Appendix D

Results from side cases

Table D1. Key results for demand sector technology cases

Consumption, emissions, combined heat and power capacity and generation	2011	2020				2030			
		2012 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology	2012 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology
Energy consumption (quadrillion Btu)									
Residential									
Liquid fuels and other petroleum[1]	1.14	1.07	1.05	1.02	0.99	0.98	0.93	0.88	0.84
Natural gas	4.83	4.73	4.62	4.36	4.03	4.70	4.46	4.00	3.48
Coal	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Renewable energy[2]	0.45	0.46	0.44	0.42	0.40	0.50	0.45	0.41	0.37
Electricity	4.86	4.92	4.84	4.44	3.95	5.54	5.36	4.75	4.02
Total residential	**11.28**	**11.18**	**10.95**	**10.25**	**9.38**	**11.72**	**11.20**	**10.04**	**8.72**
Nonmarketed renewables, residential	0.04	0.18	0.20	0.20	0.23	0.19	0.22	0.27	0.38
Commercial									
Liquid fuels and other petroleum[3]	0.69	0.65	0.65	0.66	0.66	0.64	0.64	0.64	0.64
Natural gas	3.23	3.37	3.40	3.37	3.39	3.46	3.50	3.46	3.50
Coal	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Renewable energy[4]	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Electricity	4.50	4.86	4.72	4.36	4.11	5.52	5.22	4.44	4.11
Total commercial	**8.60**	**9.06**	**8.95**	**8.56**	**8.34**	**9.80**	**9.54**	**8.71**	**8.42**
Nonmarketed renewables, commercial	0.11	0.20	0.20	0.23	0.23	0.22	0.24	0.32	0.33
Industrial[5]									
Liquefied petroleum gases	2.10	2.46	2.46	2.47	2.51	2.48	2.47	2.49	2.57
Propylene	0.40	0.54	0.56	0.58	0.59	0.50	0.52	0.54	0.55
Distillate fuel oil	1.21	1.38	1.22	1.16	1.21	1.49	1.18	1.07	1.16
Petrochemical feedstocks	0.88	1.04	1.03	1.02	1.01	1.11	1.08	1.06	1.06
Other petroleum[6]	4.00	4.14	3.97	3.84	3.92	4.20	3.89	3.69	3.87
Liquid fuels and other petroleum	8.57	9.57	9.25	9.06	9.23	9.78	9.14	8.85	9.21
Natural gas	8.34	9.89	9.56	9.61	9.60	10.74	9.91	9.93	9.95
Coal	1.62	1.65	1.58	1.56	1.59	1.64	1.57	1.55	1.60
Renewable energy[7]	2.18	2.50	2.53	2.56	2.54	2.74	2.82	2.94	2.84
Electricity	3.33	4.09	3.95	3.86	3.97	4.33	3.96	3.82	4.07
Total industrial	**24.04**	**27.71**	**26.87**	**26.66**	**26.93**	**29.23**	**27.40**	**27.08**	**27.66**
Transportation									
E85[8]	0.05	0.08	0.08	0.08	0.09	0.16	0.16	0.16	0.16
Motor gasoline[9]	16.31	14.87	14.88	14.79	14.85	13.04	13.06	13.04	13.08
Jet fuel	3.01	3.11	3.11	3.10	3.11	3.28	3.28	3.24	3.28
Distillate fuel oil	5.91	7.29	7.28	7.04	7.22	7.65	7.61	7.23	7.50
Other petroleum[10]	1.05	1.06	1.06	1.06	1.06	1.08	1.08	1.07	1.08
Liquid fuels and other petroleum	26.32	26.41	26.42	26.07	26.34	25.22	25.20	24.74	25.11
Pipeline fuel natural gas	0.70	0.73	0.71	0.69	0.69	0.78	0.74	0.70	0.69
Compressed / liquefied natural gas	0.04	0.07	0.08	0.07	0.08	0.22	0.26	0.21	0.35
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	0.05
Total transportation	**27.09**	**27.25**	**27.24**	**26.87**	**27.13**	**26.27**	**26.25**	**25.70**	**26.19**
Electric power[11]									
Distillate and residual fuel oil	0.30	0.18	0.18	0.16	0.15	0.19	0.18	0.16	0.15
Natural gas	7.76	8.60	8.40	7.97	7.97	9.91	9.08	7.58	7.41
Steam coal	17.99	17.74	16.95	15.13	13.28	18.89	18.07	16.01	13.99
Nuclear / uranium[12]	8.26	9.25	9.25	9.16	9.11	9.54	9.49	9.41	9.36
Renewable energy[13]	4.74	5.58	5.49	5.27	5.12	6.46	5.93	5.57	5.31
Net electricity imports	0.13	0.09	0.08	0.08	0.08	0.05	0.05	0.03	0.03
Total electric power[14]	**39.40**	**41.67**	**40.57**	**37.99**	**35.93**	**45.27**	**43.02**	**38.99**	**36.47**
Total energy consumption									
Liquid fuels and other petroleum	37.02	37.88	37.54	36.97	37.37	36.80	36.08	35.28	35.94
Natural gas	24.91	27.39	26.77	26.07	25.74	29.82	27.95	25.87	25.37
Steam coal	19.66	19.46	18.59	16.75	14.92	20.58	19.70	17.61	15.65
Nuclear / uranium[12]	8.26	9.25	9.25	9.16	9.11	9.54	9.49	9.41	9.36
Renewable energy[15]	7.49	8.67	8.58	8.38	8.18	9.82	9.31	9.05	8.64
Other[16]	0.35	0.31	0.31	0.31	0.31	0.28	0.28	0.26	0.26
Total energy consumption	**97.70**	**102.96**	**101.04**	**97.63**	**95.64**	**106.85**	**102.81**	**97.46**	**95.22**

2040				Annual Growth 2011-2040 (percent)			
2012 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology	2012 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology
0.93	0.86	0.80	0.75	-0.7%	-1.0%	-1.2%	-1.4%
4.61	4.23	3.70	3.12	-0.2%	-0.5%	-0.9%	-1.5%
0.01	0.00	0.00	0.00	-0.3%	-0.9%	-1.3%	-1.6%
0.53	0.45	0.40	0.34	0.6%	0.1%	-0.4%	-0.9%
6.27	6.03	5.34	4.39	0.9%	0.7%	0.3%	-0.3%
12.35	**11.57**	**10.24**	**8.61**	**0.3%**	**0.1%**	**-0.3%**	**-0.9%**
0.20	0.27	0.41	0.70	5.9%	6.9%	8.5%	10.5%
0.63	0.63	0.63	0.63	-0.3%	-0.3%	-0.3%	-0.3%
3.59	3.68	3.65	3.68	0.4%	0.4%	0.4%	0.5%
0.05	0.05	0.05	0.05	0.0%	0.0%	0.0%	0.0%
0.13	0.13	0.13	0.13	0.0%	0.0%	0.0%	0.0%
6.06	5.72	4.63	4.22	1.0%	0.8%	0.1%	-0.2%
10.46	**10.21**	**9.09**	**8.71**	**0.7%**	**0.6%**	**0.2%**	**0.0%**
0.26	0.32	0.50	0.57	2.8%	3.7%	5.2%	5.7%
2.38	2.30	2.26	2.34	0.4%	0.3%	0.3%	0.4%
0.46	0.46	0.47	0.47	0.5%	0.6%	0.6%	0.6%
1.64	1.22	1.09	1.19	1.1%	0.0%	-0.4%	0.0%
1.11	1.09	1.06	1.07	0.8%	0.7%	0.7%	0.7%
4.49	4.08	3.84	4.05	0.4%	0.1%	-0.1%	0.0%
10.08	9.16	8.72	9.12	0.6%	0.2%	0.1%	0.2%
11.65	10.38	10.22	10.26	1.2%	0.8%	0.7%	0.7%
1.67	1.61	1.60	1.63	0.1%	0.0%	0.0%	0.0%
3.48	3.65	3.89	3.67	1.6%	1.8%	2.0%	1.8%
4.63	3.91	3.69	4.00	1.1%	0.6%	0.4%	0.6%
31.52	**28.71**	**28.12**	**28.68**	**0.9%**	**0.6%**	**0.5%**	**0.6%**
0.15	0.17	0.18	0.18	3.9%	4.3%	4.7%	4.6%
12.67	12.64	12.64	12.64	-0.9%	-0.9%	-0.9%	-0.9%
3.42	3.42	3.29	3.42	0.4%	0.4%	0.3%	0.4%
8.05	7.90	7.52	7.67	1.1%	1.0%	0.8%	0.9%
1.12	1.11	1.10	1.11	0.2%	0.2%	0.2%	0.2%
25.40	25.24	24.74	25.02	-0.1%	-0.1%	-0.2%	-0.2%
0.81	0.78	0.72	0.72	0.5%	0.4%	0.1%	0.1%
0.96	1.05	0.80	1.20	11.5%	11.9%	10.8%	12.4%
0.00	0.00	0.00	0.00	- -	- -	- -	- -
0.07	0.07	0.07	0.07	3.9%	3.9%	3.9%	3.9%
27.25	**27.14**	**26.34**	**27.01**	**0.0%**	**0.0%**	**-0.1%**	**0.0%**
0.20	0.19	0.17	0.16	-1.4%	-1.6%	-1.9%	-2.2%
9.99	9.70	8.13	7.86	0.9%	0.8%	0.2%	0.0%
19.57	18.68	16.63	14.23	0.3%	0.1%	-0.3%	-0.8%
10.22	9.44	8.99	8.89	0.7%	0.5%	0.3%	0.3%
9.35	7.44	6.12	5.91	2.4%	1.6%	0.9%	0.8%
0.09	0.06	0.04	0.04	-1.3%	-2.4%	-3.9%	-3.9%
49.64	**45.73**	**40.31**	**37.32**	**0.8%**	**0.5%**	**0.1%**	**-0.2%**
37.23	36.07	35.06	35.67	0.0%	-0.1%	-0.2%	-0.1%
31.62	29.83	27.22	26.84	0.8%	0.6%	0.3%	0.3%
21.29	20.35	18.29	15.91	0.3%	0.1%	-0.2%	-0.7%
10.22	9.44	8.99	8.89	0.7%	0.5%	0.3%	0.3%
13.49	11.66	10.54	10.05	2.0%	1.5%	1.2%	1.0%
0.32	0.29	0.27	0.27	-0.4%	-0.6%	-0.9%	-0.9%
114.18	**107.64**	**100.37**	**97.64**	**0.5%**	**0.3%**	**0.1%**	**0.0%**

