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Renewable Energy Trends in Consumption and Electricity 2008

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Preface

The U.S. Energy Information Administration (EIA) reports detailed historical data on renewable energy consumption and electricity annually in its report, the *Renewable Energy Annual*. This report, *Renewable Energy Trends in Consumption and Electricity, 2008*, provides an overview and tables with historical data spanning as far back as 1989 through 2008, including revisions. These tables correspond to similar tables to be presented in chapter 1 of the *Renewable Energy Annual 2008* and are numbered accordingly.

The renewable energy resources in the report include: biomass (wood and derived fuels, municipal solid waste (MSW) biogenic, landfill gas, ethanol, biodiesel and other biomass); geothermal; wind; solar (solar thermal and photovoltaic); and conventional hydropower. Hydroelectric pumped storage is excluded, because it is usually based on non-renewable energy sources.

Definitions for terms used in this report can be found in EIA's Energy Glossary: <http://www.eia.gov/glossary/index.html>. General information about all the EIA surveys with data related to renewable energy and referenced in this report can be found here: <http://www.eia.gov/oss/forms.html>.

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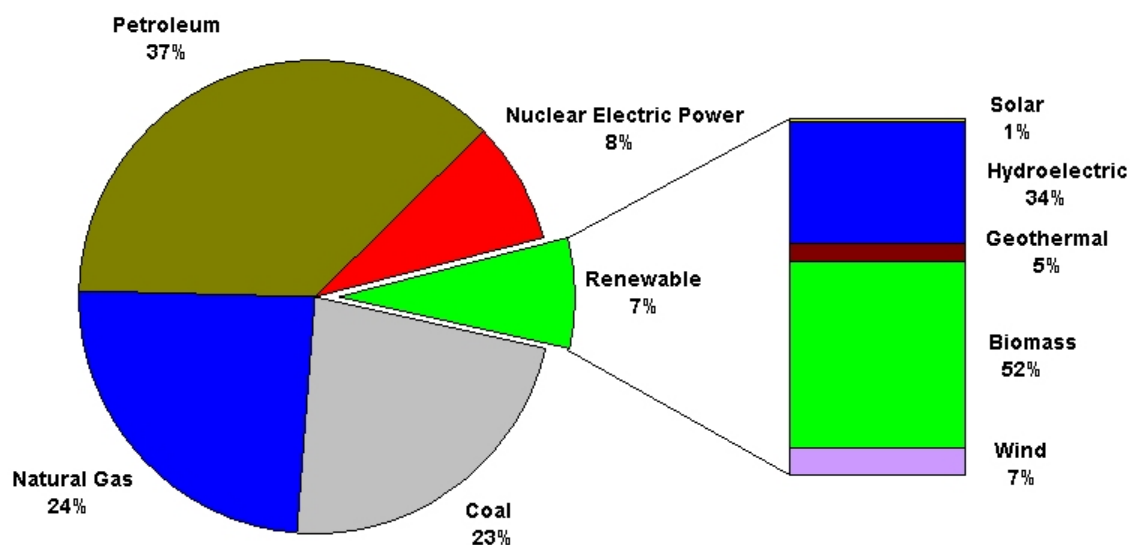
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Renewable Energy Trends in Consumption and Electricity 2008

Consumption

Between 2007 and 2008, renewable energy consumption grew 10 percent to 7.367 quadrillion Btu which was the highest level since the U.S. Energy Information Administration (EIA) began keeping records, while total U.S. energy consumption declined by 2 percent (Table 1.1). Total energy consumption declined primarily due to the economic recession. As a result, renewable energy's share of the U.S. market increased to well over 7 percent (Figure 1.1).

Figure 1.1 Renewable Energy Consumption in the Nation's Energy Supply, 2008
Total = 99.438 Quadrillion Btu **Total = 7.367 Quadrillion Btu**



Source: U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

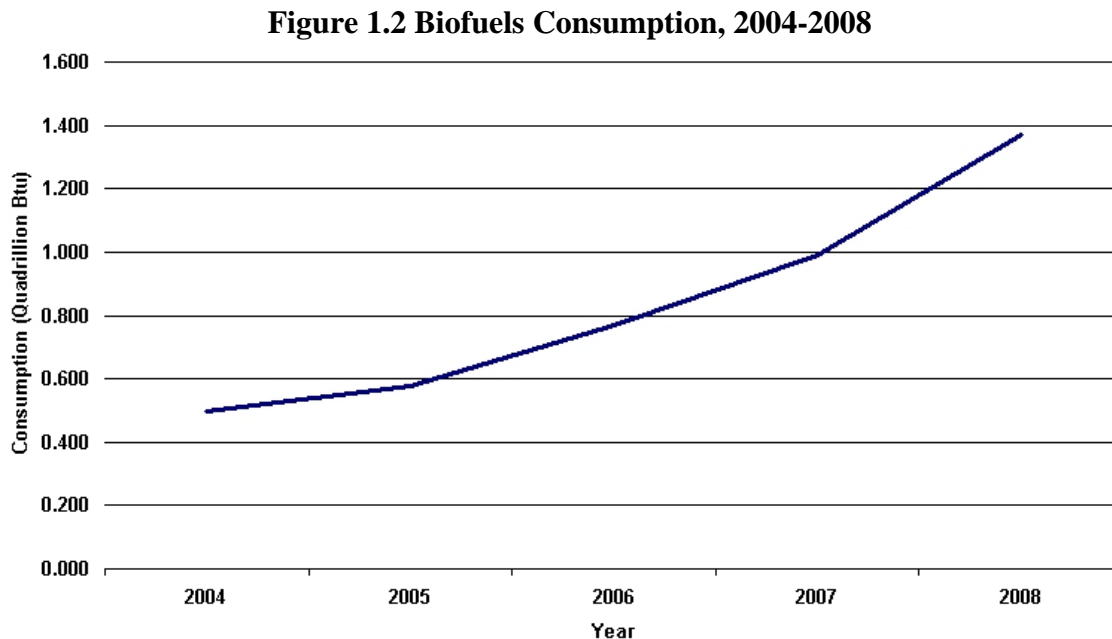
Table 1.2 shows the distribution of renewable energy consumption across five sectors. Between 2004 and 2008 renewable energy consumption was in a period of expansion and the relative importance of the sectors changed. While the transportation sector increased dramatically from 5 to 11 percent of the market due to expanded use of biofuels between 2004 and 2008, the electric power sector market share declined from 56 to 52 percent and the industrial sector's share fell from 30 to 28 percent.

Renewable energy consumption for production of electricity increased by 8 percent to 3.986 quadrillion Btu between 2007 and 2008 (Table 1.3). This gain was bolstered mainly by a 60 percent increase in wind energy consumption and modest gains in conventional hydroelectric power. The electric power sector, which includes electric utilities and independent power producers, accounted for 94 percent of renewable energy used for electricity generation. Biomass energy in the industrial sector accounted for most of the balance in consumption.

Renewable energy for nonelectric use includes energy for space heating and cooling, hot water, process heat, production of biofuels and as fuel for motor vehicles. Renewable nonelectric consumption has grown both in absolute and relative terms. Between 2004 and 2008 the increase was .857 quadrillion Btu, and nonelectric use represented 46 percent of total renewable energy consumption in 2008, up from 40 percent in 2004 (Table 1.2 and Table 1.4). This is attributed to significant gains in biofuels and biofuel feedstock consumption. Losses due to the recent recession were light for other forms of biomass such as industrial wood and derived fuels.

Over the twenty year period from 1989 to 2008, while conventional hydroelectric power consumption ranged between 2.2 and 3.6 quadrillion Btu depending on water availability, other renewable energy sources experienced considerable growth (Tables 1.5a and 1.5b). For example, in this time period biofuels consumption grew from .125 to 1.372 quadrillion Btu and wind from a mere .022 quadrillion Btu to .546 quadrillion Btu. Independent power producers in the electric power sector increased their renewable energy consumption over three and a half times.

Biofuels include ethanol (primarily made from corn) and biodiesel (primarily made from soybean oil) that are used mainly for transportation. Ethanol consumption minus denaturant increased by 231 trillion Btu to 800 trillion Btu between 2007 and 2008, while biodiesel consumption declined by 6 trillion Btu due mainly to increased exports (Table 1.6). Both fuels are needed to meet the Federal Renewable Fuel Standard, which requires an increasing supply of renewable fuels through 2022. Overall biofuels consumption increased 873 trillion Btu from 2004 to 2008 (Table 1.2 and Figure 1.2)



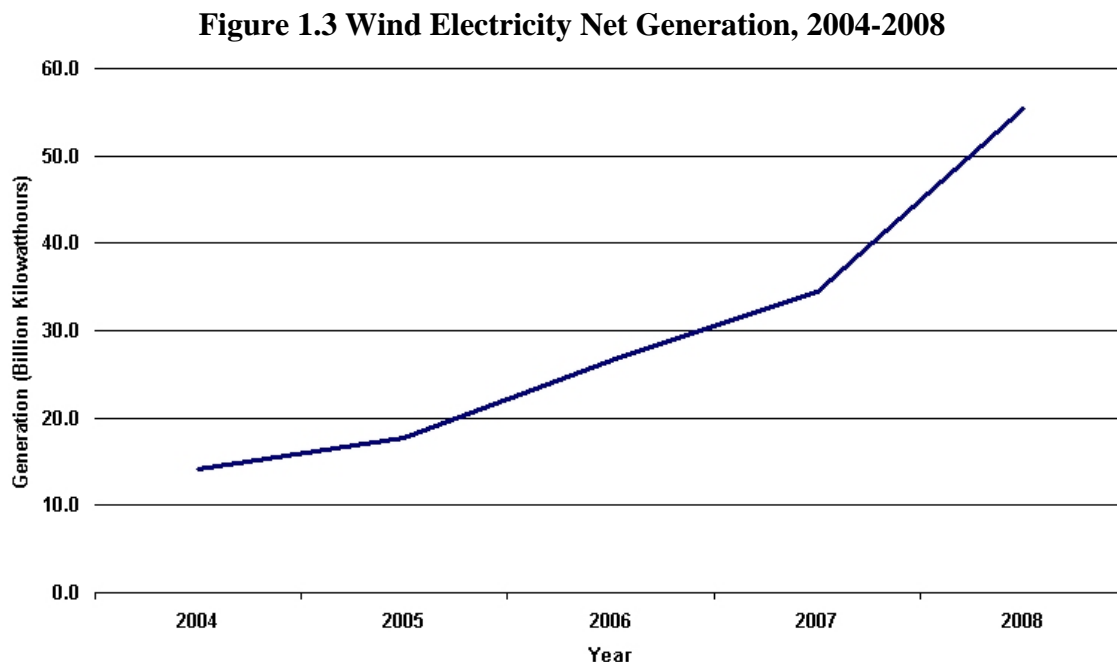
Source: U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

The electric power sector used 59 percent of waste energy consumed in 2008 (Table 1.7). Landfill gas and municipal solid waste biogenic were the leading sources of waste energy, followed by other biomass. The lumber and the paper and allied products industries consumed 66 percent of industrial sector biomass energy (Table 1.8). Biomass energy for useful thermal output accounted for 91 percent of industrial biomass consumption. The number of power plants with capacity to cofire biomass and coal increased from 57 to 61 between 2007 and 2008 in states across the nation (Table 1.9). Total capacity to cofire biomass and coal increased by 306 MW net from 3,456 to 3,772 MW between the two years.

Electricity

Total renewable net electricity generation increased by 8 percent between 2007 and 2008 (Table 1.11). Wind generation increased at the fastest rate, 61 percent for the year, and accounted for nearly three-fourths of the increase. (Figure 1.3). Wind provided 15 percent of renewable generation in 2008, up from just 4 percent in 2004, and it overtook biomass as the second most important energy source for renewable electricity generation after conventional hydropower.

Conventional hydroelectric made a modest gain in 2008. The electric power sector, which is dominated by conventional hydroelectric power, provided 92 percent of renewable generation, while the industrial sector provided nearly 8 percent. The commercial sector's contribution was negligible.



Source: U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

Total U.S.net summer capacity increased by 15,283 MW to 1,010,171 MW between 2007 and 2008 (Table 1.12). For the second consecutive year, wind was the most prevalent type of capacity added to the nation's generating fleet. Wind capacity grew by 8,136 MW to a total of 24,651 MW, while natural gas added 4,556 MW.¹ Drivers behind the expansion of wind and other renewable capacity included:

- Renewable portfolio standards (RPS) and state mandates;
- Federal production tax credits;²
- Concerns over global climate change believed to be caused by carbon dioxide emissions from fossil plants;³
- Reduced emissions of sulfur dioxide and nitrogen oxides for electricity by displacing fossil fuel combustion.

Among divisions, the Pacific Contiguous Census Division, which includes California, Oregon, and Washington, had the largest concentration of renewable electricity generation (Table 1.13). The percentage of electricity provided by conventional hydroelectric power in some states was very high – 58 percent in Oregon and 70 percent for Washington in 2008.⁴

Almost half of biomass electricity generation was in the industrial sector in 2008 (Table 1.11). Black liquor produced by the paper industry provided 31 percent of the total biomass generation and wood/wood waste liquids and solids provided 36 percent (Table 1.14). Biomass generation in the southern Census Divisions accounted for 48 percent of the total (Table 1.14).

