.60	20.64	21.14	22.86	23.27	23.64	25.10	25.84	26.32
Distillate fuel oil	27.41	21.86	22.22	22.77	25.46	26.11	26.65	28.77	29.92	31.25
Residual fuel oil.....	20.90	14.67	14.88	15.03	17.82	18.29	18.61	20.80	21.48	22.37
Natural gas ²	3.77	5.84	5.79	6.08	6.57	6.99	7.37	8.11	8.59	9.25
Metallurgical coal	7.25	8.48	8.43	8.42	9.57	9.51	9.57	10.21	10.20	10.43
Other industrial coal	3.24	3.58	3.59	3.61	3.86	3.88	3.95	4.16	4.19	4.26
Coal to liquids	--	--	--	--	--	--	--	--	--	--
Electricity.....	19.50	20.54	20.77	20.98	21.45	21.99	22.77	22.94	24.05	25.45
Transportation										
Propane	25.14	24.82	24.85	25.45	26.51	26.81	27.08	28.14	28.82	29.20
E85 ³	35.06	25.36	25.61	27.09	25.63	27.91	29.07	29.82	35.49	36.50
Motor gasoline ⁴	30.68	25.48	25.59	26.22	27.98	28.54	28.90	30.76	32.67	33.65
Jet fuel ⁵	22.99	19.12	19.47	19.95	22.89	23.71	24.33	26.92	28.07	29.36
Diesel fuel (distillate fuel oil) ⁶	28.80	26.44	26.80	27.38	30.07	30.68	31.22	33.34	34.53	35.85
Residual fuel oil.....	20.07	12.26	12.46	12.67	15.08	15.50	15.83	17.91	18.55	19.41
Natural gas ⁷	14.64	15.44	15.62	16.41	15.95	16.63	17.25	18.26	19.67	20.83
Electricity.....	31.43	29.38	29.86	30.23	31.08	31.68	32.54	32.45	34.19	35.88
Electric power⁸										
Distillate fuel oil	24.12	20.27	20.66	21.19	23.77	24.65	25.25	27.39	28.81	30.14
Residual fuel oil.....	20.68	13.65	13.86	13.98	16.72	17.14	17.46	19.76	20.42	21.32
Natural gas.....	3.44	5.06	5.07	5.37	6.04	6.49	6.89	7.63	8.16	8.78
Steam coal.....	2.39	2.59	2.61	2.64	2.90	2.93	2.95	3.16	3.19	3.24
Average price to all users⁹										
Propane	23.24	22.51	22.54	23.02	24.30	24.66	25.00	26.12	26.79	27.24
E85 ³	35.06	25.36	25.61	27.09	25.63	27.91	29.07	29.82	35.49	36.50
Motor gasoline ⁴	30.44	25.48	25.58	26.22	27.97	28.53	28.90	30.76	32.67	33.64
Jet fuel ⁵	22.99	19.12	19.47	19.95	22.89	23.71	24.33	26.92	28.07	29.36
Distillate fuel oil	28.36	25.33	25.70	26.30	28.99	29.67	30.24	32.32	33.54	34.94
Residual fuel oil.....	20.41	12.95	13.15	13.36	15.85	16.32	16.68	18.74	19.42	20.34
Natural gas.....	5.38	7.15	7.09	7.42	8.10	8.49	8.86	9.81	10.38	11.16
Metallurgical coal	7.25	8.48	8.43	8.42	9.57	9.51	9.57	10.21	10.20	10.43
Other coal	2.44	2.66	2.67	2.70	2.96	2.98	3.02	3.22	3.25	3.31
Coal to liquids	--	--	--	--	--	--	--	--	--	--
Electricity.....	28.85	29.62	29.72	29.70	30.26	30.56	31.20	31.65	32.63	33.90
Non-renewable energy expenditures by sector (billion 2012 dollars)										
Residential	234.06	244.36	249.25	258.05	254.20	272.82	296.05	271.38	306.56	350.21
Commercial	173.25	187.07	189.44	192.88	208.45	215.91	225.21	239.06	255.39	273.61
Industrial ¹	213.75	265.70	279.45	299.80	306.22	343.02	376.63	342.35	390.91	450.69
Transportation	755.09	613.11	632.05	662.34	606.78	667.67	711.94	655.67	772.91	874.31
Total non-renewable expenditures.....	1,376.15	1,310.24	1,350.18	1,413.07	1,375.65	1,499.43	1,609.82	1,508.46	1,725.77	1,948.83
Transportation renewable expenditures.....	0.50	4.86	4.89	4.77	13.77	12.96	12.35	14.14	11.80	12.43
Total expenditures	1,376.66	1,315.10	1,355.07	1,417.84	1,389.42	1,512.39	1,622.18	1,522.61	1,737.56	1,961.26

Table B3. Energy prices by sector and source (continued)
(nominal dollars per million Btu, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Residential										
Propane	24.12	28.41	26.94	26.86	42.82	34.67	33.24	66.64	45.83	42.93
Distillate fuel oil	27.30	29.00	27.94	27.87	46.59	38.50	37.35	76.92	54.12	52.10
Natural gas	10.46	13.84	13.13	13.56	21.74	18.18	17.97	36.65	26.49	26.23
Electricity	34.83	43.29	40.94	39.97	62.12	49.78	47.70	94.41	64.39	61.06
Commercial										
Propane	20.75	24.26	23.02	23.08	37.69	30.68	29.55	60.30	41.74	39.29
Distillate fuel oil	26.81	25.59	24.66	24.93	41.89	34.54	33.51	69.64	49.27	47.65
Residual fuel oil	22.84	16.97	16.31	16.11	29.25	24.12	23.33	50.10	34.80	33.58
Natural gas	8.11	11.36	10.75	11.06	18.03	15.07	14.84	30.16	21.68	21.38
Electricity	29.55	36.38	34.88	34.37	51.56	42.08	41.21	77.65	54.73	53.32
Industrial¹										
Propane	21.09	24.64	23.38	23.45	38.45	31.32	30.20	61.77	42.83	40.37
Distillate fuel oil	27.41	26.14	25.17	25.26	42.83	35.15	34.04	70.79	49.61	47.93
Residual fuel oil	20.90	17.55	16.85	16.68	29.98	24.62	23.77	51.17	35.61	34.32
Natural gas ²	3.77	6.98	6.56	6.75	11.06	9.41	9.41	19.96	14.25	14.19
Metallurgical coal	7.25	10.14	9.55	9.34	16.10	12.81	12.22	25.13	16.91	16.00
Other industrial coal	3.24	4.28	4.07	4.00	6.50	5.23	5.05	10.22	6.95	6.54
Coal to liquids	--	--	--	--	--	--	--	--	--	--
Electricity	19.50	24.56	23.52	23.28	36.09	29.60	29.09	56.45	39.88	39.03
Transportation										
Propane	25.14	29.68	28.14	28.23	44.59	36.09	34.60	69.24	47.79	44.78
E85 ³	35.06	30.32	29.00	30.05	43.12	37.57	37.14	73.38	58.85	55.99
Motor gasoline ⁴	30.68	30.46	28.98	29.09	47.06	38.42	36.92	75.69	54.17	51.61
Jet fuel ⁵	22.99	22.87	22.06	22.14	38.51	31.91	31.08	66.24	46.53	45.04
Diesel fuel (distillate fuel oil) ⁶	28.80	31.62	30.35	30.38	50.59	41.30	39.89	82.02	57.25	54.99
Residual fuel oil	20.07	14.66	14.11	14.05	25.37	20.86	20.23	44.06	30.76	29.77
Natural gas ⁷	14.64	18.46	17.69	18.21	26.83	22.38	22.04	44.93	32.61	31.95
Electricity	31.43	35.13	33.82	33.54	52.29	42.65	41.56	79.83	56.68	55.04
Electric power⁸										
Distillate fuel oil	24.12	24.23	23.40	23.51	39.98	33.18	32.26	67.38	47.77	46.22
Residual fuel oil	20.68	16.33	15.70	15.51	28.13	23.08	22.30	48.61	33.86	32.70
Natural gas	3.44	6.05	5.75	5.96	10.16	8.74	8.80	18.76	13.53	13.47
Steam coal	2.39	3.10	2.96	2.93	4.88	3.94	3.77	7.78	5.29	4.97

Table B3. Energy prices by sector and source (continued)
(nominal dollars per million Btu, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Average price to all users ⁹										
Propane	23.24	26.91	25.53	25.54	40.88	33.20	31.93	64.27	44.42	41.78
E85 ³	35.06	30.32	29.00	30.05	43.12	37.57	37.14	73.38	58.85	55.99
Motor gasoline ⁴	30.44	30.46	28.98	29.09	47.06	38.41	36.92	75.68	54.17	51.60
Jet fuel ⁵	22.99	22.87	22.06	22.14	38.51	31.91	31.08	66.24	46.53	45.04
Distillate fuel oil	28.36	30.29	29.11	29.18	48.78	39.94	38.63	79.52	55.61	53.60
Residual fuel oil	20.41	15.48	14.90	14.82	26.67	21.97	21.31	46.10	32.20	31.20
Natural gas	5.38	8.55	8.04	8.23	13.62	11.43	11.32	24.13	17.22	17.12
Metallurgical coal	7.25	10.14	9.55	9.34	16.10	12.81	12.22	25.13	16.91	16.00
Other coal	2.44	3.17	3.03	2.99	4.97	4.02	3.86	7.92	5.39	5.08
Coal to liquids	--	--	--	--	--	--	--	--	--	--
Electricity	28.85	35.42	33.66	32.95	50.90	41.13	39.85	77.86	54.11	52.00
Non-renewable energy expenditures by sector (billion nominal dollars)										
Residential	234.06	292.19	282.30	286.31	427.62	367.27	378.21	667.71	508.27	537.16
Commercial	173.25	223.69	214.56	214.01	350.66	290.65	287.71	588.19	423.44	419.68
Industrial ¹	213.75	317.71	316.50	332.63	515.14	461.77	481.15	842.31	648.12	691.29
Transportation	755.09	733.13	715.87	734.87	1,020.75	898.80	909.52	1,613.19	1,281.47	1,341.05
Total non-renewable expenditures	1,376.15	1,566.72	1,529.23	1,567.81	2,314.17	2,018.49	2,056.59	3,711.39	2,861.30	2,989.19
Transportation renewable expenditures	0.50	5.81	5.54	5.29	23.16	17.45	15.78	34.80	19.56	19.06
Total expenditures	1,376.66	1,572.53	1,534.77	1,573.10	2,337.33	2,035.94	2,072.36	3,746.19	2,880.86	3,008.25

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. Price 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 2012 are model results and may differ from official EIA data reports.

Sources: 2012 prices for motor gasoline, distillate fuel oil, and jet fuel are based on prices in the U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, DOE/EIA-0380(2013/08) (Washington, DC, August 2013). 2012 residential, commercial, and industrial natural gas delivered prices: EIA, *Natural Gas Monthly*, DOE/EIA-0130(2013/06) (Washington, DC, June 2013). 2012 transportation sector natural gas delivered prices are model results. 2012 electric power sector distillate and residual fuel oil prices: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 electric power sector natural gas prices: EIA, *Electric Power Monthly*, DOE/EIA-0228, April 2012 and April 2013, Table 4.2, and EIA, *State Energy Data Report 2011*, DOE/EIA-0214(2011) (Washington, DC, June 2013). 2012 coal prices based on: EIA, *Quarterly Coal Report, October-December 2012*, DOE/EIA-0121(2012/4Q) (Washington, DC, March 2013) and EIA, AEO2014 National Energy Modeling System run REF2014.D102413A. 2012 electricity prices: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. Projections: EIA, AEO2014 National Energy Modeling System runs LOWMACRO.D112913A, REF2014.D102413A, and HIGHMACRO.D112913A.

Table B4. Macroeconomic indicators
(billion 2005 chain-weighted dollars, unless otherwise noted)

Indicators	2012	Projections								
		2020			2030			2040		
		Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth
Real gross domestic product	13,593	15,918	16,753	17,594	18,910	21,139	22,725	23,158	26,670	29,154
Components of real gross domestic product										
Real consumption	9,603	11,020	11,592	12,118	12,576	14,220	15,309	14,671	17,635	19,162
Real investment	1,914	2,554	2,876	3,256	3,174	3,740	4,288	4,137	4,925	5,702
Real government spending	2,481	2,374	2,443	2,505	2,425	2,623	2,708	2,587	2,917	3,005
Real exports	1,837	2,778	2,863	2,962	4,703	5,056	5,438	7,707	8,186	9,273
Real imports	2,238	2,738	2,925	3,127	3,746	4,213	4,667	5,339	6,328	7,128
Energy intensity (thousand Btu per 2005 dollar of GDP)										
Delivered energy	5.08	4.51	4.40	4.30	3.72	3.54	3.46	3.05	2.88	2.86
Total energy	6.99	6.18	6.01	5.87	5.17	4.89	4.76	4.25	3.99	3.95
Price indices										
GDP chain-type price index (2005=1.000)	1.154	1.380	1.307	1.280	1.941	1.553	1.474	2.839	1.913	1.770
Consumer price index (1982-4=1.00)										
All-urban	2.30	2.77	2.63	2.58	3.99	3.20	3.04	6.01	4.05	3.76
Energy commodities and services	2.46	2.68	2.55	2.54	4.08	3.33	3.21	6.51	4.56	4.39
Wholesale price index (1982=1.00)										
All commodities	2.02	2.35	2.22	2.20	3.28	2.62	2.51	4.79	3.21	3.06
Fuel and power	2.12	2.54	2.42	2.41	4.00	3.30	3.23	6.72	4.73	4.61
Metals and metal products	2.20	2.54	2.43	2.51	3.41	2.77	2.75	4.67	3.22	3.28
Industrial commodities excluding energy	1.94	2.27	2.14	2.13	3.07	2.41	2.30	4.27	2.78	2.64
Interest rates (percent, nominal)										
Federal funds rate	0.14	5.28	3.85	3.40	7.03	4.14	3.63	7.45	4.22	3.85
10-year treasury note	1.80	6.02	4.14	3.61	7.26	4.36	3.83	7.84	4.52	4.05
AA utility bond rate	3.83	8.91	6.60	5.59	10.42	6.88	5.99	11.30	7.22	6.35
Value of shipments (billion 2005 dollars)										
Non-industrial and service sectors	21,359	24,672	26,033	27,492	28,252	31,782	34,301	31,742	37,135	40,577
Total industrial	6,147	7,439	7,960	8,614	8,400	9,537	10,672	9,475	10,994	12,985
Agriculture, mining, and construction	1,623	2,011	2,226	2,470	2,040	2,389	2,717	2,159	2,551	2,945
Manufacturing	4,525	5,428	5,735	6,144	6,360	7,148	7,955	7,315	8,443	10,041
Energy-intensive	1,616	1,861	1,931	2,012	2,003	2,171	2,292	2,105	2,303	2,484
Non-energy-intensive	2,909	3,567	3,803	4,131	4,358	4,977	5,663	5,210	6,140	7,557
Total shipments	27,506	32,111	33,994	36,105	36,651	41,319	44,973	41,217	48,129	53,563
Population and employment (millions)										
Population, with armed forces overseas	314.6	332.9	334.5	336.3	354.6	359.0	364.1	372.8	380.5	389.4
Population, aged 16 and over	249.2	265.6	266.7	268.0	284.4	287.6	291.4	301.4	307.3	314.0
Population, over age 65	43.4	56.2	56.2	56.3	72.7	73.0	73.3	79.1	79.8	80.6
Employment, nonfarm	133.7	145.4	148.4	153.5	155.0	158.6	166.4	163.0	169.2	178.4
Employment, manufacturing	11.9	12.2	12.8	13.7	11.1	12.5	13.9	9.5	11.0	13.1
Key labor indicators										
Labor force (millions)	155.0	162.4	163.5	165.0	168.3	170.9	174.7	176.9	181.2	189.8
Non-farm labor productivity (1992=1.00)	1.11	1.21	1.25	1.27	1.41	1.53	1.58	1.64	1.85	1.94
Unemployment rate (percent)	8.08	5.87	5.49	5.07	5.38	5.10	4.80	5.27	5.12	4.72
Key indicators for energy demand										
Real disposable personal income	10,304	12,212	12,710	13,204	14,681	15,926	16,752	17,688	19,724	20,650
Housing starts (millions)	0.84	1.25	1.75	2.38	1.09	1.71	2.50	1.02	1.66	2.59
Commercial floorspace (billion square feet)	82.4	88.6	89.1	89.8	96.5	98.2	100.0	105.6	108.9	112.3
Unit sales of light-duty vehicles (millions)	14.43	15.16	16.23	17.06	15.49	17.23	17.93	15.27	17.93	19.42

GDP = Gross domestic product.

Btu = British thermal unit.

Sources: 2012: IHS Global Insight, Global Insight Industry and Employment models, May 2013. Projections: U.S. Energy Information Administration, AEO2014 National Energy Modeling System runs LOWMACRO.D112913A, REF2014.D102413A, and HIGHMACRO.D112913A.

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Price case comparisons

Table C1. Total energy supply, disposition, and price summary
(quadrillion Btu per year, unless otherwise noted)

Supply, disposition, and prices	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Production										
Crude oil and lease condensate.....	13.87	19.06	20.36	22.76	14.60	17.71	19.80	12.41	16.00	17.55
Natural gas plant liquids.....	3.21	3.47	3.54	3.62	3.80	3.98	4.18	3.69	3.99	4.17
Dry natural gas.....	24.59	28.18	29.73	30.60	31.92	35.19	39.44	33.89	38.37	42.37
Coal ¹	20.60	21.75	21.70	21.30	22.70	22.61	22.32	23.08	22.61	23.23
Nuclear / uranium ²	8.05	8.15	8.15	8.15	8.16	8.18	8.22	8.41	8.49	9.37
Hydropower.....	2.67	2.80	2.81	2.80	2.86	2.87	2.88	2.90	2.90	2.92
Biomass ³	3.78	4.52	4.66	4.74	5.16	5.29	5.31	5.52	5.61	5.63
Other renewable energy ⁴	1.97	2.98	3.01	3.07	3.22	3.23	3.32	3.94	3.89	4.50
Other ⁵	0.41	0.27	0.24	0.23	0.29	0.24	0.23	0.29	0.24	0.23
Total.....	79.15	91.20	94.19	97.28	92.71	99.30	105.70	94.13	102.09	109.96
Imports										
Crude oil.....	18.57	15.06	13.15	9.40	19.49	15.00	10.61	22.99	17.43	12.69
Petroleum and other liquids ⁶	4.26	4.74	4.21	3.72	4.99	4.08	3.29	5.58	3.93	3.00
Natural gas ⁷	3.21	2.37	2.39	2.46	1.95	2.01	1.95	2.34	2.28	2.12
Other imports ⁸	0.36	0.14	0.17	0.57	0.12	0.12	0.16	0.09	0.10	0.27
Total.....	26.40	22.31	19.92	16.16	26.55	21.22	16.01	31.00	23.73	18.08
Exports										
Petroleum and other liquids ⁹	6.29	6.51	6.30	5.93	7.39	6.91	6.54	8.09	7.70	7.26
Natural gas ¹⁰	1.63	3.04	4.30	4.69	4.34	6.96	9.92	5.33	8.09	10.89
Coal.....	3.22	3.14	3.13	3.10	3.61	3.55	3.29	4.15	3.79	3.33
Total.....	11.14	12.69	13.73	13.72	15.34	17.42	19.74	17.57	19.58	21.48
Discrepancy¹¹.....	-0.61	-0.28	-0.35	-0.34	-0.12	-0.17	-0.16	0.06	-0.07	-0.14
Consumption										
Petroleum and other liquids ¹²	35.87	37.64	36.86	35.44	37.19	35.65	33.13	38.16	35.35	32.69
Natural gas.....	26.20	27.36	27.65	28.20	29.36	30.03	31.24	30.66	32.32	32.98
Coal ¹³	17.34	18.58	18.56	18.60	19.03	19.01	19.02	18.84	18.75	19.58
Nuclear / uranium ²	8.05	8.15	8.15	8.15	8.16	8.18	8.22	8.41	8.49	9.37
Hydropower.....	2.67	2.80	2.81	2.80	2.86	2.87	2.88	2.90	2.90	2.92
Biomass ¹⁴	2.53	3.24	3.35	3.45	3.87	3.95	3.98	4.24	4.26	4.28
Other renewable energy ⁴	1.97	2.98	3.01	3.07	3.22	3.23	3.32	3.94	3.89	4.50
Other ¹⁵	0.39	0.34	0.34	0.34	0.35	0.35	0.35	0.35	0.35	0.39
Total.....	95.02	101.10	100.73	100.06	104.04	103.27	102.14	107.49	106.31	106.71
Prices (2012 dollars per unit)										
Crude oil spot prices (dollars per barrel)										
Brent.....	111.65	68.90	96.57	150.28	71.90	118.99	173.69	74.90	141.46	204.24
West Texas Intermediate.....	94.12	66.90	94.57	148.28	69.90	116.99	171.69	72.90	139.46	202.24
Natural gas at Henry Hub										
(dollars per million Btu).....	2.75	4.35	4.38	4.73	5.75	6.03	6.88	7.43	7.65	8.34
Coal (dollars per ton)										
at the minemouth ¹⁶	39.94	45.43	46.52	48.49	51.20	53.15	55.00	56.67	59.16	60.51
Coal (dollars per million Btu)										
at the minemouth ¹⁶	1.98	2.27	2.33	2.42	2.58	2.67	2.75	2.85	2.96	3.04
Average end-use ¹⁷	2.60	2.76	2.85	2.99	3.03	3.17	3.30	3.25	3.43	3.60
Average electricity (cents per kilowatthour)...	9.8	10.1	10.1	10.3	10.4	10.4	10.7	11.1	11.1	11.7

Table C1. Total energy supply, disposition, and price summary (continued)
(quadrillion Btu per year, unless otherwise noted)

Supply, disposition, and prices	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Prices (nominal dollars per unit)										
Crude oil spot prices (dollars per barrel)										
Brent.....	111.65	77.64	109.37	171.98	94.64	160.19	243.19	119.51	234.53	351.41
West Texas Intermediate	94.12	75.39	107.11	169.69	92.01	157.49	240.39	116.32	231.22	347.97
Natural gas at Henry Hub										
(dollars per million Btu)	2.75	4.90	4.96	5.41	7.57	8.12	9.64	11.86	12.69	14.34
Coal (dollars per ton)										
at the minemouth ¹⁶	39.94	51.20	52.69	55.49	67.39	71.55	77.01	90.42	98.08	104.11
Coal (dollars per million Btu)										
at the minemouth ¹⁶	1.98	2.56	2.63	2.77	3.40	3.59	3.86	4.54	4.91	5.23
Average end-use ¹⁷	2.60	3.11	3.23	3.42	3.99	4.27	4.63	5.18	5.68	6.20
Average electricity (cents per kilowatthour)...	9.8	11.3	11.5	11.8	13.6	14.0	15.0	17.6	18.5	20.1

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 natural gas plant 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.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 natural gas supply values: U.S. Energy Information Administration (EIA), *Natural Gas Monthly*, DOE/EIA-0130(2013/06) (Washington, DC, June 2013). 2012 coal minemouth and delivered coal prices: EIA, *Annual Coal Report 2012*, DOE/EIA-0584(2012) (Washington, DC, December 2013). 2012 petroleum supply values: EIA, *Petroleum Supply Annual 2012*, DOE/EIA-0340(2012)/1 (Washington, DC, September 2013). 2012 crude oil spot prices and natural gas spot price at Henry Hub: Thomson Reuters. Other 2012 coal values: *Quarterly Coal Report, October-December 2012*, DOE/EIA-0121(2012/4Q) (Washington, DC, March 2013). Other 2012 values: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System runs LOWPRICE.D120613A, REF2014.D102413A, and HIGHPRICE.D120613A.

Table C2. Energy consumption by sector and source
(quadrillion Btu per year, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Energy consumption										
Residential										
Propane	0.51	0.43	0.42	0.42	0.39	0.38	0.37	0.36	0.35	0.34
Kerosene	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Distillate fuel oil	0.51	0.48	0.46	0.43	0.40	0.37	0.35	0.34	0.31	0.29
Petroleum and other liquids subtotal	1.02	0.91	0.89	0.85	0.79	0.75	0.72	0.70	0.66	0.63
Natural gas	4.26	4.57	4.56	4.54	4.44	4.43	4.39	4.22	4.21	4.16
Renewable energy ¹	0.45	0.41	0.46	0.55	0.37	0.44	0.51	0.33	0.42	0.48
Electricity	4.69	4.86	4.84	4.81	5.23	5.21	5.16	5.69	5.65	5.57
Delivered energy	10.42	10.75	10.74	10.75	10.82	10.83	10.78	10.95	10.94	10.85
Electricity related losses	9.68	9.67	9.64	9.59	10.05	10.00	9.96	10.61	10.55	10.60
Total	20.10	20.42	20.38	20.34	20.88	20.83	20.75	21.56	21.48	21.45
Commercial										
Propane	0.15	0.17	0.16	0.15	0.18	0.17	0.16	0.19	0.18	0.17
Motor gasoline ²	0.05	0.05	0.04	0.04	0.05	0.05	0.05	0.06	0.05	0.05
Kerosene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Distillate fuel oil	0.40	0.43	0.40	0.35	0.42	0.38	0.33	0.43	0.37	0.32
Residual fuel oil	0.04	0.09	0.08	0.06	0.10	0.08	0.06	0.10	0.08	0.06
Petroleum and other liquids subtotal	0.63	0.74	0.68	0.61	0.76	0.67	0.60	0.79	0.68	0.60
Natural gas	2.96	3.25	3.23	3.22	3.36	3.35	3.32	3.66	3.65	3.59
Coal	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Renewable energy ³	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Electricity	4.52	4.70	4.69	4.67	5.19	5.18	5.14	5.74	5.72	5.66
Delivered energy	8.29	8.86	8.78	8.68	9.48	9.38	9.24	10.36	10.22	10.02
Electricity related losses	9.32	9.35	9.34	9.32	9.97	9.94	9.93	10.70	10.66	10.75
Total	17.61	18.21	18.12	18.00	19.46	19.32	19.17	21.06	20.88	20.78
Industrial ⁴										
Liquefied petroleum gases and other ⁵	2.25	2.86	2.90	2.97	2.87	3.05	3.18	2.79	2.90	3.10
Motor gasoline ²	0.26	0.30	0.30	0.30	0.29	0.30	0.29	0.30	0.29	0.29
Distillate fuel oil	1.20	1.40	1.40	1.38	1.42	1.41	1.36	1.45	1.42	1.36
Residual fuel oil	0.10	0.17	0.14	0.12	0.19	0.15	0.13	0.21	0.15	0.13
Petrochemical feedstocks	0.75	1.27	1.27	1.27	1.58	1.62	1.62	1.49	1.59	1.70
Other petroleum ⁶	3.50	3.67	3.56	3.38	3.83	3.58	3.34	4.10	3.75	3.46
Petroleum and other liquids subtotal	8.06	9.66	9.56	9.43	10.19	10.10	9.92	10.33	10.10	10.04
Natural gas	7.29	8.11	8.26	8.40	8.54	8.71	8.57	8.49	8.87	8.74
Natural-gas-to-liquids heat and power	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
Lease and plant fuel ⁷	1.45	1.57	1.77	1.90	1.77	2.16	2.84	1.83	2.41	3.11
Natural gas subtotal	8.75	9.69	10.04	10.29	10.32	10.87	11.42	10.32	11.28	12.26
Metallurgical coal	0.55	0.57	0.58	0.59	0.55	0.55	0.53	0.49	0.47	0.46
Other industrial coal	0.93	0.98	0.99	0.99	0.99	1.00	1.00	1.00	1.01	1.02
Coal-to-liquids heat and power	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
Net coal coke imports	0.00	0.00	0.00	0.01	-0.03	-0.03	-0.03	-0.05	-0.05	-0.04
Coal subtotal	1.48	1.56	1.57	1.59	1.51	1.52	1.51	1.44	1.44	2.01
Biofuels heat and coproducts	0.52	0.76	0.76	0.75	0.79	0.79	0.78	0.78	0.79	0.78
Renewable energy ⁸	1.48	1.74	1.74	1.74	2.05	2.01	1.93	2.38	2.28	2.20
Electricity	3.35	4.02	4.04	4.09	4.31	4.33	4.27	4.34	4.34	4.33
Delivered energy	23.63	27.43	27.71	27.90	29.18	29.62	29.82	29.59	30.22	31.61
Electricity related losses	6.91	8.01	8.05	8.16	8.30	8.33	8.25	8.10	8.10	8.22
Total	30.54	35.44	35.76	36.05	37.48	37.94	38.07	37.69	38.33	39.83

Table C2. Energy consumption by sector and source (continued)
(quadrillion Btu per year, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil Price
Transportation										
Propane.....	0.05	0.04	0.05	0.06	0.05	0.06	0.07	0.05	0.07	0.08
Motor gasoline ⁸	16.33	15.61	15.00	14.05	13.81	12.69	11.52	13.69	12.09	10.88
of which: E85 ⁹	0.01	0.13	0.19	0.29	0.30	0.46	0.59	0.27	0.33	0.56
Jet fuel ¹⁰	3.00	3.08	3.08	3.07	3.20	3.20	3.19	3.29	3.28	3.27
Distillate fuel oil ¹¹	5.82	6.69	6.70	6.47	7.47	7.25	6.18	8.36	7.54	6.24
Residual fuel oil.....	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.60	0.60	0.60
Other petroleum ¹²	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Petroleum and other liquids subtotal.....	25.93	26.15	25.55	24.38	25.27	23.94	21.70	26.14	23.73	21.22
Pipeline fuel natural gas.....	0.73	0.71	0.74	0.76	0.76	0.82	0.86	0.78	0.85	0.89
Compressed / liquefied natural gas.....	0.04	0.07	0.08	0.43	0.08	0.28	1.44	0.10	0.86	2.32
Liquid hydrogen.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity.....	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.07
Delivered energy.....	26.72	26.97	26.40	25.60	26.16	25.08	24.05	27.08	25.50	24.51
Electricity related losses.....	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.10	0.12	0.14
Total.....	26.77	27.03	26.47	25.66	26.23	25.17	24.15	27.18	25.62	24.65
Delivered energy consumption for all sectors										
Liquefied petroleum gases and other ⁵	2.96	3.50	3.53	3.60	3.49	3.65	3.77	3.39	3.49	3.68
Motor gasoline ²	16.64	15.95	15.34	14.39	14.16	13.04	11.85	14.05	12.44	11.22
of which: E85 ⁹	0.01	0.13	0.19	0.29	0.30	0.46	0.59	0.27	0.33	0.56
Jet fuel ¹⁰	3.00	3.08	3.08	3.07	3.20	3.20	3.19	3.29	3.28	3.27
Kerosene.....	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Distillate fuel oil.....	7.93	9.00	8.95	8.64	9.71	9.41	8.23	10.58	9.63	8.21
Residual fuel oil.....	0.72	0.85	0.80	0.77	0.88	0.82	0.78	0.92	0.83	0.80
Petrochemical feedstocks.....	0.75	1.27	1.27	1.27	1.58	1.62	1.62	1.49	1.59	1.70
Other petroleum ¹³	3.64	3.81	3.70	3.52	3.97	3.73	3.48	4.24	3.89	3.61
Petroleum and other liquids subtotal.....	35.64	37.46	36.68	35.27	37.00	35.47	32.94	37.97	35.17	32.50
Natural gas.....	14.56	16.00	16.14	16.59	16.43	16.77	17.72	16.47	17.59	18.81
Natural-gas-to-liquids heat and power.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
Lease and plant fuel ⁷	1.45	1.57	1.77	1.90	1.77	2.16	2.84	1.83	2.41	3.11
Pipeline natural gas.....	0.73	0.71	0.74	0.76	0.76	0.82	0.86	0.78	0.85	0.89
Natural gas subtotal.....	16.74	18.28	18.65	19.24	18.96	19.75	21.42	19.08	20.84	23.21
Metallurgical coal.....	0.55	0.57	0.58	0.59	0.55	0.55	0.53	0.49	0.47	0.46
Other coal.....	0.98	1.03	1.03	1.04	1.03	1.04	1.05	1.04	1.05	1.07
Coal-to-liquids heat and power.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
Net coal coke imports.....	0.00	0.00	0.00	0.01	-0.03	-0.03	-0.03	-0.05	-0.05	-0.04
Coal subtotal.....	1.53	1.60	1.61	1.64	1.55	1.56	1.55	1.48	1.48	2.05
Biofuels heat and coproducts.....	0.52	0.76	0.76	0.75	0.79	0.79	0.78	0.78	0.79	0.78
Renewable energy ¹⁴	2.06	2.28	2.33	2.42	2.56	2.58	2.58	2.84	2.83	2.82
Liquid hydrogen.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity.....	12.58	13.61	13.60	13.60	14.77	14.76	14.62	15.83	15.77	15.63
Delivered energy.....	69.07	74.00	73.63	72.93	75.64	74.91	73.89	77.98	76.88	76.99
Electricity related losses.....	25.95	27.10	27.10	27.13	28.40	28.35	28.25	29.51	29.43	29.71
Total.....	95.02	101.10	100.73	100.06	104.04	103.27	102.14	107.49	106.31	106.71
Electric power ¹⁵										
Distillate fuel oil.....	0.05	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Residual fuel oil.....	0.18	0.09	0.09	0.09	0.09	0.09	0.09	0.11	0.10	0.10
Petroleum and other liquids subtotal.....	0.23	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19
Natural gas.....	9.46	9.08	9.00	8.96	10.40	10.28	9.81	11.58	11.48	9.76
Steam coal.....	15.82	16.98	16.95	16.96	17.48	17.44	17.47	17.37	17.27	17.53
Nuclear / uranium ¹⁶	8.05	8.15	8.15	8.15	8.16	8.18	8.22	8.41	8.49	9.37
Renewable energy ¹⁷	4.59	5.98	6.08	6.15	6.60	6.68	6.83	7.45	7.44	8.11
Non-biogenic municipal waste.....	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Electricity imports.....	0.16	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.16
Total.....	38.53	40.71	40.70	40.74	43.16	43.12	42.87	45.34	45.20	45.34

Table C2. Energy consumption by sector and source (continued)
(quadrillion Btu per year, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Total energy consumption										
Liquefied petroleum gases and other ⁵	2.96	3.50	3.53	3.60	3.49	3.65	3.77	3.39	3.49	3.68
Motor gasoline ²	16.64	15.95	15.34	14.39	14.16	13.04	11.85	14.05	12.44	11.22
of which: E85 ⁹	0.01	0.13	0.19	0.29	0.30	0.46	0.59	0.27	0.33	0.56
Jet fuel ¹⁰	3.00	3.08	3.08	3.07	3.20	3.20	3.19	3.29	3.28	3.27
Kerosene	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Distillate fuel oil	7.98	9.09	9.03	8.73	9.79	9.50	8.31	10.66	9.72	8.29
Residual fuel oil	0.90	0.94	0.89	0.86	0.98	0.91	0.88	1.03	0.93	0.90
Petrochemical feedstocks	0.75	1.27	1.27	1.27	1.58	1.62	1.62	1.49	1.59	1.70
Other petroleum ¹³	3.64	3.81	3.70	3.52	3.97	3.73	3.48	4.24	3.89	3.61
Petroleum and other liquids subtotal	35.87	37.64	36.86	35.44	37.19	35.65	33.13	38.16	35.35	32.69
Natural gas	24.02	25.07	25.14	25.55	26.82	27.05	27.53	28.05	29.07	28.58
Natural-gas-to-liquids heat and power	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
Lease and plant fuel ⁷	1.45	1.57	1.77	1.90	1.77	2.16	2.84	1.83	2.41	3.11
Pipeline natural gas	0.73	0.71	0.74	0.76	0.76	0.82	0.86	0.78	0.85	0.89
Natural gas subtotal	26.20	27.36	27.65	28.20	29.36	30.03	31.24	30.66	32.32	32.98
Metallurgical coal	0.55	0.57	0.58	0.59	0.55	0.55	0.53	0.49	0.47	0.46
Other coal	16.79	18.01	17.98	18.00	18.51	18.49	18.52	18.41	18.32	18.59
Coal-to-liquids heat and power	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
Net coal coke imports	0.00	0.00	0.00	0.01	-0.03	-0.03	-0.03	-0.05	-0.05	-0.04
Coal subtotal	17.34	18.58	18.56	18.60	19.03	19.01	19.02	18.84	18.75	19.58
Nuclear / uranium ¹⁶	8.05	8.15	8.15	8.15	8.16	8.18	8.22	8.41	8.49	9.37
Biofuels heat and coproducts	0.52	0.76	0.76	0.75	0.79	0.79	0.78	0.78	0.79	0.78
Renewable energy ¹⁸	6.65	8.26	8.40	8.57	9.16	9.26	9.41	10.29	10.27	10.93
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-biogenic municipal waste	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Electricity imports	0.16	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.16
Total	95.02	101.10	100.73	100.06	104.04	103.27	102.14	107.49	106.31	106.71
Energy use and related statistics										
Delivered energy use	69.07	74.00	73.63	72.93	75.64	74.91	73.89	77.98	76.88	76.99
Total energy use	95.02	101.10	100.73	100.06	104.04	103.27	102.14	107.49	106.31	106.71
Ethanol consumed in motor gasoline and E85	1.09	1.22	1.22	1.21	1.25	1.25	1.24	1.25	1.29	1.31
Population (millions)	314.58	334.47	334.47	334.47	359.03	359.03	359.03	380.53	380.53	380.53
Gross domestic product (billion 2005 dollars)	13,593	16,739	16,753	16,812	21,150	21,139	21,100	26,725	26,670	26,772
Carbon dioxide emissions (million metric tons)	5,290	5,523	5,476	5,401	5,621	5,527	5,401	5,746	5,599	5,475

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, in natural gas processing plant machinery, and for liquefaction in export facilities.

⁸Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources. Excludes ethanol in motor gasoline.

⁹E85 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.

¹⁰Includes only kerosene type.

¹¹Diesel fuel for on- and off-road use.

¹²Includes aviation gasoline and lubricants.

¹³Includes aviation gasoline, petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.

¹⁴Includes 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.

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

¹⁶These 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.

¹⁷Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes net electricity imports.

¹⁸Includes 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.

Note: Includes estimated consumption for petroleum and other liquids. Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 consumption based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 population and gross domestic product: IHS Global Insight Industry and Employment models, May 2013. 2012 carbon dioxide emissions and emission factors: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System runs LOWPRICE.D120613A, REF2014.D102413A, and HIGHPRICE.D120613A.

Table C3. Energy prices by sector and source
(2012 dollars per million Btu, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil Price
Residential										
Propane	24.12	22.39	23.79	25.81	23.38	25.75	28.16	24.24	27.64	29.79
Distillate fuel oil	27.30	19.42	24.67	34.47	20.14	28.60	38.28	20.70	32.64	43.67
Natural gas.....	10.46	11.58	11.59	11.91	13.32	13.50	14.02	15.76	15.98	17.01
Electricity.....	34.83	35.80	36.15	36.73	36.70	36.98	37.81	38.53	38.83	40.50
Commercial										
Propane	20.75	18.60	20.33	22.87	19.78	22.79	25.93	20.80	25.17	28.11
Distillate fuel oil	26.81	16.64	21.77	31.50	17.38	25.66	35.27	17.87	29.72	40.58
Residual fuel oil.....	22.84	10.41	14.40	22.09	11.17	17.92	25.57	11.73	20.99	30.45
Natural gas.....	8.11	9.45	9.49	9.79	10.95	11.19	11.62	12.85	13.08	14.20
Electricity.....	29.55	30.53	30.80	31.28	31.07	31.26	31.98	32.82	33.01	34.56
Industrial¹										
Propane	21.09	18.85	20.64	23.33	20.23	23.27	26.61	21.65	25.84	28.95
Distillate fuel oil	27.41	17.04	22.22	31.89	17.72	26.11	35.68	18.11	29.92	40.96
Residual fuel oil.....	20.90	10.84	14.88	22.60	11.54	18.29	25.97	12.15	21.48	30.80
Natural gas ²	3.77	5.70	5.79	6.11	6.70	6.99	7.67	8.48	8.59	9.53
Metallurgical coal	7.25	8.34	8.43	8.60	9.38	9.51	9.65	10.05	10.20	10.38
Other industrial coal	3.24	3.51	3.59	3.72	3.76	3.88	4.04	4.02	4.19	4.36
Coal to liquids	--	--	--	--	--	--	--	--	--	3.16
Electricity.....	19.50	20.54	20.77	21.17	21.75	21.99	22.71	23.86	24.05	25.41
Transportation										
Propane	25.14	23.49	24.85	26.88	24.52	26.81	29.22	25.43	28.82	30.84
E85 ³	35.06	22.62	25.61	33.07	24.13	27.91	34.30	26.08	35.49	40.38
Motor gasoline ⁴	30.68	21.22	25.59	34.56	21.23	28.54	37.08	21.79	32.67	42.21
Jet fuel ⁵	22.99	14.26	19.47	29.11	15.29	23.71	32.98	16.09	28.07	38.74
Diesel fuel (distillate fuel oil) ⁶	28.80	21.63	26.80	36.44	22.33	30.68	40.19	22.73	34.53	45.47
Residual fuel oil.....	20.07	8.73	12.46	19.50	9.40	15.50	22.49	10.00	18.55	26.71
Natural gas ⁷	14.64	16.00	15.62	18.62	16.68	16.63	19.78	17.80	19.67	21.46
Electricity.....	31.43	29.74	29.86	30.17	31.41	31.68	32.47	33.74	34.19	36.24
Electric power⁸										
Distillate fuel oil	24.12	15.46	20.66	30.47	16.25	24.65	34.31	16.86	28.81	39.77
Residual fuel oil.....	20.68	9.88	13.86	21.50	10.48	17.14	24.95	10.78	20.42	29.76
Natural gas.....	3.44	5.00	5.07	5.35	6.20	6.49	7.05	8.05	8.16	8.98
Steam coal	2.39	2.52	2.61	2.75	2.79	2.93	3.06	3.00	3.19	3.40
Average price to all users⁹										
Propane	23.24	20.99	22.54	24.84	21.99	24.66	27.45	22.80	26.79	29.34
E85 ³	35.06	22.62	25.61	33.07	24.13	27.91	34.30	26.08	35.49	40.38
Motor gasoline ⁴	30.44	21.22	25.58	34.56	21.22	28.53	37.08	21.78	32.67	42.21
Jet fuel ⁵	22.99	14.26	19.47	29.11	15.29	23.71	32.98	16.09	28.07	38.74
Distillate fuel oil	28.36	20.51	25.70	35.36	21.30	29.67	39.14	21.79	33.54	44.42
Residual fuel oil.....	20.41	9.39	13.15	20.34	10.10	16.32	23.48	10.70	19.42	27.91
Natural gas.....	5.38	7.03	7.09	7.55	8.16	8.49	9.57	10.00	10.38	11.96
Metallurgical coal	7.25	8.34	8.43	8.60	9.38	9.51	9.65	10.05	10.20	10.38
Other coal	2.44	2.59	2.67	2.81	2.85	2.98	3.12	3.07	3.25	3.46
Coal to liquids	--	--	--	--	--	--	--	--	--	3.16
Electricity.....	28.85	29.46	29.72	30.17	30.34	30.56	31.33	32.42	32.63	34.15
Non-renewable energy expenditures by sector (billion 2012 dollars)										
Residential	234.06	245.83	249.25	256.46	268.11	272.82	280.40	301.65	306.56	319.45
Commercial.....	173.25	186.48	189.44	195.36	211.31	215.91	222.46	249.84	255.39	268.38
Industrial ¹	213.75	249.82	279.45	335.52	285.52	343.02	407.85	312.95	390.91	479.52
Transportation.....	755.09	527.76	632.05	827.37	514.23	667.67	809.67	548.77	772.91	923.38
Total non-renewable expenditures.....	1,376.15	1,209.88	1,350.18	1,614.71	1,279.17	1,499.43	1,720.37	1,413.21	1,725.77	1,990.73
Transportation renewable expenditures.....	0.50	2.85	4.89	9.50	7.27	12.96	20.25	7.05	11.80	22.66
Total expenditures	1,376.66	1,212.74	1,355.07	1,624.21	1,286.44	1,512.39	1,740.62	1,420.26	1,737.56	2,013.39

Table C3. Energy prices by sector and source (continued)
(nominal dollars per million Btu, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Residential										
Propane	24.12	25.22	26.94	29.54	30.77	34.67	39.43	38.67	45.83	51.25
Distillate fuel oil	27.30	21.89	27.94	39.45	26.51	38.50	53.60	33.02	54.12	75.14
Natural gas	10.46	13.05	13.13	13.62	17.53	18.18	19.62	25.15	26.49	29.27
Electricity	34.83	40.34	40.94	42.04	48.31	49.78	52.93	61.48	64.39	69.68
Commercial										
Propane	20.75	20.97	23.02	26.17	26.04	30.68	36.31	33.19	41.74	48.37
Distillate fuel oil	26.81	18.75	24.66	36.05	22.87	34.54	49.38	28.51	49.27	69.82
Residual fuel oil	22.84	11.73	16.31	25.27	14.70	24.12	35.80	18.71	34.80	52.39
Natural gas	8.11	10.65	10.75	11.20	14.42	15.07	16.27	20.51	21.68	24.43
Electricity	29.55	34.40	34.88	35.80	40.89	42.08	44.78	52.37	54.73	59.46
Industrial¹										
Propane	21.09	21.24	23.38	26.70	26.63	31.32	37.26	34.54	42.83	49.82
Distillate fuel oil	27.41	19.20	25.17	36.50	23.33	35.15	49.96	28.89	49.61	70.48
Residual fuel oil	20.90	12.21	16.85	25.87	15.19	24.62	36.36	19.39	35.61	52.99
Natural gas ²	3.77	6.42	6.56	7.00	8.82	9.41	10.73	13.53	14.25	16.40
Metallurgical coal	7.25	9.40	9.55	9.84	12.35	12.81	13.51	16.04	16.91	17.87
Other industrial coal	3.24	3.95	4.07	4.26	4.94	5.23	5.66	6.42	6.95	7.51
Coal to liquids	--	--	--	--	--	--	--	--	--	5.44
Electricity	19.50	23.14	23.52	24.23	28.63	29.60	31.80	38.07	39.88	43.73
Transportation										
Propane	25.14	26.48	28.14	30.75	32.27	36.09	40.91	40.57	47.79	53.06
E85 ³	35.06	25.49	29.00	37.84	31.77	37.57	48.02	41.61	58.85	69.48
Motor gasoline ⁴	30.68	23.91	28.98	39.55	27.94	38.42	51.91	34.76	54.17	72.63
Jet fuel ⁵	22.99	16.07	22.06	33.32	20.12	31.91	46.18	25.67	46.53	66.66
Diesel fuel (distillate fuel oil) ⁶	28.80	24.38	30.35	41.70	29.39	41.30	56.27	36.26	57.25	78.23
Residual fuel oil	20.07	9.84	14.11	22.31	12.37	20.86	31.48	15.95	30.76	45.96
Natural gas ⁷	14.64	18.03	17.69	21.31	21.95	22.38	27.69	28.40	32.61	36.92
Electricity	31.43	33.51	33.82	34.52	41.34	42.65	45.46	53.83	56.68	62.36
Electric power⁸										
Distillate fuel oil	24.12	17.42	23.40	34.87	21.40	33.18	48.04	26.91	47.77	68.43
Residual fuel oil	20.68	11.13	15.70	24.60	13.79	23.08	34.94	17.19	33.86	51.21
Natural gas	3.44	5.63	5.75	6.12	8.16	8.74	9.87	12.84	13.53	15.46
Steam coal	2.39	2.84	2.96	3.14	3.67	3.94	4.29	4.79	5.29	5.84

Table C3. Energy prices by sector and source (continued)
(nominal dollars per million Btu, unless otherwise noted)

Sector and source	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Average price to all users³										
Propane	23.24	23.65	25.53	28.42	28.95	33.20	38.44	36.38	44.42	50.48
E85 ³	35.06	25.49	29.00	37.84	31.77	37.57	48.02	41.61	58.85	69.48
Motor gasoline ⁴	30.44	23.91	28.98	39.55	27.94	38.41	51.91	34.76	54.17	72.62
Jet fuel ⁵	22.99	16.07	22.06	33.32	20.12	31.91	46.18	25.67	46.53	66.66
Distillate fuel oil	28.36	23.12	29.11	40.47	28.04	39.94	54.81	34.77	55.61	76.43
Residual fuel oil	20.41	10.58	14.90	23.27	13.30	21.97	32.87	17.07	32.20	48.03
Natural gas	5.38	7.92	8.04	8.64	10.75	11.43	13.40	15.96	17.22	20.57
Metallurgical coal	7.25	9.40	9.55	9.84	12.35	12.81	13.51	16.04	16.91	17.87
Other coal	2.44	2.91	3.03	3.21	3.75	4.02	4.37	4.89	5.39	5.94
Coal to liquids	--	--	--	--	--	--	--	--	--	5.44
Electricity	28.85	33.19	33.66	34.52	39.94	41.13	43.87	51.73	54.11	58.76
Non-renewable energy expenditures by sector (billion nominal dollars)										
Residential	234.06	277.02	282.30	293.48	352.89	367.27	392.59	481.30	508.27	549.64
Commercial	173.25	210.13	214.56	223.56	278.14	290.65	311.47	398.63	423.44	461.77
Industrial ¹	213.75	281.51	316.50	383.95	375.82	461.77	571.03	499.33	648.12	825.06
Transportation	755.09	594.71	715.87	946.80	676.84	898.80	1,133.62	875.60	1,281.47	1,588.74
Total non-renewable expenditures	1,376.15	1,363.37	1,529.23	1,847.79	1,683.69	2,018.49	2,408.71	2,254.86	2,861.30	3,425.20
Transportation renewable expenditures	0.50	3.21	5.54	10.87	9.57	17.45	28.36	11.24	19.56	38.98
Total expenditures	1,376.66	1,366.59	1,534.77	1,858.66	1,693.26	2,035.94	2,437.07	2,266.10	2,880.86	3,464.18

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. Price 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 2012 are model results and may differ from official EIA data reports.

Sources: 2012 prices for motor gasoline, distillate fuel oil, and jet fuel are based on prices in the U.S. Energy Information Administration (EIA), *Petroleum Marketing Monthly*, DOE/EIA-0380(2013/08) (Washington, DC, August 2013). 2012 residential, commercial, and industrial natural gas delivered prices: EIA, *Natural Gas Monthly*, DOE/EIA-0130(2013/06) (Washington, DC, June 2013). 2012 transportation sector natural gas delivered prices are model results. 2012 electric power sector distillate and residual fuel oil prices: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 electric power sector natural gas prices: EIA, *Electric Power Monthly*, DOE/EIA-0226, April 2012 and April 2013, Table 4.2, and EIA, *State Energy Data Report 2011*, DOE/EIA-0214(2011) (Washington, DC, June 2013). 2012 coal prices based on: EIA, *Quarterly Coal Report, October-December 2012*, DOE/EIA-0121(2012/4Q) (Washington, DC, March 2013) and EIA, AEO2014 National Energy Modeling System run REF2014.D102413A. 2012 electricity prices: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. Projections: EIA, AEO2014 National Energy Modeling System runs LOWPRICE.D120613A, REF2014.D102413A, and HIGHPRICE.D120613A.

Table C4. Petroleum and other liquids supply and disposition
(million barrels per day, unless otherwise noted)

Supply and disposition	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil Price
Crude oil										
Domestic crude production ¹	6.49	8.95	9.55	10.69	6.85	8.30	9.28	5.81	7.48	8.21
Alaska	0.53	0.44	0.44	0.44	0.00	0.24	0.55	0.00	0.26	0.40
Lower 48 states	5.96	8.51	9.12	10.25	6.85	8.06	8.73	5.81	7.22	7.81
Net imports	8.43	6.65	5.79	4.09	8.65	6.64	4.66	10.26	7.74	5.61
Gross imports	8.49	6.80	5.94	4.25	8.78	6.77	4.79	10.38	7.87	5.73
Exports	0.06	0.15	0.15	0.15	0.13	0.13	0.13	0.12	0.12	0.12
Other crude supply ²	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total crude supply	15.01	15.59	15.34	14.78	15.50	14.94	13.94	16.07	15.22	13.81
Other petroleum supply										
Net product imports	-0.92	-0.70	-0.86	-0.92	-1.11	-1.29	-1.49	-1.18	-1.82	-2.04
Gross refined product imports ³	0.85	1.10	0.98	0.92	1.27	1.06	0.88	1.52	1.10	0.89
Unfinished oil imports	0.60	0.59	0.52	0.43	0.62	0.49	0.37	0.62	0.45	0.31
Blending component imports	0.62	0.68	0.62	0.52	0.60	0.50	0.40	0.62	0.40	0.31
Exports	2.98	3.08	2.97	2.79	3.60	3.33	3.14	3.95	3.76	3.54
Refinery processing gain ⁴	1.08	1.11	1.08	0.97	1.05	0.96	0.84	1.06	0.95	0.83
Product stock withdrawal	-0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other non-petroleum supply	3.48	3.90	3.96	4.00	4.19	4.32	4.43	4.11	4.36	4.88
Supply from renewable sources										
Ethanol	0.83	0.90	0.90	0.88	0.89	0.91	0.90	0.92	0.95	0.97
Domestic production	0.84	0.85	0.84	0.81	0.84	0.86	0.83	0.86	0.86	0.86
Net imports	-0.02	0.05	0.06	0.07	0.05	0.06	0.07	0.06	0.08	0.11
Stock withdrawal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biodiesel	0.06	0.07	0.09	0.09	0.06	0.09	0.09	0.06	0.09	0.10
Domestic production	0.06	0.06	0.08	0.08	0.05	0.08	0.08	0.05	0.08	0.08
Net imports	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Stock withdrawal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other biomass-derived liquids ⁵	0.00	0.04	0.03	0.04	0.08	0.04	0.05	0.06	0.03	0.02
Domestic production	0.00	0.04	0.03	0.04	0.08	0.04	0.05	0.06	0.03	0.02
Net imports	0.00	0.00	0.00	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	0.00	0.00	0.00
Liquids from gas	2.40	2.60	2.65	2.71	2.85	2.98	3.12	2.76	2.98	3.32
Natural gas plant liquids	2.40	2.60	2.65	2.71	2.85	2.98	3.12	2.76	2.98	3.11
Gas-to-liquids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
Liquids from coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
Other ⁶	0.19	0.29	0.30	0.28	0.31	0.30	0.28	0.31	0.31	0.27
Total primary supply ⁷	18.59	19.90	19.52	18.84	19.64	18.93	17.72	20.06	18.72	17.49
Product supplied										
by fuel										
Liquefied petroleum gases and other ⁸	2.32	2.70	2.73	2.79	2.71	2.84	2.94	2.63	2.73	2.88
Motor gasoline ⁹	8.71	8.67	8.35	7.85	7.73	7.15	6.52	7.67	6.84	6.20
of which: E85 ¹⁰	0.01	0.09	0.13	0.20	0.21	0.32	0.41	0.19	0.23	0.39
Jet fuel ¹¹	1.40	1.49	1.49	1.49	1.55	1.55	1.55	1.59	1.59	1.59
Distillate fuel oil ¹²	3.74	4.32	4.30	4.15	4.66	4.52	3.95	5.07	4.62	3.95
of which: Diesel	3.45	3.95	3.94	3.82	4.33	4.21	3.67	4.76	4.34	3.69
Residual fuel oil	0.35	0.41	0.39	0.37	0.43	0.40	0.38	0.45	0.40	0.39
Other ¹³	1.97	2.32	2.28	2.20	2.57	2.49	2.38	2.64	2.55	2.49
by sector										
Residential and commercial	0.94	0.92	0.88	0.83	0.87	0.81	0.76	0.84	0.76	0.71
Industrial ¹⁴	4.42	5.39	5.37	5.35	5.69	5.72	5.69	5.70	5.68	5.74
Transportation	13.44	13.51	13.19	12.59	13.01	12.32	11.20	13.42	12.20	10.96
Electric power ¹⁵	0.10	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.08	0.08
Total	18.49	19.91	19.53	18.84	19.65	18.94	17.73	20.06	18.73	17.50
Discrepancy ¹⁶	0.11	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	-0.01	-0.01

Table C4. Petroleum and other liquids supply and disposition (continued)
(million barrels per day, unless otherwise noted)

Supply and disposition	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Domestic refinery distillation capacity ¹⁷	17.3	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
Capacity utilization rate (percent) ¹⁸	89.0	86.0	84.6	81.5	85.5	82.4	76.9	88.6	84.0	76.2
Net import share of product supplied (percent) ..	40.3	30.2	25.6	17.3	38.8	28.6	18.3	45.6	32.2	21.1
Net expenditures for imported crude oil and petroleum products (billion 2012 dollars)	313.70	160.27	198.85	226.18	214.45	278.60	290.21	264.46	385.39	408.21

¹⁷Includes lease condensate.

¹⁸Strategic petroleum reserve stock additions plus unaccounted for crude oil and crude stock withdrawals minus crude product supplied.

¹⁹Includes other hydrocarbons and alcohols.

²⁰The 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.

²¹Includes pyrolysis oils, biomass-derived Fischer-Tropsch liquids, and renewable feedstocks used for the on-site production of diesel and gasoline.

²²Includes domestic sources of other blending components, other hydrocarbons, and ethers.

²³Total crude supply plus other petroleum supply plus other non-petroleum supply.

²⁴Includes ethane, natural gasoline, and refinery olefins.

²⁵Includes ethanol and ethers blended into gasoline.

²⁶E85 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.

²⁷Includes only kerosene type.

²⁸Includes distillate fuel oil from petroleum and biomass feedstocks.

²⁹Includes 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.

³⁰Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

³¹Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.

³²Balancing item. Includes unaccounted for supply, losses, and gains.

³³End-of-year operable capacity.

³⁴Rate is calculated by dividing the gross annual input to atmospheric crude oil distillation units by their operable refining capacity in barrels per calendar day.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 product supplied based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). Other 2012 data: EIA, *Petroleum Supply Annual 2012*, DOE/EIA-0340(2012)/1 (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System runs LOWPRICE.D120613A, REF2014.D102413A, and HIGHPRICE.D120613A.

