

DRAFT

(Final version will be included in the Electricity Market Module Assumptions Document)

Table 8.2 Cost and Performance Characteristics of New Central Station Electricity Generating Technologies

AEO2013 Early Release

Technology	Online Year ¹	Size (MW)	Lead time (years)	Base Overnight	Project	Technological	Total Overnight	Variable	Fixed	Heatrate ⁶	nth-of-a-kind
				Cost in 2012 (2011 \$/kW)	Contingency Factor ²	Optimism Factor ³	Cost in 2012 ⁴ (2011 \$/kW)	O&M ⁵ (2011 \$/MWh)	O&M (2011\$/kW)	in 2012 (Btu/kWh)	Heatrate (Btu/kWh)
Scrubbed Coal New ⁷	2016	1300	4	2,694	1.07	1.00	2,883	4.39	30.64	8,800	8,740
Integrated Coal-Gasification Comb Cycle (IGCC) ⁷	2016	1200	4	3,475	1.07	1.00	3,718	7.09	50.49	8,700	7,450
Pulverized Coal with carbon sequestration	2017	650	4	4,662	1.07	1.03	5,138	4.37	65.31	12,000	9,316
Conv Gas/Oil Comb Cycle	2015	620	3	858	1.05	1.00	901	3.54	12.94	7,050	6,800
Adv Gas/Oil Comb Cycle (CC)	2015	400	3	931	1.08	1.00	1,006	3.21	15.10	6,430	6,333
Adv CC with carbon sequestration	2017	340	3	1,833	1.08	1.04	2,059	6.66	31.23	7,525	7,493
Conv Comb Turbine ⁸	2014	85	2	910	1.05	1.00	956	15.18	7.21	10,850	10,450
Adv Comb Turbine	2014	210	2	632	1.05	1.00	664	10.19	6.92	9,750	8,550
Fuel Cells	2015	10	3	6,045	1.05	1.10	6,982	0.00	357.47	9,500	6,960
Adv Nuclear	2018	2236	6	4,700	1.10	1.05	5,429	2.10	91.65	10,452	10,452
Distributed Generation - Base	2015	2	3	1,395	1.05	1.00	1,465	7.62	17.14	9,038	8,900
Distributed Generation - Peak	2015	1	2	1,675	1.05	1.00	1,759	7.62	17.14	10,042	9,880
Biomass	2016	50	4	3,685	1.07	1.02	4,041	5.17	103.79	13,500	13,500
Geothermal ^{7,9}	2013	50	4	2,444	1.05	1.00	2,567	0.00	110.94	9,756	9,756
MSW - Landfill Gas	2013	50	3	7,858	1.07	1.00	8,408	8.51	381.74	13,648	13,648
Conventional Hydropower ⁹	2016	500	4	2,179	1.10	1.00	2,397	2.60	14.57	9,756	9,756
Wind	2013	100	3	2,032	1.07	1.00	2,175	0.00	38.86	9,756	9,756
Wind Offshore	2016	400	4	4,452	1.10	1.25	6,121	0.00	72.71	9,756	9,756
Solar Thermal ⁷	2015	100	3	4,653	1.07	1.00	4,979	0.00	66.09	9,756	9,756
Photovoltaic ^{7,10}	2014	150	2	3,624	1.05	1.00	3,805	0.00	21.37	9,756	9,756

¹Online year represents the first year that a new unit could be completed, given an order date of 2012. For wind, geothermal and landfill gas, the online year was moved earlier to acknowledge the significant market activity already occurring in anticipation of the expiration of the Production Tax Credit.

²A 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; particularly important where previous experience has shown that unforeseeable events which will increase costs are likely to occur”

³The technological optimism factor is applied to the first four units of a new, unproven design, it reflects the demonstrated tendency to underestimate actual costs for a first-of-a-kind unit.

⁴Overnight capital cost including contingency factors, excluding regional multipliers and learning effects. Interest charges are also excluded. These represent costs of new projects initiated in 2012.

⁵O&M = Operations and maintenance.

⁶For hydro, wind, solar and geothermal technologies, the heatrate shown represents the average heatrate for conventional thermal generation as of 2011. This is used for purposes of calculating primary energy consumption displaced for these resources, and does not imply an estimate of their actual energy conversion efficiency.

⁷Capital costs are shown before investment tax credits are applied.

⁸Combustion turbine units can be built by the model prior to 2014 if necessary to meet a given region's reserve margin.

⁹Because geothermal and hydro cost and performance characteristics are specific for each site, the table entries represent the cost of the least expensive plant that could be built in the Northwest Power Pool region, where most of the proposed sites are located.

¹⁰Costs and capacities are expressed in terms of net AC power available to the grid for the installed capacity.

Sources: For the AEO2013, EIA updated cost estimates for utility-scale electric generating plants, based on a draft report provided by external consultants. This report will be provided on the EIA website when finalized. Site specific costs for geothermal were provided by the National Energy Renewable Laboratory, "Updated U.S. Geothermal Supply Curve", February 2010.