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

Consumption, emissions, combined heat and power capacity and generation	2011	2020				2030			
		2012 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology	2012 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology
Carbon dioxide emissions (million metric tons)									
by sector									
Residential	335	324	317	301	282	316	299	272	241
Commercial	225	230	232	230	232	234	236	234	236
Industrial[5]	905	1,039	999	988	996	1,086	1,005	987	1,007
Transportation	1,841	1,827	1,826	1,801	1,819	1,761	1,759	1,721	1,754
Electric power[11]	2,166	2,167	2,081	1,884	1,707	2,347	2,224	1,947	1,746
by fuel									
Petroleum[17]	2,299	2,287	2,270	2,232	2,254	2,206	2,169	2,116	2,153
Natural gas	1,294	1,437	1,404	1,367	1,349	1,567	1,468	1,357	1,331
Coal	1,867	1,851	1,769	1,595	1,421	1,959	1,874	1,676	1,489
Other[18]	11	11	11	11	11	11	11	11	11
Total carbon dioxide emissions	**5,471**	**5,587**	**5,455**	**5,205**	**5,035**	**5,743**	**5,523**	**5,161**	**4,984**
Residential delivered energy intensity (million Btu per household)	97	88	86	80	74	83	80	71	62
Commercial delivered energy intensity (thousand Btu per square foot)	105	102	100	96	94	100	97	89	86
Industrial delivered energy intensity (thousand Btu per 2005 dollars)	3.99	3.53	3.42	3.40	3.43	3.23	3.04	3.01	3.06
Residential sector generation									
Net summer generation capacity (megawatts)									
Natural gas	0	0	0	0	0	0	0	0	0
Solar photovoltaic	1,036	8,291	8,976	9,446	10,335	8,686	10,289	13,004	19,236
Wind	108	302	750	762	809	302	750	762	809
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	1.63	12.72	14.01	14.75	16.14	13.35	16.10	20.53	30.54
Wind	0.15	0.43	1.08	1.09	1.16	0.43	1.08	1.09	1.16
Commercial sector generation									
Net summer generation capacity (megawatts)									
Natural gas	843	1,478	1,609	2,107	2,220	2,696	3,734	5,284	5,764
Solar photovoltaic	1,975	6,604	6,646	6,692	6,770	7,698	8,644	9,203	10,237
Wind	97	108	118	120	124	132	302	283	309
Electricity generation (billion kilowatthours)									
Natural gas	6.13	10.75	11.70	15.32	16.15	19.61	27.16	38.44	41.93
Solar photovoltaic	3.07	10.34	10.50	10.57	10.70	12.08	13.79	14.72	16.39
Wind	0.12	0.14	0.15	0.16	0.16	0.17	0.43	0.40	0.44

[1]Includes propane, kerosene, and distillate fuel oil.
[2]Includes wood used for residential heating.
[3]Includes propane, motor gasoline (including ethanol (blends of 15 percent or less) and ethers blended in), kerosene, distillate fuel oil, and residual fuel oil.
[4]Includes commercial sector consumption of wood and wood waste, landfill gas, municipal solid waste, and other biomass for combined heat and power.
[5]Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.
[6]Includes motor gasoline (including ethanol (blends of 15 percent or less) and ethers blended in), residual fuel oil, petroleum coke, asphalt, road oil, lubricants, still gas, and miscellaneous petroleum products.
[7]Includes consumption of energy produced from hydroelectric, wood and wood waste, municipal waste, and other biomass sources. Excludes ethanol.
[8]E85 refers to a blend of 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable). To address cold starting issues, the percentage of ethanol varies seasonally. The annual average ethanol content of 74 percent is used for this forecast.
[9]Includes ethanol (blends of 15 percent or less) and ethers blended into gasoline.
[10]Includes propane, residual fuel oil, aviation gasoline, and lubricants.
[11]Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.
[12]These values represent the energy obtained from uranium when it is used in light water reactors. The total energy content of uranium is much larger, but alternative processes are required to take advantage of it.
[13]Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes net electricity imports.
[14]Includes non-biogenic municipal waste not included above.
[15]Includes conventional hydroelectric, geothermal, wood and wood waste, biogenic municipal waste, other biomass, wind, photovoltaic, and solar thermal sources. Excludes ethanol, net electricity imports, and nonmarketed renewable energy consumption for geothermal heat pumps, buildings photovoltaic systems, and solar thermal water heaters.
[16]Includes non-biogenic municipal waste, liquid hydrogen, and net electricity imports.
[17]This includes carbon dioxide from international bunker fuels, both civilian and military, which are excluded from the accounting of carbon dioxide emissions under the United Nations convention. From 1990 through 2009, international bunker fuels accounted for 90 to 126 million metric tons annually.
[18]Includes emissions from geothermal power and nonbiogenic emissions from municipal waste.
Btu = British thermal unit.
- - = Not applicable.
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.
Source: U.S. Energy Information Administration, AEO2013 National Energy Modeling System, runs FROZTECH.D120712A, REF2013.D102312A, HIGHTECH.D120712A, and BESTTECH.D121012A.

2040				Annual Growth 2011-2040 (percent)			
2012 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology	2012 Demand Technology	Reference	High Demand Technology	Best Available Demand Technology
307	282	250	215	-0.3%	-0.6%	-1.0%	-1.5%
240	245	243	245	0.2%	0.3%	0.3%	0.3%
1,157	1,040	1,011	1,033	0.8%	0.5%	0.4%	0.5%
1,818	1,809	1,756	1,796	0.0%	-0.1%	-0.2%	-0.1%
2,416	2,315	2,036	1,792	0.4%	0.2%	-0.2%	-0.7%
2,236	2,175	2,114	2,145	-0.1%	-0.2%	-0.3%	-0.2%
1,665	1,569	1,431	1,411	0.9%	0.7%	0.3%	0.3%
2,025	1,936	1,739	1,514	0.3%	0.1%	-0.2%	-0.7%
11	11	11	11	0.0%	0.0%	0.0%	0.0%
5,938	**5,691**	**5,296**	**5,081**	**0.3%**	**0.1%**	**-0.1%**	**-0.3%**
81	76	67	56	-0.6%	-0.9%	-1.3%	-1.9%
96	94	84	80	-0.3%	-0.4%	-0.8%	-0.9%
2.97	2.74	2.72	2.76	-1.0%	-1.3%	-1.3%	-1.3%
2	2	2	2	- -	- -	- -	- -
9,649	12,927	20,651	37,759	8.0%	9.1%	10.9%	13.2%
303	751	764	818	3.6%	6.9%	7.0%	7.2%
0.00	0.00	0.00	0.00	- -	- -	- -	- -
14.84	20.38	32.96	60.49	7.9%	9.1%	10.9%	13.3%
0.43	1.08	1.10	1.17	3.7%	7.0%	7.0%	7.3%
4,951	8,437	12,017	12,626	6.3%	8.3%	9.5%	9.7%
10,091	12,141	14,213	19,129	5.8%	6.5%	7.0%	8.1%
334	762	765	950	4.4%	7.4%	7.4%	8.2%
36.01	61.37	87.42	91.85	6.3%	8.3%	9.5%	9.7%
15.85	19.56	22.95	30.74	5.8%	6.6%	7.2%	8.3%
0.47	1.07	1.07	1.32	4.7%	7.7%	7.7%	8.5%

Table D2. Energy consumption and carbon dioxide emissions for extended policy cases

Consumption and emissions	2011	2020			2030			2040		
		Reference	No Sunset	Extended Policies	Reference	No Sunset	Extended Policies	Reference	No Sunset	Extended Policies
Energy consumption by sector (quadrillion Btu)										
Residential	11.28	10.95	10.91	10.72	11.20	11.01	10.41	11.57	11.29	10.37
Commercial	8.60	8.95	8.95	8.85	9.54	9.55	9.17	10.21	10.26	9.67
Industrial[1]	24.04	26.87	26.90	26.88	27.40	27.51	27.45	28.71	28.98	28.56
Transportation	27.09	27.24	27.23	27.21	26.25	26.25	25.99	27.14	27.17	26.06
Electric power[2]	39.40	40.57	40.38	39.64	43.02	42.69	41.16	45.73	45.70	43.63
Total	**97.70**	**101.04**	**100.89**	**100.06**	**102.81**	**102.62**	**100.33**	**107.64**	**107.92**	**103.54**
Energy consumption by fuel (quadrillion Btu)										
Liquid fuels and other petroleum[3]	37.02	37.54	37.54	37.50	36.08	36.10	35.78	36.07	36.10	34.76
Natural gas	24.91	26.77	26.71	26.60	27.95	27.60	26.82	29.83	28.60	27.54
Coal	19.66	18.59	18.35	17.84	19.70	19.20	18.45	20.35	19.84	19.00
Nuclear / uranium	8.26	9.25	9.25	9.25	9.49	9.49	9.49	9.44	9.08	9.02
Renewable energy[4]	7.49	8.58	8.74	8.57	9.31	9.98	9.52	11.66	14.03	12.95
Other[5]	0.35	0.31	0.31	0.31	0.28	0.26	0.26	0.29	0.28	0.27
Total	**97.70**	**101.04**	**100.89**	**100.06**	**102.81**	**102.62**	**100.33**	**107.64**	**107.92**	**103.54**
Energy intensity (thousand Btu per 2005 dollar of GDP)	7.35	5.99	5.98	5.94	4.81	4.80	4.70	3.95	3.95	3.80
Carbon dioxide emissions by sector (million metric tons)										
Residential	335	317	317	315	299	298	285	282	280	256
Commercial	225	232	232	230	236	238	229	245	248	233
Industrial[1]	905	999	1,000	999	1,005	1,009	1,000	1,040	1,051	1,025
Transportation	1,841	1,826	1,826	1,824	1,759	1,759	1,742	1,809	1,810	1,736
Electric power[2]	2,166	2,081	2,052	2,001	2,224	2,152	2,065	2,315	2,187	2,103
Total	**5,471**	**5,455**	**5,428**	**5,370**	**5,523**	**5,456**	**5,321**	**5,691**	**5,575**	**5,353**
Carbon dioxide emissions by fuel (million metric tons)										
Petroleum	2,299	2,270	2,269	2,267	2,169	2,169	2,146	2,175	2,173	2,086
Natural gas	1,294	1,404	1,401	1,395	1,468	1,449	1,408	1,569	1,504	1,448
Coal	1,867	1,769	1,746	1,698	1,874	1,826	1,756	1,936	1,887	1,807
Other[6]	11	11	11	11	11	11	11	11	11	11
Total	**5,471**	**5,455**	**5,428**	**5,370**	**5,523**	**5,456**	**5,321**	**5,691**	**5,575**	**5,353**
Carbon dioxide emissions (tons per person)	**17.5**	**16.0**	**15.9**	**15.8**	**14.8**	**14.6**	**14.3**	**14.1**	**13.8**	**13.2**

[1]Includes combined heat and power plants that have a non-regulatory status, and small on-site generating systems.
[2]Includes electricity-only and combined heat and power plants that have a regulatory status.
[3]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.
[4]Includes grid-connected electricity from conventional hydroelectric; wood and wood waste; landfill gas; biogenic municipal solid waste; other biomass; wind; photovoltaic and solar thermal sources; and non-electric energy from renewable sources, such as active and passive solar systems, and wood; and both the ethanol and gasoline components of E85, but not the ethanol component of blends less than 85 percent. Excludes electricity imports using renewable sources and nonmarketed renewable energy.
[5]Includes non-biogenic municipal waste, net electricity imports, and liquid hydrogen.
[6]Includes emissions from geothermal power and nonbiogenic emissions from municipal solid waste.
Btu = British thermal unit.
GDP = Gross domestic product.
Note: Includes end-use, fossil electricity, and renewable technology assumptions. 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.
Source: U.S. Energy Information Administration, AEO2013 National Energy Modeling System runs REF2013.D102312A, NOSUNSET.D120712A, and EXTENDED.D041713A.