Table C5. Petroleum and other liquids prices
(2012 dollars per gallon, unless otherwise noted)

Sector and fuel	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Crude oil prices (2012 dollars per barrel)										
Brent spot.....	111.65	68.90	96.57	150.28	71.90	118.99	173.69	74.90	141.46	204.24
West Texas Intermediate spot	94.12	66.90	94.57	148.28	69.90	116.99	171.69	72.90	139.46	202.24
Average imported refiners acquisition cost ¹ ..	101.10	61.93	88.07	139.34	64.73	109.22	160.61	67.84	130.80	190.62
Delivered sector product prices										
Residential										
Propane.....	2.20	2.04	2.17	2.36	2.14	2.35	2.57	2.21	2.52	2.72
Distillate fuel oil	3.79	2.69	3.42	4.78	2.79	3.97	5.31	2.87	4.53	6.06
Commercial										
Distillate fuel oil	3.70	2.29	3.00	4.34	2.40	3.54	4.86	2.46	4.10	5.59
Residual fuel oil	3.42	1.56	2.16	3.31	1.67	2.68	3.83	1.76	3.14	4.56
Residual fuel oil (2012 dollars per barrel).	143.59	65.46	90.53	138.85	70.23	112.66	160.76	73.73	131.97	191.43
Industrial²										
Propane.....	1.93	1.72	1.89	2.13	1.85	2.13	2.43	1.98	2.36	2.64
Distillate fuel oil	3.76	2.34	3.05	4.38	2.43	3.58	4.90	2.49	4.11	5.62
Residual fuel oil	3.13	1.62	2.23	3.38	1.73	2.74	3.89	1.82	3.22	4.61
Residual fuel oil (2012 dollars per barrel).	131.40	68.13	93.56	142.11	72.54	115.00	163.27	76.40	135.04	193.63
Transportation										
Propane.....	2.30	2.15	2.27	2.45	2.24	2.45	2.67	2.32	2.63	2.82
Ethanol (E85) ³	3.33	2.15	2.43	3.14	2.29	2.65	3.26	2.48	3.37	3.84
Ethanol wholesale price	2.58	2.58	2.66	2.81	2.50	2.52	2.63	2.34	2.65	2.80
Motor gasoline ⁴	3.69	2.55	3.08	4.16	2.55	3.43	4.45	2.61	3.90	5.04
Jet fuel ⁵	3.10	1.93	2.63	3.93	2.06	3.20	4.45	2.17	3.79	5.23
Diesel fuel (distillate fuel oil) ⁶	3.95	2.96	3.67	4.99	3.06	4.20	5.51	3.11	4.73	6.23
Residual fuel oil	3.00	1.31	1.86	2.92	1.41	2.32	3.37	1.50	2.78	4.00
Residual fuel oil (2012 dollars per barrel).	126.17	54.90	78.31	122.57	59.10	97.43	141.38	62.85	116.65	167.94
Electric power⁷										
Distillate fuel oil	3.35	2.14	2.87	4.23	2.25	3.42	4.76	2.34	4.00	5.52
Residual fuel oil	3.10	1.48	2.07	3.22	1.57	2.57	3.74	1.61	3.06	4.45
Residual fuel oil (2012 dollars per barrel).	130.00	62.10	87.12	135.14	65.87	107.77	156.88	67.74	128.40	187.11
Average prices, all sectors⁸										
Propane.....	2.12	1.92	2.06	2.27	2.01	2.25	2.51	2.08	2.45	2.68
Motor gasoline ⁴	3.66	2.55	3.08	4.16	2.55	3.43	4.45	2.61	3.90	5.04
Jet fuel ⁵	3.10	1.93	2.63	3.93	2.06	3.20	4.45	2.17	3.79	5.23
Distillate fuel oil	3.89	2.81	3.53	4.85	2.92	4.07	5.37	2.99	4.60	6.09
Residual fuel oil	3.05	1.41	1.97	3.04	1.51	2.44	3.51	1.60	2.91	4.18
Residual fuel oil (2012 dollars per barrel).	128.30	59.05	82.69	127.85	63.52	102.60	147.61	67.25	122.12	175.49
Average	3.28	2.27	2.80	3.81	2.32	3.19	4.17	2.42	3.69	4.79

Table C5. Petroleum and other liquids prices (continued)
(nominal dollars per gallon, unless otherwise noted)

Sector and fuel	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Crude oil prices (nominal dollars per barrel)										
Brent spot.....	111.65	77.64	109.37	171.98	94.64	160.19	243.19	119.51	234.53	351.41
West Texas Intermediate spot.....	94.12	75.39	107.11	169.69	92.01	157.49	240.39	116.32	231.22	347.97
Average imported refiners acquisition cost ¹ ..	101.10	69.79	99.75	159.45	85.20	147.02	224.87	108.25	216.87	327.97
Delivered sector product prices										
Residential										
Propane.....	2.20	2.30	2.46	2.70	2.81	3.17	3.60	3.53	4.19	4.68
Distillate fuel oil.....	3.79	3.04	3.88	5.47	3.68	5.34	7.43	4.58	7.51	10.42
Commercial										
Distillate fuel oil.....	3.70	2.59	3.40	4.97	3.15	4.76	6.81	3.93	6.79	9.63
Residual fuel oil	3.42	1.76	2.44	3.78	2.20	3.61	5.36	2.80	5.21	7.84
Industrial²										
Propane.....	1.93	1.94	2.14	2.44	2.43	2.86	3.40	3.15	3.91	4.55
Distillate fuel oil.....	3.76	2.64	3.46	5.01	3.20	4.82	6.86	3.97	6.81	9.67
Residual fuel oil	3.13	1.83	2.52	3.87	2.27	3.69	5.44	2.90	5.33	7.93
Transportation										
Propane.....	2.30	2.42	2.57	2.81	2.95	3.30	3.74	3.71	4.36	4.85
Ethanol (E85) ³	3.33	2.42	2.76	3.60	3.02	3.57	4.56	3.96	5.59	6.60
Ethanol wholesale price.....	2.58	2.91	3.02	3.22	3.29	3.39	3.68	3.73	4.39	4.82
Motor gasoline ⁴	3.69	2.88	3.49	4.76	3.36	4.61	6.23	4.17	6.47	8.68
Jet fuel ⁵	3.10	2.17	2.98	4.50	2.72	4.31	6.23	3.47	6.28	9.00
Diesel fuel (distillate fuel oil) ⁶	3.95	3.34	4.16	5.71	4.03	5.66	7.71	4.97	7.84	10.72
Residual fuel oil	3.00	1.47	2.11	3.34	1.85	3.12	4.71	2.39	4.60	6.88
Electric power⁷										
Distillate fuel oil.....	3.35	2.42	3.25	4.84	2.97	4.60	6.66	3.73	6.62	9.49
Residual fuel oil	3.10	1.67	2.35	3.68	2.06	3.45	5.23	2.57	5.07	7.67
Average prices, all sectors⁸										
Propane.....	2.12	2.16	2.33	2.60	2.64	3.03	3.51	3.32	4.06	4.61
Motor gasoline ⁴	3.66	2.88	3.49	4.76	3.36	4.61	6.23	4.17	6.47	8.67
Jet fuel ⁵	3.10	2.17	2.98	4.50	2.72	4.31	6.23	3.47	6.28	9.00
Distillate fuel oil.....	3.89	3.17	3.99	5.55	3.85	5.48	7.52	4.77	7.63	10.48
Residual fuel oil (nominal dollars per barrel)	128.30	66.54	93.65	146.31	83.60	138.12	206.68	107.31	202.47	301.95
Average	3.28	2.56	3.17	4.36	3.05	4.30	5.84	3.85	6.11	8.24

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 2012 are model results and may differ from official EIA data reports.

Sources: 2012 Brent and West Texas Intermediate crude oil spot prices: Thomson Reuters. 2012 average imported crude oil cost: Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035Monthly Energy Review. 2012 prices for motor gasoline, distillate fuel oil, and jet fuel are based on: EIA, *Petroleum Marketing Monthly*, DOE/EIA-0380(2013/08) (Washington, DC, August 2013). 2012 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." 2012 electric power prices based on: *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. 2012 wholesale ethanol prices derived from Bloomberg U.S. average rack price. Projections: EIA, AEO2014 National Energy Modeling System runs LOWPRICE.D120613A, REF2014.D102413A, and HIGHPRICE.D120613A.

Table C6. International petroleum and other liquids supply, disposition, and prices
(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Crude oil spot prices										
(2012 dollars per barrel)										
Brent	111.65	68.90	96.57	150.28	71.90	118.99	173.69	74.90	141.46	204.24
West Texas Intermediate	94.12	66.90	94.57	148.28	69.90	116.99	171.69	72.90	139.46	202.24
(nominal dollars per barrel)										
Brent	111.65	77.64	109.37	171.98	94.64	160.19	243.19	119.51	234.53	351.41
West Texas Intermediate	94.12	75.39	107.11	169.69	92.01	157.49	240.39	116.32	231.22	347.97
Petroleum and other liquids consumption¹										
OECD										
United States (50 states)	18.21	19.61	19.23	18.55	19.35	18.63	17.43	19.76	18.42	17.18
United States territories	0.25	0.31	0.29	0.28	0.35	0.33	0.32	0.39	0.37	0.36
Canada	2.26	2.35	2.24	2.15	2.36	2.18	2.13	2.46	2.30	2.31
Mexico and Chile	2.51	2.78	2.71	2.61	3.32	3.08	3.02	4.00	3.63	3.60
OECD Europe ²	14.21	14.47	13.85	13.30	15.06	13.94	13.49	15.80	14.32	13.93
Japan	4.75	4.75	4.50	4.28	4.69	4.29	4.13	4.49	4.05	3.90
South Korea	2.65	2.74	2.76	2.65	2.97	2.68	2.58	3.18	2.76	2.68
Australia and New Zealand	1.28	1.22	1.23	1.18	1.28	1.21	1.19	1.40	1.30	1.28
Total OECD consumption	46.13	48.23	46.82	45.01	49.39	46.37	44.30	51.47	47.15	45.22
Non-OECD										
Russia	3.20	3.77	3.55	3.43	4.14	3.81	3.72	4.29	3.92	3.85
Other Europe and Eurasia ³	1.99	2.52	2.32	2.25	2.88	2.62	2.54	3.45	3.08	3.00
China	10.36	13.90	13.91	13.63	16.49	17.04	17.73	18.78	20.48	22.98
India	3.68	4.58	4.50	4.38	6.52	6.11	6.19	8.89	8.33	8.94
Other Asia ⁴	6.97	8.14	7.99	7.71	9.47	9.35	9.28	11.01	11.16	11.36
Middle East	7.67	8.64	8.81	8.54	9.15	9.22	9.22	10.00	10.38	10.74
Africa	3.47	3.79	3.70	3.55	4.16	4.03	3.93	4.52	4.58	4.54
Brazil	2.83	3.18	3.12	2.96	3.50	3.32	3.25	3.88	3.85	3.94
Other Central and South America	2.77	3.53	3.29	3.16	3.95	3.76	3.62	4.38	4.13	4.00
Total non-OECD consumption	42.94	52.06	51.19	49.60	60.26	59.24	59.48	69.20	69.90	73.35
Total consumption	89.07	100.29	98.01	94.61	109.65	105.61	103.78	120.68	117.05	118.57
Petroleum and other liquids production										
OPEC⁵										
Middle East	25.84	29.62	28.28	23.24	35.30	32.35	27.29	44.28	38.85	32.84
North Africa	3.36	3.74	3.19	2.95	3.99	3.43	3.25	4.62	3.96	3.69
West Africa	4.40	5.79	4.99	4.71	6.46	5.26	5.15	7.06	5.52	5.38
South America	2.99	3.56	3.10	2.98	4.13	3.01	2.98	5.10	3.31	3.24
Total OPEC production	36.59	42.71	39.57	33.88	49.87	44.04	38.68	61.06	51.64	45.15
Non-OPEC										
OECD										
United States (50 states)	10.84	13.63	14.25	15.30	11.73	13.23	14.19	10.63	12.42	13.52
Canada	4.00	5.18	5.10	6.00	6.15	5.92	7.24	5.77	6.21	7.81
Mexico and Chile	2.97	1.93	2.13	1.92	1.75	2.11	1.95	1.68	2.27	2.15
OECD Europe ²	3.93	3.24	3.26	3.24	2.86	2.78	2.73	3.74	3.63	3.72
Japan and South Korea	0.18	0.18	0.16	0.17	0.20	0.18	0.18	0.21	0.19	0.19
Australia and New Zealand	0.57	0.53	0.54	0.52	0.56	0.56	0.55	0.83	0.92	0.93
Total OECD production	22.48	24.69	25.44	27.15	23.25	24.78	26.84	22.85	25.64	28.31
Non-OECD										
Russia	10.40	10.22	10.74	10.76	10.81	11.44	11.41	10.86	11.68	11.98
Other Europe and Eurasia ³	3.19	3.86	3.73	3.89	4.02	4.44	4.50	3.56	5.44	5.54
China	4.37	4.49	4.91	4.56	5.51	5.50	5.80	5.63	5.62	8.43
Other Asia ⁴	3.82	3.41	3.63	3.41	3.04	3.20	2.96	3.10	3.31	3.11
Middle East	1.31	1.19	0.98	1.18	1.07	0.77	1.03	0.95	0.71	0.95
Africa	2.34	2.91	2.61	2.95	2.97	2.57	2.96	3.32	2.91	3.41
Brazil	2.49	4.81	4.00	4.80	7.03	6.36	7.46	6.65	7.03	8.95
Other Central and South America	2.16	2.23	2.38	2.26	2.32	2.44	2.32	2.90	3.06	3.00
Total non-OECD production	30.08	33.13	32.98	33.81	36.77	36.73	38.43	36.97	39.75	45.37
Total petroleum and other liquids production	89.15	100.53	97.99	94.84	109.89	105.55	103.95	120.89	117.03	118.83
OPEC market share (percent)	41.0	42.5	40.4	35.7	45.4	41.7	37.2	50.5	44.1	38.0

Table C6. International petroleum and other liquids supply, disposition, and prices (continued)
(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	2012	Projections								
		2020			2030			2040		
		Low oil price	Reference	High oil price	Low oil price	Reference	High oil price	Low oil price	Reference	High oil price
Selected world production subtotals:										
Petroleum										
Crude oil and equivalents ⁶	75.78	85.10	82.35	79.06	91.71	87.58	85.40	99.82	96.56	95.06
Tight oil.....	2.40	5.28	5.81	6.78	5.79	6.88	7.42	6.04	7.28	9.00
Bitumen ⁷	1.94	3.18	3.00	3.87	4.29	3.95	5.19	3.99	4.26	5.71
Refinery processing gain ⁸	2.37	2.40	2.26	2.11	2.70	2.52	2.32	3.00	2.86	2.52
Liquids from renewable sources ⁹	1.34	1.83	1.68	1.91	2.79	2.09	2.52	4.10	2.48	4.21
Liquids from coal ¹⁰	0.19	0.36	0.40	0.53	0.82	0.91	1.15	0.98	1.12	2.78
Liquids from natural gas.....	9.21	10.36	10.78	10.76	11.56	12.19	12.39	12.37	13.29	13.56
Natural gas plant liquids.....	9.05	10.06	10.46	10.47	11.24	11.84	12.07	12.05	12.93	13.10
Gas-to-liquids ¹¹	0.16	0.30	0.31	0.29	0.32	0.35	0.32	0.31	0.35	0.46
Liquids from kerogen ¹²	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Petroleum production ¹³										
OPEC ⁵										
Middle East.....	25.74	29.42	28.07	23.06	35.07	32.10	27.07	44.06	38.61	32.62
North Africa.....	3.36	3.74	3.19	2.95	3.99	3.43	3.25	4.62	3.96	3.69
West Africa.....	4.40	5.76	4.96	4.68	6.42	5.22	5.12	7.03	5.49	5.35
South America.....	2.99	3.56	3.10	2.98	4.13	3.01	2.98	5.10	3.31	3.24
Total OPEC production.....	36.50	42.48	39.33	33.67	49.62	43.77	38.44	60.81	51.37	44.90
Non-OPEC										
OECD										
United States (50 states).....	10.00	12.66	13.28	14.37	10.75	12.24	13.24	9.64	11.42	12.15
Canada.....	3.97	5.15	5.08	5.97	6.09	5.88	7.19	5.69	6.17	7.73
Mexico and Chile.....	2.97	1.93	2.13	1.92	1.75	2.11	1.95	1.68	2.27	2.15
OECD Europe ²	3.71	3.02	3.03	3.00	2.55	2.53	2.45	3.31	3.35	3.27
Japan and South Korea.....	0.17	0.18	0.15	0.16	0.19	0.17	0.17	0.19	0.18	0.18
Australia and New Zealand.....	0.56	0.52	0.53	0.51	0.54	0.55	0.54	0.81	0.91	0.91
Total OECD production.....	21.39	23.46	24.21	25.93	21.87	23.49	25.55	21.32	24.30	26.39
Non-OECD										
Russia.....	10.40	10.22	10.74	10.76	10.81	11.44	11.41	10.86	11.68	11.98
Other Europe and Eurasia ³	3.19	3.85	3.73	3.89	4.01	4.44	4.49	3.55	5.43	5.53
China.....	4.32	4.35	4.77	4.27	4.76	4.82	4.83	4.60	4.72	6.04
Other Asia ⁴	3.75	3.29	3.51	3.27	2.82	2.99	2.73	2.85	3.10	2.82
Middle East.....	1.31	1.19	0.98	1.18	1.07	0.77	1.03	0.95	0.71	0.95
Africa.....	2.13	2.61	2.28	2.61	2.66	2.22	2.58	3.02	2.55	3.01
Brazil.....	2.20	4.19	3.50	4.13	5.88	5.65	6.46	4.53	6.00	6.78
Other Central and South America.....	2.06	2.15	2.30	2.18	2.21	2.36	2.22	2.74	2.97	2.84
Total non-OECD production.....	29.35	31.85	31.81	32.29	34.22	34.69	35.76	33.10	37.15	39.94
Total petroleum production ¹³	87.24	97.79	95.34	91.90	105.71	101.95	99.75	115.23	112.82	111.23
OPEC market share (percent).....	41.8	43.4	41.2	36.6	46.9	42.9	38.5	52.8	45.5	40.4

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, 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, 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 natural-gas-to-liquids process.

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

¹³Includes production of crude oil (including lease condensate, tight oil (shale oil), extra-heavy oil, and bitumen (oil sands)), natural gas plant liquids, refinery gains, and other hydrogen and hydrocarbons for refinery feedstocks.

OECD = Organization for Economic Cooperation and Development.

Note: Ethanol is represented in motor gasoline equivalent barrels. Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 Brent and West Texas Intermediate crude oil spot prices: Thomson Reuters. 2012 quantities and projections: Energy Information Administration (EIA), AEO2014 National Energy Modeling System runs LOWPRICE.D120613A, REF2014.D102413A, and HIGHPRICE.D120613A and EIA, Generate World Oil Balance Model.

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Appendix D

Results from side cases

Table D1. Key results for demand sector technology cases

Consumption, emissions, combined heat and power capacity and generation	2012	2020				2030			
		2013 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology	2013 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology
Energy consumption (quadrillion Btu)									
Residential									
Liquid fuels and other petroleum ¹	1.02	0.91	0.89	0.86	0.83	0.79	0.75	0.70	0.66
Natural gas.....	4.26	4.65	4.56	4.33	4.04	4.63	4.43	4.06	3.51
Renewable energy ²	0.45	0.48	0.46	0.44	0.43	0.50	0.44	0.41	0.38
Electricity.....	4.69	5.00	4.84	4.47	4.15	5.56	5.21	4.53	4.13
Total residential.....	10.42	11.04	10.74	10.10	9.45	11.48	10.83	9.70	8.68
Nonmarketed renewables, residential.....	0.04	0.11	0.14	0.15	0.16	0.12	0.19	0.28	0.40
Commercial									
Liquid fuels and other petroleum ³	0.63	0.68	0.68	0.67	0.67	0.67	0.67	0.65	0.65
Natural gas.....	2.96	3.23	3.23	3.20	3.20	3.32	3.35	3.34	3.31
Coal	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Renewable energy ⁴	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Electricity.....	4.52	4.77	4.69	4.44	4.31	5.38	5.18	4.49	4.28
Total commercial.....	8.29	8.86	8.78	8.50	8.35	9.55	9.38	8.66	8.42
Nonmarketed renewables, commercial....	0.13	0.18	0.18	0.22	0.23	0.20	0.24	0.35	0.43
Industrial ⁵									
Liquefied petroleum gases and other ⁶	2.25	2.91	2.90	2.88	2.91	3.07	3.05	3.04	3.07
Distillate fuel oil	1.20	1.46	1.40	1.36	1.38	1.54	1.41	1.35	1.39
Petrochemical feedstocks	0.75	1.29	1.27	1.27	1.28	1.65	1.62	1.60	1.63
Other petroleum ⁷	3.86	4.12	4.00	3.92	3.99	4.26	4.02	3.92	4.03
Liquid fuels and other petroleum	8.06	9.77	9.56	9.43	9.56	10.53	10.10	9.92	10.12
Natural gas.....	8.75	10.41	10.04	10.07	10.04	11.70	10.87	10.89	10.90
Coal	1.48	1.62	1.57	1.54	1.58	1.64	1.52	1.46	1.57
Renewable energy ⁸	2.00	2.47	2.50	2.54	2.51	2.72	2.79	2.94	2.82
Electricity.....	3.35	4.14	4.04	3.99	4.08	4.57	4.33	4.27	4.47
Total industrial	23.63	28.42	27.71	27.57	27.77	31.17	29.62	29.47	29.88
Transportation									
Motor gasoline ⁹	16.33	14.99	15.00	14.88	15.00	12.64	12.69	12.54	12.71
of which: E85 ¹⁰	0.01	0.18	0.19	0.20	0.19	0.45	0.46	0.48	0.47
Jet fuel	3.00	3.08	3.08	3.06	3.08	3.20	3.20	3.16	3.20
Distillate fuel oil.....	5.82	6.70	6.70	6.58	6.68	7.20	7.25	7.08	7.32
Other petroleum ¹¹	0.77	0.78	0.78	0.77	0.78	0.80	0.80	0.79	0.80
Liquid fuels and other petroleum	25.93	25.55	25.55	25.30	25.53	23.84	23.94	23.57	24.04
Pipeline fuel natural gas.....	0.73	0.76	0.74	0.72	0.71	0.86	0.82	0.77	0.76
Compressed / liquefied natural gas.....	0.04	0.08	0.08	0.08	0.08	0.28	0.28	0.21	0.30
Liquid hydrogen.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity.....	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.04
Total transportation	26.72	26.42	26.40	26.13	26.36	25.02	25.08	24.59	25.14
Electric power ¹²									
Distillate and residual fuel oil.....	0.23	0.18	0.18	0.17	0.16	0.19	0.18	0.17	0.16
Natural gas.....	9.46	9.32	9.00	8.29	8.28	11.35	10.28	8.42	8.54
Steam coal.....	15.82	17.42	16.95	16.16	15.05	17.81	17.44	16.43	15.11
Nuclear / uranium ¹³	8.05	8.15	8.15	8.15	8.15	8.20	8.18	8.15	8.15
Renewable energy ¹⁴	4.59	6.15	6.08	5.69	5.55	7.17	6.68	6.18	6.02
Non-biogenic municipal waste	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Net electricity imports.....	0.16	0.11	0.11	0.11	0.11	0.12	0.12	0.09	0.09
Total electric power.....	38.53	41.56	40.70	38.81	37.54	45.07	43.12	39.68	38.30
Total energy consumption									
Liquid fuels and other petroleum.....	35.87	37.09	36.86	36.42	36.76	36.02	35.65	35.01	35.63
Natural gas.....	26.20	28.45	27.65	26.69	26.35	32.14	30.03	27.68	27.31
Steam coal.....	17.34	19.08	18.56	17.74	16.67	19.50	19.01	17.93	16.73
Nuclear / uranium ¹³	8.05	8.15	8.15	8.15	8.15	8.20	8.18	8.15	8.15
Renewable energy ¹⁵	7.17	9.24	9.17	8.81	8.63	10.52	10.05	9.66	9.36
Other ¹⁶	0.39	0.34	0.34	0.34	0.34	0.35	0.35	0.32	0.32
Total energy consumption	95.02	102.35	100.73	98.16	96.90	106.74	103.27	98.76	97.50

2040				Annual Growth 2012-2040 (percent)			
2013 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology	2013 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology
0.72	0.66	0.60	0.55	-1.2%	-1.5%	-1.9%	-2.2%
4.54	4.21	3.75	3.02	0.2%	0.0%	-0.5%	-1.2%
0.50	0.42	0.36	0.33	0.4%	-0.3%	-0.8%	-1.2%
6.15	5.65	4.92	4.36	1.0%	0.7%	0.2%	-0.3%
11.91	10.94	9.64	8.26	0.5%	0.2%	-0.3%	-0.8%
0.13	0.27	0.48	0.79	4.3%	6.9%	9.1%	11.1%
0.68	0.68	0.65	0.65	0.2%	0.2%	0.1%	0.1%
3.53	3.65	3.69	3.63	0.6%	0.7%	0.8%	0.7%
0.04	0.04	0.04	0.04	0.0%	0.0%	0.0%	0.0%
0.13	0.13	0.13	0.13	0.0%	0.0%	0.0%	0.0%
6.27	5.72	4.71	4.48	1.2%	0.8%	0.2%	0.0%
10.66	10.22	9.24	8.93	0.9%	0.7%	0.4%	0.3%
0.23	0.35	0.59	0.75	2.2%	3.7%	5.6%	6.5%
2.95	2.90	2.88	2.91	1.0%	0.9%	0.9%	0.9%
1.61	1.42	1.36	1.39	1.1%	0.6%	0.4%	0.5%
1.65	1.59	1.57	1.60	2.9%	2.7%	2.7%	2.7%
4.53	4.19	4.08	4.19	0.6%	0.3%	0.2%	0.3%
10.74	10.10	9.89	10.10	1.0%	0.8%	0.7%	0.8%
12.47	11.28	11.24	11.27	1.3%	0.9%	0.9%	0.9%
1.62	1.44	1.38	1.51	0.3%	-0.1%	-0.3%	0.1%
2.92	3.07	3.32	3.09	1.4%	1.5%	1.8%	1.6%
4.78	4.34	4.24	4.51	1.3%	0.9%	0.8%	1.1%
32.53	30.22	30.06	30.47	1.1%	0.9%	0.9%	0.9%
12.05	12.09	12.07	12.18	-1.1%	-1.1%	-1.1%	-1.0%
0.34	0.33	0.35	0.35	11.9%	11.9%	12.0%	12.1%
3.28	3.28	3.17	3.28	0.3%	0.3%	0.2%	0.3%
7.51	7.54	7.55	7.63	0.9%	0.9%	0.9%	1.0%
0.82	0.82	0.81	0.82	0.2%	0.2%	0.2%	0.2%
23.66	23.73	23.61	23.91	-0.3%	-0.3%	-0.3%	-0.3%
0.89	0.85	0.77	0.77	0.7%	0.5%	0.2%	0.2%
0.79	0.86	0.54	0.95	11.0%	11.3%	9.5%	11.7%
0.00	0.00	0.00	0.00	--	--	--	--
0.06	0.06	0.07	0.06	3.6%	3.6%	3.9%	3.6%
25.41	25.50	24.99	25.70	-0.2%	-0.2%	-0.2%	-0.1%
0.20	0.19	0.17	0.16	-0.5%	-0.8%	-1.1%	-1.3%
12.38	11.48	9.08	9.24	1.0%	0.7%	-0.1%	-0.1%
17.75	17.27	16.35	15.05	0.4%	0.3%	0.1%	-0.2%
9.32	8.49	8.25	8.15	0.5%	0.2%	0.1%	0.0%
9.30	7.44	6.51	6.33	2.6%	1.7%	1.3%	1.2%
0.23	0.23	0.23	0.23	0.0%	0.0%	0.0%	0.0%
0.14	0.12	0.10	0.10	-0.4%	-1.1%	-1.6%	-1.8%
49.32	45.20	40.69	39.26	0.9%	0.6%	0.2%	0.1%
36.00	35.35	34.91	35.37	0.0%	-0.1%	-0.1%	-0.1%
34.61	32.32	29.08	28.88	1.0%	0.8%	0.4%	0.3%
19.41	18.75	17.77	16.60	0.4%	0.3%	0.1%	-0.2%
9.32	8.49	8.25	8.15	0.5%	0.2%	0.1%	0.0%
12.86	11.05	10.32	9.88	2.1%	1.6%	1.3%	1.2%
0.37	0.35	0.33	0.33	-0.1%	-0.4%	-0.5%	-0.6%
112.56	106.31	100.67	99.21	0.6%	0.4%	0.2%	0.2%

Table D1. Key results for demand sector technology cases (continued)

Consumption, emissions, combined heat and power capacity and generation	2012	2020				2030			
		2013 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology	2013 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology
Carbon dioxide emissions (million metric tons)									
by sector									
Residential.....	295	308	302	288	271	300	286	263	231
Commercial.....	206	224	224	222	222	228	230	228	226
Industrial ⁵	937	1,094	1,060	1,054	1,061	1,183	1,107	1,097	1,114
Transportation.....	1,812	1,779	1,777	1,759	1,775	1,672	1,677	1,644	1,681
Electric power ¹²	2,039	2,174	2,112	2,000	1,892	2,318	2,227	2,031	1,911
by fuel									
Petroleum ¹⁷	2,254	2,263	2,252	2,226	2,244	2,152	2,136	2,098	2,133
Natural gas.....	1,366	1,489	1,447	1,396	1,378	1,684	1,572	1,448	1,428
Coal.....	1,657	1,815	1,766	1,688	1,586	1,854	1,807	1,705	1,590
Other ¹⁸	12	12	12	12	12	12	12	12	12
Total carbon dioxide emissions.....	5,290	5,579	5,476	5,322	5,220	5,702	5,527	5,263	5,163
Residential delivered energy intensity (million Btu per household).....									
Commercial delivered energy intensity (thousand Btu per square foot).....	100.7	99.4	98.5	95.3	93.7	97.3	95.6	88.2	85.8
Industrial delivered energy intensity (thousand Btu per 2005 dollar).....	3.84	3.57	3.48	3.46	3.48	3.29	3.11	3.06	3.09
Residential sector net summer capacity (megawatts)									
Natural gas.....	0	0	0	0	0	0	0	0	0
Solar photovoltaic.....	1,553	5,330	6,327	6,867	7,904	5,638	9,364	14,807	22,999
Wind.....	55	186	590	644	737	186	590	644	737
Residential sector electricity generation (billion kilowatthours)									
Natural gas.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solar photovoltaic.....	2.48	8.29	9.96	10.81	12.47	8.80	14.92	23.67	36.77
Wind.....	0.07	0.26	0.82	0.89	1.00	0.26	0.82	0.89	1.00
Commercial sector net summer capacity (megawatts)									
Natural gas.....	1,041	1,638	1,770	2,132	2,177	3,085	4,206	5,921	5,959
Solar photovoltaic.....	3,155	6,205	6,417	6,731	7,566	7,170	9,561	12,978	18,279
Wind.....	97	104	109	108	109	160	307	309	303
Commercial sector electricity generation (billion kilowatthours)									
Natural gas.....	7.57	11.91	12.87	15.50	15.83	22.43	30.59	43.07	43.35
Solar photovoltaic.....	4.86	9.53	9.94	10.46	11.80	11.07	15.16	20.63	28.99
Wind.....	0.12	0.13	0.14	0.14	0.14	0.22	0.43	0.43	0.43

¹Includes propane, kerosene, and distillate fuel oil.²Includes wood used for residential heating. Excludes nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.³Includes propane, motor gasoline (including ethanol and ethers), kerosene, distillate fuel oil, and residual fuel oil.⁴Includes commercial sector consumption of wood and wood waste, landfill gas, municipal waste, and other biomass for combined heat and power. Excludes nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.⁵Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.⁶Includes ethane, natural gasoline, and refinery olefins.⁷Includes motor gasoline (including ethanol and ethers), residual fuel oil, petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.⁸Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources. Excludes ethanol.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 propane, residual fuel oil, aviation gasoline, and lubricants.¹²Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.¹³These 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.¹⁴Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes net electricity imports.¹⁵Includes 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.¹⁶Includes non-biogenic municipal waste, liquid hydrogen, and net electricity imports.¹⁷This 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 2012, international bunker fuels accounted for 90 to 126 million metric tons annually.¹⁸Includes emissions from geothermal power and emissions from non-biogenic municipal waste.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: U.S. Energy Information Administration, AEO2014 National Energy Modeling System, runs FROZTECH.D121813A, REF2014.D102413A, HIGHTECH.D121813A, and BESTTECH.D121813A.

2040				Annual Growth 2012-2040 (percent)			
2013 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology	2013 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology
289	268	240	197	-0.1%	-0.4%	-0.7%	-1.4%
240	246	246	242	0.5%	0.6%	0.6%	0.6%
1,235	1,123	1,110	1,128	1.0%	0.6%	0.6%	0.7%
1,685	1,691	1,660	1,703	-0.3%	-0.2%	-0.3%	-0.2%
2,361	2,271	2,057	1,941	0.5%	0.4%	0.0%	-0.2%
2,145	2,113	2,090	2,113	-0.2%	-0.2%	-0.3%	-0.2%
1,811	1,694	1,523	1,512	1.0%	0.8%	0.4%	0.4%
1,842	1,780	1,687	1,576	0.4%	0.3%	0.1%	-0.2%
12	12	12	12	0.0%	0.0%	0.0%	0.0%
5,810	5,599	5,313	5,213	0.3%	0.2%	0.0%	-0.1%
83.3	76.5	67.4	57.7	-0.3%	-0.6%	-1.1%	-1.6%
97.9	93.9	84.8	82.0	-0.1%	-0.3%	-0.6%	-0.7%
2.98	2.75	2.71	2.73	-0.9%	-1.2%	-1.2%	-1.2%
1	1	1	1	--	--	--	--
6,283	14,366	27,180	47,373	5.1%	8.3%	10.8%	13.0%
186	610	667	794	4.4%	8.9%	9.3%	10.0%
0.00	0.00	0.00	0.00	--	--	--	--
9.82	23.12	43.67	75.94	5.0%	8.3%	10.8%	13.0%
0.26	0.85	0.92	1.09	4.6%	9.1%	9.4%	10.0%
5,691	9,752	14,094	13,792	6.3%	8.3%	9.7%	9.6%
9,341	15,094	23,123	33,742	4.0%	5.7%	7.4%	8.8%
396	814	944	1,114	5.2%	7.9%	8.5%	9.1%
41.40	70.94	102.53	100.33	6.3%	8.3%	9.7%	9.6%
14.54	24.33	36.99	53.91	4.0%	5.9%	7.5%	9.0%
0.56	1.16	1.34	1.57	5.6%	8.3%	8.9%	9.5%

Table D2. Key results for policy extension cases

Consumption, emissions, electricity generating capacity and generation, and prices	2012	2020			2030			2040		
		Reference	No Sunset	Extended Policies	Reference	No Sunset	Extended Policies	Reference	No Sunset	Extended Policies
Energy consumption (quadrillion Btu)										
Residential										
Liquid fuels and other petroleum ¹	1.02	0.89	0.88	0.89	0.75	0.75	0.75	0.66	0.66	0.65
Natural gas	4.26	4.56	4.52	4.54	4.43	4.34	4.24	4.21	4.07	3.89
Renewable energy ²	0.45	0.46	0.46	0.46	0.44	0.44	0.44	0.42	0.41	0.41
Electricity	4.69	4.84	4.79	4.79	5.21	5.02	4.80	5.65	5.36	4.96
Total residential	10.42	10.74	10.65	10.67	10.83	10.55	10.22	10.94	10.50	9.91
Commercial										
Liquid fuels and other petroleum ³	0.63	0.68	0.68	0.68	0.67	0.67	0.67	0.68	0.68	0.67
Natural gas	2.96	3.23	3.23	3.22	3.35	3.38	3.35	3.65	3.72	3.65
Coal	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Renewable energy ⁴	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Electricity	4.52	4.69	4.69	4.68	5.18	5.16	5.10	5.72	5.69	5.62
Total commercial	8.29	8.78	8.78	8.76	9.38	9.39	9.29	10.22	10.27	10.11
Industrial ⁵										
Liquid fuels and other petroleum ⁶	8.06	9.56	9.56	9.55	10.10	10.13	10.06	10.10	10.15	9.94
Natural gas	8.75	10.04	10.03	10.05	10.87	10.94	10.93	11.28	11.42	11.36
Coal	1.48	1.57	1.56	1.56	1.52	1.53	1.53	1.44	1.46	1.46
Renewable energy ⁷	2.00	2.50	2.50	2.49	2.79	2.81	2.80	3.07	3.08	3.07
Electricity	3.35	4.04	4.04	4.03	4.33	4.35	4.35	4.34	4.38	4.37
Total industrial	23.63	27.71	27.68	27.68	29.62	29.76	29.68	30.22	30.49	30.19
Transportation										
Liquid fuels and other petroleum ⁸	25.93	25.55	25.54	25.51	23.94	23.96	23.56	23.73	23.80	22.33
Pipeline fuel natural gas	0.73	0.74	0.74	0.75	0.82	0.81	0.80	0.85	0.80	0.80
Compressed / liquefied natural gas	0.04	0.08	0.08	0.08	0.28	0.28	0.26	0.86	0.91	0.94
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.06	0.06	0.12
Total transportation	26.72	26.40	26.40	26.37	25.08	25.10	24.68	25.50	25.58	24.19
Electric power ⁹										
Distillate and residual fuel oil	0.23	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.18	0.18
Natural gas	9.46	9.00	9.26	9.26	10.28	9.76	9.54	11.48	9.11	8.88
Steam coal	15.82	16.95	16.77	16.75	17.44	17.23	17.10	17.27	17.13	16.99
Nuclear / uranium ¹⁰	8.05	8.15	8.15	8.15	8.18	8.15	8.15	8.49	8.15	8.15
Renewable energy ¹¹	4.59	6.08	5.73	5.71	6.68	7.21	6.86	7.44	10.62	9.81
Non-biogenic municipal waste	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Net electricity imports	0.16	0.11	0.11	0.11	0.12	0.11	0.10	0.12	0.11	0.10
Total electric power	38.53	40.70	40.43	40.37	43.12	42.88	42.15	45.20	45.53	44.34
Total energy consumption										
Liquid fuels and other petroleum	35.87	36.86	36.84	36.80	35.65	35.70	35.21	35.35	35.47	33.76
Natural gas	26.20	27.65	27.87	27.89	30.03	29.52	29.12	32.32	30.03	29.51
Steam coal	17.34	18.56	18.38	18.35	19.01	18.81	18.67	18.75	18.63	18.49
Nuclear / uranium ¹⁰	8.05	8.15	8.15	8.15	8.18	8.15	8.15	8.49	8.15	8.15
Renewable energy ¹²	7.17	9.17	8.81	8.79	10.05	10.59	10.23	11.05	14.25	13.42
Other ¹³	0.39	0.34	0.34	0.34	0.35	0.34	0.33	0.35	0.34	0.33
Total energy consumption	95.02	100.73	100.39	100.32	103.27	103.11	101.72	106.31	106.88	103.67
Carbon dioxide emissions (million metric tons)										
by sector										
Residential	295	302	300	301	286	281	275	268	260	250
Commercial	206	224	224	223	230	231	229	246	250	245
Industrial ⁵	937	1,060	1,059	1,060	1,107	1,113	1,108	1,123	1,134	1,116
Transportation	1,812	1,777	1,776	1,775	1,677	1,676	1,648	1,691	1,694	1,595
Electric power ⁹	2,039	2,112	2,109	2,106	2,227	2,179	2,155	2,271	2,132	2,107
by fuel										
Petroleum ¹⁴	2,254	2,252	2,249	2,249	2,136	2,135	2,104	2,113	2,117	2,001
Natural gas	1,366	1,447	1,459	1,460	1,572	1,545	1,524	1,694	1,573	1,545
Coal	1,657	1,766	1,748	1,746	1,807	1,788	1,775	1,780	1,768	1,755
Other ¹⁵	12	12	12	12	12	12	12	12	12	12
Total carbon dioxide emissions	5,290	5,476	5,468	5,466	5,527	5,480	5,415	5,599	5,469	5,313

Table D2. Key results for policy extension cases (continued)

Consumption, emissions, electricity generating capacity and generation, and prices	2012	2020			2030			2040		
		Reference	No Sunset	Extended Policies	Reference	No Sunset	Extended Policies	Reference	No Sunset	Extended Policies
Electricity generating capacity (gigawatts)	1,066	1,069	1,056	1,053	1,168	1,184	1,156	1,316	1,414	1,350
Electric power sector ^a	1,032	1,022	1,000	996	1,105	1,084	1,055	1,228	1,262	1,198
Coal	307	259	255	253	258	254	252	258	254	252
Oil and natural gas steam	100	86	84	82	72	70	65	70	67	62
Combined-cycle	212	231	231	233	286	262	261	342	287	281
Combustion turbine / diesel	140	150	148	147	184	173	164	224	208	186
Nuclear / uranium	102	98	98	98	98	98	98	102	98	98
Pumped storage	22	22	22	22	22	22	22	22	22	22
Renewable sources	149	174	161	161	180	203	191	201	321	292
of which: Solar	3	10	9	9	10	19	17	19	66	58
of which: Wind	59	76	62	62	76	90	80	85	159	138
Distributed generation	0	2	1	1	5	3	2	9	5	4
Residential and commercial sectors	7	16	25	25	25	60	60	41	103	103
of which: Natural gas	1	2	2	2	4	5	4	10	10	10
of which: Solar photovoltaic	5	13	21	21	19	49	49	29	81	81
of which: Wind	0	1	1	2	1	5	5	1	11	11
Industrial sector ^b	27	31	32	32	39	40	41	46	49	49
of which: Natural gas	15	17	18	18	23	25	25	29	32	32
Cumulative capacity additions (gigawatts)	0	87	80	81	201	224	203	351	458	401
Cumulative capacity retirements (gigawatts)	0	78	85	89	94	101	108	97	105	111
Generation by fuel (billion kilowatthours)	4,054	4,402	4,400	4,399	4,815	4,819	4,742	5,219	5,243	5,116
Electric power sector ^a	3,890	4,193	4,175	4,173	4,540	4,479	4,400	4,844	4,753	4,628
Coal	1,499	1,632	1,616	1,614	1,678	1,660	1,647	1,661	1,649	1,637
Petroleum	20	16	16	16	16	16	16	16	16	16
Natural gas	1,133	1,155	1,189	1,191	1,391	1,296	1,266	1,605	1,231	1,199
Nuclear / uranium	769	779	779	779	782	779	779	811	779	779
Pumped storage / other	6	3	3	3	3	3	3	3	3	3
Renewable sources	463	607	571	569	668	723	687	743	1,072	992
of which: Wood and other biomass	11	37	43	42	68	60	59	72	64	65
of which: Solar	4	18	17	17	20	40	35	39	147	129
of which: Wind	142	218	172	172	219	258	229	248	480	417
Distributed generation	0	1	1	1	2	2	2	4	3	2
Residential and commercial sectors	20	38	53	53	66	123	123	125	225	222
of which: Natural gas	8	13	13	13	31	33	33	71	75	73
of which: Solar photovoltaic	7	20	33	33	30	79	79	47	129	129
of which: Wind	0	1	2	2	1	7	7	2	15	15
Industrial sector ^b	145	171	172	173	209	216	218	251	265	266
of which: Natural gas	88	99	101	102	128	135	137	160	174	175
Delivered natural gas prices (2012 dollars per thousand cubic feet)										
Residential	10.69	11.85	11.89	11.98	13.80	13.65	13.62	16.33	15.62	15.77
Commercial	8.29	9.70	9.73	9.83	11.44	11.25	11.11	13.37	12.65	12.56
Industrial ^c	3.85	5.92	5.94	6.06	7.14	6.96	6.81	8.78	8.28	8.23
Electric power ^d	3.51	5.19	5.21	5.32	6.64	6.43	6.27	8.34	7.70	7.65
Average electricity price (2012 cents per kilowatthour)	9.8	10.1	10.1	10.1	10.4	10.3	10.2	11.1	10.7	10.6

¹Includes propane, kerosene, and distillate fuel oil.²Includes wood used for residential heating. Excludes nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.³Includes propane, motor gasoline (including ethanol and ethers), kerosene, distillate fuel oil, and residual fuel oil.⁴Includes commercial sector consumption of wood and wood waste, landfill gas, municipal waste, and other biomass for combined heat and power. Excludes nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.⁵Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.⁶Includes motor gasoline (including ethanol and ethers), residual fuel oil, petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.⁷Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources. Excludes ethanol.⁸Includes propane, motor gasoline, ethanol and ethers, jet fuel, distillate fuel oil, residual fuel oil, aviation gasoline, and lubricants.⁹Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.¹⁰These 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.¹¹Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources.¹²Includes 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.¹³Includes non-biogenic municipal waste, liquid hydrogen, and net electricity imports.¹⁴This 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 2012, international bunker fuels accounted for 90 to 126 million metric tons annually.¹⁵Includes emissions from geothermal power and emissions from non-biogenic municipal waste.

Btu = British thermal unit.

-- = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: U.S. Energy Information Administration, AEO2014 National Energy Modeling System, runs REF2014.D102413A, NOSUNSET.D121713A, and EXTENDED.D022814A.

Table D3. Key results for accelerated power plant retirement and nuclear plant cases
(gigawatts, unless otherwise noted)

Net summer capacity, generation, emissions, and fuel prices	2012	2040					
		High Nuclear	Reference	Accelerated Coal Retirements	Accelerated Nuclear Retirements	Accelerated Coal and Nuclear Retirements	Low Nuclear
Capacity							
Coal steam.....	306.6	258.3	258.4	198.8	260.0	204.7	239.1
Oil and natural gas steam.....	100.4	70.5	69.6	65.3	67.4	64.7	75.2
Combined cycle.....	211.9	331.5	342.2	383.9	373.7	406.9	406.1
Combustion turbine / diesel.....	139.8	221.9	223.7	221.1	223.5	220.7	229.4
Nuclear / uranium.....	102.1	119.7	102.0	104.1	60.4	60.4	25.2
Pumped storage.....	22.4	22.4	22.4	22.4	22.4	22.4	22.4
Fuel cells.....	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Renewable sources.....	148.9	199.4	200.5	202.1	213.9	211.6	200.8
Distributed generation.....	0.0	9.1	8.9	6.0	8.9	5.5	12.6
Combined heat and power ¹	33.8	86.4	87.7	95.3	89.8	97.5	152.5
Total.....	1,065.8	1,319.4	1,315.6	1,299.1	1,319.8	1,294.4	1,363.3
Cumulative additions							
Coal steam.....	0.0	2.6	2.6	2.5	4.2	2.5	2.5
Oil and natural gas steam.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combined cycle.....	0.0	119.9	130.6	172.3	162.1	195.3	194.5
Combustion turbine / diesel.....	0.0	91.4	93.2	90.8	93.1	90.6	99.0
Nuclear / uranium.....	0.0	16.4	9.7	11.8	5.5	5.5	5.5
Pumped storage.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fuel cells.....	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewable sources.....	0.0	51.4	52.5	54.1	65.8	63.5	52.8
Distributed generation.....	0.0	9.1	8.9	6.0	8.9	5.5	12.6
Combined heat and power ¹	0.0	52.6	53.9	61.5	56.0	63.8	118.7
Total.....	0.0	343.5	351.5	399.1	395.8	426.8	485.6
Cumulative retirements.....	0.0	95.9	96.7	160.8	136.8	193.2	183.2
Generation by fuel (billion kilowatthours)							
Coal.....	1,499	1,659	1,661	1,118	1,672	1,178	1,504
Petroleum.....	20	16	16	14	16	15	16
Natural gas.....	1,133	1,493	1,605	1,922	1,834	2,114	2,413
Nuclear / uranium.....	769	951	811	827	483	483	201
Pumped storage / other.....	6	3	3	3	3	3	3
Renewable sources.....	463	739	743	820	782	849	727
Distributed generation.....	0	4	4	3	5	3	34
Combined heat and power ¹	165	371	375	404	383	412	505
Total.....	4,054	5,238	5,219	5,111	5,178	5,056	5,404
Carbon dioxide emissions by the electric power sector (million metric tons)²							
Petroleum.....	19	14	14	13	14	13	14
Natural gas.....	494	570	608	714	684	780	914
Coal.....	1,514	1,635	1,637	1,082	1,646	1,142	1,479
Other ³	12	12	12	12	12	12	12
Total.....	2,039	2,231	2,271	1,821	2,356	1,946	2,418
Prices to the electric power sector²							
(2012 dollars per million Btu)							
Petroleum.....	21.46	24.25	24.30	23.83	24.29	23.91	21.23
Natural gas.....	3.44	7.87	8.16	8.60	8.57	9.03	5.43
Coal.....	2.39	3.18	3.19	5.14	3.20	5.20	3.01
Average electricity price							
(2012 cents per kilowatthour)							
	9.8	11.0	11.1	12.0	11.5	12.5	9.9

¹Includes combined heat and power plants and electricity-only plants in commercial and industrial sectors that have a non-regulatory status. Includes 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. Excludes off-grid photovoltaics and other generators not connected to the distribution or transmission systems.

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

³Includes emissions from geothermal power and nonbiogenic emissions from municipal solid waste.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: U.S. Energy Information Administration, AEO2014 National Energy Modeling System runs HINUC14.D120313A, REF2014.D102413A, HCCSTOM.D012314A, LOWNUC14.D012314B, HCLONUC.D012314A, and ALTLONUC14.D012314C.

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Table D4. Key results for renewable technology case

Capacity, generation, and emissions	2012	2020		2030		2040	
		Reference	Low Renewable Technology Cost	Reference	Low Renewable Technology Cost	Reference	Low Renewable Technology Cost
Net summer capacity (gigawatts)							
Electric power sector ¹							
Conventional hydropower	78.10	78.41	79.55	79.75	80.50	80.35	82.00
Geothermal ²	2.58	4.02	4.28	6.58	6.66	8.80	9.07
Municipal waste ³	3.57	3.63	3.63	3.63	3.63	3.63	3.63
Wood and other biomass ⁴	2.70	3.14	3.14	3.14	3.26	3.46	4.56
Solar thermal	0.48	1.73	1.73	1.73	1.73	1.73	1.73
Solar photovoltaic ⁵	2.49	7.90	14.63	8.62	20.83	17.07	56.34
Wind	59.01	75.59	77.27	76.12	82.63	85.48	119.92
Total	148.92	174.43	184.23	179.56	199.24	200.52	277.26
End-use sector ⁶							
Conventional hydropower	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Municipal waste ⁷	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Wood and other biomass	4.89	6.27	6.92	7.95	9.86	9.62	13.35
Solar photovoltaic ⁵	4.71	12.75	13.89	18.93	25.65	29.47	43.27
Wind	0.15	0.70	1.21	0.90	1.70	1.42	3.38
Total	10.51	20.48	22.77	28.53	37.97	41.26	60.75
Generation (billion kilowatthours)							
Electric power sector ¹							
Coal	1,499	1,632	1,602	1,678	1,656	1,661	1,644
Petroleum	20	16	16	16	16	16	17
Natural gas	1,133	1,155	1,132	1,391	1,337	1,605	1,405
Total fossil	2,651	2,803	2,750	3,085	3,009	3,282	3,066
Conventional hydropower	273.89	287.67	293.48	294.35	297.83	297.34	303.30
Geothermal	15.56	28.24	30.34	49.04	49.86	67.26	69.62
Municipal waste ⁸	16.79	19.05	18.67	18.15	18.53	19.21	19.12
Wood and other biomass ⁴	11.04	36.71	63.30	67.50	85.07	72.22	93.42
Dedicated plants	9.84	15.31	15.86	16.17	17.43	18.99	27.03
Cofiring	1.20	21.40	47.44	51.33	67.64	53.23	66.39
Solar thermal	0.90	3.52	3.52	3.53	3.53	3.53	3.53
Solar photovoltaic ⁵	3.25	14.54	30.06	16.07	44.82	35.24	128.36
Wind	141.87	217.53	223.15	219.06	237.99	248.02	354.74
Total renewable	463.29	607.26	662.52	667.71	737.62	742.82	972.09
End-use sector ⁶							
Total fossil	112	128	128	175	173	247	247
Conventional hydropower	1.38	1.38	1.38	1.38	1.38	1.38	1.38
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Municipal waste ⁷	3.65	3.63	3.63	3.63	3.63	3.63	3.63
Wood and other biomass	26.53	34.10	37.75	43.75	54.79	53.50	75.17
Solar photovoltaic ⁵	7.35	19.91	21.75	30.09	40.94	47.46	69.49
Wind	0.20	0.96	1.62	1.25	2.33	2.01	4.67
Total renewable	39.11	59.98	66.13	80.10	103.07	107.99	154.34

Table D4. Key results for renewable technology case (continued)

Capacity, generation, and emissions	2012	2020		2030		2040	
		Reference	Low Renewable Technology Cost	Reference	Low Renewable Technology Cost	Reference	Low Renewable Technology Cost
Carbon dioxide emissions by the electric power sector (million metric tons) ¹							
Coal.....	1,514	1,609	1,580	1,656	1,634	1,637	1,621
Petroleum.....	19	13	13	14	14	14	14
Natural gas.....	494	478	469	545	530	608	541
Other ⁹	12	12	12	12	12	12	12
Total	2,039	2,112	2,073	2,227	2,189	2,271	2,188

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 all 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 2012, EIA estimates that as much as 274 megawatts of remote electricity generation PV applications (i.e., off-grid power systems) were in service in 2012, 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 combined heat and power plants and electricity-only plants in the commercial and industrial sectors that have a non-regulatory status. Includes 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. Excludes off-grid photovoltaics and other generators not connected to the distribution or transmission systems.

⁷Includes 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.

⁸Includes 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 2012 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).

⁹Includes emissions from geothermal power and nonbiogenic emissions from municipal solid waste.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: U.S. Energy Information Administration, AEO2014 National Energy Modeling System runs REF2014.D102413A, and LCR_2014.D120613A.

Table D5. Key results for environmental cases

Net summer capacity, generation, emissions, fuel prices, and coal production	2012	2030					2040				
		Reference	GHG10	GHG25	High Oil and Gas Resource	GHG10 and Low Gas Prices	Reference	GHG10	GHG25	High Oil and Gas Resource	GHG10 and Low Gas Prices
Capacity (gigawatts)											
Coal steam.....	306.6	258.4	208.4	52.6	243.8	163.2	258.4	176.7	19.1	243.8	127.4
Oil and natural gas steam.....	100.4	72.1	64.8	42.4	81.2	65.9	69.6	55.2	31.2	79.8	60.4
Combined cycle.....	211.9	285.6	313.4	381.6	294.4	372.6	342.2	365.4	420.7	382.3	477.5
Combustion turbine / diesel.....	139.8	184.0	178.8	185.8	202.4	191.1	223.7	206.1	179.4	241.2	218.4
Nuclear / uranium.....	102.1	98.2	101.3	142.1	97.8	97.8	102.0	141.8	231.6	97.8	111.0
Pumped storage.....	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4
Renewable sources.....	148.9	179.6	200.5	312.6	170.1	183.5	200.5	279.8	363.1	177.4	227.5
Distributed generation.....	0.0	4.6	1.5	0.3	7.6	2.4	8.9	2.9	0.3	17.8	4.8
Combined heat and power ¹	33.8	63.4	67.1	75.5	64.0	67.6	87.7	96.4	109.3	86.9	95.2
Total.....	1,065.8	1,168.2	1,158.4	1,215.2	1,183.7	1,166.5	1,315.6	1,346.6	1,377.3	1,349.5	1,344.4
Cumulative additions (gigawatts)											
Coal steam.....	0.0	2.5	2.5	2.5	2.5	2.5	2.6	2.5	2.5	2.5	2.5
Combined cycle.....	0.0	74.0	101.8	170.0	82.8	160.9	130.6	153.8	209.1	170.7	265.9
Combustion turbine / diesel.....	0.0	53.0	48.3	59.8	70.7	60.1	93.2	77.2	75.2	110.0	88.2
Nuclear / uranium.....	0.0	5.8	9.0	49.8	5.5	5.5	9.7	49.4	139.3	5.5	18.7
Renewable sources.....	0.0	31.6	52.5	164.6	22.1	35.5	52.5	131.8	215.1	29.4	79.5
Distributed generation.....	0.0	4.6	1.5	0.3	7.6	2.4	8.9	2.9	0.3	17.8	4.8
Combined heat and power ¹	0.0	29.7	33.4	41.7	30.2	33.8	53.9	62.6	75.6	53.2	61.4
Total.....	0.0	201.1	249.0	488.6	221.4	300.8	351.5	480.2	717.2	389.1	520.9
Cumulative retirements (gigawatts).....	0.0	93.8	151.4	334.1	98.5	195.2	96.7	194.5	400.6	100.4	237.3
Generation by fuel (billion kilowatthours)											
Coal.....	1,499	1,678	1,255	241	1,544	834	1,661	964	48	1,445	460
Petroleum.....	20	16	15	10	16	13	16	14	9	16	12
Natural gas.....	1,133	1,391	1,531	1,780	1,647	2,148	1,605	1,489	1,405	2,108	2,623
Nuclear / uranium.....	769	782	802	1,114	779	779	811	1,116	1,819	779	879
Pumped storage / other.....	6	3	3	3	3	3	3	3	3	3	3
Renewable sources.....	463	668	794	1,044	631	717	743	1,074	1,185	672	847
Distributed generation.....	0	2	1	0	22	1	4	1	0	48	2
Combined heat and power ¹	165	276	287	313	283	295	375	400	432	385	411
Total.....	4,054	4,815	4,689	4,505	4,924	4,791	5,219	5,060	4,902	5,456	5,237
Retrofits (gigawatts)											
Scrubber.....	0.00	31.99	23.25	22.94	28.71	23.03	31.99	23.25	22.94	28.71	23.03
Nitrogen oxide controls											
Combustion.....	0.00	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Selective catalytic reduction post-combustion.....	0.00	10.33	11.11	11.71	10.29	10.25	10.33	11.97	11.71	10.29	10.68
Selective non-catalytic reduction post-combustion.....	0.00	3.04	3.04	3.04	3.04	3.04	3.04	4.49	3.04	3.04	3.78
Emissions by the electric power sector ²											
Sulfur dioxide (million short tons).....	3.34	1.58	1.09	0.24	1.37	0.67	1.61	0.84	0.03	1.32	0.38
Nitrogen oxides (million short tons).....	1.68	1.59	1.16	0.37	1.44	0.78	1.60	0.94	0.24	1.39	0.55
Mercury (short tons).....	26.35	6.69	4.90	1.15	6.07	3.24	6.81	3.90	0.28	5.91	1.90
Carbon dioxide emissions (million metric tons)											
by sector											
Residential.....	295	286	282	277	291	288	268	264	257	277	271
Commercial.....	206	230	224	219	239	234	246	240	233	263	254
Industrial ³	937	1,107	1,086	1,073	1,151	1,121	1,123	1,102	1,078	1,206	1,171
Transportation.....	1,812	1,677	1,647	1,606	1,723	1,686	1,691	1,651	1,604	1,767	1,714
Electric power ²	2,039	2,227	1,810	826	2,201	1,620	2,271	1,446	419	2,254	1,372
by fuel											
Petroleum ⁴	2,254	2,136	2,094	2,040	2,192	2,141	2,113	2,060	2,000	2,208	2,143
Natural gas.....	1,366	1,572	1,589	1,592	1,730	1,851	1,694	1,595	1,412	1,981	2,066
Coal.....	1,657	1,807	1,354	358	1,671	944	1,780	1,036	168	1,565	562
Other ⁵	12	12	12	12	12	12	12	12	12	12	12
Total carbon dioxide emissions.....	5,290	5,527	5,049	4,001	5,605	4,949	5,599	4,703	3,591	5,767	4,782

Table D5. Key results for environmental cases (continued)

Net summer capacity, generation, emissions, fuel prices, and coal production	2012	2030					2040				
		Reference	GHG10	GHG25	High Oil and Gas Resource	GHG10 and Low Gas Prices	Reference	GHG10	GHG25	High Oil and Gas Resource	GHG10 and Low Gas Prices
Energy consumption (quadrillion Btu)											
Liquid fuels and other petroleum ⁶	35.87	35.65	35.01	34.28	36.59	35.87	35.35	34.57	33.72	37.20	36.16
Natural gas	26.20	30.03	30.56	31.99	33.02	35.53	32.32	31.07	30.36	37.86	39.93
Coal ⁷	17.34	19.01	14.50	3.95	17.57	10.07	18.75	11.41	1.96	16.49	6.15
Nuclear / uranium ⁸	8.05	8.18	8.40	11.66	8.15	8.15	8.49	11.68	19.03	8.15	9.20
Hydropower	2.67	2.87	2.91	2.93	2.83	2.87	2.90	2.98	2.95	2.84	2.94
Biomass ⁹	2.53	3.95	4.61	4.13	3.96	4.32	4.26	5.29	4.33	4.37	4.53
Other renewable energy ¹⁰	1.97	3.23	3.76	6.69	2.91	3.32	3.89	6.03	8.15	3.21	4.62
Other ¹¹	0.39	0.35	0.35	0.42	0.33	0.34	0.35	0.36	0.45	0.30	0.32
Total consumption	95.02	103.27	100.10	96.05	105.37	100.47	106.31	103.40	100.95	110.43	103.85
Prices to the electric power sector ² (2012 dollars per million Btu)											
Natural gas	3.44	6.49	7.70	9.34	5.02	6.07	8.16	9.57	12.38	5.17	7.31
Coal	2.39	2.93	4.74	7.14	2.78	4.45	3.19	6.08	10.27	2.97	5.62
Average energy prices to all users (2012 dollars per million Btu)											
Propane	23.24	24.66	26.03	27.85	22.48	23.99	26.79	28.59	31.75	24.04	26.10
E85 ¹²	35.06	27.91	28.85	30.40	26.18	26.72	35.49	35.93	37.64	33.33	33.92
Motor gasoline ¹³	30.44	28.53	29.95	32.02	26.09	27.32	32.67	34.65	37.85	29.18	30.82
Jet fuel ¹⁴	22.99	23.71	25.09	27.10	20.82	22.07	28.07	30.28	33.46	24.10	26.52
Distillate fuel oil	28.36	29.67	31.06	33.10	27.15	28.40	33.54	35.61	38.90	30.19	32.20
Residual fuel oil	20.41	16.32	17.79	19.83	14.79	16.07	19.42	21.81	25.28	17.18	19.54
Natural gas	5.38	8.49	9.62	11.07	6.88	7.65	10.38	11.86	14.65	7.06	8.92
Metallurgical coal	7.25	9.51	11.60	14.45	9.42	11.49	10.20	13.52	18.91	10.05	13.35
Other coal	2.44	2.98	4.82	7.46	2.85	4.56	3.25	6.18	11.26	3.04	5.84
Electricity	28.85	30.56	33.64	38.27	28.56	31.42	32.63	36.54	39.72	28.40	32.93
Average electricity price (2012 cents per kilowatthour)											
	9.8	10.4	11.5	13.1	9.7	10.7	11.1	12.5	13.6	9.7	11.2

¹Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors that have a non-regulatory status. Includes 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. Excludes off-grid photovoltaics and other generators not connected to the distribution or transmission systems.