Renewable electric generation spanned across all 50 states in 2007 and 2008 (Table 1.17 and Table 1.20). The leading States (in order of importance) for conventional hydroelectric power were: Washington, Oregon, New York, California, Montana and Idaho in 2008. While conventional hydroelectric generation was down in key States such as California and Washington, in some States such as Alabama, Arkansas and New York conventional hydroelectric generation was up. Nonhydroelectric renewable generation continued to expand outside California in a number of states, especially in Texas, which had the largest gain among the States between 2007 and 2008 (mainly for wind power).

In 2008, the four largest states for renewable capacity were Washington, California, Oregon and Texas. Among the various renewable energy sources the biggest increases for 2008 were for wind capacity in Texas (2,937 MW), Iowa (1,465 MW), and Kansas

¹ See U.S. Energy Information Administration, *Electric Power Annual 2008*, (Washington, D.C. January 2010) Table 1.1 here: http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html .

² During much of 2008 there was uncertainty over the extension of the federal production tax credit which was set to expire at the end of the year hence the rush to complete projects before year's end. In October the Emergency Economic Stabilization Act of 2008 extended the credit one year to the end of 2009.

³ See Intergovernmental Panel on Climate Change website for related reports here: <http://www.ipcc.ch/> .

⁴ Conventional hydroelectric power was just 12 percent in California. See U.S. Energy Information Administration, State Electricity Profiles website here: http://www.eia.doe.gov/cneaf/electricity/st_profiles/e_profiles_sum.html .

(449 MW) (Table 1.23 and Table 1.26). By the end of the year there were seven states with at least 1,000 MW of wind. There were other increases as well such as: solar/PV in California (12 MW) and Nevada (10 WM), and geothermal in Idaho (10 MW) and Nevada (26 MW).

In 2008, renewable energy's share of total U.S. generation was 9.3 percent, up from 8.5 percent in 2007 (Table 1.27). Due to the presence of hydropower, some states such as Idaho, Oregon and Washington have high percentages of renewable generation. The U.S. share of nonhydro renewable generation increased from 2.5 to 3.1 percent between 2007 and 2008. Maine had the largest share of nonhydro renewable generation in 2008 at 23.7 percent because of its wide use of biomass. States where wind expanded rapidly also experienced significant increases in their shares of nonhydro renewable generation.

By the end of 2009, there were 36 states and the District of Columbia with renewable portfolio standards (RPS) or state mandates in place (Table 1.28). Two states were new on the list in 2009. Kansas enacted legislation in May 2009 to establish its standard. The Kansas RPS requires 20 percent of each utility's peak capacity demand based on the average demand of the previous three years be met by eligible renewable energy sources by 2020. Small cooperative utilities in general are excluded.

In June 2009, West Virginia enacted an Alternative and Renewable Energy Portfolio Standard. Since West Virginia's standard does not require a minimum contribution from renewable energy, it is feasible (though not necessary) that the standard could be met using no renewable resources, but just alternate sources such as advanced forms of coal and natural gas, waste coal, synthetic gases, tire derived fuel and hydroelectric pumped storage, etc. Thus, it functions more as a non-binding renewable goal.

Data Revisions

Every four years the EIA conducts its detailed Manufacturing Energy Consumption Survey (MECS). Data on biomass from the MECS 2006 was available for this report. Incorporating this information resulted in a decrease in industrial sector biomass consumption of about 60 trillion Btu (Table 1.2).⁵

The presentation of biofuels was expanded for this report. In the case of ethanol the petroleum denaturant (added to make it undrinkable) is now accounted for distinctly.⁶ In Table 1.6 ethanol feedstocks minus losses and coproducts plus denaturants equal ethanol production. Consumption minus denaturant is the renewable portion of ethanol consumption and is used in renewable energy consumption estimates in this report.⁷ In addition data was revised back to 1989 to reflect updated estimates of ethanol heat content and fuel ethanol feedstock factors.

⁵ See also U.S. Energy Information Administration, *Renewable Energy Annual 2007* (Washington, DC April 2009) table 1.2.

⁶ Ethanol to be used for fuel is typically denatured prior to transport from the ethanol production facility, by adding 2-5 volume percent denaturant (usually pentanes plus or conventional motor gasoline).

⁷ See tables 1.1, 1.2, 1.4, 1.5a, 1.5b, and 1.8.

New data was also added to Table 1.6 for biodiesel. United States Department of Agriculture data on net imports of biodiesel was added and consumption is now the sum of production and net imports. Information on stock changes and the balancing item will be included for the first time with 2009 data reporting (not included here).

Table 1.9, which reports information on the capacity to cofire coal and biomass, was corrected due to computer programming error. The updated table shows net summer capacity of plants in operation with the capacity to cofire coal and biomass. Previously the table displayed nameplate capacity for all cofiring plants including some that were retired or otherwise out of service. The net impact of making these two corrections was to lower the estimate of capacity to cofire coal and biomass by 1,614 MW for 2007.

Table 1.1 U.S. Energy Consumption by Energy Source, 2004 - 2008

(Quadrillion Btu)

Energy Source	2004	2005	2006	2007	2008
Total	100.334	100.468	99.790	101.502	99.438
Fossil Fuels	85.828	85.815	84.687	86.223	83.532
Coal	22.466	22.797	22.447	22.749	22.398
Coal Coke Net Imports	0.137	0.045	0.061	0.025	0.040
Natural Gas ¹	22.931	22.583	22.224	23.679	23.814
Petroleum ²	40.292	40.391	39.955	39.769	37.279
Electricity Net Imports	0.039	0.084	0.063	0.106	0.113
Nuclear Electric Power	8.222	8.161	8.215	8.455	8.427
Renewable Energy	6.247	6.407	6.825	6.719	7.367
Biomass ³	3.010	3.117	3.277	3.503	3.852
Biofuels	0.500	0.577	0.771	0.991	1.372
Waste	0.389	0.403	0.397	0.413	0.436
Wood and Derived Fuels	2.121	2.136	2.109	2.098	2.044
Geothermal Energy	0.341	0.343	0.343	0.349	0.360
Hydroelectric Conventional	2.690	2.703	2.869	2.446	2.512
Solar Thermal/PV Energy	0.065	0.066	0.072	0.081	0.097
Wind Energy	0.142	0.178	0.264	0.341	0.546

¹Includes supplemental gaseous fuels.

²Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.

³Biomass includes: biofuels, waste (landfill gas, MSW biogenic, and other biomass), wood and wood derived fuels.

PV = Photovoltaic.

Notes: Data revisions are discussed in the Highlights section.

Totals may not equal sum of components due to independent rounding.

Sources: Non-renewable energy: U.S. Energy Information Administration (EIA), Monthly Energy Review (MER)

March 2010, DOE/EIA-0035 (2010/03) (Washington, DC, March 2010), Tables 1.3, 1.4a and 1.4b; Renewable

Energy: Table 1.2 of this report.

Table 1.2 Renewable Energy Consumption by Energy Use Sector and Energy Source, 2004 - 2008

(Quadrillion Btu)

Sector and Source	2004	2005	2006	2007	2008
Total	6.247	6.407	6.825	6.719	7.367
Biomass	3.010	3.117	3.277	3.503	3.852
Biofuels	0.500	0.577	0.771	0.991	1.372
Biodiesel ¹	0.003	0.012	0.033	0.046	0.040
Ethanol ²	0.293	0.335	0.453	0.569	0.800
Losses and Coproducts	0.203	0.230	0.285	0.377	0.532
Biodiesel Feedstock ³	*	*	*	0.001	0.001
Ethanol Feedstock ⁴	0.203	0.230	0.285	0.376	0.531
Waste	0.389	0.403	0.397	0.413	0.436
Landfill Gas	0.144	0.148	0.157	0.173	0.187
MSW Biogenic ⁵	0.164	0.168	0.171	0.165	0.169
Other Biomass ⁶	0.081	0.088	0.069	0.075	0.079
Wood and Derived Fuels ⁷	2.121	2.136	2.109	2.098	2.044
Geothermal	0.341	0.343	0.343	0.349	0.360
Hydroelectric Conventional	2.690	2.703	2.869	2.446	2.512
Solar Thermal/PV	0.065	0.066	0.072	0.081	0.097
Wind	0.142	0.178	0.264	0.341	0.546
Residential	0.483	0.507	0.475	0.527	0.565
Biomass	0.410	0.430	0.390	0.430	0.450
Wood and Derived Fuels ⁸	0.410	0.430	0.390	0.430	0.450
Geothermal	0.014	0.016	0.018	0.022	0.026
Solar Thermal/PV ⁹	0.059	0.061	0.067	0.075	0.088
Commercial	0.118	0.119	0.117	0.118	0.125
Biomass	0.105	0.105	0.102	0.102	0.109
Biofuels	0.001	0.001	0.001	0.002	0.002
Ethanol ²	0.001	0.001	0.001	0.002	0.002
Waste	0.034	0.034	0.036	0.031	0.034
Landfill Gas	0.002	0.003	0.004	0.003	0.003
MSW Biogenic ⁵	0.025	0.025	0.026	0.021	0.026
Other Biomass ⁶	0.007	0.007	0.007	0.007	0.005
Wood and Derived Fuels ⁷	0.070	0.070	0.065	0.069	0.073
Geothermal	0.012	0.014	0.014	0.014	0.015
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	-	-	*
Industrial	1.853	1.873	1.930	1.964	2.053
Biomass	1.817	1.837	1.897	1.944	2.031
Biofuels	0.209	0.237	0.295	0.387	0.544
Ethanol ²	0.006	0.007	0.010	0.010	0.012
Losses and Coproducts	0.203	0.230	0.285	0.377	0.532
Biodiesel Feedstock ³	*	*	*	0.001	0.001
Ethanol Feedstock ⁴	0.203	0.230	0.285	0.376	0.531
Waste	0.132	0.148	0.130	0.144	0.144
Landfill Gas	0.076	0.081	0.081	0.093	0.093
MSW Biogenic ⁵	0.006	0.007	0.006	0.006	0.003
Other Biomass ⁶	0.050	0.061	0.043	0.046	0.048
Wood and Derived Fuels ⁷	1.476	1.452	1.472	1.413	1.344
Geothermal	0.004	0.004	0.004	0.005	0.005
Hydroelectric Conventional	0.033	0.032	0.029	0.016	0.017
Solar Thermal/PV	-	-	-	-	-
Wind	-	-	-	-	-
Transportation	0.290	0.339	0.475	0.603	0.827
Biomass	0.290	0.339	0.475	0.603	0.827
Biofuels	0.290	0.339	0.475	0.603	0.827
Biodiesel ¹	0.003	0.012	0.033	0.046	0.040
Ethanol ²	0.286	0.328	0.442	0.557	0.786
Electric Power ¹⁰	3.503	3.568	3.827	3.508	3.798
Biomass	0.388	0.406	0.412	0.423	0.435
Waste	0.223	0.221	0.231	0.237	0.258
Landfill Gas	0.066	0.065	0.073	0.077	0.092
MSW Biogenic ⁵	0.133	0.136	0.139	0.138	0.141
Other Biomass ⁶	0.023	0.020	0.019	0.022	0.026
Wood and Derived Fuels ⁷	0.165	0.185	0.182	0.186	0.177
Geothermal	0.311	0.309	0.306	0.308	0.314
Hydroelectric Conventional	2.656	2.670	2.839	2.430	2.495
Solar Thermal/PV	0.006	0.006	0.005	0.006	0.009
Wind	0.142	0.178	0.264	0.341	0.546

¹Biodiesel primarily derived from soybean oil.

Table 1.2 Renewable Energy Consumption by Energy Use Sector and Energy Source, 2004 - 2008
(Quadrillion Btu) (Continued)

Sector and Source	2004	2005	2006	2007	2008
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²Ethanol primarily derived from corn minus denaturant.

³Losses and coproducts from the production of biodiesel. Does not include natural gas, electricity, and other nonbiomass energy used in the production of biodiesel.

⁴Losses and coproducts from the production of ethanol. Does not include natural gas, electricity, and other non-biomass energy used in the production of ethanol.

⁵Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

⁶Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

⁷Black liquor, and wood/wood waste solids and liquids.

⁸Wood and wood pellet fuels.

⁹Includes small amounts of distributed solar thermal and photovoltaic energy used in the commercial, industrial and electric power sectors.

¹⁰The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public. MSW = Municipal Solid Waste.

PV = Photovoltaic.

* = Less than 500 billion Btu.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Data revisions are discussed in the Highlights section.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

Energy consumption for the noncombustible renewable energy sources (hydroelectric conventional, solar thermal, PV and wind) used in electricity generation is determined by multiplying generation times the fossil fuel equivalent heat rate.

Energy consumption for geothermal energy used in electricity generation is determined by multiplying generation times the geothermal heat rate. See EIA, Annual Energy Review (AER) 2008, DOE/EIA-0384 (2008) (Washington, DC, June 2009), Table A6.

