Economic growth case comparisons

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

						Projections	i			
			2020			2030			2040	
Supply, disposition, and prices	2011	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	12.16	15.95	15.95	15.99	12.93	13.47	13.79	12.69	13.12	13.37
Natural gas plant liquids	2.88	4.10	4.14	4.20	3.80	3.85	3.92	3.86	3.89	3.95
Dry natural gas	23.51	26.58	27.19	27.80	29.33	30.44	31.92	32.46	33.87	35.32
Coal ¹	22.21	20.30	21.74	22.90	21.61	23.25	24.28	22.01	23.54	24.64
Nuclear / uranium ²	8.26	9.16	9.25	9.25	9.41	9.49	9.60	8.91	9.44	11.47
Hydropower	3.17	2.81	2.83	2.84	2.84	2.87	2.90	2.90	2.92	2.95
Biomass ³	4.05	4.77	5.00	5.06	5.09	5.42	5.60	5.95	6.96	7.48
Other renewable energy ⁴	1.58	2.19	2.22	2.51	2.36	2.50	3.14	2.81	3.84	5.86
Other ⁵	1.20	0.80	0.83	0.86	0.82	0.88	0.93	0.82	0.89	0.96
Total	79.02	86.65	89.16	91.40	88.18	92.18	96.08	92.41	98.46	105.99
Imports										
Crude oil	19.46	13.71	15.02	16.14	14.38	16.33	18.27	14.17	16.89	19.70
Liquid fuels and other petroleum ⁶	5.24	5.44	5.55	5.60	5.19	5.33	5.59	4.81	4.82	5.70
Natural gas ⁷	3.54	2.46	2.58	2.70	2.42	2.63	2.88	1.97	2.01	2.07
Other imports ⁸	0.43	0.11	0.11	0.16	0.09	0.13	0.34	0.70	0.84	1.49
Total	28.66	21.72	23.26	24.60	22.07	24.41	27.08	21.64	24.55	28.95
Exports										
Liquid fuels and other petroleum9	6.08	5.41	5.37	5.28	5.33	5.25	5.33	5.72	5.71	5.86
Natural gas ¹⁰	1.52	2.69	2.67	2.65	5.38	4.71	4.63	6.50	5.56	5.38
Coal	2.75	3.11	3.13	3.10	3.50	3.51	3.51	3.79	3.79	3.82
Total	10.35	11.21	11.17	11.03	14.22	13.47	13.47	16.01	15.06	15.07
Discrepancy ¹¹	-0.36	0.21	0.21	0.20	0.32	0.30	0.41	0.29	0.32	0.50
Consumption										
Liquid fuels and other petroleum ¹²	37.02	35.91	37.54	39.02	33.05	36.08	38.64	32.32	36.07	40.00
Natural gas	24.91	26.08	26.77	27.52	26.05	27.95	29.75	27.60	29.83	31.49
Coal ¹³	19.66	17.17	18.59	19.74	18.11	19.70	20.88	18.73	20.35	21.97
Nuclear / uranium ²	8.26	9.16	9.25	9.25	9.41	9.49	9.60	8.91	9.44	11.47
Hydropower	3.17	2.81	2.83	2.84	2.84	2.87	2.90	2.90	2.92	2.95
Biomass ¹⁴	2.74	3.33	3.53	3.57	3.64	3.94	4.09	4.18	4.91	5.33
Other renewable energy ⁴	1.58	2.19	2.22	2.51	2.36	2.50	3.14	2.81	3.84	5.86
Other ¹⁵	0.35	0.31	0.31	0.31	0.26	0.28	0.28	0.29	0.29	0.30
Total	97.70	96.95	101.04	104.76	95.72	102.81	109.28	97.74	107.64	119.37
Prices (2011 dollars per unit)										
Crude oil spot prices (dollars per barrel)										
Brent	111.26	103.47	105.57	107.22	127.05	130.47	133.60	157.47	162.68	168.70
West Texas Intermediate	94.86	101.51	103.57	105.19	125.11	128.47	131.55	155.53	160.68	166.63
Natural gas at Henry Hub										
(dollars per million Btu) Coal (dollars per ton)	3.98	3.78	4.13	4.54	5.11	5.40	6.03	7.22	7.83	8.44
at the minemouth 16	41.16	49.48	49.26	49.38	55.65	55.64	56.52	60.63	61.28	62.91
Coal (dollars per million Btu)										
at the minemouth 16	2.04	2.46	2.45	2.47	2.78	2.79	2.83	3.04	3.08	3.17
Average end-use ¹⁷	2.57	2.73	2.77	2.82	3.03	3.10	3.17	3.34	3.42	3.53
Average electricity (cents per kilowatthour)	9.9	9.5	9.4	9.5	9.6	9.7	10.0	10.4	10.8	11.2

Table B1. Total energy supply, disposition, and price summary (continued)

(quadrillion Btu per year, unless otherwise noted)

		Projections												
			2020			2030		2040						
Supply, disposition, and prices	2011	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	111.26	128.51	121.73	120.63	223.19	180.04	173.06	395.38	268.50	249.71				
West Texas Intermediate	94.86	126.08	119.43	118.34	219.76	177.28	170.41	390.52	265.20	246.64				
Natural gas at Henry Hub														
(dollars per million Btu)	3.98	4.69	4.77	5.11	8.98	7.45	7.82	18.12	12.92	12.49				
Coal (dollars per ton)														
at the minemouth 16	41.16	61.45	56.81	55.55	97.75	76.78	73.22	152.24	101.14	93.11				
Coal (dollars per million Btu)														
at the minemouth 16	2.04	3.06	2.83	2.77	4.88	3.85	3.67	7.64	5.08	4.70				
Average end-use ¹⁷	2.57	3.38	3.19	3.18	5.33	4.28	4.11	8.38	5.65	5.23				
Average electricity (cents per kilowatthour)	9.9	11.8	10.8	10.7	16.8	13.4	13.0	26.1	17.8	16.6				

Includes waste coal.