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

³Includes combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

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 2012, international bunker fuels accounted for 90 to 126 million metric tons annually.

⁵Includes emissions from geothermal power and emissions from non-biogenic municipal waste.

⁶Estimated 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 natural gas plant liquids and crude oil consumed as a fuel. Refer to Table A17 for detailed renewable liquid fuels consumption.

⁷Excludes coal converted to coal-based synthetic liquids and natural gas.

⁸These 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.

⁹Includes 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.

¹⁰Includes 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.

¹¹Includes non-biogenic municipal waste, liquid hydrogen, and net electricity imports.

¹²E85 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.

¹³Sales weighted-average price for all grades. Includes Federal, State and local taxes.

¹⁴Kerosene-type jet fuel. Includes Federal and State taxes while excluding county and local taxes.

GHG = Greenhouse gas.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: U.S. Energy Information Administration, AEO2014 National Energy Modeling System runs REF2014.D102413A, CO2FEE10.D011614A, CO2FEE25.D011614A, HIGHRESOURCE.D112913B, CO2FEE10HR.D011614A.

Table D6. Key results for low electricity demand case
(gigawatts, unless otherwise noted)

Net summer capacity, generation, emissions, and fuel prices	2012	2020		2030		2040	
		Reference	Low Electricity Demand	Reference	Low Electricity Demand	Reference	Low Electricity Demand
Total electricity sales (billion kilowatthours)	3,686	3,986	3,580	4,327	3,604	4,623	3,690
Average electricity price							
(2012 cents per kilowatthour)	9.8	10.1	9.9	10.4	9.9	11.1	10.1
Capacity							
Coal steam	306.6	259.2	199.9	258.4	199.6	258.4	199.6
Oil and natural gas steam	100.4	86.0	65.8	72.1	37.9	69.6	32.5
Combined cycle	211.9	231.0	229.4	285.6	230.6	342.2	242.1
Combustion turbine / diesel	139.8	149.7	133.8	184.0	119.6	223.7	120.8
Nuclear / uranium	102.1	97.8	97.8	98.2	97.8	102.0	97.8
Pumped storage	22.4	22.4	22.4	22.4	22.4	22.4	22.4
Fuel cells	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Renewable sources	148.9	174.4	159.4	179.6	162.5	200.5	166.7
Distributed generation	0.0	1.6	0.2	4.6	0.2	8.9	0.5
Combined heat and power ¹	33.8	47.2	50.1	63.4	84.6	87.7	137.2
Total	1,065.8	1,069.5	958.7	1,168.2	955.2	1,315.6	1,019.7
Cumulative additions							
Coal steam	0.0	2.5	2.5	2.5	2.5	2.6	2.5
Oil and natural gas steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combined cycle	0.0	19.4	17.8	74.0	19.0	130.6	30.5
Combustion turbine / diesel	0.0	17.8	7.4	53.0	8.1	93.2	12.5
Nuclear / uranium	0.0	5.5	5.5	5.8	5.5	9.7	5.5
Pumped storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fuel cells	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewable sources	0.0	26.4	11.4	31.6	14.5	52.5	18.7
Distributed generation	0.0	1.6	0.2	4.6	0.2	8.9	0.5
Combined heat and power ¹	0.0	13.5	16.3	29.7	50.8	53.9	103.4
Total	0.0	86.7	61.0	201.1	100.6	351.5	173.6
Cumulative retirements	0.0	78.0	163.2	93.8	206.3	96.7	214.7
Generation by fuel (billion kilowatthours)							
Coal	1,499	1,632	1,322	1,678	1,335	1,661	1,318
Petroleum	20	16	14	16	13	16	14
Natural gas	1,133	1,155	1,096	1,391	1,076	1,605	1,138
Nuclear / uranium	769	779	779	782	779	811	779
Pumped storage / other	6	3	3	3	3	3	3
Renewable sources	463	607	546	668	577	743	612
Distributed generation	0	1	0	2	0	4	0
Total electric power sector generation²	3,890	4,193	3,760	4,540	3,783	4,844	3,865
Combined heat and power ¹	165	209	215	276	309	375	457
Total electricity generation	4,054	4,402	3,974	4,815	4,092	5,219	4,321
Carbon dioxide emissions by the electric power sector (million metric tons)²							
Petroleum	19	13	12	14	12	14	12
Natural gas	494	478	453	545	438	608	456
Coal	1,514	1,609	1,296	1,656	1,308	1,637	1,292
Other ³	12	12	12	12	12	12	12
Total	2,039	2,112	1,772	2,227	1,770	2,271	1,771
Prices to the electric power sector² (2012 dollars per million Btu)							
Petroleum	21.46	17.28	17.08	20.80	20.69	24.30	24.06
Natural gas	3.44	5.07	5.02	6.49	5.95	8.16	7.33
Coal	2.39	2.61	2.43	2.93	2.69	3.19	2.93

¹Includes combined heat and power plants and electricity-only plants in commercial and industrial sectors that have a non-regulatory status. Includes 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. Excludes off-grid photovoltaics and other generators not connected to the distribution or transmission systems.

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

³Includes emissions from geothermal power and nonbiogenic emissions from municipal solid waste.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.
Source: U.S. Energy Information Administration, AEO2014 National Energy Modeling System runs REF2014.D102413A, and FLAT.D010914A.

Table D7. Natural gas supply and disposition, oil and gas resource cases
(trillion cubic feet per year, unless otherwise noted)

Supply, disposition, and prices	2012	2020			2030			2040		
		Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource
Henry Hub spot price										
(2012 dollars per million Btu).....	2.75	5.28	4.38	4.34	8.15	6.03	4.25	10.53	7.65	4.58
(2012 dollars per thousand cubic feet).....	2.81	5.39	4.47	4.44	8.33	6.17	4.35	10.76	7.82	4.68
Dry gas production¹	24.06	26.77	29.09	31.29	28.99	34.43	39.07	28.07	37.54	45.51
Lower 48 onshore.....	22.07	24.30	26.65	28.61	25.28	30.82	36.29	23.59	33.43	42.41
Associated-dissolved ²	2.06	2.47	2.65	3.09	2.04	2.25	3.43	1.69	1.91	2.99
Non-associated.....	20.02	21.83	24.00	25.52	23.25	28.57	32.86	21.89	31.52	39.42
Tight gas.....	4.86	5.99	6.48	6.54	6.31	8.06	7.62	6.55	8.41	9.51
Shale gas.....	9.72	11.53	13.33	14.79	13.10	16.92	21.85	11.59	19.82	26.95
Coalbed methane.....	1.58	1.73	1.66	1.59	1.86	1.61	1.43	2.15	1.71	1.40
Other.....	3.86	2.57	2.53	2.60	1.97	1.98	1.96	1.59	1.58	1.56
Lower 48 offshore.....	1.66	2.19	2.16	2.40	2.53	2.42	2.52	3.32	2.95	2.81
Associated-dissolved ²	0.48	0.68	0.68	0.77	0.61	0.58	0.60	0.78	0.71	0.69
Non-associated.....	1.18	1.51	1.48	1.64	1.92	1.84	1.92	2.53	2.24	2.13
Alaska.....	0.33	0.28	0.28	0.28	1.18	1.19	0.27	1.17	1.17	0.28
Supplemental natural gas ³	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Net imports	1.51	-0.99	-1.93	-2.18	-2.66	-4.94	-6.66	-2.21	-5.80	-8.30
Pipeline ⁴	1.37	0.18	0.00	0.15	-0.69	-1.57	-1.69	-0.35	-2.43	-3.33
Liquefied natural gas.....	0.15	-1.17	-1.93	-2.33	-1.97	-3.37	-4.97	-1.86	-3.37	-4.97
Total supply	25.64	25.84	27.23	29.18	26.39	29.56	32.48	25.92	31.81	37.27
Consumption by sector										
Residential.....	4.17	4.42	4.46	4.52	4.20	4.33	4.41	3.98	4.12	4.28
Commercial.....	2.90	3.10	3.16	3.27	3.09	3.28	3.41	3.35	3.57	3.85
Industrial ⁵	7.14	8.00	8.09	8.20	8.11	8.52	8.79	8.24	8.68	9.22
Natural-gas-to-liquids heat and power ⁶	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural gas to liquids production ⁷	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electric power ⁸	9.25	7.82	8.81	10.33	8.19	10.06	12.10	7.31	11.23	14.99
Transportation ⁹	0.04	0.08	0.08	0.08	0.21	0.28	0.22	0.48	0.85	0.76
Pipeline fuel.....	0.72	0.67	0.73	0.74	0.71	0.80	0.89	0.71	0.83	0.98
Lease and plant fuel ¹⁰	1.42	1.59	1.74	1.86	1.71	2.11	2.50	1.69	2.35	2.98
Total	25.64	25.68	27.06	29.01	26.23	29.39	32.31	25.76	31.63	37.05
Discrepancy¹¹	0.00	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.18	0.21
Lower 48 end of year dry reserves¹	320.09	334.75	352.47	388.50	342.80	382.58	427.94	347.18	402.59	492.37

¹Marketed production (wet) minus extraction losses.

²Gas which occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with crude oil (dissolved).

³Synthetic 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.

⁴Includes any natural gas regasified in the Bahamas and transported via pipeline to Florida, as well as gas from Canada and Mexico.

⁵Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.

⁶Includes any natural gas used in the process of converting natural gas to liquid fuel that is not actually converted.

⁷Includes any natural gas converted into liquid fuel.

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

⁹Natural gas used as fuel in motor vehicles, trains, and ships.

¹⁰Represents natural gas used in well, field, and lease operations, in natural gas processing plant machinery, and for liquefaction in export facilities.

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, 2012 values include net storage injections.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 supply values; lease, plant, and pipeline fuel consumption: U.S. Energy Information Administration (EIA), *Natural Gas Monthly*, DOE/EIA-0130(2013/06) (Washington, DC, June 2013). Other 2012 consumption based on: EIA, *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 natural gas price at Henry Hub based on daily spot prices published in Natural Gas Intelligence. Projections: EIA, AEO2014 National Energy Modeling System runs LOWRESOURCE.D112913A, REF2014.D102413A, and HIGHRESOURCE.D112913B.

Table D8. Liquid fuels supply and disposition, oil and gas resource case
(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	2012	2020			2030			2040		
		Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource
Crude oil prices (2012 dollars per barrel)										
Brent spot.....	111.65	98.61	96.57	91.58	122.90	118.99	106.55	145.02	141.46	124.74
West Texas Intermediate spot	94.12	96.56	94.57	89.69	120.83	116.99	104.76	142.96	139.46	122.97
Imported crude oil ¹	101.10	90.10	88.07	82.58	113.23	109.22	96.67	133.65	130.80	113.71
Crude oil supply										
Domestic production ²	6.49	8.85	9.55	11.41	7.05	8.30	12.85	6.61	7.48	13.22
Alaska	0.53	0.44	0.44	0.49	0.24	0.24	0.69	0.31	0.26	1.00
Lower 48 States	5.96	8.42	9.12	10.93	6.81	8.06	12.16	6.30	7.22	12.22
Net imports.....	8.43	6.49	5.79	3.95	7.82	6.64	2.33	8.71	7.74	2.38
Gross imports.....	8.49	6.64	5.94	4.10	7.95	6.77	2.46	8.84	7.87	2.51
Exports	0.06	0.15	0.15	0.15	0.13	0.13	0.13	0.12	0.12	0.12
Other crude oil supply ³	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total crude oil supply	15.01	15.35	15.34	15.36	14.88	14.94	15.17	15.32	15.22	15.60
Other petroleum supply										
Net product imports.....	-0.92	-0.94	-0.86	-0.92	-1.07	-1.29	-1.32	-1.34	-1.82	-2.55
Gross refined product imports ⁴	0.85	0.94	0.98	1.12	1.02	1.06	1.26	1.19	1.10	1.08
Unfinished oil imports	0.60	0.52	0.52	0.52	0.49	0.49	0.49	0.45	0.45	0.45
Blending component imports.....	0.62	0.62	0.62	0.61	0.50	0.50	0.49	0.40	0.40	0.38
Exports	2.98	3.02	2.97	3.18	3.08	3.33	3.56	3.38	3.76	4.46
Refinery processing gain ⁵	1.08	1.10	1.08	1.02	0.99	0.96	0.86	0.99	0.95	0.82
Product stock withdrawal	-0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other non-petroleum supply	3.48	3.99	3.96	4.34	3.85	4.32	4.77	3.55	4.36	5.99
Supply from renewable sources.....	0.89	1.01	1.01	1.02	1.04	1.04	1.04	1.06	1.07	1.08
Ethanol.....	0.83	0.89	0.90	0.90	0.92	0.91	0.92	0.96	0.95	0.96
Domestic production.....	0.84	0.83	0.84	0.84	0.85	0.86	0.87	0.87	0.86	0.89
Net imports	-0.02	0.06	0.06	0.06	0.07	0.06	0.05	0.08	0.08	0.07
Biodiesel.....	0.06	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Domestic production	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Net imports	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Other biomass-derived liquids ⁶	0.00	0.03	0.03	0.03	0.03	0.04	0.03	0.01	0.03	0.03
Liquids from gas.....	2.40	2.68	2.65	3.05	2.50	2.98	3.44	2.17	2.98	4.62
Natural gas plant liquids.....	2.40	2.68	2.65	3.05	2.50	2.98	3.44	2.17	2.98	4.62
Gas-to-liquids	0.00	0.00	0.00	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	0.00	0.00	0.00
Other ⁷	0.19	0.30	0.30	0.27	0.31	0.30	0.29	0.32	0.31	0.29
Total primary supply ⁸	18.59	19.49	19.52	19.80	18.64	18.93	19.48	18.52	18.72	19.85
Net import share of product supplied (percent) ..	40.3	28.8	25.6	15.7	36.6	28.6	5.5	40.3	32.2	-0.4
Net expenditures for imports of crude oil and petroleum products (billion 2012 dollars)	313.70	226.68	198.85	131.35	337.87	278.60	94.87	441.03	385.39	112.60
Lower 48 end of year reserves² (billion barrels).....										
	24.71	29.22	31.78	37.19	29.86	34.42	47.13	32.56	35.45	48.12

Table D8. Liquid fuels supply and disposition, oil and gas resource case (continued)
(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	2012	2020			2030			2040		
		Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource
Refined petroleum product prices to the transportation sector (2012 dollars per gallon)										
Propane	2.30	2.33	2.27	2.20	2.54	2.45	2.27	2.68	2.63	2.42
Ethanol (E85) ⁹	3.33	2.46	2.43	2.36	2.68	2.65	2.49	3.36	3.37	3.17
Ethanol wholesale price	2.58	2.71	2.66	2.64	2.62	2.52	2.41	2.64	2.65	2.54
Motor gasoline ¹⁰	3.69	3.11	3.08	2.96	3.50	3.43	3.13	3.92	3.90	3.49
Jet fuel ¹¹	3.10	2.68	2.63	2.49	3.32	3.20	2.81	3.89	3.79	3.25
Distillate fuel oil ¹²	3.95	3.72	3.67	3.54	4.32	4.20	3.85	4.79	4.73	4.26
Residual fuel oil	3.00	1.90	1.86	1.78	2.41	2.32	2.13	2.86	2.78	2.47
Residual fuel oil (2012 dollars per barrel).....	126.17	79.86	78.31	74.64	101.27	97.43	89.26	120.14	116.65	103.86

⁹Weighted average price delivered to U.S. refiners.

¹⁰Includes lease condensate.

¹¹Strategic petroleum reserve stock additions plus unaccounted for crude oil and crude stock withdrawals minus crude product supplied.

¹²Includes other hydrocarbons and alcohol.

¹³The 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.

¹⁴Includes pyrolysis oils, biomass-derived Fischer-Tropsch liquids, and renewable feedstocks used for the on-site production of diesel and gasoline.

¹⁵Includes domestic sources of other blending components, other hydrocarbons, and ethers.

¹⁶Total crude supply plus other petroleum supply plus other non-petroleum supply.

¹⁷E85 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.

¹⁸Sales weighted-average price for all grades. Includes Federal, State, and local taxes.

¹⁹Includes only kerosene-type.

²⁰Diesel fuel for on-road use. Includes Federal and State taxes while excluding county and local taxes.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 product supplied data and imported crude oil price based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013). 2012 crude oil spot prices: Thomson Reuters. 2012 transportation sector prices based on: EIA, Form EIA-782A, "Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report". 2012 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. 2012 wholesale ethanol prices derived from Bloomberg U.S. average rack price. Other 2012 data: EIA, *Petroleum Supply Annual 2012*, DOE/EIA-0340(2012)/1 (Washington, DC, September 2013). Projections: EIA, AEO2014 National Energy Modeling System runs LOWRESOURCE.D112913A, REF2014.D102413A, and HIGHRESOURCE.D112913B.

Table D9. Key transportation results, oil and gas resource cases

Consumption and indicators	2012	2020			2030			2040		
		Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource
Level of travel										
(billion vehicle miles traveled)										
Light-duty vehicles less than 8,501 pounds..	2,662	2,846	2,851	2,869	3,118	3,138	3,201	3,422	3,434	3,529
Commercial light trucks ¹	63	76	76	77	88	90	91	101	103	106
Freight trucks greater than 10,000 pounds..	245	308	310	317	351	362	377	398	411	437
(billion seat miles available)										
Air.....	990	1,064	1,064	1,065	1,135	1,135	1,135	1,199	1,199	1,199
(billion ton miles traveled)										
Rail.....	1,729	1,675	1,624	1,581	1,761	1,738	1,688	1,763	1,736	1,647
Domestic shipping.....	378	386	390	406	356	369	403	360	371	419
Energy efficiency indicators										
(miles per gallon)										
Tested new light-duty vehicle ²	31.7	38.7	38.6	38.5	47.9	47.8	47.4	48.1	48.2	47.7
New car ²	36.3	44.2	44.2	44.2	55.2	55.4	55.2	55.4	55.6	55.3
New light truck ²	27.5	33.7	33.7	33.6	40.8	40.7	40.6	40.9	40.8	40.7
On-road new light-duty vehicle ³	25.6	31.2	31.2	31.1	38.7	38.6	38.3	38.9	38.9	38.5
New car ³	29.7	36.1	36.1	36.1	45.1	45.2	45.1	45.2	45.4	45.2
New light truck ³	22.0	27.0	27.0	26.9	32.7	32.6	32.5	32.7	32.7	32.6
Light-duty stock ⁴	21.5	25.1	25.1	25.1	32.6	32.6	32.4	37.2	37.2	36.9
New commercial light truck ¹	18.1	20.9	20.9	20.8	24.5	24.5	24.4	24.6	24.6	24.5
Stock commercial light truck ¹	15.2	18.0	18.0	18.0	22.5	22.5	22.5	24.5	24.5	24.4
Freight truck.....	6.7	7.3	7.3	7.3	7.7	7.7	7.7	7.8	7.8	7.8
(seat miles per gallon)										
Aircraft.....	62.4	63.9	63.9	63.9	67.0	67.0	67.0	71.5	71.5	71.6
(ton miles per thousand Btu)										
Rail.....	3.4	3.6	3.6	3.6	3.9	3.9	3.9	4.2	4.2	4.2
Domestic shipping.....	4.7	5.0	5.0	5.0	5.4	5.4	5.4	5.8	5.8	5.8
Energy use by mode (quadrillion Btu)										
Light-duty vehicles.....	15.49	14.21	14.24	14.34	12.00	12.09	12.38	11.53	11.58	12.00
Commercial light trucks ¹	0.52	0.53	0.53	0.53	0.49	0.50	0.51	0.52	0.53	0.54
Bus transportation.....	0.24	0.25	0.25	0.25	0.27	0.27	0.27	0.29	0.29	0.29
Freight trucks.....	5.02	5.83	5.87	6.00	6.26	6.47	6.73	6.97	7.23	7.71
Rail, passenger.....	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06
Rail, freight.....	0.48	0.46	0.45	0.43	0.45	0.45	0.43	0.43	0.42	0.40
Shipping, domestic.....	0.10	0.09	0.09	0.10	0.08	0.08	0.09	0.07	0.08	0.09
Shipping, international.....	0.58	0.59	0.59	0.59	0.60	0.60	0.60	0.61	0.61	0.61
Recreational boats.....	0.24	0.25	0.25	0.26	0.27	0.27	0.28	0.28	0.28	0.29
Air.....	2.47	2.60	2.60	2.60	2.68	2.69	2.69	2.70	2.70	2.70
Military use.....	0.70	0.64	0.64	0.64	0.68	0.68	0.68	0.77	0.77	0.77
Lubricants.....	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Pipeline fuel.....	0.73	0.69	0.74	0.75	0.72	0.82	0.91	0.72	0.85	1.00
Total.....	26.74	26.31	26.41	26.66	24.69	25.09	25.75	25.07	25.51	26.59

Table D9. Key transportation results, oil and gas resource cases (continued)

Consumption and indicators	2012	2020			2030			2040		
		Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource	Low Oil and Gas Resource	Reference	High Oil and Gas Resource
Energy use by fuel (quadrillion Btu)										
Propane	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.07
Motor gasoline ⁵	16.33	14.97	15.00	15.11	12.59	12.69	13.02	12.04	12.09	12.56
of which: E85 ⁶	0.01	0.19	0.19	0.18	0.49	0.46	0.43	0.34	0.33	0.29
Jet fuel ⁷	3.00	3.08	3.08	3.08	3.20	3.20	3.20	3.28	3.28	3.28
Distillate fuel oil ⁸	5.82	6.67	6.70	6.81	7.12	7.25	7.55	7.65	7.54	8.08
Residual fuel oil	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.60	0.60	0.60
Other petroleum ⁹	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Liquid fuels and other petroleum	25.93	25.50	25.55	25.78	23.70	23.94	24.57	23.79	23.73	24.74
Pipeline fuel natural gas	0.73	0.69	0.74	0.75	0.72	0.82	0.91	0.72	0.85	1.00
Compressed/liquefied natural gas	0.04	0.08	0.08	0.08	0.21	0.28	0.22	0.48	0.86	0.77
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.06	0.06	0.06
Delivered energy	26.72	26.30	26.40	26.65	24.69	25.08	25.74	25.06	25.50	26.58
Electricity related losses	0.05	0.06	0.06	0.06	0.09	0.08	0.08	0.12	0.12	0.11
Total	26.77	26.36	26.47	26.71	24.77	25.17	25.82	25.18	25.62	26.68

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

²Environmental Protection Agency rated miles per gallon.

³Tested new vehicle efficiency revised for on-road performance.

⁴Combined "on-the-road" estimate for all cars and light trucks.

⁵Includes ethanol and ethers blended into gasoline.

⁶E85 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.

⁷Includes only kerosene type.

⁸Diesel fuel for on- and off- road use.

⁹Includes aviation gasoline and lubricants.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: 2012 consumption based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0384(2013/09) (Washington, DC, September 2013). Other 2012 data: Federal Highway Administration, *Highway Statistics 2010* (Washington, DC, February 2012); Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 31* (Oak Ridge, TN, July 2012); National Highway Traffic and Safety Administration, *Summary of Fuel Economy Performance* (Washington, DC, October 28, 2010); U.S. Department of Commerce, Bureau of the Census, "Vehicle Inventory and Use Survey", EC02TV (Washington, DC, December 2004); EIA, *Alternatives to Traditional Transportation Fuels 2009* (Part II – User and Fuel Data), April 2011; EIA, *State Energy Data Report 2011*, DOE/EIA-0214(2011) (Washington, DC, June 2013); U.S. Department of Transportation, Research and Special Programs Administration, *Air Carrier Statistics Monthly, December 2010-2009* (Washington, DC, December 2010); and United States Department of Defense, Defense Fuel Supply Center, *Factbook* (January, 2010). Projections: EIA, AEO2014 National Energy Modeling System runs LOWRESOURCE.D112913A, REF2014.D102413A, and HIGHRESOURCE.D112913B.

Table D10. Key transportation results, vehicle miles traveled cases

Consumption and indicators	2012	2020			2030			2040		
		Low VMT	Reference	High VMT	Low VMT	Reference	High VMT	Low VMT	Reference	High VMT
Level of travel										
(billion vehicle miles traveled)										
Light-duty vehicles less than 8,501 pounds.	2,662	2,752	2,851	2,954	2,772	3,138	3,301	2,793	3,434	3,624
Commercial light trucks ¹	63	75	76	77	86	90	91	97	103	105
Freight trucks greater than 10,000 pounds..	245	310	310	310	362	362	362	410	411	411
(billion seat miles available)										
Air	990	1,064	1,064	1,064	1,135	1,135	1,135	1,199	1,199	1,199
(billion ton miles traveled)										
Rail	1,729	1,624	1,624	1,620	1,736	1,738	1,736	1,738	1,736	1,737
Domestic shipping	378	390	390	390	368	369	369	370	371	371
Vehicles miles traveled per licensed driver										
(thousand miles)	12.5	11.8	12.2	12.7	11.0	12.5	13.1	10.4	12.8	13.5
Licensed drivers (millions)	213.1	233.5	233.5	233.5	252.0	252.0	252.0	268.6	268.6	268.6
Energy efficiency indicators										
(miles per gallon)										
Tested new light-duty vehicle ²	31.7	38.6	38.6	38.7	47.8	47.8	47.9	48.0	48.2	48.2
New car ²	36.3	44.2	44.2	44.2	55.4	55.4	55.2	55.5	55.6	55.4
New light truck ²	27.5	33.7	33.7	33.7	40.9	40.7	40.9	40.9	40.8	40.9
On-road new light-duty vehicle ³	25.6	31.2	31.2	31.3	38.6	38.6	38.7	38.8	38.9	39.0
New car ³	29.7	36.1	36.1	36.1	45.2	45.2	45.1	45.3	45.4	45.3
New light truck ³	22.0	27.0	27.0	27.0	32.7	32.6	32.7	32.8	32.7	32.8
Light-duty stock ⁴	21.5	25.1	25.1	25.1	32.6	32.6	32.6	37.2	37.2	37.3
New commercial light truck ¹	18.1	20.9	20.9	20.9	24.6	24.5	24.6	24.7	24.6	24.7
Stock commercial light truck ¹	15.2	18.0	18.0	18.0	22.6	22.5	22.6	24.6	24.5	24.6
Freight truck	6.7	7.3	7.3	7.3	7.7	7.7	7.7	7.8	7.8	7.8
(seat miles per gallon)										
Aircraft	62.4	63.9	63.9	63.9	67.0	67.0	67.0	71.5	71.5	71.5
(ton miles per thousand Btu)										
Rail	3.4	3.6	3.6	3.6	3.9	3.9	3.9	4.2	4.2	4.2
Domestic shipping	4.7	5.0	5.0	5.0	5.4	5.4	5.4	5.8	5.8	5.8
Energy use by mode (quadrillion Btu)										
Light-duty vehicles	15.49	13.74	14.24	14.75	10.66	12.09	12.71	9.42	11.58	12.21
Commercial light trucks ¹	0.52	0.52	0.53	0.54	0.48	0.50	0.51	0.49	0.53	0.53
Bus transportation	0.24	0.25	0.25	0.25	0.27	0.27	0.27	0.29	0.29	0.29
Freight trucks	5.02	5.87	5.87	5.87	6.46	6.47	6.47	7.22	7.23	7.24
Rail, passenger	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06
Rail, freight	0.48	0.45	0.45	0.45	0.45	0.45	0.45	0.42	0.42	0.42
Shipping, domestic	0.10	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08
Shipping, international	0.58	0.59	0.59	0.59	0.60	0.60	0.60	0.61	0.61	0.61
Recreational boats	0.24	0.25	0.25	0.25	0.27	0.27	0.27	0.29	0.28	0.28
Air	2.47	2.60	2.60	2.60	2.68	2.69	2.69	2.70	2.70	2.70
Military use	0.70	0.64	0.64	0.64	0.68	0.68	0.68	0.77	0.77	0.77
Lubricants	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Pipeline fuel	0.73	0.74	0.74	0.74	0.81	0.82	0.82	0.84	0.85	0.84
Total	26.74	25.91	26.41	26.94	23.63	25.09	25.72	23.31	25.51	26.15
Energy use by fuel (quadrillion Btu)										
Propane	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.07
Motor gasoline ⁵	16.33	14.51	15.00	15.50	11.31	12.69	13.28	10.04	12.09	12.68
of which: E85 ⁶	0.01	0.21	0.19	0.15	0.56	0.46	0.39	0.49	0.33	0.34
Jet fuel ⁷	3.00	3.08	3.08	3.08	3.20	3.20	3.20	3.28	3.28	3.28
Distillate fuel oil ⁸	5.82	6.68	6.70	6.71	7.18	7.25	7.27	7.41	7.54	7.58
Residual fuel oil	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.60	0.60	0.60
Other petroleum ⁹	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Liquid fuels and other petroleum	25.93	25.05	25.55	26.07	22.48	23.94	24.55	21.54	23.73	24.37
Pipeline fuel natural gas	0.73	0.74	0.74	0.74	0.81	0.82	0.82	0.84	0.85	0.84
Compressed/liquefied natural gas	0.04	0.08	0.08	0.08	0.28	0.28	0.29	0.86	0.86	0.86
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.06	0.06
Delivered energy	26.72	25.90	26.40	26.93	23.62	25.08	25.71	23.30	25.50	26.14

Table D10. Key transportation results, vehicle miles traveled cases (continued)

Consumption and indicators	2012	2020			2030			2040		
		Low VMT	Reference	High VMT	Low VMT	Reference	High VMT	Low VMT	Reference	High VMT
Carbon dioxide emissions in the transportation sector (million metric tons)										
Petroleum ¹⁰	1,771	1,701	1,734	1,769	1,521	1,618	1,662	1,451	1,600	1,642
Natural gas ¹¹	41	44	44	44	58	58	59	91	91	91
Total.....	1,812	1,745	1,777	1,812	1,579	1,677	1,721	1,542	1,691	1,733

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

¹¹Environmental Protection Agency rated miles per gallon.

¹²Tested new vehicle efficiency revised for on-road performance.

¹³Combined "on-the-road" estimate for all cars and light trucks.

¹⁴Includes ethanol and ethers blended into gasoline.

¹⁵E85 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.

¹⁶Includes only kerosene type.

¹⁷Diesel fuel for on- and off-road use.

¹⁸Includes aviation gasoline and lubricants.

¹⁹This 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 2012, international bunker fuels accounted for 90 to 126 million metric tons annually.

²⁰Include pipeline fuel natural gas and natural gas used as fuel in motor vehicles, trains, and ships.

VMT = Vehicle miles traveled.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: 2012 consumption based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0384(2013/09) (Washington, DC, September 2013). Other 2012 data: Federal Highway Administration, *Highway Statistics 2010* (Washington, DC, February 2012); Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 31* (Oak Ridge, TN, July 2012); National Highway Traffic and Safety Administration, *Summary of Fuel Economy Performance* (Washington, DC, October 28, 2010); U.S. Department of Commerce, Bureau of the Census, "Vehicle Inventory and Use Survey", EC02TV (Washington, DC, December 2004); EIA, *Alternatives to Traditional Transportation Fuels 2009* (Part II – User and Fuel Data), April 2011; EIA, *State Energy Data Report 2011*, DOE/EIA-0214(2011) (Washington, DC, June 2013); U.S. Department of Transportation, Research and Special Programs Administration, *Air Carrier Statistics Monthly, December 2010-2009* (Washington, DC, December 2010); and United States Department of Defense, Defense Fuel Supply Center, *Factbook* (January, 2010). Projections: EIA, AEO2014 National Energy Modeling System runs LOWVMT.D020314B, REF2014.D102413A, and HIGHVMT.D020314D.

Table D11. Key transportation results, rail liquefied natural gas cases

Consumption and indicators	2012	2020			2030			2040		
		Low Rail LNG	Reference	High Rail LNG	Low Rail LNG	Reference	High Rail LNG	Low Rail LNG	Reference	High Rail LNG
Rail travel										
(billion ton miles traveled).....	1,729	1,622	1,624	1,622	1,742	1,738	1,739	1,734	1,736	1,737
Rail efficiency										
(ton miles per thousand Btu).....	3.4	3.6	3.6	3.6	3.9	3.9	3.9	4.2	4.2	4.2
Energy use by mode (quadrillion Btu)										
Light-duty vehicles	15.49	14.24	14.24	14.24	12.09	12.09	12.09	11.58	11.58	11.59
Commercial light trucks ¹	0.52	0.53	0.53	0.53	0.50	0.50	0.50	0.53	0.53	0.53
Bus transportation.....	0.24	0.25	0.25	0.25	0.27	0.27	0.27	0.29	0.29	0.29
Freight trucks	5.02	5.87	5.87	5.87	6.47	6.47	6.47	7.24	7.23	7.23
Rail, passenger	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06
Rail, freight.....	0.48	0.45	0.45	0.45	0.45	0.45	0.44	0.41	0.42	0.41
Distillate fuel oil	0.48	0.44	0.44	0.42	0.41	0.37	0.21	0.35	0.27	0.02
Liquefied natural gas	0.00	0.00	0.00	0.02	0.04	0.08	0.24	0.06	0.15	0.39
Shipping, domestic.....	0.10	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08
Shipping, international.....	0.58	0.59	0.59	0.59	0.60	0.60	0.60	0.61	0.61	0.61
Recreational boats	0.24	0.25	0.25	0.25	0.27	0.27	0.27	0.28	0.28	0.28
Air.....	2.47	2.60	2.60	2.60	2.69	2.69	2.69	2.70	2.70	2.70
Military use.....	0.70	0.64	0.64	0.64	0.68	0.68	0.68	0.77	0.77	0.76
Lubricants	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Pipeline fuel	0.73	0.74	0.74	0.74	0.83	0.82	0.83	0.85	0.85	0.85
Total.....	26.74	26.41	26.41	26.41	25.10	25.09	25.10	25.51	25.51	25.51
Energy use by fuel (quadrillion Btu)										
Propane	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.07
Motor gasoline ²	16.33	15.00	15.00	15.00	12.69	12.69	12.69	12.09	12.09	12.09
of which: E85 ³	0.01	0.19	0.19	0.19	0.46	0.46	0.46	0.33	0.33	0.34
Jet fuel ⁴	3.00	3.08	3.08	3.08	3.20	3.20	3.20	3.28	3.28	3.28
Distillate fuel oil ⁵	5.82	6.70	6.70	6.68	7.29	7.25	7.09	7.61	7.54	7.32
Residual fuel oil.....	0.58	0.58	0.58	0.58	0.59	0.59	0.59	0.60	0.60	0.60
Other petroleum ⁶	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Liquid fuels and other petroleum	25.93	25.55	25.55	25.53	23.98	23.94	23.78	23.79	23.73	23.51
Pipeline fuel natural gas.....	0.73	0.74	0.74	0.74	0.83	0.82	0.83	0.85	0.85	0.85
Compressed/liquefied natural gas.....	0.04	0.08	0.08	0.10	0.24	0.28	0.44	0.79	0.86	1.07
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity.....	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.06	0.06	0.06
Delivered energy	26.72	26.40	26.40	26.40	25.09	25.08	25.09	25.50	25.50	25.51
Carbon dioxide emissions in the transportation sector (million metric tons)										
Petroleum ⁷	1,771	1,734	1,734	1,732	1,621	1,618	1,607	1,605	1,600	1,585
Natural gas ⁸	41	44	44	45	57	58	67	87	91	103
Total.....	1,812	1,778	1,777	1,777	1,678	1,677	1,674	1,693	1,691	1,687

¹Commercial trucks 8,501 to 10,000 pounds gross vehicle weight rating.²Includes ethanol and ethers blended into gasoline.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.⁴Includes only kerosene type.⁵Diesel fuel for on- and off-road use.⁶Includes aviation gasoline and lubricants.⁷This 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 2012, international bunker fuels accounted for 90 to 126 million metric tons annually.⁸Includes pipeline fuel natural gas and natural gas used as fuel in motor vehicles, trains, and ships.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: 2012 consumption based on: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0384(2013/09) (Washington, DC, September 2013). Other 2012 data: Federal Highway Administration, *Highway Statistics 2010* (Washington, DC, February 2012); Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 31* (Oak Ridge, TN, July 2012); National Highway Traffic and Safety Administration, *Summary of Fuel Economy Performance* (Washington, DC, October 28, 2010); U.S. Department of Commerce, Bureau of the Census, "Vehicle Inventory and Use Survey", EC02TV (Washington, DC, December 2004); EIA, *Alternatives to Traditional Transportation Fuels 2009* (Part II – User and Fuel Data), April 2011; EIA, *State Energy Data Report 2011*, DOE/EIA-0214(2011) (Washington, DC, June 2013); U.S. Department of Transportation, Research and Special Programs Administration, *Air Carrier Statistics Monthly, December 2010-2009* (Washington, DC, December 2010); and United States Department of Defense, Defense Fuel Supply Center, *Factbook* (January, 2010). Projections: EIA, AEO2014 National Energy Modeling System runs RLNGLOW20.D012914C, REF2014.D102413A, and RLNGHIGH20.D012914C.

Table D12. Key results for energy savings and industrial competitiveness act case
(quadrillion Btu per year, unless otherwise noted)

Consumption, emissions	2012	2020		2030		2040	
		Reference	ESICA	Reference	ESICA	Reference	ESICA
Energy consumption							
Residential	10.42	10.74	10.70	10.83	10.71	10.94	10.78
Propane, kerosene, and distillate fuel oil.....	1.02	0.89	0.88	0.75	0.75	0.66	0.66
Natural gas.....	4.26	4.56	4.52	4.43	4.35	4.21	4.10
Renewable energy ¹	0.45	0.46	0.46	0.44	0.44	0.42	0.41
Electricity.....	4.69	4.84	4.83	5.21	5.18	5.65	5.62
Commercial	8.29	8.78	8.76	9.38	9.31	10.22	10.14
Liquid fuels and other petroleum ²	0.63	0.68	0.68	0.67	0.67	0.68	0.67
Natural gas.....	2.96	3.23	3.22	3.35	3.31	3.65	3.59
Coal.....	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Renewable energy ³	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Electricity.....	4.52	4.69	4.68	5.18	5.16	5.72	5.70
Industrial ⁴	23.63	27.71	27.71	29.62	29.59	30.22	30.19
Liquid fuels and other petroleum ⁵	8.06	9.56	9.55	10.10	10.08	10.10	10.07
Natural gas.....	8.75	10.04	10.04	10.87	10.86	11.28	11.27
Coal.....	1.48	1.57	1.57	1.52	1.52	1.44	1.44
Renewable energy ⁶	2.00	2.50	2.50	2.79	2.79	3.07	3.07
Electricity.....	3.35	4.04	4.04	4.33	4.33	4.34	4.35
Transportation	26.72	26.40	26.40	25.08	25.08	25.50	25.50
Liquid fuels and other petroleum ⁷	25.93	25.55	25.55	23.94	23.94	23.73	23.73
Pipeline fuel natural gas.....	0.73	0.74	0.74	0.82	0.81	0.85	0.84
Compressed / liquefied natural gas.....	0.04	0.08	0.08	0.28	0.28	0.86	0.86
Electricity and liquid hydrogen.....	0.02	0.03	0.03	0.05	0.05	0.07	0.07
Electric power ⁸	38.53	40.70	40.66	43.12	43.04	45.20	45.08
Natural gas.....	9.46	9.00	8.99	10.28	10.23	11.48	11.33
Steam coal.....	15.82	16.95	16.95	17.44	17.43	17.27	17.27
Nuclear / uranium ⁹	8.05	8.15	8.15	8.18	8.18	8.49	8.56
Renewable energy ¹⁰	4.59	6.08	6.06	6.68	6.68	7.44	7.41
Other ¹¹	0.62	0.52	0.52	0.53	0.53	0.53	0.52
Total energy consumption	95.02	100.73	100.63	103.27	103.02	106.31	105.97
Carbon dioxide emissions (million metric tons)							
by sector							
Residential.....	295	302	300	286	281	268	262
Commercial.....	206	224	223	230	227	246	242
Industrial ⁴	937	1,060	1,059	1,107	1,106	1,123	1,121
Transportation.....	1,812	1,777	1,777	1,677	1,676	1,691	1,691
Electric power ⁸	2,039	2,112	2,111	2,227	2,223	2,271	2,263
by fuel							
Petroleum ¹²	2,254	2,252	2,251	2,136	2,134	2,113	2,111
Natural gas.....	1,366	1,447	1,443	1,572	1,563	1,694	1,676
Coal.....	1,657	1,766	1,766	1,807	1,805	1,780	1,780
Other ¹³	12	12	12	12	12	12	12
Total carbon dioxide emissions	5,290	5,476	5,472	5,527	5,513	5,599	5,579

¹Includes wood used for residential heating. Excludes nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.

²Includes propane, motor gasoline, ethanol and ethers, kerosene, distillate fuel oil, and residual fuel oil.

³Includes commercial sector consumption of wood and wood waste, landfill gas, municipal waste, and other biomass for combined heat and power. Excludes nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.

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

⁵Includes ethane, natural gasoline, refinery olefins, liquefied petroleum gases, motor gasoline, ethanol and ethers, distillate fuel oil, residual fuel oil, petrochemical feedstocks, petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.

⁶Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources. Excludes ethanol.

⁷Includes propane, motor gasoline, ethanol and ethers, jet fuel, distillate fuel oil, residual fuel oil, aviation gasoline, and lubricants.

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

⁹These 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.

¹⁰Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes net electricity imports.

¹¹Includes distillate fuel oil, residual fuel oil, non-biogenic municipal waste, and net electricity imports.

¹²This 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 2012, international bunker fuels accounted for 90 to 126 million metric tons annually.

¹³Includes emissions from geothermal power and emissions from non-biogenic municipal waste.

ESICA = Energy Savings and Industrial Competitiveness Act.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Source: U.S. Energy Information Administration, AEO2014 National Energy Modeling System, runs REF2014.D102413A, and ESICA.D021014A.

Table D13. Key results for no greenhouse gas concern case
(million short tons per year, unless otherwise noted)

Supply, disposition, prices, and electricity generating capacity additions	2012	2020		2030		2040	
		Reference	No GHG Concern	Reference	No GHG Concern	Reference	No GHG Concern
Production¹	1,016	1,077	1,084	1,127	1,136	1,121	1,159
Appalachia	293	261	262	253	255	247	252
Interior	180	228	231	266	268	289	310
West	543	587	591	607	613	584	597
Waste coal supplied ²	11	14	14	15	15	19	20
Net imports ³	-118	-126	-126	-147	-147	-160	-160
Total supply⁴	909	965	971	995	1,004	979	1,020
Consumption by sector							
Commercial and institutional	2	2	2	2	2	2	2
Coke plants	21	22	22	21	21	18	18
Other industrial ⁵	43	49	49	49	49	50	50
Coal-to-liquids	0	0	0	0	0	0	0
Electric power ⁶	825	892	898	923	931	909	950
Total coal consumption	891	965	971	995	1,004	979	1,020
Average minemouth price⁷							
(2012 dollars per short ton)	39.94	46.52	46.53	53.15	53.15	59.16	59.33
(2012 dollars per million Btu)	1.98	2.33	2.33	2.67	2.67	2.96	2.98
Delivered prices⁸							
(2012 dollars per short ton)							
Commercial and institutional	90.76	95.19	95.30	101.39	102.33	108.37	109.02
Coke plants	190.55	221.01	221.03	249.43	249.52	267.23	267.29
Other industrial ⁵	70.32	76.39	76.44	82.64	83.42	89.22	90.11
Coal to liquids	--	--	--	--	--	--	--
Electric power ⁶	46.13	49.63	49.71	55.32	55.37	60.61	61.20
Average	50.85	54.99	55.04	60.85	60.90	65.97	66.35
Electric power (2012 dollars per million Btu) ⁶	2.39	2.61	2.62	2.93	2.93	3.19	3.23
Exports ⁹	118.43	136.76	136.75	145.97	146.13	150.13	150.56
Electricity generating capacity (gigawatts)							
Cumulative capacity additions¹⁰							
Coal	0.0	2.5	2.5	2.5	4.1	2.6	13.0
Conventional with scrubber	0.0	1.0	1.0	1.0	2.6	1.1	11.5
IGCC without sequestration	0.0	0.6	0.6	0.6	0.6	0.6	0.6
IGCC with sequestration	0.0	0.9	0.9	0.9	0.9	0.9	0.9
End-use generators ¹¹	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural gas	0.0	41.7	40.6	142.6	139.3	255.2	246.4
Nuclear / uranium	0.0	5.5	5.5	5.8	5.5	9.7	7.2
Renewables ¹²	0.0	36.4	36.5	49.6	49.3	83.3	77.7
Other	0.0	0.6	0.6	0.6	0.6	0.6	0.6
Total cumulative additions	0.0	86.7	85.7	201.1	198.9	351.5	344.9
Cumulative coal capacity retirements ¹³	0.0	49.9	48.5	50.7	49.3	50.8	49.4
Total coal capacity	310.0	262.6	264.0	261.8	264.8	261.8	273.6
Liquids from coal (million barrels per day)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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.

⁷Includes 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.

⁸Prices weighted by consumption tonnage; weighted average excludes export free-alongside-ship prices.

⁹Free-alongside-ship price at U.S. port of exit.

¹⁰Cumulative additions after December 31, 2012. Includes all additions of electricity only and combined heat and power plants projected for the electric power, industrial, and commercial sectors.

¹¹Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors that have a non-regulatory status. Includes 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.

¹²Includes conventional hydroelectric, geothermal, wood, wood waste, municipal waste, landfill gas, other biomass, solar, and wind power. Facilities co-firing biomass and coal are classified as coal.

¹³Cumulative retirements after December 31, 2012. Includes retirements of electricity-only and combined heat and power plants that have a regulatory status.

-- = Not applicable.

Btu = British thermal unit.

GHG = Greenhouse gas.

IGCC = Integrated coal-gasification combined cycle.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 data based on: U.S. Energy Information Administration (EIA), *Annual Coal Report 2012*, DOE/EIA-0584(2012) (Washington, DC, December 2013); EIA, *Quarterly Coal Report, October-December 2012*, DOE/EIA-0121(2012/4Q) (Washington, DC, March 2013); and EIA, AEO2014 National Energy Modeling System run REF2014.D102413A. Projections: EIA, AEO2014 National Energy Modeling System runs REF2014.D102413A and NOGHGCONCERN.D120413A.

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Table D14. Key results and assumptions for coal cost cases
(million short tons per year, unless otherwise noted)

Supply, disposition, prices, electricity generating capacity, and costs	2012	2020			2040			Annual growth 2012-2040 (percent)		
		Low Coal Cost	Reference	High Coal Cost	Low Coal Cost	Reference	High Coal Cost	Low Coal Cost	Reference	High Coal Cost
Production ¹	1,016	1,122	1,077	1,003	1,244	1,121	814	0.7%	0.3%	-0.8%
Appalachia.....	293	271	261	247	293	247	200	0.0%	-0.6%	-1.4%
Interior.....	180	230	228	225	268	289	253	1.4%	1.7%	1.2%
West.....	543	622	587	530	683	584	360	0.8%	0.3%	-1.5%
Waste coal supplied ²	11	11	14	15	11	19	27	0.1%	1.9%	3.2%
Net imports ³	-118	-127	-126	-122	-201	-160	-69	1.9%	1.1%	-1.9%
Total supply ⁴	909	1,006	965	895	1,054	979	771	0.5%	0.3%	-0.6%
Consumption by sector										
Commercial and institutional.....	2	2	2	2	2	2	2	0.0%	-0.1%	-0.2%
Coke plants.....	21	22	22	22	18	18	17	-0.4%	-0.5%	-0.6%
Other industrial ⁵	43	49	49	49	51	50	49	0.6%	0.5%	0.4%
Coal-to-liquids.....	0	0	0	0	0	0	0	--	--	--
Electric power ⁶	825	933	892	822	983	909	705	0.6%	0.3%	-0.6%
Total coal use.....	891	1,006	965	895	1,054	979	773	0.6%	0.3%	-0.5%
Average minemouth price⁷										
(2012 dollars per short ton).....	39.94	39.46	46.52	55.11	32.29	59.16	113.47	-0.8%	1.4%	3.8%
(2012 dollars per million Btu).....	1.98	1.97	2.33	2.76	1.61	2.96	5.54	-0.7%	1.4%	3.7%
Delivered prices⁸										
(2012 dollars per short ton)										
Commercial and institutional.....	90.76	86.19	95.19	105.18	70.73	108.37	165.32	-0.9%	0.6%	2.2%
Coke plants.....	190.55	197.05	221.01	248.69	170.56	267.23	428.62	-0.4%	1.2%	2.9%
Other industrial ⁵	70.32	68.17	76.39	85.17	55.92	89.22	141.81	-0.8%	0.9%	2.5%
Coal to liquids.....	--	--	--	--	--	--	--	--	--	--
Electric power ⁶										
(2012 dollars per short ton).....	46.13	44.13	49.63	55.83	35.89	60.61	105.06	-0.9%	1.0%	3.0%
(2012 dollars per million Btu).....	2.39	2.31	2.61	2.95	1.89	3.19	5.36	-0.8%	1.0%	2.9%
Average.....	50.85	48.76	54.99	62.22	39.28	65.97	114.80	-0.9%	0.9%	3.0%
Exports ⁹	118.43	120.29	136.76	155.84	96.59	150.13	250.91	-0.7%	0.9%	2.7%
Electricity generating capacity (gigawatts)										
Capacity										
Coal.....	310.0	269.1	262.6	244.2	274.0	261.8	243.3	-0.4%	-0.6%	-0.9%
Conventional.....	306.2	263.8	257.3	238.9	268.7	256.5	238.0	0.0	0.0	0.0
IGCC without sequestration.....	0.4	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0
IGCC with sequestration.....	0.0	0.9	0.9	0.9	0.9	0.9	0.9	--	--	--
End-use generators ¹⁰	3.4	3.4	3.4	3.4	3.4	3.4	3.4	0.0%	0.0%	0.0%
Natural gas.....	367.9	397.3	401.5	410.7	609.5	613.7	622.8	1.8%	1.8%	1.9%
Nuclear / uranium.....	102.1	97.8	97.8	97.8	100.5	102.0	101.4	-0.1%	0.0%	0.0%
Renewables ¹¹	159.4	195.1	194.9	196.0	248.0	241.8	239.0	1.6%	1.5%	1.5%
Other.....	126.3	112.6	112.6	111.4	96.8	96.2	94.7	-0.9%	-1.0%	-1.0%
Total capacity.....	1,065.8	1,072.0	1,069.5	1,060.2	1,328.9	1,315.6	1,301.3	0.8%	0.8%	0.7%
Cumulative capacity additions¹²										
Coal.....	0.0	2.5	2.5	2.5	8.2	2.6	2.5	--	--	--
Conventional with scrubber.....	0.0	1.0	1.0	1.0	6.8	1.1	1.0	--	--	--
IGCC without sequestration.....	0.0	0.6	0.6	0.6	0.6	0.6	0.6	--	--	--
IGCC with sequestration.....	0.0	0.9	0.9	0.9	0.9	0.9	0.9	--	--	--
End-use generators ¹⁰	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Natural gas.....	0.0	37.5	41.7	51.1	251.0	255.2	264.3	--	--	--
Nuclear / uranium.....	0.0	5.5	5.5	5.5	8.2	9.7	9.1	--	--	--
Renewables ¹¹	0.0	36.6	36.4	37.5	89.5	83.3	80.5	--	--	--
Other.....	0.0	0.6	0.6	0.6	0.6	0.6	0.6	--	--	--
Total cumulative additions.....	0.0	82.7	86.7	97.2	357.6	351.5	357.1	--	--	--
Cumulative capacity retirements¹³										
Coal.....	0.0	43.4	49.9	68.3	44.2	50.8	69.2	--	--	--
Natural gas.....	0.0	8.1	8.1	8.3	9.4	9.4	9.5	--	--	--
Nuclear / uranium.....	0.0	4.8	4.8	4.8	4.8	4.8	4.8	--	--	--
Renewables ¹¹	0.0	0.9	0.9	0.9	0.9	0.9	0.9	--	--	--
Other.....	0.0	14.3	14.4	15.6	30.1	30.8	32.2	--	--	--
Total cumulative retirements.....	0.0	71.5	78.0	97.9	89.5	96.7	116.6	--	--	--
Liquids from coal (million barrels per day).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	--	--

Table D14. Key results and assumptions for coal cost cases (continued)
(million short tons per year, unless otherwise noted)

Supply, disposition, prices, electricity generating capacity, and costs	2012	2020			2040			Annual growth 2012-2040 (percent)		
		Low Coal Cost	Reference	High Coal Cost	Low Coal Cost	Reference	High Coal Cost	Low Coal Cost	Reference	High Coal Cost
Cost indices										
(constant dollar index, 2012=1.000)										
Transportation rate multipliers										
Eastern railroads	1.000	0.960	1.022	1.090	0.760	1.008	1.260	-1.0%	0.0%	0.8%
Western railroads	1.000	0.940	1.005	1.070	0.750	0.996	1.250	-1.0%	0.0%	0.8%
Mine equipment costs										
Underground	1.000	0.932	1.000	1.072	0.762	1.000	1.308	-1.0%	0.0%	1.0%
Surface	1.000	0.932	1.000	1.072	0.762	1.000	1.308	-1.0%	0.0%	1.0%
Other mine supply costs										
East of the Mississippi: all mines.....	1.000	0.932	1.000	1.072	0.762	1.000	1.308	-1.0%	0.0%	1.0%
West of the Mississippi: underground.....	1.000	0.932	1.000	1.072	0.762	1.000	1.308	-1.0%	0.0%	1.0%
West of the Mississippi: surface	1.000	0.932	1.000	1.072	0.762	1.000	1.308	-1.0%	0.0%	1.0%
Coal mining labor productivity										
(short tons per miner per hour)	5.19	5.52	4.64	3.85	6.89	3.68	1.68	1.0%	-1.2%	-4.0%
Average coal miner wage										
(2012 dollars per year).....	80,450	87,295	93,666	100,431	79,835	104,525	136,440	0.0%	0.9%	1.9%

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.

⁷Includes 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.

⁸Prices weighted by consumption tonnage; weighted average excludes export free-alongside-ship prices.

⁹Free-alongside-ship price at U.S. port of exit.

¹⁰Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors that have a non-regulatory status. Includes 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.

¹¹Includes conventional hydroelectric, geothermal, wood, wood waste, municipal waste, landfill gas, other biomass, solar, and wind power. Facilities co-firing biomass and coal are classified as coal.

¹²Cumulative additions after December 31, 2012. Includes all additions of electricity-only and combined heat and power plants projected for the electric power, industrial, and commercial sectors.

¹³Cumulative retirements after December 31, 2012. Includes retirements of electricity-only and combined heat and power plants that have a regulatory status.

-- = Not applicable.

Btu = British thermal unit.

IGCC = Integrated coal-gasification combined cycle.