Table D3. Electricity generation and generating capacity in extended policy cases

(gigawatts, unless otherwise noted)

Net summer capacity, generation, consumption, and emissions	2011	2020			2030			2040		
		Reference	No Sunset	Extended Policies	Reference	No Sunset	Extended Policies	Reference	No Sunset	Extended Policies
Capacity	**1,048.8**	**1,068.1**	**1,071.3**	**1,038.6**	**1,147.0**	**1,167.8**	**1,102.4**	**1,293.3**	**1,378.0**	**1,264.3**
Electric power sector[1]	1,018.1	1,019.6	1,013.5	980.4	1,085.8	1,070.5	1,005.5	1,212.3	1,233.0	1,121.3
Pulverized coal	313.9	271.0	262.4	252.1	270.1	262.1	251.8	271.3	262.1	251.8
Coal gasification combined-cycle	0.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Oil and natural gas steam	102.7	87.2	84.7	72.9	69.9	64.4	53.6	64.8	56.8	40.9
Conventional natural gas combined-cycle	205.5	216.7	216.7	216.4	221.8	220.4	219.3	227.6	225.1	222.3
Advanced natural gas combined-cycle	0.0	2.5	1.6	1.0	42.5	26.2	17.3	86.8	57.4	43.8
Conventional combustion turbine	138.9	137.8	135.4	133.7	137.1	133.8	130.4	136.9	133.3	130.2
Advanced combustion turbine	0.0	14.9	11.2	9.0	42.8	35.7	19.4	74.8	67.0	37.6
Nuclear / uranium	101.1	110.6	110.6	110.6	113.6	113.6	113.6	113.1	108.5	107.8
Pumped storage	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
Fuel cells	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewable sources	133.1	153.8	166.1	159.9	160.5	188.1	174.6	207.6	294.8	260.6
Distributed generation	0.0	0.9	0.6	0.4	3.1	2.0	1.2	5.1	3.6	2.0
Combined heat and power[2]	30.6	48.5	57.8	58.2	61.1	97.2	96.9	81.0	145.0	143.0
Fossil fuels / other	21.7	24.4	25.3	25.5	32.0	34.8	34.2	43.5	47.6	46.2
Renewable fuels	8.9	24.2	32.5	32.6	29.1	62.4	62.6	37.5	97.4	96.9
Cumulative additions	**0.0**	**87.6**	**103.9**	**94.8**	**182.2**	**219.6**	**178.6**	**339.9**	**443.8**	**359.4**
Electric power sector[1]	0.0	69.7	76.7	67.3	151.7	153.0	112.3	289.5	329.4	247.0
Pulverized coal	0.0	4.9	4.9	4.9	4.9	4.9	4.9	6.1	4.9	4.9
Coal gasification combined-cycle	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Conventional natural gas combined-cycle	0.0	11.4	11.4	11.2	16.5	15.2	14.1	22.4	19.9	17.0
Advanced natural gas combined-cycle	0.0	2.5	1.6	1.0	42.5	26.2	17.3	86.8	57.4	43.8
Conventional combustion turbine	0.0	6.1	5.8	5.6	6.1	5.8	5.6	6.1	5.8	5.6
Advanced combustion turbine	0.0	14.9	11.2	9.0	42.8	35.7	19.4	74.8	67.0	37.6
Nuclear / uranium	0.0	5.5	5.5	5.5	5.5	5.5	5.5	11.0	6.5	5.7
Renewable sources	0.0	21.8	34.2	28.0	28.6	56.2	42.7	75.7	162.9	128.7
Distributed generation	0.0	0.9	0.6	0.4	3.1	2.0	1.2	5.1	3.6	2.0
Combined heat and power[2]	0.0	17.9	27.1	27.5	30.5	66.6	66.2	50.4	114.4	112.4
Fossil fuels / other	0.0	2.7	3.5	3.8	10.3	13.1	12.5	21.8	25.9	24.5
Renewable fuels	0.0	15.2	23.6	23.7	20.2	53.5	53.7	28.6	88.5	87.9
Cumulative retirements	**0.0**	**72.7**	**85.9**	**109.5**	**92.0**	**108.6**	**133.0**	**103.4**	**122.6**	**151.9**
Generation by fuel (billion kilowatthours)	**4,093**	**4,389**	**4,388**	**4,317**	**4,777**	**4,786**	**4,613**	**5,212**	**5,254**	**5,026**
Electric power sector[1]	3,954	4,182	4,162	4,089	4,506	4,446	4,277	4,842	4,765	4,548
Coal	1,715	1,640	1,617	1,570	1,745	1,699	1,635	1,804	1,756	1,686
Petroleum	26	15	15	15	16	15	15	16	16	16
Natural gas	930	1,078	1,065	1,057	1,221	1,144	1,086	1,348	1,122	1,082
Nuclear / uranium	790	885	885	885	908	908	908	903	868	863
Renewable sources	489	559	575	558	602	670	625	754	992	894
Pumped storage / other	4	2	2	2	3	3	3	3	3	3
Distributed generation	0	3	2	1	10	7	4	13	8	5
Combined heat and power[2]	139	208	226	228	271	340	336	370	489	478
Fossil fuels / other	103	140	145	146	189	205	201	266	290	280
Renewable fuels	36	68	81	82	82	135	136	104	199	198
Average electricity price (cents per kilowatthour)	**9.9**	**9.4**	**9.4**	**9.4**	**9.7**	**9.6**	**9.5**	**10.8**	**10.4**	**10.1**

[1]Includes electricity-only and combined heat and power plants that have a regulatory status.
[2]Includes 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.
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.
Source: U.S. Energy Information Administration, AEO2013 National Energy Modeling System runs REF2013.D102312A, NOSUNSET.D120712A, and EXTENDED.D041713A.

Table D4. Key results for nuclear plant cases

(gigawatts, unless otherwise noted)

Net summer capacity, generation, emissions, and fuel prices	2011	2030				2040			
		Low Nuclear	Reference	High Nuclear	Small Modular Reactor	Low Nuclear	Reference	High Nuclear	Small Modular Reactor
Capacity									
Coal steam	314.4	273.7	272.1	272.3	271.7	278.7	273.3	273.4	272.7
Oil and natural gas steam	102.7	67.3	69.9	70.4	68.7	62.0	64.8	64.8	65.1
Combined cycle	205.5	264.4	264.3	258.3	264.0	337.0	314.4	301.3	312.8
Combustion turbine / diesel	138.9	183.5	179.9	179.9	182.1	218.6	211.7	218.1	212.9
Nuclear / uranium	101.1	102.8	113.6	121.9	113.7	62.6	113.1	127.2	115.4
Pumped storage	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
Fuel cells	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewable sources	133.1	160.9	160.5	160.2	160.5	211.3	207.6	202.9	204.9
Distributed generation	0.0	2.6	3.1	3.2	3.1	4.1	5.1	5.3	5.1
Combined heat and power[1]	30.6	61.9	61.1	61.1	61.2	83.4	81.0	80.4	81.1
Total	**1,048.8**	**1,139.6**	**1,147.0**	**1,149.6**	**1,147.4**	**1,280.1**	**1,293.3**	**1,295.9**	**1,292.3**
Cumulative additions									
Coal steam	0.0	6.4	6.4	6.4	6.4	11.4	7.6	7.5	7.5
Oil and natural gas steam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combined cycle	0.0	59.2	59.0	53.1	58.8	131.8	109.1	96.1	107.6
Combustion turbine / diesel	0.0	51.9	48.9	48.4	51.3	87.0	80.9	86.7	82.5
Nuclear / uranium	0.0	5.5	5.5	13.3	5.6	5.5	11.0	18.7	13.3
Pumped storage	0.0	0.0	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	0.0	0.0
Renewable sources	0.0	29.0	28.6	28.3	28.6	79.4	75.7	71.0	73.0
Distributed generation	0.0	2.6	3.1	3.2	3.1	4.1	5.1	5.3	5.1
Combined heat and power[1]	0.0	31.3	30.5	30.4	30.6	52.8	50.4	49.8	50.5
Total	**0.0**	**186.0**	**182.2**	**183.1**	**184.5**	**372.0**	**339.9**	**335.1**	**339.5**
Cumulative retirements	**0.0**	**96.6**	**92.0**	**90.3**	**93.9**	**142.0**	**103.4**	**96.0**	**103.9**
Generation by fuel (billion kilowatthours)									
Coal	1,715	1,771	1,745	1,734	1,740	1,846	1,804	1,804	1,801
Petroleum	26	16	16	16	16	16	16	16	16
Natural gas	930	1,267	1,221	1,181	1,225	1,602	1,348	1,272	1,338
Nuclear / uranium	790	824	908	974	909	507	903	1,014	921
Pumped storage / other	4	3	3	3	3	3	3	3	3
Renewable sources	489	599	602	600	601	770	754	741	748
Distributed generation	0	9	10	10	11	12	13	14	14
Combined heat and power[1]	139	275	271	272	272	381	370	368	370
Total	**4,093**	**4,764**	**4,777**	**4,789**	**4,775**	**5,136**	**5,212**	**5,231**	**5,211**
Carbon dioxide emissions by the electric power sector (million metric tons)[2]									
Petroleum	25	14	14	14	14	14	14	14	14
Natural gas	411	500	482	468	483	602	514	489	511
Coal	1,718	1,743	1,717	1,707	1,713	1,812	1,775	1,776	1,773
Other[3]	11	11	11	11	11	11	11	11	11
Total	**2,166**	**2,267**	**2,224**	**2,201**	**2,221**	**2,440**	**2,315**	**2,291**	**2,310**
Prices to the electric power sector[2] (2011 dollars per million Btu)									
Petroleum	17.49	28.20	28.23	28.24	28.18	33.49	33.49	33.47	33.47
Natural gas	4.77	6.20	6.05	5.95	6.07	9.36	8.38	8.36	8.51
Coal	2.38	2.88	2.87	2.86	2.86	3.23	3.20	3.20	3.20

[1]Includes 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.
[2]Includes electricity-only and combined heat and power plants that have a regulatory status.
[3]Includes 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 2011 are model results and may differ slightly from official EIA data reports.
Source: U.S. Energy Information Administration, AEO2013 National Energy Modeling System runs LOWNUC13.D112112A, REF2013.D102312A, HINUC13.D112112A, and NUCSMR13.D112712A.

Table D5. Key results for renewable technology case

Capacity, generation, and emissions	2011	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	77.87	78.34	78.68	79.11	79.75	80.31	82.06
Geothermal[2]	2.38	3.63	3.37	5.70	6.20	7.46	7.94
Municipal waste[3]	3.34	3.44	3.44	3.44	3.44	3.44	3.44
Wood and other biomass[4]	2.37	2.82	2.81	2.85	3.22	3.70	6.18
Solar thermal	0.49	1.35	1.35	1.35	1.35	1.35	1.35
Solar photovoltaic	1.01	5.37	10.15	6.80	15.08	24.54	45.95
Wind	45.68	58.81	64.67	61.30	70.37	86.83	116.68
Total	**133.14**	**153.75**	**164.48**	**160.54**	**179.40**	**207.63**	**263.61**
End-use sector[5]							
Conventional hydropower	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Municipal waste[6]	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Wood and other biomass	4.92	6.87	7.61	8.34	10.36	10.18	14.01
Solar photovoltaic	3.02	15.63	16.81	18.94	23.22	25.08	33.51
Wind	0.21	0.87	1.36	1.05	1.73	1.51	2.84
Total	**8.93**	**24.15**	**26.55**	**29.12**	**36.10**	**37.55**	**51.15**
Generation (billion kilowatthours)							
Electric power sector[1]							
Coal	1,715	1,640	1,609	1,745	1,709	1,804	1,758
Petroleum	26	15	15	16	16	16	16
Natural gas	930	1,078	1,062	1,221	1,184	1,348	1,238
Total fossil	2,671	2,733	2,686	2,982	2,908	3,169	3,013
Conventional hydropower	323.14	288.54	290.00	292.39	295.25	297.28	303.59
Geothermal	16.70	25.28	23.25	42.02	46.15	56.40	60.51
Municipal waste[7]	16.62	14.09	14.09	14.09	14.09	14.10	14.10
Wood and other biomass[4]	10.50	54.45	72.77	65.48	86.74	75.64	113.52
Dedicated plants	9.35	14.85	14.75	15.30	17.96	21.59	39.64
Cofiring	1.16	39.60	58.03	50.18	68.78	54.05	73.88
Solar thermal	0.81	2.74	2.74	2.73	2.74	2.73	2.73
Solar photovoltaic	0.97	9.83	20.85	13.40	32.67	56.22	105.76
Wind	119.63	163.48	182.60	172.11	199.32	251.94	340.16
Total renewable	**488.38**	**558.41**	**606.30**	**602.22**	**676.96**	**754.32**	**940.37**
End-use sector[5]							
Total fossil	88	122	122	171	169	248	242
Conventional hydropower[8]	1.89	1.82	1.82	1.82	1.82	1.82	1.82
Geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Municipal waste[6]	2.04	3.55	3.55	3.55	3.55	3.55	3.55
Wood and other biomass	26.75	36.95	40.54	45.55	56.25	56.25	77.56
Solar photovoltaic	4.71	24.53	26.37	29.91	36.82	39.97	53.71
Wind	0.28	1.23	1.87	1.50	2.41	2.15	3.93
Total renewable	**35.68**	**68.09**	**74.14**	**82.33**	**100.85**	**103.74**	**140.57**
Carbon dioxide emissions by the electric power sector (million metric tons)[1]							
Coal	1,718	1,610	1,580	1,717	1,681	1,775	1,730
Petroleum	25	13	13	14	14	14	14
Natural gas	411	446	440	482	471	514	476
Other [9]	11	11	11	11	11	11	11
Total	**2,166**	**2,081**	**2,044**	**2,224**	**2,177**	**2,315**	**2,232**