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

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

Includes grid-connected electricity from landfill gas; biogenic municipal waste; wind; photovoltaic and solar thermal sources; and non-electric energy demand from wood. Refer to Table A17 for details.

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

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

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

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

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

Includes re-exported iquefied natural gas.

Includes reported iquefied natural gas plant liquids and rurde oil consumed as a fuel. Refer to Table A17 for detailed renewable liquid fuels consumption.

Includes reported prices for both open market and captive mines. Prices weighted by production, which differs from average minemouth prices published in EIA data reports.

Includes reporte

Btu = British thermal unit.

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

Sources: 2011 natural gas supply values: U.S. Energy Information Administration (EIA), Natural Gas Monthly, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). 2011 natural gas spot price at Henry Hub based on daily data from Natural Gas Intelligence. 2011 coal minemouth and delivered coal prices: EIA, Annual Coal Report 2011, DOE/EIA-0340(2011)/1 (Washington, DC, November 2012). 2011 petroleum supply values: EIA, Petroleum Supply Annual 2011, DOE/EIA-0340(2011)/1 (Washington, DC, August 2012). 2011 crude oil spot prices: Thomson Reuters. Other 2011 coal values: Quarterly Coal Report, October-December 2011, DOE/EIA-0121(2011/4Q) (Washington, DC, March 2012). Other 2011 values: EIA, Annual Energy Review 2011, DOE/EIA-0384(2011) (Washington, DC, September 2012). Projections: EIA, AEO2013 National Energy Modeling System runs LOWMACRO.D110912A, REF2013.D102312A, and HIGHMACRO.D110912A.

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

		Projections											
			2020			2030			2040				
Sector and source	2011	Low		High	Low		High	Low		High			
		economic growth	Reference	economic growth	economic growth	Reference	economic growth	economic growth	Reference	economic growth			
inergy consumption													
Residential													
Propane	0.53	0.52	0.52	0.53	0.50	0.52	0.55	0.49	0.52	0.57			
Kerosene	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.0			
Distillate fuel oil	0.59	0.51	0.51	0.51	0.40	0.40	0.40	0.32	0.32	0.3			
Liquid fuels and other petroleum subtotal	1.14	1.04	1.05	1.05	0.91	0.93	0.96	0.82	0.86	0.9			
Natural gas	4.83	4.58	4.62	4.69	4.27	4.46	4.67	3.93	4.23	4.5			
Coal	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.0			
Renewable energy ¹	0.45	0.43	0.44	0.45	0.42	0.45	0.47	0.42	0.45	0.5			
Electricity	4.86	4.67	4.84	5.02	4.97	5.36	5.85	5.38	6.03	6.9			
Delivered energy	11.28	10.72	10.95	11.21	10.58	11.20	11.96	10.55	11.57	12.8			
Electricity related losses	10.20	9.30	9.66	10.02	9.80	10.45	11.30	10.27	11.50	13.3			
Total	21.48	20.02	20.62	21.24	20.38	21.65	23.26	20.82	23.08	26.1			
Commercial													
Propane	0.14	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.1			
Motor gasoline ²	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.0			
Kerosene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.0			
Distillate fuel oil	0.42	0.34	0.34	0.34	0.32	0.32	0.32	0.30	0.30	0.3			
Residual fuel oil	0.07	0.10	0.09	0.09	0.09	0.09	0.09	0.08	0.09	0.0			
Liquid fuels and other petroleum subtotal	0.69	0.66	0.65	0.65	0.64	0.64	0.64	0.62	0.63	0.6			
Natural gas	3.23	3.42	3.40	3.37	3.51	3.50	3.49	3.65	3.68	3.7			
Coal	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.0			
Renewable energy ³	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.1			
Electricity	4.50	4.68	4.72	4.73	5.16	5.22	5.27	5.61	5.72	5.8			
Delivered energy	8.60	8.93	8.95	8.93	9.48	9.54	9.57	10.06	10.21	10.3			
Electricity related losses	9.45	9.30	9.42	9.44	10.18	10.18	10.16	10.72	10.92	11.2			
Total	18.05	18.23	18.37	18.38	19.66	19.72	19.73	20.78	21.13	21.5			
Industrial ⁴													
Liquefied petroleum gases	2.10	2.33	2.46	2.56	2.20	2.47	2.59	2.02	2.30	2.5			
Propylene	0.40	0.52	0.56	0.58	0.46	0.52	0.55	0.41	0.46	0.5			
Motor gasoline ²	0.27	0.29	0.32	0.35	0.28	0.32	0.35	0.28	0.32	0.3			
Distillate fuel oil	1.21	1.10	1.22	1.37	1.02	1.18	1.35	1.06	1.22	1.4			
Residual fuel oil	0.11	0.10	0.11	0.12	0.10	0.11	0.12	0.10	0.11	0.1			
Petrochemical feedstocks	0.88	1.01	1.03	1.06	1.03	1.08	1.13	1.02	1.09	1.1			
Other petroleum ⁵	3.61	3.26	3.54	3.86	3.04	3.46	3.87	3.16	3.65	4.1			
Liquid fuels and other petroleum subtotal	8.57	8.60	9.25	9.88	8.11	9.14	9.96	8.04	9.16	10.2			
Natural gas	6.92	7.41	7.86	8.28	7.13	7.97	8.70	7.01	8.08	9.3			
Natural-gas-to-liquids heat and power	0.00	0.07	0.13	0.13	0.11	0.21	0.21	0.16	0.33	0.3			
Lease and plant fuel ⁶	1.42	1.54	1.57	1.60	1.74	1.73	1.80	1.96	1.97	2.0			
Natural gas subtotal	8.34	9.02	9.56	10.01	8.98	9.91	10.72	9.13	10.38	11.8			
Metallurgical coal	0.56	0.55	0.60	0.68	0.45	0.52	0.63	0.38	0.46	0.6			
Other industrial coal	1.04	0.96	1.00	1.04	0.43	1.00	1.06	0.97	1.05	1.1			
Coal-to-liquids heat and power	0.00	0.00	0.00	0.11	0.00	0.09	0.17	0.10	0.15	0.2			
Net coal coke imports	0.01	-0.01	-0.01	-0.01	-0.04	-0.04	-0.05	-0.05	-0.05	-0.0			
Coal subtotal	1.62	1.50	1.58	1.81	1.35	1.57	1.81	1.41	1.61	2.0			
Biofuels heat and coproducts	0.67	0.80	0.82	0.84	0.83	0.85	0.87	1.14	1.37	1.4			
Renewable energy ⁷	1.51	1.58	1.72	1.80	1.70	1.97	2.11	1.14	2.28	2.5			
Electricity	3.33	3.65	3.95	4.22	3.49	3.96	4.35	3.42	3.91	4.5			
Delivered energy	24.04		26.87	28.56	24.48	27.40	29.83	25.09	28.71	32.5			
Electricity related losses	6.99	7.25	7.89	8.43	6.89	7.72	8.40	6.53	7.45	8.7			
Licotholty I Glateu 103363	0.55	1.20	1.09	0.43	0.09	35.11	38.22	31.62	1.40	0.77			