Note: Totals may not equal sum of components due to independent rounding. Data for 2012 are model results and may differ from official EIA data reports.

Sources: 2012 data based on: U.S. Energy Information Administration (EIA), *Annual Coal Report 2012*, DOE/EIA-0584(2012) (Washington, DC, December 2013); EIA, *Quarterly Coal Report, October-December 2012*, DOE/EIA-0121(2012/4Q) (Washington, DC, March 2013); U.S. Department of Labor, Bureau of Labor Statistics, *Quarterly Census of Employment and Wages: Coal Mining*, Series ID: ENUUS0005052121; and EIA, AEO2014 National Energy Modeling System run REF2014.D102413A. Projections: EIA, AEO2014 National Energy Modeling System runs LCCST14.D120413A, REF2014.D102413A, and HCCST14.D120413A.

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NEMS overview and brief description of cases

The National Energy Modeling System

Projections in the *Annual Energy Outlook 2014* (AEO2014) are generated using the National Energy Modeling System (NEMS) [7], developed and maintained by the Office of Energy Analysis of the U.S. Energy Information Administration (EIA). In addition to its use in developing the *Annual Energy Outlook* (AEO) projections, NEMS is used to complete analytical studies for the U.S. Congress, the Executive Office of the President, other offices within the U.S. Department of Energy (DOE), and other federal agencies. NEMS is also used by nongovernment groups, such as the Electric Power Research Institute, Duke University, and Georgia Institute of Technology. In addition, AEO projections are used by analysts and planners in other government agencies and nongovernmental organizations.

The projections in NEMS are developed with the use of a market-based approach, subject to regulations and standards. For each fuel and consuming sector, NEMS balances energy supply and demand, accounting for economic competition across the various energy fuels and sources. The time horizon of NEMS extends to 2040. To represent regional differences in energy markets, the component modules of NEMS function at the regional level: the 9 Census divisions for the end-use demand modules; production regions specific to oil, natural gas, and coal supply and distribution; 22 regions and subregions of the North American Electric Reliability Corporation for electricity; and 9 refining regions that are a subset of the 5 Petroleum Administration for Defense Districts (PADDs).

NEMS is organized and implemented as a modular system. The modules represent each of the fuel supply markets, conversion sectors, and end-use consumption sectors of the energy system. The modular design also permits the use of the methodology and level of detail most appropriate for each energy sector. NEMS executes each of the component modules to solve for prices of energy delivered to end users and the quantities consumed, by product, region, and sector. The delivered fuel prices encompass all activities necessary to produce, import, and transport fuels to end users. The information flows also include such areas as economic activity, domestic production, and international petroleum supply. NEMS calls each supply, conversion, and end-use demand module in sequence until the delivered prices of energy and the quantities demanded have converged within tolerance, thereby achieving an economic equilibrium of supply and demand in the consuming sectors. A solution is reached for each year from 2013 through 2040. Other variables, such as petroleum product imports, crude oil imports, and several macroeconomic indicators, also are evaluated for convergence.

Each NEMS component represents the effects and costs of legislation and environmental regulations that affect each sector. NEMS accounts for all energy-related carbon dioxide (CO₂) emissions, as well as emissions of sulfur dioxide (SO₂), nitrogen oxides (NO_x), and mercury from the electricity generation sector.

The version of NEMS used for AEO2014 generally represents current legislation and environmental regulations, including recent government actions for which implementing regulations were available as of October 31, 2013, as discussed in the Legislation and Regulations section of the AEO. The potential effects of proposed federal and state legislation, regulations, or standards—or of sections of legislation that have been enacted but require funds or implementing regulations that have not been provided or specified—are not reflected in NEMS. Many of the pending provisions are examined, however, in alternative cases included in AEO2014 or in other analysis completed by EIA.

In general, the historical data presented with AEO2014 projections are based on various EIA publications [2]; however, data were taken from multiple sources. Historical numbers are presented for comparison only and may be estimates. Source documents should be consulted for the official data values. Footnotes to AEO2014 appendix tables indicate the definitions and sources of historical data.

Where possible AEO2014, which was developed during the summer of 2013, presents information for 2013 and 2014 that is consistent with the short-term projections from EIA's September 2013 *Short-Term Energy Outlook* (STEO) [3]. EIA's views regarding energy use over the 2013 through 2015 period are reported in monthly STEO updates [4], which should be considered to supersede information reported for those years in AEO2014.

Component modules

The component modules of NEMS represent the individual supply, demand, and conversion sectors of domestic energy markets and also include international and macroeconomic modules. In general, the modules interact through values representing prices or expenditures for energy delivered to the consuming sectors and the quantities of end-use energy consumption.

Macroeconomic Activity Module

The Macroeconomic Activity Module (MAM) provides a set of macroeconomic drivers to the energy modules and receives energy-related indicators from the NEMS energy components as part of the macroeconomic feedback mechanism within NEMS. Key macroeconomic variables used in the energy modules include gross domestic product (GDP), disposable income, values of industrial shipments, new housing starts, sales of new light-duty vehicles (LDVs), interest rates, and employment. Key energy indicators fed back to the MAM include aggregate energy prices and quantities. The MAM uses the following models from IHS

Global Insight: Macroeconomic Model of the U.S. Economy, National Industrial Output model, and National Employment by Industry Model. In addition, EIA has constructed a Regional Economic, Industrial Output and Employment by Industry model to project regional economic drivers, and a Commercial Floorspace model to project 13 floorspace types in the nine Census divisions. The accounting framework for industrial value of shipments uses the North American Industry Classification System (NAICS).

International Energy Module

The International Energy Module (IEM) uses assumptions of economic growth and expectations of future U.S. and world petroleum and other liquids production and consumption, by year, to project the interaction of U.S. and international petroleum and other liquids markets. This module provides a world crude-like liquids supply curve and generates a worldwide oil supply/demand balance for each year of the projection period. The supply-curve calculations are based on historical market data and a world oil supply/demand balance, which is developed from reduced-form models of international petroleum and other liquids supply and demand, current investment trends in exploration and development, and long-term resource economics by country and territory. The oil production estimates include both petroleum and other liquids supply recovery technologies. The IEM also provides, for each year of the projection period, endogenous assumptions for petroleum products for import and export in the United States. The IEM, through interaction with the rest of NEMS, changes North Sea Brent and West Texas Intermediate (WTI) prices in response to changes in expected production and consumption of crude-like liquids in the United States.

Residential and Commercial Demand Modules

The Residential Demand Module projects energy consumption in the residential sector by Census division, housing type, and end use, based on delivered energy prices, the menu of equipment available, the availability of renewable sources of energy, and changes in the housing stock. The Commercial Demand Module projects energy consumption in the commercial sector by Census division, building type, and category of end use, based on delivered prices of energy, the menu of available equipment, availability of renewable sources of energy, and changes in commercial floorspace.

Both modules estimate the equipment stock for the major end-use services, incorporating assessments of advanced technologies, representations of renewable energy technologies, and the effects of both building shell and appliance standards. The modules also include projections of distributed generation. The Commercial Demand Module also incorporates combined heat and power (CHP) technology. Both modules incorporate projections of heating and cooling degree-days by Census division, based on a 30-year historical trend and on state-level population projections. The Residential Demand Module projects an increase in the average square footage of both new construction and existing structures, based on trends in new construction and remodeling.

Industrial Demand Module

The Industrial Demand Module (IDM) projects the consumption of energy for heat and power, as well as the consumption of feedstocks and raw materials in each of 21 industry groups, subject to the delivered prices of energy and macroeconomic estimates of employment and the value of shipments for each industry. As noted in the description of MAM, the representation of industrial activity in NEMS is based on the NAICS. The industries are classified into three groups—energy-intensive manufacturing, non-energy-intensive manufacturing, and nonmanufacturing. Seven of eight energy-intensive manufacturing industries are modeled in the IDM, including energy-consuming components for boiler/steam/cogeneration, buildings, and process/assembly use of energy. Energy demand for petroleum and other liquids refining (the other energy-intensive manufacturing industry) is modeled in the Liquid Fuels Market Module (LFMM) as described below, but the projected consumption is reported under the industrial totals.

There are several updates and upgrades in the representations of select industries. AEO2014 includes an upgraded representation for the glass industry. Instead of assuming that technological development for a particular process occurs on a predetermined or exogenous path based on engineering judgment, these upgrades allow technological change in the glass industry to be modeled endogenously, using a more detailed process flow representation. The upgrade allows for explicit technological change, and therefore energy intensity, to respond to economic, regulatory, and other conditions. The combined cement and lime industries and aluminum industry were upgraded to process flow models in previous AEOs. The iron and steel and paper industries will be similarly upgraded in future AEOs.

Model input data associated with energy intensity were aligned with the Manufacturing Energy Consumption Survey 2010 data. In the bulk chemicals model, behavior of naphtha and ethane prices was modified to better respond to oil price cases. The cement model was modified to include multichannel burners that add flexibility for fuel mix, allowing the use of significant amounts of secondary fuels, such as alternative solid fuels including tires, plastics, wood, and waste. The model also includes more rapid penetration of energy-efficient grinding. In the food industry, shipments were categorized in more detail, to grain and oil seed milling, dairy, animal slaughter, and all other. Changes also were made to the nonmanufacturing data approach. Census, U.S. Department of Agriculture, and EIA's Fuel Oil Kerosene Sales data were used to improve projections of petroleum product and natural gas consumption in agriculture, construction, and mining. CHP use is now differentiated by region and industry, based on EIA's updated historical data.

Transportation Demand Module

The Transportation Demand Module projects consumption of energy by mode and fuel—including petroleum products, electricity, methanol, ethanol, compressed natural gas (CNG), liquefied natural gas (LNG), and hydrogen—in the transportation sector, subject to delivered energy prices, macroeconomic variables such as GDP, and other factors such as technology adoption and consumer behavior. The Transportation Demand Module includes legislation and regulations—such as the Energy Policy Act of 2005 (EPACT2005), the Energy Improvement and Extension Act of 2008 (EIEA2008), and the American Recovery and Reinvestment Act of 2009 (ARRA2009)—which contain tax credits for the purchase of alternatively fueled vehicles. Representations of LDV corporate average fuel economy (CAFE) and greenhouse gas (GHG) emissions standards, heavy-duty vehicle (HDV) fuel consumption and GHG emissions standards, and biofuels consumption reflect standards enacted by the National Highway Traffic Safety Administration (NHTSA) and the U.S. Environmental Protection Agency (EPA), as well as provisions in the Energy Independence and Security Act of 2007 (EISA2007).

The air transportation component of the Transportation Demand Module represents air travel in domestic and foreign markets and includes the industry practice of parking aircraft in both domestic and international markets to reduce operating costs, as well as the movement of aging aircraft from passenger to cargo markets. For passenger travel and air freight shipments, the module represents regional fuel use and travel demand for three aircraft types: regional, narrow-body, and wide-body. An infrastructure constraint, which is also modeled, can potentially limit overall growth in passenger and freight air travel to levels commensurate with industry-projected infrastructure expansion and capacity growth.

The Transportation Demand Module projects energy consumption for freight and passenger rail and marine vessels by mode and fuel, subject to macroeconomic variables such as the value and type of industrial shipments. Freight ton-miles and efficiency also are projected in the model.

Electricity Market Module

There are three primary submodules of the Electricity Market Module (EMM)—capacity planning, fuel dispatching, and finance and pricing. The capacity expansion submodule uses the stock of existing generation capacity, known environmental regulations, the expected cost and performance of future generation capacity, expected fuel prices, expected financial parameters, and expected electricity demand to project the optimal mix of new generation capacity that should be added in future years. The fuel dispatching submodule uses the existing stock of generation equipment types, their operation and maintenance costs and performance, fuel prices to the electricity sector, electricity demand, and all applicable environmental regulations to determine the least-cost way to meet that demand. This submodule also determines transmission and pricing of electricity. The finance and pricing submodule uses capital costs, fuel costs, macroeconomic parameters, environmental regulations, and load shapes to estimate generation costs for each technology.

All specifically identified options promulgated by EPA for compliance with the Clean Air Act Amendments of 1990 are explicitly represented in the capacity expansion and dispatch decisions. All financial incentives for power generation expansion and dispatch specifically identified in EPACT2005 have been implemented. Several states, primarily in the Northeast, have enacted air emission regulations for CO₂ that affect the electricity generation sector, and those regulations are represented in AEO2014. The AEO2014 Reference case also imposes a limit on CO₂ emissions for specific covered sectors, including the electric power sector in California as represented in California Assembly Bill 32, the Global Warming Solutions Act of 2006 (AB 32). The AEO2014 Reference case leaves the Clean Air Interstate Rule (CAIR) in effect after the court vacated the Cross-State Air Pollution Rule in August 2012. CAIR incorporates a cap-and-trade program for annual emissions of SO₂ and annual and seasonal emissions of NO_x from fossil fuel power plants. Reductions in hazardous air pollutant emissions from coal- and oil-fired steam electric power plants also are reflected through the inclusion of the Mercury and Air Toxics Standards for power plants, finalized by EPA on December 16, 2011.

Although currently there is no federal legislation in place that restricts GHG emissions, regulators and the investment community have continued to push energy companies to invest in technologies that are less GHG-intensive. The trend is captured in the AEO2014 Reference case through a 3-percentage-point increase in the cost of capital when evaluating investments in new coal-fired power plants, new coal-to-liquids (CTL) plants without carbon capture and storage (CCS), and pollution control retrofits.

Renewable Fuels Module

The Renewable Fuels Module (RFM) includes submodules representing renewable resource supply and technology input information for central-station, grid-connected electricity generation technologies, including conventional hydroelectricity, biomass (dedicated biomass plants and co-firing in existing coal plants), geothermal, landfill gas, solar thermal electricity, solar photovoltaics (PV), and both onshore and offshore wind energy. The RFM contains renewable resource supply estimates representing the regional opportunities for renewable energy development. Investment tax credits (ITCs) for renewable fuels are incorporated, as currently enacted, including a permanent 10% ITC for business investment in solar energy (thermal nonpower uses as well as power uses) and geothermal power (available only to those projects not accepting the production tax credit [PTC] for geothermal power). In addition, the module reflects the increase in the ITC to 30% for solar energy systems installed before January 1, 2017. The extension of the credit to individual homeowners under EIEA2008 is reflected in the Residential and Commercial Demand Modules.

PTCs for wind, geothermal, landfill gas, and some types of hydroelectric and biomass-fueled plants also are represented. They provide a credit of up to 2.3 cents/kilowatthour (kWh) for electricity produced in the first 10 years of plant operation. For AEO2014, EIA represents the expiration of the PTC that occurred at the end of 2013. However, because the expiration date reflects an under-construction versus in-service deadline, the effective modeled eligibility deadline is extended to new wind and landfill gas plants coming online by the end of 2015, and to other eligible plants coming online by the end of 2016. AEO2014 also accounts for new renewable energy capacity resulting from state renewable portfolio standard programs, mandates, and goals, as described in Assumptions to the Annual Energy Outlook 2014 [5].

Oil and Gas Supply Module

The Oil and Gas Supply Module represents domestic crude oil and natural gas supply within an integrated framework that captures the interrelationships among the various sources of supply—onshore, offshore, and Alaska—by all production techniques, including natural gas recovery from coalbeds and low-permeability geologic formations. The framework analyzes cash flow and profitability to compute investment and drilling for each of the supply sources, based on the prices for crude oil and natural gas, the domestic recoverable resource base, and the state of technology. Oil and natural gas production activities are modeled for 12 supply regions, including six onshore, three offshore, and in three Alaska regions.

The Onshore Lower 48 Oil and Gas Supply Submodule evaluates the economics of future exploration and development projects for crude oil and natural gas plays. Crude oil resources include structurally reservoirized resources (i.e., conventional) as well as highly fractured continuous zones, such as the Austin Chalk and Bakken shale formations. Production potential from advanced secondary recovery techniques (such as infill drilling, horizontal continuity, and horizontal profile) and enhanced oil recovery (such as CO₂ flooding, steam flooding, polymer flooding, and profile modification) are explicitly represented. Natural gas resources include high-permeability carbonate and sandstone, tight gas, shale gas, and coalbed methane.

Domestic crude oil production volumes are used as inputs to the LFMM for conversion and blending into refined petroleum products. Supply curves for natural gas are used as inputs to the Natural Gas Transmission and Distribution Module (NGTDM) for determining natural gas wellhead prices and domestic production.

Natural Gas Transmission and Distribution Module

The NGTDM represents the transmission, distribution, and pricing of natural gas, subject to end-use demand for natural gas and the availability of domestic natural gas and natural gas traded on the international market. The module balances natural gas supply and demand, tracks the flows of natural gas, and determines the associated capacity expansion requirements in an aggregate pipeline network, connecting domestic and limited foreign supply sources with 12 lower 48 states regions. The 12 lower 48 states regions align with the nine Census divisions, with three subdivided, and Alaska handled separately. The flow of natural gas is determined for both a peak and off-peak period in the year, assuming a historically based seasonal distribution of natural gas demand. Key components of pipeline and distributor tariffs are included in separate pricing algorithms. The primary outputs of the module are delivered natural gas prices by region and sector, supply prices, and realized domestic natural gas production. The module also projects natural gas pipeline imports and exports to Canada and Mexico, as well as LNG imports and exports.

Liquid Fuels Market Module

The LFMM projects prices of petroleum products, crude oil and product import/export activity, and domestic refinery operations, subject to demand for petroleum products, availability and price of imported petroleum, environmental regulations, and domestic production of crude oil, natural gas liquids, and biofuels—ethanol, biodiesel, biomass-to-liquids (BTL), CTL, gas-to-liquids (GTL), and coal-and-biomass-to-liquids (CBTL). Costs, performance, and first dates of commercial availability for the advanced liquid fuels technologies [6] are reviewed and updated annually.

The module represents refining activities in eight U.S. regions, and a new Maritime Canada/Caribbean refining region (created to represent short-haul international refineries that predominantly serve U.S. markets). In order to better represent policy, import/export patterns, and biofuels production, the eight U.S. regions are defined by subdividing three of the five U.S. PADDs. All nine refining regions are defined below:

- Region 1. PADD I – East Coast
- Region 2. PADD II – Interior
- Region 3. PADD II – Great Lakes
- Region 4. PADD III – Gulf Coast
- Region 5. PADD III – Interior
- Region 6. PADD IV – Mountain
- Region 7. PADD V – California
- Region 8. PADD V – Other
- Region 9. Maritime Canada/Caribbean.

The LFMM models the costs of automotive fuels, such as conventional and reformulated gasoline, and includes production of biofuels for blending in gasoline and diesel. Fuel ethanol and biodiesel are included in the LFMM because they are commonly

blended into petroleum products. The module allows ethanol blending into gasoline at 10% by volume (E10), 15% by volume (E15) in states that lack explicit language capping ethanol volume or oxygen content, and up to 85% by volume (E85) for use in flex-fuel vehicles. The module also includes a 16% by volume biobutanol/gasoline blend. Crude oil and refinery product imports are represented by supply curves defined by the NEMS IEM. Products also can be imported from refining region nine (Maritime Canada/Caribbean). Refinery product exports are represented by demand curves, also provided by the IEM.

Capacity expansion of refinery process units and nonpetroleum liquid fuels production facilities is also modeled in the LFMM. The model uses current liquid fuels production capacity, the cost and performance of each production unit, expected fuel and feedstock costs, expected financial parameters, expected liquid fuels demand, and relevant environmental policies to project the optimal mix of new capacity that should be added in the future.

The LFMM includes representation of the renewable fuels standard (RFS) specified in EISA2007, which mandates the use of 36 billion gallons of ethanol equivalent renewable fuel by 2022. Both domestic and imported biofuels count toward the RFS. Domestic ethanol production is modeled for three feedstock categories: corn, cellulosic plant materials, and advanced feedstock materials. Starch-based ethanol plants are numerous (more than 175 are now in operation, with a total maximum sustainable nameplate capacity of more than 13 billion gallons annually), and are based on a well-known technology that converts starch and sugar into ethanol. Ethanol from cellulosic sources is a new technology with only a few small pilot plants in operation. Ethanol from advanced feedstocks—produced at ethanol refineries that ferment and distill grains other than corn, and reduce GHG emissions by at least 50%—is another new technology modeled in the LFMM. The LFMM also has the capability to produce biobutanol from a retrofitted corn ethanol facility, if economically competitive.

Fuels produced by Fischer-Tropsch synthesis and through a pyrolysis process are also modeled in the LFMM, based on their economics compared with competing feedstocks and products. The five processes modeled are CTL, CBTL, GTL, BTL, and pyrolysis.

Two California-specific policies are also represented in the LFMM: the low carbon fuel standard (LCFS) and the AB 32 cap-and-trade program. The LCFS requires the carbon intensity (amount of greenhouse gases/unit of energy) of transportation fuels sold for use in California to decrease according to a schedule published by the California Air Resources Board. California's AB 32 cap-and-trade program is established to help California achieve its goal of reducing CO₂ emissions to 1990 levels by 2020. Working with other NEMS modules (IDM, EMM, and Emissions Policy Module), the LFMM provides emissions allowances and actual emissions of CO₂ from California refineries, and NEMS provides the mechanism (carbon price) to trade allowances such that the total CO₂ emissions cap is met.

Coal Market Module

The Coal Market Module (CMM) simulates mining, transportation, and pricing of coal, subject to end-use demand for coal differentiated by heat and sulfur content. U.S. coal production is represented in the CMM by 41 separate supply curves—differentiated by region, mine type, coal rank, and sulfur content. The coal supply curves respond to mining capacity, capacity utilization of mines, labor productivity, and factor input costs (mining equipment, mining labor, and fuel requirements). Projections of U.S. coal distribution are determined by minimizing the cost of coal supplied, given coal demands by region and sector; environmental restrictions; and accounting for mine-mouth prices, transportation costs, and coal supply contracts. Over the projection horizon, coal transportation costs in the CMM vary in response to changes in the cost of rail investments.

The CMM produces projections of U.S. steam and metallurgical coal exports and imports in the context of world coal trade, determining the pattern of world coal trade flows that minimizes production and transportation costs while meeting a specified set of regional coal import demands, subject to constraints on export capacities and trade flows. The international coal market component of the module computes trade in two types of coal (steam and metallurgical) for 17 export regions and 20 import regions. U.S. coal production and distribution are computed for 14 supply regions and 16 demand regions.

Annual Energy Outlook 2014 cases

Table E1 provides a summary of the cases produced as part of AEO2014. For each case, the table gives the name used in AEO2014, a brief description of the major assumptions underlying the projections, and a reference to the pages in the body of the report and in this appendix where the case is discussed. The text sections following Table E1 describe the various cases in more detail. The Reference case assumptions for each sector are described in Assumptions to the Annual Energy Outlook 2014 [7]. Regional results and other details of the projections are available at http://www.eia.gov/forecasts/aeo/tables_ref.cfm#supplement.

Macroeconomic growth cases

In addition to the AEO2014 Reference case, Low Economic Growth and High Economic Growth cases were developed to reflect the uncertainty in projections of economic growth. The alternative cases are intended to show the effects of alternative growth assumptions on energy market projections. The cases are described as follows:

- In the Reference case, population grows by 0.7%/year, nonfarm employment by 0.8%/year, and labor productivity by 1.8%/year from 2012 to 2040. Economic output as measured by real GDP increases by 2.4%/year from 2012 through 2040, and growth in real disposable income per capita averages 1.7%/year.

Table E1. Summary of the AEO2014 cases

Case name	Description	Reference in text	Reference in Appendix E
Reference	Real GDP grows at an average annual rate of 2.4% from 2012 to 2040. Crude oil prices rise to about \$141/barrel (2012 dollars) in 2040. Complete projection tables in Appendix A.	--	--
Low Economic Growth	Real GDP grows at an average annual rate of 1.9% from 2012 to 2040. Other energy market assumptions are the same as in the Reference case. Partial projection tables in Appendix B.	p. MT-2	p. E-8
High Economic Growth	Real GDP grows at an average annual rate of 2.8% from 2012 to 2040. Other energy market assumptions are the same as in the Reference case. Partial projection tables in Appendix B.	p. MT-2	p. E-9
Low Oil Price	Low prices result from a combination of low demand for petroleum and other liquids in the non-Organization for Economic Cooperative Development (non-OECD) nations and higher global supply. Lower demand is measured by lower economic growth relative to the Reference case. On the supply side, the Organization of the Petroleum Exporting Countries (OPEC) increases its market share to 51%, and the costs of other liquids production technologies are lower than in the Reference case. Light, sweet crude oil prices fall to \$70/barrel in 2017 and rise slowly to \$75/barrel in 2040. Partial projection tables in Appendix C.	p. MT-3	p. E-9
High Oil Price	High prices result from a combination of higher demand for liquid fuels in non-OECD nations and lower global supply. Higher demand is measured by higher economic growth relative to the Reference case. OPEC market share averages 37% throughout the projection. Non-OPEC petroleum production expands more slowly in the short to middle term relative to the Reference case. Crude oil prices rise to \$204/barrel (2012 dollars) in 2040. Partial projection tables in Appendix C.	p. MT-3	p. E-9
No Sunset	Begins with the Reference case and assumes extension of all existing tax credits and policies that contain sunset provisions, except those requiring additional funding (e.g., loan guarantee programs) and those that involve extensive regulatory analysis, such as CAFE improvements and periodic updates of efficiency standards. Also includes extension of the \$1.01/gallon ethanol subsidy and \$1.00/gallon biodiesel subsidy to the end of the projection period. Partial projection tables in Appendix D.	p. IF-3	p. E-10
Extended Policies	Begins with the No Sunset case but excludes extension of the ethanol and biofuel subsidies that were included in the No Sunset case. Assumes an increase in the capacity limitations on the ITC for CHP and extension of the program. The case includes additional rounds of efficiency standards for residential and commercial products, as well as new standards for products not yet covered; adds multiple rounds of national building codes by 2026; and increases LDV and HDV fuel economy standards in the transportation sector. Partial projection tables in Appendix D.	p. IF-3	p. E-10
High Rail LNG	Assumes a higher LNG locomotive penetration rate into motive stock such that 100% of locomotives are LNG capable by 2037. Partial projection tables in Appendix D.	p. IF-18	p. E-11
Low Rail LNG	Assumes a lower LNG locomotive penetration rate into motive stock, at a 1.0 average annual turnover rate for dual-fuel engines that can use up to 80% LNG. Partial projection tables in Appendix D.	p. IF-18	p. E-11
High VMT	Assumes higher licensing rates and travel demand for specific age and gender cohorts. Vehicle miles traveled per licensed driver in 2012 is 3% higher than in the Reference case, increasing to 7% higher in 2027, and then declining to 3% above the Reference case in 2040. Partial projection tables in Appendix D.	p. IF-22	p. E-11
Low VMT	Assumes lower licensing rates and travel demand for specific age and gender cohorts. Vehicle miles traveled per licensed driver is 5% lower than in the Reference case for the full projection. Licensing rates stay constant at 2011 levels or decline from 2011 to 2040, specific to gender, age, and census division categories. Partial projection tables in Appendix D.	p. IF-22	p. E-11

Table E1. Summary of the AEO2014 cases (continued)

Case name	Description	Reference in text	Reference in Appendix E
Accelerated Nuclear Retirements	Assumes that all nuclear plants are limited to a 60-year life, uprates are limited to the 0.7 gigawatts (GW) that have been reported to EIA, and no new additions beyond those planned in the Reference case. Nonfuel operating costs for existing nuclear plants are assumed to increase by 3%/year after 2013. Partial projection tables in Appendix D.	p. IF-35	p. E-11
Accelerated Coal Retirements	Begins with the AEO2014 High Coal Cost case assumptions and also assumes that nonfuel operating costs for existing coal plants increase by 3%/year after 2013. Partial projection tables in Appendix D.	p. IF-35	p. E-12
Accelerated Nuclear and Coal Retirements	Combines the assumptions in the Accelerated Nuclear Retirements and Accelerated Coal Retirements cases. Partial projection tables in Appendix D.	p. IF-35	p. E-12
Electricity: Low Nuclear	Begins with the Accelerated Nuclear Retirements case and combines with assumptions in the High Oil and Gas Resource and the No Sunset cases. Partial projection tables in Appendix D.	p. MT-19	p. E-12
Electricity: High Nuclear	Assumes that all nuclear plants are life-extended beyond 60 years (except for 4.8 GW of announced retirement), and a total of 6.0 GW of uprates. New plants include those under construction and plants that have a scheduled U.S. Nuclear Regulatory Commission (NRC) or Atomic Safety and Licensing Board hearing. Partial projection tables in Appendix D.	p. MT-19	p. E-12
Renewable Fuels: Low Renewable Technology Cost	Capital costs for new nonhydro renewable generating technologies are 20% lower than Reference case levels through 2040, and biomass feedstocks are 20% less expensive for a given resource quantity. Capital costs for new ethanol, biodiesel, pyrolysis, and other BTL production technologies are 20% lower than Reference case levels through 2040, and the industrial sector assumes a higher rate of recovery for biomass byproducts from industrial processes. Partial projection tables in Appendix D.	p. MT-8	p. E-12
Oil and Gas: Low Oil and Gas Resource	Estimated ultimate recovery per shale gas, tight gas, and tight oil well is 50% lower than in the Reference case. All other resource assumptions remain the same as in the Reference case. Partial projection tables in Appendix D.	p. IF-12	p. E-12
Oil and Gas: High Oil and Gas Resource	Estimated ultimate recovery per shale gas, tight gas, and tight oil well is 50% higher and well spacing is 50% lower (or the number of wells left to be drilled is 100% higher) than in the Reference case. In addition, tight oil resources are added to reflect new plays or the expansion of known tight oil plays and the estimated ultimate recovery for tight and shale wells increases 1%/year to reflect additional technological improvement. Also includes kerogen development, tight oil resources in Alaska, and 50% higher undiscovered resources in the offshore lower 48 states, Alaska, and shale gas in Canada than in the Reference case. Partial projection tables in Appendix D.	p. IF-12	p. E-13
Coal: Low Coal Cost	Regional productivity growth rates for coal mining are approximately 2.3 percentage points per year higher than in the Reference case, and coal miner wages, mine equipment costs, and coal transportation rates are lower than in the Reference case, falling to about 25% below the Reference case in 2040. The price change for non-U.S. export supplies is assumed to be roughly 10% less than the price change projected for U.S. coal exports. Partial projection tables in Appendix D.	p. MT-32	p. E-13
Coal: High Coal Cost	Regional productivity growth rates for coal mining are approximately 2.3 percentage points per year lower than in the Reference case, and coal miner wages, mine equipment costs, and coal transportation rates are higher than in the Reference case, ranging between 24% and 31% above the Reference case in 2040. The price change for non-U.S. export supplies is assumed to be roughly 10% less than the price change projected for U.S. coal exports. Partial projection tables in Appendix D.	p. MT-32	p. E-13
Integrated 2013 Demand Technology	Referred to in the text as 2013 Demand Technology. Assumes that future equipment purchases in the residential and commercial sectors are based only on the range of equipment available in 2013. Commercial and existing residential building shell efficiency is held constant at 2013 levels. Energy efficiency of new industrial plant and equipment is held constant at the 2014 level over the projection period. Partial projection tables in Appendix D.	p. MT-6	p. E-9

Table E1. Summary of the AEO2014 cases (continued)

Case name	Description	Reference in text	Reference in Appendix E
Integrated Best Available Demand Technology	Referred to in the text as Best Available Demand Technology. Assumes that all future equipment purchases in the residential and commercial sectors are made from a menu of technologies that includes only the most efficient models available in a particular year, regardless of cost. All residential building shells for new construction are assumed to be code compliant and built to the most efficient specifications after 2013, and existing residential shells have twice the improvement of the Reference case. New and existing commercial building shell efficiencies improve 50% more than in the Reference case by 2040. Industrial and transportation sector assumptions are the same as in the Reference case. Partial projection tables in Appendix D.	p. MT-6	p. E-9
Integrated High Demand Technology	Referred to in the text as High Demand Technology. Assumes earlier availability, lower costs, and higher efficiencies for more advanced residential and commercial equipment. For new residential construction, building code compliance is assumed to improve after 2013, and building shell efficiencies are assumed to meet ENERGY STAR requirements by 2023. Existing residential building shells exhibit 50% more improvement than in the Reference case after 2013. New and existing commercial building shells are assumed to improve 25% more than in the Reference case by 2040. Industrial sector assumes earlier availability, lower costs, and higher efficiency for more advanced equipment and a more rapid rate of improvement in the recovery of biomass byproducts from industrial processes. In the transportation sector, the characteristics of conventional and alternative-fuel LDVs reflect more optimistic assumptions about incremental improvements in fuel economy and costs, as well as battery electric vehicle costs. Freight trucks are assumed to see more rapid improvement in fuel efficiency. More optimistic assumptions for fuel efficiency improvements are also made for the air, rail, and shipping sectors. Partial projection tables in Appendix D.	p. MT-6	p. E-9
Energy Savings and Industrial Competitiveness Act	Begins with the Reference case and assumes passage of the energy efficiency provisions in S. 1392, including appropriation of funds at the levels authorized in the bill. Key provisions modeled include improved national building codes for new homes and commercial buildings and a rebate program for advanced industrial motor systems, assuming the bill's passage in 2014. For new residential construction, building shell efficiencies are assumed to improve by 15% relative to IECC2009 by 2020, and building code compliance is assumed to improve. New commercial building shells are assumed to be 30% more efficient than ASHRAE 90.1-2004 by 2020. Partial projection tables in Appendix D.	p. IF-6	--
Low Electricity Demand	This case was developed to explore the effects on the electric power sector if growth in sales to the grid remained relatively low. Begins with the Best Available Demand Technology case, which lowers demand in the building sectors, and also assumes greater improvement in industrial motor efficiency. Partial projection tables in Appendix D.	p. IF-46	p. E-12
No GHG Concern	No GHG emissions reduction policy is enacted, and market investment decisions are not altered in anticipation of such a policy. Partial projection tables in Appendix D.	p. MT-33	p. E-14
GHG10	Applies a price for CO ₂ emissions throughout the economy, starting at \$10/metric ton in 2015 and rising by 5%/year through 2040. Partial projection tables in Appendix D.	p. MT-34	p. E-14
GHG25	Applies a price for CO ₂ emissions throughout the economy, starting at \$25/metric ton in 2015 and rising by 5%/year through 2040. Partial projection tables in Appendix D.	p. MT-34	p. E-14
GHG10 and Low Gas Prices	Combines GHG10 and High Oil and Gas Resource cases. Partial projection tables in Appendix D.	p. MT-34	p. E-14

- The Low Economic Growth case assumes lower growth rates for population (0.6%/year) and labor productivity (1.4%/year), resulting in lower nonfarm employment (0.7%/year), higher prices and interest rates, and lower growth in industrial output. In the Low Economic Growth case, economic output as measured by real GDP increases by 1.9%/year from 2012 through 2040, and growth in real disposable income per capita averages 1.3%/year.
- The High Economic Growth case assumes higher growth rates for population (0.8%/year) and labor productivity (2.0%/year), resulting in higher nonfarm employment (1.0%/year). With higher productivity gains and employment growth, inflation and interest rates are lower than in the Reference case, and consequently economic output grows at a higher rate (2.8%/year) than in the Reference case (2.4%). Disposable income per capita grows by 1.7%/year, the same as in the Reference case.

Oil price cases

The benchmark oil price is the price for Brent crude oil, which better reflects the marginal price paid by refineries for imported light, sweet crude oil used to produce petroleum products for consumers. EIA continues to report the WTI price and the Imported Refiner Acquisition Cost.

The historical record shows substantial variability in oil prices, and there is arguably even more uncertainty about future prices in the long term. AEO2014 considers three oil price cases (Reference, Low Oil Price, and High Oil Price) to allow an assessment of alternative views on the future course of oil prices.

The Low and High Oil Price cases reflect a wide range of potential price paths, resulting primarily from variation in demand for petroleum and other liquid fuels in non-OECD countries due to different levels of economic growth. The Low and High Oil Price cases also reflect different assumptions about decisions by members of OPEC regarding the preferred rate of oil production and about the future finding and development costs and accessibility of non-OPEC oil resources.

- In the Reference case, real oil prices (in 2012 dollars) rise from \$112/barrel in 2012 to \$141/barrel in 2040. The Reference case represents EIA's current judgment regarding exploration and development costs and accessibility of oil resources. Compared with AEO2013, EIA sees increasing production from non-OPEC countries, particularly the United States. However, EIA also assumes that OPEC producers will choose to maintain their share of the market and will schedule investments in incremental production capacity so that OPEC oil production will represent between 39% and 44% of the world's total petroleum and other liquids production over the projection period.
- In the Low Oil Price case, crude oil prices fall to \$70/barrel (2012 dollars) in 2016, remain below \$70/barrel through 2023, and stay below \$75/barrel through 2040. The low price results from lower costs of production and lower demand from China and the Middle East compared with the Reference case. Crude oil production from across OPEC rises throughout the projection period in this case, displacing more expensive crude projected in the Reference case (including from the United States). Correspondingly, OPEC's market share of petroleum rises steadily from 40% through 2015 to almost 53% in 2040. In addition, in this case, bitumen production in Canada and renewable fuels from Brazil and the United States see decreases in costs, leading to increased production. This keeps the OPEC market share to between 39% and 50% of the total liquids market. With the exceptions of China and the Middle East, which see reduced economic growth in this case, the lower prices generally lead to higher demand than projected in the Reference case.
- In the High Oil Price case, oil prices reach about \$204/barrel (2012 dollars) in 2040. The high prices result primarily from higher costs of petroleum supply. Fewer structurally reservoirized crude oil supplies are developed than in the Reference case, leading to increased development of more costly resources, including tight oil and bitumen. Higher prices also lead to significant increases in renewable liquid fuels and coal-to-liquid products as compared with the Reference case. In this case, OPEC's share of world liquids production never exceeds the high of 40% that it reaches in 2013 and drops as low as 37%. The higher supply costs depress demand globally through 2028, but stronger growth in non-OECD countries than is projected in the Reference case leads to higher demand than in the Reference case, starting in these countries in 2029, and starting globally in 2037.

Buildings sector cases

In addition to the AEO2014 Reference case, three technology-focused cases using the NEMS Demand Modules were developed to examine the effects of changes in technology. Residential sector assumptions for the technology-focused cases are as follows:

- The Integrated 2013 Demand Technology case assumes that all future residential equipment purchases are limited to the range of equipment available in 2013. Existing building shell efficiencies are assumed to be fixed at 2013 levels (no further improvements). For new construction, building shell assumptions are the same as in the Reference case.
- The Integrated High Demand Technology case assumes that residential advanced equipment is available earlier, at lower costs, and/or at higher efficiencies [8]. Existing building shell efficiencies exhibit 50% more improvement than in the Reference case after 2013. For new construction, building code compliance is assumed to improve after 2013, and building shell efficiencies are assumed to meet ENERGY STAR requirements by 2023. Consumers evaluate investments in energy efficiency at a 7% real discount rate.
- The Integrated Best Available Demand Technology case assumes that all future residential equipment purchases are made from a menu of technologies that includes only the most efficient models available in a particular year for each technology class,

regardless of cost. Existing building shell efficiencies have twice the improvement of the Reference case after 2013. For new construction, 100% compliance with building codes is assumed, and building shell efficiencies are assumed to meet the criteria for the most efficient components after 2013. Consumers evaluate investments in energy efficiency at a 7% real discount rate.

Commercial sector assumptions for the technology-focused cases are as follows:

- The Integrated 2013 Demand Technology case assumes that all future commercial equipment purchases are limited to the range of equipment available in 2013. Building shell efficiencies are assumed to be fixed at 2013 levels.
- The Integrated High Demand Technology case assumes that commercial advanced equipment is available earlier, at lower costs, and/or with higher efficiencies than in the Reference case. Energy efficiency investments are evaluated at a 7% real discount rate. For new and existing buildings in 2040, building shell efficiencies are assumed to show 25% more improvement than in the Reference case.
- The Integrated Best Available Demand Technology case assumes that all future commercial equipment purchases are made from a menu of technologies that includes only the most efficient models available in a particular year for each technology class, regardless of cost. Energy efficiency investments are evaluated at a 7% real discount rate. For new and existing buildings in 2040, building shell efficiencies are assumed to show 50% more improvement than in the Reference case.

The Residential and Commercial Demand Modules of NEMS were also used to complete the Low Renewable Technology Cost case, which is discussed in more detail in the renewable fuels cases section. In combination with assumptions for electricity generation from renewable fuels in the electric power sector and industrial sector, this sensitivity case analyzes the impacts of changes in generating technologies that use renewable fuels and in the availability of renewable energy sources. For the Residential and Commercial Demand Modules:

- The Low Renewable Technology Cost case assumes greater improvements in residential and commercial PV and wind systems than in the Reference case. The assumptions for capital cost estimates are 20% below Reference case assumptions from 2014 through 2040.

The No Sunset and Extended Policies cases described below in the cross-cutting integrated cases discussion also include assumptions in the Residential and Commercial Demand Modules of NEMS. The Extended Policies case builds on the No Sunset case and adds multiple rounds of appliance standards and building codes as described below.

- The No Sunset case assumes that selected federal policies with sunset provisions will be extended indefinitely rather than allowed to sunset as the law currently prescribes. For the residential sector, these extensions include personal tax credits for PV installations, solar water heaters, small wind turbines, and geothermal heat pumps, as well as tax credits for energy-efficient homes and selected residential appliances. For the commercial sector, business ITC for PV installations, solar water heaters, small wind turbines, geothermal heat pumps, and CHP are extended to the end of the projection. The business tax credit for solar technologies remains at the current 30% level without reverting to 10% as scheduled.
- The Extended Policies case includes updates to federal appliance standards, as prescribed by the timeline in DOE's multiyear plan, and introduces new standards for products currently not covered by DOE. Efficiency levels for the updated residential appliance standards are based on current ENERGY STAR guidelines. End-use technologies eligible for No Sunset incentives are not subject to new standards. Efficiency levels for updated commercial equipment standards are based on the technology menu from the AEO2014 Reference case and purchasing specifications for federal agencies designated by the Federal Energy Management Program. The case also adds two additional rounds of improved national building codes with full implementation in 2023 and 2029.

Industrial sector cases

In addition to the AEO2014 Reference case, two technology-focused cases developed using the IDM of NEMS examine the effects of less rapid and more rapid technology change and adoption. The energy intensity changes discussed in this section exclude the refining industry, which is modeled separately from the IDM in the LFMM. Different assumptions for the IDM were also used as part of the Integrated Low Renewable Technology Cost case, No Sunset case, and Extended Policies case, but each is structured on a set of the initial industrial assumptions used for the Integrated 2013 Demand Technology case and Integrated High Demand Technology case. For the industrial sector, assumptions for the two technology-focused cases are as follows:

- For the Integrated 2013 Demand Technology case, the energy efficiency of new industrial plant and equipment is held constant at the 2014 level over the projection period. Changes in aggregate energy intensity may result both from changing equipment and production efficiency and from changing the composition of output within an individual industry. Because all AEO2014 side cases are integrated runs, potential feedback effects from energy market interactions are captured. Therefore, the level and composition of overall industrial output varies from the Reference case, and any change in energy intensity in the two technology side cases is attributable to process and efficiency changes and increased use of CHP, as well as changes in the level and composition of overall industrial output.
- For the Integrated High Demand Technology case, the IDM assumes earlier availability, lower costs, and higher efficiency for more advanced equipment [9] and a more rapid rate of improvement in the recovery of biomass byproducts from industrial

processes—i.e., 0.7%/year as compared with 0.4%/year in the Reference case. The same assumption is incorporated in the Low Renewable Technology Cost case, which focuses on electricity generation. Although the choice of the 0.7% annual rate of improvement in byproduct recovery is an assumption in the High Demand Technology case, it is based on the expectation of higher recovery rates and substantially increased use of CHP in that case. Due to integration with other NEMS modules, potential feedback effects from energy market interactions are captured.

The No Sunset and Extended Policies cases described below in the cross-cutting integrated cases discussion also include assumptions in the IDM of NEMS. The Extended Policies case builds on the No Sunset case and modifies selected industrial assumptions as follows:

- The No Sunset case and Extended Policies case include an assumption for CHP that extends the existing ITC for industrial CHP through the end of the projection period. Additionally, the Extended Policies case includes an increase in the capacity limitations on the ITC by increasing the cap on CHP equipment from 15 megawatts (MW) to 25 MW and eliminating the system-wide cap of 50 MW. These assumptions are based on the proposals made in H.R. 2750 and H.R. 2784 of the 112th Congress.

Transportation sector cases

In addition to the AEO2014 Reference case, the NEMS Transportation Demand Module was used as part of six AEO2014 side cases.

The Transportation Demand Module was used to examine the effects of advanced technology costs and efficiency improvement for technology adoption and vehicle fuel economy as part of the Integrated High Demand Technology case. For the Integrated High Demand Technology case, the characteristics of conventional and alternative-fuel LDVs reflect more optimistic assumptions about incremental improvements in fuel economy and costs, including battery electric systems. In the freight truck sector, the Integrated High Demand Technology case assumes more rapid incremental improvement in fuel efficiency. More optimistic assumptions for fuel efficiency improvements are also made for the air, rail, and shipping sectors.

The Transportation Demand Module was used to examine the effects of an extension to the LDV GHG Emissions and CAFE Standards beyond 2025 as part of the Extended Policies case. The joint EPA and NHTSA CAFE Standards were increased after 2025, at an average annual rate of 1.3% through 2040, reaching a combined average LDV fuel economy compliance of 55.7 miles/gallon in 2040. As part of the Extended Policies case, the Transportation Demand Module was also used to examine the effects of extending and enhancing the HDV fuel consumption and GHG emissions standards through 2040. The regulations are currently specified for model year (MY) 2014 to MY 2018. The Extended Policies case includes a modest increase in fuel consumption and GHG emissions standards for 13 HDV vehicle size classes.

Assumptions in the NEMS Transportation Demand Module were modified for the High Vehicle Miles Traveled (VMT) and Low VMT cases. These cases examine the effects of changes to licensing rates and VMT on the LDV transportation sector. The High VMT case includes assumptions for increases in VMT per licensed driver for the five VMT age cohorts. VMT per licensed driver is 3% higher than in the Reference case in 2012, increases to 7% above the Reference case in 2027, and decreases back to 3% above the Reference case by 2040. The Low VMT case includes assumptions for a decline in licensed drivers for the 13 gender/age cohorts, as well as decreases in VMT per licensed driver for the five VMT age groups. VMT per licensed driver are 5% lower than in the Reference case for the entire projection, and the licensing rates either stay constant at 2011 levels for all age cohorts or decline as portrayed in the Reference case.

The Transportation Demand Module was also used to examine the effect of varying LNG locomotive penetration in the freight rail sector. The High Rail LNG case allows for LNG locomotives to penetrate the rail sector fully by 2037. The Low Rail LNG case incorporates dual-fuel engines that utilize LNG up to 80%, with an LNG locomotive penetration rate at 1.0% of the average annual stock turnover.

Electricity sector cases

In addition to the Reference case, several integrated cases with alternative electric power assumptions were developed to support discussions in the Market Trends and Issues in Focus sections of AEO2014. Three alternative cases were run to examine the impacts on the electric power sector of potentially large retirements of baseload coal and nuclear plants. In recent years, a combination of low natural gas prices, high retrofit or repair costs, and uncertainty about environmental legislation have led to an increase in announced retirements of coal and nuclear plants. The Issues in Focus article, "Implications of accelerated power plant retirements," discusses the factors influencing those retirement decisions, using the analysis cases to illustrate potential impacts. Two additional cases for nuclear power plants were developed to address uncertainties about the operating lives of existing reactors and the potential for new nuclear capacity and for capacity uprates at existing plants.

A final case combines technology and efficiency improvements across the end-use demand sectors to create a case that projects relatively low growth in total electricity consumption. The Issues in Focus article, "Implications of low electricity demand growth," analyzes the impacts on power sector capacity and generation requirements under a scenario of low demand growth.

Accelerated Retirement cases

- The Accelerated Nuclear Retirement case assumes that reactors will not receive second license renewals, so that all existing nuclear plants are retired within 60 years after beginning operation. The 4.8 GW of announced retirements remain as in the

Reference case, along with the decrease of 5.7 GW of nuclear capacity by 2020 to reflect plants at risk of early closure in specific regions. In the Reference case, after 2020, existing plants are assumed to run as long as they continue to be economic, implicitly assuming that a second 20-year license renewal will occur for most plants that reach 60 years of operation before 2040. In the Accelerated Nuclear Retirement case, an additional 37 GW of nuclear capacity is retired by 2040. The Accelerated Nuclear Retirement case also assumes that no new nuclear capacity is added throughout the projection, excluding capacity already planned and under construction. It assumes that only those capacity uprates already reported to EIA (0.7 GW) are completed, as in the Reference case, and that nonfuel operating costs at existing nuclear plants increase by 3%/year after 2013.

- The Accelerated Coal Retirement case includes the assumptions used for the High Coal Cost case, including lower productivity and higher costs associated with mining and coal transportation rates. In 2040, delivered coal prices are more than 60% higher in the Accelerated Coal Retirement case than in the Reference case. This case also assumes that non-fuel operating costs at existing coal plants increase by 3%/year after 2013.
- The Accelerated Coal and Nuclear Retirement case combines the assumptions of the Accelerated Coal Retirement and Accelerated Nuclear Retirement cases.

Nuclear cases

- The Low Nuclear case combines the Accelerated Nuclear Retirement case with the High Oil and Gas Resource case and the No Sunset case. This combines more pessimistic assumptions for nuclear costs and lifetimes with more favorable conditions for natural gas-fired and renewable technologies, so that the impacts on the power sector can be viewed under an outlook where output from nuclear power is greatly reduced.
- The High Nuclear case was run to provide a more optimistic outlook, with all nuclear power plant licenses renewed and all plants continuing to operate economically beyond 60 years (excluding the 4.8 GW of announced retirements). The High Nuclear case also assumes that additional planned nuclear capacity is completed, based on combined license applications (COL) issued by the NRC and whether an Atomic Safety and Licensing Board hearing has been scheduled for a COL. The High Nuclear case assumes 12.6 GW of planned capacity additions, as compared with 5.5 GW of planned capacity additions assumed in the Reference case. Finally, the High Nuclear case assumes a total of 6.0 GW of uprates at existing plants, reflecting an assumption that most plants with remaining uprate potential will elect to perform such uprates.

Low Electricity Demand case

- The Low Electricity Demand case uses the assumptions in the Best Available Demand Technology case for the residential and commercial sectors. In addition, input values for the industrial sector motor model are adjusted to increase system savings values for pumps, fans, and air compressors relative to the Reference case. This adjustment lowers total motor electricity consumption by slightly less than 20%. Although technically plausible, this decrease in motor adjustment is not intended to be a likely representation of motor development. As a result of these changes across the end-use sectors, retail sales in 2040 in this case are roughly the same as in 2012.

Renewable fuels cases

In addition to the AEO2014 Reference case, EIA developed a case with alternative assumptions about renewable generation technologies and policies to examine the effects of more aggressive improvement in the costs of renewable technologies.

- In the Low Renewable Technology Cost case, the capital costs of new non-hydro renewable generating technologies are assumed to be 20% below Reference case assumptions from 2014 through 2040. In general, lower costs are represented by reducing the capital costs of new plant construction. Biomass fuel supplies also are assumed to be 20% less expensive than in the Reference case for the same resource quantities. Assumptions for other generating technologies are unchanged from those in the Reference case. In the Low Renewable Technology Cost case, the rate of improvement in recovery of biomass byproducts from industrial processes also is increased. Capital costs for new ethanol, biodiesel, pyrolysis, and other BTL production technologies also are 20% lower than Reference case levels through 2040.
- In the No Sunset case and the Extended Policies case, expiring federal tax credits targeting renewable electricity are assumed to be permanently extended. This applies to the PTC, which is a tax credit of 2.3 cents/kWh (adjusted annually for inflation) available for the first 10 years of production by new generators using wind, geothermal, and certain biomass fuels, or a tax credit of 1.1 cents/kWh available for the first 10 years of production by new generators using geothermal energy, certain hydroelectric technologies, and biomass fuels not eligible for the full credit of 2.3 cents/kWh. The extension also applies to the 30% ITC for new generators using solar energy, which may also be claimed in lieu of the PTC for eligible technologies.

Oil and natural gas supply cases

The sensitivity of the AEO2014 projections to changes in assumptions regarding technically recoverable domestic crude oil and natural gas resources is examined in two cases. These cases do not represent a confidence interval for future domestic oil and natural gas supply, but rather provide a framework to examine the effects of higher and lower domestic supply on energy demand, imports, and prices. Assumptions associated with these cases are described below.

- In the Low Oil and Gas Resource case, the estimated ultimate recovery per tight oil, tight gas, or shale gas well is assumed to be 50% lower than in the Reference case, increasing the per-unit cost of developing the resource. The total unproved technically recoverable resource of crude oil is decreased to 180 billion barrels, and the natural gas resource is decreased to 1,480 trillion cubic feet (Tcf), as compared with unproved resource estimates of 209 billion barrels of crude oil and 1,932 Tcf of natural gas as of January 1, 2012, in the Reference case.
- In the High Oil and Gas Resource case, the resource assumptions are adjusted to allow a continued increase in domestic crude oil production, to more than 13 million barrels per day (MMbbl/d) in 2040 compared with 7.5 MMbbl/d in the Reference case. This case includes: (1) 50% higher estimated ultimate recovery per tight oil, tight gas, or shale gas well, with 50% lower acre spacing (minimum 40 acres) than in the Reference case, as well as additional unidentified tight oil resources to reflect the possibility that additional layers or new areas of low-permeability zones will be identified and developed; (2) diminishing returns on the estimated ultimate recovery once drilling levels in a county exceed the number of potential wells assumed in the Reference case to reflect well interference at greater drilling density; (3) additional 1% annual increase in the estimated ultimate recovery for tight oil, tight gas, and shale gas wells due to faster technological improvement; (4) kerogen development reaching 135,000 barrels/day in 2024; (5) tight oil development in Alaska, increasing the total Alaska technically recoverable resource by 1.9 billion barrels; and (6) 50% higher technically recoverable undiscovered resources in Alaska, the offshore lower 48 states, and shale gas in Canada than in the Reference case. Additionally, a few offshore Alaska fields are assumed to be discovered and developed earlier than in the Reference case. The total unproved technically recoverable resource of crude oil increases to 401 billion barrels, and the natural gas resource increases to 3,349 Tcf as compared with unproved resource estimates of 209 billion barrels of crude oil and 1,932 Tcf of natural gas in the Reference case as of the start of 2012.

Liquids market cases

The Liquid Fuels Market Module of NEMS was used (with other NEMS models) to complete the Low Renewable Technology Cost case, which is discussed in more detail in the renewable fuels cases section. In addition to the 20% reduction in nonhydro renewable generating technologies, 20% reduction in biomass feedstock costs, and higher rate of recovery for biomass byproducts from industrial processes, the LFMM assumes capital costs for new ethanol, biodiesel, pyrolysis, and other BTL technologies are 20% lower than reference case levels through 2040.

Some assumptions in the LFMM were changed to support the No Sunset case by extending the ethanol and biodiesel subsidies beyond their current end dates (2013). This assumption was excluded from the Extended Policies case.

Coal market cases

Two alternative coal cost cases examine the impacts on U.S. coal supply, demand, distribution, and prices that result from alternative assumptions about mining productivity, labor costs, mine equipment costs, coal transportation rates, and costs of non-U.S. coal supplies to international markets. The alternative productivity and cost assumptions are applied in every year from 2014 through 2040. For the coal cost cases, adjustments to the Reference case assumptions for coal mining productivity are based on variation in the average annual productivity growth of 2.4 percentage points observed since 2000 for mines in Wyoming's Powder River Basin and 2.3 percentage points for other coal-producing regions. Transportation rates are lowered (in the Low Coal Cost case) or raised (in the High Coal Cost case) from Reference case levels to achieve a 25% change in rates relative to the Reference case in 2040. In both the High and Low Coal Cost cases, price trends for non-U.S. coal export supplies (e.g., coal exported to international markets from ports in Australia or Southern Africa, a NEMS-defined region that includes South Africa, Mozambique, and Botswana) are assumed to be similar, but price changes are approximately 10% less than the price changes projected for U.S. coal exports. The Low and High Coal Cost cases represent fully integrated NEMS runs, with feedback from the macroeconomic activity, international, supply, conversion, and end-use demand modules.

- In the Low Coal Cost case, the average annual growth rates for coal mining productivity are higher than those in the Reference case and are applied at the supply curve level. As an example, the average annual productivity growth rate for Wyoming's Southern Powder River Basin supply curve is increased from -1.5% in the Reference case for the years 2014 through 2040 to 0.9% in the Low Coal Cost case. Coal miner wages, mine equipment costs, and other mine supply costs all are assumed to be about 24% lower in 2040 in real terms in the Low Coal Cost case than in the Reference case. Coal transportation rates, excluding the impact of fuel surcharges, are assumed to be 25% lower in 2040. In the international coal market, the price change for non-U.S. export supplies is assumed to be roughly 10% less than the price change projected for U.S. coal exports.
- In the High Coal Cost case, the average annual productivity growth rates for coal mining are lower than those in the Reference case and are applied as described in the Low Coal Cost case. Coal miner wages, mine equipment costs, and other mine supply costs in 2040 are assumed to be about 31% higher than in the Reference case, and coal transportation rates in 2040 are assumed to be 25% higher. In the international coal market, the price change for non-U.S. export supplies is assumed to be roughly 10% less than the price change projected for U.S. coal exports.

Additional data on productivity, wage, mine equipment cost, and coal transportation rate assumptions for the Reference and alternative coal cost cases are included in Appendix D.

Cross-cutting integrated cases

A series of cross-cutting integrated cases are used in AEO2014 to analyze specific cases with broader sectoral impacts. For example, three integrated technology progress cases analyze the effects of faster and slower technology improvement in the demand sectors (partially described in the sector-specific sections above). In addition, four cases were run with alternative assumptions about expectations for future regulation of GHG emissions.

Integrated technology cases

In the demand sectors (residential, commercial, industrial, and transportation), technology improvement typically means greater efficiency and/or reduced technology cost. Three alternative demand technology cases—Integrated 2013 Demand Technology, Integrated Best Available Demand Technology, and Integrated High Demand Technology—are used in AEO2014 to examine the potential effects of variation in the rate of technology improvement in the end-use demand sectors, independent of any offsetting effects of variations in technology improvement in the supply/conversion sectors. Assumptions for each end-use sector are described in the sector-specific sections above.

No Sunset case

In addition to the AEO2014 Reference case, a No Sunset case was run, assuming the extension of all existing tax credits and policies that contain sunset provisions, except those requiring additional funding (e.g., loan guarantee programs) and those that involve extensive regulatory analysis, such as CAFE improvements and periodic updates of efficiency standards. The No Sunset case also includes extension of the \$1.01/gallon ethanol subsidy and \$1.00/gallon biodiesel subsidy to the end of the projection period. Specific assumptions for each end-use sector and for renewables are described in the sector-specific sections above.