[1]Includes electricity-only and combined heat and power plants that have a regulatory status.
[2]Includes both hydrothermal resources (hot water and steam) and near-field enhanced geothermal systems (EGS). Near-field EGS potential occurs on known hydrothermal sites, however this potential requires the addition of external fluids for electricity generation and is only available after 2025.
[3]Includes 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.
[4]Facilities co-firing biomass and coal are classified as coal.
[5]Includes 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.
[6]Includes municipal waste, landfill gas, and municipal sewage sludge. All municipal waste is included, although a portion of the municipal waste stream contains petroleum-derived plastics and other non-renewable sources.
[7]Includes biogenic municipal waste, landfill gas, and municipal sewage sludge. Incremental growth is assumed to be for landfill gas facilities.
[8]Represents own-use industrial hydroelectric power.
[9]Includes 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 2011 are model results and may differ slightly from official EIA data reports.
Source: U.S. Energy Information Administration, AEO2013 National Energy Modeling System runs REF2013.D102312A, and LCR20.D112012A.

Table D6. Key results for environmental cases

Net summer capacity, generation, emissions, and fuel prices	2011	2040							
		Reference	GHG10	GHG15	GHG25	High Oil and Gas Resource	GHG10 and Low Gas Prices	GHG15 and Low Gas Prices	GHG25 and Low Gas Prices
Capacity (gigawatts)									
Coal steam	314.4	273.3	219.6	120.1	28.8	248.0	145.5	80.7	29.5
Oil and natural gas steam	102.7	64.8	51.7	37.9	26.0	68.5	57.6	56.2	19.9
Combined cycle	205.5	314.4	312.8	336.2	368.3	343.6	433.4	458.7	517.1
Combustion turbine / diesel	138.9	211.7	200.3	192.5	174.0	250.3	213.4	201.5	176.7
Nuclear / uranium	101.1	113.1	137.3	166.5	226.6	106.5	115.9	130.7	150.5
Pumped storage	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
Renewable sources	133.1	207.6	264.4	375.5	439.0	162.3	197.2	260.7	325.5
Distributed generation	0.0	5.1	0.2	0.0	0.0	28.2	0.3	0.1	0.0
Combined heat and power[1]	30.6	81.0	91.8	99.1	108.3	85.1	93.2	96.4	103.2
Total	**1,048.8**	**1,293.3**	**1,300.4**	**1,350.2**	**1,393.3**	**1,314.8**	**1,278.8**	**1,307.2**	**1,344.6**
Cumulative additions (gigawatts)									
Coal steam	0.0	7.6	6.4	7.2	6.5	6.4	6.4	6.4	6.4
Combined cycle	0.0	109.1	107.6	131.0	163.0	138.4	228.1	253.5	311.8
Combustion turbine / diesel	0.0	80.9	70.5	69.1	71.1	116.3	82.0	72.9	72.7
Nuclear / uranium	0.0	11.0	35.3	64.4	124.6	5.5	13.9	28.6	48.5
Renewable sources	0.0	75.7	132.5	243.6	307.1	30.4	65.3	128.8	193.6
Distributed generation	0.0	5.1	0.2	0.0	0.0	28.2	0.3	0.1	0.0
Combined heat and power[1]	0.0	50.4	61.2	68.5	77.6	54.5	62.6	65.8	72.5
Total	**0.0**	**339.9**	**413.6**	**583.9**	**750.0**	**379.7**	**458.6**	**556.0**	**705.5**
Cumulative retirements (gigawatts)	**0.0**	**103.4**	**170.0**	**290.5**	**413.5**	**121.7**	**236.5**	**305.6**	**417.7**
Generation by fuel (billion kilowatthours)									
Coal	1,715	1,804	1,190	602	61	1,426	550	176	32
Petroleum	26	16	15	12	10	16	12	10	10
Natural gas	930	1,348	1,240	1,263	1,105	1,971	2,473	2,491	2,189
Nuclear / uranium	790	903	1,091	1,317	1,788	853	925	1,039	1,195
Pumped storage / other	4	3	3	3	3	3	3	3	3
Renewable sources	489	754	1,070	1,277	1,382	633	772	912	1,077
Distributed generation	0	13	0	0	0	122	0	0	0
Combined heat and power[1]	139	370	417	437	463	409	441	452	473
Total	**4,093**	**5,212**	**5,026**	**4,911**	**4,812**	**5,432**	**5,177**	**5,083**	**4,977**
Emissions by the electric power sector[2]									
Carbon dioxide (million metric tons)	2,166	2,315	1,639	1,034	360	2,227	1,444	1,056	544
Sulfur dioxide (million short tons)	4.42	1.66	0.90	0.47	0.06	1.09	0.40	0.13	0.04
Nitrogen oxides (million short tons)	1.94	1.87	1.31	0.70	0.26	1.56	0.72	0.41	0.30
Mercury (short tons)	31.49	7.75	5.32	2.81	0.53	6.16	2.39	0.97	0.37
Retrofits (gigawatts)									
Scrubber	0.00	33.87	36.06	20.75	15.76	33.92	22.05	17.32	14.36
Nitrogen oxide controls									
Combustion	0.00	0.79	0.79	0.79	0.01	0.78	0.00	0.01	0.00
Selective catalytic reduction post-combustion	0.00	13.90	12.28	13.65	14.17	13.52	14.12	12.28	12.31
Selective non-catalytic reduction post-combustion	0.00	0.70	1.22	1.17	0.70	2.51	1.17	0.70	0.70
Prices to the electric power sector[2] (2011 dollars per million Btu)									
Natural gas	4.77	8.38	10.03	11.01	12.87	5.13	7.47	8.47	10.40
Coal	2.38	3.20	6.38	7.71	10.58	2.91	5.83	7.25	10.75

[1]Includes 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.
[2]Includes electricity-only and combined heat and power plants that have a regulatory status.
Btu = British thermal unit.
GHG = Greenhouse gas.
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.
Source: U.S. Energy Information Administration, AEO2013 National Energy Modeling System runs REF2013.D102312A, CO2FEE10.D021413A, CO2FEE15.D021413A, CO2FEE25.D021413A, HIGHRESOURCE.D021413A, CO2FEE10HR.D021413A, CO2FEE15HR.D021413A, and CO2FEE25HR.D021413A.

Table D7. Natural gas supply and disposition, oil and gas resource cases

(trillion cubic feet per year, unless otherwise noted)

Supply, disposition, and prices	2011	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										
(2011 dollars per million Btu)	3.98	5.37	4.13	2.72	7.05	5.40	3.26	10.36	7.83	4.32
(2011 dollars per thousand cubic feet)	4.07	5.49	4.22	2.78	7.21	5.52	3.33	10.59	8.00	4.42
Dry gas production[1]	**23.00**	**24.23**	**26.61**	**30.94**	**25.75**	**29.79**	**36.89**	**27.03**	**33.14**	**44.91**
Lower 48 onshore	20.54	21.84	24.27	28.37	21.85	26.26	33.30	22.47	29.12	40.74
Associated-dissolved[2]	1.54	1.78	2.14	3.00	1.24	1.43	3.05	0.93	1.09	2.70
Non-associated	19.00	20.06	22.13	25.37	20.62	24.83	30.25	21.54	28.03	38.04
Tight gas	5.86	5.98	6.40	7.63	5.77	6.67	8.86	5.95	7.34	10.72
Shale gas	7.85	9.29	11.05	13.18	10.40	14.17	17.56	11.14	16.70	23.93
Coalbed methane	1.71	1.79	1.71	1.60	2.15	1.69	1.51	2.55	2.11	1.53
Other	3.58	2.99	2.97	2.96	2.30	2.31	2.32	1.90	1.87	1.86
Lower 48 offshore	2.11	2.11	2.07	2.29	2.70	2.34	2.37	3.38	2.85	2.92
Associated-dissolved[2]	0.54	0.66	0.66	0.74	0.71	0.60	0.65	0.89	0.74	0.81
Non-associated	1.58	1.44	1.41	1.55	1.99	1.73	1.72	2.49	2.11	2.12
Alaska	0.35	0.28	0.28	0.28	1.19	1.19	1.22	1.18	1.18	1.25
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	**1.95**	**0.24**	**-0.14**	**-0.52**	**-0.83**	**-2.10**	**-3.63**	**-2.56**	**-3.55**	**-6.70**
Pipeline[4]	1.67	0.50	0.13	-0.26	0.04	-0.67	-1.57	-1.39	-2.09	-2.84
Liquefied natural gas	0.28	-0.26	-0.26	-0.26	-0.87	-1.43	-2.06	-1.17	-1.46	-3.86
Total supply	**25.01**	**24.53**	**26.54**	**30.48**	**24.98**	**27.75**	**33.33**	**24.53**	**29.65**	**38.27**
Consumption by sector										
Residential	4.72	4.44	4.52	4.64	4.26	4.36	4.52	4.02	4.14	4.31
Commercial	3.16	3.20	3.32	3.51	3.26	3.42	3.71	3.40	3.60	3.97
Industrial[5]	6.77	7.52	7.68	7.96	7.55	7.79	8.04	7.59	7.90	8.14
Natural-gas-to-liquids heat and power[6]	0.00	0.07	0.13	0.14	0.09	0.21	0.36	0.11	0.33	1.01
Natural gas to liquids production[7]	0.00	0.07	0.14	0.15	0.09	0.22	0.39	0.12	0.35	1.10
Electric power[8]	7.60	6.87	8.23	11.27	7.23	8.89	12.89	6.13	9.50	14.78
Transportation[9]	0.04	0.07	0.08	0.08	0.18	0.26	0.27	0.77	1.04	1.04
Pipeline fuel	0.68	0.66	0.70	0.78	0.67	0.73	0.85	0.66	0.76	0.97
Lease and plant fuel[10]	1.39	1.42	1.54	1.74	1.46	1.70	2.12	1.59	1.93	2.79
Total	**24.37**	**24.31**	**26.32**	**30.26**	**24.78**	**27.57**	**33.14**	**24.40**	**29.54**	**38.11**
Discrepancy[11]	0.64	0.22	0.22	0.22	0.19	0.18	0.19	0.14	0.12	0.16
Lower 48 end of year dry reserves[1]	**298.96**	**308.37**	**332.51**	**398.38**	**321.33**	**350.65**	**435.34**	**330.37**	**359.97**	**450.88**

[1]Marketed production (wet) minus extraction losses.
[2]Gas which occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with crude oil (dissolved).
[3]Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.
[4]Includes any natural gas regasified in the Bahamas and transported via pipeline to Florida, as well as gas from Canada and Mexico.
[5]Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.
[6]Includes any natural gas used in the process of converting natural gas to liquid fuel that is not actually converted.
[7]Includes any natural gas converted into liquid fuel.
[8]Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.
[9]Natural gas used as a vehicle fuel.
[10]Represents natural gas used in well, field, and lease operations, in natural gas processing plant machinery, and for liquefaction in export facilities.
[11]Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2011 values include net storage injections.