Sources: Analysis conducted by U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels and specific sources described as follows. Residential: U.S. Energy Information Administration, Form EIA-457A/G, "Residential Energy Consumption Survey;" Oregon Institute of Technology, Geo-Heat Center; and U.S. Energy Information Administration, Form EIA-63-A, "Annual Solar Thermal Collector Manufacturers Survey" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Commercial: U.S. Energy Information Administration, Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center. Industrial: U.S. Energy Information Administration, Form EIA-846 (A, B, C) "Manufacturing Energy Consumption Survey;" Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center; Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook;

U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and losses and coproducts from the production of biodiesel calculated as the difference between energy in feedstocks and production and from the production of ethanol calculated as the difference between energy in feedstocks and production less denaturants. Biofuels for Transportation: Biodiesel: Consumption: 2001-2008 Calculated as biodiesel production plus net imports; Production: 2001-2005: U.S. Department of Agriculture (USDA), Commodity Credit Corporation, Bioenergy Program, 2006: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for soybean oil in methyl esters (biodiesel), 2007: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for fats and oils in methyl esters, and 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey;" Trade: USDA imports data for Harmonized Tariff Schedule code 3824.90.40.20 (Fatty Esters Animal/ Vegetable Mixture) and exports data for Schedule B code 3824.90.40.00 (Fatty Substances Animal/ Vegetable Mixture, and Ethanol: 2001-2004: EIA, Petroleum Supply Annual, Tables 2 and 16. Calculated as ten percent of oxygenated finished motor gasoline field production (Table 2) plus fuel ethanol refinery input (Table 16). 2005-2008: EIA Petroleum Supply Annual (Various Issues), Tables 1 and 15. Calculated as motor gasoline blending components adjustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery and blender net inputs (Table 15). Small amounts of ethanol consumption are distributed to the commercial and industrial sectors according to those sector's shares of U.S. motor gasoline supplied. Electric Power: U.S. Energy Information Administration, Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report."

Table 1.3 Renewable Energy Consumption for Electricity Generation by Energy Use Sector and Energy Source, 2004 - 2008
(Quadrillion Btu)

Sector and Source	2004	2005	2006	2007	2008
Total	3.723	3.781	4.035	3.699	3.986
Biomass	0.574	0.585	0.591	0.598	0.606
Waste	0.230	0.230	0.241	0.245	0.267
Landfill Gas	0.069	0.068	0.076	0.080	0.094
MSW Biogenic ¹	0.142	0.144	0.147	0.146	0.148
Other Biomass ²	0.019	0.018	0.018	0.019	0.024
Wood and Derived Fuels ³	0.344	0.355	0.350	0.353	0.339
Geothermal	0.311	0.309	0.306	0.308	0.314
Hydroelectric Conventional	2.690	2.703	2.869	2.446	2.512
Solar Thermal/PV	0.006	0.006	0.005	0.006	0.009
Wind	0.142	0.178	0.264	0.341	0.546
Commercial	0.021	0.021	0.022	0.020	0.021
Biomass	0.019	0.020	0.021	0.020	0.021
Waste	0.019	0.020	0.021	0.019	0.020
Landfill Gas	0.002	0.002	0.003	0.002	0.003
MSW Biogenic ¹	0.013	0.013	0.013	0.013	0.014
Other Biomass ²	0.004	0.005	0.004	0.004	0.004
Wood and Derived Fuels	*	*	*	*	*
Geothermal	-	-	-	-	-
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	-	-	*
Wind	-	-	-	-	-
Industrial	0.231	0.226	0.219	0.208	0.200
Biomass	0.199	0.194	0.190	0.193	0.184
Waste	0.005	0.005	0.003	0.004	0.005
Landfill Gas	0.001	0.001	*	*	*
MSW Biogenic ¹	*	*	*	0.001	-
Other Biomass ²	0.004	0.003	0.003	0.003	0.004
Wood and Derived Fuels ³	0.194	0.189	0.187	0.188	0.179
Geothermal	-	-	-	-	-
Hydroelectric Conventional	0.033	0.032	0.029	0.016	0.017
Solar Thermal/PV	-	-	-	-	-
Wind	-	-	-	-	-
Electric Power ⁴	3.471	3.534	3.794	3.470	3.764
Biomass	0.356	0.371	0.379	0.386	0.401
Waste	0.206	0.205	0.216	0.221	0.242
Landfill Gas	0.066	0.064	0.072	0.077	0.091
MSW Biogenic ¹	0.129	0.131	0.134	0.132	0.135
Other Biomass ²	0.011	0.010	0.010	0.012	0.016
Wood and Derived Fuels ³	0.150	0.166	0.163	0.165	0.159
Geothermal	0.311	0.309	0.306	0.308	0.314
Hydroelectric Conventional	2.656	2.670	2.839	2.430	2.495
Solar Thermal/PV	0.006	0.006	0.005	0.006	0.009
Wind	0.142	0.178	0.264	0.341	0.546

¹Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

⁴The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

* = Less than 500 billion Btu.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. Starting with 2004 EIA adopted a new method of allocating fuel consumption between electric power generation and useful thermal out put (UTO) for combined heat and power (CHP) plants. The new method proportionately distributes a CHP plant's losses between the two output products (electric power and UTO) assuming the same efficiency for production of electricity as UTO. Energy consumption for the noncombustible renewable energy sources (hydroelectric conventional, solar thermal, PV and wind) used in electricity generation is determined by multiplying generation times the fossil fuel equivalent heat rate. Energy consumption for geothermal energy used in electricity generation is determined by multiplying generation times the geothermal heat rate. See EIA, Annual Energy Review (AER) 2008, DOE/EIA-0384 (2008) (Washington, DC, June 2009), Table A6.

Data revisions are discussed in the Highlights section.

Sources: Analysis conducted by U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels and the following specific sources:

U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."

Table 1.4 Renewable Energy Consumption for Nonelectric Use by Energy Use Sector and Energy Source, 2004 - 2008

(Quadrillion Btu)

Sector and Source	2004	2005	2006	2007	2008
Total	2.524	2.626	2.790	3.020	3.381
Biomass	2.436	2.531	2.686	2.904	3.247
Biofuels	0.500	0.577	0.771	0.991	1.372
Biodiesel ¹	0.003	0.012	0.033	0.046	0.040
Ethanol ²	0.293	0.335	0.453	0.569	0.800
Losses and Coproducts	0.203	0.230	0.285	0.377	0.532
Biodiesel Feedstock ³	*	*	*	0.001	0.001
Ethanol Feedstock ⁴	0.203	0.230	0.285	0.376	0.531
Waste	0.159	0.173	0.156	0.168	0.169
Landfill Gas	0.075	0.080	0.081	0.093	0.093
MSW Biogenic ⁵	0.023	0.023	0.024	0.019	0.021
Other Biomass ⁶	0.061	0.070	0.051	0.056	0.055
Wood and Derived Fuels ⁷	1.777	1.781	1.759	1.745	1.705
Geothermal	0.030	0.034	0.037	0.041	0.046
Solar Thermal/PV	0.059	0.061	0.067	0.075	0.088
Residential	0.483	0.507	0.475	0.527	0.565
Biomass	0.410	0.430	0.390	0.430	0.450
Wood and Derived Fuels ⁸	0.410	0.430	0.390	0.430	0.450
Geothermal	0.014	0.016	0.018	0.022	0.026
Solar Thermal/PV	0.059	0.061	0.067	0.075	0.088
Commercial	0.098	0.098	0.095	0.097	0.104
Biomass	0.086	0.085	0.081	0.083	0.089
Biofuels	0.001	0.001	0.001	0.002	0.002
Ethanol ²	0.001	0.001	0.001	0.002	0.002
Waste	0.015	0.014	0.016	0.012	0.014
Landfill Gas	*	*	0.001	0.001	*
MSW Biogenic ⁵	0.012	0.012	0.013	0.008	0.012
Other Biomass ⁶	0.003	0.002	0.002	0.003	0.002
Wood and Derived Fuels ⁷	0.070	0.069	0.064	0.069	0.073
Geothermal	0.012	0.014	0.014	0.014	0.015
Solar Thermal/PV	-	-	-	-	-
Industrial	1.621	1.647	1.711	1.756	1.852
Biomass	1.618	1.643	1.706	1.751	1.847
Biofuels	0.209	0.237	0.295	0.387	0.544
Ethanol ²	0.006	0.007	0.010	0.010	0.012
Losses and Coproducts	0.203	0.230	0.285	0.377	0.532
Biodiesel Feedstock ³	*	*	*	0.001	0.001
Ethanol Feedstock ⁴	0.203	0.230	0.285	0.376	0.531
Waste	0.127	0.143	0.126	0.140	0.139
Landfill Gas	0.074	0.079	0.080	0.093	0.092
MSW Biogenic ⁵	0.006	0.007	0.006	0.005	0.003
Other Biomass ⁶	0.047	0.057	0.040	0.043	0.044
Wood and Derived Fuels ⁷	1.282	1.262	1.286	1.225	1.165
Geothermal	0.004	0.004	0.004	0.005	0.005
Solar Thermal/PV	-	-	-	-	-
Transportation	0.290	0.339	0.475	0.603	0.827
Biomass	0.290	0.339	0.475	0.603	0.827
Biofuels	0.290	0.339	0.475	0.603	0.827
Biodiesel ¹	0.003	0.012	0.033	0.046	0.040
Ethanol ²	0.286	0.328	0.442	0.557	0.786
Electric Power ⁹	0.032	0.035	0.033	0.038	0.034
Biomass	0.032	0.035	0.033	0.038	0.034
Waste	0.017	0.015	0.014	0.016	0.016
Landfill Gas	*	0.001	*	*	*
MSW Biogenic ⁵	0.005	0.005	0.005	0.006	0.006
Other Biomass ⁶	0.012	0.010	0.009	0.010	0.010
Wood and Derived Fuels ⁷	0.015	0.019	0.019	0.021	0.018
Geothermal	-	-	-	-	-
Solar Thermal/PV	-	-	-	-	-

¹Biodiesel primarily derived from soybean oil.

²Ethanol primarily derived from corn minus denaturant.

³Losses and coproducts from the production of biodiesel. Does not include natural gas, electricity, and other nonbiomass energy used in the production of biodiesel.

⁴Losses and coproducts from the production of ethanol. Does not include natural gas, electricity, and other non-biomass energy used in the production of ethanol.

⁵Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

⁶Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

⁷Black liquor, and wood/wood waste solids and liquids.

Table 1.4 Renewable Energy Consumption for Nonelectric Use by Energy Use Sector and Energy Source, 2004 - 2008 (Quadrillion Btu) (Continued)

Sector and Source	2004	2005	2006	2007	2008
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⁸Wood and wood pellet fuels.

⁹The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

* = Less than 500 billion Btu.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. Starting with 2004 EIA adopted a new method of allocating fuel consumption between electric power generation and useful thermal out put (UTO) for combined heat and power (CHP) plants. The new method proportionately distributes a CHP plant's losses between the two output products (electric power and UTO) assuming the same efficiency for production of electricity as UTO. Data revisions are discussed in the Highlights section.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

Sources: Analysis conducted by U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels and specific sources described as follows. Residential: U.S. Energy Information Administration, Form EIA-457A/G, "Residential Energy Consumption Survey;" Oregon Institute of Technology, Geo-Heat Center; and U.S. Energy Information Administration, Form EIA-63-A, "Annual Solar Thermal Collector Manufacturers Survey" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Commercial: U.S. Energy Information Administration, Form EIA-920, "Combined Heat and Power Plant Report" and Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center. Industrial: U.S. Energy Information Administration, Form EIA-846 (A, B, C) "Manufacturing Energy Consumption Survey," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report;" Oregon Institute of Technology, Geo-Heat Center; Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook; U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and losses and coproducts from the production of biodiesel calculated as the difference between energy in feedstocks and production and from the production of ethanol calculated as the difference between energy in feedstocks and production less denaturants. Biofuels for Transportation: Biodiesel: Consumption: 2001-2008 Calculated as biodiesel production plus net imports; Production: 2001-2005: U.S. Department of Agriculture (USDA), Commodity Credit Corporation, Bioenergy Program, 2006: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for soybean oil in methyl esters (biodiesel), 2007: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for fats and oils in methyl esters, and 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey;" Trade: USDA imports data for Harmonized Tariff Schedule code 3824.90.40.20 (Fatty Esters Animal/ Vegetable Mixture) and exports data for Schedule B code 3824.90.40.00 (Fatty Substances Animal/ Vegetable Mixture, and Ethanol: 2001-2004: EIA, Petroleum Supply Annual, Tables 2 and 16. Calculated as ten percent of oxygenated finished motor gasoline field production (Table 2) plus fuel ethanol refinery input (Table 16). 2005-2008: EIA Petroleum Supply Annual (Various Issues), Tables 1 and 15. Calculated as motor gasoline blending components adjustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery and blender net inputs (Table 15). Small amounts of ethanol consumption are distributed to the commercial and industrial sectors according to those sector's shares of U.S. motor gasoline supplied. Electric Power: U.S. Energy Information Administration, Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report."