Extended Policies case

The Extended Policies case begins with the No Sunset case described above but excludes extension of the ethanol and biofuel subsidies included in the No Sunset case, because the RFS program already included in the AEO2014 Reference case tends to determine the levels of ethanol and biodiesel use. The Extended Policies case assumes an increase in the capacity limitations on the ITC and extension of the program. It includes additional rounds of federal efficiency standards for residential and commercial products, as well as new standards for products not yet covered; adds multiple rounds of national building codes by 2029; and increases LDV and HDV fuel economy standards in the transportation sector. Specific assumptions for each end-use sector and for renewables are described in the sector-specific sections above.

Greenhouse gas cases

Given concerns about climate change and possible future policy actions to limit GHG emissions, regulators and the investment community are beginning to push energy companies to invest in technologies that are less GHG-intensive. To reflect the market's current reaction to potential future GHG regulation, a 3-percentage-point increase in the cost of capital is assumed for investments in new coal-fired power and CTL plants without CCS and for all capital investment projects (excluding CCS) at existing coal-fired power plants in the Reference case and all other AEO2014 cases except the No GHG Concern case, GHG10 case, GHG25 case, and GHG10 and Low Gas Prices case. Those assumptions affect cost evaluations for the construction of new capacity but not the actual operating costs when a new plant begins operation.

The four alternative GHG cases are used to provide a range of potential outcomes, from no concern about future GHG legislation to the imposition of a specific economywide carbon emissions price, as well as an examination of the impact of a combination of a specific economywide carbon emission price and low natural gas price. AEO2014 includes three economywide CO₂ price cases—two levels of carbon prices and one case combined with an alternative natural gas price projection. In the GHG10 case and the GHG10 and Low Gas Prices case, the price of carbon emissions is set at \$10/metric ton of CO₂ in 2015. In the GHG25 case, the price is set at \$25/metric ton of CO₂ in 2015. In all cases, the price begins to rise in 2016 at 5%/year. The GHG10 case and the GHG25 case use the Reference case assumptions regarding oil and natural gas resource availability. The GHG10 and Low Gas Prices case uses the assumptions from the High Oil and Gas Resource case, as described above in the Oil and natural gas supply section. The GHG cases are intended to measure the sensitivity of the AEO2014 projections to a range of implicit or explicit valuations of CO₂ emissions. At the time AEO2014 was completed, no legislation including a GHG price was pending; however, the EPA is developing technology-based CO₂ standards for new coal-fired power plants. In the GHG cases for AEO2014, no assumptions are made with regard to offsets, policies to promote CCS, or specific policies to mitigate impacts in selected sectors.

The No GHG Concern case was run without any adjustment for concern about potential GHG regulations (without the 3-percentage point increase in the cost of capital). In the No GHG Concern case, the same cost of capital is used to evaluate all new capacity builds, regardless of type.

Endnotes for Appendix E

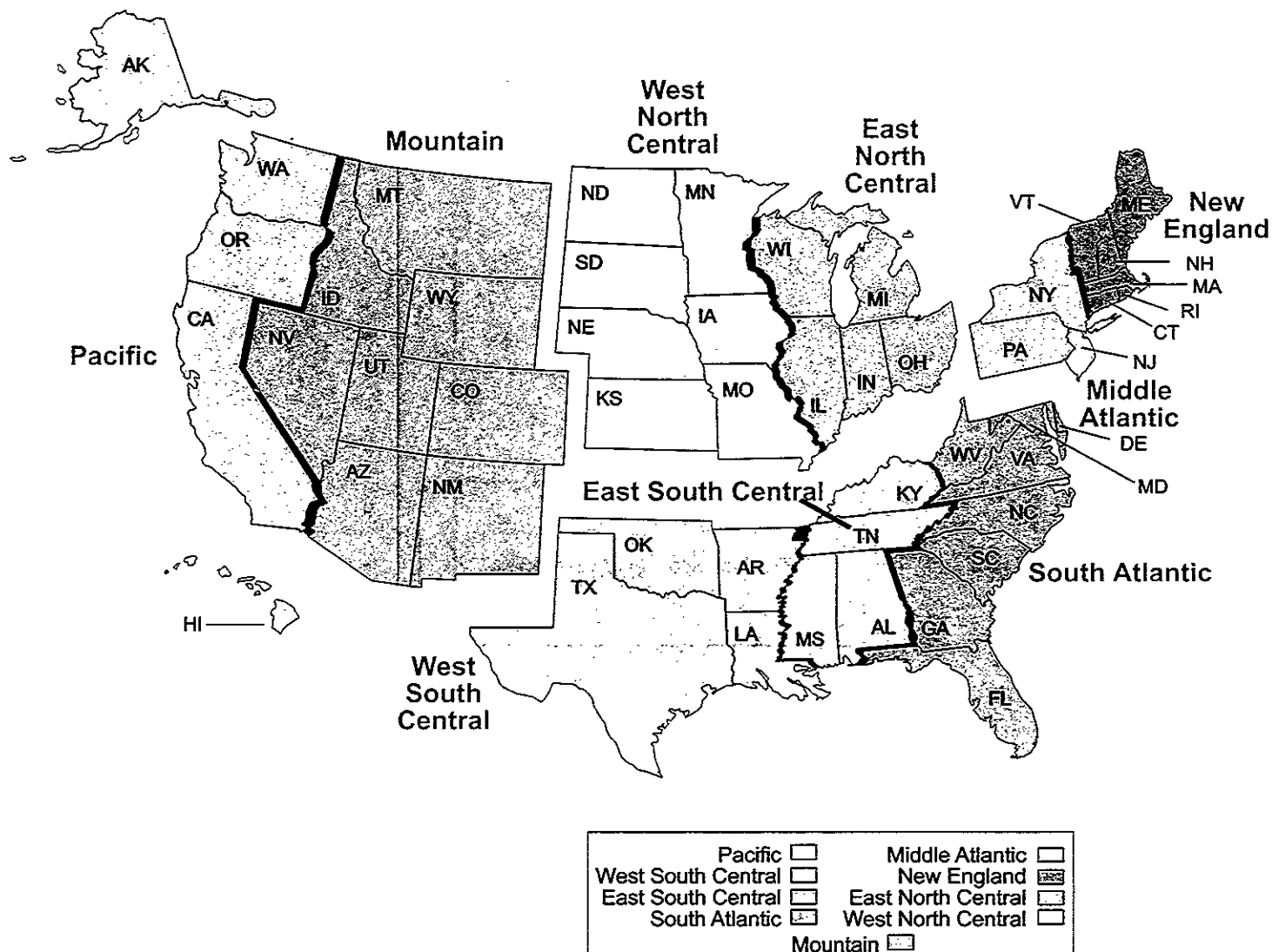
Links current as of April 2014

1. U.S. Energy Information Administration, *The National Energy Modeling System: An Overview 2009*, DOE/EIA-0581(2009) (Washington, DC, October 2009), <http://www.eia.gov/oiaf/aeo/overview>.
2. Selected EIA publications used for data sources include *Monthly Energy Review*, *Natural Gas Annual*, *Natural Gas Monthly*, *Electric Power Monthly*, *Electric Power Annual*, *Annual Coal Report*, *Petroleum Supply Annual*, and *Quarterly Coal Report*, as well as EIA surveys.
3. U.S. Energy Information Administration, *Short-Term Energy Outlook September 2013* (Washington, DC, September 2013), <http://www.eia.gov/forecasts/steo/archives/Sep13.pdf>. Portions of the preliminary information were also used to initialize the NEMS Liquids Fuels Market Module projection.
4. U.S. Energy Information Administration, *Short-Term Energy Outlook* (Washington, DC, January 2014), <http://www.eia.gov/forecasts/steo/outlook.cfm>.
5. U.S. Energy Information Administration, *Assumptions to the Annual Energy Outlook 2014*, DOE/EIA-0554(2014) (Washington, DC, April 2014), <http://www.eia.gov/forecasts/aeo/assumptions>.
6. Alternative technologies for other liquids include all biofuels technologies plus CTL and GTL.
7. U.S. Energy Information Administration, *Assumptions to the Annual Energy Outlook 2014*, DOE/EIA-0554(2014) (Washington, DC, April 2014), <http://www.eia.gov/forecasts/aeo/assumptions>.
8. High technology assumptions for the buildings sector are based on U.S. Energy Information Administration, *EIA—Technology Forecast Updates—Residential and Commercial Building Technologies—Advanced Case* (Navigant Consulting, Inc. with SAIC, September 2011), and *EIA—Technology Forecast Updates—Residential and Commercial Building Technologies—Advanced Case* (Navigant Consulting, Inc. with SAIC, November 2012).
9. These assumptions are based in part on U.S. Energy Information Administration, *Industrial Technology and Data Analysis Supporting the NEMS Industrial Model* (FOCIS Associates, October 2005).

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Regional Maps

Figure F1. United States Census Divisions



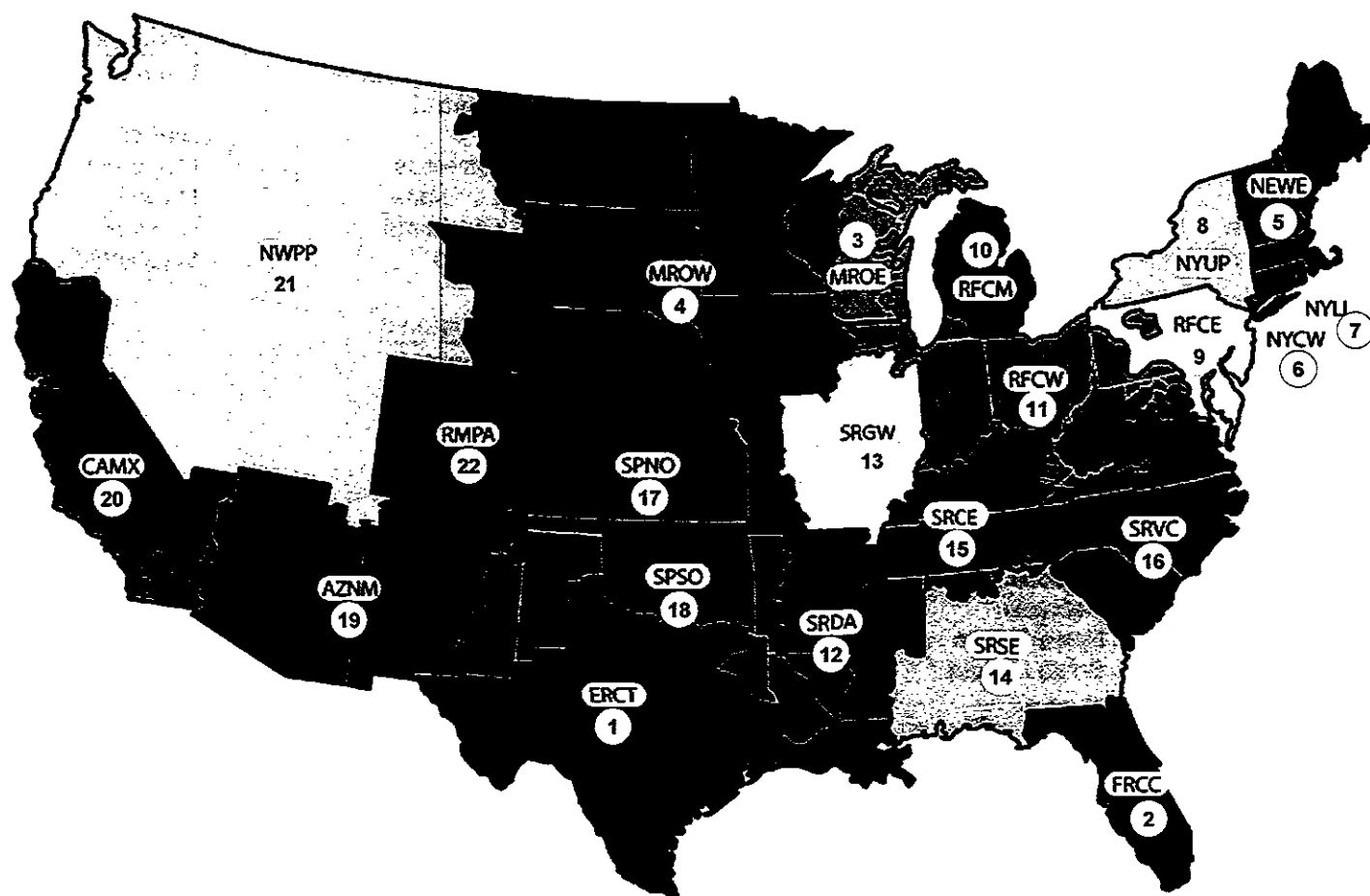
Source: U.S. Energy Information Administration, Office of Energy Analysis.

Figure F1. United States Census Divisions (continued)

<u>Division 1</u> New England	<u>Division 3</u> East North Central	<u>Division 5</u> South Atlantic	<u>Division 7</u> West South Central	<u>Division 9</u> Pacific
Connecticut	Illinois	Delaware	Arkansas	Alaska
Maine	Indiana	District of Columbia	Louisiana	California
Massachusetts	Michigan	Florida	Oklahoma	Hawaii
New Hampshire	Ohio	Georgia	Texas	Oregon
Rhode Island	Wisconsin	Maryland		Washington
Vermont		North Carolina	<u>Division 8</u> Mountain	
<u>Division 2</u> Middle Atlantic	<u>Division 4</u> West North Central	South Carolina	Arizona	
New Jersey	Iowa	Virginia	Colorado	
New York	Kansas	West Virginia	Idaho	
Pennsylvania	Minnesota	<u>Division 6</u> East South Central	Montana	
	Missouri	Alabama	Nevada	
	Nebraska	Kentucky	New Mexico	
	North Dakota	Mississippi	Utah	
	South Dakota	Tennessee	Wyoming	

Source: U.S. Energy Information Administration, Office of Energy Analysis.

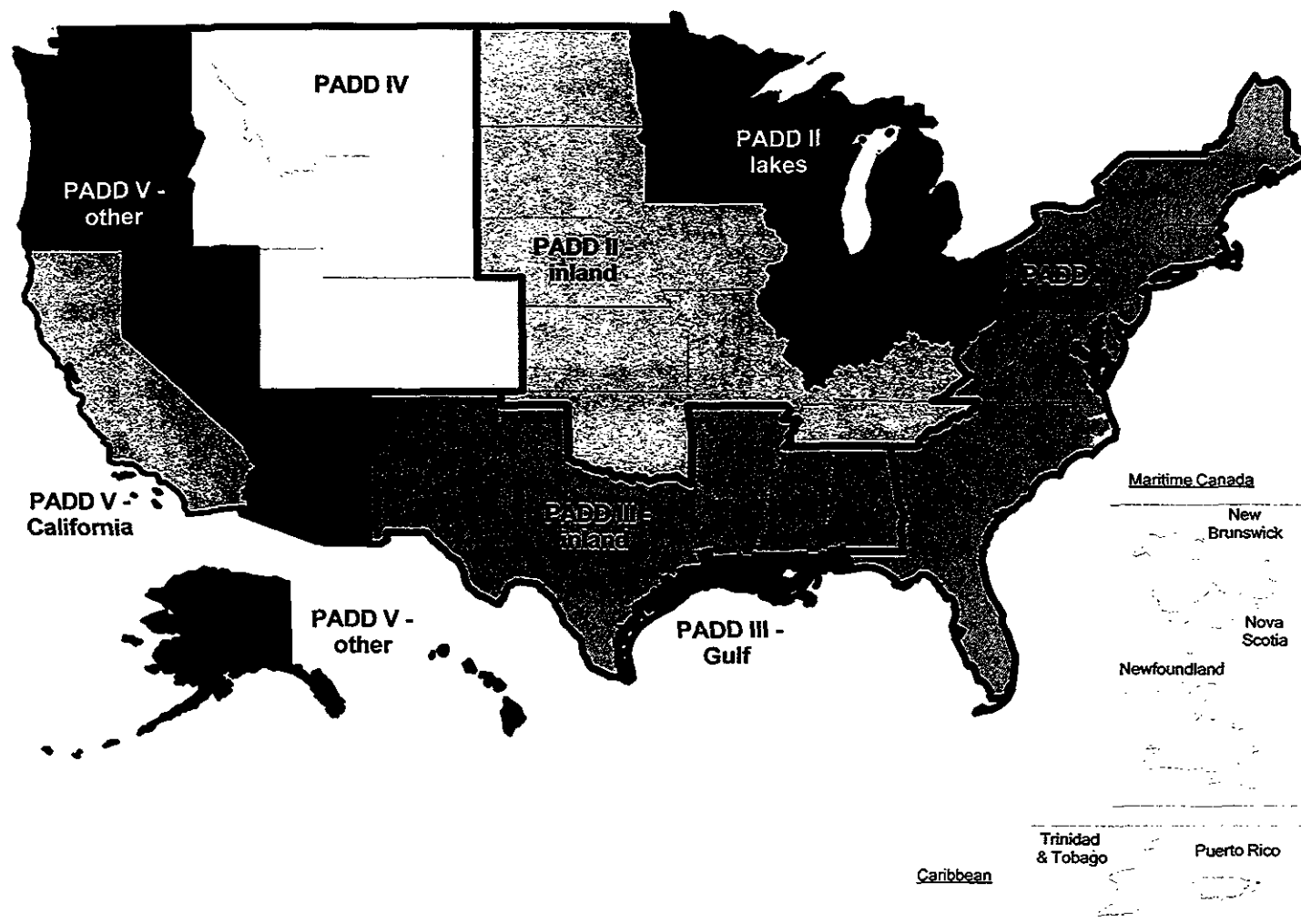
Figure F2. Electricity market module regions



- | | | | |
|----------|----------------------|----------|-------------------|
| 1. ERCT | TRE All | 12. SRDA | SERC Delta |
| 2. FRCC | FRCC All | 13. SRGW | SERC Gateway |
| 3. MROE | MRO East | 14. SRSE | SERC Southeastern |
| 4. MROW | MRO West | 15. SRCE | SERC Central |
| 5. NEWE | NPCC New England | 16. SRVC | SERC VACAR |
| 6. NYCW | NPCC NYC/Westchester | 17. SPNO | SPP North |
| 7. NYLI | NPCC Long Island | 18. SPSO | SPP South |
| 8. NYUP | NPCC Upstate NY | 19. AZNM | WECC Southwest |
| 9. RFCE | RFC East | 20. CAMX | WECC California |
| 10. RFCM | RFC Michigan | 21. NWPP | WECC Northwest |
| 11. RFCW | RFC West | 22. RMPA | WECC Rockies |

Source: U.S. Energy Information Administration, Office of Energy Analysis.

Figure F3. Liquid fuels market module regions



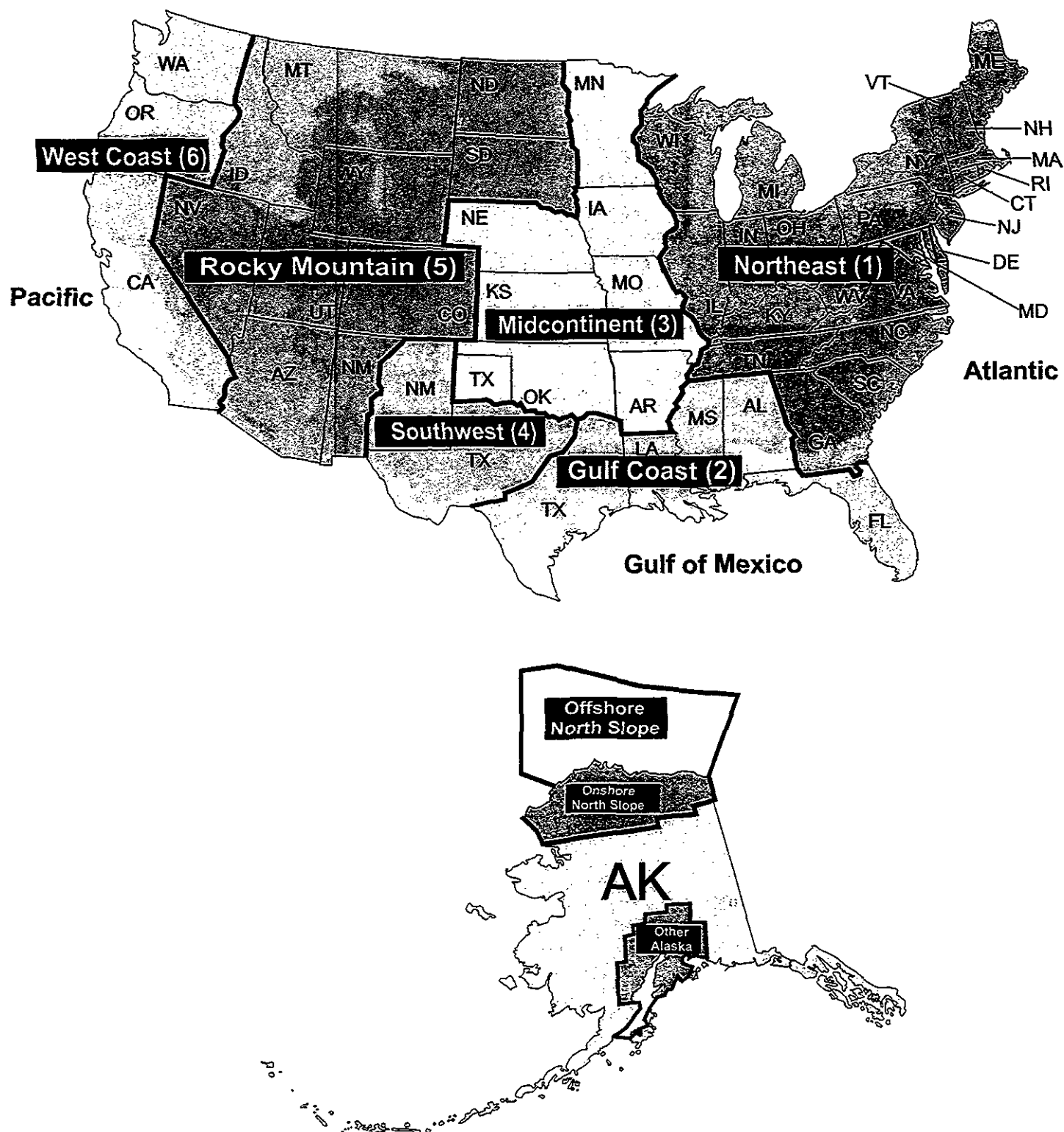
□ PADD boundary

LFMM regions

- | | | |
|----------------|-----------------|----------------------------|
| PADD I | PADD III Gulf | PADD V California |
| PADD II inland | PADD III inland | PADD V other |
| PADD II lakes | PADD IV | Maritime Canada; Caribbean |

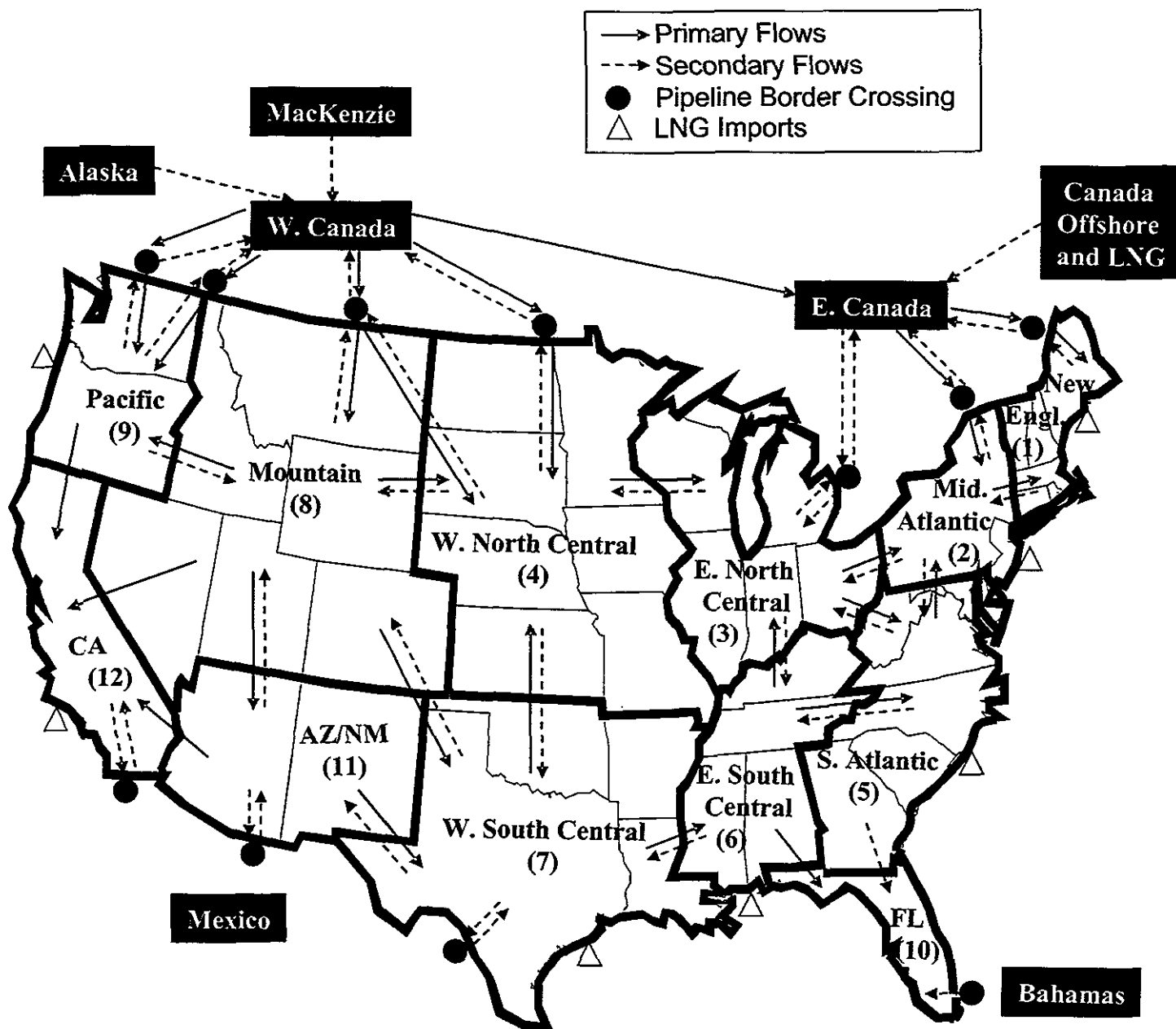
Source: U.S. Energy Information Administration, Office of Energy Analysis.

Figure F4. Oil and gas supply model regions



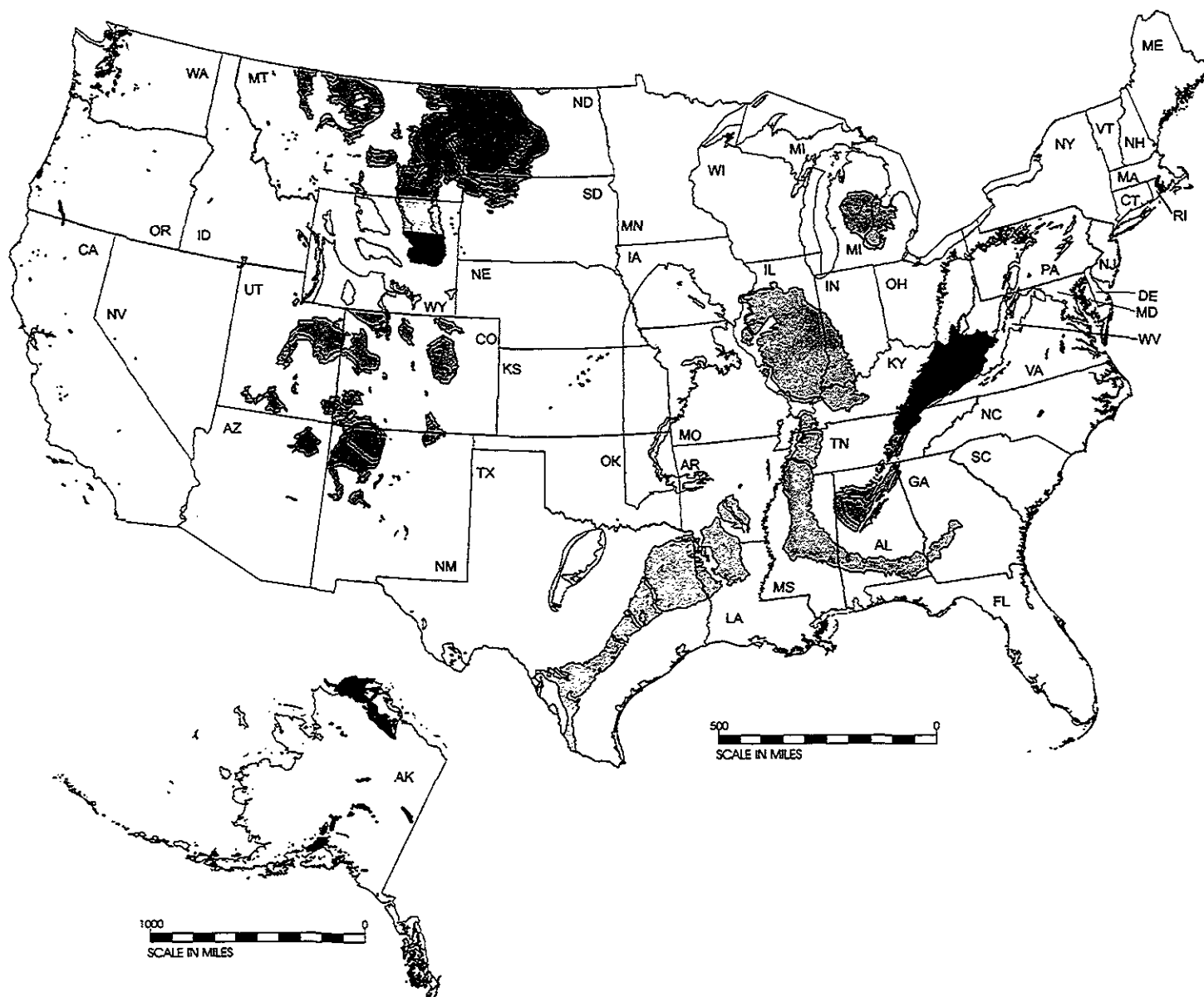
Source: U.S. Energy Information Administration, Office of Energy Analysis.

Figure F5. Natural gas transmission and distribution model regions



Source: U.S. Energy Information Administration, Office of Energy Analysis.

Figure F6. Coal supply regions

**APPALACHIA**

- Northern Appalachia
- Central Appalachia
- ▨ Southern Appalachia

INTERIOR

- ▨ Eastern Interior
- Western Interior
- ▨ Gulf Lignite

NORTHERN GREAT PLAINS

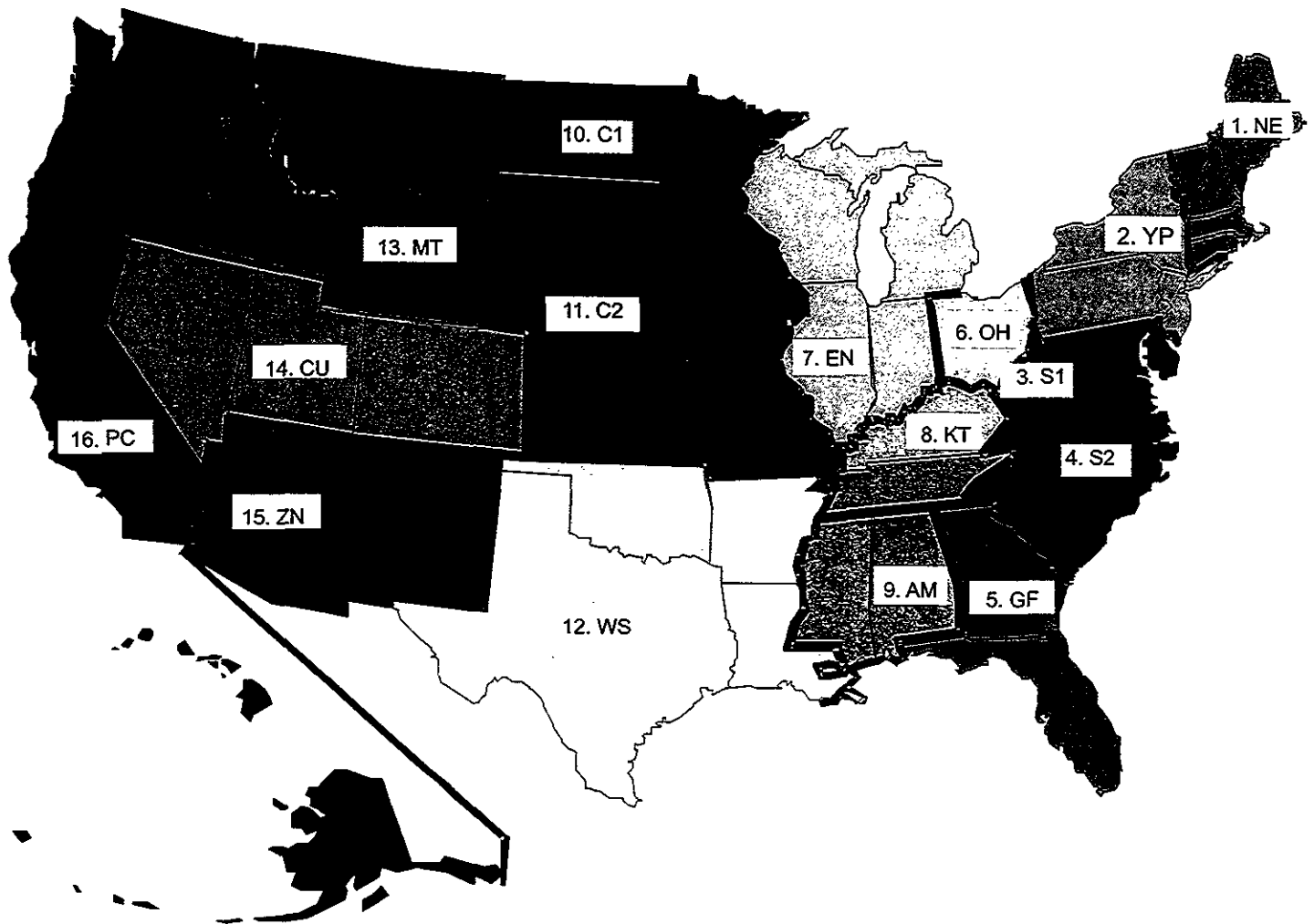
- ▨ Dakota Lignite
- ▨ Western Montana
- Wyoming, Northern Powder River Basin
- Wyoming, Southern Powder River Basin
- Western Wyoming

OTHER WEST

- ▨ Rocky Mountain
- ▨ Southwest
- Northwest

Source: U.S. Energy Information Administration, Office of Energy Analysis.

Figure F7. Coal demand regions



Region Code	Region Content
1. NE	CT,MA,ME,NH,RI,VT
2. YP	NY,PA,NJ
3. S1	WV,MD,DC,DE
4. S2	VA,NC,SC
5. GF	GA,FL
6. OH	OH
7. EN	IN,IL,MI,WI
8. KT	KY,TN

Region Code	Region Content
9. AM	AL,MS
10. C1	MN,ND,SD
11. C2	IA,NE,MO,KS
12. WS	TX,LA,OK,AR
13. MT	MT,WY,ID
14. CU	CO,UT,NV
15. ZN	AZ,NM
16. PC	AK,HI,WA,OR,CA

Source: U.S. Energy Information Administration, Office of Energy Analysis.

Conversion factors

Table G1. Heat contents

Fuel	Units	Approximate heat content
Coal¹		
Production	million Btu per short ton	20.142
Consumption	million Btu per short ton	19.622
Coke plants	million Btu per short ton	26.304
Industrial	million Btu per short ton	22.999
Residential and commercial	million Btu per short ton	21.122
Electric power sector	million Btu per short ton	19.176
Imports	million Btu per short ton	25.132
Exports	million Btu per short ton	25.606
Coal coke	million Btu per short ton	24.800
Crude oil¹		
Production	million Btu per barrel	5.850
Imports	million Btu per barrel	5.992
Petroleum products and other liquids		
Consumption ¹	million Btu per barrel	5.316
Motor gasoline ¹	million Btu per barrel	5.047
Jet fuel	million Btu per barrel	5.670
Distillate fuel oil ¹	million Btu per barrel	5.761
Diesel fuel ¹	million Btu per barrel	5.757
Residual fuel oil	million Btu per barrel	6.287
Liquefied petroleum gases and other ^{1,2} ...	million Btu per barrel	3.550
Kerosene	million Btu per barrel	5.670
Petrochemical feedstocks ¹	million Btu per barrel	5.066
Unfinished oils ¹	million Btu per barrel	6.098
Imports ¹	million Btu per barrel	5.548
Exports ¹	million Btu per barrel	5.584
Ethanol ³	million Btu per barrel	3.560
Biodiesel	million Btu per barrel	5.359
Natural gas plant liquids¹		
Production	million Btu per barrel	3.667
Natural gas¹		
Production, dry	Btu per cubic foot	1,022
Consumption	Btu per cubic foot	1,022
End-use sectors	Btu per cubic foot	1,022
Electric power sector	Btu per cubic foot	1,022
Imports	Btu per cubic foot	1,025
Exports	Btu per cubic foot	1,009
Electricity consumption	Btu per kilowatthour	3,412

¹Conversion factor varies from year to year. The value shown is for 2012.

²Includes ethane, natural gasoline, and refinery olefins.

³Includes denaturant.

Btu = British thermal unit.

Sources: U.S. Energy Information Administration (EIA), *Monthly Energy Review*, DOE/EIA-0035(2013/09) (Washington, DC, September 2013), and EIA, AEO2014 National Energy Modeling System run REF2014.D102413A.

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Independent Statistics & Analysis

U.S. Energy Information
Administration

September 2015



Short-Term Energy Outlook (STEO)

Highlights

- North Sea Brent crude oil prices averaged \$47/barrel (b) in August, a \$10/b decrease from July. This third consecutive monthly decrease in prices likely reflects concerns about lower economic growth in emerging markets, expectations of higher oil exports from Iran, and continuing growth in global inventories. Crude oil price volatility increased significantly, with Brent prices showing daily changes of more than 5% for four consecutive trading days from August 27 to September 1, the longest such stretch since December 2008.
- EIA forecasts that Brent crude oil prices will average \$54/b in 2015 and \$59/b in 2016, unchanged from last month's STEO. Forecast West Texas Intermediate (WTI) crude oil prices in 2015 and 2016 average \$5/b lower than the Brent price. The current values of futures and options contracts for December 2015 delivery (*Market Prices and Uncertainty Report*) suggest the market expects WTI prices to range from \$32/b to \$73/b (at the 95% confidence interval) in December 2015.
- U.S. regular gasoline monthly retail prices averaged \$2.64/gallon (gal) in August, a decrease of 16 cents/gal from July and 85 cents/gal lower than in August 2014. EIA expects monthly gasoline prices to decline from the August level to an average of \$2.11/gal during the fourth quarter of 2015. EIA forecasts U.S. regular gasoline retail prices to average \$2.38/gal in 2016.
- EIA estimates total U.S. crude oil production declined by 140,000 barrels per day (b/d) in August compared with July production. Crude oil production is forecast to continue decreasing through mid-2016 before growth resumes late in 2016. Projected U.S. crude oil production averages 9.2 million b/d in 2015 and 8.8 million b/d in 2016, which are both 0.1 million b/d lower than in the prior STEO.
- Natural gas working inventories were 3,193 billion cubic feet (Bcf) on August 28. This level was 18% higher than a year ago and 4% higher than the previous five-year average (2010-14) for this week. EIA projects inventories will close the injection season at the end of October at 3,840 Bcf, which would be the third-highest end-of-October level on record.

Global Petroleum and Other Liquids

Global liquids production continues to outpace consumption, leading to strong inventory builds throughout the forecast period. Global oil inventory builds in the second quarter of 2015 averaged 2.9 million b/d, compared with 1.9 million b/d in the first quarter. The pace of inventory builds is expected to slow in the second half of 2015, to roughly 1.8 million b/d. In 2016, inventory builds are forecast to slow to an average of 1.1 million b/d.

Global Petroleum and Other Liquids Consumption. EIA estimates that global consumption of petroleum and other liquids grew by 1.2 million b/d in 2014, averaging 92.4 million b/d for the year. EIA expects global consumption of petroleum and other liquids to grow by 1.2 million b/d in 2015 and by 1.3 million b/d in 2016. Growth in global consumption for 2016 was revised downward by almost 0.2 million b/d, compared with last month's forecast, as China and other Asian economies continue to show signs of weakness. World real gross domestic product (GDP) weighted for oil consumption increased by 2.8% in 2014, and is projected to grow by 2.3% in 2015 and by 2.9% in 2016.

Consumption of petroleum and other liquids in countries outside of the Organization for Economic Cooperation and Development (OECD) grew by 1.4 million b/d in 2014 and is projected to grow by 0.7 million b/d in 2015 and by 1.1 million b/d in 2016. Despite signs of slowing economic growth, China continues to be a driver of non-OECD oil consumption growth. China's growth in oil consumption is expected to average slightly less than 0.3 million b/d in 2015 and 2016, below the 0.4 million b/d growth in 2014. Also, Iran is expected to experience an uptick in economic activity and petroleum consumption in 2016, assuming implementation of the Joint Comprehensive Plan of Action (JCPOA) between Iran and the P5+1 that was announced on July 14.

After falling by 0.3 million b/d in 2014, OECD petroleum and other liquids consumption is expected to rise by 0.4 million b/d in 2015 and by 0.3 million b/d in 2016, reaching an average of 46.4 million b/d, the highest annual average level of OECD consumption since 2010. U.S. consumption is expected to grow by an average of 0.3 million b/d in 2015 and by 0.1 million b/d in 2016. Several European countries saw economic conditions improve as they emerged from recessions, which, combined with colder-than-normal weather early in 2015 across Europe, contributes to a projected 0.1 million b/d increase in consumption in OECD Europe in 2015.

Non-OPEC Petroleum and Other Liquids Supply. EIA estimates that petroleum and other liquids production in countries outside of the Organization of the Petroleum Exporting Countries (OPEC) grew by 2.4 million b/d in 2014, which mainly reflects production growth in the United States. EIA expects non-OPEC liquids production to grow by 1.4 million b/d in 2015, but to remain roughly flat in 2016, as declining U.S. production is offset by modest growth in other non-OPEC producers.

Non-OPEC production growth in 2015 is largely attributable to investments made when oil prices were higher. For example, the decisions to invest in the Golden Eagle, Peregrine, and Kinnoull fields in the United Kingdom's sector of the North Sea were made in the second half of

2011 when Brent crude prices were more than \$100/b. The three fields started producing at the end of 2014 and the beginning of 2015. Redirection of investment is also helping to maintain or raise production levels in non-OPEC countries. Some companies have cut back on investments in exploring for new fields, and some are directing a greater share of investments toward currently producing fields to maintain production levels and positive cash flow in the short term. However, this redirection of investment could contribute to lower production beyond the forecast period.

Production growth in Canada is expected to average 0.3 million b/d in both 2015 and 2016, driven by continued expansion in oil sands projects. Although some previously announced oil sands projects have been put on hold, the vast majority continue as planned, including Imperial Oil and Cenovus oil sands projects scheduled to come online by the end of 2016.

Unplanned supply disruptions among non-OPEC producers averaged 0.7 million b/d in August, slightly less than in the previous month.

OPEC Petroleum and Other Liquids Supply. EIA estimates that OPEC crude oil production averaged 30.1 million b/d in 2014, unchanged from 2013. Crude oil production declines in Libya, Angola, Algeria, and Kuwait offset production growth in Iraq and Iran. EIA forecasts OPEC crude oil production to increase by 0.8 million b/d in 2015 and remain relatively flat in 2016. Iraq is expected to be the largest contributor to OPEC production growth in 2015. In 2016, additional OPEC crude oil supply is expected to come from Iran, which is forecast to boost production if international sanctions targeting its oil sector are suspended.

On July 14, the P5+1 and Iran announced an agreement that could result in relief from United States and European Union nuclear-related sanctions (which include some oil-related sanctions). Sanctions relief is contingent on verification by the International Atomic Energy Agency that Iran has complied with key nuclear-related steps. The sanctions relief would put additional Iranian oil supplies on a global market that has already seen oil inventories increase significantly over the past year.

The JCPOA is currently undergoing a congressional review. As of the time of this writing, Congress had not voted on the agreement, but for the purposes of this STEO, EIA assumes sanctions relief could occur in mid-2016. If sanctions relief occurs, EIA forecasts Iranian crude oil supplies will increase by about 0.3 million b/d on average in 2016, with most of the growth occurring in the second half of the year. Much uncertainty remains as to the timing of sanctions relief. Iran produced 3.6 million b/d of crude oil in late 2011, before the recent round of sanctions was enacted. The sanctions forced Iran to shut in a substantial portion of its production, with production currently averaging about 2.8 million b/d. Iran's ability to bring online previously shut-in volumes and increase exports depends on several factors, including the current condition of oil fields and infrastructure that were shut in and the pace of sanctions relief.

Saudi Arabia and other OPEC member countries are not expected to reduce production to accommodate additional Iranian volumes, although some producers will see production declines

in the near term. For example, Saudi Arabia's production is expected to decline as seasonal power demand abates, reducing the use of crude oil to generate electricity. Also, there is considerable uncertainty regarding Iraq's ability to sustain its higher production and export levels, particularly in light of increased outages on the pipeline through Turkey to the port of Ceyhan that is connected to the Kurdistan Regional Government's independent pipeline.

OPEC noncrude liquids production, which averaged 6.3 million b/d in 2014, is expected to increase by 0.2 million b/d in 2015 and by 0.3 million b/d in 2016, led by production increases in Iran, Qatar, and Kuwait.

In August, unplanned crude oil supply disruptions among OPEC producers averaged 2.8 million b/d, nearly the same level as in the previous month. Kuwait and Saudi Arabia continue to have a total of 0.5 million b/d disrupted at the Wafra and Khafji fields in the Neutral Zone that straddles the two countries.

EIA expects OPEC surplus crude oil production capacity, which is concentrated in Saudi Arabia, to average 1.5 million b/d in 2015 and then increase to 2.0 million b/d in 2016, after averaging 2.0 million b/d in 2014. Surplus capacity is typically an indicator of market conditions, and surplus capacity lower than 2.5 million b/d indicates a relatively tight oil market, but the current and forecast levels of global inventory builds make the projected low surplus capacity level in 2015 less significant. EIA does not expect any Iranian spare capacity to be available throughout the forecast period despite increases in effective capacity, as Iran is expected to produce crude oil at the maximum available level through the end of 2016 if and when sanctions are lifted.

OECD Petroleum Inventories. EIA estimates that OECD commercial crude oil and other liquids inventories totaled 2.70 billion barrels at the end of 2014, equivalent to roughly 59 days of consumption. Forecast OECD inventories rise to 2.99 billion barrels at the end of 2015 and then to 3.11 billion barrels at the end of 2016.

Crude Oil Prices. Brent crude oil spot prices decreased by \$10/b in August to a monthly average of \$47/b, driven by continued growth in global liquids inventories and expectations of weakening global economic activity. Along with increasing volatility in global equity prices and exchange rates, crude oil price volatility increased significantly in August, reflecting uncertainty about potential lower economic and oil demand growth in emerging market countries. Volatility remained heightened at the end of August and into September, with Brent spot prices increasing from \$42/b on August 26 to \$52/b on August 31, before falling below \$50/b again on September 1. During this period, Brent prices showed daily changes of more than 5% for four consecutive trading days, the longest stretch of such high volatility since December 2008.

Continuing increases in global liquids inventories have put significant downward pressure on prices. Inventories rose by an estimated 2.4 million b/d through the first eight months of 2015, compared with an average build of 0.6 million b/d over the same period in 2014. Inventory builds are projected to moderate somewhat in the coming months, but are expected to remain high compared with previous years.

The monthly average WTI crude oil spot price fell to an average of \$43/b in August, down \$8/b from July. Crude oil inventories at Cushing, Oklahoma, despite being 4.9 million barrels lower than the record high of 62.2 million barrels on April 17, remain about 37 million barrels higher than at the same time last year. U.S. crude oil inventories remain elevated compared with historical levels, despite strong U.S. refinery runs, which in recent weeks reached new highs of more than 17 million b/d.

EIA projects the Brent crude oil price will average \$54/b in 2015 and \$59/b in 2016, unchanged from August's STEO. WTI prices in both 2015 and 2016 are expected to average \$5/b less than the Brent crude oil price. EIA's updated projection remains subject to significant uncertainties as the oil market moves toward balance. During this period of price discovery, oil prices could continue to experience periods of heightened volatility. The oil market faces many uncertainties heading into 2016, including the pace and volume at which Iranian oil reenters the market, the strength of oil consumption growth, and the responsiveness of non-OPEC production to low oil prices. In the more immediate future, there is potential downward price pressure heading into the fourth quarter of 2015 if refinery runs drop by more than expected during the fall maintenance season.

The current values of futures and options contracts continue to suggest high uncertainty in the price outlook (*Market Prices and Uncertainty Report*). WTI futures contracts for December 2015 delivery, traded during the five-day period ending September 3, averaged \$48/b, while implied volatility averaged 47%. These levels established the lower and upper limits of the 95% confidence interval for the market's expectations of monthly average WTI prices in December 2015 at \$32/b and \$73/b, respectively. The 95% confidence interval for market expectations widens over time, with lower and upper limits of \$26/b and \$108/b for prices in December 2016. Last year at this time, WTI for December 2014 delivery averaged \$93/b, and implied volatility averaged 16%. The corresponding lower and upper limits of the 95% confidence interval were \$81/b and \$107/b.

U.S. Petroleum and Other Liquids

The most recent data from the U.S. Federal Highway Administration show Americans drove a record 1.54 trillion miles during the first half of 2015, compared with the previous high of 1.50 trillion miles driven in the first half of 2007, contributing to higher demand for gasoline in the United States.

Monthly data show gasoline consumption in the United States increased by 3% during the first half of 2015 compared with the first half of 2014. This growing domestic consumption and strong demand from abroad have contributed to high refinery wholesale gasoline margins (the difference between the wholesale price of gasoline and the price of Brent crude oil). U.S. average wholesale gasoline margins averaged 65 cents/gal in August, 31 cents/gal higher than in August 2014 and 34 cents/gal higher than the five-year average (2010-14) for August.

Refinery outages in the Midwest and on the West Coast have contributed to gasoline prices in those regions rising by more than the U.S. average over the past few months, and have resulted

in significant price volatility. In Petroleum Administration for Defense District (PADD) 2 (Midwest), retail regular gasoline prices rose by 32 cents/gal during the week of August 17 to an average of \$2.79/gal, 7 cents/gal higher than the U.S. average, following a temporary unplanned refinery outage at BP's Whiting, Indiana, refinery. The outage at Whiting has since ended and PADD 2 retail gasoline prices fell to \$2.47/gal on August 31, 4 cents/gal below the U.S. average. After reaching a 2015 peak of \$3.60/gal on July 20, regular gasoline prices in PADD 5 (West Coast) have since fallen to \$3.16/gal as of August 31 but remain 65 cents/gal above the U.S. average as a result of tight gasoline supplies that reflect ongoing refinery outages in California.

In August, monthly average regional gasoline retail prices ranged from a low of \$2.31/gal in PADD 3 (Gulf Coast) to a high of \$3.33/gal in PADD 5. EIA expects gasoline prices to fall from their current levels, with the U.S. regular gasoline price averaging \$2.11/gal in the fourth quarter of 2015.

Liquid Fuels Consumption. Total U.S. liquid fuels consumption rose by an estimated 140,000 b/d (0.8%) in 2014. Total liquid fuels consumption is forecast to grow by 330,000 b/d (1.7%) in 2015 and by 130,000 b/d (0.7%) in 2016.

Motor gasoline consumption, which rose by 80,000 b/d in 2014, increases by a projected 210,000 b/d (2.3%) in 2015 as the effects of employment growth and lower gasoline prices outweigh increases in vehicle fleet efficiency. Gasoline consumption is forecast to remain flat in 2016, as a long-term trend toward vehicles that are more fuel efficient offsets the effect of continued economic growth on highway travel.

Consumption of distillate fuel, which includes diesel fuel and heating oil, is forecast to be relatively unchanged in 2015 and then increase by 60,000 b/d (1.5%) in 2016. The 2016 growth is driven by increasing manufacturing output, foreign trade, and marine fuel use.

Hydrocarbon gas liquids (HGL) consumption, which fell by 50,000 b/d (1.9%) in 2014, is projected to increase by 60,000 b/d in 2015 and by 80,000 b/d in 2016, as new petrochemical plant capacity increases the use of HGL as a feedstock. In addition, new HGL export terminal capacity contributes to an increase in HGL net exports from an average of 560,000 b/d in 2014 to 1.1 million b/d in 2016.

Liquid Fuels Supply. U.S. crude oil production is projected to increase from an average of 8.7 million b/d in 2014 to 9.2 million b/d in 2015 and then decrease to 8.8 million b/d in 2016. For both 2015 and 2016, the forecast is about 0.1 million b/d lower than in the August STEO. The decrease in the crude oil production forecast mostly reflects downward revisions to U.S. oil production estimates for the first half of 2015.

In late August, EIA released data from its first survey-based reporting of monthly crude oil production, which represents more than 90% of U.S. oil production. Based on these data, monthly national production estimates for January through May 2015 were revised downward by 40,000 b/d to 130,000 b/d. The largest revisions include decreases of crude oil production in Texas (ranging from about 100,000 b/d to 150,000 b/d) and increases in the federal Gulf of

Mexico (ranging from about 10,000 b/d to 50,000 b/d). EIA estimates U.S. crude oil production in June 2015 was 9.3 million b/d, a decrease of 0.1 million b/d from the revised May 2015 figure.

Based on the revised data, U.S. crude oil production averaged 9.4 million b/d in the first half of 2015. This level is 0.2 million b/d higher than the average production during the fourth quarter of 2014, despite an almost 60% decline in the total U.S. oil-directed rig count since October 2014. Lower 48 onshore production began falling in April, but the decline was offset by production gains in the Gulf of Mexico that kept total production growth positive until May. Total U.S. production began declining in May, falling more than 0.2 million b/d from the April level.

EIA expects U.S. crude oil production declines to continue through August 2016, when total production is forecast to average 8.6 million b/d. Forecast production begins rising in late 2016, returning to an average of 9.0 million b/d in the fourth quarter. A total of 12 projects are scheduled to come online in the Gulf of Mexico in 2015 and 2016, pushing up production from an average of 1.4 million b/d in the fourth quarter of 2014 to more than 1.6 million b/d in the same period of 2016.

Expected crude oil production declines from May 2015 through mid-2016 are largely attributable to unattractive economic returns in some areas of both emerging and mature onshore oil production regions, as well as seasonal factors such as anticipated hurricane-related production disruptions in the Gulf of Mexico. Reductions in 2015 cash flows and capital expenditures have prompted companies to defer or redirect investment away from marginal exploration and research drilling to focus on core areas of major tight oil plays. Reduced investment has resulted in the lowest count of oil-directed rigs in nearly five years and in well completions that are significantly behind 2014 levels.

Oil prices, particularly in the second quarter of 2015, remained high enough to support continued development drilling in the core areas of the Bakken, Eagle Ford, Niobrara, and Permian basins, with July showing the first month-to-month increase in the oil-directed rig count since October 2014. However, WTI prices below \$60/b through the forecast period are anticipated to slow the rate of recovery in onshore drilling and well completion totals, despite continued increases in rig and well productivity and falling drilling and completion costs. The forecast remains sensitive to actual wellhead prices and rapidly changing drilling economics that vary across regions and operators.

While projected oil production in the Gulf of Mexico rises during the forecast period, Alaska oil production falls. Production in these areas is less sensitive to short-term price movements than onshore production in the Lower 48 states and reflects anticipated growth from new projects and declines from legacy fields.

HGL production at natural gas processing plants reached a record high of 3.31 million b/d in April 2015, and it is projected to average 3.27 million b/d in 2015 and 3.53 million b/d in 2016. EIA expects higher ethane recovery rates in 2016 following planned increases in petrochemical

plant feedstock demand. Export terminal expansions will allow for higher quantities of domestically produced ethane, propane, and butanes to reach the international market.

U.S. petroleum product gross exports continue to grow, up almost 0.5 million b/d (13%) in the first half of 2015 compared with the same period in 2014. More than half of the growth in liquid fuel exports came from HGL. The increase in refined product exports, combined with the growth in domestic liquid fuels consumption, contributed to U.S. refinery utilization averaging 90.6% during the first half of the year, up from 88.5% last year, and the highest rate for this period since 2005. Gross inputs to U.S. refineries exceeded 17 million b/d for six consecutive weeks in July and August, a level not previously reached or exceeded in any week since EIA began publishing the data in 1990.

Petroleum Product Prices. Rising crude oil prices, strong gasoline demand, and several refinery outages on the West Coast contributed to an increase in U.S. regular gasoline retail prices from a monthly average of \$2.47/gal in April to \$2.80/gal in June. Falling crude oil prices and narrowing wholesale gasoline margins have since contributed to prices declining in August to an average of \$2.64/gal. EIA expects monthly average prices to decline in the coming months as refineries continue to produce high levels of gasoline, as demand begins to decrease following the peak in the summer driving season, and as the market transitions to lower-cost winter-grade gasoline. EIA projects regular gasoline retail prices to average \$2.11/gal in the fourth quarter of 2015.

The U.S. regular gasoline retail price, which averaged \$3.36/gal in 2014, is projected to average \$2.41/gal in 2015 and \$2.38/gal in 2016. The 2015 forecast is unchanged from the August STEO, and the 2016 forecast is 2 cents/gal lower.

The diesel fuel retail price, which averaged \$3.83/gal in 2014, is projected to fall to an average of \$2.73/gal in 2015 and then rise to \$2.77/gal in 2016, which is 4 cents/gal lower than in the August's STEO.

Natural Gas

Total weekly natural gas storage injections from the beginning of the injection season through August 28 were 1,732 billion cubic feet (Bcf), compared with the five-year (2010-14) average of 1,420 for the same time period. However, 2015 injections have been 8% lower than last year's record injections of 1,887 for the same weeks. The largest injections occurred earlier in the injection season, with injections in recent weeks closer to the five-year average. Production growth has been the main driver of strong inventory builds this year.