Table B2. Energy consumption by sector and source (continued)

(quadrillion Btu per year, unless otherwise noted)

		Projections										
			2020 2030						2040	040		
Sector and source	2011	Low		High	Low		High	Low		High		
		economic growth	Reference	economic growth	economic growth	Reference	economic growth	economic growth	Reference	economi growth		
Transportation		•	•				•	•	•			
Propane	0.06	0.06	0.06	0.06	0.06	0.07	0.08	0.07	0.08	0.1		
E85 ⁸	0.05	0.09	0.08	0.08	0.28	0.16	0.15	0.26	0.17	0.2		
Motor gasoline ²	16.31	14.49	14.88	15.14	12.01	13.06	13.70	11.10	12.64	13.6		
Jet fuel ⁹	3.01	3.08	3.11	3.14	3.22	3.28	3.34	3.32	3.42	3.5		
Distillate fuel oil ¹⁰	5.91	6.72	7.28	7.83	6.64	7.61	8.60	6.90	7.90	9.5		
Residual fuel oil	0.82	0.84	0.84	0.85	0.85	0.86	0.86	0.86	0.87	0.8		
Other petroleum ¹¹	0.17	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.1		
Liquid fuels and other petroleum subtotal	26.32	25.44	26.42	27.26	23.21	25.20	26.90	22.66	25.24	28.0		
Pipeline fuel natural gas	0.70	0.70	0.71	0.73	0.71	0.74	0.78	0.74	0.78	0.8		
Compressed / liquefied natural gas	0.04	0.07	0.08	0.08	0.27	0.26	0.25	0.94	1.05	1.2		
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0		
Electricity	0.02	0.03	0.03 27.24	0.03	0.04 24.24	0.04	0.05	0.06	0.07	0.0		
Delivered energy Electricity related losses	27.09 0.05	26.24 0.06	0.06	28.09 0.06	0.08	26.25 0.09	27.98 0.09	24.40 0.12	27.14 0.13	30.1 0.1		
Total	27.13	26.29	27.30	28.15	24.32	26.33	28.07	24.52	27.27	30.3		
Delivered energy consumption for all sectors												
Liquefied petroleum gases	2.82	3.07	3.21	3.31	2.93	3.23	3.38	2.75	3.08	3.4		
Propylene	0.40	0.52	0.56	0.58	0.46	0.52	0.55	0.41	0.46	0.5		
E85 ⁸	0.05	0.09	0.08	0.08	0.28	0.16	0.15	0.26	0.17	0.2		
Motor gasoline ²	16.64	14.84	15.26	15.54	12.35	13.43	14.12	11.44	13.03	14.0		
Jet fuel ⁹	3.01	3.08	3.11	3.14	3.22	3.28	3.34	3.32	3.42	3.5		
Kerosene	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.0		
Distillate fuel oil	8.12	8.66	9.35	10.04	8.37	9.51	10.67	8.58	9.74	11.5		
Residual fuel oil	1.01	1.04	1.05	1.06	1.03	1.05	1.07	1.04	1.07	1.0		
Petrochemical feedstocks	0.88	1.01	1.03	1.06	1.03	1.08	1.13	1.02	1.09	1.1		
Other petroleum ¹²	3.77	3.40	3.69	4.00	3.19	3.61	4.02	3.31	3.80	4.2		
Liquid fuels and other petroleum subtotal	36.72	35.74	37.37	38.84	32.87	35.90	38.45	32.14	35.88	39.8		
Natural gas	15.03	15.48	15.95	16.42	15.19	16.19	17.11	15.52	17.05	18.9		
Natural-gas-to-liquids heat and power	0.00	0.07	0.13	0.13	0.11	0.21	0.21	0.16	0.33	0.3		
Lease and plant fuel ⁶	1.42	1.54	1.57	1.60	1.74	1.73	1.80	1.96	1.97	2.0		
Pipeline natural gas	0.70	0.70	0.71	0.73	0.71	0.74	0.78	0.74	0.78	0.8		
Natural gas subtotal	17.15	17.79	18.36	18.88	17.75	18.87	19.90	18.39	20.13	22.1		
Metallurgical coal	0.56	0.55	0.60	0.68	0.45	0.52	0.63	0.38	0.46	0.6		
Other coal	1.10	1.02	1.06	1.10	1.00	1.06	1.11	1.03	1.11	1.2		
Coal-to-liquids heat and power	0.00	0.00	0.00	0.11	0.00	0.09	0.17	0.10	0.15	0.2		
Net coal coke imports	0.01	-0.01	-0.01	-0.01	-0.04	-0.04	-0.05	-0.05	-0.05	-0.0		
Coal subtotal	1.67	1.56	1.64	1.87	1.41	1.63	1.87	1.47	1.67	2.0		
Biofuels heat and coproducts	0.67	0.80	0.82	0.84	0.83	0.85	0.87	1.14	1.37	1.4		
Renewable energy ¹³	2.08	2.13	2.28	2.37	2.25	2.54	2.71	2.48	2.86	3.1		
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0		
Electricity	12.71	13.03	13.54	14.01	13.66	14.59	15.52	14.48	15.72	17.3		
Delivered energy	71.01	71.04	74.01	76.80	68.77	74.38	79.33	70.10	77.63	85.9		
Total	26.69 97.70	25.91 96.95	27.03 101.04	27.96 104.76	26.95 95.72	28.43 102.81	29.95 109.28	27.64 97.74	30.00 107.64	33.4 119.3		
Electric power ¹⁴												
Distillate fuel oil	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.0		
Residual fuel oil	0.23	0.09	0.10	0.10	0.10	0.10	0.11	0.10	0.11	0.1		
Liquid fuels and other petroleum subtotal	0.30	0.17	0.18	0.18	0.17	0.18	0.19	0.18	0.19	0.2		
Natural gas	7.76	8.29	8.40	8.65	8.30	9.08	9.84	9.21	9.70	9.3		
Steam coal	17.99	15.61	16.95	17.87	16.71	18.07	19.01	17.26	18.68	19.9		
Nuclear / uranium ¹⁵	8.26	9.16	9.25	9.25	9.41	9.49	9.60	8.91	9.44	11.4		
Renewable energy ¹⁶	4.74	5.39	5.49	5.72	5.76	5.93	6.55	6.27	7.44	9.5		
Electricity imports	0.13	0.08	0.08	0.08	0.03	0.05	0.05	0.06	0.06	0.0		
Total ¹⁷	39.40	38.94	40.57	41.97	40.61	43.02	45.47	42.12	45.73	50.		