Table 1.5a Historical Renewable Energy Consumption by Sector and Energy Source, 1989-1999

(Quadrillion Btu)

Sector and Source	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total	6.391	6.206	6.238	5.992	6.261	6.153	6.703	7.166	7.175	6.654	6.677
Biomass	3.159	2.735	2.782	2.932	2.908	3.028	3.101	3.157	3.105	2.928	2.963
Biofuels ¹	0.125	0.111	0.128	0.145	0.169	0.188	0.200	0.143	0.184	0.201	0.209
Waste ²	0.354	0.408	0.440	0.473	0.479	0.515	0.531	0.577	0.551	0.542	0.540
Wood and Derived Fuels ³	2.680	2.216	2.214	2.313	2.260	2.324	2.370	2.437	2.371	2.184	2.214
Geothermal	0.317	0.336	0.346	0.349	0.364	0.338	0.294	0.316	0.325	0.328	0.331
Hydroelectric Conventional	2.837	3.046	3.016	2.617	2.892	2.683	3.205	3.590	3.640	3.297	3.268
Solar Thermal/PV ⁴	0.055	0.060	0.063	0.064	0.066	0.069	0.070	0.071	0.070	0.070	0.069
Wind	0.022	0.029	0.031	0.030	0.031	0.036	0.033	0.033	0.034	0.031	0.046
Residential	0.978	0.641	0.674	0.706	0.618	0.590	0.591	0.612	0.503	0.452	0.462
Biomass	0.920	0.580	0.610	0.640	0.550	0.520	0.520	0.540	0.430	0.380	0.390
Wood and Derived Fuels	0.920	0.580	0.610	0.640	0.550	0.520	0.520	0.540	0.430	0.380	0.390
Geothermal	0.005	0.006	0.006	0.006	0.007	0.006	0.007	0.007	0.008	0.008	0.009
Solar Thermal/PV ⁴	0.053	0.056	0.058	0.060	0.062	0.064	0.065	0.065	0.065	0.065	0.064
Commercial	0.102	0.098	0.100	0.109	0.114	0.112	0.118	0.135	0.138	0.127	0.129
Biomass	0.099	0.094	0.095	0.105	0.109	0.106	0.113	0.129	0.131	0.118	0.121
Biofuels ⁵	0.001	*	*	*	*	*	*	*	*	*	*
Waste ²	0.022	0.028	0.026	0.032	0.033	0.035	0.040	0.053	0.058	0.054	0.054
Wood and Derived Fuels ³	0.076	0.066	0.068	0.072	0.076	0.072	0.072	0.076	0.073	0.064	0.067
Geothermal	0.003	0.003	0.003	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.007
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	-	-	-	-	-	-	-	-	-
Industrial	1.871	1.717	1.684	1.737	1.773	1.927	1.992	2.033	2.057	1.929	1.934
Biomass	1.841	1.684	1.652	1.705	1.741	1.862	1.934	1.969	1.996	1.872	1.882
Biofuels ⁶	0.057	0.050	0.057	0.065	0.075	0.083	0.087	0.062	0.081	0.088	0.091
Waste ²	0.200	0.192	0.185	0.179	0.181	0.199	0.195	0.224	0.184	0.180	0.171
Wood and Derived Fuels ³	1.584	1.442	1.410	1.461	1.484	1.580	1.652	1.683	1.731	1.603	1.620
Geothermal	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004
Hydroelectric Conventional	0.028	0.031	0.030	0.031	0.030	0.062	0.055	0.061	0.058	0.055	0.049
Solar Thermal/PV	-	-	-	-	-	-	-	-	-	-	-
Wind	-	-	-	-	-	-	-	-	-	-	-
Transportation	0.068	0.060	0.070	0.080	0.094	0.105	0.113	0.081	0.102	0.113	0.118
Biomass	0.068	0.060	0.070	0.080	0.094	0.105	0.113	0.081	0.102	0.113	0.118
Biofuels ⁷	0.068	0.060	0.070	0.080	0.094	0.105	0.113	0.081	0.102	0.113	0.118
Electric Power ⁸	3.372	3.689	3.710	3.360	3.662	3.420	3.889	4.305	4.375	4.032	4.034
Electric Utilities	2.983	3.151	3.114	2.712	2.953	2.714	3.173	3.553	3.620	3.279	3.123
Biomass	0.020	0.022	0.021	0.022	0.021	0.021	0.017	0.020	0.020	0.021	0.020
Waste ²	0.010	0.013	0.014	0.013	0.011	0.013	0.010	0.012	0.013	0.013	0.013
Wood and Derived Fuels ³	0.010	0.008	0.008	0.008	0.009	0.008	0.007	0.008	0.008	0.007	0.007
Geothermal	0.197	0.181	0.170	0.169	0.158	0.145	0.099	0.110	0.115	0.109	0.036
Hydroelectric Conventional	2.765	2.948	2.923	2.521	2.774	2.549	3.056	3.423	3.485	3.149	3.067
Solar Thermal/PV	*	*	*	*	*	*	*	*	*	*	*
Wind	*	*	*	*	*	*	*	*	*	*	*
Independent Power Producers	0.389	0.538	0.596	0.648	0.709	0.705	0.716	0.752	0.754	0.753	0.910
Biomass	0.211	0.295	0.333	0.381	0.394	0.413	0.405	0.418	0.426	0.424	0.433
Waste ²	0.122	0.175	0.215	0.249	0.253	0.269	0.286	0.288	0.296	0.294	0.302
Wood and Derived Fuels ³	0.089	0.120	0.118	0.132	0.141	0.144	0.119	0.130	0.129	0.129	0.131

Table 1.5a Historical Renewable Energy Consumption by Sector and Energy Source, 1989-1999
(Quadrillion Btu) (Continued)

Sector and Source	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Geothermal	0.111	0.145	0.165	0.168	0.193	0.180	0.181	0.191	0.194	0.202	0.276
Hydroelectric Conventional	0.043	0.066	0.062	0.065	0.087	0.072	0.093	0.104	0.096	0.092	0.151
Solar Thermal/PV	0.003	0.004	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Wind	0.022	0.029	0.031	0.030	0.031	0.036	0.033	0.033	0.034	0.031	0.046

Table 1.5b Historical Renewable Energy Consumption by Sector and Energy Source, 2000-2008

(Quadrillion Btu)

Sector and Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total	6.260	5.311	5.888	6.141	6.247	6.407	6.825	6.719	7.367
Biomass	3.008	2.622	2.701	2.807	3.010	3.117	3.277	3.503	3.852
Biofuels ¹	0.236	0.253	0.303	0.404	0.500	0.577	0.771	0.991	1.372
Waste ²	0.511	0.364	0.402	0.401	0.389	0.403	0.397	0.413	0.436
Wood and Derived Fuels ³	2.262	2.006	1.995	2.002	2.121	2.136	2.109	2.098	2.044
Geothermal	0.317	0.311	0.328	0.331	0.341	0.343	0.343	0.349	0.360
Hydroelectric Conventional	2.811	2.242	2.689	2.825	2.690	2.703	2.869	2.446	2.512
Solar Thermal/PV ⁴	0.066	0.065	0.064	0.064	0.065	0.066	0.072	0.081	0.097
Wind	0.057	0.070	0.105	0.115	0.142	0.178	0.264	0.341	0.546
Residential	0.490	0.439	0.449	0.471	0.483	0.507	0.475	0.527	0.565
Biomass	0.420	0.370	0.380	0.400	0.410	0.430	0.390	0.430	0.450
Wood and Derived Fuels	0.420	0.370	0.380	0.400	0.410	0.430	0.390	0.430	0.450
Geothermal	0.009	0.009	0.010	0.013	0.014	0.016	0.018	0.022	0.026
Solar Thermal/PV ⁴	0.061	0.060	0.059	0.058	0.059	0.061	0.067	0.075	0.088
Commercial	0.128	0.101	0.104	0.113	0.118	0.119	0.117	0.118	0.125
Biomass	0.119	0.092	0.095	0.101	0.105	0.105	0.102	0.102	0.109
Biofuels ⁵	*	*	*	0.001	0.001	0.001	0.001	0.002	0.002
Waste ²	0.047	0.025	0.026	0.029	0.034	0.034	0.036	0.031	0.034
Wood and Derived Fuels ³	0.071	0.067	0.069	0.071	0.070	0.070	0.065	0.069	0.073
Geothermal	0.008	0.008	0.009	0.011	0.012	0.014	0.014	0.014	0.015
Hydroelectric Conventional	0.001	0.001	*	0.001	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	-	-	-	-	-	-	*
Industrial	1.928	1.719	1.720	1.726	1.853	1.873	1.930	1.964	2.053
Biomass	1.881	1.681	1.676	1.679	1.817	1.837	1.897	1.944	2.031
Biofuels ⁶	0.100	0.110	0.133	0.173	0.209	0.237	0.295	0.387	0.544
Waste ²	0.145	0.129	0.146	0.142	0.132	0.148	0.130	0.144	0.144
Wood and Derived Fuels ³	1.636	1.443	1.396	1.363	1.476	1.452	1.472	1.413	1.344
Geothermal	0.004	0.005	0.005	0.003	0.004	0.004	0.004	0.005	0.005
Hydroelectric Conventional	0.042	0.033	0.039	0.043	0.033	0.032	0.029	0.016	0.017
Solar Thermal/PV	-	-	-	-	-	-	-	-	-
Wind	-	-	-	-	-	-	-	-	-
Transportation	0.135	0.142	0.170	0.230	0.290	0.339	0.475	0.603	0.827
Biomass	0.135	0.142	0.170	0.230	0.290	0.339	0.475	0.603	0.827
Biofuels ⁷	0.135	0.142	0.170	0.230	0.290	0.339	0.475	0.603	0.827
Electric Power ⁸	3.579	2.910	3.445	3.601	3.503	3.568	3.827	3.508	3.798
Electric Utilities	2.607	2.063	2.529	2.615	2.522	2.530	2.688	2.356	2.404
Biomass	0.021	0.014	0.033	0.029	0.031	0.040	0.042	0.048	0.047
Waste ²	0.014	0.008	0.022	0.012	0.011	0.013	0.015	0.016	0.018
Wood and Derived Fuels ³	0.007	0.006	0.011	0.017	0.020	0.027	0.027	0.032	0.029
Geothermal	0.003	0.003	0.029	0.026	0.026	0.024	0.024	0.024	0.025
Hydroelectric Conventional	2.582	2.044	2.465	2.556	2.461	2.455	2.598	2.241	2.263
Solar Thermal/PV	*	*	*	*	*	*	*	*	*
Wind	*	0.001	0.002	0.004	0.004	0.010	0.023	0.043	0.068
Independent Power Producers	0.972	0.847	0.916	0.986	0.981	1.038	1.139	1.152	1.394
Biomass	0.432	0.323	0.347	0.368	0.357	0.365	0.370	0.376	0.388
Waste ²	0.305	0.202	0.208	0.218	0.212	0.208	0.216	0.221	0.240
Wood and Derived Fuels ³	0.127	0.121	0.140	0.151	0.145	0.158	0.154	0.154	0.148

Table 1.5b Historical Renewable Energy Consumption by Sector and Energy Source, 2000-2008
(Quadrillion Btu) (Continued)

Sector and Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
Geothermal	0.293	0.286	0.275	0.277	0.285	0.285	0.282	0.284	0.289
Hydroelectric Conventional	0.185	0.165	0.185	0.224	0.196	0.215	0.242	0.189	0.231
Solar Thermal/PV	0.005	0.006	0.006	0.005	0.006	0.005	0.005	0.006	0.008
Wind	0.057	0.068	0.103	0.111	0.138	0.168	0.240	0.297	0.478

Table 1.5a and 5b Historical Renewable Energy Consumption by Sector and Energy Source, 1989-2008

Notes and Sources

¹Biofuels and biofuel losses and coproducts.

²Municipal solid waste biogenic, landfill gases, agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases. Includes municipal solid waste nonbiogenic and tires for 1989-2000.

³Black liquor, and wood/wood waste solids and liquids.

⁴Includes small amounts of distributed solar thermal and photovoltaic energy used in the commercial, industrial and electric power sectors.

⁵Ethanol primarily derived from corn minus denaturant.

⁶Ethanol primarily derived from corn minus denaturant and losses and coproducts from production of biodiesel and ethanol.

⁷Biodiesel primarily derived from soybean oil and ethanol primarily derived from corn minus denaturant.

⁸The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

PV = Photovoltaic.

* = Less than 500 billion Btu.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Energy consumption for the noncombustible renewable energy sources (hydroelectric conventional, solar thermal, PV and wind) used in electricity generation is determined by multiplying generation times the fossil fuel equivalent heat rate. Energy consumption for geothermal energy used in electricity generation is determined by multiplying generation times the geothermal heat rate. See EIA, Annual Energy Review (AER) 2008, DOE/EIA-0384 (2008) (Washington, DC, June 2009), Table A6.

Sources: Analysis conducted by U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels and Specific sources described as follows. Residential: U.S. Energy Information Administration, Form EIA-457A/G, "Residential Energy Consumption Survey;" Oregon Institute of Technology, Geo-Heat Center and U.S. Energy Information Administration, Form EIA-63-A, "Annual Solar Thermal Collector Manufacturers Survey" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Commercial: U.S. Energy Information Administration, Form EIA-867, "Annual Nonutility Power Producer Report," Form EIA-860B, "Annual Electric Generator Report - Nonutility," Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center. Industrial: U.S. Energy Information Administration, Form EIA-846 (A,B,C) "Manufacturing Energy Consumption Survey," Form EIA-867, "Annual Nonutility Power Producer Report," Form EIA-860B, "Annual Electric Generator Report - Nonutility," Form EIA-906, "Power Plant Report", Form EIA-920, "Combined Heat and Power Report," Form EIA-923, "Power Plant Operations Report;" Oregon Institute of Technology, Geo-Heat Center; Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook;

U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and estimated losses and coproducts from the production of biodiesel and ethanol. Biofuels for Transportation: Biodiesel: Consumption: 2001-2008 Calculated as biodiesel production plus net imports; Production: 2001-2005: U.S. Department of Agriculture (USDA), Commodity Credit Corporation, Bioenergy Program, 2006: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for soybean oil in methyl esters (biodiesel), 2007: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for fats and oils in methyl esters, and 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey;" Trade: USDA imports data for Harmonized Tariff Schedule code 3824.90.40.20 (Fatty Esters Animal/ Vegetable Mixture) and exports data for Schedule B code 3824.90.40.00 (Fatty Substances Animal/ Vegetable Mixture; and Ethanol: 1989: EIA, Estimates of U.S. Biofuels Consumption 1990, Table 10, 1990-1992: EIA, Estimates of U.S. Biomass Energy Consumption 1992, Table D2, 1993-2004: EIA, Petroleum Supply Monthly, Tables 2 and 16. Calculated as ten percent of oxygenated finished motor gasoline field production (Table 2) plus fuel ethanol refinery input (Table 16).2005-2008: EIA Petroleum Supply Annual (Various Issues), Tables 1 and 15. Calculated as motor gasoline blending components adjustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery and blender net inputs (Table 15).

