## Table 40. Cost and Performance Characteristics of New Electricity Generation Technologies [from the Energy Information Administration (EIA)]

| Technology | Online Years[1] | Size (MW) | Leadtimes (Years) | Overnight Costs[2] in 2002 ($2001/kW) | Contingency Factors: Project Contingency Factor | Contingency Factors: Technological Optimism Factor[3] | Total Overnight Costs including Contingencies in 2002[4] ($2001/kW) | Total MAIN Area Overnight Costs including Contingencies in 2002[9] ($2002/kW) | Variable O&M[5] ($2001/MWh) | Fixed O&M[5] ($2002/kW) | Heatrate in 2002 (Btu/kWh) | Heatrate nth-of-a-kind (Btu/kWh) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scrubbed Coal New | 2006 | 600 | 4 | 1,079 | 1.07 | 1.00 | 1,154 | 1,193 | 3.07 | 25.26 | 9,000 | 8,600 |
| Integrated Coal-Gasification Combined Cycle | 2006 | 550 | 4 | 1,277 | 1.07 | 1.00 | 1,367 | 1,414 | 2.04 | 34.73 | 8,000 | 7,200 |
| Conventional Gas/Oil Combined Cycle | 2005 | 250 | 3 | 510 | 1.05 | 1.00 | 536 | 554 | 2.04 | 12.63 | 7,500 | 7,000 |
| Advanced Gas/Oil Combined Cycle | 2005 | 400 | 3 | 563 | 1.08 | 1.00 | 608 | 629 | 2.04 | 10.53 | 7,000 | 6,350 |
| Conventional Combustion Turbine[6] | 2004 | 160 | 2 | 389 | 1.05 | 1.00 | 409 | 423 | 4.09 | 10.53 | 10,939 | 10,450 |
| Advanced Combustion Turbine | 2004 | 230 | 2 | 439 | 1.05 | 1.00 | 460 | 476 | 3.07 | 8.42 | 9,394 | 8,550 |
| Fuel Cells | 2005 | 10 | 3 | 1,850 | 1.05 | 1.10 | 2,137 | 2,210 | 20.43 | 7.36 | 7,500 | 6,750 |
| Advanced Nuclear | 2007 | 1000 | 5 | 1,750 | 1.10 | 1.10 | 2,117 | 2,189 | 0.43 | 60.23 | 10,400 | 10,400 |
| Distributed Generation - Base | 2005 | 2 | 3 | 766 | 1.05 | 1.00 | 804 | 831 | 6.13 | 14.20 | 9,400 | 8,900 |
| Distributed Generation - Peak | 2004 | 1 | 2 | 919 | 1.05 | 1.00 | 965 | 998 | 6.13 | 14.20 | 10,400 | 9,880 |
| Biomass | 2006 | 100 | 4 | 1,569 | 1.07 | 1.05 | 1,763 | 1,823 | 2.96 | 47.32 | 8,911 | 8,911 |
| MSW - Landfill Gas | 2005 | 30 | 3 | 1,365 | 1.07 | 1.00 | 1,460 | 1,510 | 0.01 | 101.37 | 13,648 | 13,648 |
| Geothermal[7,8] | 2006 | 50 | 4 | 1,681 | 1.05 | 1.00 | 1,766 | 1,826 | 0.00 | 73.90 | 32,320 | 31,797 |
| Wind | 2005 | 50 | 3 | 938 | 1.07 | 1.00 | 1,003 | 1,037 | 0.00 | 26.88 | 10,280 | 10,280 |
| Solar Thermal[8] | 2005 | 100 | 3 | 2,204 | 1.07 | 1.10 | 2,594 | 2,683 | 0.00 | 50.38 | 10,280 | 10,280 |
| Solar Photovoltaic[8] | 2004 | 5 | 2 | 3,389 | 1.05 | 1.10 | 3,915 | 4,049 | 0.00 | 10.36 | 10,280 | 10,280 |

[1] Online year represents the first year that a new unit could be completed, given an order date of 2002.

[2] Costs reflect market status and penetration as of 2002.

[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 2002.

[5] O&M = Operation and maintenance. The economic analysis is in 2002 dollars and so the Fixed O&M costs were converted from 2001 to 2002 dollars. The MISO's LMP analysis is in 2001 dollars and thus for easy reference, the Variable O&M costs in this table were left in 2001 dollars.

[6] Combustion turbine units can be built by the model prior to 2004 if necessary to meet a given region's reserve margin.

[7] Because geothermal 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.

[8] Capital costs for geothermal and solar technologies are net of (reduced by) the ten percent investment tax credit.

[9] MAIN region overnight capital cost including contingency factors and the regional multiplier for MAIN from the table below. This column was added to the table for ease of reference and is not part of the EIA table.

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.

### Regional Multipliers for Construction of Fossil-Fueled, Nuclear, and Renewable[1] Generating Technologies

| EMM Region | NE, NY | MAAC | STV | MAPP, ECAR, MAIN | SPP |
|---|---|---|---|---|---|
| | 1.043 | 0.996 | 0.96 | 1.004 | 0.997 |
| **EMM Region** | **RA** | **NWP** | **FL** | **CNV** | **ERCOT** |
| | 1.003 | 1.026 | 0.961 | 1.058 | 0.986 |

[1] Regional multipliers are not applied to geothermal technologies because costs are site specific.

Source: Argonne National Laboratory, Cost and Performance Database for Electric Power Generating Technologies..

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Ken Detmer from the PSC recommended that this table be used for the Arrowhead-Weston analysis. http://www.eia.doe.gov/oiaf/aeo/assumption/pdf/0554(2003).pdf