Table B2. Energy consumption by sector and source (continued)

(quadrillion Btu per year, unless otherwise noted)

						Projections				
			2020			2030			2040	
Sector and source	2011	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	2.82	3.07	3.21	3.31	2.93	3.23	3.38	2.75	3.08	3.41
Propylene	0.40	0.52	0.56	0.58	0.46	0.52	0.55	0.41	0.46	0.51
E85 ⁸	0.05	0.09	0.08	0.08	0.28	0.16	0.15	0.26	0.17	0.22
Motor gasoline ²	16.64	14.84	15.26	15.54	12.35	13.43	14.12	11.44	13.03	14.03
Jet fuel ⁹	3.01	3.08	3.11	3.14	3.22	3.28	3.34	3.32	3.42	3.53
Kerosene	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.03
Distillate fuel oil	8.18	8.74	9.43	10.12	8.45	9.59	10.75	8.65	9.82	11.62
Residual fuel oil	1.24	1.13	1.15	1.16	1.13	1.15	1.17	1.15	1.17	1.21
Petrochemical feedstocks	0.88	1.01	1.03	1.06	1.03	1.08	1.13	1.02	1.09	1.16
Other petroleum ¹²	3.77	3.40	3.69	4.00	3.19	3.61	4.02	3.31	3.80	4.29
Liquid fuels and other petroleum subtotal	37.02	35.91	37.54	39.02	33.05	36.08	38.64	32.32	36.07	40.00
Natural gas	22.79	23.78	24.36	25.07	23.49	25.27	26.96	24.73	26.75	28.26
Natural-gas-to-liquids heat and power	0.00	0.07	0.13	0.13	0.11	0.21	0.21	0.16	0.33	0.36
Lease and plant fuel ⁶	1.42	1.54	1.57	1.60	1.74	1.73	1.80	1.96	1.97	2.07
Pipeline natural gas	0.70	0.70	0.71	0.73	0.71	0.74	0.78	0.74	0.78	0.80
Natural gas subtotal	24.91	26.08	26.77	27.52	26.05	27.95	29.75	27.60	29.83	31.49
Metallurgical coal	0.56	0.55	0.60	0.68	0.45	0.52	0.63	0.38	0.46	0.63
Other coal	19.09	16.63	18.01	18.97	17.70	19.12	20.13	18.28	19.79	21.11
Coal-to-liquids heat and power	0.00	0.00	0.00	0.11	0.00	0.09	0.17	0.10	0.15	0.29
Net coal coke imports	0.01	-0.01	-0.01	-0.01	-0.04	-0.04	-0.05	-0.05		-0.06
Coal subtotal	19.66	17.17	18.59	19.74	18.11	19.70	20.88	18.73	20.35	21.97
Nuclear / uranium ¹⁵	8.26	9.16	9.25	9.25	9.41	9.49	9.60	8.91	9.44	11.47
Biofuels heat and coproducts	0.67	0.80	0.82	0.84	0.83	0.85	0.87	1.14	1.37	1.40
Renewable energy ¹⁸	6.82	7.53	7.77	8.09	8.01	8.47	9.25	8.75	10.30	12.74
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Electricity imports	0.13	0.08	0.08	0.08	0.03	0.05	0.05	0.06		0.07
Total	97.70	96.95	101.04	104.76	95.72	102.81	109.28	97.74		119.37
Energy use and related statistics										
Delivered energy use	71.01	71.04	74.01	76.80	68.77	74.38	79.33	70.10	77.63	85.95
Total energy use	97.70	96.95	101.04	104.76	95.72	102.81	109.28	97.74		119.37
Ethanol consumed in motor gasoline and E85	1.17	1.31	1.34	1.37	1.22	1.24	1.29	1.13		1.32
Population (millions)	312.38	338.25	340.45	342.94	367.06	372.41	378.73	395.19		415.38
Gross domestic product (billion 2005 dollars).	13,299	15,717	16,859	17,754	18,703	21,355	23,232	23,283		30,552
Carbon dioxide emissions (million metric tons)	5,471	5,192	5,455	5,685	5,095	5,523	5,882	5,197	5,691	6,163