Natural Gas Consumption. EIA's forecast of U.S. total natural gas consumption averages 76.5 Bcf/d in 2015 and 76.6 Bcf/d in 2016, compared with 73.5 Bcf/d in 2014. EIA projects natural gas consumption in the power sector to increase by 14.4% in 2015 and then decrease by 3.3% in 2016. Natural gas prices, which are expected to remain below \$3 per million British thermal units (MMBtu) through November, support increased use of natural gas for electricity generation in 2015. Industrial sector consumption increases by 0.9% in 2015 and by 6.4% in

2016, as new industrial projects, particularly in the fertilizer and chemicals sectors, come online late this year and next year, and as industrial consumers continue to take advantage of low natural gas prices. Natural gas consumption in the residential and commercial sectors is projected to decline in both 2015 and 2016.

Natural Gas Production and Trade. EIA expects that marketed natural gas production will increase by 4.2 Bcf/d (5.7%) and by 1.7 Bcf/d (2.2%) in 2015 and 2016, respectively. EIA expects moderate production growth through 2016, with increases in the Lower 48 states expected to more than offset continuing production declines in the Gulf of Mexico. Increases in drilling efficiency will continue to support growing natural gas production in the forecast despite relatively low natural gas prices. Most of the growth is expected to come from the Marcellus Shale as the backlog of uncompleted wells is reduced and as new pipelines come online to deliver Marcellus natural gas to markets in the Northeast.

Increases in domestic natural gas production are expected to reduce demand for natural gas imports from Canada and to support growth in exports to Mexico. Earlier this year, natural gas net imports fell to the lowest monthly level since 1987, averaging 2.3 Bcf/d in both May and June. EIA expects natural gas exports to Mexico, particularly from the Eagle Ford Shale in South Texas, to increase because of growing demand from Mexico's electric power sector coupled with flat natural gas production in Mexico.

EIA projects liquefied natural gas (LNG) gross exports will increase to an average of 0.79 Bcf/d in 2016, with the startup of a major LNG liquefaction plant in the Lower 48 states.

Natural Gas Inventories. On August 28, natural gas working inventories totaled 3,193 Bcf, 495 Bcf (18%) above the level at the same time in 2014 and 122 Bcf (4%) above the five-year average for that week. EIA projects end-of-October 2015 inventories will total 3,840 Bcf, which would be 43 Bcf above the five-year average.

Natural Gas Prices. The Henry Hub natural gas spot price averaged \$2.77/MMBtu in August, a decrease of 7 cents/MMBtu from the July price. The current STEO lowers the projection for prices slightly from last month's forecast; monthly average spot prices remain lower than \$3/MMBtu through November, and lower than \$4/MMBtu through the remainder of the forecast. The projected Henry Hub natural gas price averages \$2.84/MMBtu in 2015 and \$3.11/MMBtu in 2016.

Natural gas futures contracts for December 2015 delivery traded during the five-day period ending September 3 averaged \$2.91/MMBtu. Current options and futures prices imply that market participants place the lower and upper bounds for the 95% confidence interval for December 2015 contracts at \$2.08/MMBtu and \$4.06/MMBtu, respectively. At this time in 2014, the natural gas futures contract for December 2014 delivery averaged \$4.07 /MMBtu, and the corresponding lower and upper limits of the 95% confidence interval were \$3.09/MMBtu and \$5.35/MMBtu, respectively.

Coal

Coal Trade. Slower growth in world coal demand, lower international coal prices, and higher coal output in other coal-exporting countries have all led to a decline in U.S. coal exports. Lower mining costs, cheaper transportation costs, and favorable exchange rates will continue to provide an advantage to mines in other major coal-exporting countries compared with U.S. producers. Coal exports for the first half of 2015 are down 20% compared with the same period in 2014, and U.S. steam coal exports fell by 21%, or 4.1 million short tons (MMst). The 5.8 MMst of coal exports for June 2015 was the lowest monthly volume for coal exports since February 2010. EIA projects coal exports will fall by 18 MMst, to 80 MMst, in 2015, and then decrease by another 7 MMst (9%) in 2016. U.S. coal imports, which increased by more than 2 MMst in 2014 to 11 MMst, are expected to average near that level in 2015 and 2016.

Coal Consumption. EIA expects a 7% decrease in total coal consumption in 2015, with electric power sector consumption also falling by 7%. Lower natural gas prices are the key factor driving the decrease in coal consumption. Projected low natural gas prices (power sector natural gas prices are 27% lower in 2015 compared with 2014) make it more economical to run natural gas-fired generating units at higher utilization rates. The retirements of coal-fired power plants in response to the implementation of the Mercury and Air Toxics Standards (MATS) also reduces coal-fired capacity in the power sector in 2015, but because the retirements are occurring throughout 2015, the full effect will not be evident until 2016.

Projected rising electricity demand and higher natural gas prices next year are expected to contribute to higher utilization rates among the remaining coal-fired power plants. Even with continued implementation of MATS, which the U.S. Supreme Court recently sent back to the U.S. Court of Appeals for the D.C. Circuit for further review, coal consumption in the electric power sector is forecast to increase by 1.5% in 2016. Expected growth in renewable-based generation is one barrier to a larger rebound in coal-fired generation in 2016. Nonhydropower renewable-based electricity generation is expected to grow by 12% in 2016, with the largest growth occurring in the South (21%).

Coal Supply. Lower domestic coal consumption and exports, combined with a slight increase in coal imports, are projected to contribute to an 86 MMst (9%) decline in production in 2015. Coal production is expected to decrease in all coal-producing regions in 2015, with the largest decline (on a percentage basis) occurring in the Appalachian region. U.S. production is expected to decrease slightly (3 MMst) in 2016.

Electric power sector stockpiles were 168 MMst in June (the most recent month for which data are available), a 4% decrease from the level in May. This decrease in coal stockpiles from May to June follows the normal seasonal pattern, where coal stockpiles begin to decrease as the U.S. enters the summer months. Coal inventories in June 2015 were 35 MMst higher than in June 2014 when inventories were still recovering from the effects of colder-than-normal temperatures during the 2013-14 winter season.

Coal Prices. The annual average coal price to the electric power sector increased from \$2.34/MMBtu in 2013 to \$2.36/MMBtu in 2014. EIA expects the delivered coal price to average \$2.27/MMBtu in both 2015 and 2016.

Electricity

The electricity industry retired nearly 9,800 megawatts (MW) of conventional steam coal-fired generating capacity during the first six months of this year. These retirements represent 3.3% of the amount of operating steam coal capacity existing at the end of 2014. The states with the largest amount of retired coal capacity include Ohio (2,659 MW), Georgia (1,861 MW), and Kentucky (1,409 MW). The industry plans to retire an additional 3,133 MW of coal capacity this year and nearly 6,000 MW during 2016.

Electricity Consumption. Retail sales of electricity to the residential sector during the first six months of 2015 were 1.7% lower than residential sales during the first half of 2014, as winter and spring temperatures this year were milder than last year. EIA expects residential sales during the second half of 2015 will be 2.1% higher than the same period in 2014 because of comparatively warmer summer temperatures. Forecast residential sales of electricity decline by 0.6% in 2016. Projected retail sales of electricity to the commercial sector grow by 0.7% in 2015, while industrial sector electricity sales fall by 0.2%. EIA expects commercial and industrial sales in 2016 to grow by 1.3% and 1.2%, respectively.

Electricity Generation. While the retirement of some coal-fired capacity has contributed to the decline in coal-fired electricity generation over the past year, the relatively low cost of natural gas has been a more significant driver in coal's declining generation fuel share and the increase in the share generated by natural gas. During the first half of 2015, coal accounted for 34% of total generation compared with 40% during the same period last year, while natural gas accounted for 30%, up from 25% during the first half of 2014. For all of 2015, EIA expects the annual amount of coal generation will be 8.2% lower than in 2014, and the annual level of natural gas generation will rise by 14.5%. The forecast for coal generation increases slightly (1.4%) in 2016, and natural gas generation falls (3.0%) in response to projected higher natural gas fuel costs.

Electricity Retail Prices. The U.S. retail price of electricity to the residential sector is projected to average 12.7 cents per kilowatthour in 2015, which is 1.3% higher than the average price last year. The largest price increases are projected to be in New England, where residential electricity prices are forecast to increase by 10.8% in 2015, as electricity distribution companies recover higher generation and power purchase costs incurred during 2014. Wholesale power prices in New England have been relatively low this year, and EIA expects retail New England prices during the second half of 2015 will be lower than during the first half.

Renewables and Carbon Dioxide Emissions

Electricity and Heat Generation from Renewables. EIA expects total renewables used in the electric power sector will decrease by 3.5% in 2015. Conventional hydropower generation is

forecast to decrease by 10.4%, and nonhydropower renewable power generation is forecast to increase by 3.2%. The 2015 decrease in hydropower generation reflects the effects of the California drought. Forecast generation from hydropower in the electric power sector increases by 9.2% in 2016.

EIA expects continued growth in utility-scale solar power generation, which is projected to average 89 gigawatthours per day (GWh/d) in 2016. Because the growth is from a small base, utility-scale solar power averages 0.8% of total U.S. electricity generation in 2016. Although solar growth has historically been concentrated in customer-sited distributed generation installations (rooftop panels), EIA expects utility-scale solar capacity will increase by more than 100% (11 GW) between the end of 2014 and the end of 2016, with 4.1 GW of new capacity being built in California. Other leading states in utility-scale solar capacity include North Carolina and Nevada, which, combined with California, account for almost 70% of the projected utility-scale capacity additions for 2015 and 2016.

Power plant developers have notified EIA of plans to construct 13 solar projects in Georgia (totaling 607 MW) with expected 2015 or 2016 in-service dates. Five of these new projects (166 MW) will be built on U.S. military bases. Georgia currently has 66 MW of utility-scale solar capacity. According to current law, projects coming online after the end of 2016 will see a federal investment tax credit of 10%, lower than the 30% investment tax credit available for projects that come online before the end of 2016. This impending decline in the tax credit provides a strong incentive for projects to enter service before the end of 2016.

Wind capacity, which grew by 8% in 2014, is forecast to increase by 12% in 2015 and by 13% in 2016. Because wind is starting from a much larger base than solar, even though the growth rate is lower, the absolute increase in wind capacity is twice that of solar: 18 GW of wind compared with 11 GW of utility-scale solar between 2014 and 2016.

Liquid Biofuels. On May 29, the U.S. Environmental Protection Agency (EPA) proposed a rule setting Renewable Fuel Standard (RFS) volumes for 2014 through 2016. Although these volumes could be modified before the final rule is issued, they are used in developing the current STEO. Ethanol production, which averaged 934,000 b/d in 2014, is forecast to average more than 950,000 b/d in both 2015 and 2016. Ethanol consumption, which averaged 877,000 b/d in 2014, is forecast to average slightly more than 900,000 b/d in both 2015 and 2016, resulting in an average 9.9% ethanol share of the total gasoline pool. EIA does not expect significant increases in E15 or E85 consumption over the forecast period. The proposed RFS targets could encourage imports of Brazilian sugarcane ethanol, which were 3,000 b/d in 2014.

EIA expects the largest effect of the proposed RFS targets will be on biodiesel consumption, which contributes to meeting the biomass-based diesel, advanced biofuel, and total renewable fuel RFS targets. Biodiesel production averaged an estimated 81,000 b/d in 2014 and is forecast to average 92,000 b/d in 2015 and 98,000 b/d in 2016. Net imports of biomass-based diesel are also expected to increase from 15,000 b/d in 2014 to 23,000 b/d in 2015, and to 35,000 b/d in 2016. EIA expects that a combination of higher biomass-based diesel consumption, higher

consumption of domestic and imported ethanol, and banked Renewable Identification Numbers (RINs) will help meet the newly proposed RFS volumes through 2016.

Energy-Related Carbon Dioxide Emissions. EIA estimates that emissions grew by 1.0% in 2014. Emissions are projected to fall by 0.4% in 2015 and then rise by 0.6% in 2016. These forecasts are sensitive to both weather and economic assumptions. Monthly carbon dioxide emissions from the electric power sector were at a 27-year low in April, which is typically the month with the lowest generation level each year.

U.S. Economic Assumptions

Recent Economic Indicators. The Bureau of Economic Analysis reported that U.S. real GDP increased at an annual rate of 3.7% in the second quarter of 2015, higher than the initial estimate of 2.3%. The increase in real GDP in the second quarter reflected positive contributions from personal consumption expenditures, exports, state and local government spending, nonresidential fixed investment, residential fixed investment, and private inventory investment.

EIA used the August 2015 version of the IHS macroeconomic model with EIA's energy price forecasts as model inputs to develop the economic projections in the STEO.

Production, Income, and Employment. Forecast real GDP growth reaches 2.1% in 2015 and rises to 2.5% in 2016. The GDP growth forecast is slightly below the forecast in the August STEO. Real disposable income grows by 3.5% in 2015, unchanged from the forecast last month, and by 2.7% in 2016. Total industrial production grows at 1.5% in 2015 and 1.6% in 2016. Projected growth in nonfarm employment averages 2.1% in 2015 and 1.4% in 2016.

Expenditures. Forecast growth in private real fixed investment averages 3.8% and 6.3% in 2015 and 2016, respectively, led by equipment in 2015 and 2016 and by equipment and structures in 2016. Real consumption expenditures grow faster than real GDP in 2015, at 3.0%, and 2016, at 2.8%. Durable goods expenditures drive consumption spending in both years. Export growth is 1.9% and 4.2% and import growth is 5.7% and 4.4% in 2015 and 2016, respectively. Total government expenditures rise 0.5% in 2015 and 0.7% in 2016.

This report was prepared by the U.S. Energy Information Administration (EIA), the statistical and analytical agency within the U.S. Department of Energy. By law, EIA's data, analyses, and forecasts are independent of approval by any other officer or employee of the United States Government. The views in this report therefore should not be construed as representing those of the U.S. Department of Energy or other federal agencies.

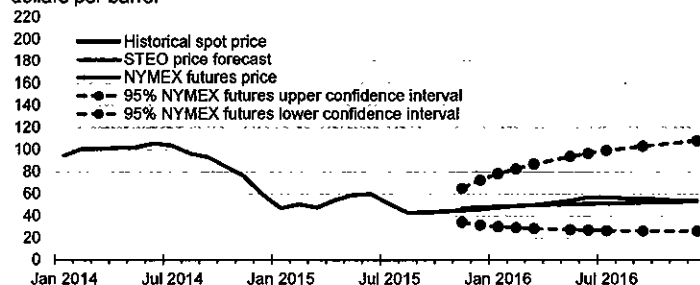


Short-Term Energy Outlook

Chart Gallery for September 2015

West Texas Intermediate (WTI) Crude Oil Price

dollars per barrel

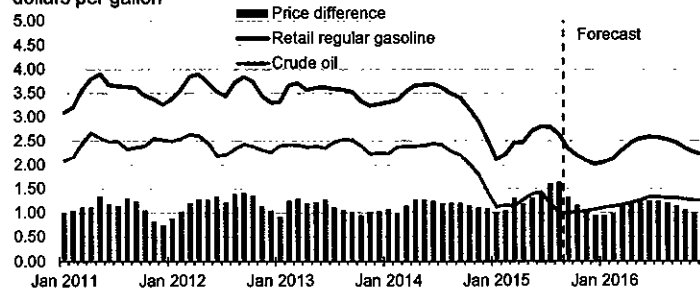


Note: Confidence interval derived from options market information for the 5 trading days ending Sep. 3, 2015. Intervals not calculated for months with sparse trading in near-the-money options contracts.

Source: Short-Term Energy Outlook, September 2015.

U.S. Gasoline and Crude Oil Prices

dollars per gallon

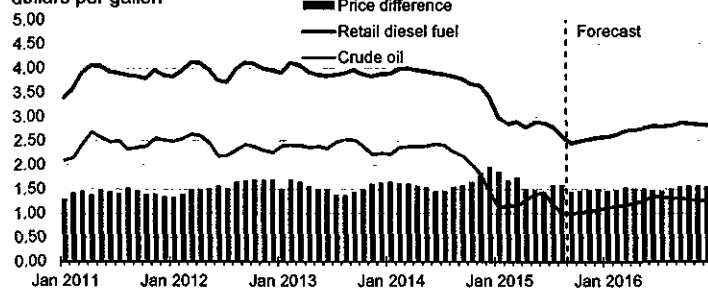


Crude oil price is composite refiner acquisition cost. Retail prices include state and federal taxes.

Source: Short-Term Energy Outlook, September 2015.

U.S. Diesel Fuel and Crude Oil Prices

dollars per gallon

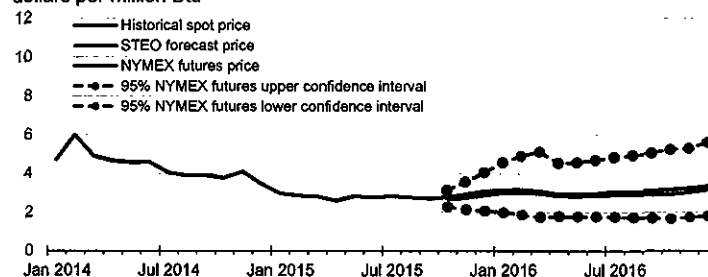


Crude oil price is composite refiner acquisition cost. Retail prices include state and federal taxes.

Source: Short-Term Energy Outlook, September 2015.

Henry Hub Natural Gas Price

dollars per million Btu

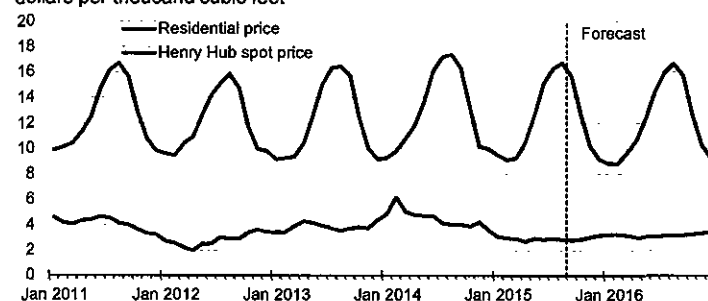


Note: Confidence interval derived from options market information for the 5 trading days ending Sep. 3, 2015. Intervals not calculated for months with sparse trading in near-the-money options contracts.

Source: Short-Term Energy Outlook, September 2015.

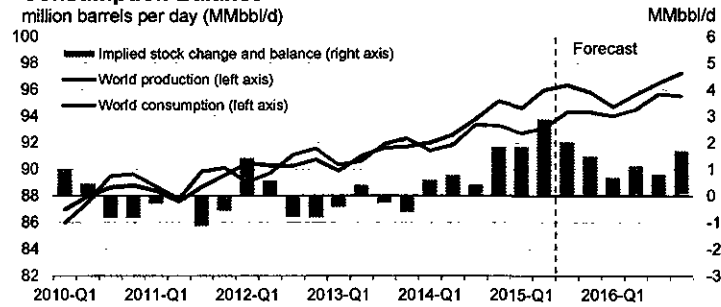
U.S. Natural Gas Prices

dollars per thousand cubic feet

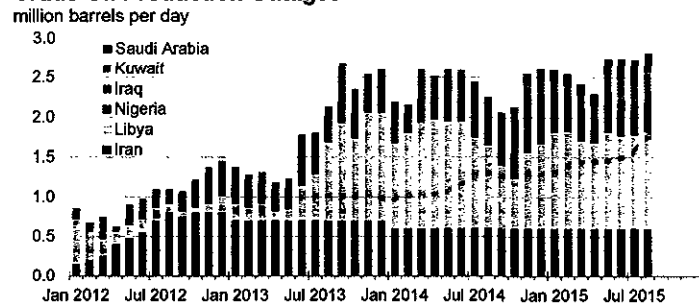


Source: Short-Term Energy Outlook, September 2015.

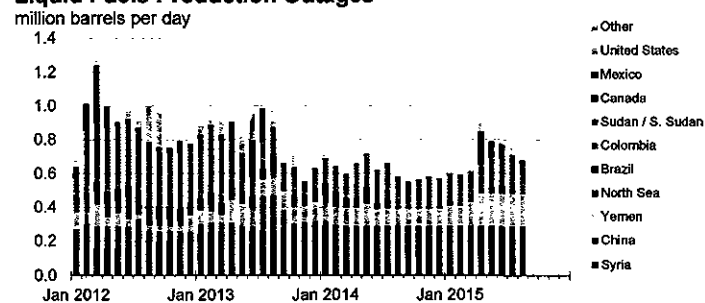
World Liquid Fuels Production and Consumption Balance



Estimated Historical Unplanned OPEC Crude Oil Production Outages

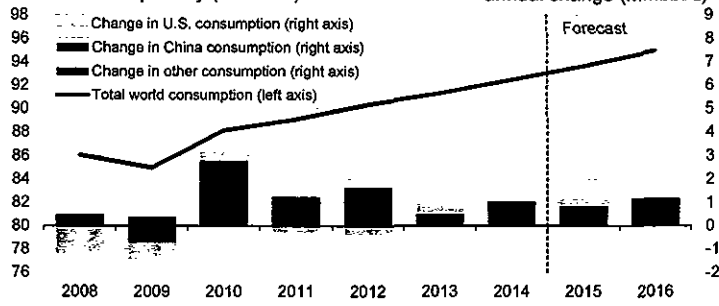


Estimated Historical Unplanned Non-OPEC Liquid Fuels Production Outages



World Liquid Fuels Consumption

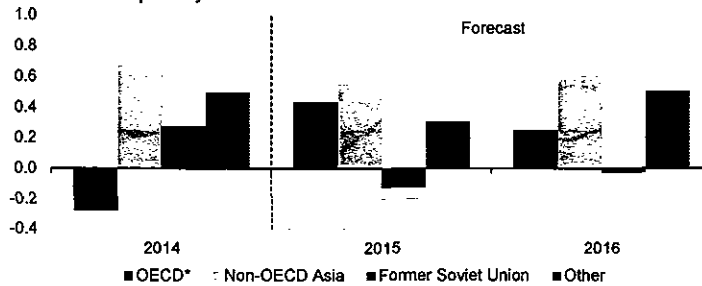
million barrels per day (MMbbl/d)



Source: Short-Term Energy Outlook, September 2015.

World Liquid Fuels Consumption Growth

million barrels per day

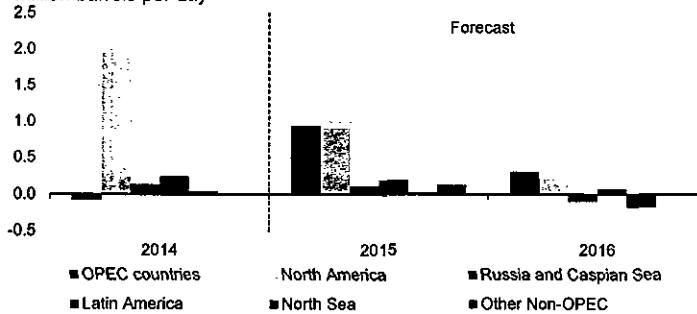


* Countries belonging to the Organization for Economic Cooperation and Development

Source: Short-Term Energy Outlook, September 2015.

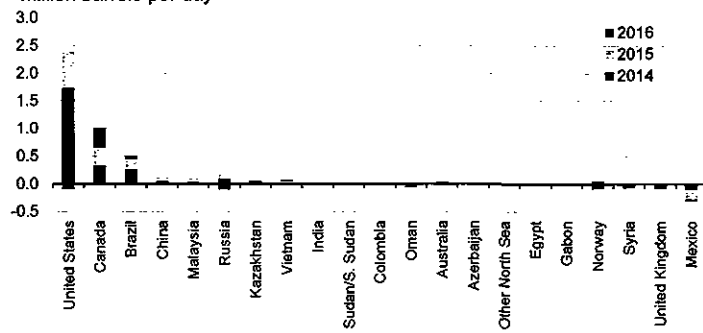
World Crude Oil and Liquid Fuels Production Growth

million barrels per day



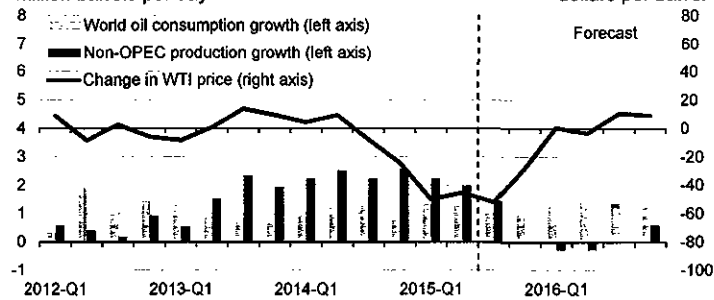
Source: Short-Term Energy Outlook, September 2015.

Non-OPEC Crude Oil and Liquid Fuels Production Growth



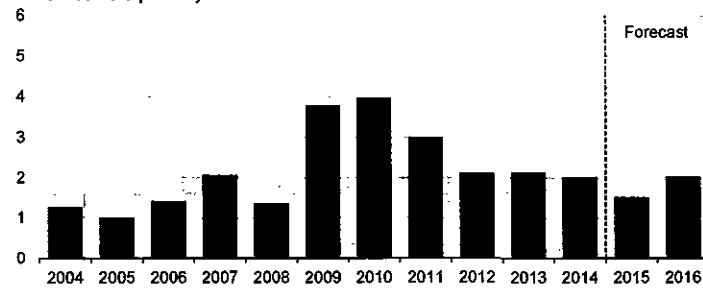
Source: Short-Term Energy Outlook, September 2015.

World Consumption and Non-OPEC Production Growth



Source: Short-Term Energy Outlook, September 2015.

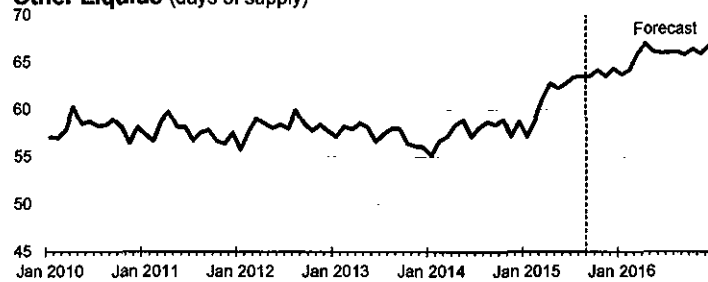
OPEC surplus crude oil production capacity



Note: Shaded area represents 2004-2014 average (2.2 million barrels per day).

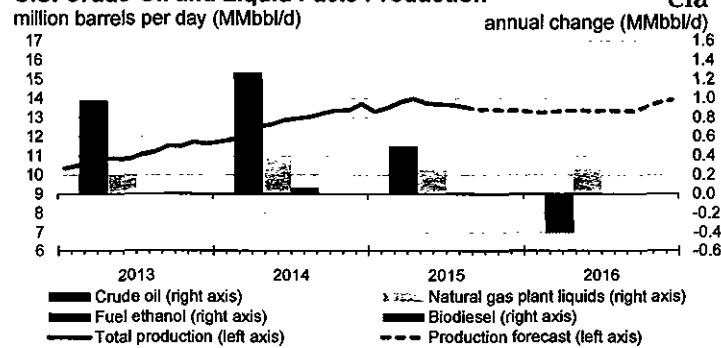
Source: Short-Term Energy Outlook, September 2015.

OECD Commercial Stocks of Crude Oil and Other Liquids (days of supply)



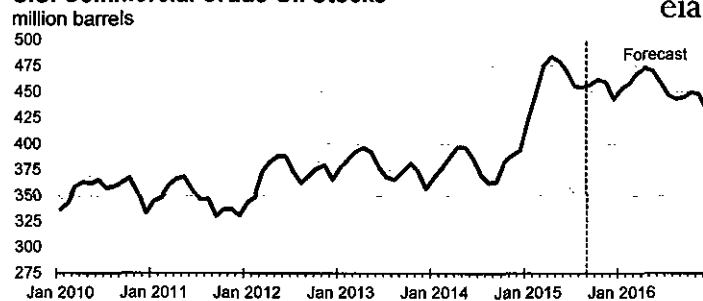
Note: Colored band around days of supply of crude oil and other liquids stocks represent the range between the minimum and maximum from Jan. 2010 - Dec. 2014.
Source: Short-Term Energy Outlook, September 2015.

U.S. Crude Oil and Liquid Fuels Production



Source: Short-Term Energy Outlook, September 2015.

U.S. Commercial Crude Oil Stocks



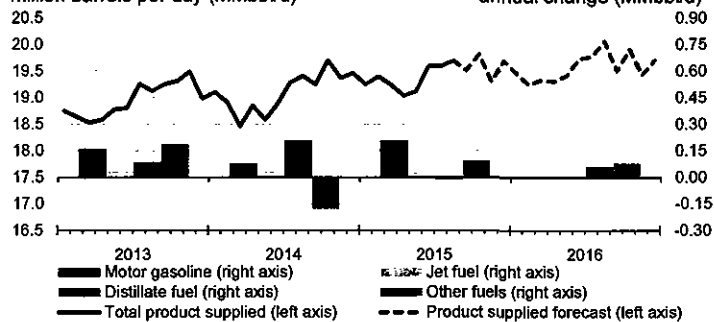
Note: Colored band around storage levels represents the range between the minimum and maximum from Jan. 2010 - Dec. 2014.

Source: Short-Term Energy Outlook, September 2015.

U.S. Liquid Fuels Product Supplied

million barrels per day (MMbbl/d)

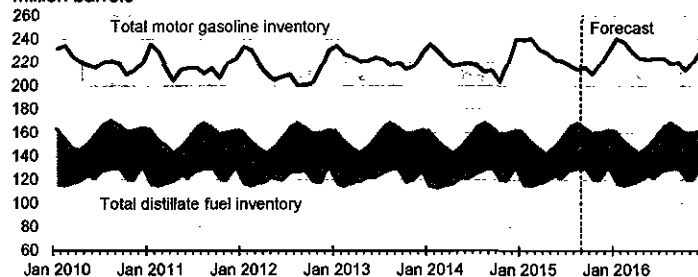
annual change (MMbbl/d)



Source: Short-Term Energy Outlook, September 2015.

U.S. Gasoline and Distillate Inventories

million barrels



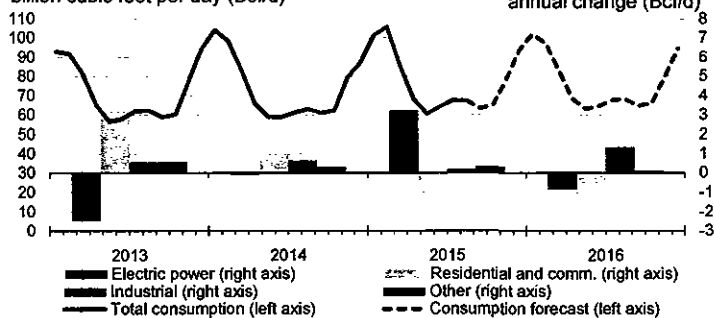
Note: Colored bands around storage levels represent the range between the minimum and maximum from Jan. 2010 - Dec. 2014.

Source: Short-Term Energy Outlook, September 2015.

U.S. Natural Gas Consumption

billion cubic feet per day (Bcf/d)

annual change (Bcf/d)

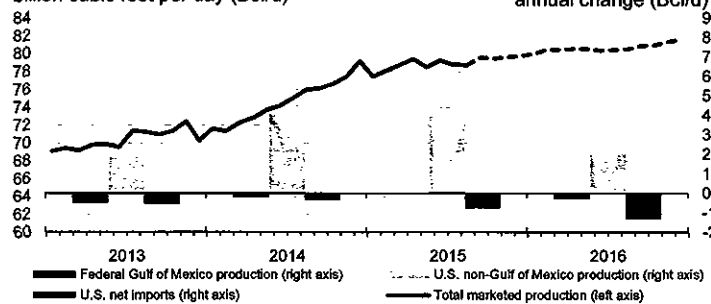


Source: Short-Term Energy Outlook, September 2015.

U.S. Natural Gas Production and Imports

billion cubic feet per day (Bcf/d)

annual change (Bcf/d)

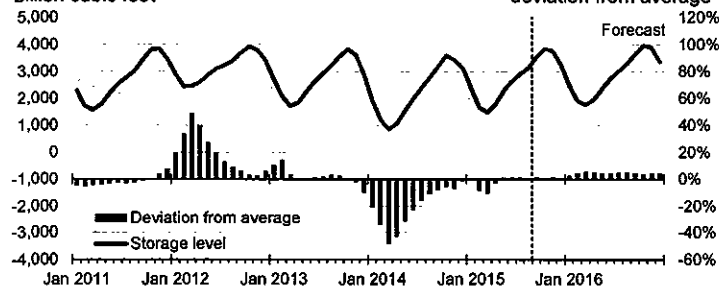


Source: Short-Term Energy Outlook, September 2015.

U.S. Working Natural Gas in Storage

billion cubic feet

deviation from average



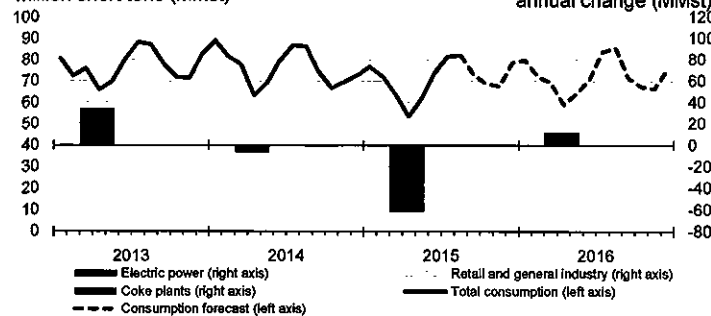
Note: Colored band around storage levels represents the range between the minimum and maximum from Jan. 2010 - Dec. 2014.

Source: Short-Term Energy Outlook, September 2015.

U.S. Coal Consumption

million short tons (MMst)

annual change (MMst)

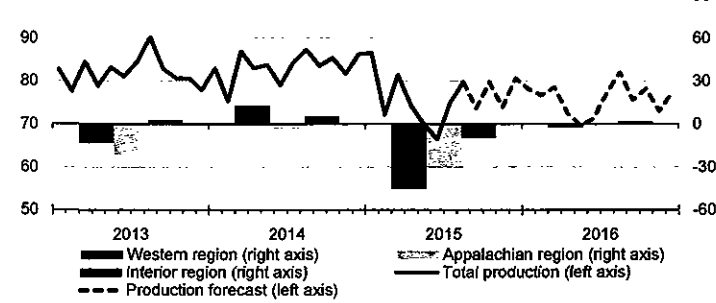


Source: Short-Term Energy Outlook, September 2015.

U.S. Coal Production

million short tons (MMst)

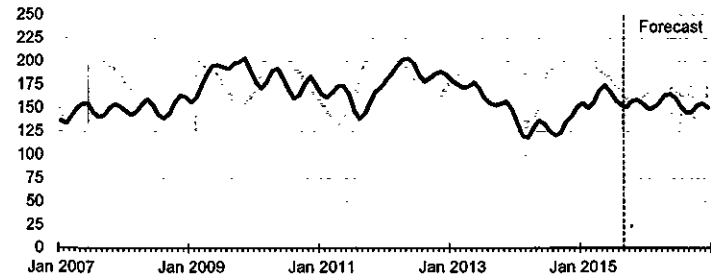
annual change (MMst)



Source: Short-Term Energy Outlook, September 2015.

U.S. Electric Power Coal Stocks

million short tons



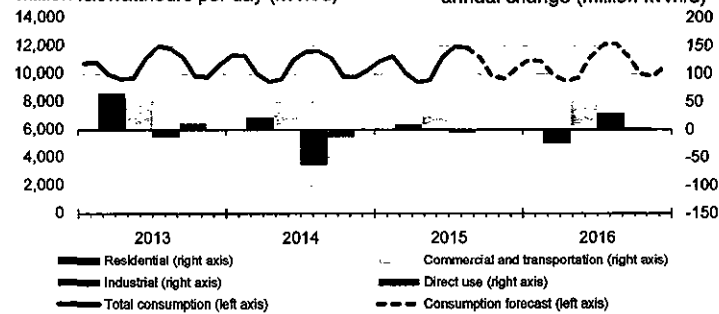
Note: Colored band around stock levels represents the range between the minimum and maximum from Jan. 2007 - Dec. 2014.

Source: Short-Term Energy Outlook, September 2015.

U.S. Electricity Consumption

million kilowatthours per day (kWh/d)

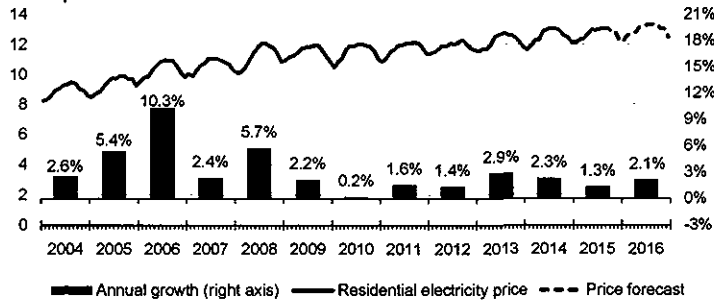
annual change (million kWh/d)



Source: Short-Term Energy Outlook, September 2015.

U.S. Residential Electricity Price

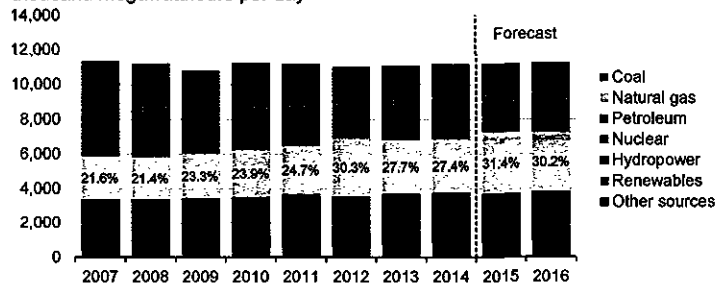
cents per kilowatthour



Source: Short-Term Energy Outlook, September 2015.

U.S. Electricity Generation by Fuel, All Sectors

thousand megawatthours per day

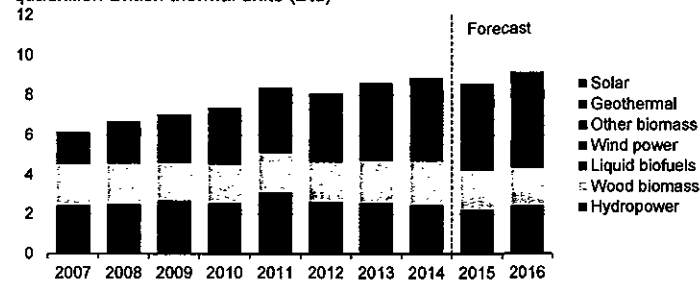


Note: Labels show percentage share of total generation provided by coal and natural gas.

Source: Short-Term Energy Outlook, September 2015.

U.S. Renewable Energy Supply

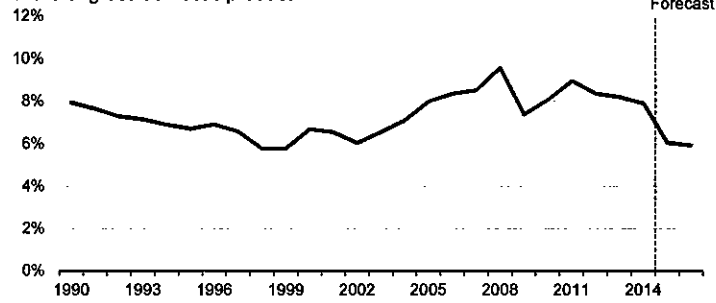
quadrillion British thermal units (Btu)



Note: Hydropower excludes pumped storage generation. Liquid biofuels include ethanol and biodiesel. Other biomass includes municipal waste from biogenic sources, landfill gas, and other non-wood waste.

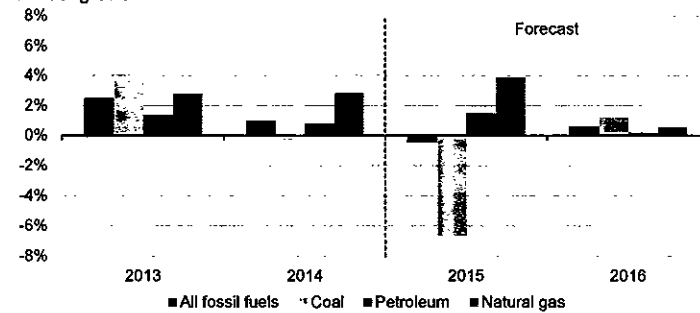
Source: Short-Term Energy Outlook, September 2015.

U.S. Annual Energy Expenditures share of gross domestic product



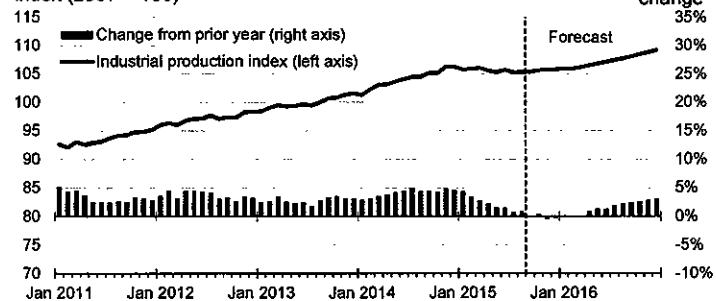
Source: Short-Term Energy Outlook, September 2015.

U.S. Energy-Related Carbon Dioxide Emissions annual growth



Source: Short-Term Energy Outlook, September 2015.

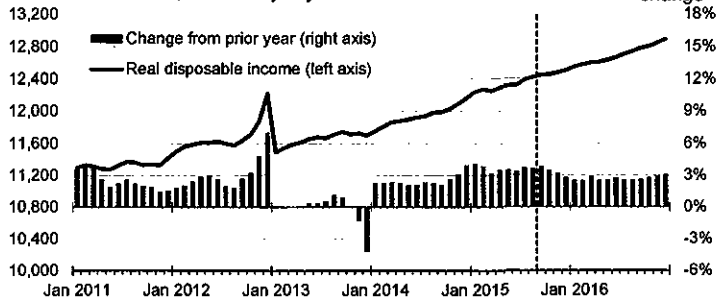
U.S. Total Industrial Production Index index (2007 = 100)



Source: Short-Term Energy Outlook, September 2015.

U.S. Disposable Income

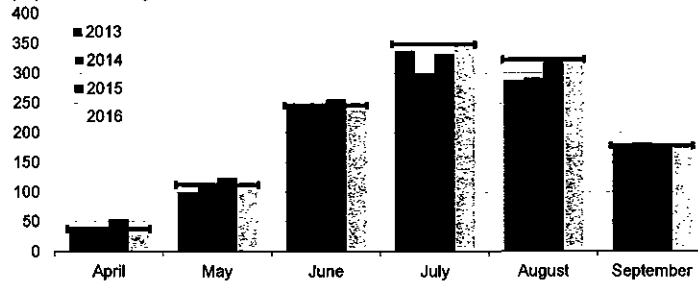
billion 2009 dollars, seasonally adjusted



Source: Short-Term Energy Outlook, September 2015.

U.S. Summer Cooling Degree Days

population-weighted

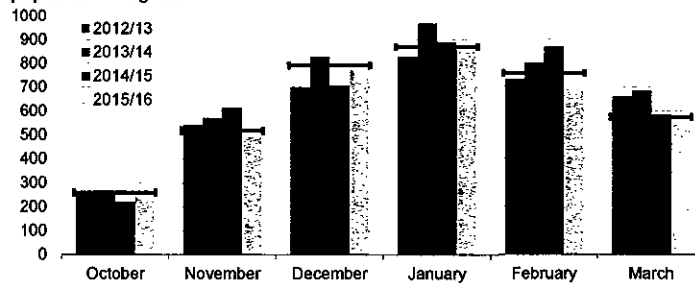


Note: EIA calculations based on from the National Oceanic and Atmospheric Administration data. Horizontal lines indicate each month's prior 10-year average (2005-2014). Projections reflect NOAA's 14-16 month outlook.

Source: Short-Term Energy Outlook, September 2015.

U.S. Winter Heating Degree Days

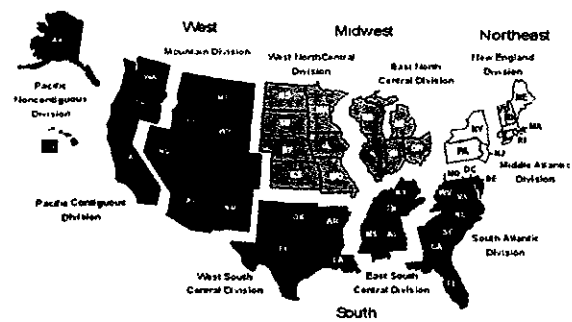
population-weighted



Note: EIA calculations based on National Oceanic and Atmospheric Administration (NOAA) data. Horizontal lines indicate each month's prior 10-year average (Oct 2005 - Mar 2015). Projections reflect NOAA's 14-16 month outlook.

Source: Short-Term Energy Outlook, September 2015.

U.S. Census Regions and Divisions



Source: Short-Term Energy Outlook, September 2015.

Table SF01. U.S. Motor Gasoline Summer Outlook

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014			2015			Year-over-year Change (percent)		
	Q2	Q3	Season	Q2	Q3	Season	Q2	Q3	Season
Nominal Prices (dollars per gallon)									
WTI Crude Oil (Spot) ^a	2.46	2.33	2.39	1.38	1.09	1.23	-44.0	-53.3	-48.6
Brent Crude oil Price (Spot)	2.61	2.43	2.52	1.47	1.21	1.34	-43.8	-50.1	-46.9
U.S. Refiner Average Crude Oil Cost	2.41	2.30	2.35	1.37	1.06	1.21	-43.2	-53.7	-48.4
Wholesale Gasoline Price ^b	2.98	2.76	2.87	2.01	1.80	1.90	-32.4	-35.0	-33.6
Wholesale Diesel Fuel Price ^b	3.00	2.88	2.94	1.89	1.54	1.71	-37.0	-46.5	-41.7
Regular Gasoline Retail Price ^c	3.68	3.50	3.59	2.67	2.60	2.63	-27.5	-25.9	-26.7
Diesel Fuel Retail Price ^c	3.94	3.84	3.89	2.85	2.61	2.73	-27.7	-32.0	-29.8
Gasoline Consumption/Supply (million barrels per day)									
Total Consumption	9.006	9.130	9.069	9.260	9.339	9.300	2.8	2.3	2.5
Total Refinery and Blender Output ^d	7.879	8.036	7.958	8.022	8.259	8.141	1.8	2.8	2.3
Fuel Ethanol Blending	0.886	0.889	0.887	0.919	0.918	0.918	3.7	3.2	3.5
Total Stock Withdrawal ^e	0.026	0.074	0.050	0.115	0.058	0.086			
Net Imports ^e	0.215	0.131	0.173	0.204	0.105	0.154	-4.9	-20.2	-10.7
Refinery Utilization (percent)	90.4	93.4	91.9	92.8	93.9	93.4			
Gasoline Stocks, Including Blending Components (million barrels)									
Beginning	221.6	219.3	221.6	231.5	221.0	231.5			
Ending	219.3	212.5	212.5	221.0	215.7	215.7			
Economic Indicators (annualized billion 2000 dollars)									
Real GDP	16,010	16,206	16,108	16,381	16,458	16,419	2.3	1.6	1.9
Real Income	11,900	11,970	11,935	12,312	12,417	12,365	3.5	3.7	3.6

^a Spot Price of West Texas Intermediate (WTI) crude oil.^b Price product sold by refiners to resellers.^c Average pump price including taxes.^d Refinery and blender net production plus finished motor gasoline adjustment.^e Total stock withdrawal and net imports includes both finished gasoline and gasoline blend components.

GDP = gross domestic product.

Notes: Minor discrepancies with other Energy Information Administration (EIA) published historical data are due to rounding. Historical data are printed in bold. Forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Historical data: latest data available from: EIA *Petroleum Supply Monthly*, DOE/EIA-0109; Monthly Energy Review, DOE/EIA-0035; U.S. Department of Commerce, Bureau of Economic Analysis (GDP and income); Reuters News Service (WTI and Brent crude oil spot prices). Macroeconomic projections are based on IHS Global Insight Macroeconomic Forecast Model.

Table SF02 Average Summer Residential Electricity Usage, Prices and Expenditures

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2010	2011	2012	2013	2014	Forecast 2015	Change from 2014
United States							
Usage (kWh)	3,471	3,444	3,354	3,126	3,019	3,122	3.4%
Price (cents/kWh)	12.00	12.06	12.09	12.67	13.02	13.00	-0.2%
Expenditures	\$416	\$415	\$405	\$396	\$393	\$406	3.2%
New England							
Usage (kWh)	2,227	2,122	2,188	2,173	1,927	1,977	2.6%
Price (cents/kWh)	16.14	15.85	15.50	16.16	17.61	19.66	11.6%
Expenditures	\$359	\$336	\$339	\$351	\$339	\$389	14.5%
Mid-Atlantic							
Usage (kWh)	2,644	2,531	2,548	2,447	2,208	2,346	6.2%
Price (cents/kWh)	16.66	16.39	15.63	16.51	16.85	16.48	-2.2%
Expenditures	\$440	\$415	\$398	\$404	\$372	\$387	3.9%
East North Central							
Usage (kWh)	3,073	2,975	3,048	2,618	2,494	2,478	-0.7%
Price (cents/kWh)	11.94	12.17	12.08	12.67	13.07	13.12	0.4%
Expenditures	\$367	\$362	\$368	\$332	\$326	\$325	-0.3%
West North Central							
Usage (kWh)	3,558	3,517	3,547	3,098	3,004	3,058	1.8%
Price (cents/kWh)	10.74	11.16	11.50	12.35	12.45	12.75	2.4%
Expenditures	\$382	\$393	\$408	\$383	\$374	\$390	4.2%
South Atlantic							
Usage (kWh)	4,411	4,277	4,001	3,771	3,760	3,988	6.1%
Price (cents/kWh)	11.39	11.48	11.65	11.84	12.11	12.02	-0.7%
Expenditures	\$502	\$491	\$466	\$447	\$455	\$479	5.3%
East South Central							
Usage (kWh)	4,902	4,750	4,467	4,078	4,020	4,316	7.4%
Price (cents/kWh)	9.90	10.28	10.36	10.80	11.09	10.93	-1.4%
Expenditures	\$485	\$488	\$463	\$440	\$446	\$472	5.8%
West South Central							
Usage (kWh)	4,830	5,231	4,781	4,507	4,242	4,407	3.9%
Price (cents/kWh)	10.86	10.64	10.27	11.03	11.41	11.17	-2.1%
Expenditures	\$525	\$557	\$491	\$497	\$484	\$492	1.7%
Mountain							
Usage (kWh)	3,340	3,322	3,440	3,381	3,215	3,231	0.5%
Price (cents/kWh)	11.25	11.29	11.55	12.06	12.37	12.51	1.1%
Expenditures	\$376	\$375	\$397	\$408	\$398	\$404	1.7%
Pacific							
Usage (kWh)	2,006	2,022	2,079	2,026	2,071	2,021	-2.4%
Price (cents/kWh)	12.95	13.22	13.78	14.59	15.20	15.44	1.6%
Expenditures	\$260	\$267	\$286	\$295	\$315	\$312	-0.8%

Notes: kWh = kilowatthours. All data cover the 3-month period of June-August of each year. Usage amounts represent total residential retail electricity sales per customer. Prices and expenditures are not adjusted for inflation.

Source: EIA Form-861 and Form-826 databases, Short-Term Energy Outlook.

Table 1. U.S. Energy Markets Summary
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Energy Supply															
Crude Oil Production (a) (million barrels per day)	8.15	8.62	8.85	9.25	9.40	9.44	9.11	8.96	8.84	8.78	8.68	8.98	8.72	9.22	8.82
Dry Natural Gas Production (billion cubic feet per day)	67.84	69.33	71.30	73.31	73.68	74.34	74.32	74.88	75.52	75.72	75.83	76.47	70.46	74.31	75.89
Coal Production (million short tons)	245	246	255	253	240	211	228	234	233	213	235	229	1,000	914	910
Energy Consumption															
Liquid Fuels (million barrels per day)	18.82	18.77	19.31	19.51	19.29	19.25	19.60	19.60	19.34	19.48	19.78	19.68	19.11	19.44	19.57
Natural Gas (billion cubic feet per day)	95.10	61.23	61.75	76.19	97.05	64.30	66.07	78.99	94.07	65.43	66.86	80.11	73.48	76.52	76.60
Coal (b) (million short tons)	248	212	247	209	212	189	236	215	221	194	241	209	917	853	865
Electricity (billion kilowatt hours per day)	10.87	10.04	11.46	9.95	10.73	10.04	11.68	9.97	10.58	10.14	11.85	10.10	10.58	10.61	10.67
Renewables (c) (quadrillion Btu)	2.37	2.57	2.28	2.39	2.42	2.44	2.23	2.27	2.39	2.62	2.44	2.46	9.61	9.37	9.91
Total Energy Consumption (d) (quadrillion Btu)	28.59	23.01	24.07	24.79	26.39	22.92	24.12	24.65	26.05	23.17	24.49	24.88	98.46	98.09	98.59
Energy Prices															
Crude Oil (e) (dollars per barrel)	97.60	101.08	96.45	73.48	47.98	57.42	44.66	44.02	48.00	53.36	55.34	53.33	92.05	48.54	52.59
Natural Gas Henry Hub Spot (dollars per million Btu)	5.21	4.61	3.96	3.80	2.90	2.75	2.78	2.95	3.14	2.96	3.08	3.26	4.39	2.84	3.11
Coal (dollars per million Btu)	2.33	2.39	2.37	2.37	2.26	2.25	2.28	2.27	2.26	2.29	2.29	2.26	2.36	2.27	2.27
Macroeconomic															
Real Gross Domestic Product (billion chained 2009 dollars - SAAR)	15,832	16,010	16,206	16,295	16,288	16,381	16,458	16,568	16,667	16,774	16,890	17,028	16,086	16,424	16,840
Percent change from prior year	1.9	2.6	2.7	2.4	2.9	2.3	1.6	1.7	2.3	2.4	2.6	2.8	2.4	2.1	2.5
GDP Implicit Price Deflator (Index, 2009=100)	107.7	108.3	108.6	108.7	108.7	109.2	109.7	110.1	110.7	111.3	111.7	112.2	108.3	109.4	111.5
Percent change from prior year	1.4	1.7	1.6	1.2	0.9	0.9	1.0	1.3	1.9	1.9	1.9	1.9	1.5	1.0	1.9
Real Disposable Personal Income (billion chained 2009 dollars - SAAR)	11,810	11,900	11,970	12,093	12,251	12,312	12,417	12,477	12,576	12,637	12,742	12,846	11,943	12,364	12,700
Percent change from prior year	2.4	2.2	2.3	3.3	3.7	3.5	3.7	3.2	2.7	2.6	2.6	3.0	2.5	3.5	2.7
Manufacturing Production Index (Index, 2007=100)	99.4	101.2	102.4	103.5	103.3	103.6	103.7	104.3	104.4	105.3	106.4	107.6	101.6	103.7	105.9
Percent change from prior year	2.4	3.8	4.6	4.5	3.9	2.4	1.3	0.8	1.1	1.6	2.6	3.2	3.8	2.1	2.1
Weather															
U.S. Heating Degree-Days	2,449	480	81	1,541	2,342	443	76	1,528	2,114	477	76	1,529	4,551	4,389	4,196
U.S. Cooling Degree-Days	35	394	775	96	47	434	835	92	38	391	846	94	1,299	1,408	1,369

- = no data available

Prices are not adjusted for inflation.

(a) Includes lease condensate.

(b) Total consumption includes Independent Power Producer (IPP) consumption.

(c) Renewable energy includes minor components of non-marketed renewable energy that is neither bought nor sold, either directly or indirectly, as inputs to marketed energy.

EIA does not estimate or project end-use consumption of non-marketed renewable energy.

(d) The conversion from physical units to Btu is calculated using a subset of conversion factors used in the calculations of gross energy consumption in EIA's Monthly Energy Review. Consequently, the historical data may not precisely match those published in the MER or the Annual Energy Review (AER).

(e) Refers to the refiner average acquisition cost (RAC) of crude oil.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Petroleum Supply Monthly*, DOE/EIA-0109;

Petroleum Supply Annual, DOE/EIA-0340/2; *Weekly Petroleum Status Report*, DOE/EIA-0208; *Petroleum Marketing Monthly*, DOE/EIA-0380; *Natural Gas Monthly*, DOE/EIA-0130;

Electric Power Monthly, DOE/EIA-0226; *Quarterly Coal Report*, DOE/EIA-0121; and *International Petroleum Monthly*, DOE/EIA-0520.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model. Macroeconomic projections are based on Global Insight Model of the U.S. Economy.

Weather projections from National Oceanic and Atmospheric Administration.

Table 2. Energy Prices

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Crude Oil (dollars per barrel)															
West Texas Intermediate Spot Average	98.68	103.35	97.87	73.21	48.48	67.85	45.75	45.00	49.05	54.38	56.31	54.33	93.17	49.23	53.57
Brent Spot Average	108.14	109.70	101.90	76.43	63.91	61.65	50.89	50.00	54.05	59.38	61.31	59.33	98.89	54.07	58.57
U.S. Imported Average	94.18	98.64	93.85	71.43	46.40	66.06	42.07	41.50	45.51	50.82	52.83	50.84	89.63	46.45	50.12
U.S. Refiner Average Acquisition Cost	97.60	101.08	96.45	73.48	47.98	67.42	44.66	44.02	48.00	53.36	55.34	53.33	92.05	48.54	52.59
U.S. Liquid Fuels (cents per gallon)															
Refiner Prices for Resale															
Gasoline	272	298	276	203	169	201	180	136	149	184	181	155	262	169	167
Diesel Fuel	303	300	288	240	176	189	154	162	171	181	189	188	282	170	182
Heating Oil	303	289	276	228	178	180	145	159	166	166	174	183	274	166	172
Refiner Prices to End Users															
Jet Fuel	297	295	289	234	172	186	148	156	167	176	182	182	278	165	177
No. 6 Residual Fuel Oil (a)	249	244	243	194	137	154	125	115	119	128	137	133	231	132	129
Retail Prices Including Taxes															
Gasoline Regular Grade (b)	340	368	350	288	227	267	260	211	217	253	252	227	336	241	238
Gasoline All Grades (b)	348	375	358	296	238	275	268	219	226	262	261	236	344	250	246
On-highway Diesel Fuel	396	394	384	368	292	285	261	254	265	277	283	285	383	273	277
Heating Oil	397	382	369	330	288	276	247	254	262	260	261	272	372	273	265
Natural Gas															
Henry Hub Spot (dollars per thousand cubic feet)	5.36	4.75	4.08	3.91	2.99	2.83	2.86	3.04	3.24	3.05	3.17	3.36	4.52	2.93	3.20
Henry Hub Spot (dollars per million Btu)	5.21	4.61	3.96	3.80	2.90	2.75	2.78	2.95	3.14	2.96	3.08	3.26	4.39	2.84	3.11
U.S. End-Use Prices (dollars per thousand cubic feet)															
Industrial Sector	6.17	5.62	5.06	5.16	4.66	3.69	3.78	4.08	4.44	3.93	4.07	4.44	5.53	4.05	4.23
Commercial Sector	8.66	9.64	9.69	8.51	7.95	8.13	8.72	7.98	8.05	8.44	9.00	8.26	8.87	8.06	8.27
Residential Sector	9.82	13.11	16.92	10.52	9.29	12.01	16.17	10.04	9.03	11.88	16.07	10.16	10.94	10.33	10.25
U.S. Electricity															
Power Generation Fuel Costs (dollars per million Btu)															
Coal	2.33	2.39	2.37	2.37	2.26	2.25	2.28	2.27	2.26	2.29	2.29	2.26	2.36	2.27	2.27
Natural Gas	6.82	4.93	4.25	4.30	4.09	3.12	3.57	3.94	4.09	3.68	3.81	4.20	4.98	3.65	3.93
Residual Fuel Oil (c)	19.97	20.44	19.75	14.72	10.82	11.51	11.23	10.14	10.22	11.50	11.85	11.64	19.18	10.88	11.29
Distillate Fuel Oil	23.40	22.77	21.88	18.72	15.39	15.02	12.83	13.70	14.25	14.56	15.04	15.84	22.34	14.52	14.87
End-Use Prices (cents per kilowatthour)															
Industrial Sector	6.99	6.92	7.36	6.76	6.76	6.73	7.50	6.87	6.90	6.88	7.59	6.93	7.01	6.97	7.08
Commercial Sector	10.55	10.68	11.11	10.59	10.50	10.56	11.36	10.80	10.76	10.82	11.59	11.01	10.75	10.83	11.06
Residential Sector	11.91	12.73	13.01	12.38	12.24	12.85	13.03	12.54	12.51	13.08	13.31	12.81	12.50	12.67	12.94

- = no data available

Prices are not adjusted for inflation.