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 supply values; lease, plant, and pipeline fuel consumption: U.S. Energy Information Administration (EIA), *Natural Gas Monthly*, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). Other 2011 consumption based on: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2011 natural gas price at Henry Hub based on daily spot prices published in Natural Gas Intelligence. **Projections:** EIA, AEO2013 National Energy Modeling System runs LOWRESOURCE.D012813A, REF2013.D102312A, and HIGHRESOURCE.D021413A.

Table D8. Liquid fuels supply and disposition, oil and gas resource cases

(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	2011	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 (2011 dollars per barrel)										
Brent spot	111.26	107.96	105.57	98.30	132.32	130.47	117.09	165.01	162.68	143.97
West Texas Intermediate spot	94.86	105.92	103.57	96.43	130.29	128.47	115.30	162.98	160.68	142.20
Imported crude oil[1]	102.65	104.36	102.19	95.26	126.68	125.64	112.93	157.23	154.96	136.97
Crude oil supply										
Domestic production[2]	5.67	6.82	7.47	9.68	5.96	6.30	9.96	5.90	6.13	10.24
Alaska	0.57	0.49	0.49	0.54	0.38	0.38	0.69	0.41	0.41	0.89
Lower 48 States	5.10	6.33	6.98	9.14	5.57	5.92	9.27	5.49	5.72	9.35
Net imports	8.89	7.55	6.82	4.57	7.89	7.36	3.74	8.12	7.57	3.09
Gross imports	8.94	7.55	6.82	4.57	7.89	7.36	3.74	8.12	7.57	3.09
Exports	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other crude oil supply[3]	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total crude oil supply	**14.81**	**14.37**	**14.29**	**14.24**	**13.85**	**13.66**	**13.70**	**14.02**	**13.70**	**13.33**
Other petroleum supply	**3.02**	**3.90**	**4.04**	**4.40**	**3.65**	**3.82**	**4.30**	**3.17**	**3.29**	**3.96**
Natural gas plant liquids	2.22	2.77	3.13	4.13	2.46	2.90	4.69	2.40	2.92	5.02
Net product imports	-0.30	0.06	-0.13	-0.68	0.15	-0.08	-1.22	-0.32	-0.67	-1.82
Gross refined product imports[4]	1.15	1.46	1.47	1.42	1.71	1.53	1.36	1.67	1.42	1.30
Unfinished oil imports	0.69	0.56	0.56	0.56	0.51	0.51	0.51	0.45	0.45	0.45
Blending component imports	0.72	0.63	0.63	0.63	0.54	0.54	0.45	0.42	0.40	0.37
Exports	2.86	2.60	2.79	3.30	2.62	2.67	3.53	2.86	2.94	3.94
Refinery processing gain[5]	1.08	1.08	1.04	0.95	1.04	1.00	0.82	1.08	1.03	0.77
Product stock withdrawal	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other non-petroleum supply	**1.09**	**1.47**	**1.51**	**1.50**	**1.48**	**1.58**	**1.60**	**1.79**	**1.97**	**2.25**
Supply from renewable sources	0.90	1.18	1.18	1.19	1.13	1.14	1.16	1.40	1.43	1.38
Ethanol	0.84	1.07	1.08	1.09	0.99	0.99	1.02	0.95	0.97	0.99
Domestic production	0.91	1.00	1.01	1.02	0.95	0.95	0.98	0.86	0.89	0.93
Net imports	-0.07	0.07	0.07	0.07	0.04	0.04	0.04	0.10	0.08	0.06
Biodiesel	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Domestic production	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
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	0.02	0.02	0.02	0.06	0.06	0.06	0.37	0.38	0.32
Liquids from gas	0.00	0.04	0.08	0.08	0.05	0.13	0.22	0.07	0.20	0.62
Liquids from coal	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.03	0.06	0.04
Other[7]	0.18	0.26	0.25	0.23	0.28	0.28	0.22	0.29	0.28	0.20
Total primary supply[8]	**18.92**	**19.74**	**19.84**	**20.15**	**18.98**	**19.06**	**19.59**	**18.99**	**18.96**	**19.55**
Net import share of product supplied (percent)	45.0	39.0	34.1	19.7	42.7	38.5	13.1	41.7	36.9	6.9
Net expenditures for imports of crude oil and petroleum products (billion 2011 dollars)	362.66	293.15	259.66	163.99	370.21	342.67	158.79	471.38	433.65	159.39
Lower 48 end of year reserves[2] (billion barrels)	**21.36**	**23.07**	**24.63**	**29.69**	**24.11**	**24.92**	**31.36**	**26.03**	**26.72**	**32.75**

Table D8. Liquid fuels supply and disposition, oil and gas resource cases (continued)

(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	2011	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 (2011 dollars per gallon)										
Propane	2.22	2.18	2.07	1.73	2.34	2.26	1.94	2.50	2.44	2.24
Ethanol (E85)[9]	2.42	2.89	2.83	2.73	2.61	2.57	2.35	3.14	2.92	2.74
Ethanol wholesale price	2.54	3.05	3.00	2.95	2.36	2.28	2.27	2.61	2.48	2.27
Motor gasoline[10]	3.45	3.38	3.32	3.16	3.72	3.67	3.39	4.39	4.32	3.93
Jet fuel[11]	3.04	2.97	2.90	2.70	3.59	3.51	3.16	4.34	4.19	3.71
Distillate fuel oil[12]	3.58	3.71	3.65	3.45	4.28	4.22	3.94	5.05	4.94	4.47
Residual fuel oil	2.67	2.29	2.23	2.07	2.78	2.75	2.46	3.44	3.36	2.98
Residual fuel oil (2011 dollars per barrel)	112.11	96.00	93.74	87.03	116.81	115.30	103.28	144.39	141.16	125.08

[1]Weighted average price delivered to U.S. refiners.
[2]Includes lease condensate.
[3]Strategic petroleum reserve stock additions plus unaccounted for crude oil and crude stock withdrawals minus crude product supplied.
[4]Includes other hydrocarbons and alcohol.
[5]The volumetric amount by which total output is greater than input due to the processing of crude oil into products which, in total, have a lower specific gravity than the crude oil processed.
[6]Includes pyrolysis oils, biomass-derived Fischer-Tropsch liquids, and renewable feedstocks used for the on-site production of diesel and gasoline.
[7]Includes domestic sources of other blending components, other hydrocarbons, and ethers.
[8]Total crude supply plus other petroleum supply plus other non-petroleum supply.
[9]E85 refers to a blend of 85 pecent 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.
[10]Sales weighted-average price for all grades. Includes Federal, State, and local taxes.
[11]Includes only kerosene-type.
[12]Diesel 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 2011 are model results and may differ slightly from official EIA data reports.
Sources: 2011 product supplied data and imported crude oil price based on: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2011 crude oil spot prices: Thomson Reuters. 2011 transportation sector prices based on: EIA, Form EIA-782A, "Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report". 2011 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. 2011 wholesale ethanol prices derived from Bloomberg U.S. average rack price. Other 2011 data: EIA, *Petroleum Supply Annual 2011*, DOE/EIA-0340(2011)/1 (Washington, DC, August 2012). **Projections:** EIA, AEO2013 National Energy Modeling System runs LOWRESOURCE.D012813A, REF2013.D102312A, and HIGHRESOURCE.D021413A.

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

Consumption and indicators	2011	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	2,629	2,860	2,870	2,901	3,312	3,323	3,372	3,711	3,719	3,775
Commercial light trucks[1]	65	80	80	81	94	94	96	109	110	112
Freight trucks greater than 10,000 pounds	240	321	323	332	369	371	385	437	438	454
(billion seat miles available)										
Air	982	1,081	1,082	1,082	1,177	1,177	1,177	1,274	1,274	1,274
(billion ton miles traveled)										
Rail	1,557	1,755	1,719	1,622	1,909	1,910	1,772	2,000	2,017	1,947
Domestic shipping	514	594	612	703	567	578	737	581	591	773
Energy efficiency indicators										
(miles per gallon)										
Tested new light-duty vehicle[2]	31.5	38.0	37.9	37.7	48.2	48.1	47.7	49.1	49.0	48.5
New car[2]	36.4	44.4	44.4	44.3	55.6	55.6	55.5	56.1	56.1	55.9
New light truck[2]	27.3	32.1	32.0	31.9	40.4	40.3	40.1	40.5	40.4	40.1
On-road new light-duty vehicle[3]	25.5	30.7	30.6	30.4	39.0	38.9	38.6	39.7	39.7	39.3
New car[3]	29.8	36.3	36.3	36.2	45.4	45.4	45.3	45.8	45.8	45.7
New light truck[3]	21.8	25.7	25.6	25.5	32.4	32.3	32.1	32.4	32.3	32.1
Light-duty stock[4]	20.6	24.1	24.1	24.0	31.4	31.3	31.2	36.2	36.1	35.8
New commercial light truck[1]	18.1	20.0	20.0	19.9	24.2	24.1	24.0	24.2	24.2	24.0
Stock commercial light truck[1]	14.9	17.9	17.9	17.9	22.2	22.2	22.1	24.1	24.1	23.9
Freight truck	6.7	7.3	7.3	7.3	8.0	8.0	8.0	8.2	8.2	8.1
(seat miles per gallon)										
Aircraft	62.3	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	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Domestic shipping	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6
Energy use by mode (quadrillion Btu)										
Light-duty vehicles	15.56	14.29	14.35	14.53	12.71	12.77	13.02	12.38	12.43	12.72
Commercial light trucks[1]	0.54	0.56	0.56	0.57	0.53	0.53	0.54	0.57	0.57	0.58
Bus transportation	0.25	0.27	0.27	0.27	0.29	0.29	0.29	0.32	0.32	0.32
Freight trucks	4.95	6.02	6.07	6.24	6.34	6.39	6.64	7.27	7.31	7.62
Rail, passenger	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06
Rail, freight	0.45	0.51	0.49	0.47	0.54	0.54	0.50	0.56	0.57	0.55
Shipping, domestic	0.21	0.24	0.25	0.29	0.23	0.23	0.30	0.23	0.23	0.30
Shipping, international	0.80	0.81	0.81	0.81	0.82	0.82	0.82	0.84	0.84	0.84
Recreational boats	0.24	0.26	0.26	0.26	0.27	0.28	0.28	0.29	0.29	0.30
Air	2.46	2.65	2.65	2.66	2.78	2.78	2.79	2.85	2.86	2.86
Military use	0.74	0.63	0.63	0.63	0.68	0.68	0.68	0.77	0.77	0.77
Lubricants	0.13	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13
Pipeline fuel	0.70	0.67	0.71	0.79	0.69	0.74	0.86	0.68	0.78	0.99
Total	**27.09**	**27.08**	**27.24**	**27.69**	**26.07**	**26.24**	**26.92**	**26.94**	**27.14**	**28.03**