¹¹ºIncludes conventional hydroelectric; geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes net electricity imports.

¹¹Includes non-biogenic municipal waste not included above.

¹¹Includes 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: Totals may not equal sum of components due to independent rounding. Data for 2011 are model results and may differ slightly from official EIA data reports.

Sources: 2011 consumption based on: U.S. Energy Information Administration (EIA), Annual Energy Review 2011, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2011 population and gross domestic product: IHS Global Insight Industry and Employment models, August 2012. 2011 carbon dioxide emissions: EIA, Monthly Energy Review, DOE/EIA-0035(2012/08) (Washington, DC, August 2012). Projections: EIA, AEO2013 National Energy Modeling System runs LOWMACRO.D110912A, REF2013.D102312A, and HIGHMACRO.D110912A.

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.
¹Includes ethanol (blends of 15 percent or less) 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.
¹Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.
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¹Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site g

Includes consumption of energy produced from hydroelectric, wood and wood waste, multicipal waste, and other bronks sources.

East in motor gasoline.

Best 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.

Includes only kerosene type.

Diesel fuel for on- and off- road use.

Includes aviation gasoline and lubricants.

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

¹⁴Includes unfinished oils, natural gasoline, motor gasoline pieriuling components, aviation gasoline, 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.

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

15These 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.

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

Table B3. Energy prices by sector and source

(2011 dollars per million Btu, unless otherwise noted)

