Report #: DOE/EIA-0554(2010)
Release date: April 9, 2010
Next release date: March 2011

Assumptions to the Annual Energy Outlook 2010

Table 13.1. Overnight Capital Cost Characteristics for Renewable Energy Generating Technologies in Three Cases (2008$/kW)

Technology	Year	Reference	High Cost Renewable[1]	Low Cost Renewable
Geothermal[2]	2009	1,749	1,749	1,749
	2015	5,474	5,809	4,790
	2025	4,312	4,981	3,571
	2035	3,422	5,762	2,955
Hydroelectric[2]	2009	2,291	2,291	2,291
	2015	2,556	2,556	2,238
	2025	2,157	2,157	1,826
	2035	1,777	1,776	902
Photovoltaic[3]	2009	6,171	6,171	5,468
	2015	6,248	6,755	5,259
	2025	4,603	5,944	3,572
	2035	3,288	5,061	2,467
Solar Thermal Electric[3]	2009	5,132	5,132	4,414
	2015	4,814	5,618	4,047
	2025	3,617	4,943	2,804
	2035	2,555	4,209	1,918
Biomass[4]	2009	3,995	3,791	3,559
	2015	5,583	5,805	4,718
	2025	3,160	3,442	2,464
	2035	2,386	2,804	1,790
Offshore Wind	2009	3,937	3,841	3,505
	2015	4,118	4,204	3,490
	2025	3,374	3,699	2,641
	2035	2,662	3,150	1,997
Onshore Wind[4]	2009	1,966	1,966	1,759
	2015	2,546	2,582	2,170
	2025	2,225	2,272	1,753
	2035	1,884	1,935	1,414

[1]Overnight capital cost (that is, excluding interest charges), plus contingency, learning, and technological optimism factors, excluding regional multipliers. A contingency allowance is defined by the American Association of Cost Engineers as the specific provision for unforeseeable elements of costs within a defined project scope. This is particularly important where previous experience has shown that unforeseeable events which will increase costs are likely to occur.

[2]Geothermal and Hydroelectric costs are specific for each site. The table entries represent the least cost unit available in the specified year in the Northwest Power Pool region. In the 2006 Renewables cases, costs vary as different sites continue to be developed.

[3]Biomass plants share significant components with similar coal-fired plants, these components continue to decline in cost in the Low Renewables case, although biomass-specific components (especially fuel handling components) do not see cost declines beyond 2010.

[4]Wind costs are region specific. The table represents costs in the Northwest Power Pool region.

Source: AEO2010 National Energy Modeling System runs AEO2010R.D110908A, HIRENCST10.D011410A, and LORENCST10.D011510A.

Table 13.2. Capacity Factors[1] for Renewable Energy Generating Technologies in Three Cases

	Calendar Year	AEO2010R.d111809A	HIRENCST10.D011410A	LORENCST10.D011510A
Geothermal[2]	2009	0.90	0.90	0.90
	2015	0.90	0.90	0.90
	2025	0.90	0.90	0.90
	2035	0.90	0.85	0.90
Hydrolectric[2]	2009	0.65	0.65	0.65
	2015	0.57	0.57	0.57
	2025	0.48	0.48	0.58
	2035	0.48	0.48	0.29
Photovoltaic	2009	0.21	0.21	0.21
	2015	0.21	0.21	0.21
	2025	0.21	0.21	0.21
	2035	0.21	0.21	0.21
Solar Thermal Electric	2009	0.31	0.31	0.31
	2015	0.31	0.31	0.31
	2025	0.31	0.31	0.31
	2035	0.31	0.31	0.31
Biomass	2009	0.83	0.83	0.83
	2015	0.83	0.83	0.83
	2025	0.83	0.83	0.83
	2035	0.83	0.83	0.83
Offshore Wind[3]	2009	0.43	0.43	0.43
	2015	0.43	0.43	0.43
	2025	0.45	0.43	0.45
	2035	0.45	0.43	0.45
Onshore Wind[3]	2009	0.44	0.44	0.44
	2015	0.46	0.44	0.40
	2025	0.46	0.44	0.40
	2035	0.40	0.44	0.40

[1]Capacity factor for units available to be built in specified year. Capacity factor represents maximum expected annual power output as a fraction of theoretical output if plant were operated at rated capacity for a full year.

[2]Hydroelectric capacity factors are specific for each site. The table entries represent the least-cost unit available in the specified year in the Northwest Power Pool region.

[3]Wind capacity factors are based on regional resource availability and generation characteristics. The table entries represent the highest quality resource available in the specified year.

Source: AEO2010 National Energy Modeling System runs AEO2010R.D110908A, HIRENCST10.D011410A, and LORENCST10.D011510A.

Table 13.3. 2020 Maximum U.S. Biomass Resources, by Coal Demand Region and Type

(Trillion Btu)

Coal Demand Region	States	Agricultural Sector	Forestry Residue	Urban Wood Waste/Mill Residue	Total[1]
1	CT, MA, ME, NH, RI, VT	165	158	15	339
2	NY, PA, NJ	277	167	59	503
3	WV, MD, DC, DE, VA, NC, SC	436	426	56	918
4	GA, FL	239	265	47	551
5	OH	348	37	16	402
6	IN, IL, MI, WI	1209	190	47	1,446
7	KY, TN	497	152	30	679
8	AL, MS	357	326	19	702
9	MN, IA, ND, SD, NE, MO, KS	2294	155	28	2,477
10	TX, LA, OK, AR	728	378	57	1,163
11	MT, WY, ID	197	100	25	322
12	CO, UT, NV	209	70	7	285
13	AZ, NM	168	45	7	220
14	AK, HI, WA, OR, CA	226	429	83	738

[1]May include rounding error.

Sources: Urban Wood Wastes: Antares Group Inc., *Biomass Residue Supply Curves for the U.S (updated),* prepared for the National Renewable Energy Laboratory, June 1999; Agricultural residues, energy crops, and forestry residues from the University of Tennessee Department of Agricultural Economics POLYSIS model, May 2008.

Table 13.4. Aggregate Regional RPS Requirements

Region[1]	2015	2025	2035
ECAR	3.0%	5.7%	5.7%
ERCOT	5.0%	5.0%	5.0%
MAAC	10.1%	15.4%	15.4%
MAIN	6.7%	15.3%	15.3%
MAPP	8.5%	11.1%	11.1%
NY	18.3%	18.3%	18.3%
NE	9.6%	13.8%	13.8%
FL	0.0%	0.0%	0.0%
STV	0.9%	1.9%	1.9%
SPP	1.9%	3.8%	3.8%
NWP	7.3%	13.7%	13.7%
RA	4.2%	6.9%	6.9%
CNV	18.7%	20.0%	20.0%

[1] See chapter on the electricity Market Module for a map of the electricity regions