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

Consumption and indicators	2011	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	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.09
E85[5]	0.05	0.08	0.08	0.08	0.16	0.16	0.17	0.15	0.17	0.16
Motor gasoline[6]	16.31	14.82	14.88	15.07	13.00	13.06	13.32	12.61	12.64	12.98
Jet fuel[7]	3.01	3.11	3.11	3.12	3.28	3.28	3.28	3.42	3.42	3.42
Distillate fuel oil[8]	5.91	7.25	7.28	7.44	7.64	7.61	7.86	8.12	7.90	8.22
Residual fuel oil	0.82	0.84	0.84	0.85	0.85	0.86	0.87	0.87	0.87	0.89
Other petroleum[9]	0.17	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16
Liquid fuels and other petroleum	26.32	26.31	26.42	26.79	25.16	25.20	25.74	25.41	25.24	25.92
Pipeline fuel natural gas	0.70	0.67	0.71	0.79	0.69	0.74	0.86	0.68	0.78	0.99
Compressed/liquefied natural gas	0.04	0.07	0.08	0.08	0.18	0.26	0.27	0.78	1.05	1.06
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	0.05	0.04	0.04	0.07	0.07	0.06
Delivered energy	**27.09**	**27.08**	**27.24**	**27.69**	**26.07**	**26.25**	**26.92**	**26.94**	**27.14**	**28.03**
Electricity related losses	0.05	0.06	0.06	0.06	0.09	0.09	0.08	0.13	0.13	0.12
Total	**27.13**	**27.15**	**27.30**	**27.74**	**26.16**	**26.33**	**27.01**	**27.07**	**27.27**	**28.15**

[1]Commercial trucks 8,501 to 10,000 pounds gross vehicle weight rating.
[2]Environmental Protection Agency rated miles per gallon.
[3]Tested new vehicle efficiency revised for on-road performance.
[4]Combined "on-the-road" estimate for all cars and light trucks.
[5]E85 refers to a blend of 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable). To address cold starting issues, the percentage of ethanol varies seasonally. The annual average ethanol content of 74 percent is used for this forecast.
[6]Includes ethanol (blends of 15 percent or less) and ethers blended into gasoline.
[7]Includes only kerosene type.
[8]Diesel fuel for on- and off- road use.
[9]Includes aviation gasoline and lubricants.
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.
Source: 2011 consumption based on: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). Other 2011 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 2010*, DOE/EIA-0214(2010) (Washington, DC, June 2012); U.S. Department of Transportation, Research and Special Programs Administration, *Air Carrier Statistics Monthly, December 2010-2009* (Washington, DC, December 2010); and United States Department of Defense, Defense Fuel Supply Center, Factbook (January, 2010). **Projections:** EIA, AEO2013 National Energy Modeling System runs LOWRESOURCE.D012813A, REF2013.D102312A, and HIGHRESOURCE.D021413A.

Table D10. Natural gas supply and disposition, oil import cases

(trillion cubic feet per year, unless otherwise noted)

Supply, disposition, and prices	2011	2030				2040			
		High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports	High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports
Henry Hub spot price									
(2011 dollars per million Btu)	3.98	7.12	5.40	3.26	3.34	10.69	7.83	4.32	4.36
(2011 dollars per thousand cubic feet)	4.07	7.28	5.52	3.33	3.41	10.93	8.00	4.42	4.45
Dry gas production[1]	**23.00**	**25.87**	**29.79**	**36.89**	**37.23**	**27.29**	**33.14**	**44.91**	**45.12**
Lower 48 onshore	20.54	21.95	26.26	33.30	33.65	22.69	29.12	40.74	41.03
Associated-dissolved[2]	1.54	1.24	1.43	3.05	3.02	0.93	1.09	2.70	2.67
Non-associated	19.00	20.71	24.83	30.25	30.62	21.76	28.03	38.04	38.36
Tight gas	5.86	5.79	6.67	8.86	8.96	5.97	7.34	10.72	10.78
Shale gas	7.85	10.45	14.17	17.56	17.84	11.32	16.70	23.93	24.18
Coalbed methane	1.71	2.16	1.69	1.51	1.52	2.59	2.11	1.53	1.53
Other	3.58	2.30	2.31	2.32	2.31	1.88	1.87	1.86	1.87
Lower 48 offshore	2.11	2.73	2.34	2.37	2.36	3.41	2.85	2.92	2.85
Associated-dissolved[2]	0.54	0.72	0.60	0.65	0.65	0.90	0.74	0.81	0.79
Non-associated	1.58	2.01	1.73	1.72	1.71	2.52	2.11	2.12	2.06
Alaska	0.35	1.19	1.19	1.22	1.22	1.18	1.18	1.25	1.24
Supplemental natural gas[3]	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Net imports	**1.95**	**-0.78**	**-2.10**	**-3.63**	**-3.60**	**-2.24**	**-3.55**	**-6.70**	**-6.68**
Pipeline[4]	1.67	0.08	-0.67	-1.57	-1.53	-1.10	-2.09	-2.84	-2.82
Liquefied natural gas	0.28	-0.86	-1.43	-2.06	-2.06	-1.14	-1.46	-3.86	-3.86
Total supply	**25.01**	**25.16**	**27.75**	**33.33**	**33.70**	**25.11**	**29.65**	**38.27**	**38.50**
Consumption by sector									
Residential	4.72	4.25	4.36	4.52	4.51	4.00	4.14	4.31	4.34
Commercial	3.16	3.25	3.42	3.71	3.69	3.37	3.60	3.97	3.97
Industrial[5]	6.77	7.66	7.79	8.04	7.94	7.74	7.90	8.14	8.16
Natural-gas-to-liquids heat and power[6]	0.00	0.09	0.21	0.36	0.36	0.11	0.33	1.01	0.93
Natural gas to liquids production[7]	0.00	0.10	0.22	0.39	0.39	0.12	0.35	1.10	1.01
Electric power[8]	7.60	7.11	8.89	12.89	12.83	6.02	9.50	14.78	14.78
Transportation[9]	0.04	0.36	0.26	0.27	0.70	1.29	1.04	1.04	1.26
Pipeline fuel	0.68	0.68	0.73	0.85	0.85	0.67	0.76	0.97	0.97
Lease and plant fuel[10]	1.39	1.48	1.70	2.12	2.18	1.66	1.93	2.79	2.83
Total	**24.37**	**24.98**	**27.57**	**33.14**	**33.46**	**25.00**	**29.54**	**38.11**	**38.26**
Discrepancy[11]	0.64	0.18	0.18	0.19	0.24	0.11	0.12	0.16	0.24
Lower 48 end of year dry reserves[1]	**298.96**	**321.40**	**350.65**	**435.34**	**435.38**	**329.61**	**359.97**	**450.88**	**450.65**

[1]Marketed production (wet) minus extraction losses.
[2]Gas which occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with crude oil (dissolved).
[3]Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.
[4]Includes any natural gas regasified in the Bahamas and transported via pipeline to Florida, as well as gas from Canada and Mexico.
[5]Includes energy for combined heat and power plants that have a non-regulatory status, and small on-site generating systems.
[6]Includes any natural gas used in the process of converting natural gas to liquid fuel that is not actually converted.
[7]Includes any natural gas converted into liquid fuel.
[8]Includes consumption of energy by electricity-only and combined heat and power plants that have a regulatory status.
[9]Natural gas used as a vehicle fuel.
[10]Represents natural gas used in well, field, and lease operations, in natural gas processing plant machinery, and for liquefaction in export facilities.
[11]Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2011 values include net storage injections.

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 supply values; lease, plant, and pipeline fuel consumption: U.S. Energy Information Administration (EIA), *Natural Gas Monthly*, DOE/EIA-0130(2012/07) (Washington, DC, July 2012). Other 2011 consumption based on: EIA, *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2011 natural gas price at Henry Hub based on daily spot prices published in Natural Gas Intelligence. **Projections:** EIA, AEO2013 National Energy Modeling System runs HIGHIMPORT.D012813A, REF2013.D102312A, HIGHRESOURCE.D021413A, and LOWIMPORT.D021113B.

Table D11. Liquid fuels supply and disposition, oil import cases

(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	2011	2030				2040			
		High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports	High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports
Crude oil prices (2011 dollars per barrel)									
Brent spot	111.26	135.83	130.47	117.09	111.04	170.69	162.68	143.97	133.95
West Texas Intermediate spot	94.86	133.75	128.47	115.30	109.33	168.59	160.68	142.20	132.30
Imported crude oil[1]	102.65	129.57	125.64	112.93	107.01	161.59	154.96	136.97	127.64
Crude oil supply									
Domestic production[2]	5.67	6.04	6.30	9.96	9.92	5.90	6.13	10.24	10.15
Alaska	0.57	0.44	0.38	0.69	0.69	0.38	0.41	0.89	0.91
Lower 48 States	5.10	5.60	5.92	9.27	9.23	5.51	5.72	9.35	9.25
Net imports	8.89	8.80	7.36	3.74	3.15	9.28	7.57	3.09	3.29
Gross imports	8.94	8.80	7.36	3.74	3.15	9.28	7.57	3.09	3.29
Exports	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other crude oil supply[3]	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total crude oil supply	**14.81**	**14.84**	**13.66**	**13.70**	**13.06**	**15.18**	**13.70**	**13.33**	**13.45**
Other petroleum supply	**3.02**	**3.74**	**3.82**	**4.30**	**2.99**	**3.36**	**3.29**	**3.96**	**1.11**
Natural gas plant liquids	2.22	2.47	2.90	4.69	4.70	2.43	2.92	5.02	5.00
Net product imports	-0.30	0.11	-0.08	-1.22	-2.41	-0.32	-0.67	-1.82	-4.64
Gross refined product imports[4]	1.15	1.71	1.53	1.36	1.38	1.69	1.42	1.30	1.33
Unfinished oil imports	0.69	0.51	0.51	0.51	0.51	0.45	0.45	0.45	0.45
Blending component imports	0.72	0.56	0.54	0.45	0.45	0.48	0.40	0.37	0.37
Exports	2.86	2.67	2.67	3.53	4.75	2.94	2.94	3.94	6.79
Refinery processing gain[5]	1.08	1.16	1.00	0.82	0.70	1.25	1.03	0.77	0.75
Product stock withdrawal	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other non-petroleum supply	**1.09**	**1.62**	**1.58**	**1.60**	**1.60**	**2.01**	**1.97**	**2.25**	**2.25**
Supply from renewable sources	0.90	1.23	1.14	1.16	1.17	1.57	1.43	1.38	1.44
Ethanol	0.84	1.09	0.99	1.02	1.03	1.13	0.97	0.99	1.01
Domestic production	0.91	1.01	0.95	0.98	0.97	1.01	0.89	0.93	0.95
Net imports	-0.07	0.08	0.04	0.04	0.06	0.12	0.08	0.06	0.06
Biodiesel	0.06	0.08	0.08	0.08	0.07	0.08	0.08	0.08	0.07
Domestic production	0.06	0.07	0.07	0.07	0.06	0.07	0.07	0.07	0.06
Net imports	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Other biomass-derived liquids[6]	0.00	0.06	0.06	0.06	0.07	0.36	0.38	0.32	0.36
Liquids from gas	0.00	0.05	0.13	0.22	0.22	0.07	0.20	0.62	0.57
Liquids from coal	0.00	0.04	0.04	0.00	0.00	0.06	0.06	0.04	0.04
Other[7]	0.18	0.30	0.28	0.22	0.21	0.31	0.28	0.20	0.21
Total primary supply[8]	**18.92**	**20.20**	**19.06**	**19.59**	**17.65**	**20.55**	**18.96**	**19.55**	**16.81**
Net import share of product supplied (percent)	45.0	44.6	38.5	13.1	4.6	44.3	36.9	6.9	-7.6
Net expenditures for imports of crude oil and petroleum products (billion 2011 dollars)	362.66	421.73	342.67	158.79	127.58	553.11	433.65	159.39	158.09
Lower 48 end of year reserves[2] (billion barrels)	**21.36**	**24.19**	**24.92**	**31.36**	**31.32**	**26.06**	**26.72**	**32.75**	**32.55**