Reference growth Reference g	gh commic with growth 6.28 27.5 2.06 35.3 4.11 15.5 5.14 36.3 3.68 25.3 9.24 32.6 9.01 22.9 1.33 12.5	8 27.99 7 36.54 6 16.36 1 37.10 9 25.94 2 33.74	28.56 38.26 17.95 37.97
Commercial Propane 22.10 19.32 20.04 20.66 22.35 22.97 20.04 20.66 20.35 20.04 20.04 20.06 20.04 20.04 20.06 20.04	6.28 27.5 2.06 35.3 4.11 15.5 5.14 36.3 3.68 25.3 9.24 32.6 9.01 22.9	8 27.99 7 36.54 6 16.36 1 37.10 9 25.94 2 33.74	28.56 38.26 17.95 37.97
Propane 25.06 22.83 23.41 23.91 25.25 25.73 2 Distillate fuel oil 26.38 26.37 26.91 27.27 30.41 31.26 3 Natural gas 10.80 11.37 11.78 12.30 12.88 13.37 1 Electricity 34.34 34.22 33.62 33.85 34.42 34.56 3 Commercial Propane 22.10 19.32 20.04 20.66 22.35 22.97 2 Distillate fuel oil 25.87 23.83 24.26 24.60 27.76 28.51 2	2.06 35.3 4.11 15.5 5.14 36.3 3.68 25.3 9.24 32.6 9.01 22.9	7 36.54 6 16.36 1 37.10 9 25.94 2 33.74	38.26 17.95 37.97 26.76
Distillate fuel oil 26.38 26.37 26.91 27.27 30.41 31.26 3 Natural gas 10.80 11.37 11.78 12.30 12.88 13.37 1 Electricity 34.34 34.22 33.62 33.85 34.42 34.56 3 Commercial Propane 22.10 19.32 20.04 20.66 22.35 22.97 2 Distillate fuel oil 25.87 23.83 24.26 24.60 27.76 28.51 2	2.06 35.3 4.11 15.5 5.14 36.3 3.68 25.3 9.24 32.6 9.01 22.9	7 36.54 6 16.36 1 37.10 9 25.94 2 33.74	38.26 17.95 37.97 26.76
Distillate fuel oil 26.38 26.37 26.91 27.27 30.41 31.26 3 Natural gas 10.80 11.37 11.78 12.30 12.88 13.37 1 Electricity 34.34 34.22 33.62 33.85 34.42 34.56 3 Commercial Propane 22.10 19.32 20.04 20.66 22.35 22.97 2 Distillate fuel oil 25.87 23.83 24.26 24.60 27.76 28.51 2	2.06 35.3 4.11 15.5 5.14 36.3 3.68 25.3 9.24 32.6 9.01 22.9	7 36.54 6 16.36 1 37.10 9 25.94 2 33.74	38.26 17.95 37.97 26.76
Natural gas 10.80 11.37 11.78 12.30 12.88 13.37 1 Electricity 34.34 34.22 33.62 33.85 34.42 34.56 3 Commercial Propane 22.10 19.32 20.04 20.66 22.35 22.97 2 Distillate fuel oil 25.87 23.83 24.26 24.60 27.76 28.51 2	4.11 15.5 5.14 36.3 3.68 25.3 9.24 32.6 9.01 22.9	6 16.36 1 37.10 9 25.94 2 33.74	17.95 37.97 26.76
Electricity 34.34 34.22 33.62 33.85 34.42 34.56 3 Commercial Propane 22.10 19.32 20.04 20.66 22.35 22.97 2 Distillate fuel oil 25.87 23.83 24.26 24.60 27.76 28.51 2	5.14 36.3 3.68 25.3 9.24 32.6 9.01 22.9	 37.10 25.94 33.74 	37.97 26.76
Propane 22.10 19.32 20.04 20.66 22.35 22.97 2 Distillate fuel oil 25.87 23.83 24.26 24.60 27.76 28.51 2	9.24 32.6 9.01 22.9	2 33.74	
Distillate fuel oil	9.24 32.6 9.01 22.9	2 33.74	
Distillate fuel oil	9.01 22.9		
Residual fuel oil		2 22 44	35.73
Natural gas	1.00 12.0		
· · · · · · · · · · · · · · · · · · ·	9.76 30.3		
Industrial ¹			
	4.37 26.1	6 26.78	28.08
	9.58 33.0		
	1.34 25.3		
	7.13 8.3		
	0.13		
· · · · · · · · · · · · · · · · · · ·			
Other industrial coal	3.77 3.9		
·	2.60 2.9 0.86 21.4		
Transportation			
•	7.25 20.6	E 20.07	20.00
	7.35 28.6		
	8.58 31.8		
	1.28 35.1		
	6.70 30.6		
	1.46 34.9		
	8.74 21.9		
· · · · · · · · · · · · · · · · · · ·	9.62 19.7 2.82 33.3		
•			
Electric power ⁸			
	7.58 30.8		
Residual fuel oil	9.79 34.0	4 34.54	35.34
· · · · · · · · · · · · · · · · · · ·	6.66 7.8		
Steam coal	2.92 3.1	3 3.20	3.27
Average price to all users ⁹ Propane	9.37 22.7	7 23.79	25.04
' <u>'</u>	9.3 <i>1</i> 22. <i>1</i> 8.58 31.8		
	1.28 35.1		
	6.70 30.6		
	1.15 34.6		
	0.02 23.4		
· · · · · · · · · · · · · · · · · · ·	8.82 10.3		
· · · · · · · · · · · · · · · · · · ·	0.13 11.0		
Other coal	2.97 3.1	8 3.25	3.32
Coal to liquids 2.11 2.55	2.60 2.9	0 2.95	2.90
Electricity	9.31 30.4	9 31.58	32.86
Non-renewable energy expenditures by			
sector (billion 2011 dollars) Posidontial 248 08 237 55 243 44 254 57 251 11 271 05 20	0 14 2017	A 310.63	372 OF
	9.14 281.7		
	3.44 234.8		
	7.55 296.1		
·	7.74 779.0		1,055.41
Total non-renewable expenditures	,	,	,
Transportation renewable expenditures 1.24 2.69 2.44 2.52 7.56 4.39 Total expenditures	4.34		

Table B3. Energy prices by sector and source (continued)

(nominal dollars per million Btu, unless otherwise noted)

		Projections										
			2020			2030			2040			
Sector and source	2011	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth	Low economic growth	Reference	High economic growth		
Residential												
Propane	25.06	28.35	27.00	26.90	44.35	35.51	34.04	69.24	46.20	42.27		
Distillate fuel oil	26.38	32.75	31.03	30.68	53.42	43.14	41.52	88.80	60.31	56.64		
Natural gas	10.80	14.12	13.58	13.84	22.63	18.45	18.28	39.07	27.01	26.56		
Electricity	34.34	42.50	38.76	38.08	60.47	47.69	45.53	91.16	61.23	56.21		
Commercial												
Propane	22.10	24.00	23.11	23.24	39.26	31.70	30.67	63.74	42.82	39.60		
Distillate fuel oil	25.87	29.60	27.97	27.68	48.76	39.34	37.87	81.91	55.68	52.88		
Residual fuel oil	19.17	18.05	17.09	16.90	31.77	25.90	24.63	57.55	38.64	35.61		
Natural gas	8.84	11.29	10.92	11.18	18.06	14.76	14.68	31.47	21.81	20.92		
Electricity	29.98	35.65	32.94	32.86	49.15	39.54	38.56	76.30	52.40	49.46		
Industrial ¹												
Propane	22.54	24.52	23.65	23.80	40.33	32.62	31.57	65.69	44.20	41.56		
Distillate fuel oil	26.50	30.19	28.45	28.12	49.57	39.89	38.32	83.08	56.39	53.36		
Residual fuel oil	18.86	20.98	19.82	19.59	36.05	29.10	27.65	63.69	42.55	39.02		
Natural gas ²	4.89	6.44	6.38	6.72	11.00	9.05	9.24	21.03	14.66	13.95		
Metallurgical coal	7.01	10.94	10.09	9.83	17.78	13.92	13.12	27.68	18.34	16.76		
Other industrial coal	3.43	4.27	3.97	3.91	6.43	5.12	4.88	10.03	6.70	6.10		
Coal to liquids				2.37		3.52	3.36	7.28	4.87	4.30		
Electricity	19.98	23.07	21.59	21.83	33.37	27.22	27.03	53.86	37.54	35.99		
Transportation												
Propane	26.06	29.67	28.22	28.10	46.23	36.98	35.42	71.93	47.97	44.25		
E85 ³	25.30	35.44	34.18	33.89	47.99	37.18	37.02	79.96	50.46	49.62		
Motor gasoline ⁴	28.70	34.25	32.10	31.77	52.98	42.41	40.52	88.14	59.72	56.19		
Jet fuel ⁵	22.49	26.21	24.79	24.54	44.75	35.92	34.59	76.97	51.27	48.75		
Diesel fuel (distillate fuel oil) ⁶	26.15	32.63	30.68	30.29	52.95	42.52	40.75	87.80	59.50	56.33		
Residual fuel oil	17.83	18.18	17.19	17.02	31.48	25.31	24.28	55.18	37.06	34.59		
Natural gas ⁷	16.14	20.21	19.46	19.64	31.55	26.08	25.42	49.62	34.98	32.95		
Electricity	32.77	36.36	34.13	34.22	53.57	43.51	42.52	83.64	57.88	54.52		
Electric power ⁸												
Distillate fuel oil	23.30	27.20	25.89	25.67	45.54	36.98	35.73	77.51	52.87	50.33		
Residual fuel oil	15.97	30.62	28.76	28.38	51.00	40.52	38.59	85.47	57.01	52.31		
Natural gas	4.77	5.64	5.65	6.01	9.99	8.35	8.62	19.73	13.83	13.01		
Steam coal	2.38	3.06	2.90	2.89	4.93	3.96	3.78	7.86	5.28	4.84		