Small amounts of ethanol consumption are distributed to the commercial and industrial sectors according to those sector's shares of U.S. motor gasoline supplied. Electric Power: U.S. Energy Information Administration, Form EIA-759, "Monthly Power Plant Report," Form EIA-867, "Annual Nonutility Power Producer Report," Form EIA-860B, "Annual Electric Generator Report - Nonutility," Form EIA-906, "Monthly Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report."

Table 1.6 Biofuels Overview, 2004 - 2008

(Trillion Btu)

Type	2004	2005	2006	2007	2008
Ethanol					
Feedstock ¹	484	552	688	914	1,300
Losses and Coproducts ²	203	230	285	376	531
Denaturant ³	8	9	11	14	21
Production ⁴	289	331	414	553	790
Net Imports ⁵	13	12	62	37	45
Stock Change ⁶	*	-2	11	6	13
Consumption ⁴	301	344	465	584	821
Consumption minus Denaturant	293	335	453	569	800
Biodiesel					
Feedstock ⁷	4	12	32	63	88
Losses and Coproducts ⁸	*	*	*	1	1
Production ⁹	4	12	32	62	87
Net Imports ¹⁰	*	*	1	-17	-46
Stock Change ¹¹	-	-	-	-	-
Balancing Item ¹²	-	-	-	-	-
Consumption	3	12	33	46	40

¹Total corn and other biomass inputs to the production of fuel ethanol.

²Losses and coproducts from the production of ethanol. Does not include natural gas, electricity, and other non-biomass energy used in the production of ethanol.

³Petroleum, typically pentanes plus or conventional motor gasoline, added to ethanol to make it unfit for human consumption.

⁴Includes denaturant.

⁵Fuel ethanol imports. There are no exports. Includes denaturant.

⁶A negative number indicates a decrease in stocks and a positive number indicates an increase. Includes denaturant.

⁷Total soy bean oil and other biomass inputs to the production of biodiesel.

⁸Losses and coproducts from the production of biodiesel. Does not include natural gas, electricity, and other nonbiomass energy used in the production of biodiesel.

⁹Production of biofuels for use as diesel fuel substitutes or additives.

¹⁰Net imports equal imports minus exports.

¹¹A negative number indicates a decrease in stocks and a positive number indicates an increase.

¹²Calculated as biodiesel consumption and biodiesel stock change minus biodiesel production and net imports.

* = Less than 0.5 trillion Btu.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Sources: (Note: For ethanol and biodiesel heat contents, see Table 10.) Ethanol Feedstock: Calculated as fuel ethanol production multiplied by the approximate heat content of the corn and other biomass inputs to the production of fuel ethanol. Ethanol Losses and Co-products: Calculated as ethanol feedstock minus fuel ethanol production excluding denaturant. Ethanol Denaturant: 2004-2008: Denaturant estimated as 2 percent of ethanol production. Ethanol Production: 2004 and forward: U.S. Energy Information Administration (EIA), Form EIA-819, "Monthly Oxygenate Report," and predecessor form. Ethanol Net Imports, Stocks and Stock Change: 2002 and forward: EIA, Petroleum Supply Annual (PSA), annual reports. Ethanol Consumption: 2002-2004: EIA, PSA, annual reports, Tables 2 and 16. Calculated as ten percent of oxygenated finished motor gasoline field production (Table 2), plus fuel ethanol refinery input (Table 16). 2005-2008: EIA, PSA (Various Issues), Tables 1 and 15. Calculated as motor gasoline blending components adjustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery blender net inputs (Table 15). Biodiesel Feedstock: Calculated as biodiesel production multiplied by the approximate heat content of the vegetable oil and other biomass inputs to the production of biodiesel. Biodiesel Losses and Co-products: Calculated as biodiesel feedstock minus biodiesel production. Biodiesel Production: 2001-2005: U.S. Department of Agriculture, Commodity Credit Corporation, Bioenergy Program records, 2006: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for soybean oil in methyl esters (biodiesel), 2007: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for fats and oils in methyl esters, and 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey." Trade: USDA imports data for Harmonized Tariff Schedule code 3824.90.40.20 (Fatty Esters Animal/ Vegetable Mixture) and exports data for Schedule B code 3824.90.40.00 (Fatty Substances Animal/ Vegetable Mixture, and analysis conducted by U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

Table 1.7 Waste Energy Consumption by Type of Waste and Energy Use Sector, 2008
(Trillion Btu)

Type	Sector				
	Commercial	Industrial	Electric Power		Total
			Electric Utilities	Independent Power Producers	
Total	34	144	18	240	436
Landfill Gas	3	93	10	81	187
MSW Biogenic ¹	26	3	4	136	169
Other Biomass ²	5	48	3	22	79

¹Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

MSW = Municipal Solid Waste.

Note: Totals may not equal sum of components due to independent rounding.

Sources: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report;" Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook; and U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates.

Table 1.8 Industrial Biomass Energy Consumption and Electricity Net Generation by Industry and Energy Source, 2008

Industry	Energy Source	Biomass Energy Consumption (Trillion Btu)			Net Generation (Million Kilowatthours)
		Total	For Electricity	For Useful Thermal Output	
Total	Total	2,031.193	183.953	1,847.240	27,462
Agriculture, Forestry and Mining	Total	16.159	1.231	14.928	229
	Agricultural Byproducts/Crops	16.159	1.231	14.928	229
Manufacturing	Total	1,908.531	182.721	1,725.810	27,233
Food and Kindred Products	Total	21.328	0.631	20.697	107
	Agricultural Byproducts/Crops	15.819	0.160	15.659	33
	Other Biomass Gases	0.289	0.095	0.194	7
	Other Biomass Liquids	0.044	0.044	-	5
	Sludge Waste	0.243	0.055	0.188	8
	Wood/Wood Waste Solids	4.933	0.277	4.657	54
Lumber	Total	225.729	10.682	215.047	1,287
	Sludge Waste	0.052	0.006	0.046	1
	Wood/Wood Waste Solids	225.676	10.676	215.001	1,286
Paper and Allied Products	Total	1,116.304	170.909	945.396	25,774
	Agricultural Byproducts/Crops	1.335	0.036	1.300	5
	Black Liquor	787.380	112.361	675.019	17,152
	Landfill Gas	0.034	0.004	0.029	1
	Other Biomass Gases	0.183	0.015	0.168	3
	Other Biomass Liquids	0.122	0.015	0.107	3
	Other Biomass Solids	9.477	1.762	7.715	326
	Sludge Waste	4.083	0.937	3.147	160
	Wood/Wood Waste Liquids	2.510	0.383	2.127	73
	Wood/Wood Waste Solids	311.180	55.395	255.785	8,050
Chemicals and Allied Products	Total	4.319	0.152	4.167	28
	Other Biomass Liquids	0.061	0.005	0.056	1
	Sludge Waste	0.305	0.043	0.261	9
	Wood/Wood Waste Solids	3.953	0.104	3.849	18
Biorefineries	Total	532.042	-	532.042	-
	Biofuel Losses and Coproducts ³	532.042	-	532.042	-
	Biodiesel Feedstock	1.195	-	1.195	-
	Ethanol Feedstock	530.847	-	530.847	-
Other ¹	Total	8.810	0.349	8.461	37
Nonspecified ²	Total	106.502	-	106.502	-
	Ethanol ⁴	11.652	-	11.652	-
	Landfill Gas	92.233	-	92.233	-
	Municipal Solid Waste Biogenic ⁵	2.617	-	2.617	-

¹Other includes Apparel; Petroleum Refining; Rubber and Misc. Plastic Products; Transportation Equipment; Stone, Clay, Glass, and Concrete Products; Furniture and Fixtures; and related industries.

²Primary purpose of business is not specified.

³Losses and coproducts from production of biodiesel and ethanol.

⁴Ethanol primarily derived from corn minus denaturant.

⁵Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding. Starting with 2004 EIA adopted a new method of allocating fuel consumption between electric power generation and useful thermal out put (UTO) for combined heat and power (CHP) plants. The new method proportionately distributes a CHP plant's losses between the two output products (electric power and UTO) assuming the same efficiency for production of electricity as UTO.

Sources: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report;" Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook; U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; ethanol and biofuel losses and coproducts: table 1.2 of this report; and analysis conducted by the U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

Table 1.9 Net Summer Capacity of Plants Cofiring Biomass and Coal, 2007 and 2008

(Megawatts)

State	Company Name	Plant I.D.	Plant Name	County	2007		2008	
					Biomass/ Coal Cofiring Capacity	Total Plant Capacity	Biomass/ Coal Cofiring Capacity	Total Plant Capacity
AL	DTE Energy Services	50407	Mobile Energy Services LLC	Mobile	73	73	73	73
AL	Georgia-Pacific Corp	10699	Georgia Pacific Naheola Mill	Choctaw	29	73	29	73
AL	International Paper Co	52140	International Paper Prattville Mill	Autauga	46	74	43	78
AR	Domtar Industries Inc	54104	Ashdown	Little River	128	128	128	128
AZ	Tucson Electric Power Co	126	H Wilson Sundt Generating Station	Pima	156	472	156	472
CA	Air Products Energy Enterprise	10640	Stockton Cogen	San Joaquin	-	-	54	54
DE	Conectiv Delmarva Gen Inc	593	Edge Moor	New Castle	260	723	260	718
FL	International Paper Co-Pensacola	50250	International Paper Pensacola	Escambia	76	76	76	76
FL	Jefferson Smurfit Corp	10202	Jefferson Smurfit Fernandina Beach	Nassau	50	80	50	80
FL	Stone Container Corp-Panama Ci	50807	Stone Container Panama City Mill	Bay	20	34	22	36
GA	Georgia Pacific CSO LLC	54101	Georgia Pacific Cedar Springs	Early	90	90	90	90
GA	International Paper Co-Augusta	54358	International Paper Augusta Mill	Richmond	79	79	79	79
GA	Riverwood Intl USA Inc	54464	Riverwood International Macon Mill	Bibb	-	-	35	40
GA	SP Newsprint Company	54004	Dublin Mill	Laurens	-	-	44	84
GA	SP Newsprint Company	54004	SP Newsprint	Laurens	44	84	-	-
HI	Hawaiian Com & Sugar Co Ltd	10604	Hawaiian Comm & Sugar Puunene Mill	Maui	46	46	46	46
IA	Ames City of	1122	Ames Electric Services Power Plant	Story	108	108	105	105
IA	University of Iowa	54775	University of Iowa Main Power Plant	Johnson	21	23	21	23
KY	East Kentucky Power Coop, Inc	6041	H L Spurlock	Mason	268	1,118	268	1,103
LA	International Paper Co	54090	International Paper Louisiana Mill	Morehouse	63	63	63	63
MD	NewPage Corporation	50282	Luke Mill	Allegany	60	60	60	60
ME	NewPage Corporation	10495	Rumford Cogeneration	Oxford	85	85	85	85
ME	S D Warren Co.- Westbrook	50447	S D Warren Westbrook	Cumberland	16	65	56	65
ME	Verso Bucksport LLC	50243	Verso Paper	Hancock	-	-	93	250
MI	Decorative Panels International, Inc.	10149	Decorative Panels Intl	Alpena	7	7	7	7
MI	NewPage Corporation	10208	Escanaba Paper Company	Delta	77	100	77	100
MI	S D Warren Co	50438	S D Warren Muskegon	Muskegon	37	37	37	37
MI	TES Filer City Station LP	50835	TES Filer City Station	Manistee	60	60	60	60
MN	Willmar Municipal Utilities	2022	Willmar	Kandiyohi	-	-	16	23
MN	Minnesota Power Inc	10686	Rapids Energy Center	Itasca	29	29	29	29
MN	Minnesota Power Inc	1897	M L Hibbard	St Louis	50	50	59	59
MO	Anheuser-Busch Inc	10430	Anheuser Busch St Louis	St Louis City	-	-	26	26
MO	University of Missouri-Columbia	50969	University of Missouri Columbia	Boone	6	77	18	77
MS	Weyerhaeuser Co	50184	Weyerhaeuser Columbus MS	Lowndes	123	123	123	123
NC	Carlyle/Riverstone Renewable Energy	10381	Coastal Carolina Clean Power	Duplin	32	32	27	27
NC	Corn Products Intl Inc	54618	Corn Products Winston Salem	Forsyth	7	7	7	7
NC	Domtar Paper Company LLC	50189	Domtar Paper Co LLC Plymouth NC	Martin	146	146	146	146
NC	Primary Energy of North Carolina LLC	10379	Primary Energy Roxboro	Person	56	56	56	56
NY	AES Greenidge	2527	AES Greenidge LLC	Yates	106	159	104	156
NY	AES Hickling LLC	2529	AES Hickling LLC	Steuben	70	70	-	-
NY	AES Jennison LLC	2531	AES Jennison LLC	Chenango	60	60	-	-
NY	Black River Generation LLC	10464	Black River Generation	Jefferson	55	55	55	55
NY	Niagara Generation LLC	50202	WPS Power Niagara	Niagara	50	50	50	50
PA	Domtar LLC	54638	Johnsonburg Mill	Elk	49	49	49	49
PA	P H Glatfelter Co	50397	P H Glatfelter	York	5	89	-	-
SC	International Paper Co-Eastovr	52151	International Paper Eastover Facility	Richland	46	103	46	103
SC	Smurfit-Stone Container Enterprises Inc	50806	Stone Container Florence Mill	Florence	75	103	75	103
SC	South Carolina Electric&Gas Co	7737	Cogen South	Charleston	90	90	90	90
VA	GP Big Island LLC	50479	Georgia Pacific Big Island	Bedford	7	7	7	7
VA	International Paper	52152	International Paper Franklin Mill	Isle of Wight	85	90	89	108
VA	MeadWestvaco Corp	50900	Covington Facility	Covington	102	102	102	102
VA	Smurfit-Stone Container Enterprises Inc	50813	Stone Container Hopewell Mill	Hopewell City	-	-	41	41
WI	Flambeau River Papers	50620	Flambeau River Papers	Price	-	-	5	5
WI	Fox Valley Energy Center LLC	56037	Fox Valley Energy Center	Winnebago	7	7	7	7
WI	Madison Gas & Electric Co	3992	Blount Street	Dane	97	187	97	187
WI	Manitowoc Public Utilities	4125	Manitowoc	Manitowoc	10	126	116	126
WI	Mosinee Paper Corp	50614	Mosinee Paper	Marathon	18	21	-	-
WI	NewPage Corporation	10234	Biron Mill	Wood	22	62	22	62
WI	NewPage Corporation	10476	Whiting Mill	Portage	4	4	4	4
WI	NewPage Corporation	10477	Wisconsin Rapids Pulp Mill	Wood	67	67	67	67
WI	NewPage Corporation	54857	Niagara Mill	Marinette	12	25	12	25
WI	Northern States Power Co	3982	Bay Front	Ashland	44	73	44	73
WI	State of Wisconsin	54407	Waupun Correctional Central Heating Plt	Dodge	1	1	1	1
WI	State of Wisconsin	54408	Univ of Wisc Madison Charter Sreet Plant	Dane	6	6	6	6
WI	Thilmany LLC	54098	International Paper Kaukauna Mill	Outagamie	33	45	45	45
WI	Wausau Paper Specialty Products LLC	50614	Mosinee Paper	Marathon	-	-	18	21
Total					3,466	5,926	3,772	6,147