Table D11. Liquid fuels supply and disposition, oil import cases (continued)

(million barrels per day, unless otherwise noted)

Supply, disposition, and prices	2011	2030				2040			
		High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports	High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports
Refined petroleum product prices to the transportation sector (2011 dollars per gallon)									
Propane	2.22	2.35	2.26	1.94	1.94	2.52	2.44	2.24	2.18
Ethanol (E85)[9]	2.42	2.95	2.57	2.35	2.44	3.81	2.92	2.74	2.72
Ethanol wholesale price	2.54	2.67	2.28	2.27	2.56	3.13	2.48	2.27	2.38
Motor gasoline[10]	3.45	3.85	3.67	3.39	3.32	4.64	4.32	3.93	3.68
Jet fuel[11]	3.04	3.68	3.51	3.16	3.04	4.50	4.19	3.71	3.53
Distillate fuel oil[12]	3.58	4.36	4.22	3.94	3.87	5.16	4.94	4.47	4.27
Residual fuel oil	2.67	2.83	2.75	2.46	2.35	3.55	3.36	2.98	2.80
Residual fuel oil (2011 dollars per barrel)	112.11	118.76	115.30	103.28	98.84	149.01	141.16	125.08	117.71

[1]Weighted average price delivered to U.S. refiners.
[2]Includes lease condensate.
[3]Strategic petroleum reserve stock additions plus unaccounted for crude oil and crude stock withdrawals minus crude product supplied.
[4]Includes other hydrocarbons and alcohol.
[5]The volumetric amount by which total output is greater than input due to the processing of crude oil into products which, in total, have a lower specific gravity than the crude oil processed.
[6]Includes pyrolysis oils, biomass-derived Fischer-Tropsch liquids, and renewable feedstocks used for the on-site production of diesel and gasoline.
[7]Includes domestic sources of other blending components, other hydrocarbons, and ethers.
[8]Total crude supply plus other petroleum supply plus other non-petroleum supply.
[9]E85 refers to a blend of 85 pecent 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.
[10]Sales weighted-average price for all grades. Includes Federal, State, and local taxes.
[11]Includes only kerosene-type.
[12]Diesel 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 2011 are model results and may differ slightly from official EIA data reports.
Sources: 2011 product supplied data and imported crude oil price based on: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). 2011 crude oil spot prices: Thomson Reuters. 2011 transportation sector prices based on: EIA, Form EIA-782A, "Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report". 2011 E85 prices derived from monthly prices in the Clean Cities Alternative Fuel Price Report. 2011 wholesale ethanol prices derived from Bloomberg U.S. average rack price. Other 2011 data: EIA, Petroleum Supply Annual 2011, DOE/EIA-0340(2011)/1 (Washington, DC, August 2012). **Projections:** EIA, AEO2013 National Energy Modeling System runs HIGHIMPORT.D012813A, REF2013.D102312A, HIGHRESOURCE.D021413A, and LOWIMPORT.D021113B.

Table D12. Key transportation results, oil import cases

Consumption and indicators	2011	2030				2040			
		High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports	High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports
Level of travel									
(billion vehicle miles traveled)									
Light-duty vehicles less than 8,501 pounds	2,629	3,257	3,323	3,372	2,753	3,607	3,719	3,775	2,761
Commercial light trucks[1]	65	93	94	96	90	109	110	112	103
Freight trucks greater than 10,000 pounds	240	369	371	385	385	437	438	454	455
(billion seat miles available)									
Air	982	1,177	1,177	1,177	1,177	1,274	1,274	1,274	1,274
(billion ton miles traveled)									
Rail	1,557	1,910	1,910	1,772	1,784	1,997	2,017	1,947	1,966
Domestic shipping	514	570	578	737	735	582	591	773	769
Energy efficiency indicators									
(miles per gallon)									
Tested new light-duty vehicle[2]	31.5	38.8	48.1	47.7	51.6	39.8	49.0	48.5	57.6
New car[2]	36.4	44.4	55.6	55.5	60.5	45.5	56.1	55.9	66.4
New light truck[2]	27.3	32.7	40.3	40.1	43.5	33.2	40.4	40.1	48.1
On-road new light-duty vehicle[3]	25.5	31.4	38.9	38.6	41.7	32.2	39.7	39.3	46.6
New car[3]	29.8	36.3	45.4	45.3	49.4	37.1	45.8	45.7	54.2
New light truck[3]	21.8	26.2	32.3	32.1	34.8	26.6	32.3	32.1	38.5
Light-duty stock[4]	20.6	27.5	31.3	31.2	31.7	29.8	36.1	35.8	39.1
New commercial light truck[1]	18.1	20.5	24.1	24.0	24.9	20.7	24.2	24.0	26.9
Stock commercial light truck[1]	14.9	19.8	22.2	22.1	22.4	20.6	24.1	23.9	25.7
Freight truck	6.7	7.5	8.0	8.0	8.4	7.6	8.2	8.1	8.7
(seat miles per gallon)									
Aircraft	62.3	66.0	67.0	67.0	68.1	69.3	71.5	71.5	74.6
(ton miles per thousand Btu)									
Rail	3.4	3.4	3.5	3.5	3.6	3.4	3.5	3.5	3.7
Domestic shipping	2.4	2.4	2.5	2.5	2.6	2.4	2.6	2.6	2.7
Energy use by mode (quadrillion Btu)									
Light-duty vehicles	15.56	14.29	12.77	13.02	10.41	14.64	12.43	12.72	8.47
Commercial light trucks[1]	0.54	0.59	0.53	0.54	0.50	0.66	0.57	0.58	0.50
Bus transportation	0.25	0.29	0.29	0.29	0.29	0.32	0.32	0.32	0.32
Freight trucks	4.95	6.79	6.39	6.64	6.28	7.80	7.31	7.62	7.19
Rail, passenger	0.05	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06
Rail, freight	0.45	0.55	0.54	0.50	0.51	0.58	0.57	0.55	0.55
Shipping, domestic	0.21	0.24	0.23	0.30	0.29	0.24	0.23	0.30	0.29
Shipping, international	0.80	0.83	0.82	0.82	0.82	0.84	0.84	0.84	0.83
Recreational boats	0.24	0.27	0.28	0.28	0.28	0.28	0.29	0.30	0.30
Air	2.46	2.82	2.78	2.79	2.75	2.94	2.86	2.86	2.75
Military use	0.74	0.68	0.68	0.68	0.68	0.77	0.77	0.77	0.77
Lubricants	0.13	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13
Pipeline fuel	0.70	0.69	0.74	0.86	0.87	0.69	0.78	0.99	0.99
Total	**27.09**	**28.23**	**26.24**	**26.92**	**23.88**	**29.95**	**27.14**	**28.03**	**23.16**

Table D12. Key transportation results, oil import cases (continued)

Consumption and indicators	2011	2030				2040			
		High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports	High Net Imports	Reference	High Oil and Gas Resource	Low/No Net Imports
Energy use by fuel (quadrillion Btu)									
Propane	0.06	0.08	0.07	0.08	0.07	0.10	0.08	0.09	0.07
E85[5]	0.05	0.15	0.16	0.17	0.43	0.20	0.17	0.16	0.65
Motor gasoline[6]	16.31	14.57	13.06	13.32	10.53	14.77	12.64	12.98	8.31
Jet fuel[7]	3.01	3.32	3.28	3.28	3.24	3.50	3.42	3.42	3.32
Distillate fuel oil[8]	5.91	8.00	7.61	7.86	6.89	8.26	7.90	8.22	7.34
Residual fuel oil	0.82	0.86	0.86	0.87	0.87	0.88	0.87	0.89	0.88
Other petroleum[9]	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Liquid fuels subtotal	26.32	27.13	25.20	25.74	22.20	27.87	25.24	25.92	20.73
Pipeline fuel natural gas	0.70	0.69	0.74	0.86	0.87	0.69	0.78	0.99	0.99
Compressed / liquefied natural gas	0.04	0.36	0.26	0.27	0.71	1.31	1.05	1.06	1.29
Liquid hydrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.02	0.04	0.04	0.04	0.09	0.07	0.07	0.06	0.15
Delivered energy	**27.09**	**28.23**	**26.25**	**26.92**	**23.88**	**29.95**	**27.14**	**28.03**	**23.16**
Electricity related losses	0.05	0.09	0.09	0.08	0.18	0.14	0.13	0.12	0.26
Total	**27.13**	**28.32**	**26.33**	**27.01**	**24.05**	**30.09**	**27.27**	**28.15**	**23.42**

[1]Commercial trucks 8,501 to 10,000 pounds gross vehicle weight rating.
[2]Environmental Protection Agency rated miles per gallon.
[3]Tested new vehicle efficiency revised for on-road performance.
[4]Combined "on-the-road" estimate for all cars and light trucks.
[5]E85 refers to a blend of 85 percent ethanol (renewable) and 15 percent motor gasoline (nonrenewable). To address cold starting issues, the percentage of ethanol varies seasonally. The annual average ethanol content of 74 percent is used for this forecast.
[6]Includes ethanol (blends of 15 percent or less) and ethers blended into gasoline.
[7]Includes only kerosene type.
[8]Diesel fuel for on- and off- road use.
[9]Includes aviation gasoline and lubricants.
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.
Source: 2011 consumption based on: U.S. Energy Information Administration (EIA), *Annual Energy Review 2011*, DOE/EIA-0384(2011) (Washington, DC, September 2012). Other 2011 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 2010*, DOE/EIA-0214(2010) (Washington, DC, June 2012); U.S. Department of Transportation, Research and Special Programs Administration, *Air Carrier Statistics Monthly, December 2010-2009* (Washington, DC, December 2010); and United States Department of Defense, Defense Fuel Supply Center, Factbook (January, 2010). **Projections:** EIA, AEO2013 National Energy Modeling System runs HIGHIMPORT.D012813A, REF2013.D102312A, HIGHRESOURCE.D021413A, and LOWIMPORT.D021113B.

