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Assumptions to the Annual Energy Outlook 2010

Table 8.1. Generating Capacity Types Represented in the Electricity Market Module

Capacity Type
Existing coal steam plants[1]
High Sulfur Pulverized Coal with Wet Flue Gas Desulfurization
Advanced Coal - Integrated Coal Gasification Combined Cycle
Advanced Coal with carbon sequestration
Oil/Gas Steam - Oil/Gas Steam Turbine
Combined Cycle - Conventional Gas/Oil Combined Cycle Combustion Turbine
Advanced Combined Cycle - Advanced Gas/Oil Combined Cycle Combustion Turbine
Advanced Combined Cycle with carbon sequestration
Combustion Turbine - Conventional Combustion Turbine
Advanced Combustion Turbine - Steam Injected Gas Turbine
Molten Carbonate Fuel Cell
Conventional Nuclear
Advanced Nuclear - Advanced Light Water Reactor
Generic Distributed Generation - Baseload
Generic Distributed Generation - Peak
Conventional Hydropower - Hydraulic Turbine
Pumped Storage - Hydraulic Turbine Reversible
Geothermal
Municipal Solid Waste
Biomass - Integrated Gasification Combined-Cycle
Solar Thermal - Central Receiver
Solar Photovoltaic - Single Axis Flat Plate
Wind
Wind Offshore

[1]The EMM represents 32 different types of existing coal steam plants, based on the different possible configuration of No_x, particulate and SO_2 emission control devices, as well as future options for controlling mercury.

Source: Energy Information Administration, Office of Integrated Analysis and Forecasting.

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

Technology	Online Year[1]	Size (mW)	Leadtime (Years)	Base Overnight Cost In 2009 ($2008/kW)	Contingency Factors: Project Contingency Factor[2]	Contingency Factors: Technological Optimism Factor[3]	Total Overnight Cost In 2009[4] (2008 $/kW)	Variable O&M[5] ($2008 mills/kWh)	Fixed O&M[5] ($2008/kW)	Heatrate[6] in 2009 (Btu/kWhr)	Heatrate nth-of-a-kind (Btu/kWr)
Scrubbed Coal New[7]	2013	600	4	2,078	1.07	1.00	2,223	4.69	28.15	9,200	8,740
Integrated Coal-Gasification Combined Cycle (IGCC)[7]	2013	550	4	2,401	1.07	1.00	2,569	2.99	39.53	8,765	7,450
IGCC withCarbon Sequestration	2016	380	4	3,427	1.07	1.03	3,776	4.54	47.15	10,781	8,307
Conv Gas/Oil Comb Cycle	2012	250	3	937	1.05	1.00	984	2.11	12.76	7,196	6,800
Adv Gas/Oil Comb Cycle (CC)	2012	400	3	897	1.08	1.00	968	2.04	11.96	6,752	6,333
ADVCC with Carbon Sequestion	2016	400	3	1,720	1.08	1.04	1,932	3.01	20.35	8,613	7,493
Conv Combustion Turbine[8]	2011	160	2	653	1.05	1.00	685	3.65	12.38	10,788	10,450
Adv Combustion Turbine	2011	230	2	617	1.05	1.00	648	3.24	10.77	9,289	8,550
Fuel Cells	2012	10	3	4,744	1.05	1.10	5,478	49.00	5.78	7,930	6,960
Advanced Nuclear	2016	1350	6	3,308	1.10	1.05	3,820	0.51	92.04	10,488	10,488
Distributed Generation -Base	2012	2	3	1,334	1.05	1.00	1,400	7.28	16.39	9,050	8,900
Distributed Generation -Peak	2011	1	2	1,601	1.05	1.00	1,681	7.28	16.39	10,069	9,880
Biomass	2013	80	4	3,414	1.07	1.05	3,849	6.86	65.89	9,451	7,765
Geothermal [7,9]	2010	50	4	1,666	1.05	1.00	1,749	0.00	168.33	32,969	30,326
MSW - Landfill Gas	2010	30	3	2,430	1.07	1.00	2,599	0.01	116.80	13,648	13,648
Conventional Hydropower[9]	2013	500	4	2,084	1.10	1.00	2,291	2.49	13.93	9,884	9,884
Wind	2009	50	3	1,837	1.07	1.00	1,966	0.00	30.98	9,884	9,884
Wind Offshore	2013	100	4	3,492	1.10	1.02	3,937	0.00	86.92	9,884	9,884
Solar Thermal[7]	2012	100	3	4,798	1.07	1.00	5,132	0.00	58.05	9,884	9,884
Photovoltaic[7]	2011	5	2	5,879	1.05	1.00	6,171	0.00	11.94	9,884	9,884

[1]Online year represents the first year that a new unit could be completed, given an order date of 2009. For wind, geothermal and landfill gas, the online year was moved earlier to acknowledge the significant market activity already occuring in anticipation of the expiration of the Production Tax Credit.

[2]A contingency allowance is defined by the American Association of Cost Engineers as the "specific provision for unforeseeable elements if costs within a defined project scope: particularly important where previous experience has shown that unforeseeable events which will increase costs are likely to occur."

[3]The 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.

[4]Overnight capital cost including contingency factors, excluding regional multipliers and learning effects. Interest charges are also excluded. These represent costs of new projects initiated in 2009.

[5]O&M = Operations and maintenance.

[6]For hydro, wind, and solar technologies, the heatrate shown represents the average heatrate for conventional thermal generation as of 2008. 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.

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

[8]Combustion turbine units can be built by the model prior to 2011 if necessary to meet a given region's reserve margin.

[9]Because 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.

Sources: The values shown in this table are developed by the Energy Information Administration, Office of Integrated Analysis and Forecasting, from analysis of reports and discussions with various sources from industry, government, and the Department of Energy Fuel Offices and National Laboratories. They are not based on any specific technology model, but rather, are meant to represent the cost and performance of typical plants under normal operating conditions for each plant type. Key sources reviewed are listed in the 'Notes and Sources' section at the end of the chapter.