- = No data reported.

Note: State abbreviations are documented on the United States Postal Service website: http://www.usps.com/ncsc/lookups/usps_abbreviations.htm.

Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report," Schedule 3, Part B.

Table 1.10 Average Heat Content of Selected Biomass Fuels

Fuel Type	Heat Content	Units
Agricultural Byproducts	8.248	Million Btu/Short Ton
Biodiesel	5.359	Million Btu/Barrel
Black Liquor	11.758	Million Btu/Short Ton
Digester Gas	0.619	Million Btu/Thousand Cubic Feet
Ethanol	3.563	Million Btu/Barrel
Landfill Gas	0.490	Million Btu/Thousand Cubic Feet
MSW Biogenic	9.696	Million Btu/Short Ton
Methane	0.841	Million Btu/Thousand Cubic Feet
Paper Pellets	13.029	Million Btu/Short Ton
Peat	8.000	Million Btu/Short Ton
Railroad Ties	12.618	Million Btu/Short Ton
Sludge Waste	7.512	Million Btu/Short Ton
Sludge Wood	10.071	Million Btu/Short Ton
Solid Byproducts	25.830	Million Btu/Short Ton
Spent Sulfite Liquor	12.720	Million Btu/Short Ton
Utility Poles	12.500	Million Btu/Short Ton
Waste Alcohol	3.800	Million Btu/Barrel

MSW = Municipal Solid Waste.

Note: For detailed characteristics of biomass feedstocks, see the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, website here: http://www1.eere.energy.gov/biomass/for_researchers.html.

Sources: Biodiesel and ethanol: U.S. Energy Information Administration, Monthly Energy Review March 2010, DOE/EIA-0035 (2010/03) (Washington, DC, March 2010), Table A3; MSW Biogenic: U.S. Energy Information Administration, Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy (Washington, DC, May 2007); and all other fuel types: U.S. Energy Information Administration, Form EIA-860B (1999), "Annual Electric Generator Report - Nonutility 1999."

Table 1.11 Electricity Net Generation From Renewable Energy by Energy Use Sector and Energy Source, 2004 - 2008

(Thousand Kilowatthours)

Sector/Source	2004	2005	2006	2007	2008
Total	351,484,632	357,650,653	385,771,908	352,747,486	381,043,759
Biomass	53,537,453	54,276,810	54,860,621	55,538,578	55,033,612
Waste	15,420,570	15,420,393	16,098,525	16,524,554	17,733,759
Landfill Gas	5,128,425	5,142,111	5,677,040	6,157,750	7,156,340
MSW Biogenic ¹	8,150,974	8,330,471	8,477,571	8,303,838	8,096,801
Other Biomass ²	2,141,171	1,947,810	1,943,913	2,062,966	2,480,617
Wood and Derived Fuels ³	38,116,883	38,856,417	38,762,096	39,014,024	37,299,853
Geothermal	14,810,975	14,691,745	14,568,029	14,637,213	14,951,348
Hydroelectric Conventional	268,417,308	270,321,255	289,246,416	247,509,974	254,831,385
Solar Thermal/PV	575,155	550,294	507,706	611,793	864,315
Wind	14,143,741	17,810,549	26,589,137	34,449,927	55,363,100
Commercial	1,680,155	1,758,789	1,712,691	1,691,439	1,614,986
Biomass	1,575,188	1,672,752	1,619,245	1,614,160	1,554,948
Waste	1,561,794	1,656,755	1,598,646	1,598,799	1,533,645
Landfill Gas	172,029	217,632	172,590	202,547	233,636
MSW Biogenic ¹	945,344	953,093	955,910	962,496	910,908
Other Biomass ²	444,421	486,031	470,146	433,756	389,101
Wood and Derived Fuels ³	13,394	15,997	20,599	15,361	21,303
Hydroelectric Conventional	104,967	86,037	93,446	77,279	59,957
Solar Thermal/PV	-	-	-	-	80
Industrial	32,412,566	32,198,528	31,871,511	30,508,807	29,138,172
Biomass	29,164,073	29,003,087	28,972,463	28,918,826	27,462,283
Waste	796,988	732,553	572,447	631,452	821,394
Landfill Gas	120,018	113,155	28,786	27,087	21,494
MSW Biogenic ¹	30,213	34,441	34,541	39,782	-
Other Biomass ²	646,757	584,957	509,120	564,583	799,900
Wood and Derived Fuels ³	28,367,085	28,270,534	28,400,016	28,287,374	26,640,889
Hydroelectric Conventional	3,248,493	3,195,441	2,899,048	1,589,981	1,675,889
Solar Thermal/PV	-	-	-	-	-
Electric Power ⁴	317,391,910	323,693,336	352,187,707	320,547,239	350,290,602
Biomass	22,798,191	23,600,971	24,268,913	25,005,592	26,016,380
Waste	13,061,787	13,031,084	13,927,432	14,294,304	15,378,719
Landfill Gas	4,836,377	4,811,325	5,475,664	5,928,117	6,901,211
MSW Biogenic ¹	7,175,417	7,342,938	7,487,120	7,301,560	7,185,893
Other Biomass ²	1,049,993	876,822	964,648	1,064,627	1,291,615
Wood and Derived Fuels ³	9,736,404	10,569,886	10,341,481	10,711,288	10,637,661
Geothermal	14,810,975	14,691,745	14,568,029	14,637,213	14,951,348
Hydroelectric Conventional	265,063,848	267,039,777	286,253,922	245,842,714	253,095,539
Solar Thermal/PV	575,155	550,294	507,706	611,793	864,235
Wind	14,143,741	17,810,549	26,589,137	34,449,927	55,363,100

¹Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

⁴The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Data revisions are discussed in the Highlights section.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

Source: Electric Power: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."

Table 1.12 U.S. Electric Net Summer Capacity, 2004 - 2008

(Megawatts)

Source	2004	2005	2006	2007	2008
Total	962,942	978,020	986,215	994,888	1,010,171
Renewable Total	96,357	98,746	101,934	107,954	116,423
Biomass	9,711	9,802	10,100	10,839	11,050
Waste	3,529	3,609	3,727	4,134	4,186
Landfill Gas	859	887	978	1,319	1,429
MSW ¹	2,196	2,167	2,188	2,218	2,215
Other Biomass ²	474	554	561	598	542
Wood and Derived Fuels ³	6,182	6,193	6,372	6,704	6,864
Geothermal	2,152	2,285	2,274	2,214	2,256
Hydroelectric Conventional	77,641	77,541	77,821	77,885	77,930
Solar Thermal/PV	398	411	411	502	536
Wind	6,456	8,706	11,329	16,515	24,651
Nonrenewable Total	866,585	879,274	884,281	886,934	893,747

¹Includes total capacity whose primary energy source is MSW.

²Agriculture byproducts/crops, sludge waste and other biomass solids, liquids and gases. Does not include tires.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

Notes: Totals may not equal sum of components due to independent rounding.

Data revisions are discussed in the Highlights section.

Revisions to biomass capacity removed tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.13 Renewable Electricity Net Generation by Energy Source and Census Division, 2008

(Thousand Kilowatthours)

Census Division	Biomass				Geothermal	Hydroelectric Conventional	Solar Thermal/PV	Wind	Total
	Waste			Wood and Derived Fuels ³					
	Landfill Gas	MSW Biogenic ¹	Other Biomass ²						
Total	7,156,340	8,096,801	2,480,617	37,299,853	14,951,348	254,831,385	864,315	55,363,100	381,043,759
New England	409,067	1,969,383	53,704	5,217,524	-	9,300,499	80	155,847	17,106,104
Middle Atlantic	1,212,763	2,592,792	5,242	1,213,072	-	29,297,762	2,844	2,001,010	36,325,485
East North Central	2,143,973	221,243	26,657	2,904,192	-	3,942,284	-	3,218,758	12,457,107
West North Central	245,844	325,915	483,166	726,882	-	8,195,808	-	12,453,910	22,431,525
South Atlantic	860,885	2,457,999	737,496	10,238,625	-	10,740,641	1,801	391,910	25,429,357
East South Central	132,445	-	51,083	5,939,923	-	13,699,691	-	50,117	19,873,259
West South Central	441,974	-	283,774	5,103,457	-	10,575,410	-	18,583,101	34,987,716
Mountain	52,264	-1,163	59,574	642,434	1,834,015	32,253,554	189,091	6,650,682	41,680,450
Pacific Contiguous	1,657,126	346,627	656,821	5,313,745	12,883,000	135,569,591	670,481	11,617,673	168,715,065
Pacific Noncontiguous	-	184,005	123,100	-	234,333	1,256,144	18	240,091	2,037,691

¹Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."

Table 1.14 Total Biomass Electricity Net Generation by Census Division and Energy Source, 2008

(Thousand Kilowatthours)

Energy Source	Census Division										
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific Contiguous	Pacific Noncontiguous	Total
Total	7,649,678	5,023,869	5,296,064	1,781,808	14,295,005	6,123,451	5,829,204	753,109	7,974,319	307,105	55,033,612
Agricultural Byproducts/Crops	-	-	-	18,377	461,746	8,933	91,329	-	190,635	6,146	777,165
Black Liquor	1,118,012	505,828	1,023,088	306,330	6,018,146	4,139,061	3,415,587	361,454	443,099	-	17,330,605
Landfill Gases	409,067	1,212,763	2,143,973	245,844	860,885	132,445	441,974	52,264	1,657,126	-	7,156,340
MSW Biogenic	1,969,383	2,592,792	221,243	325,915	2,457,999	-	-	-1,163	346,627	184,005	8,096,801
Other Biomass Gases	1,517	1,972	3,544	40,104	43,928	-	23,138	59,574	454,265	-	628,041
Other Biomass Liquids	158	883	63	-	2,829	-	3,083	-	-	4,682	11,697
Other Biomass Solids	-	-	12,590	409,428	165,298	15,119	164,175	-	-	112,273	878,884
Sludge Waste	52,029	2,387	10,461	15,257	63,695	27,031	2,049	-	11,921	-	184,830
Wood/Wood Waste Liquids	-	73,101	-	-	-	-	-	-	-	-	73,101
Wood/Wood Waste Solids	4,099,512	634,143	1,881,104	420,552	4,220,479	1,800,862	1,687,869	280,980	4,870,646	-	19,896,147

MSW = Municipal Solid Waste.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."