(a) Average for all sulfur contents.

(b) Average self-service cash price.

(c) Includes fuel oils No. 4, No. 5, No. 6, and topped crude.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Prices exclude taxes unless otherwise noted.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Petroleum Marketing Monthly*, DOE/EIA-0380;*Weekly Petroleum Status Report*, DOE/EIA-0208; *Natural Gas Monthly*, DOE/EIA-0130; *Electric Power Monthly*, DOE/EIA-0226; and *Monthly Energy Review*, DOE/EIA-0035.WTI and Brent crude oils, and Henry Hub natural gas spot prices from Reuters News Service (<http://www.reuters.com>).

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 3a. International Petroleum and Other Liquids Production, Consumption, and Inventories
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Supply (million barrels per day) (a)															
OECD	25.11	25.51	25.80	26.72	26.59	26.80	26.64	26.63	26.54	26.54	26.62	27.16	25.79	26.67	26.72
U.S. (50 States)	13.16	13.97	14.37	14.82	14.72	15.04	14.86	14.70	14.55	14.66	14.68	15.07	14.09	14.83	14.74
Canada	4.42	4.27	4.33	4.55	4.68	4.65	4.70	4.90	4.94	5.02	5.12	5.24	4.39	4.73	5.08
Mexico	2.89	2.86	2.79	2.74	2.68	2.59	2.66	2.65	2.63	2.62	2.60	2.59	2.82	2.65	2.61
North Sea (b)	3.07	2.81	2.71	3.02	3.02	3.05	2.83	2.82	2.88	2.72	2.68	2.73	2.90	2.93	2.75
Other OECD	1.57	1.59	1.60	1.58	1.49	1.47	1.58	1.55	1.52	1.52	1.55	1.53	1.59	1.53	1.53
Non-OECD	66.86	67.08	67.95	68.37	68.02	69.20	69.72	69.18	68.17	69.10	69.89	70.09	67.57	69.04	69.32
OPEC	36.26	35.94	36.52	36.66	36.66	37.38	37.68	37.45	37.02	37.30	37.84	38.28	36.35	37.29	37.61
Crude Oil Portion	30.01	29.70	30.28	30.34	30.29	30.97	31.19	30.89	30.38	30.58	31.05	31.40	30.08	30.84	30.86
Other Liquids	6.25	6.24	6.24	6.32	6.36	6.41	6.49	6.56	6.64	6.72	6.79	6.87	6.26	6.46	6.76
Eurasia	13.90	13.84	13.85	13.99	14.10	14.03	14.03	13.93	13.89	13.91	13.93	13.96	13.90	14.02	13.92
China	4.60	4.61	4.53	4.68	4.66	4.73	4.66	4.67	4.64	4.67	4.68	4.68	4.61	4.68	4.67
Other Non-OECD	12.11	12.69	13.04	13.02	12.61	13.06	13.35	13.13	12.62	13.22	13.45	13.18	12.72	13.04	13.12
Total World Supply	91.98	92.59	93.75	95.09	94.61	96.00	96.37	95.81	94.71	95.65	96.52	97.25	93.36	95.70	96.03
Non-OPEC Supply	55.72	56.65	57.23	58.43	57.96	58.62	58.69	58.37	57.68	58.34	58.68	58.98	57.02	58.41	58.42
Consumption (million barrels per day) (c)															
OECD	45.75	44.84	45.97	46.44	46.53	45.30	46.18	46.74	46.75	45.63	46.46	46.91	45.75	46.19	46.44
U.S. (50 States)	18.82	18.77	19.31	19.51	19.29	19.25	19.60	19.60	19.34	19.48	19.78	19.68	19.11	19.44	19.57
U.S. Territories	0.35	0.35	0.35	0.35	0.37	0.37	0.37	0.37	0.40	0.40	0.40	0.40	0.35	0.37	0.40
Canada	2.43	2.34	2.46	2.42	2.36	2.32	2.43	2.41	2.38	2.32	2.43	2.41	2.41	2.38	2.38
Europe	12.98	13.38	13.86	13.52	13.55	13.30	13.75	13.71	13.62	13.34	13.79	13.74	13.44	13.58	13.62
Japan	5.02	3.88	3.88	4.43	4.74	3.85	3.88	4.25	4.55	3.82	3.85	4.22	4.30	4.18	4.11
Other OECD	6.14	6.11	6.11	6.21	6.21	6.20	6.15	6.39	6.47	6.27	6.22	6.46	6.14	6.24	6.35
Non-OECD	45.63	46.96	47.35	46.81	46.21	47.79	48.13	47.57	47.25	48.87	49.20	48.63	46.69	47.43	48.49
Eurasia	4.82	4.76	4.98	4.96	4.66	4.60	4.87	4.85	4.63	4.56	4.83	4.81	4.88	4.75	4.71
Europe	0.70	0.71	0.73	0.73	0.71	0.72	0.74	0.74	0.72	0.73	0.75	0.75	0.72	0.73	0.73
China	10.45	11.03	10.98	10.94	10.72	11.31	11.27	11.22	10.99	11.60	11.55	11.50	10.85	11.13	11.41
Other Asia	11.80	12.01	11.56	11.88	12.07	12.29	11.82	12.15	12.38	12.60	12.11	12.45	11.81	12.09	12.39
Other Non-OECD	17.86	18.46	19.10	18.31	18.04	18.87	19.43	18.61	18.53	19.38	19.96	19.12	18.43	18.74	19.25
Total World Consumption	91.38	91.80	93.32	93.25	92.74	93.09	94.31	94.30	94.00	94.49	95.67	95.54	92.45	93.62	94.93
Total Crude Oil and Other Liquids Inventory Net Withdrawals (million barrels per day)															
U.S. (50 States)	0.03	-0.66	-0.22	-0.22	-0.64	-0.69	-0.21	0.57	0.07	-0.24	-0.06	0.57	-0.27	-0.21	0.08
Other OECD	-0.31	-0.02	-0.50	0.33	-0.19	-0.78	-0.66	-0.76	-0.29	-0.32	-0.28	-0.82	-0.12	-0.60	-0.42
Other Stock Draws and Balance	-0.31	-0.11	0.30	-1.96	-1.15	-1.44	-1.19	-1.33	-0.49	-0.59	-0.51	-1.46	-0.62	-1.28	-0.77
Total Stock Draw	-0.69	-0.79	-0.43	-1.84	-1.87	-2.92	-2.06	-1.51	-0.70	-1.15	-0.85	-1.71	-0.92	-2.09	-1.11
End-of-period Commercial Crude Oil and Other Liquids Inventories															
U.S. Commercial Inventory	1,063	1,128	1,149	1,169	1,217	1,277	1,295	1,242	1,236	1,258	1,264	1,211	1,169	1,242	1,211
OECD Commercial Inventory	2,575	2,542	2,711	2,698	2,763	2,894	2,973	2,989	3,009	3,060	3,091	3,114	2,698	2,989	3,114

- = no data available

OECD = Organization for Economic Cooperation and Development: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

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

(a) Supply includes production of crude oil (including lease condensates), natural gas plant liquids, biofuels, other liquids, and refinery processing gains.

(b) Includes offshore supply from Denmark, Germany, the Netherlands, Norway, and the United Kingdom.

(c) Consumption of petroleum by the OECD countries is synonymous with "petroleum product supplied," defined in the glossary of the EIA *Petroleum Supply Monthly*, DOE/EIA-0109.

Consumption of petroleum by the non-OECD countries is "apparent consumption," which includes internal consumption, refinery fuel and loss, and bunkering.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from Energy Information Administration international energy statistics.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 3b. Non-OPEC Petroleum and Other Liquids Supply (million barrels per day)
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
North America	20.47	21.11	21.49	22.12	22.08	22.28	22.23	22.26	22.13	22.30	22.39	22.89	21.30	22.21	22.43
Canada	4.42	4.27	4.33	4.65	4.68	4.66	4.70	4.90	4.94	5.02	5.12	5.24	4.39	4.73	5.08
Mexico	2.89	2.86	2.79	2.74	2.68	2.69	2.66	2.65	2.63	2.62	2.60	2.59	2.82	2.65	2.61
United States	13.16	13.97	14.37	14.82	14.72	15.04	14.86	14.70	14.55	14.66	14.68	15.07	14.09	14.83	14.74
Central and South America	4.55	5.17	5.56	5.39	4.95	5.44	5.67	5.43	4.98	5.56	5.77	5.51	5.17	5.38	5.46
Argentina	0.70	0.71	0.73	0.73	0.70	0.72	0.75	0.75	0.70	0.74	0.76	0.76	0.72	0.73	0.74
Brazil	2.34	2.98	3.32	3.16	2.73	3.22	3.43	3.16	2.74	3.29	3.50	3.23	2.96	3.14	3.19
Colombia	1.03	0.99	1.02	1.03	1.06	1.05	1.01	1.03	1.05	1.04	1.01	1.02	1.02	1.04	1.03
Other Central and S. America	0.48	0.48	0.48	0.48	0.47	0.46	0.48	0.49	0.48	0.49	0.50	0.49	0.48	0.47	0.49
Europe	4.06	3.80	3.70	4.02	4.00	4.02	3.80	3.78	3.84	3.68	3.64	3.69	3.89	3.90	3.71
Norway	1.97	1.80	1.86	1.97	1.94	1.94	1.89	1.87	1.86	1.76	1.82	1.83	1.90	1.91	1.82
United Kingdom (offshore)	0.93	0.85	0.66	0.84	0.88	0.93	0.78	0.77	0.84	0.79	0.68	0.72	0.82	0.84	0.76
Other North Sea	0.18	0.16	0.19	0.21	0.20	0.18	0.17	0.17	0.18	0.18	0.18	0.19	0.19	0.18	0.18
Eurasia	13.91	13.85	13.87	14.01	14.11	14.05	14.04	13.95	13.90	13.92	13.95	13.97	13.91	14.04	13.94
Azerbaijan	0.85	0.86	0.88	0.84	0.86	0.87	0.88	0.88	0.88	0.88	0.87	0.87	0.86	0.87	0.87
Kazakhstan	1.73	1.66	1.71	1.78	1.76	1.71	1.70	1.69	1.70	1.71	1.71	1.74	1.72	1.72	1.72
Russia	10.86	10.83	10.79	10.93	10.99	10.98	10.96	10.88	10.83	10.84	10.87	10.87	10.85	10.95	10.85
Turkmenistan	0.27	0.28	0.28	0.25	0.29	0.27	0.28	0.27	0.28	0.29	0.29	0.28	0.27	0.28	0.28
Other Eurasia	0.20	0.21	0.22	0.21	0.20	0.21	0.22	0.21	0.21	0.21	0.21	0.20	0.21	0.21	0.21
Middle East	1.19	1.17	1.20	1.16	1.19	1.15	1.17	1.15	1.12	1.10	1.10	1.10	1.18	1.16	1.11
Oman	0.96	0.95	0.96	0.94	0.97	0.99	1.03	1.02	0.94	0.94	0.94	0.94	0.96	1.00	0.94
Syria	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.01	0.01	0.01	0.00	0.03	0.04	0.01
Yemen	0.13	0.13	0.13	0.12	0.11	0.05	0.03	0.02	0.10	0.08	0.09	0.08	0.13	0.05	0.09
Asia and Oceania	9.23	9.24	9.11	9.39	9.34	9.42	9.52	9.55	9.48	9.56	9.59	9.56	9.24	9.46	9.55
Australia	0.46	0.48	0.49	0.46	0.39	0.38	0.48	0.46	0.43	0.43	0.45	0.43	0.47	0.43	0.44
China	4.60	4.61	4.63	4.68	4.66	4.73	4.66	4.67	4.64	4.67	4.68	4.68	4.61	4.68	4.67
India	1.02	1.01	0.99	1.02	1.01	1.00	1.01	1.03	1.03	1.03	1.03	1.03	1.01	1.01	1.03
Indonesia	0.91	0.91	0.91	0.90	0.88	0.93	0.97	1.00	0.99	1.02	1.02	0.98	0.91	0.94	1.00
Malaysia	0.69	0.69	0.66	0.75	0.80	0.77	0.75	0.76	0.75	0.75	0.77	0.77	0.70	0.77	0.76
Vietnam	0.32	0.31	0.30	0.33	0.35	0.34	0.38	0.39	0.38	0.39	0.39	0.40	0.32	0.36	0.39
Africa	2.32	2.31	2.31	2.33	2.29	2.27	2.25	2.25	2.22	2.23	2.23	2.25	2.32	2.27	2.23
Egypt	0.70	0.70	0.70	0.72	0.71	0.71	0.70	0.70	0.69	0.68	0.68	0.67	0.71	0.71	0.68
Equatorial Guinea	0.29	0.29	0.29	0.29	0.27	0.27	0.27	0.27	0.25	0.25	0.25	0.25	0.29	0.27	0.25
Gabon	0.22	0.22	0.22	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22	0.21	0.21
Sudan	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Total non-OPEC liquids	55.72	56.65	57.23	58.43	57.96	58.62	58.69	58.37	57.68	58.34	58.68	58.98	57.02	58.41	58.42
OPEC non-crude liquids	6.25	6.24	6.24	6.32	6.36	6.41	6.49	6.56	6.64	6.72	6.79	6.87	6.26	6.46	6.76
Non-OPEC + OPEC non-crude	61.97	62.89	63.47	64.75	64.32	65.03	65.17	64.93	64.32	65.06	65.47	65.85	63.28	64.87	65.18
Unplanned non-OPEC Production Outages	0.66	0.67	0.60	0.57	0.62	0.83	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	0.62	<i>n/a</i>	<i>n/a</i>

- = no data available

Sudan production represents total production from both north and south.

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

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Supply includes production of crude oil (including lease condensates), natural gas plant liquids, biofuels, other liquids, and refinery processing gains.

Not all countries are shown in each region and sum of reported country volumes may not equal regional volumes.

Historical data: Latest data available from Energy Information Administration international energy statistics.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 3c. OPEC Crude Oil (excluding condensates) Supply (million barrels per day)

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Crude Oil															
Algeria	1.15	1.15	1.15	1.15	1.10	1.10	-	-	-	-	-	-	1.15	-	-
Angola	1.63	1.63	1.72	1.73	1.75	1.77	-	-	-	-	-	-	1.68	-	-
Ecuador	0.55	0.55	0.55	0.55	0.55	0.54	-	-	-	-	-	-	0.55	-	-
Iran	2.80	2.80	2.80	2.80	2.80	2.82	-	-	-	-	-	-	2.80	-	-
Iraq	3.26	3.29	3.28	3.53	3.57	4.03	-	-	-	-	-	-	3.34	-	-
Kuwait	2.60	2.60	2.60	2.48	2.57	2.53	-	-	-	-	-	-	2.57	-	-
Libya	0.38	0.23	0.58	0.69	0.40	0.45	-	-	-	-	-	-	0.47	-	-
Nigeria	2.00	1.97	2.07	1.98	2.03	1.88	-	-	-	-	-	-	2.00	-	-
Qatar	0.74	0.73	0.72	0.68	0.68	0.68	-	-	-	-	-	-	0.72	-	-
Saudi Arabia	9.80	9.55	9.70	9.63	9.73	10.07	-	-	-	-	-	-	9.70	-	-
United Arab Emirates	2.70	2.70	2.70	2.70	2.70	2.70	-	-	-	-	-	-	2.70	-	-
Venezuela	2.40	2.40	2.40	2.40	2.40	2.40	-	-	-	-	-	-	2.40	-	-
OPEC Total	30.01	29.70	30.28	30.34	30.29	30.97	31.19	30.89	30.38	30.58	31.05	31.40	30.08	30.84	30.86
Other Liquids															
Other Liquids	6.25	6.24	6.24	6.32	6.36	6.41	6.49	6.56	6.64	6.72	6.79	6.87	6.26	6.46	6.76
Total OPEC Supply	36.26	35.94	36.52	36.66	36.66	37.38	37.68	37.45	37.02	37.30	37.84	38.28	36.35	37.29	37.61
Crude Oil Production Capacity															
Africa	5.15	4.97	5.51	5.54	5.29	5.18	5.08	5.18	5.20	5.32	5.43	5.44	5.29	5.18	5.35
South America	2.95	2.95	2.95	2.95	2.95	2.93	2.96	2.96	2.86	2.85	2.87	2.88	2.95	2.95	2.87
Middle East	23.93	23.88	23.86	23.79	23.90	24.21	24.39	24.38	24.36	24.46	24.77	25.11	23.86	24.22	24.68
OPEC Total	32.02	31.80	32.32	32.28	32.14	32.32	32.43	32.52	32.42	32.63	33.08	33.43	32.10	32.35	32.89
Surplus Crude Oil Production Capacity															
Africa	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
South America	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Middle East	2.01	2.09	2.04	1.93	1.83	1.34	1.23	1.64	2.03	2.05	2.03	2.03	2.02	1.51	2.03
OPEC Total	2.01	2.09	2.04	1.93	1.85	1.35	1.23	1.64	2.03	2.05	2.03	2.03	2.02	1.51	2.03
Unplanned OPEC Production Outages	2.32	2.57	2.26	2.43	2.52	2.59	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	2.40	<i>n/a</i>	<i>n/a</i>

- = no data available

OPEC = Organization of Petroleum Exporting Countries: Algeria, Angola, Libya, and Nigeria (Africa); Ecuador and Venezuela (South America); Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates (Middle East).

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from Energy Information Administration international energy statistics.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 3d. World Petroleum and Other Liquids Consumption (million barrels per day)

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				2014	2015	2016
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
North America	23.21	23.09	23.74	23.92	23.53	23.52	23.96	23.95	23.66	23.76	24.14	24.03	23.49	23.74	23.90
Canada	2.43	2.34	2.48	2.42	2.36	2.32	2.43	2.41	2.38	2.32	2.43	2.41	2.41	2.38	2.38
Mexico	1.95	1.97	1.96	1.98	1.87	1.95	1.92	1.93	1.93	1.95	1.92	1.93	1.97	1.92	1.93
United States	18.82	18.77	19.31	19.51	19.29	19.25	19.60	19.60	19.34	19.48	19.78	19.68	19.11	19.44	19.57
Central and South America	7.05	7.30	7.33	7.31	7.05	7.37	7.41	7.38	7.17	7.44	7.47	7.45	7.25	7.30	7.38
Brazil	3.03	3.14	3.21	3.20	3.03	3.14	3.21	3.20	3.06	3.18	3.24	3.23	3.15	3.15	3.18
Europe	13.68	14.09	14.59	14.25	14.26	14.02	14.49	14.45	14.34	14.06	14.53	14.49	14.16	14.31	14.36
Eurasia	4.85	4.79	5.01	4.99	4.69	4.63	4.90	4.88	4.66	4.59	4.86	4.85	4.91	4.78	4.74
Russia	3.49	3.45	3.65	3.63	3.34	3.30	3.49	3.48	3.25	3.20	3.39	3.38	3.56	3.40	3.31
Middle East	7.97	8.33	8.98	8.17	8.01	8.64	9.22	8.37	8.36	8.96	9.56	8.68	8.36	8.56	8.89
Asia and Oceania	30.88	30.48	29.99	30.91	31.30	31.03	30.50	31.41	31.77	31.65	31.10	32.03	30.56	31.06	31.64
China	10.45	11.03	10.98	10.94	10.72	11.31	11.27	11.22	10.99	11.60	11.55	11.50	10.85	11.13	11.41
Japan	5.02	3.88	3.88	4.43	4.74	3.85	3.88	4.25	4.55	3.82	3.85	4.22	4.30	4.18	4.11
India	3.88	3.86	3.54	3.83	4.08	4.06	3.72	4.02	4.25	4.23	3.88	4.19	3.78	3.97	4.14
Africa	3.73	3.73	3.68	3.70	3.89	3.88	3.84	3.86	4.04	4.03	3.99	4.01	3.71	3.86	4.02
Total OECD Liquid Fuels Consumption	45.75	44.84	45.97	46.44	46.53	45.30	46.18	46.74	46.75	45.63	46.46	46.91	45.75	46.19	46.44
Total non-OECD Liquid Fuels Consumption	45.63	46.96	47.35	46.81	46.21	47.79	48.13	47.57	47.25	48.87	49.20	48.63	46.69	47.43	48.49
Total World Liquid Fuels Consumption	91.38	91.80	93.32	93.25	92.74	93.09	94.31	94.30	94.00	94.49	95.67	95.54	92.45	93.62	94.93
Oil-weighted Real Gross Domestic Product (a)															
World Index, 2010 Q1 = 100	113.4	114.3	115.2	116.0	116.5	116.9	117.7	118.5	119.4	120.3	121.3	122.3	114.7	117.4	120.8
Percent change from prior year	2.8	2.8	2.7	2.6	2.7	2.3	2.2	2.2	2.5	2.9	3.1	3.2	2.8	2.3	2.9
OECD Index, 2010 Q1 = 100	110.0	110.6	111.3	111.9	112.2	112.7	113.2	113.9	114.5	115.1	115.8	116.6	110.9	113.0	115.5
Percent change from prior year	1.9	1.9	1.8	1.8	2.0	1.9	1.7	1.7	2.0	2.2	2.3	2.5	1.9	1.8	2.2
Non-OECD Index, 2010 Q1 = 100	117.7	118.9	120.0	121.0	121.7	122.2	123.2	124.4	125.6	126.7	128.1	129.4	119.4	122.9	127.4
Percent change from prior year	4.0	3.9	3.8	3.6	3.5	2.8	2.7	2.8	3.2	3.7	3.9	4.1	3.8	2.9	3.7
Real U.S. Dollar Exchange Rate (a)															
Index, January 2010 = 100	108.07	107.84	109.02	113.60	119.25	119.48	122.35	123.90	124.18	124.15	123.92	123.92	109.63	121.25	124.04
Percent change from prior year	3.8	2.0	1.9	6.7	10.3	10.8	12.2	9.1	4.1	3.9	1.3	0.0	3.6	10.6	2.3

- = no data available

OECD = Organisation for Economic Co-operation and Development: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Finland,

France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal,

Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

(a) Weighted geometric mean of real indices for various countries with weights equal to each country's share of world oil consumption in the base period. Exchange rate is measured in foreign currency per U.S. dollar.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from Energy Information Administration international energy statistics.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 4a. U.S. Petroleum and Other Liquids Supply, Consumption, and Inventories
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Supply (million barrels per day)															
Crude Oil Supply															
Domestic Production (a)	8.15	8.62	8.85	9.25	9.40	9.44	9.11	8.96	8.84	8.78	8.68	8.98	8.72	9.22	8.82
Alaska	0.53	0.52	0.43	0.51	0.50	0.49	0.42	0.49	0.48	0.48	0.42	0.47	0.50	0.48	0.46
Federal Gulf of Mexico (b)	1.32	1.42	1.43	1.42	1.48	1.47	1.49	1.56	1.61	1.63	1.53	1.63	1.40	1.50	1.60
Lower 48 States (excl GOM)	6.30	6.68	6.99	7.32	7.43	7.48	7.19	6.91	6.74	6.68	6.74	6.87	6.83	7.25	6.76
Crude Oil Net Imports (c)	7.11	6.93	7.15	6.78	6.84	6.74	7.05	6.61	6.70	7.29	7.58	6.73	6.99	6.81	7.07
SPR Net Withdrawals	0.00	0.05	0.00	0.00	0.00	-0.03	-0.01	0.00	0.00	0.00	0.00	0.00	0.01	-0.01	0.00
Commercial Inventory Net Withdrawals	-0.33	0.01	0.25	-0.33	-0.91	0.06	0.14	0.15	-0.27	0.10	0.15	0.14	-0.10	-0.14	0.03
Crude Oil Adjustment (d)	0.26	0.27	0.12	0.25	0.20	0.28	0.31	0.15	0.19	0.19	0.21	0.15	0.22	0.23	0.19
Total Crude Oil Input to Refineries	15.19	15.88	16.36	15.96	15.53	16.48	16.60	15.87	15.46	16.36	16.62	16.00	15.85	16.12	16.11
Other Supply															
Refinery Processing Gain	1.05	1.07	1.10	1.10	0.99	1.02	1.09	1.08	1.05	1.08	1.11	1.09	1.08	1.05	1.08
Natural Gas Plant Liquids Production	2.75	3.00	3.15	3.16	3.09	3.27	3.35	3.35	3.36	3.49	3.58	3.69	3.01	3.27	3.53
Renewables and Oxygenate Production (e)	1.01	1.06	1.06	1.08	1.05	1.10	1.09	1.09	1.09	1.08	1.09	1.07	1.05	1.08	1.08
Fuel Ethanol Production	0.91	0.94	0.93	0.96	0.96	0.96	0.95	0.95	0.97	0.95	0.95	0.94	0.93	0.95	0.95
Petroleum Products Adjustment (f)	0.20	0.23	0.22	0.24	0.20	0.21	0.22	0.22	0.21	0.23	0.23	0.23	0.22	0.21	0.22
Product Net Imports (c)	-1.73	-1.74	-2.11	-2.13	-1.89	-2.12	-2.43	-2.44	-2.18	-2.41	-2.62	-2.84	-1.93	-2.22	-2.52
Hydrocarbon Gas Liquids	-0.36	-0.57	-0.66	-0.64	-0.68	-0.80	-0.93	-0.99	-0.96	-1.06	-1.15	-1.29	-0.56	-0.85	-1.12
Unfinished Oils	0.34	0.43	0.34	0.37	0.28	0.28	0.38	0.37	0.38	0.44	0.44	0.38	0.37	0.32	0.41
Other HC/Oxygenates	-0.09	-0.09	-0.08	-0.09	-0.08	-0.09	-0.07	-0.06	-0.09	-0.07	-0.05	-0.04	-0.09	-0.07	-0.06
Motor Gasoline Blend Comp.	0.30	0.58	0.46	0.39	0.41	0.52	0.45	0.43	0.42	0.61	0.44	0.40	0.44	0.45	0.47
Finished Motor Gasoline	-0.40	-0.37	-0.33	-0.47	-0.44	-0.32	-0.35	-0.45	-0.37	-0.48	-0.38	-0.45	-0.39	-0.39	-0.42
Jet Fuel	-0.07	-0.02	-0.09	-0.09	-0.06	0.01	-0.02	-0.03	-0.05	-0.06	-0.01	-0.04	-0.07	-0.03	-0.04
Distillate Fuel Oil	-0.67	-1.00	-1.07	-0.89	-0.67	-1.05	-1.09	-0.96	-0.73	-0.97	-1.08	-1.04	-0.91	-0.94	-0.96
Residual Fuel Oil	-0.23	-0.18	-0.17	-0.18	-0.13	-0.21	-0.23	-0.22	-0.24	-0.26	-0.26	-0.22	-0.19	-0.20	-0.24
Other Oils (g)	-0.55	-0.52	-0.50	-0.53	-0.50	-0.46	-0.57	-0.53	-0.55	-0.56	-0.57	-0.55	-0.53	-0.51	-0.56
Product Inventory Net Withdrawals	0.35	-0.72	-0.47	0.11	0.36	-0.72	-0.33	0.43	0.35	-0.35	-0.22	0.43	-0.18	-0.07	0.05
Total Supply	18.82	18.77	19.31	19.51	19.32	19.25	19.60	19.60	19.34	19.48	19.78	19.68	19.11	19.44	19.57
Consumption (million barrels per day)															
Hydrocarbon Gas Liquids	2.70	2.12	2.32	2.66	2.72	2.27	2.36	2.67	2.77	2.38	2.45	2.74	2.45	2.50	2.59
Unfinished Oils	-0.07	-0.03	-0.03	-0.02	-0.05	0.05	0.02	0.04	0.00	0.00	0.01	0.02	-0.04	0.02	0.01
Motor Gasoline	8.54	9.01	9.13	9.00	8.81	9.26	9.34	9.09	8.88	9.23	9.30	9.09	8.92	9.13	9.13
Fuel Ethanol blended into Motor Gasoline	0.84	0.89	0.89	0.90	0.87	0.92	0.92	0.90	0.87	0.91	0.92	0.90	0.88	0.90	0.90
Jet Fuel	1.39	1.47	1.52	1.50	1.45	1.54	1.57	1.48	1.43	1.52	1.58	1.50	1.47	1.51	1.51
Distillate Fuel Oil	4.19	3.95	3.89	4.12	4.27	3.88	3.85	4.10	4.18	4.04	3.99	4.12	4.04	4.02	4.08
Residual Fuel Oil	0.25	0.25	0.25	0.28	0.24	0.19	0.21	0.22	0.22	0.19	0.19	0.20	0.26	0.22	0.20
Other Oils (g)	1.83	2.01	2.24	1.96	1.85	2.06	2.24	2.00	1.87	2.10	2.26	2.01	2.01	2.04	2.06
Total Consumption	18.82	18.77	19.31	19.51	19.29	19.25	19.60	19.60	19.34	19.48	19.78	19.68	19.11	19.44	19.57
Total Petroleum and Other Liquids Net Imports	5.38	5.20	5.04	4.65	4.95	4.61	4.63	4.18	4.52	4.88	4.95	3.89	5.07	4.59	4.56
End-of-period Inventories (million barrels)															
Commercial Inventory															
Crude Oil (excluding SPR)	386.7	386.0	363.3	393.3	474.8	469.5	457.0	443.3	468.2	458.8	444.9	432.1	393.3	443.3	432.1
Hydrocarbon Gas Liquids	99.5	166.1	211.7	175.4	138.8	196.3	227.8	182.3	146.9	184.3	208.1	161.9	175.4	182.3	161.9
Unfinished Oils	91.9	87.6	84.3	78.3	84.7	86.0	90.1	83.2	92.8	89.6	87.3	82.0	78.3	83.2	82.0
Other HC/Oxygenates	22.7	23.3	22.4	23.3	26.7	25.0	24.6	24.9	27.0	25.8	25.0	25.3	23.3	24.9	25.3
Total Motor Gasoline	221.6	219.3	212.5	240.4	231.5	221.0	215.7	230.0	228.9	223.0	219.8	232.0	240.4	230.0	232.0
Finished Motor Gasoline	34.4	28.8	28.4	31.2	26.9	25.7	26.8	28.7	26.6	26.3	25.7	27.1	31.2	28.7	27.1
Motor Gasoline Blend Comp.	187.2	190.5	184.1	209.1	204.6	195.4	189.0	201.3	202.3	196.7	194.1	204.8	209.1	201.3	204.8
Jet Fuel	36.4	37.1	39.8	38.3	37.2	43.7	44.2	40.8	40.4	40.9	43.3	39.7	38.3	40.8	39.7
Distillate Fuel Oil	115.2	121.6	131.4	136.3	128.3	139.4	148.7	150.9	137.2	143.2	151.7	153.0	136.3	150.9	153.0
Residual Fuel Oil	36.0	36.6	36.6	33.7	38.1	41.8	39.3	38.1	38.2	38.3	36.8	37.1	33.7	38.1	37.1
Other Oils (g)	52.9	60.6	46.7	49.6	57.3	54.6	47.8	49.0	56.3	54.0	47.1	48.5	49.6	49.0	48.5
Total Commercial Inventory	1,063	1,128	1,149	1,169	1,217	1,277	1,295	1,242	1,236	1,258	1,264	1,211	1,169	1,242	1,211
Crude Oil in SPR	696	691	691	691	691	694	695	695	695	695	695	695	691	695	695

- = no data available

(a) Includes lease condensate.

(b) Crude oil production from U.S. Federal leases in the Gulf of Mexico (GOM).

(c) Net imports equals gross imports minus gross exports.

(d) Crude oil adjustment balances supply and consumption and was previously referred to as "Unaccounted for Crude Oil."

(e) Renewables and oxygenate production includes pentanes plus, oxygenates (excluding fuel ethanol), and renewable fuels.

(f) Petroleum products adjustment includes hydrogen/oxygenates/renewables/other hydrocarbons, motor gasoline blend components, and finished motor gasoline.

(g) "Other Oils" includes aviation gasoline blend components, finished aviation gasoline, kerosene, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt and road oil, still gas, and miscellaneous products.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

SPR: Strategic Petroleum Reserve

HC: Hydrocarbons

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Petroleum Supply Monthly*, DOE/EIA-0109; *Petroleum Supply Annual*, DOE/EIA-0340/2; and *Weekly Petroleum Status Report*, DOE/EIA-0208.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 4b. U.S. Hydrocarbon Gas Liquids (HGL) and Petroleum Refinery Balances (million barrels per day, except inventories and utilization factor)

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
HGL Production															
Natural Gas Processing Plants															
Ethane	1.05	1.11	1.11	1.09	1.05	1.10	1.17	1.20	1.25	1.31	1.34	1.45	1.09	1.13	1.34
Propane	0.88	0.96	1.03	1.06	1.07	1.12	1.12	1.13	1.11	1.14	1.16	1.19	0.88	1.11	1.15
Butanes	0.48	0.53	0.57	0.59	0.58	0.62	0.62	0.60	0.60	0.62	0.62	0.62	0.54	0.61	0.62
Natural Gasoline (Pentanes Plus)	0.34	0.39	0.43	0.42	0.39	0.44	0.44	0.42	0.40	0.43	0.45	0.43	0.39	0.42	0.43
Refinery and Blender Net Production															
Ethane/Ethylene	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Propane/Propylene	0.57	0.60	0.59	0.59	0.54	0.58	0.59	0.59	0.57	0.60	0.60	0.60	0.59	0.59	0.59
Butanes/Butylenes	-0.05	0.27	0.21	-0.18	-0.08	0.27	0.18	-0.15	-0.03	0.25	0.18	-0.15	0.06	0.06	0.06
Renewable Fuels and Oxygenate Plant Net Production															
Natural Gasoline (Pentanes Plus)	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
HGL Net Imports															
Ethane	-0.02	-0.02	-0.06	-0.06	-0.06	-0.07	-0.08	-0.09	-0.10	-0.14	-0.16	-0.26	-0.04	-0.07	-0.17
Propane/Propylene	-0.17	-0.34	-0.36	-0.39	-0.40	-0.49	-0.56	-0.63	-0.57	-0.60	-0.64	-0.70	-0.32	-0.52	-0.63
Butanes/Butylenes	-0.04	-0.06	-0.09	-0.03	-0.06	-0.09	-0.11	-0.10	-0.11	-0.15	-0.16	-0.14	-0.06	-0.09	-0.14
Natural Gasoline (Pentanes Plus)	-0.13	-0.16	-0.16	-0.15	-0.17	-0.15	-0.18	-0.18	-0.18	-0.17	-0.19	-0.19	-0.15	-0.17	-0.18
HGL Refinery and Blender Net Inputs															
Butanes/Butylenes	0.37	0.28	0.30	0.48	0.40	0.27	0.31	0.44	0.37	0.29	0.30	0.42	0.36	0.35	0.35
Natural Gasoline (Pentanes Plus)	0.14	0.16	0.16	0.16	0.15	0.14	0.17	0.18	0.17	0.18	0.18	0.18	0.15	0.16	0.18
HGL Consumption															
Ethane/Ethylene	1.04	0.99	1.10	1.06	1.03	1.02	1.12	1.14	1.13	1.14	1.20	1.21	1.05	1.08	1.17
Propane/Propylene	1.46	0.91	1.01	1.30	1.43	0.92	0.99	1.27	1.42	0.99	1.01	1.27	1.17	1.15	1.17
Butanes/Butylenes	0.15	0.18	0.17	0.22	0.16	0.24	0.19	0.21	0.19	0.22	0.20	0.21	0.18	0.20	0.20
Natural Gasoline (Pentanes Plus)	0.05	0.04	0.04	0.08	0.10	0.09	0.06	0.04	0.04	0.04	0.05	0.04	0.05	0.07	0.04
HGL Inventories (million barrels)															
Ethane/Ethylene	30.03	37.15	38.95	36.45	31.38	31.65	31.06	30.21	30.43	34.46	33.92	33.04	35.67	31.07	32.96
Propane/Propylene	28.81	57.90	81.41	77.95	58.10	84.20	99.11	82.32	55.35	69.30	80.04	62.89	77.95	82.32	62.89
Butanes/Butylenes	26.31	52.35	72.40	41.95	32.46	59.42	76.65	49.60	39.75	58.98	72.38	45.80	41.95	49.60	45.80
Natural Gasoline (Pentanes Plus)	13.99	15.77	20.39	20.61	17.16	20.51	21.42	21.23	19.99	21.05	21.95	21.33	20.61	21.23	21.33
Refinery and Blender Net Inputs															
Crude Oil	15.19	15.88	16.36	15.96	15.53	16.48	16.60	15.87	15.46	16.36	16.62	16.00	15.85	16.12	16.11
Hydrocarbon Gas Liquids	0.52	0.43	0.46	0.64	0.54	0.40	0.48	0.62	0.55	0.48	0.48	0.61	0.51	0.51	0.53
Other Hydrocarbons/Oxygenates	1.09	1.16	1.16	1.14	1.12	1.18	1.20	1.21	1.16	1.21	1.24	1.22	1.14	1.18	1.21
Unfinished Oils	0.26	0.51	0.41	0.45	0.24	0.22	0.31	0.41	0.28	0.47	0.45	0.42	0.41	0.29	0.40
Motor Gasoline Blend Components	0.55	1.00	0.80	0.33	0.72	0.91	0.68	0.46	0.60	0.85	0.63	0.45	0.67	0.69	0.63
Aviation Gasoline Blend Components	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Refinery and Blender Net Inputs	17.60	18.88	18.18	18.51	18.14	19.18	19.27	18.56	18.04	19.36	19.43	18.69	18.57	18.79	18.88
Refinery Processing Gain															
.....	1.05	1.07	1.10	1.10	0.99	1.02	1.09	1.08	1.05	1.08	1.11	1.09	1.08	1.05	1.08
Refinery and Blender Net Production															
Hydrocarbon Gas Liquids	0.53	0.87	0.80	0.41	0.47	0.86	0.78	0.45	0.55	0.86	0.78	0.45	0.65	0.64	0.66
Finished Motor Gasoline	9.11	9.77	9.71	9.69	9.48	9.83	9.84	9.71	9.40	9.88	9.84	9.71	9.57	9.72	9.71
Jet Fuel	1.45	1.50	1.64	1.57	1.50	1.61	1.60	1.48	1.47	1.59	1.62	1.50	1.54	1.55	1.54
Distillate Fuel	4.69	4.97	5.00	5.00	4.82	4.99	5.00	5.04	4.72	5.03	5.12	5.12	4.92	4.96	5.00
Residual Fuel	0.46	0.44	0.42	0.43	0.43	0.44	0.42	0.42	0.45	0.46	0.44	0.42	0.44	0.42	0.44
Other Oils (a)	2.42	2.50	2.70	2.52	2.44	2.48	2.73	2.54	2.50	2.63	2.75	2.57	2.54	2.55	2.61
Total Refinery and Blender Net Production	18.65	20.05	20.28	19.62	19.13	20.20	20.36	19.65	19.10	20.44	20.54	19.78	19.65	19.84	19.97
Refinery Distillation Inputs															
.....	15.52	16.18	16.65	16.26	15.78	16.69	16.88	16.19	15.79	16.60	16.90	16.31	16.16	16.39	16.40
Refinery Operable Distillation Capacity															
.....	17.93	17.91	17.83	17.82	17.88	17.98	17.98	18.02	18.05	18.05	18.21	18.29	17.87	17.96	18.15
Refinery Distillation Utilization Factor															
.....	0.87	0.90	0.93	0.91	0.88	0.93	0.94	0.90	0.87	0.92	0.93	0.89	0.90	0.91	0.90

- = no data available

(a) "Other Oils" includes aviation gasoline blend components, finished aviation gasoline, kerosene, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt and road oil, still gas, and miscellaneous products.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Petroleum Supply Monthly*, DOE/EIA-0109;

Petroleum Supply Annual, DOE/EIA-0340/2; *Weekly Petroleum Status Report*, DOE/EIA-0208.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 4c. U.S. Regional Motor Gasoline Prices and Inventories

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Prices (cents per gallon)															
Refiner Wholesale Price	272	298	276	203	159	201	180	136	149	184	181	155	262	169	167
Gasoline Regular Grade Retail Prices Including Taxes															
PADD 1	344	365	348	292	228	259	247	211	220	251	250	231	337	236	238
PADD 2	337	365	343	279	216	256	252	202	212	252	249	220	331	232	234
PADD 3	318	345	329	265	204	240	229	187	197	232	230	204	314	215	216
PADD 4	326	351	363	297	207	261	271	211	201	242	252	225	335	238	230
PADD 5	362	401	386	315	271	328	326	247	243	282	282	256	366	294	266
U.S. Average	340	368	350	288	227	267	260	211	217	253	252	227	336	241	238
Gasoline All Grades Including Taxes	348	375	358	296	236	275	268	219	226	262	261	236	344	250	246
End-of-period Inventories (million barrels)															
Total Gasoline Inventories															
PADD 1	57.7	63.1	55.7	62.1	64.5	61.3	56.4	59.4	60.6	62.0	57.8	60.1	62.1	59.4	60.1
PADD 2	49.1	49.7	47.1	52.4	52.9	50.4	48.9	50.4	51.2	48.8	49.2	50.6	52.4	50.4	50.6
PADD 3	78.5	73.2	74.9	84.2	78.4	74.6	76.2	81.0	79.7	77.5	78.0	82.0	84.2	81.0	82.0
PADD 4	6.4	6.1	7.4	7.9	6.5	6.8	6.9	7.7	7.2	6.9	6.9	7.7	7.9	7.7	7.7
PADD 5	29.9	27.1	27.3	33.7	29.2	28.0	27.4	31.5	30.2	27.9	27.9	31.6	33.7	31.5	31.6
U.S. Total	221.6	219.3	212.5	240.4	231.5	221.0	215.7	230.0	228.9	223.0	219.8	232.0	240.4	230.0	232.0
Finished Gasoline Inventories															
U.S. Total	34.4	28.8	28.4	31.2	26.9	25.7	26.8	28.7	26.6	26.3	25.7	27.1	31.2	28.7	27.1
Gasoline Blending Components Inventories															
U.S. Total	187.2	190.5	184.1	209.1	204.6	195.4	189.0	201.3	202.3	196.7	194.1	204.8	209.1	201.3	204.8

- = no data available

Prices are not adjusted for inflation.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Regions refer to Petroleum Administration for Defense Districts (PADD).

 See "Petroleum for Administration Defense District" in EIA's Energy Glossary (<http://www.eia.doe.gov/glossary/index.html>) for a list of States in each region.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Petroleum Marketing Monthly*, DOE/EIA-0380; *Petroleum Supply Monthly*, DOE/EIA-0109; *Petroleum Supply Annual*, DOE/EIA-0340/2; and *Weekly Petroleum Status Report*, DOE/EIA-0208.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 5a. U.S. Natural Gas Supply, Consumption, and Inventories

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Supply (billion cubic feet per day)															
Total Marketed Production	71.74	73.55	75.72	77.77	78.12	79.05	79.02	79.61	80.29	80.50	80.62	81.30	74.72	78.95	80.68
Alaska	0.99	0.93	0.85	0.98	0.99	0.93	0.78	0.93	0.98	0.84	0.75	0.91	0.94	0.91	0.87
Federal GOM (a)	3.29	3.42	3.41	3.38	3.37	3.72	3.34	3.20	3.25	3.20	3.03	2.99	3.37	3.41	3.12
Lower 48 States (excl GOM)	67.47	69.21	71.46	73.41	73.76	74.40	74.90	75.48	76.06	76.45	76.84	77.39	70.41	74.64	76.69
Total Dry Gas Production	67.84	69.33	71.30	73.31	73.68	74.34	74.32	74.88	75.52	75.72	75.83	76.47	70.46	74.31	75.89
LNG Gross Imports	0.17	0.17	0.15	0.16	0.43	0.08	0.18	0.17	0.14	0.16	0.17	0.15	0.16	0.21	0.15
LNG Gross Exports	0.03	0.02	0.09	0.03	0.06	0.06	0.00	0.56	0.68	0.69	0.72	1.07	0.04	0.17	0.79
Pipeline Gross Imports	8.44	6.52	6.47	7.47	8.36	6.68	6.35	6.86	7.26	6.22	6.54	6.72	7.22	7.05	6.68
Pipeline Gross Exports	4.67	3.89	3.85	4.02	4.86	4.37	4.51	4.81	4.89	4.73	4.92	5.09	4.10	4.63	4.91
Supplemental Gaseous Fuels	0.17	0.16	0.13	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.15	0.16	0.16
Net Inventory Withdrawals	22.75	-12.71	-12.96	0.55	18.44	-12.87	-9.62	3.14	16.34	-10.75	-9.90	3.14	-0.69	-0.30	-0.31
Total Supply	94.67	59.56	61.15	77.59	96.15	63.95	66.87	79.83	93.84	66.09	67.16	80.48	73.16	76.63	76.88
Balancing Item (b)	0.43	1.67	0.59	-1.40	0.91	0.35	-0.80	-0.84	0.22	-0.66	-0.30	-0.37	0.32	-0.10	-0.28
Total Primary Supply	95.10	61.23	61.75	76.19	97.05	64.30	66.07	78.99	94.07	65.43	66.86	80.11	73.48	76.52	76.60
Consumption (billion cubic feet per day)															
Residential	28.70	7.50	3.68	15.97	27.49	6.86	3.65	16.26	25.73	7.00	3.67	16.43	13.90	13.51	13.19
Commercial	16.46	6.25	4.59	10.74	15.98	5.81	4.39	10.50	14.65	5.91	4.44	10.65	9.48	9.14	8.90
Industrial	22.92	20.03	19.66	21.32	22.71	19.67	19.79	22.53	23.87	21.44	21.35	23.42	20.97	21.17	22.52
Electric Power (c)	19.68	21.12	27.34	21.09	23.10	25.20	31.42	22.39	21.94	24.21	30.48	22.16	22.33	25.54	24.71
Lease and Plant Fuel	4.12	4.22	4.35	4.47	4.49	4.54	4.54	4.57	4.61	4.62	4.63	4.67	4.29	4.53	4.63
Pipeline and Distribution Use	3.14	2.02	2.04	2.51	3.20	2.12	2.18	2.64	3.18	2.16	2.21	2.68	2.42	2.53	2.55
Vehicle Use	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.09	0.09	0.10
Total Consumption	95.10	61.23	61.75	76.19	97.05	64.30	66.07	78.99	94.07	65.43	66.86	80.11	73.48	76.52	76.60
End-of-period Inventories (billion cubic feet)															
Working Gas Inventory	857	2,005	3,187	3,141	1,482	2,647	3,532	3,244	1,757	2,735	3,645	3,356	3,141	3,244	3,356
Producing Region (d)	358	691	952	1,070	604	1,037	1,243	1,196	781	1,058	1,228	1,207	1,070	1,196	1,207
East Consuming Region (d)	316	952	1,753	1,807	501	1,144	1,784	1,578	659	1,220	1,872	1,640	1,607	1,578	1,640
West Consuming Region (d)	184	362	482	484	377	466	505	470	316	456	546	509	464	470	509

- = no data available

(a) Marketed production from U.S. Federal leases in the Gulf of Mexico.

(b) The balancing item represents the difference between the sum of the components of natural gas supply and the sum of components of natural gas demand.

(c) Natural gas used for electricity generation and (a limited amount of) useful thermal output by electric utilities and independent power producers.

(d) For a list of States in each inventory region refer to *Methodology for EIA Weekly Underground Natural Gas Storage Estimates* (<http://tonto.eia.doe.gov/oog/info/ngs/methodology.html>).

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

LNG: liquefied natural gas.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Natural Gas Monthly*, DOE/EIA-0130; and *Electric Power Monthly*, DOE/EIA-0226.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 5b. U.S. Regional Natural Gas Prices (dollars per thousand cubic fee
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Wholesale/Spot															
Henry Hub Spot Price	5.36	4.75	4.08	3.91	2.99	2.83	2.86	3.04	3.24	3.05	3.17	3.36	4.52	2.93	3.20
Residential															
New England	13.65	15.98	18.01	14.41	13.08	13.32	16.34	12.98	12.44	14.08	16.77	13.28	14.52	13.31	13.23
Middle Atlantic	10.71	13.04	17.25	11.15	9.50	11.18	17.01	11.78	10.55	12.99	17.42	12.03	11.58	10.75	11.76
E. N. Central	8.67	12.96	16.85	8.96	7.79	10.56	16.68	8.54	7.67	11.04	16.64	8.57	9.70	8.85	8.87
W. N. Central	9.10	11.75	18.16	9.83	8.65	11.90	17.11	8.81	7.81	10.67	17.08	9.10	10.10	9.53	9.07
S. Atlantic	11.34	16.37	22.98	12.85	10.68	16.65	22.22	12.55	11.11	16.14	22.25	12.81	13.03	12.50	12.89
E. S. Central	9.63	14.08	19.70	11.14	9.34	14.34	18.66	10.64	9.03	13.19	18.38	10.99	11.02	10.67	10.57
W. S. Central	8.53	14.22	20.25	11.62	8.42	13.92	18.26	9.86	7.44	12.51	18.25	10.35	10.83	10.14	9.61
Mountain	9.07	11.22	15.15	9.86	9.58	10.86	14.95	9.64	8.79	9.75	13.53	8.80	10.13	10.21	9.29
Pacific	10.97	11.66	12.41	11.25	11.47	11.46	11.15	9.54	9.56	10.22	10.81	9.79	11.37	10.79	9.90
U.S. Average	9.82	13.11	16.92	10.52	9.29	12.01	16.17	10.04	9.03	11.88	16.07	10.16	10.94	10.33	10.25
Commercial															
New England	11.35	12.82	11.77	11.36	10.70	10.06	9.58	9.96	10.46	10.24	10.25	10.44	11.64	10.32	10.40
Middle Atlantic	9.30	9.06	8.04	8.05	7.90	7.43	7.65	8.31	8.61	8.24	8.08	8.72	8.78	7.89	8.52
E. N. Central	8.02	9.96	10.18	7.71	6.96	7.55	8.85	7.16	7.24	8.38	9.22	7.42	8.33	7.23	7.60
W. N. Central	8.35	9.10	10.19	8.22	7.65	8.00	8.86	7.22	7.39	7.69	8.81	7.41	8.54	7.65	7.54
S. Atlantic	9.23	10.56	10.90	9.47	8.44	9.19	10.06	9.01	9.02	9.70	10.37	9.44	9.69	8.91	9.42
E. S. Central	8.90	10.71	11.17	9.58	8.58	9.66	9.85	8.76	8.28	9.17	9.87	9.05	9.57	8.90	8.81
W. S. Central	7.49	9.24	9.26	8.25	7.14	7.20	7.64	6.99	6.93	7.59	8.14	7.40	8.23	7.18	7.33
Mountain	7.81	8.74	9.90	8.47	8.29	8.37	9.38	8.06	7.67	7.86	9.04	7.96	8.40	8.35	7.93
Pacific	9.29	9.26	9.56	9.28	9.21	8.52	8.66	8.58	8.74	8.58	8.92	8.69	9.32	8.78	8.72
U.S. Average	8.66	9.64	9.69	8.51	7.95	8.13	8.72	7.98	8.05	8.44	9.00	8.26	8.87	8.06	8.27
Industrial															
New England	10.03	9.97	8.04	9.09	9.04	7.60	7.24	8.38	8.81	8.19	8.01	9.00	9.45	8.32	8.61
Middle Atlantic	9.28	8.78	8.15	7.98	7.87	7.21	7.45	7.92	8.04	7.30	7.62	8.25	8.77	7.72	7.91
E. N. Central	8.03	8.87	7.89	6.94	6.49	5.70	5.88	5.89	6.45	6.08	6.21	6.27	7.84	6.13	6.31
W. N. Central	7.34	6.28	5.91	6.38	5.90	4.63	4.76	5.21	5.46	4.74	4.75	5.20	6.57	5.19	5.08
S. Atlantic	6.91	6.42	5.92	5.99	5.50	4.56	4.78	5.09	5.32	5.05	5.19	5.50	6.34	5.01	5.28
E. S. Central	6.37	6.14	5.31	5.50	5.13	4.24	4.45	4.72	5.12	4.69	4.83	5.14	5.86	4.67	4.96
W. S. Central	5.15	4.91	4.52	4.26	3.21	2.93	3.11	3.17	3.32	3.20	3.46	3.54	4.71	3.11	3.38
Mountain	6.55	6.68	6.95	6.65	6.55	6.19	6.29	6.05	5.57	5.24	5.83	5.87	6.69	6.28	5.64
Pacific	7.84	7.63	7.70	7.54	7.36	6.89	7.08	6.42	6.16	5.94	6.43	6.56	7.68	6.94	6.28
U.S. Average	6.17	5.62	5.06	5.16	4.56	3.69	3.78	4.08	4.44	3.93	4.07	4.44	5.53	4.05	4.23

- = no data available

Prices are not adjusted for inflation.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Regions refer to U.S. Census divisions.

See "Census division" in EIA's Energy Glossary (<http://www.eia.doe.gov/glossary/index.html>) for a list of States in each region.

Historical data: Latest data available from Energy Information Administration databases supporting the *Natural Gas Monthly*, DOE/EIA-0130.

Natural gas Henry Hub spot price from Reuter's News Service (<http://www.reuters.com>).

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 6. U.S. Coal Supply, Consumption, and Inventories

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Supply (million short tons)															
Production	245.2	245.8	255.3	253.3	240.2	210.7	228.4	234.3	233.5	213.5	234.9	228.7	999.7	913.6	910.4
Appalachia	67.5	69.7	67.5	63.5	62.3	57.7	58.6	58.5	62.8	58.6	57.0	56.2	268.2	237.1	234.6
Interior	46.3	44.8	49.3	48.3	45.2	39.7	46.3	47.7	45.0	43.5	47.0	45.3	188.7	178.9	180.9
Western	131.4	131.4	138.5	141.5	132.7	113.2	123.6	128.1	125.7	111.3	130.9	127.2	542.8	497.5	495.0
Primary Inventory Withdrawals	-0.5	0.6	2.4	-1.5	-0.7	0.3	3.1	-1.6	-1.0	0.7	2.9	-1.6	0.9	1.1	1.0
Imports	2.4	3.5	3.2	2.1	3.0	2.6	3.2	2.9	2.2	2.4	3.3	2.9	11.3	11.7	10.8
Exports	27.7	24.6	22.7	22.3	22.0	19.8	17.9	19.8	16.3	19.6	17.4	19.1	97.3	79.5	72.3
Metallurgical Coal	16.9	15.8	15.2	15.2	13.5	12.7	10.9	11.4	11.4	11.6	9.9	11.4	63.0	48.6	44.3
Steam Coal	10.9	8.8	7.5	7.1	8.5	7.0	7.0	8.4	4.9	7.9	7.4	7.7	34.3	31.0	28.0
Total Primary Supply	219.4	225.4	238.2	231.6	220.5	193.9	216.8	215.7	218.4	197.0	223.6	210.8	914.5	846.9	849.9
Secondary Inventory Withdrawals	30.6	-14.8	8.4	-28.0	-3.3	-13.2	16.6	-3.8	-0.1	-5.9	14.2	-4.6	-3.8	-3.6	3.6
Waste Coal (a)	3.2	2.8	2.6	2.6	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	11.2	10.8	11.1
Total Supply	253.2	213.3	249.2	206.2	219.9	183.4	236.1	214.6	221.1	193.9	240.6	209.0	921.9	854.1	864.6
Consumption (million short tons)															
Coke Plants	4.8	5.1	5.2	5.2	4.4	4.4	5.3	5.3	4.4	4.3	5.1	5.0	20.4	19.4	18.8
Electric Power Sector (b)	231.3	196.0	231.2	193.0	196.5	174.6	220.5	198.2	205.1	178.8	224.9	192.8	851.4	789.7	801.6
Retail and Other Industry	12.0	10.9	11.0	11.1	11.4	10.4	10.6	11.2	11.6	10.8	10.7	11.2	45.0	43.5	44.2
Residential and Commercial	0.7	0.4	0.4	0.7	0.8	0.6	0.6	0.7	0.8	0.5	0.5	0.7	2.2	2.7	2.5
Other Industrial	11.3	10.5	10.6	10.4	10.6	9.8	10.0	10.4	10.8	10.2	10.2	10.5	42.8	40.9	41.7
Total Consumption	248.2	212.0	247.4	209.3	212.3	189.4	236.4	214.6	221.1	193.9	240.6	209.0	916.9	852.6	864.6
Discrepancy (c)	5.0	1.3	1.9	-3.1	7.7	-6.0	-0.2	0.0	0.0	0.0	0.0	0.0	5.1	1.5	0.0
End-of-period Inventories (million short tons)															
Primary Inventories (d)	46.2	45.6	43.2	44.7	45.5	45.2	42.1	43.7	44.7	44.0	41.1	42.7	44.7	43.7	42.7
Secondary Inventories	124.0	138.9	130.5	158.4	161.7	174.9	158.2	162.0	162.1	168.0	153.8	158.4	158.4	162.0	158.4
Electric Power Sector	118.3	132.9	123.8	151.4	155.6	168.0	150.8	154.2	155.3	160.5	145.8	150.1	151.4	154.2	150.1
Retail and General Industry	3.5	3.6	4.4	4.8	4.1	4.5	5.1	5.5	4.8	5.0	5.6	5.9	4.8	5.5	5.9
Coke Plants	1.8	1.9	1.8	1.9	1.6	1.9	1.9	1.9	1.6	2.0	1.9	1.9	1.9	1.9	1.9
Coal Market Indicators															
Coal Miner Productivity															
(Tons per hour)	5.47	5.47	5.47	5.47	5.61	5.61	5.61	5.61	5.46	5.46	5.46	5.46	5.47	5.61	5.46
Total Raw Steel Production															
(Million short tons per day)	0.262	0.263	0.271	0.262	0.247	0.242	0.249	0.238	0.242	0.252	0.237	0.222	0.264	0.244	0.238
Cost of Coal to Electric Utilities															
(Dollars per million Btu)	2.33	2.39	2.37	2.37	2.26	2.25	2.28	2.27	2.26	2.29	2.29	2.26	2.36	2.27	2.27

- = no data available

(a) Waste coal includes waste coal and coal slurry reprocessed into briquettes.