Table B3. Energy prices by sector and source (continued)

(nominal dollars per million Btu, unless otherwise noted)

		Projections												
	2011		2020			2030		2040						
Sector and source		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	17.13	15.94	15.78	16.32	30.33	25.03	25.09	57.18	39.26	37.06				
E85 ³	25.30	35.44	34.18	33.89	47.99	37.18	37.02	79.96	50.46	49.62				
Motor gasoline ⁴	28.47	34.24	32.10	31.77	52.97	42.40	40.51	88.13	59.70	56.17				
Jet fuel⁵	22.49	26.21	24.79	24.54	44.75	35.92	34.59	76.97	51.27	48.75				
Distillate fuel oil	26.18	32.17	30.27	29.89	52.35	42.07	40.35	86.98	58.97	55.83				
Residual fuel oil	17.65	19.45	18.41	18.25	33.55	27.03	25.93	58.78	39.53	36.84				
Natural gas	6.68	8.37	8.16	8.44	14.04	11.41	11.42	26.01	18.06	17.42				
Metallurgical coal	7.01	10.94	10.09	9.83	17.78	13.92	13.12	27.68	18.34	16.76				
Other coal	2.45	3.14	2.97	2.95	5.02	4.03	3.84	8.00	5.37	4.92				
Coal to liquids				2.37		3.52	3.36	7.28	4.87	4.30				
Electricity	29.03	34.59	31.71	31.41	49.24	39.20	37.96	76.55	52.12	48.63				
Non-renewable energy expenditures by sector (billion nominal dollars)														
Residential	248.08	295.03	280.71	286.39	441.11	374.04	387.49	707.41	527.54	552.03				
Commercial	179.97	223.21	209.48	209.95	345.35	281.23	276.49	589.66	411.95	395.67				
Industrial	225.18	290.58	298.68	323.30	444.67	407.07	437.25	743.64	583.76	636.70				
Transportation	718.25	819.97	801.07	817.92	1,179.60	1,034.13	1,059.28	1,956.18	1,486.52	1,562.18				
Total non-renewable expenditures	1,371.48	1,628.79	1,589.94	1,637.57	2,410.74	2,096.47	2,160.51	3,996.88	3,009.77	3,146.58				
Transportation renewable expenditures	1.24	3.34	2.81	2.83	13.28	6.06	5.62	21.08	8.33	10.74				
Total expenditures	1,372.71	1,632.13	1,592.75	1,640.40	2,424.02	2,102.52	2,166.12	4,017.96	3,018.11	3,157.32				

¹Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.
¹Excludes 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.
¹Sales weighted-average price for all grades. Includes Federal, State and local taxes.
¹Verosene-type jet fuel. Includes Federal and State taxes while excluding county and local taxes.
¹Natural gas used as a vehicle fuel. Includes setimated motor vehicle fuel taxes and estimated dispensing costs or charges.
¹Includes electricity-only and combined heat and power plants that have a regulatory status.
³Weighted 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 2011 are model results and may differ slightly from official EIA data reports.
Sources: 2011 prices for motor gasoline, distillate fuel oil, and jet fuel are based on prices in the U.S. Energy Information Administration (EIA), (2012/08) (Washington, DC, August 2012). 2011 residential, commercial, and industrial natural gas delivered prices: EIA, Natural Gas Monthly, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). 2011 pesigential, commercial, and industrial natural gas delivered prices are model results. 2011 electric power sector institutilate and residual fuel oil prices: EIA, Monthly Fenergy Review 2011, Penergy Review 2012, 2011 and April 2012, Table 4.2, and EIA, State Energy Data Report 2010, DG/EIA-0214(2010) (Washington, D.C., Une 2012). 2011 can Electric Power Monthly, DOE/EIA-0226, April 2011 and April 2012, Table 4.2, and EIA, State Energy Data Report 2010, DG/EIA-0214(2010) (Washington, D.C., Une 2012). 2011 cap prices EIA, Annual Energy Review 2011, DOE/EIA-0384(2011) (Washington, D.C., Septem