Table 1.15 Renewable Electric Power Sector Net Generation by Energy Source and State, 2007

(Thousand Kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW Biogenic ¹	Other Biomass ²						
Alabama	4,136,114	-	-	209,227	-	-	-	209,227	4,345,341
Alaska	1,291,223	-	-	-	-	-	1,012	1,012	1,292,235
Arizona	6,597,671	28,507	-	-	-	8,649	-	37,156	6,634,827
Arkansas	3,236,753	33,438	5,091	-	-	-	-	38,529	3,275,282
California	27,314,363	1,538,096	346,943	2,536,524	12,990,711	556,969	5,584,933	23,554,176	50,868,540
Colorado	1,729,533	-	31,105	-	-	2,208	1,291,516	1,324,829	3,054,362
Connecticut	363,261	728,164	-	1,676	-	-	-	729,839	1,093,100
Delaware	-	48,116	-	-	-	-	-	48,116	48,116
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	154,446	1,793,086	281,067	409,908	-	-	-	2,484,061	2,638,507
Georgia	2,217,013	12,808	-	-	-	-	-	12,808	2,229,821
Hawaii	54,611	-	109,237	-	229,886	-	238,184	577,307	631,918
Idaho	9,021,690	-	-	75,285	-	-	172,267	247,552	9,269,242
Illinois	153,727	603,225	16,348	-	-	-	664,427	1,284,000	1,437,727
Indiana	449,936	189,853	-	-	-	-	-	189,853	639,789
Iowa	962,346	122,715	-	-	-	-	2,756,676	2,879,391	3,841,737
Kansas	10,501	-	-	-	-	-	1,152,538	1,152,538	1,163,039
Kentucky	1,668,587	93,440	-	-	-	-	-	93,440	1,762,027
Louisiana	826,642	-	74,988	-	-	-	-	74,988	901,630
Maine	3,043,827	113,562	13,026	1,910,641	-	-	99,071	2,136,300	5,180,127
Maryland	1,652,216	383,974	-	-	-	-	-	383,974	2,036,191
Massachusetts	778,232	1,094,431	-	119,157	-	-	-	1,213,588	1,991,820
Michigan	1,243,903	555,824	54	1,014,377	-	-	2,723	1,572,979	2,816,882
Minnesota	558,269	413,529	135,303	248,844	-	-	2,638,812	3,436,488	3,994,757
Mississippi	-	-	-	-	-	-	-	-	-
Missouri	1,204,326	21,944	-	120	-	-	-	22,064	1,226,390
Montana	9,364,336	-	-	-	-	-	495,776	495,776	9,860,112
Nebraska	347,444	46,184	2,837	-	-	-	216,765	265,786	613,230
Nevada	2,003,191	-	-	-	1,252,691	43,967	-	1,296,658	3,299,849
New Hampshire	1,260,733	152,816	-	970,038	-	-	-	1,122,854	2,383,587
New Jersey	20,909	822,453	-	-	-	-	20,412	842,865	863,774
New Mexico	267,978	-	15,994	-	-	-	1,393,239	1,409,233	1,677,211
New York	25,190,534	1,312,795	7,416	270,749	-	-	833,476	2,424,437	27,614,970
North Carolina	2,974,677	85,745	-	432,033	-	-	-	517,778	3,492,455
North Dakota	1,305,393	-	-	-	-	-	620,772	620,772	1,926,165
Ohio	410,436	10,972	-	31,210	-	-	14,748	56,930	467,366
Oklahoma	3,065,862	-	-	-	-	-	1,849,144	1,849,144	4,915,006
Oregon	33,587,439	88,363	-	242,017	-	-	1,246,994	1,577,374	35,164,813
Pennsylvania	2,235,982	1,324,739	13,314	191,340	-	-	470,018	1,999,411	4,235,393
Rhode Island	4,364	154,757	-	-	-	-	-	154,757	159,121
South Carolina	1,555,213	63,842	-	375,755	-	-	-	439,597	1,994,809
South Dakota	2,917,283	-	-	-	-	-	150,018	150,018	3,067,301
Tennessee	4,939,601	19,228	-	-	-	-	49,937	69,165	5,008,766
Texas	1,644,437	302,739	8,770	-	-	-	9,006,383	9,317,892	10,962,329
Utah	538,782	5,954	-	-	163,925	-	-	169,879	708,662
Vermont	645,081	-	-	453,038	-	-	10,511	463,549	1,108,629
Virginia	1,241,501	498,237	-	459,154	-	-	-	957,392	2,198,892
Washington	78,781,231	162,890	1	567,160	-	-	2,437,823	3,167,874	81,949,105
West Virginia	805,854	-	-	-	-	-	167,588	167,588	973,442
Wisconsin	1,335,840	403,251	3,132	193,035	-	-	109,283	708,701	2,044,541
Wyoming	729,424	-	-	-	-	-	754,881	754,881	1,484,305
U.S. Total	245,842,714	13,229,677	1,064,627	10,711,288	14,637,213	611,793	34,449,927	74,704,525	320,547,239

¹Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."

Table 1.16 Renewable Commercial and Industrial Sector Net Generation by Energy Source and State, 2007

(Thousand Kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW Biogenic ¹	Other Biomass ²						
Alabama	-	3,520	13,218	3,574,655	-	-	-	3,591,393	3,591,393
Alaska	-	-	10,196	22	-	-	-	10,218	10,218
Arizona	-	-	4,483	-	-	-	-	4,483	4,483
Arkansas	-	-	4,412	1,580,803	-	-	-	1,585,215	1,585,215
California	13,388	119,002	301,187	870,891	-	-	-	1,291,081	1,304,469
Colorado	-	-	-	-	-	-	-	-	-
Connecticut	-	-	-	-	-	-	-	-	-
Delaware	-	-	-	-	-	-	-	-	-
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	-	1,404	297,462	1,519,891	-	-	-	1,818,757	1,818,757
Georgia	19,175	3,413	37,103	3,362,097	-	-	-	3,402,614	3,421,789
Hawaii	37,733	169,450	6,590	-	-	-	-	176,040	213,773
Idaho	-	-	-	405,297	-	-	-	405,297	405,297
Illinois	-	-	752	-	-	-	-	752	752
Indiana	-	41,394	-	-	-	-	-	41,394	41,394
Iowa	-	-	28,368	16	-	-	-	28,384	28,384
Kansas	-	-	-	-	-	-	-	-	-
Kentucky	-	-	1,973	370,210	-	-	-	372,183	372,183
Louisiana	-	-	6,524	2,898,371	-	-	-	2,904,895	2,904,895
Maine	694,340	94,519	39,236	1,936,925	-	-	-	2,070,680	2,765,020
Maryland	-	16,390	-	203,097	-	-	-	219,487	219,487
Massachusetts	19,250	-	26,636	-	-	-	-	26,636	45,886
Michigan	26,086	165,460	484	677,825	-	-	-	843,768	869,854
Minnesota	95,553	9,953	7,587	478,610	-	-	-	496,150	591,703
Mississippi	-	-	5,017	1,488,348	-	-	-	1,493,365	1,493,365
Missouri	-	-	7,245	-	-	-	-	7,245	7,245
Montana	-	-	-	110,945	-	-	-	110,945	110,945
Nebraska	-	-	12,238	-	-	-	-	12,238	12,238
Nevada	-	-	-	-	-	-	-	-	-
New Hampshire	4,496	-	-	418	-	-	-	418	4,914
New Jersey	-	-	713	-	-	-	-	713	713
New Mexico	-	-	-	-	-	-	-	-	-
New York	62,022	129,135	-	221,512	-	-	-	350,647	412,669
North Carolina	9,482	-	1,100	1,153,341	-	-	-	1,154,441	1,163,923
North Dakota	-	-	13,507	-	-	-	-	13,507	13,507
Ohio	-	-	10,045	368,169	-	-	-	378,214	378,214
Oklahoma	-	3,721	-	276,133	-	-	-	279,854	279,854
Oregon	-	12,026	38,345	600,549	-	-	-	650,919	650,919
Pennsylvania	-	115,944	2,613	428,226	-	-	-	546,784	546,784
Rhode Island	-	-	-	-	-	-	-	-	-
South Carolina	699	36,760	-	1,519,677	-	-	-	1,556,437	1,557,136
South Dakota	-	-	-	-	-	-	-	-	-
Tennessee	-	-	33,252	868,110	-	-	-	901,361	901,361
Texas	-	19,532	36,023	914,164	-	-	-	969,720	969,720
Utah	-	25,076	-	-	-	-	-	25,076	25,076
Vermont	1,524	-	-	-	-	-	-	-	1,524
Virginia	6,763	254,691	20,317	1,333,172	-	-	-	1,608,180	1,614,943
Washington	47,964	-	13,460	549,220	-	-	-	562,680	610,644
West Virginia	448,543	-	-	-	-	-	-	-	448,543
Wisconsin	180,243	10,520	18,252	592,044	-	-	-	620,817	801,059
Wyoming	-	-	-	-	-	-	-	-	-
U.S. Total	1,667,260	1,231,911	998,339	28,302,736	-	-	-	30,532,986	32,200,246

¹Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."

Table 1.17 Total Renewable Net Generation by Energy Source and State, 2007

(Thousand Kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW Biogenic ¹	Other Biomass ²						
Alabama	4,136,114	3,520	13,218	3,783,882	-	-	-	3,800,620	7,936,734
Alaska	1,291,223	-	10,196	22	-	-	1,012	11,230	1,302,453
Arizona	6,597,671	28,507	4,483	-	-	8,649	-	41,639	6,639,310
Arkansas	3,236,753	33,438	9,503	1,580,803	-	-	-	1,623,744	4,860,497
California	27,327,751	1,657,098	648,130	3,407,416	12,990,711	556,969	5,584,933	24,845,257	52,173,008
Colorado	1,729,533	-	31,105	-	-	2,208	1,291,516	1,324,829	3,054,362
Connecticut	363,261	728,164	-	1,676	-	-	-	729,839	1,093,100
Delaware	-	48,116	-	-	-	-	-	48,116	48,116
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	154,446	1,794,490	578,529	1,929,798	-	-	-	4,302,818	4,457,264
Georgia	2,236,188	16,221	37,103	3,362,097	-	-	-	3,415,422	5,651,610
Hawaii	92,343	169,450	115,827	-	229,886	-	238,184	753,347	845,691
Idaho	9,021,690	-	-	480,582	-	-	172,267	652,849	9,674,539
Illinois	153,727	603,225	17,100	-	-	-	664,427	1,284,752	1,438,480
Indiana	449,936	231,247	-	-	-	-	-	231,247	681,183
Iowa	962,346	122,715	28,368	16	-	-	2,756,676	2,907,775	3,870,121
Kansas	10,501	-	-	-	-	-	1,152,538	1,152,538	1,163,039
Kentucky	1,668,587	93,440	1,973	370,210	-	-	-	465,623	2,134,210
Louisiana	826,642	-	81,512	2,898,371	-	-	-	2,979,883	3,806,525
Maine	3,738,168	208,081	52,262	3,847,566	-	-	99,071	4,206,979	7,945,147
Maryland	1,652,216	400,364	-	203,097	-	-	-	603,462	2,255,678
Massachusetts	797,482	1,094,431	26,636	119,157	-	-	-	1,240,224	2,037,706
Michigan	1,269,989	721,284	538	1,692,202	-	-	2,723	2,416,747	3,686,736
Minnesota	653,822	423,482	142,889	727,455	-	-	2,638,812	3,932,638	4,586,460
Mississippi	-	-	5,017	1,488,348	-	-	-	1,493,365	1,493,365
Missouri	1,204,326	21,944	7,245	120	-	-	-	29,309	1,233,635
Montana	9,364,336	-	-	110,945	-	-	495,776	606,721	9,971,057
Nebraska	347,444	46,184	15,075	-	-	-	216,765	278,024	625,468
Nevada	2,003,191	-	-	-	1,252,691	43,967	-	1,296,658	3,299,849
New Hampshire	1,265,229	152,816	-	970,456	-	-	-	1,123,272	2,388,501
New Jersey	20,909	822,453	713	-	-	-	20,412	843,578	864,487
New Mexico	267,978	-	15,994	-	-	-	1,393,239	1,409,233	1,677,211
New York	25,252,555	1,441,930	7,416	492,261	-	-	833,476	2,775,084	28,027,639
North Carolina	2,984,159	85,745	1,100	1,585,374	-	-	-	1,672,219	4,656,377
North Dakota	1,305,393	-	13,507	-	-	-	620,772	634,279	1,939,672
Ohio	410,436	10,972	10,045	399,378	-	-	14,748	435,143	845,579
Oklahoma	3,065,862	3,721	-	276,133	-	-	1,849,144	2,128,998	5,194,860
Oregon	33,587,439	100,389	38,345	842,565	-	-	1,246,994	2,228,293	35,815,732
Pennsylvania	2,235,982	1,440,683	15,928	619,567	-	-	470,018	2,546,196	4,782,178
Rhode Island	4,364	154,757	-	-	-	-	-	154,757	159,121
South Carolina	1,555,912	100,602	-	1,895,432	-	-	-	1,996,034	3,551,946
South Dakota	2,917,283	-	-	-	-	-	150,018	150,018	3,067,301
Tennessee	4,939,601	19,228	33,252	868,110	-	-	49,937	970,526	5,910,127
Texas	1,644,437	322,272	44,793	914,164	-	-	9,006,383	10,287,612	11,932,049
Utah	538,782	31,030	-	-	163,925	-	-	194,955	733,738
Vermont	646,605	-	-	453,038	-	-	10,511	463,549	1,110,153
Virginia	1,248,264	752,928	20,317	1,792,326	-	-	-	2,565,571	3,813,835
Washington	78,829,195	162,890	13,461	1,116,380	-	-	2,437,823	3,730,554	82,559,749
West Virginia	1,254,397	-	-	-	-	-	167,588	167,588	1,421,985
Wisconsin	1,516,083	413,771	21,384	785,079	-	-	109,283	1,329,518	2,845,600
Wyoming	729,424	-	-	-	-	-	754,881	754,881	1,484,305
U.S. Total	247,509,974	14,461,588	2,062,966	39,014,024	14,637,213	611,793	34,449,927	105,237,511	352,747,486

¹Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."