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	2011	2020		2030		2040	
		Reference	No GHG Concern	Reference	No GHG Concern	Reference	No GHG Concern
Production[1]	1,096	1,071	1,080	1,153	1,149	1,167	1,211
Appalachia	337	288	290	295	298	283	284
Interior	171	198	198	212	213	226	248
West	588	585	592	646	638	658	679
Waste coal supplied[2]	13	19	19	20	20	27	29
Net imports[3]	-96	-125	-125	-139	-133	-123	-111
Total supply[4]	**1,012**	**966**	**974**	**1,034**	**1,036**	**1,071**	**1,128**
Consumption by sector							
Residential and commercial	3	3	3	3	3	3	3
Coke plants	21	23	23	20	20	18	18
Other industrial[5]	46	50	50	50	50	52	52
Coal-to-liquids heat and power	0	0	0	5	2	8	4
Coal-to-liquids liquids production	0	0	0	4	2	6	3
Electric power[6]	929	890	898	953	960	984	1,048
Total coal consumption	**999**	**966**	**974**	**1,034**	**1,036**	**1,071**	**1,128**
Average minemouth price[7]							
(2011 dollars per short ton)	41.16	49.26	49.13	55.64	55.83	61.28	61.15
(2011 dollars per million Btu)	2.04	2.45	2.45	2.79	2.79	3.08	3.09
Delivered prices[8]							
(2011 dollars per short ton)							
Coke plants	184.44	229.19	228.99	264.13	263.97	290.84	290.85
Other industrial[5]	70.68	72.44	72.48	78.25	78.24	85.63	86.67
Coal to liquids	- -	- -	- -	47.71	55.16	55.60	52.25
Electric power[6]							
(2011 dollars per short ton)	46.38	47.91	47.86	54.37	54.44	60.77	61.34
(2011 dollars per million Btu)	2.38	2.52	2.51	2.87	2.87	3.20	3.24
Average	**50.64**	**53.47**	**53.39**	**59.53**	**59.64**	**65.70**	**66.04**
Exports[9]	148.86	168.73	168.93	177.76	177.62	176.05	173.77
Cumulative electricity generating capacity additions (gigawatts)[10]							
Coal	0.0	6.4	6.4	7.2	8.4	8.8	25.7
Conventional	0.0	4.9	4.9	4.9	6.5	6.1	23.6
Advanced without sequestration	0.0	0.6	0.6	0.6	0.6	0.6	0.6
Advanced 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	0.8	0.4	1.3	0.7
Petroleum	0.0	0.3	0.3	0.3	0.3	0.3	0.3
Natural gas	0.0	38.1	37.4	120.2	117.1	215.2	209.4
Nuclear / uranium	0.0	5.5	5.5	5.5	5.5	11.0	6.1
Renewables[12]	0.0	37.1	37.4	48.8	47.8	104.3	84.8
Other	0.0	0.2	0.2	0.2	0.2	0.2	0.2
Total	**0.0**	**87.6**	**87.2**	**182.2**	**179.2**	**339.9**	**326.4**
Liquids from coal (million barrels per day)	0.00	0.00	0.00	0.04	0.02	0.06	0.03

[1]Includes anthracite, bituminous coal, subbituminous coal, and lignite.
[2]Includes waste coal consumed by the electric power and industrial sectors. Waste coal supplied is counted as a supply-side item to balance the same amount of waste coal included in the consumption data.
[3]Excludes imports to Puerto Rico and the U.S. Virgin Islands.
[4]Production plus waste coal supplied plus net imports.
[5]Includes consumption for combined heat and power plants that have a non-regulatory status, and small on-site generating systems. Excludes all coal use in the coal-to-liquids process.
[6]Includes all electricity-only and combined heat and power plants that have a regulatory status.
[7]Includes reported prices for both open market and captive mines.
[8]Prices weighted by consumption tonnage; weighted average excludes residential and commercial prices, and export free-alongside-ship prices.
[9]Free-alongside-ship price at U.S. port of exit.
[10]Cumulative additions after December 31, 2011. Includes all additions of electricity only and combined heat and power plants projected for the electric power, industrial, and commercial sectors.
[11]Includes 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.
[12]Includes 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.

- - = Not applicable.
Btu = British thermal unit.
GHG = Greenhouse gas.
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 data based on: U.S. Energy Information Administration (EIA), *Annual Coal Report 2011*, DOE/EIA-0584(2011) (Washington, DC, November 2012); EIA, *Quarterly Coal Report, October-December 2011*, DOE/EIA-0121(2011/4Q) (Washington, DC, March 2012); and EIA, AEO2013 National Energy Modeling System run REF2013.D102312A. **Projections:** EIA, AEO2013 National Energy Modeling System runs REF2013.D102312A and NOGHGCONCERN.D110912A.

Table D14. Key results for coal cost cases

(million short tons per year, unless otherwise noted)

Supply, disposition, prices, electricity generating capacity additions, and costs	2011	2020			2040			Annual growth 2011-2040 (percent)		
		Low Coal Cost	Reference	High Coal Cost	Low Coal Cost	Reference	High Coal Cost	Low Coal Cost	Reference	High Coal Cost
Production[1]	1,096	1,129	1,071	985	1,363	1,167	838	0.8%	0.2%	-0.9%
Appalachia	337	300	288	276	345	283	243	0.1%	-0.6%	-1.1%
Interior	171	210	198	185	253	226	191	1.4%	1.0%	0.4%
West	588	619	585	525	764	658	404	0.9%	0.4%	-1.3%
Waste coal supplied[2]	13	16	19	20	13	27	47	0.1%	2.7%	4.6%
Net imports[3]	-96	-129	-125	-123	-206	-123	-78	2.7%	0.9%	-0.7%
Total supply[4]	**1,012**	**1,016**	**966**	**882**	**1,170**	**1,071**	**806**	**0.5%**	**0.2%**	**-0.8%**
Consumption by sector										
Residential and commercial	3	3	3	3	3	3	2	-0.2%	-0.3%	-0.4%
Coke plants	21	23	23	23	18	18	17	-0.6%	-0.7%	-0.8%
Other industrial[5]	46	50	50	50	52	52	51	0.4%	0.4%	0.3%
Coal-to-liquids heat and power	0	5	0	0	13	8	0	- -	- -	- -
Coal-to-liquids liquids production	0	4	0	0	10	6	0	- -	- -	- -
Electric power[6]	929	932	890	807	1,075	984	735	0.5%	0.2%	-0.8%
Total coal use	**999**	**1,016**	**966**	**882**	**1,170**	**1,071**	**807**	**0.5%**	**0.2%**	**-0.7%**
Average minemouth price[7]										
(2011 dollars per short ton)	41.16	40.89	49.26	61.11	33.90	61.28	128.09	-0.7%	1.4%	4.0%
(2011 dollars per million Btu)	2.04	2.04	2.45	3.02	1.70	3.08	6.20	-0.6%	1.4%	3.9%
Delivered prices[8] (2011 dollars per short ton)										
Coke plants	184.44	198.35	229.19	264.37	178.75	290.84	475.91	-0.1%	1.6%	3.3%
Other industrial[5]	70.68	63.21	72.44	83.01	53.10	85.63	145.06	-1.0%	0.7%	2.5%
Coal to liquids	- -	29.33	- -	- -	27.23	55.60	107.69	- -	- -	- -
Electric power[6]										
(2011 dollars per short ton)	46.38	41.46	47.91	56.00	35.63	60.77	110.99	-0.9%	0.9%	3.1%
(2011 dollars per million Btu)	2.38	2.17	2.52	2.93	1.88	3.20	5.68	-0.8%	1.0%	3.0%
Average	**50.64**	**46.00**	**53.47**	**62.86**	**38.45**	**65.70**	**120.95**	**-0.9%**	**0.9%**	**3.0%**
Exports[9]	148.86	147.66	168.73	194.63	117.53	176.05	317.96	-0.8%	0.6%	2.7%
Cumulative electricity generating capacity additions (gigawatts)[10]										
Coal	0.0	7.1	6.4	6.4	16.2	8.8	6.5	- -	- -	- -
Conventional	0.0	4.9	4.9	4.9	12.9	6.1	4.9	- -	- -	- -
Advanced without sequestration	0.0	0.6	0.6	0.6	0.6	0.6	0.6	- -	- -	- -
Advanced with sequestration	0.0	0.9	0.9	0.9	0.9	0.9	0.9	- -	- -	- -
End-use generators[11]	0.0	0.7	0.0	0.0	1.8	1.3	0.1	- -	- -	- -
Petroleum	0.0	0.3	0.3	0.3	0.3	0.3	0.3	- -	- -	- -
Natural gas	0.0	37.0	38.1	37.3	210.7	215.2	221.8	- -	- -	- -
Nuclear / uranium	0.0	5.5	5.5	5.5	8.6	11.0	8.7	- -	- -	- -
Renewables[12]	0.0	38.4	37.1	38.2	111.4	104.3	90.3	- -	- -	- -
Other	0.0	0.2	0.2	0.2	0.2	0.2	0.2	- -	- -	- -
Total	**0.0**	**88.5**	**87.6**	**87.9**	**347.3**	**339.9**	**327.7**	- -	- -	- -
Liquids from coal (million barrels per day)	0.00	0.03	0.00	0.00	0.09	0.06	0.00	- -	- -	- -

Table D14. Key results for coal cost cases (continued)

(million short tons per year, unless otherwise noted)

Supply, disposition, and prices	2011	2020			2040			Annual growth 2011-2040 (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, 2011=1.000)										
Transportation rate multipliers										
Eastern railroads	1.000	0.950	1.028	1.070	0.750	1.003	1.240	-1.0%	0.0%	0.7%
Western railroads	1.000	0.920	0.989	1.060	0.760	1.013	1.270	-0.9%	0.0%	0.8%
Mine equipment costs										
Underground	1.000	0.923	1.000	1.083	0.755	1.000	1.321	-1.0%	0.0%	1.0%
Surface	1.000	0.923	1.000	1.083	0.755	1.000	1.321	-1.0%	0.0%	1.0%
Other mine supply costs										
East of the Mississippi: all mines	1.000	0.923	1.000	1.083	0.755	1.000	1.321	-1.0%	0.0%	1.0%
West of the Mississippi: underground	1.000	0.923	1.000	1.083	0.755	1.000	1.321	-1.0%	0.0%	1.0%
West of the Mississippi: surface	1.000	0.923	1.000	1.083	0.755	1.000	1.321	-1.0%	0.0%	1.0%
Coal mining labor productivity (short tons per miner per hour)	5.19	5.45	4.43	3.49	6.68	3.47	1.44	0.9%	-1.4%	-4.3%
Average coal miner wage (2011 dollars per year)	81,258	87,721	95,199	102,572	80,105	105,676	138,365	0.0%	0.9%	1.9%

[1]Includes anthracite, bituminous coal, subbituminous coal, and lignite.
[2]Includes waste coal consumed by the electric power and industrial sectors. Waste coal supplied is counted as a supply-side item to balance the same amount of waste coal included in the consumption data.
[3]Excludes imports to Puerto Rico and the U.S. Virgin Islands.
[4]Production plus waste coal supplied plus net imports.
[5]Includes consumption for combined heat and power plants that have a non-regulatory status, and small on-site generating systems. Excludes all coal use in the coal to liquids process.
[6]Includes all electricity-only and combined heat and power plants that have a regulatory status.
[7]Includes reported prices for both open market and captive mines.
[8]Prices weighted by consumption tonnage; weighted average excludes residential and commercial prices, and export free-alongside-ship prices.
[9]Free-alongside-ship price at U.S. port of exit.
[10]Cumulative additions after December 31, 2011. Includes all additions of electricity only and combined heat and power plants projected for the electric power, industrial, and commercial sectors.
[11]Includes 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.
[12]Includes 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.
- - = Not applicable.
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 data based on: U.S. Energy Information Administration (EIA), *Annual Coal Report 2011*, DOE/EIA-0584(2011) (Washington, DC, November 2012); EIA, *Quarterly Coal Report, October-December 2011*, DOE/EIA-0121(2011/4Q) (Washington, DC, March 2012); U.S. Department of Labor, Bureau of Labor Statistics, Average Hourly Earnings of Production Workers: Coal Mining, Series ID : ceu1021210008; and EIA, AEO2013 National Energy Modeling System run REF2013.D102312A. **Projections:** EIA, AEO2013 National Energy Modeling System runs LCCST13.D112112A, REF2013.D102312A, and HCCST13.D112112A.