Table B4. Macroeconomic indicators

(billion 2005 chain-weighted dollars, unless otherwise noted)

						Projections				
			2020			2030			2040	
Indicators	2011	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	13,299	15,717	16,859	17,754	18,703	21,355	23,232	23,283	27,277	30,552
Components of real gross domestic product										
Real consumption	9,429	10,836	11,528	12,113	12,482	14,243	15,541	14,836	17,917	20,161
Real investment	1,744	2,530	2,909	3,335	3,363	3,914	4,504	4,776	5,409	6,269
Real government spending	2,524	2,358	2,446	2,512	2,442	2,659	2,777	2,620	2,980	3,172
Real exports	1,777	2,896	3,016	3,102	4,789	5,214	5,652	7,650	8,357	9,553
Real imports	2,185	2,817	2,927	3,163	4,089	4,311	4,806	5,847	6,518	7,531
Energy intensity										
(thousand Btu per 2005 dollar of GDP)										
Delivered energy	5.34	4.52	4.39	4.33	3.68	3.48	3.41	3.01	2.85	2.81
Total energy	7.35	6.17	5.99	5.90	5.12	4.81	4.70	4.20	3.95	3.91
Price indices										
GDP chain-type price index (2005=1.000)	1.134	1.408	1.307	1.275	1.991	1.564	1.469	2.847	1.871	1.678
Consumer price index (1982-4=1)										
All-urban	2.25	2.86	2.66	2.59	4.13	3.27	3.07	6.09	4.04	3.64
Energy commodities and services	2.44	2.90	2.70	2.67	4.42	3.53	3.39	7.18	4.86	4.57
All commodities	2.01	2.39	2.22	2.21	3.31	2.59	2.48	4.73	3.10	2.88
Fuel and power	2.16	2.63	2.48	2.50	4.18	3.38	3.30	7.17	4.90	4.65
Metals and metal products	2.26	2.68	2.52	2.62	3.53	2.83	2.83	4.63	3.16	3.22
Industrial commodities excluding energy	1.93	2.30	2.12	2.11	3.02	2.34	2.22	4.01	2.57	2.37
Interest rates (percent, nominal)										
Federal funds rate	0.10	5.52	4.04	3.50	6.97	3.97	3.29	7.11	3.74	3.04
10-year treasury note	2.79	7.36	4.88	4.09	7.69	4.95	4.17	7.72	4.86	4.06
AA utility bond rate	4.78	9.84	6.91	5.57	10.47	7.21	5.77	10.90	7.39	5.53
Value of shipments (billion 2005 dollars)										
Service sectors	21,168	24,814	26,492	28,005	29,028	32,624	35,626	33,484	38,529	43,296
Total industrial	6,019	7,136	7,894	8,633	7,721	9,087	10,325	8,909	10,616	12,730
Agriculture, mining, and construction	1,582	1,937	2,211	2,535	1,986	2,375	2,775	2,239	2,644	3,099
Manufacturing	4,438	5,199	5,683	6,099	5,736	6,712	7,550	6,670	7,972	9,631
Energy-intensive	1,615	1,783	1,893	1,992	1,817	2,027	2,182	1,891	2,144	2,394
Non-energy-intensive	2,823	3,416	3,790	4,106	3,919	4,685	5,368	4,779	5,828	7,237
Total shipments	27,187	31,950	34,385	36,639	36,749	41,711	45,951	42,393	49,145	56,026
Population and employment (millions)										
Population with armed forces overseas	312.4	338.2	340.5	342.9	367.1	372.4	378.7	395.2	404.4	415.4
Population, aged 16 and over	247.0	268.0	269.5	271.3	292.3	296.3	300.9	316.0	322.9	331.0
Population, over age 65	41.6	55.0	55.4	55.5	72.1	72.7	73.0	81.1	81.8	82.6
Employment, nonfarm	131.3	146.6	149.2	153.3	156.5	160.8	165.7	167.1	174.0	182.5
Employment, manufacturing	11.7	11.8	12.4	13.0	10.4	11.2	12.2	9.3	9.9	11.3
Key labor indicators										
Labor force (millions)	153.6	163.8	164.7	166.1	172.5	174.9	178.1	186.2	190.7	196.1
Non-farm labor productivity (1992=1.00)	1.10	1.20	1.25	1.28	1.40	1.54	1.60	1.66	1.88	1.99
Unemployment rate (percent)	8.95	5.93	5.49	5.02	5.47	5.32	5.08	5.42	5.24	4.96
Key indicators for energy demand										
Real disposable personal income	10,150	12,097	12,655	13,209	14,637	15,948	17,001	17,912	19,785	21,416
Housing starts (millions)	0.66	1.38	1.89	2.59	1.25	1.89	2.74	1.25	1.89	2.89
Commercial floorspace (billion square feet)	81.7	88.5	89.1	89.7	96.3	98.1	100.0	105.4	108.8	112.3
Unit sales of light-duty vehicles (millions)	12.73	15.39	16.85	18.12	15.08	17.74	19.13	15.40	19.21	21.87

GDP = Gross domestic product.
Btu = British thermal unit.
Sources: 2011: IHS Global Insight, Global Insight Industry and Employment models, August 2012. Projections: U.S. Energy Information Administration, AEO2013
National Energy Modeling System runs LOWMACRO.D110912A, REF2013.D102312A, and HIGHMACRO.D110912A.