

Table 12.3 – Coal-Displacement Calculation

Conversion Formula: Step 1 Capacity (A) x Capacity Factor (B) x Annual Hours (C) = Annual Electricity Generation (D)
 Step 2 Annual Electricity Generation (D) x Conversion Efficiency (E) = Total Output (F)
 Step 3 Total Output (F) / Fuel Heat Rate (G) = Quantity Fuel (H)

Technology	<u>Wind</u>	<u>Geothermal</u>	<u>Biomass</u>	<u>Hydropower</u>	<u>PV</u>	<u>Solar Thermal</u>
(A) Capacity (kW)	11,558,205	2,232,495	6,594,096	78,312,583	280,355	388,893
(B) Capacity Factor (%)	36.0%	90.0%	80.0%	44.2%	22.5%	24.4%
(C) Annual Hours	8,760	8,760	8,760	8,760	8,760	8,760
(D) Annual Electricity Generation (kWh)	36,449,954,187	17,600,991,128	46,211,427,727	303,176,455,525	552,579,314	831,235,472
(E) Competing Heat Rate (Btu/kWh)	10,107	10,107	10,107	10,107	10,107	10,107
(F) Total Output (Million Btu)	368,399,686	177,893,217	467,058,900	3,064,204,435	5,584,919	8,401,296
(G) Coal Heat Rate (Btu per short ton)	20,411,000	20,411,000	20,411,000	20,411,000	20,411,000	20,411,000
(H) Coal (short tons)	18,049,076	8,715,556	22,882,705	150,125,150	273,623	411,606

Sources: Capacity: EIA, *Annual Energy Outlook 2006*, DOE/EIA-0383 (2006) (Washington, D.C., February 2006), Table A16, 2006.

Capacity factors: Hydropower calculated from EIA, *Annual Energy Outlook 2005*, DOE/EIA-0383 (2005) (Washington, D.C., February 2005), Table A16. All others based on DOE, *Renewable Energy Technology Characterizations*, EPRI TR-109496, 1997 and Program data.

Conversion Efficiency: EIA, *Annual Energy Review 2004*, DOE/EIA-0384(2003) (Washington, D.C., August 2005), Table A6.

Heat Rate: *Annual Energy Outlook 2006*, DOE/EIA-0383 (2006) (Washington, D.C., February 2006), Table H1.

Notes:

For illustrative purposes only, displacement of fossil generation depends on power system generation portfolio and dispatch order.

Capacity values exclude combined-heat-and-power (CHP) data, but include end-use sector (industrial and commercial) non-CHP data.