(b) Coal used for electricity generation and (a limited amount of) useful thermal output by electric utilities and independent power producers.

(c) The discrepancy reflects an unaccounted-for shipper and receiver reporting difference, assumed to be zero in the forecast period.

(d) Primary stocks are held at the mines and distribution points.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Quarterly Coal Report*, DOE/EIA-0121; and *Electric Power Monthly*, DOE/EIA-0226.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 7a. U.S. Electricity Industry Overview

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Electricity Supply (billion kilowatthours per day)															
Electricity Generation	11.49	10.77	12.06	10.54	11.33	10.74	12.27	10.58	11.06	10.93	12.49	10.73	11.21	11.23	11.30
Electric Power Sector (a)	11.04	10.36	11.62	10.11	10.91	10.33	11.82	10.15	10.64	10.52	12.03	10.28	10.78	10.80	10.87
Comm. and Indus. Sectors (b)	0.44	0.41	0.44	0.42	0.42	0.41	0.45	0.43	0.42	0.41	0.46	0.44	0.43	0.43	0.43
Net Imports	0.11	0.12	0.16	0.14	0.17	0.20	0.18	0.11	0.11	0.11	0.14	0.09	0.13	0.17	0.11
Total Supply	11.59	10.89	12.22	10.68	11.50	10.94	12.45	10.69	11.17	11.05	12.63	10.82	11.35	11.40	11.42
Losses and Unaccounted for (c)	0.72	0.86	0.76	0.73	0.77	0.90	0.77	0.72	0.59	0.91	0.78	0.72	0.77	0.79	0.75
Electricity Consumption (billion kilowatthours per day unless noted)															
Retail Sales	10.48	9.67	11.07	9.58	10.36	9.68	11.29	9.60	10.21	9.78	11.45	9.71	10.20	10.23	10.29
Residential Sector	4.31	3.36	4.26	3.45	4.19	3.35	4.43	3.44	4.00	3.37	4.47	3.48	3.84	3.85	3.83
Commercial Sector	3.62	3.65	4.06	3.54	3.61	3.67	4.12	3.57	3.63	3.72	4.20	3.63	3.72	3.74	3.79
Industrial Sector	2.52	2.65	2.73	2.57	2.53	2.64	2.72	2.56	2.56	2.67	2.76	2.59	2.62	2.61	2.64
Transportation Sector	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Direct Use (d)	0.39	0.36	0.39	0.37	0.37	0.36	0.39	0.38	0.37	0.36	0.40	0.39	0.38	0.37	0.38
Total Consumption	10.87	10.04	11.46	9.95	10.73	10.04	11.68	9.97	10.58	10.14	11.85	10.10	10.58	10.61	10.67
Average residential electricity usage per customer (kWh)	3,022	2,371	3,038	2,454	2,914	2,347	3,131	2,428	2,780	2,340	3,124	2,425	10,885	10,820	10,669
Prices															
Power Generation Fuel Costs (dollars per million Btu)															
Coal	2.33	2.39	2.37	2.37	2.26	2.25	2.28	2.27	2.26	2.29	2.29	2.26	2.36	2.27	2.27
Natural Gas	6.82	4.93	4.25	4.30	4.09	3.12	3.57	3.94	4.09	3.68	3.81	4.20	4.98	3.65	3.93
Residual Fuel Oil	19.97	20.44	19.75	14.72	10.82	11.51	11.23	10.14	10.22	11.50	11.85	11.64	19.18	10.88	11.29
Distillate Fuel Oil	23.40	22.77	21.88	18.72	15.39	15.02	12.83	13.70	14.25	14.56	15.04	15.84	22.34	14.52	14.87
End-Use Prices (cents per kilowatthour)															
Residential Sector	11.91	12.73	13.01	12.38	12.24	12.85	13.03	12.54	12.51	13.08	13.31	12.81	12.50	12.67	12.94
Commercial Sector	10.55	10.68	11.11	10.59	10.50	10.56	11.36	10.80	10.76	10.82	11.59	11.01	10.75	10.83	11.06
Industrial Sector	6.99	6.92	7.36	6.76	6.76	6.73	7.50	6.87	6.90	6.88	7.59	6.93	7.01	6.97	7.08

- = no data available. kWh = kilowatthours. Btu = British thermal units.

Prices are not adjusted for inflation.

(a) Generation supplied by electricity-only and combined-heat-and-power (CHP) plants operated by electric utilities and independent power producers.

(b) Generation supplied by CHP and electricity-only plants operated by businesses in the commercial and industrial sectors, primarily for onsite use.

(c) Includes transmission and distribution losses, data collection time-frame differences, and estimation error.

 (d) Direct Use represents commercial and industrial facility use of onsite net electricity generation; and electrical sales or transfers to adjacent or colocated facilities for which revenue information is not available. See Table 7.6 of the EIA *Monthly Energy Review*.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

 Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Electric Power Monthly*, DOE/EIA-0226; and *Electric Power Annual*, DOE/EIA-0348.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 7b. U.S. Regional Electricity Retail Sales (Million Kilowatthours per Day)
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Residential Sector															
New England	163	111	136	118	152	111	137	121	143	113	138	122	129	130	129
Middle Atlantic	423	315	383	323	423	321	404	326	392	318	412	327	361	369	362
E. N. Central	616	446	513	479	588	428	523	477	553	435	551	482	513	504	506
W. N. Central	362	246	293	265	325	232	302	263	319	240	310	267	289	280	284
S. Atlantic	1,080	858	1,088	861	1,072	889	1,159	861	994	863	1,157	864	971	995	970
E. S. Central	404	278	363	288	390	276	388	282	356	280	384	281	333	334	325
W. S. Central	617	501	731	498	602	503	761	497	576	531	747	505	587	591	590
Mountain	238	242	321	226	234	240	328	231	245	245	345	238	257	258	269
Pacific contiguous	419	347	422	378	394	336	416	373	405	336	409	377	391	380	382
AK and HI	14	11	12	13	13	11	12	13	13	12	12	13	13	12	13
Total	4,315	3,355	4,260	3,449	4,194	3,348	4,429	3,443	3,997	3,374	4,465	3,476	3,844	3,853	3,829
Commercial Sector															
New England	148	138	154	139	148	139	156	138	145	140	157	138	145	145	145
Middle Atlantic	442	413	461	409	444	416	466	410	440	415	473	412	431	434	435
E. N. Central	511	490	526	480	510	490	530	484	511	500	553	495	502	504	515
W. N. Central	287	273	298	272	281	269	301	274	285	279	313	280	282	281	289
S. Atlantic	803	842	920	793	805	859	940	805	810	857	957	822	840	853	862
E. S. Central	239	237	271	226	235	239	278	227	235	240	281	230	243	245	247
W. S. Central	494	521	610	504	496	529	624	508	501	541	635	519	532	540	549
Mountain	239	259	287	243	239	256	288	247	246	261	296	253	257	257	264
Pacific contiguous	442	463	514	461	434	458	518	463	438	467	518	466	470	468	472
AK and HI	17	16	17	17	16	16	17	17	16	16	17	17	16	16	16
Total	3,621	3,652	4,056	3,544	3,609	3,671	4,118	3,573	3,627	3,715	4,200	3,631	3,719	3,744	3,794
Industrial Sector															
New England	49	50	52	50	49	51	52	50	49	50	53	49	50	51	50
Middle Atlantic	201	198	205	194	198	196	206	197	203	203	209	198	199	199	203
E. N. Central	525	532	544	519	520	525	533	505	515	523	533	505	530	521	519
W. N. Central	231	240	253	238	237	242	258	244	242	252	267	249	241	245	252
S. Atlantic	372	397	404	383	376	407	397	377	374	401	406	382	389	389	391
E. S. Central	279	287	296	283	279	287	289	277	295	291	289	284	286	283	289
W. S. Central	431	465	471	444	428	457	477	449	438	468	486	451	453	453	461
Mountain	210	235	250	220	217	235	252	225	220	242	260	230	229	232	238
Pacific contiguous	213	228	244	223	216	226	241	222	213	226	242	223	227	226	226
AK and HI	13	14	14	14	13	13	14	14	13	13	14	14	14	14	14
Total	2,522	2,646	2,734	2,567	2,531	2,641	2,720	2,560	2,561	2,669	2,758	2,585	2,618	2,613	2,643
Total All Sectors (a)															
New England	352	300	344	308	350	304	347	310	339	304	350	310	326	328	326
Middle Atlantic	1,078	936	1,059	936	1,077	944	1,087	945	1,047	946	1,106	948	1,002	1,013	1,012
E. N. Central	1,654	1,469	1,584	1,480	1,620	1,445	1,587	1,467	1,581	1,460	1,638	1,483	1,547	1,529	1,541
W. N. Central	870	760	843	776	843	744	861	781	846	771	890	796	812	807	826
S. Atlantic	2,259	2,100	2,415	2,041	2,256	2,159	2,501	2,046	2,181	2,124	2,524	2,072	2,204	2,241	2,226
E. S. Central	922	803	931	797	904	802	955	786	886	811	954	794	863	862	861
W. S. Central	1,542	1,487	1,812	1,446	1,527	1,489	1,862	1,455	1,516	1,540	1,868	1,476	1,572	1,584	1,600
Mountain	687	737	858	689	690	731	868	702	711	748	901	722	743	748	771
Pacific contiguous	1,076	1,040	1,182	1,064	1,046	1,022	1,177	1,060	1,057	1,032	1,171	1,069	1,091	1,077	1,083
AK and HI	44	41	43	43	42	41	43	44	43	41	43	44	43	42	43
Total	10,481	9,674	11,072	9,581	10,356	9,681	11,289	9,597	10,208	9,779	11,446	9,714	10,202	10,231	10,288

- = no data available

(a) Total retail sales to all sectors includes residential, commercial, industrial, and transportation sector sales.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Retail Sales represents total retail electricity sales by electric utilities and power marketers.

Regions refer to U.S. Census divisions.

See "Census division" in EIA's Energy Glossary (<http://www.eia.doe.gov/glossary/index.html>) for a list of States in each region.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Electric Power Monthly*, DOE/EIA-0226; and *Electric Power Annual*, DOE/EIA-0348.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 7c. U.S. Regional Electricity Prices (Cents per Kilowatthour)

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Residential Sector															
New England	17.53	18.03	17.60	18.24	20.42	20.31	19.49	18.69	18.83	19.02	19.18	19.20	17.82	19.75	19.05
Middle Atlantic	16.26	16.58	16.66	16.02	15.76	16.07	16.42	16.09	16.14	16.47	16.78	16.49	16.38	16.08	16.47
E. N. Central	11.56	12.96	12.98	12.73	12.22	13.19	13.04	12.86	12.52	13.43	13.26	13.10	12.50	12.79	13.05
W. N. Central	10.04	11.80	12.31	10.65	10.25	12.16	12.58	10.90	10.55	12.41	12.87	11.15	11.14	11.43	11.72
S. Atlantic	11.31	11.98	12.13	11.61	11.39	11.91	12.09	11.71	11.76	12.27	12.38	11.97	11.75	11.78	12.10
E. S. Central	10.30	11.21	10.97	10.66	10.34	11.16	10.87	10.76	10.74	11.46	11.19	11.05	10.75	10.75	11.09
W. S. Central	10.40	11.43	11.39	11.06	10.67	11.36	11.20	10.92	10.82	11.48	11.36	10.97	11.07	11.04	11.17
Mountain	10.93	12.02	12.33	11.31	11.31	12.21	12.51	11.53	11.60	12.56	12.85	11.83	11.71	11.95	12.27
Pacific	12.93	12.78	15.63	13.16	13.68	13.46	15.94	13.76	14.23	13.77	16.43	14.24	13.65	14.28	14.73
U.S. Average	11.91	12.73	13.01	12.38	12.24	12.85	13.03	12.54	12.51	13.08	13.31	12.81	12.50	12.67	12.94
Commercial Sector															
New England	15.62	14.32	14.43	14.33	16.93	15.17	15.37	15.20	18.02	16.37	16.40	16.23	14.68	15.67	16.75
Middle Atlantic	14.29	13.32	13.94	12.94	13.18	12.98	14.73	13.48	13.42	13.33	14.95	13.67	13.64	13.62	13.88
E. N. Central	9.69	9.96	10.00	9.88	9.75	9.94	10.02	9.90	9.87	10.04	10.09	9.94	9.88	9.90	9.99
W. N. Central	8.60	9.39	9.86	8.69	8.57	9.51	10.27	8.92	8.79	9.77	10.53	9.16	9.15	9.34	9.59
S. Atlantic	9.83	9.68	9.70	9.65	9.68	9.44	9.76	9.81	9.85	9.65	9.95	9.98	9.72	9.67	9.86
E. S. Central	10.26	10.51	10.40	10.22	10.22	10.35	10.45	10.54	10.52	10.58	10.62	10.70	10.35	10.39	10.61
W. S. Central	8.13	8.34	8.30	8.15	8.05	7.90	8.36	8.14	8.24	8.13	8.51	8.21	8.24	8.13	8.28
Mountain	9.12	9.89	10.19	9.42	9.39	9.95	10.38	9.63	9.63	10.23	10.65	9.88	9.69	9.87	10.13
Pacific	11.73	13.21	15.67	13.79	12.30	13.40	16.20	14.03	12.84	13.67	16.67	14.49	13.68	14.09	14.51
U.S. Average	10.55	10.68	11.11	10.59	10.50	10.56	11.36	10.80	10.76	10.82	11.59	11.01	10.75	10.83	11.06
Industrial Sector															
New England	12.97	11.47	11.43	11.18	13.18	11.72	12.97	12.41	14.36	12.50	13.66	12.98	11.74	12.56	13.38
Middle Atlantic	8.74	7.36	7.28	7.07	7.87	7.19	7.95	7.35	7.92	7.29	7.97	7.40	7.61	7.59	7.65
E. N. Central	7.01	6.84	7.01	6.85	6.87	6.78	7.18	7.03	7.05	6.96	7.32	7.14	6.93	6.97	7.12
W. N. Central	6.52	6.68	7.32	6.32	6.49	6.88	7.78	6.60	6.70	7.04	7.94	6.72	6.72	6.96	7.12
S. Atlantic	6.80	6.68	6.96	6.49	6.56	6.38	7.02	6.51	6.69	6.57	7.05	6.51	6.73	6.62	6.71
E. S. Central	6.16	6.23	6.76	5.68	5.78	5.95	6.66	5.76	5.79	6.02	6.68	5.74	6.22	6.05	6.06
W. S. Central	5.87	6.04	6.34	5.92	5.65	5.50	6.07	5.61	5.65	5.60	6.09	5.61	6.05	5.72	5.75
Mountain	6.15	6.73	7.38	6.25	6.18	6.65	7.49	6.37	6.36	6.83	7.67	6.51	6.66	6.70	6.87
Pacific	7.70	8.11	9.59	8.63	7.83	8.28	9.86	8.94	8.12	8.41	9.99	9.03	8.54	8.76	8.92
U.S. Average	6.99	6.92	7.36	6.76	6.76	6.73	7.50	6.87	6.90	6.88	7.59	6.93	7.01	6.97	7.08
All Sectors (a)															
New England	16.05	15.19	15.20	15.29	17.90	16.46	16.61	16.08	17.79	16.68	17.05	16.85	15.45	16.79	17.11
Middle Atlantic	14.00	13.15	13.63	12.78	13.20	12.82	14.05	13.08	13.35	13.07	14.28	13.31	13.42	13.31	13.53
E. N. Central	9.53	9.73	9.93	9.74	9.72	9.75	10.06	9.87	9.87	9.94	10.25	10.01	9.73	9.85	10.02
W. N. Central	8.63	9.31	9.95	8.64	8.64	9.49	10.34	8.86	8.86	9.70	10.57	9.07	9.14	9.34	9.57
S. Atlantic	10.04	10.05	10.34	9.88	9.97	9.88	10.40	10.00	10.18	10.13	10.60	10.17	10.09	10.08	10.28
E. S. Central	9.04	9.22	9.47	8.77	8.90	9.05	9.47	8.93	9.03	9.25	9.66	9.05	9.13	9.10	9.26
W. S. Central	8.41	8.66	9.04	8.47	8.41	8.33	8.94	8.31	8.47	8.52	9.02	8.36	8.66	8.52	8.62
Mountain	8.84	9.58	10.17	9.03	9.03	9.63	10.35	9.21	9.30	9.89	10.64	9.45	9.46	9.61	9.87
Pacific	11.39	11.93	14.35	12.47	11.89	12.28	14.79	12.86	12.41	12.53	15.19	13.25	12.59	13.02	13.41
U.S. Average	10.25	10.36	10.92	10.21	10.29	10.31	11.09	10.38	10.47	10.52	11.29	10.57	10.45	10.54	10.74

- = no data available

Prices are not adjusted for inflation.

(a) Volume-weighted average of retail prices to residential, commercial, industrial, and transportation sectors.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Regions refer to U.S. Census divisions.

 See "Census division" in EIA's Energy Glossary (<http://www.eia.doe.gov/glossary/index.html>) for a list of States in each region.

Historical data: Latest data available from Energy Information Administration databases supporting the following reports: *Electric Power Monthly*, DOE/EIA-0226; and *Electric Power Annual*, DOE/EIA-0348.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 7d. U.S. Regional Electricity Generation, All Sectors (Thousand megawatthours per day)
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
United States															
Coal	4,864	4,029	4,624	3,869	4,094	3,516	4,389	3,944	4,195	3,640	4,493	3,838	4,344	3,986	4,042
Natural Gas	2,715	2,898	3,725	2,948	3,236	3,452	4,228	3,159	3,086	3,305	4,123	3,143	3,074	3,521	3,415
Petroleum (a)	148	64	66	58	124	61	69	69	83	71	77	68	84	80	75
Other Gases	28	29	35	34	34	33	35	35	34	34	36	36	32	34	35
Nuclear	2,201	2,060	2,289	2,184	2,248	2,133	2,239	2,016	2,115	2,078	2,226	2,065	2,184	2,159	2,121
Renewable Energy Sources:															
Conventional Hydropower	703	849	652	633	797	688	557	507	644	808	685	635	709	636	693
Wind	553	549	367	525	506	531	414	555	603	646	473	610	498	501	583
Wood Biomass	119	114	121	118	117	109	123	116	117	111	128	121	118	116	119
Waste Biomass	56	59	60	59	55	57	61	60	58	59	62	60	58	58	60
Geothermal	45	45	45	46	47	46	48	49	49	48	48	49	46	47	48
Solar	35	61	61	44	56	88	82	49	53	108	116	78	50	69	89
Pumped Storage Hydropower	-13	-18	-21	-16	-14	-10	-15	-14	-13	-11	-15	-13	-17	-13	-13
Other Nonrenewable Fuels (b)	32	34	36	35	33	36	36	35	34	37	37	36	34	35	36
Total Generation	11,486	10,773	12,060	10,536	11,333	10,739	12,265	10,580	11,058	10,934	12,490	10,726	11,214	11,230	11,304
Northeast Census Region															
Coal	353	244	210	207	293	177	172	247	304	169	191	208	253	222	218
Natural Gas	413	485	632	493	479	533	690	538	500	567	704	546	506	561	580
Petroleum (a)	55	2	3	3	47	2	5	6	10	4	6	5	16	15	6
Other Gases	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Nuclear	542	471	539	531	545	499	529	469	493	482	513	476	521	510	491
Hydropower (c)	94	100	84	91	91	97	86	73	93	107	93	92	92	87	97
Other Renewables (d)	73	64	60	72	76	65	60	69	73	64	62	73	67	67	68
Other Nonrenewable Fuels (b)	11	12	13	12	11	12	12	12	12	12	12	12	12	12	12
Total Generation	1,542	1,381	1,543	1,411	1,543	1,387	1,556	1,415	1,485	1,408	1,583	1,414	1,469	1,475	1,473
South Census Region															
Coal	2,122	1,849	2,100	1,614	1,713	1,539	1,965	1,556	1,708	1,590	1,964	1,534	1,920	1,694	1,699
Natural Gas	1,544	1,729	2,088	1,637	1,976	2,060	2,381	1,778	1,777	1,997	2,352	1,761	1,751	2,049	1,972
Petroleum (a)	53	28	26	24	42	25	26	26	34	29	31	25	33	30	30
Other Gases	11	11	14	14	13	12	13	14	13	13	14	15	13	13	14
Nuclear	966	882	994	977	974	956	989	893	942	930	1,006	933	955	953	953
Hydropower (c)	150	107	80	107	127	113	75	82	130	124	83	103	111	99	110
Other Renewables (d)	241	257	204	240	228	262	232	282	300	324	272	322	235	251	305
Other Nonrenewable Fuels (b)	13	13	14	14	14	15	14	14	14	16	14	14	13	14	15
Total Generation	5,100	4,875	5,520	4,627	5,089	4,981	5,695	4,645	4,918	5,022	5,737	4,706	5,031	5,103	5,096
Midwest Census Region															
Coal	1,801	1,439	1,682	1,492	1,581	1,305	1,596	1,498	1,590	1,375	1,721	1,514	1,603	1,495	1,550
Natural Gas	194	184	203	189	295	254	330	217	254	229	289	212	193	274	246
Petroleum (a)	14	13	12	9	12	11	13	11	12	11	13	11	12	12	12
Other Gases	11	12	14	12	13	13	15	12	13	13	15	13	12	13	13
Nuclear	533	543	586	525	553	529	555	503	521	509	542	503	547	535	519
Hydropower (c)	33	45	44	41	42	46	43	31	42	49	45	39	41	40	44
Other Renewables (d)	253	214	148	244	250	217	161	246	259	247	178	265	214	218	237
Other Nonrenewable Fuels (b)	4	5	5	4	4	5	5	5	4	5	5	5	4	5	5
Total Generation	2,843	2,454	2,693	2,516	2,749	2,379	2,717	2,523	2,695	2,439	2,807	2,561	2,626	2,592	2,626
West Census Region															
Coal	588	497	632	556	506	496	655	643	592	507	617	582	568	576	574
Natural Gas	564	500	802	628	486	605	827	627	555	512	777	624	624	637	618
Petroleum (a)	25	21	24	23	23	23	25	27	27	27	28	28	23	24	27
Other Gases	5	5	6	6	6	6	6	6	7	6	6	6	5	6	6
Nuclear	160	164	170	150	176	149	167	151	159	156	166	154	161	161	159
Hydropower (c)	414	579	423	378	522	422	337	306	366	516	448	387	448	396	430
Other Renewables (d)	240	293	243	236	228	287	275	232	248	337	315	259	253	256	290
Other Nonrenewable Fuels (b)	5	5	5	4	4	4	5	4	4	5	5	5	5	4	5
Total Generation	2,001	2,063	2,304	1,982	1,953	1,992	2,297	1,997	1,960	2,066	2,362	2,044	2,088	2,060	2,109

(a) Residual fuel oil, distillate fuel oil, petroleum coke, and other petroleum liquids.

(b) Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, nonrenewable waste, and miscellaneous technologies.

(c) Conventional hydroelectric and pumped storage generation.

(d) Wind, biomass, geothermal, and solar generation.

Notes: Data reflect generation supplied by electricity-only and combined-heat-and-power (CHP) plants operated by electric utilities, independent power producers, and the commercial and industrial sectors. The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from U.S. Energy Information Administration *Electric Power Monthly* and *Electric Power Annual*.

Projections: EIA Regional Short-Term Energy Model.

Table 7e. U.S. Regional Fuel Consumption for Electricity Generation, All Sectors
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Fuel Consumption for Electricity Generation, All Sectors															
United States															
Coal (thousand st/d)	2,579	2,161	2,522	2,105	2,190	1,927	2,404	2,161	2,259	1,971	2,452	2,103	2,341	2,171	2,197
Natural Gas (million cf/d)	20,666	22,042	28,356	22,049	23,991	26,114	32,413	23,387	22,865	25,127	31,506	23,214	23,296	26,491	25,687
Petroleum (thousand b/d)	262	111	115	103	216	108	119	123	148	125	135	122	147	141	133
Residual Fuel Oil	86	24	29	24	77	26	29	30	35	30	33	29	41	41	32
Distillate Fuel Oil	87	24	24	25	66	26	28	30	37	28	29	29	40	37	31
Petroleum Coke (a)	69	60	59	50	59	52	58	58	68	62	68	59	59	57	64
Other Petroleum Liquids (b)	20	3	3	4	13	4	5	5	8	5	6	5	7	7	6
Northeast Census Region															
Coal (thousand st/d)	161	113	102	96	132	82	81	114	137	77	88	95	118	102	99
Natural Gas (million cf/d)	3,191	3,701	4,921	3,729	3,614	4,077	5,363	4,034	3,752	4,298	5,428	4,059	3,890	4,276	4,386
Petroleum (thousand b/d)	92	4	6	5	76	4	10	10	17	8	10	9	26	25	11
South Census Region															
Coal (thousand st/d)	1,084	963	1,116	855	889	820	1,047	834	894	841	1,046	822	1,004	898	901
Natural Gas (million cf/d)	11,736	13,138	15,819	12,131	14,453	15,565	18,126	13,064	13,067	15,123	17,866	12,918	13,214	15,306	14,747
Petroleum (thousand b/d)	101	51	49	45	79	45	48	49	64	53	58	47	61	55	56
Midwest Census Region															
Coal (thousand st/d)	1,005	811	952	842	884	745	904	844	891	770	970	853	902	844	871
Natural Gas (million cf/d)	1,574	1,436	1,638	1,513	2,275	1,977	2,708	1,671	1,954	1,809	2,360	1,628	1,540	2,158	1,938
Petroleum (thousand b/d)	28	23	22	17	23	22	22	22	22	20	22	22	23	22	22
West Census Region															
Coal (thousand st/d)	329	274	351	313	286	280	372	369	336	283	348	332	317	327	325
Natural Gas (million cf/d)	4,165	3,767	5,979	4,675	3,649	4,494	6,217	4,618	4,092	3,897	5,851	4,609	4,651	4,751	4,616
Petroleum (thousand b/d)	41	33	38	36	38	36	39	43	44	43	45	45	37	39	44
End-of-period U.S. Fuel Inventories Held by Electric Power Sector															
Coal (million short tons)	118.3	132.9	123.8	151.4	155.6	168.0	150.8	154.2	155.3	160.5	145.8	150.1	151.4	154.2	150.1
Residual Fuel Oil (mmb)	10.5	10.6	10.4	12.7	10.2	10.5	10.9	11.5	11.5	11.4	11.2	11.4	12.7	11.5	11.4
Distillate Fuel Oil (mmb)	15.5	15.5	15.5	16.9	15.8	15.9	15.9	16.2	16.2	16.1	16.0	16.2	16.9	16.2	16.2
Petroleum Coke (mmb)	1.7	2.0	1.9	4.2	4.1	5.2	5.2	5.1	5.0	4.9	4.8	4.8	4.2	5.1	4.8

(a) Petroleum coke consumption converted from short tons to barrels by multiplying by five.

(b) Other petroleum liquids include jet fuel, kerosene, and waste oil.

Notes: Data reflect generation supplied by electricity-only and combined-heat-and-power (CHP) plants operated by electric utilities, independent power producers, and the commercial and industrial sectors. Data include fuel consumed only for generation of electricity. Values do not include consumption by CHP plants for useful thermal output.

The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Physical Units: st/d = short tons per day; b/d = barrels per day; cf/d = cubic feet per day; mmb = million barrels.

Historical data: Latest data available from U.S. Energy Information Administration *Electric Power Monthly* and *Electric Power Annual*.

Projections: EIA Regional Short-Term Energy Model.

Table 8. U.S. Renewable Energy Consumption (Quadrillion Btu)
U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Electric Power Sector															
Hydroelectric Power (a)	0.596	0.731	0.566	0.549	0.677	0.592	0.482	0.437	0.550	0.696	0.594	0.549	2.443	2.188	2.388
Wood Biomass (b)	0.063	0.056	0.064	0.063	0.063	0.056	0.065	0.060	0.063	0.057	0.070	0.063	0.247	0.244	0.254
Waste Biomass (c)	0.063	0.065	0.066	0.066	0.063	0.062	0.069	0.068	0.066	0.067	0.070	0.068	0.260	0.261	0.270
Wind	0.473	0.475	0.321	0.459	0.433	0.459	0.362	0.486	0.522	0.559	0.414	0.534	1.729	1.740	2.028
Geothermal	0.039	0.039	0.039	0.041	0.040	0.040	0.043	0.043	0.042	0.041	0.042	0.043	0.158	0.165	0.169
Solar	0.029	0.051	0.052	0.037	0.047	0.074	0.071	0.042	0.045	0.092	0.101	0.068	0.170	0.234	0.306
Subtotal	1.263	1.418	1.109	1.215	1.323	1.283	1.091	1.135	1.286	1.511	1.290	1.324	5.006	4.832	5.414
Industrial Sector															
Hydroelectric Power (a)	0.008	0.006	0.006	0.007	0.007	0.006	0.006	0.006	0.006	0.005	0.006	0.006	0.026	0.025	0.024
Wood Biomass (b)	0.318	0.327	0.335	0.336	0.321	0.312	0.310	0.305	0.293	0.289	0.300	0.303	1.317	1.248	1.185
Waste Biomass (c)	0.044	0.046	0.046	0.046	0.045	0.047	0.048	0.047	0.046	0.046	0.048	0.048	0.183	0.186	0.188
Geothermal	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.004
Biofuel Losses and Co-products (f)	0.182	0.190	0.190	0.196	0.189	0.192	0.192	0.193	0.195	0.191	0.194	0.192	0.758	0.767	0.773
Subtotal	0.557	0.574	0.582	0.591	0.567	0.562	0.562	0.557	0.546	0.537	0.555	0.555	2.305	2.249	2.193
Commercial Sector															
Wood Biomass (b)	0.018	0.018	0.018	0.018	0.018	0.020	0.019	0.019	0.019	0.019	0.019	0.019	0.071	0.076	0.077
Waste Biomass (c)	0.012	0.011	0.011	0.012	0.012	0.011	0.012	0.012	0.011	0.011	0.012	0.012	0.046	0.047	0.047
Geothermal	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.020	0.020	0.020
Subtotal	0.036	0.036	0.036	0.036	0.037	0.037	0.037	0.037	0.036	0.036	0.037	0.037	0.144	0.148	0.146
Residential Sector															
Wood Biomass (b)	0.143	0.145	0.146	0.146	0.110	0.111	0.113	0.113	0.103	0.104	0.105	0.105	0.580	0.447	0.418
Geothermal	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.011	0.011	0.011	0.011	0.040	0.040	0.044
Solar (d)	0.062	0.063	0.063	0.063	0.069	0.070	0.071	0.071	0.077	0.077	0.078	0.078	0.252	0.281	0.311
Subtotal	0.215	0.217	0.220	0.220	0.189	0.191	0.194	0.194	0.191	0.193	0.195	0.195	0.871	0.768	0.773
Transportation Sector															
Ethanol (e)	0.255	0.274	0.278	0.280	0.266	0.286	0.286	0.282	0.270	0.282	0.289	0.282	1.087	1.118	1.123
Biodiesel (e)	0.039	0.046	0.056	0.052	0.034	0.058	0.065	0.070	0.059	0.063	0.069	0.071	0.193	0.227	0.261
Subtotal	0.295	0.320	0.334	0.332	0.300	0.341	0.350	0.352	0.329	0.345	0.358	0.353	1.280	1.343	1.384
All Sectors Total															
Hydroelectric Power (a)	0.604	0.737	0.572	0.555	0.685	0.598	0.488	0.443	0.556	0.701	0.600	0.555	2.469	2.213	2.412
Wood Biomass (b)	0.542	0.546	0.563	0.563	0.512	0.500	0.507	0.496	0.478	0.469	0.495	0.491	2.214	2.016	1.934
Waste Biomass (c)	0.119	0.121	0.124	0.124	0.120	0.121	0.128	0.126	0.123	0.124	0.130	0.128	0.488	0.495	0.504
Wind	0.473	0.475	0.321	0.459	0.433	0.459	0.362	0.486	0.522	0.559	0.414	0.534	1.729	1.740	2.028
Geothermal	0.055	0.055	0.055	0.057	0.056	0.056	0.059	0.059	0.059	0.058	0.060	0.060	0.222	0.230	0.237
Solar	0.092	0.116	0.117	0.102	0.117	0.146	0.143	0.114	0.123	0.171	0.180	0.147	0.427	0.521	0.622
Ethanol (e)	0.260	0.279	0.283	0.285	0.271	0.289	0.293	0.287	0.276	0.287	0.295	0.287	1.107	1.139	1.145
Biodiesel (e)	0.039	0.046	0.056	0.052	0.034	0.058	0.065	0.070	0.059	0.063	0.069	0.071	0.193	0.227	0.261
Biofuel Losses and Co-products (f)	0.182	0.190	0.190	0.196	0.189	0.192	0.192	0.193	0.195	0.191	0.194	0.192	0.758	0.767	0.773
Total Consumption	2.366	2.565	2.282	2.394	2.417	2.442	2.234	2.274	2.389	2.622	2.436	2.463	9.607	9.367	9.910

- = no data available

(a) Conventional hydroelectric power only. Hydroelectricity generated by pumped storage is not included in renewable energy.

(b) Wood and wood-derived fuels.

(c) Municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass.

(d) Includes small-scale solar thermal and photovoltaic energy used in the commercial, industrial, and electric power sectors.

(e) Fuel ethanol and biodiesel consumption in the transportation sector includes production, stock change, and imports less exports. Some biodiesel may be consumed in the residential sector in heating oil.

(f) Losses and co-products from the production of fuel ethanol and biodiesel

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from EIA databases supporting the following reports: *Electric Power Monthly*, DOE/EIA-0226 and *Renewable Energy Annual*, DOE/EIA-0603; *Petroleum Supply Monthly*, DOE/EIA-0109.

Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model.

Table 9a. U.S. Macroeconomic Indicators and CO₂ Emissions

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Macroeconomic															
Real Gross Domestic Product															
(billion chained 2009 dollars - SAAR)	15,832	16,010	16,206	16,295	16,288	16,381	16,458	16,568	16,667	16,774	16,890	17,028	16,086	16,424	16,840
Real Personal Consumption Expend.															
(billion chained 2009 dollars - SAAR)	10,844	10,913	11,000	11,120	11,178	11,259	11,338	11,420	11,488	11,573	11,654	11,737	10,969	11,299	11,613
Real Fixed Investment															
(billion chained 2009 dollars - SAAR)	2,536	2,595	2,643	2,673	2,671	2,676	2,725	2,776	2,827	2,863	2,897	2,945	2,612	2,712	2,883
Business Inventory Change															
(billion chained 2009 dollars - SAAR)	40	100	95	93	111	107	61	44	21	8	13	26	82	81	17
Real Government Expenditures															
(billion chained 2009 dollars - SAAR)	2,869	2,881	2,912	2,898	2,893	2,899	2,911	2,915	2,917	2,922	2,926	2,933	2,890	2,904	2,925
Real Exports of Goods & Services															
(billion chained 2009 dollars - SAAR)	2,027	2,081	2,104	2,127	2,095	2,123	2,130	2,153	2,178	2,203	2,228	2,253	2,085	2,125	2,215
Real Imports of Goods & Services															
(billion chained 2009 dollars - SAAR)	2,474	2,541	2,535	2,599	2,643	2,666	2,694	2,726	2,753	2,783	2,817	2,851	2,537	2,682	2,801
Real Disposable Personal Income															
(billion chained 2009 dollars - SAAR)	11,810	11,900	11,970	12,093	12,251	12,312	12,417	12,477	12,576	12,637	12,742	12,846	11,943	12,364	12,700
Non-Farm Employment															
(millions)	137.8	138.6	139.4	140.2	141.0	141.6	142.2	142.7	143.1	143.5	144.0	144.7	139.0	141.9	143.8
Civilian Unemployment Rate															
(percent)	6.6	6.2	6.1	5.7	5.6	5.4	5.3	5.3	5.3	5.3	5.3	5.3	6.2	5.4	5.3
Housing Starts															
(millions - SAAR)	0.93	0.98	1.03	1.06	0.98	1.14	1.14	1.20	1.23	1.26	1.31	1.37	1.00	1.11	1.29
Industrial Production Indices (Index, 2007=100)															
Total Industrial Production	102.2	103.7	104.7	105.9	105.9	105.6	105.4	105.8	106.0	106.8	107.7	108.8	104.1	105.7	107.3
Manufacturing	99.4	101.2	102.4	103.5	103.3	103.6	103.7	104.3	104.4	105.3	106.4	107.6	101.6	103.7	105.9
Food	106.1	106.5	105.6	107.7	108.8	108.5	109.0	109.5	110.0	110.6	111.3	111.9	106.5	109.0	111.0
Paper	82.4	83.3	82.6	83.1	82.2	82.8	82.6	82.2	81.9	81.8	82.0	82.2	82.9	82.4	82.0
Petroleum and Coal Products	97.7	98.2	98.9	98.7	99.4	100.6	101.6	102.2	102.5	102.9	103.3	103.7	98.4	101.0	103.1
Chemicals	87.7	88.4	90.1	91.3	92.0	92.0	92.5	92.8	93.3	94.1	95.3	96.5	89.4	92.3	94.8
Nonmetallic Mineral Products	75.5	77.4	79.9	80.2	80.5	80.6	81.5	82.6	84.1	85.7	87.5	89.4	78.3	81.3	86.7
Primary Metals	101.9	106.2	108.2	105.5	100.9	101.1	101.7	101.3	100.9	101.6	102.8	104.1	105.5	101.2	102.4
Coal-weighted Manufacturing (a)	91.8	93.7	94.6	94.4	93.3	93.6	94.2	94.3	94.5	95.3	96.3	97.4	93.6	93.9	95.9
Distillate-weighted Manufacturing (a)	92.3	93.9	95.0	95.6	95.1	95.2	95.7	96.2	96.9	97.8	98.8	99.9	94.2	95.6	98.3
Electricity-weighted Manufacturing (a)	97.1	99.1	100.1	100.6	99.8	100.2	100.7	100.9	101.1	101.9	103.1	104.3	99.2	100.4	102.6
Natural Gas-weighted Manufacturing (a)	93.6	94.6	95.6	96.2	95.6	96.1	96.7	96.9	97.1	98.1	99.4	100.7	95.0	96.4	98.8
Price Indexes															
Consumer Price Index (all urban consumers)															
(index, 1982-1984=1.00)	2.35	2.37	2.38	2.37	2.35	2.37	2.38	2.38	2.40	2.41	2.43	2.44	2.37	2.37	2.42
Producer Price Index: All Commodities															
(index, 1982=1.00)	2.06	2.07	2.06	2.02	1.92	1.92	1.92	1.92	1.93	1.94	1.96	1.95	2.05	1.92	1.95
Producer Price Index: Petroleum															
(index, 1982=1.00)	2.88	2.99	2.90	2.35	1.71	1.95	1.84	1.62	1.70	1.91	1.94	1.81	2.78	1.78	1.84
GDP Implicit Price Deflator															
(index, 2009=100)	107.7	108.3	108.6	108.7	108.7	109.2	109.7	110.1	110.7	111.3	111.7	112.2	108.3	109.4	111.5
Miscellaneous															
Vehicle Miles Traveled (b)															
(million miles/day)	7,708	8,691	8,614	8,300	7,991	8,983	8,855	8,497	8,154	8,992	8,909	8,578	8,331	8,584	8,659
Air Travel Capacity															
(Available ton-miles/day, thousands)	503	548	561	535	517	574	581	544	506	557	583	547	537	554	548
Aircraft Utilization															
(Revenue ton-miles/day, thousands)	310	347	353	332	322	356	371	342	312	352	376	344	336	348	346
Airline Ticket Price Index															
(index, 1982-1984=100)	297.3	334.3	301.0	298.2	286.4	313.0	288.7	294.5	295.0	317.3	306.7	311.5	307.7	295.6	307.6
Raw Steel Production															
(million short tons per day)	0.262	0.263	0.271	0.262	0.247	0.242	0.249	0.238	0.242	0.252	0.237	0.222	0.264	0.244	0.238
Carbon Dioxide (CO₂) Emissions (million metric tons)															
Petroleum	547	556	568	577	562	568	577	576	564	569	578	577	2,249	2,283	2,287
Natural Gas	461	298	305	377	471	310	326	391	461	319	330	396	1,441	1,498	1,506
Coal	463	397	461	391	397	358	443	402	414	364	450	391	1,713	1,599	1,619
Total Energy (c)	1,475	1,254	1,337	1,348	1,432	1,239	1,349	1,372	1,442	1,255	1,360	1,367	5,414	5,391	5,425

- = no data available

SAAR = Seasonally-adjusted annual rate

(a) Fuel share weights of individual sector indices based on EIA Manufacturing Energy Consumption Survey.

(b) Total highway travel includes gasoline and diesel fuel vehicles.

(c) Includes electric power sector use of geothermal energy and non-biomass waste.

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Historical data: Latest data available from U.S. Department of Commerce, Bureau of Economic Analysis; Federal Reserve System, Statistical release G17; Federal Highway Administration; and Federal Aviation Administration. Minor discrepancies with published historical data are due to independent rounding.

Projections: EIA Regional Short-Term Energy Model. Macroeconomic projections are based on Global Insight Model of the U.S. Economy.

Table 9b. U.S. Regional Macroeconomic Data

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Real Gross State Product (Billion \$2009)															
New England	855	861	866	878	877	883	887	892	897	901	907	914	865	885	905
Middle Atlantic	2,393	2,409	2,443	2,468	2,464	2,478	2,491	2,506	2,520	2,533	2,547	2,565	2,428	2,485	2,541
E. N. Central	2,193	2,215	2,231	2,241	2,239	2,250	2,260	2,273	2,284	2,295	2,309	2,325	2,220	2,255	2,303
W. N. Central	1,020	1,032	1,044	1,045	1,044	1,050	1,055	1,061	1,067	1,073	1,081	1,089	1,035	1,053	1,078
S. Atlantic	2,796	2,832	2,859	2,872	2,875	2,897	2,914	2,936	2,956	2,976	2,999	3,026	2,840	2,905	2,989
E. S. Central	726	735	738	741	741	745	748	753	757	761	766	772	735	747	764
W. S. Central	1,949	1,979	2,006	2,006	2,002	2,005	2,010	2,025	2,037	2,055	2,068	2,088	1,985	2,011	2,062
Mountain	1,005	1,015	1,028	1,041	1,043	1,050	1,056	1,063	1,070	1,079	1,088	1,098	1,022	1,053	1,084
Pacific	2,808	2,845	2,904	2,915	2,913	2,932	2,948	2,968	2,988	3,009	3,032	3,058	2,868	2,941	3,022
Industrial Output, Manufacturing (Index, Year 2007=100)															
New England	96.1	97.3	98.0	98.7	98.3	98.9	98.8	99.3	99.3	100.2	101.2	102.2	97.5	98.8	100.7
Middle Atlantic	94.4	95.7	96.4	97.2	96.9	97.4	97.4	97.9	97.9	98.6	99.4	100.5	95.9	97.4	99.1
E. N. Central	101.5	103.4	104.7	106.2	106.5	107.3	107.5	108.1	108.0	108.8	109.8	110.9	104.0	107.3	109.4
W. N. Central	102.6	104.5	105.6	106.9	106.5	106.8	106.8	107.5	107.7	108.7	109.9	111.1	104.9	106.9	109.4
S. Atlantic	95.0	96.9	98.3	99.4	99.4	99.9	100.3	100.9	101.0	101.9	102.8	103.9	97.4	100.1	102.4
E. S. Central	97.5	99.3	101.0	102.1	102.1	102.1	102.3	103.0	103.1	103.9	104.8	105.8	100.0	102.4	104.4
W. S. Central	104.1	106.2	107.6	108.9	107.8	107.0	106.7	107.1	107.1	107.9	109.0	110.3	106.7	107.1	108.6
Mountain	101.5	103.3	104.5	105.5	106.0	106.5	106.8	107.7	108.1	109.5	111.0	112.5	103.7	106.7	110.3
Pacific	100.7	102.5	103.5	104.4	104.3	105.1	104.9	105.4	105.6	106.6	107.8	109.2	102.8	104.9	107.3
Real Personal Income (Billion \$2009)															
New England	760	761	766	778	790	795	801	804	810	814	819	825	766	797	817
Middle Atlantic	2,035	2,039	2,054	2,081	2,117	2,124	2,143	2,151	2,168	2,174	2,187	2,204	2,063	2,134	2,183
E. N. Central	1,855	1,864	1,871	1,893	1,922	1,934	1,948	1,955	1,969	1,976	1,988	2,001	1,871	1,940	1,984
W. N. Central	872	881	885	894	901	907	916	921	929	931	938	945	883	911	936
S. Atlantic	2,474	2,494	2,508	2,539	2,582	2,600	2,625	2,639	2,663	2,679	2,700	2,724	2,504	2,611	2,692
E. S. Central	653	658	660	668	679	682	687	690	696	699	703	709	660	684	702
W. S. Central	1,542	1,556	1,571	1,589	1,610	1,612	1,625	1,632	1,647	1,657	1,671	1,688	1,564	1,620	1,666
Mountain	869	874	880	894	907	912	921	926	935	941	949	958	879	917	945
Pacific	2,327	2,345	2,373	2,400	2,441	2,460	2,483	2,497	2,519	2,533	2,552	2,576	2,361	2,470	2,545
Households (Thousands)															
New England	5,764	5,765	5,762	5,767	5,771	5,771	5,771	5,776	5,779	5,782	5,786	5,791	5,767	5,776	5,791
Middle Atlantic	15,836	15,838	15,829	15,843	15,850	15,849	15,844	15,853	15,857	15,865	15,875	15,887	15,843	15,853	15,887
E. N. Central	18,576	18,587	18,582	18,596	18,598	18,593	18,586	18,598	18,606	18,617	18,629	18,644	18,596	18,598	18,644
W. N. Central	8,410	8,423	8,429	8,447	8,460	8,469	8,475	8,489	8,500	8,514	8,528	8,545	8,447	8,489	8,545
S. Atlantic	24,217	24,276	24,320	24,398	24,467	24,525	24,577	24,654	24,725	24,801	24,879	24,961	24,398	24,654	24,961
E. S. Central	7,450	7,453	7,452	7,461	7,466	7,468	7,468	7,477	7,485	7,496	7,507	7,519	7,461	7,477	7,519
W. S. Central	14,103	14,148	14,182	14,232	14,275	14,311	14,341	14,385	14,425	14,468	14,513	14,559	14,232	14,385	14,559
Mountain	8,604	8,625	8,642	8,672	8,698	8,720	8,741	8,770	8,798	8,829	8,862	8,897	8,672	8,770	8,897
Pacific	18,186	18,232	18,267	18,323	18,371	18,410	18,440	18,485	18,531	18,578	18,624	18,674	18,323	18,485	18,674
Total Non-farm Employment (Millions)															
New England	7.1	7.1	7.1	7.1	7.2	7.2	7.2	7.2	7.3	7.3	7.3	7.3	7.1	7.2	7.3
Middle Atlantic	18.7	18.8	18.8	18.9	18.9	19.0	19.1	19.1	19.2	19.2	19.2	19.3	18.8	19.0	19.2
E. N. Central	21.0	21.1	21.2	21.3	21.4	21.5	21.5	21.6	21.6	21.7	21.7	21.8	21.1	21.5	21.7
W. N. Central	10.3	10.3	10.4	10.4	10.4	10.4	10.5	10.5	10.5	10.6	10.6	10.6	10.3	10.5	10.6
S. Atlantic	26.1	26.2	26.4	26.6	26.7	26.9	27.1	27.2	27.3	27.4	27.5	27.7	26.3	27.0	27.5
E. S. Central	7.6	7.7	7.7	7.8	7.8	7.8	7.8	7.9	7.9	7.9	7.9	8.0	7.7	7.8	7.9
W. S. Central	16.1	16.2	16.4	16.5	16.6	16.6	16.7	16.7	16.8	16.8	16.9	17.0	16.3	16.6	16.9
Mountain	9.7	9.7	9.8	9.9	9.9	10.0	10.0	10.1	10.1	10.2	10.2	10.3	9.8	10.0	10.2
Pacific	21.1	21.2	21.4	21.6	21.8	21.9	22.0	22.1	22.2	22.2	22.3	22.4	21.3	21.9	22.3

- = no data available

Notes: The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Regions refer to U.S. Census divisions.

See "Census division" in EIA's Energy Glossary (<http://www.eia.doe.gov/glossary/index.html>) for a list of States in each region.

Historical data: Latest data available from U.S. Department of Commerce, Bureau of Economic Analysis; Federal Reserve System, Statistical release G17.

Minor discrepancies with published historical data are due to independent rounding.

Projections: Macroeconomic projections are based on the Global Insight Model of the U.S. Economy.

Table 9c. U.S. Regional Weather Data

U.S. Energy Information Administration | Short-Term Energy Outlook - September 2015

	2014				2015				2016				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	2014	2015	2016
Heating Degree Days															
New England	3,563	885	148	2,082	3,857	820	134	2,174	3,188	862	135	2,175	6,678	6,985	6,360
Middle Atlantic	3,439	702	100	1,966	3,584	612	96	1,977	2,917	675	88	1,981	6,208	6,269	5,661
E. N. Central	3,935	728	168	2,365	3,694	660	147	2,244	3,086	724	128	2,248	7,196	6,746	6,186
W. N. Central	3,864	755	178	2,613	3,376	653	167	2,427	3,174	685	154	2,429	7,309	6,622	6,442
South Atlantic	1,714	196	14	1,041	1,675	156	16	997	1,481	210	16	997	2,964	2,844	2,705
E. S. Central	2,266	229	17	1,410	2,146	185	25	1,338	1,875	266	23	1,338	3,923	3,693	3,502
W. S. Central	1,481	92	4	848	1,397	69	6	872	1,301	102	5	848	2,425	2,344	2,256
Mountain	2,116	713	151	1,762	1,900	706	144	1,855	2,202	667	142	1,840	4,741	4,605	4,852
Pacific	1,248	466	56	986	1,076	526	57	1,044	1,308	501	88	1,080	2,757	2,702	2,977
U.S. Average	2,449	480	81	1,541	2,342	443	76	1,528	2,114	477	76	1,529	4,551	4,389	4,196
Heating Degree Days, Prior 10-year Average															
New England	3,152	836	134	2,167	3,166	838	134	2,147	3,213	824	140	2,143	6,289	6,286	6,320
Middle Atlantic	2,905	660	88	1,983	2,935	666	90	1,976	2,983	651	95	1,970	5,636	5,667	5,699
E. N. Central	3,117	690	120	2,243	3,192	694	123	2,262	3,247	689	132	2,256	6,170	6,272	6,324
W. N. Central	3,209	686	149	2,404	3,273	691	150	2,433	3,298	693	158	2,439	6,449	6,547	6,588
South Atlantic	1,465	194	14	1,006	1,481	196	14	1,013	1,502	185	15	1,008	2,679	2,704	2,711
E. S. Central	1,810	236	19	1,336	1,853	236	19	1,358	1,898	225	20	1,353	3,402	3,465	3,497
W. S. Central	1,157	85	5	827	1,189	86	5	834	1,221	83	5	840	2,075	2,113	2,149
Mountain	2,267	728	156	1,887	2,258	730	150	1,873	2,230	725	149	1,878	5,038	5,011	4,982
Pacific	1,554	625	96	1,236	1,533	621	92	1,205	1,493	609	86	1,196	3,511	3,452	3,384
U.S. Average	2,161	492	77	1,569	2,182	493	77	1,567	2,199	483	79	1,562	4,298	4,319	4,323
Cooling Degree Days															
New England	0	75	339	0	0	71	426	1	0	89	415	1	414	497	504
Middle Atlantic	0	158	432	6	0	184	549	5	0	169	561	5	595	738	735
E. N. Central	0	230	377	3	0	219	447	8	0	217	544	8	609	674	769
W. N. Central	0	262	538	12	3	267	610	11	3	273	683	11	812	891	969
South Atlantic	107	644	1,060	194	136	763	1,151	227	111	620	1,137	229	2,005	2,277	2,097
E. S. Central	6	506	925	66	23	582	1,025	65	26	494	1,034	65	1,503	1,694	1,619
W. S. Central	35	780	1,442	218	52	855	1,510	185	65	814	1,487	196	2,475	2,603	2,562
Mountain	31	438	871	95	46	434	893	78	19	442	958	83	1,435	1,452	1,502
Pacific	41	227	690	113	54	233	637	76	31	199	579	75	1,071	1,001	884
U.S. Average	35	394	775	96	47	434	835	92	38	391	846	94	1,299	1,408	1,369
Cooling Degree Days, Prior 10-year Average															
New England	0	83	417	1	0	85	419	1	0	81	413	1	500	505	495
Middle Atlantic	0	167	558	5	0	168	557	5	0	168	542	6	730	731	715
E. N. Central	3	230	546	6	3	234	545	6	3	229	523	6	785	787	760
W. N. Central	7	277	678	9	7	282	683	9	7	279	669	9	972	981	964
South Atlantic	110	636	1,154	213	110	635	1,155	210	113	660	1,143	211	2,112	2,109	2,127
E. S. Central	35	528	1,045	57	33	526	1,053	52	32	542	1,039	53	1,666	1,664	1,666
W. S. Central	102	882	1,506	190	94	883	1,519	184	91	890	1,512	183	2,680	2,679	2,675
Mountain	18	420	922	70	17	424	930	75	21	430	928	75	1,431	1,446	1,454
Pacific	26	166	589	58	26	170	601	65	29	181	608	67	839	863	885
U.S. Average	41	393	843	83	41	396	849	83	42	404	841	84	1,361	1,369	1,371

- = no data available

Notes: Regional degree days for each period are calculated by EIA as contemporaneous period population-weighted averages of state degree day data published by the National Oceanic and Atmospheric Administration (NOAA).

See *Change in Regional and U.S. Degree-Day Calculations* (http://www.eia.gov/forecasts/steo/special/pdf/2012_sp_04.pdf) for more information.

The approximate break between historical and forecast values is shown with historical data printed in bold; estimates and forecasts in italics.

Regions refer to U.S. Census divisions. See "Census division" in EIA's Energy Glossary (<http://www.eia.gov/tools/glossary/>) for a list of states in each region.

Historical data: Latest data available from U.S. Department of Commerce, National Oceanic and Atmospheric Association (NOAA).

Projections: Based on forecasts by the NOAA Climate Prediction Center (<http://www.cpc.ncep.noaa.gov/pacdir/DDdir/NHOME3.shtml>).



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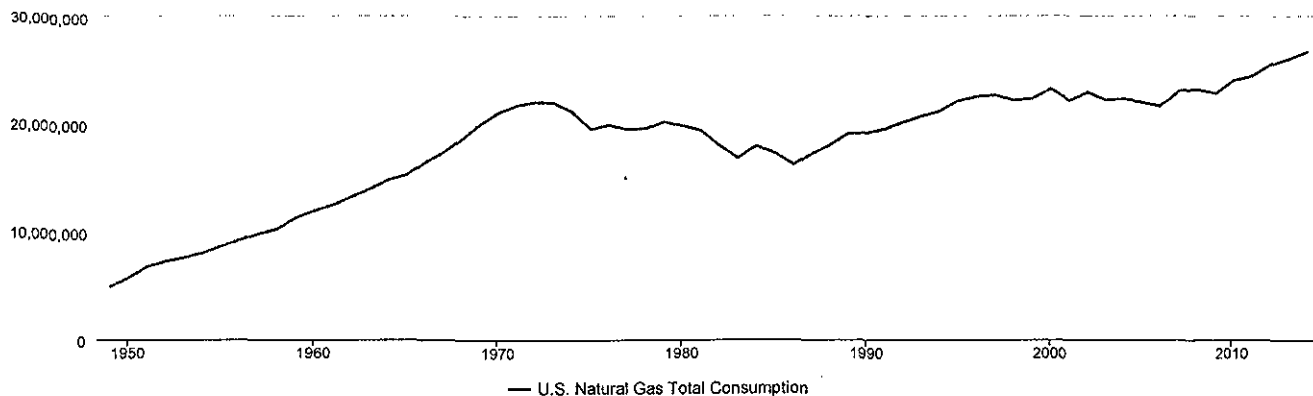
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- U.S. Natural Gas Consumption by End Use
- Natural Gas Consumption (Annual Supply & Disposition)

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U.S. Natural Gas Total Consumption

Million Cubic Feet



Source: U.S. Energy Information Administration

This series is available through the EIA open data API and can be downloaded to Excel or embedded as an interactive chart or map on your website.

U.S. Natural Gas Total Consumption (Million Cubic Feet)

Decade	Year-0	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9
1940's										4,971,152
1950's	5,766,542	6,810,162	7,294,320	7,639,270	8,048,504	8,693,657	9,288,865	9,846,139	10,302,608	11,321,181
1960's	11,966,537	12,489,268	13,266,513	13,970,229	14,813,808	15,279,716	16,452,403	17,388,360	18,632,062	20,056,240
1970's	21,139,386	21,793,454	22,101,451	22,049,363	21,223,133	19,537,593	19,946,496	19,520,581	19,627,478	20,240,761
1980's	19,877,293	19,403,858	18,001,055	16,834,912	17,950,527	17,280,943	16,221,296	17,210,809	18,029,585	19,118,997
1990's	19,173,556	19,562,067	20,228,228	20,789,842	21,247,098	22,206,889	22,609,080	22,737,342	22,245,956	22,405,151
2000's	23,333,121	22,238,624	23,027,021	22,276,502	22,402,546	22,014,434	21,699,071	23,103,793	23,277,008	22,910,078
2010's	24,086,797	24,477,425	25,538,487	26,130,666	26,821,398					

- = No Data Reported; -- = Not Applicable; NA = Not Available; W = Withheld to avoid disclosure of individual company data.

Release Date: 08/31/2015

Next Release Date: 09/30/2015

Referring Pages:

- Natural Gas Consumption
- U.S. Natural Gas Consumption by End Use
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EIA Forecasts of U.S. Natural Gas Prices