Table 1.18 Renewable Electric Power Sector Net Generation by Energy Source and State, 2008

(Thousand Kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW Biogenic ¹	Other Biomass ²						
Alabama	6,136,148	-	3,882	163,097	-	-	-	166,979	6,303,127
Alaska	1,171,801	-	-	-	-	-	68	68	1,171,869
Arizona	7,285,902	19,050	-	75,947	-	14,724	-	109,721	7,395,623
Arkansas	4,660,297	35,751	6,092	-	-	-	-	41,843	4,702,140
California	24,127,810	1,583,714	369,659	2,820,899	12,883,000	670,481	5,384,955	23,712,708	47,840,517
Colorado	2,039,327	8,366	36,753	135	-	18,354	3,220,843	3,284,451	5,323,778
Connecticut	556,177	731,881	-	1,633	-	-	-	733,514	1,289,691
Delaware	-	163,375	-	-	-	-	-	163,375	163,375
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	206,158	1,725,470	233,611	368,795	-	-	-	2,327,877	2,534,035
Georgia	2,122,606	31,427	-	-	-	-	-	31,427	2,154,033
Hawaii	45,073	-	112,273	-	234,333	18	240,023	586,647	631,720
Idaho	9,362,501	-	-	69,395	85,547	-	207,472	362,414	9,724,915
Illinois	138,549	697,186	34	-	-	-	2,336,996	3,034,215	3,172,764
Indiana	436,780	229,247	-	-	-	-	238,356	467,603	904,383
Iowa	819,047	98,298	35,194	49	-	-	4,083,787	4,217,327	5,036,374
Kansas	10,574	-	-	-	-	-	1,759,412	1,759,412	1,769,986
Kentucky	1,917,470	105,094	-	-	-	-	-	105,094	2,022,564
Louisiana	1,064,373	-	69,878	-	-	-	-	69,878	1,134,251
Maine	3,695,396	108,042	7,702	1,779,596	-	-	131,621	2,026,961	5,722,357
Maryland	1,974,078	391,349	-	-	-	-	-	391,349	2,365,427
Massachusetts	1,142,180	1,127,529	-	122,580	-	-	3,672	1,253,781	2,395,961
Michigan	1,338,568	613,778	63	1,004,059	-	-	141,182	1,759,081	3,097,649
Minnesota	609,428	389,752	364,492	259,120	-	-	4,354,620	5,367,984	5,977,412
Mississippi	-	-	-	44	-	-	-	44	44
Missouri	2,046,773	29,899	3,704	-	-	-	203,313	236,916	2,283,689
Montana	9,999,557	-	-	-	111,371	-	593,138	704,509	10,704,066
Nebraska	346,456	44,559	3,508	-	-	-	214,184	262,251	608,707
Nevada	1,750,620	-	-	-	1,382,820	156,013	-	1,538,833	3,289,453
New Hampshire	1,625,546	155,025	-	1,009,322	-	-	10,319	1,174,666	2,800,212
New Jersey	25,773	878,731	-	-	-	2,669	20,885	902,285	928,058
New Mexico	312,288	-	18,885	-	-	-	1,642,787	1,661,672	1,973,960
New York	26,654,569	1,384,394	-	316,021	-	-	1,250,700	2,951,115	29,605,684
North Carolina	3,023,577	101,952	18,530	399,357	-	1,801	-	521,639	3,545,217
North Dakota	1,252,790	-	-	-	-	-	1,693,458	1,693,458	2,946,248
Ohio	386,435	182,666	-	29,076	-	-	15,084	226,826	613,261
Oklahoma	3,811,273	5,443	-	-	-	-	2,358,080	2,363,523	6,174,796
Oregon	33,805,024	108,945	-	216,278	-	-	2,575,234	2,900,458	36,705,482
Pennsylvania	2,548,858	1,303,110	-150	206,096	-	175	729,425	2,238,656	4,787,514
Rhode Island	4,977	158,407	-	-	-	-	-	158,407	163,384
South Carolina	1,122,544	86,942	-	291,448	-	-	-	378,390	1,500,934
South Dakota	2,993,107	-	1,665	-	-	-	145,136	146,801	3,139,908
Tennessee	5,646,073	27,351	-	-	-	-	50,117	77,468	5,723,541
Texas	1,039,467	384,736	3,083	-	-	-	16,225,022	16,612,841	17,652,308
Utah	668,084	23,685	-	-	254,277	-	23,900	301,862	969,946
Vermont	1,471,808	-	-	415,103	-	-	10,235	425,338	1,897,146
Virginia	1,002,083	560,856	41	506,781	-	-	-	1,067,678	2,069,761
Washington	77,588,810	155,960	-	377,996	-	-	3,657,484	4,191,440	81,780,251
West Virginia	820,765	-	-	-390	-	-	391,910	391,520	1,212,285
Wisconsin	1,452,763	435,133	2,719	205,223	-	-	487,141	1,130,216	2,582,979
Wyoming	835,275	-	-	-	-	-	962,542	962,542	1,797,817
U.S. Total	253,095,539	14,087,104	1,291,615	10,637,661	14,951,348	864,235	55,363,100	97,195,063	350,290,602

¹Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."

Table 1.19 Renewable Commercial and Industrial Sector Net Generation by Energy Source and State, 2008

(Thousand Kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric						Total	
		Biomass			Geothermal	Solar Thermal/PV	Wind		Total
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW Biogenic ¹	Other Biomass ²						
Alabama	-	-	29,816	3,160,519	-	-	-	3,190,335	3,190,335
Alaska	-	-	4,682	-	-	-	-	4,682	4,682
Arizona	-	-	3,936	-	-	-	-	3,936	3,936
Arkansas	-	-	4,927	1,466,063	-	-	-	1,470,990	1,470,990
California	-	133,332	275,241	662,656	-	-	-	1,071,229	1,071,229
Colorado	-	-	-	-	-	-	-	-	-
Connecticut	-	-	-	-	-	-	-	-	-
Delaware	-	-	-	-	-	-	-	-	-
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	-	814	374,232	1,599,946	-	-	-	1,974,991	1,974,991
Georgia	22,012	-	90,258	2,660,285	-	-	-	2,750,543	2,772,555
Hawaii	39,270	184,005	6,146	-	-	-	-	190,151	229,421
Idaho	-	-	-	385,998	-	-	-	385,998	385,998
Illinois	-	-	150	611	-	-	-	761	761
Indiana	-	43,790	-	-	-	-	-	43,790	43,790
Iowa	-	-	33,772	-	-	-	-	33,772	33,772
Kansas	-	-	-	-	-	-	-	-	-
Kentucky	-	-	3,786	350,740	-	-	-	354,525	354,525
Louisiana	-	-	1,008	2,638,789	-	-	-	2,639,797	2,639,797
Maine	762,009	97,565	44,485	1,888,973	-	-	-	2,031,023	2,793,033
Maryland	-	23,432	-	197,704	-	-	-	221,137	221,137
Massachusetts	13,631	-	1,517	-	-	80	-	1,597	15,228
Michigan	25,810	124,389	1,307	706,364	-	-	-	832,060	857,870
Minnesota	117,633	9,251	7,547	466,100	-	-	-	482,898	600,531
Mississippi	-	-	5,051	1,386,231	-	-	-	1,391,281	1,391,281
Missouri	-	-	7,496	1,613	-	-	-	9,109	9,109
Montana	-	-	-	110,958	-	-	-	110,958	110,958
Nebraska	-	-	12,861	-	-	-	-	12,861	12,861
Nevada	-	-	-	-	-	-	-	-	-
New Hampshire	7,678	-	-	318	-	-	-	318	7,996
New Jersey	-	-	3,004	-	-	-	-	3,004	3,004
New Mexico	-	-	-	-	-	-	-	-	-
New York	68,562	128,467	-	239,075	-	-	-	367,542	436,104
North Carolina	10,065	-	-	1,400,573	-	-	-	1,400,573	1,410,638
North Dakota	-	-	12,927	-	-	-	-	12,927	12,927
Ohio	-	-	7,509	389,041	-	-	-	396,549	396,549
Oklahoma	-	-	164,175	23,006	-	-	-	187,181	187,181
Oregon	-	21,802	-	500,839	-	-	-	522,641	522,641
Pennsylvania	-	110,854	2,387	451,879	-	-	-	565,120	565,120
Rhode Island	-	-	-	-	-	-	-	-	-
South Carolina	571	32,817	-	1,404,618	-	-	-	1,437,435	1,438,006
South Dakota	-	-	-	-	-	-	-	-	-
Tennessee	-	-	8,549	879,293	-	-	-	887,842	887,842
Texas	-	16,043	34,611	975,599	-	-	-	1,026,254	1,026,254
Utah	-	-	-	-	-	-	-	-	-
Vermont	21,096	-	-	-	-	-	-	-	21,096
Virginia	8,910	200,451	20,824	1,409,507	-	-	-	1,630,782	1,639,692
Washington	47,948	-	11,921	735,077	-	-	-	746,998	794,945
West Virginia	427,272	-	-	-	-	-	-	-	427,272
Wisconsin	163,379	39,026	14,876	569,817	-	-	-	623,719	787,098
Wyoming	-	-	-	-	-	-	-	-	-
U.S. Total	1,735,846	1,166,038	1,189,002	26,662,192	-	80	-	29,017,312	30,753,158

¹Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."

Table 1.20 Total Renewable Net Generation by Energy Source and State, 2008
(Thousand Kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW Biogenic ¹	Other Biomass ²						
Alabama	6,136,148	-	33,698	3,323,616	-	-	-	3,357,313	9,493,461
Alaska	1,171,801	-	4,682	-	-	-	68	4,750	1,176,551
Arizona	7,285,902	19,050	3,936	75,947	-	14,724	-	113,658	7,399,560
Arkansas	4,660,297	35,751	11,019	1,466,063	-	-	-	1,512,833	6,173,130
California	24,127,810	1,717,046	644,900	3,483,555	12,883,000	670,481	5,384,955	24,783,937	48,911,746
Colorado	2,039,327	8,366	36,753	135	-	18,354	3,220,843	3,284,451	5,323,778
Connecticut	556,177	731,881	-	1,633	-	-	-	733,514	1,289,691
Delaware	-	163,375	-	-	-	-	-	163,375	163,375
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	206,158	1,726,284	607,843	1,968,741	-	-	-	4,302,868	4,509,026
Georgia	2,144,618	31,427	90,258	2,660,285	-	-	-	2,781,970	4,926,588
Hawaii	84,343	184,005	118,418	-	234,333	18	240,023	776,797	861,140
Idaho	9,362,501	-	-	455,393	85,547	-	207,472	748,412	10,110,913
Illinois	138,549	697,186	184	611	-	-	2,336,996	3,034,977	3,173,526
Indiana	436,780	273,038	-	-	-	-	238,356	511,393	948,173
Iowa	819,047	98,298	68,966	49	-	-	4,083,787	4,251,099	5,070,146
Kansas	10,574	-	-	-	-	-	1,759,412	1,759,412	1,769,986
Kentucky	1,917,470	105,094	3,786	350,740	-	-	-	459,619	2,377,089
Louisiana	1,064,373	-	70,886	2,638,789	-	-	-	2,709,675	3,774,048
Maine	4,457,405	205,608	52,187	3,668,569	-	-	131,621	4,057,985	8,515,390
Maryland	1,974,078	414,781	-	197,704	-	-	-	612,485	2,586,563
Massachusetts	1,155,811	1,127,529	1,517	122,580	-	80	3,672	1,255,378	2,411,189
Michigan	1,364,378	738,167	1,370	1,710,423	-	-	141,182	2,591,141	3,955,519
Minnesota	727,061	399,003	372,039	725,220	-	-	4,354,620	5,850,882	6,577,943
Mississippi	-	-	5,051	1,386,275	-	-	-	1,391,326	1,391,326
Missouri	2,046,773	29,899	11,200	1,613	-	-	203,313	246,026	2,292,799
Montana	9,999,557	-	-	110,958	111,371	-	593,138	815,467	10,815,024
Nebraska	346,456	44,559	16,370	-	-	-	214,184	275,113	621,569
Nevada	1,750,620	-	-	-	1,382,820	156,013	-	1,538,833	3,289,453
New Hampshire	1,633,224	155,025	-	1,009,640	-	-	10,319	1,174,984	2,808,208
New Jersey	25,773	878,731	3,004	-	-	2,669	20,885	905,290	931,063
New Mexico	312,288	-	18,885	-	-	-	1,642,787	1,661,672	1,973,960
New York	26,723,131	1,512,860	-	555,097	-	-	1,250,700	3,318,657	30,041,788
North Carolina	3,033,642	101,952	18,530	1,799,930	-	1,801	-	1,922,213	4,955,855
North Dakota	1,252,790	-	12,927	-	-	-	1,693,458	1,706,385	2,959,175
Ohio	386,435	182,666	7,509	418,117	-	-	15,084	623,376	1,009,811
Oklahoma	3,811,273	5,443	164,175	23,006	-	-	2,358,080	2,550,704	6,361,977
Oregon	33,805,024	130,747	-	717,117	-	-	2,575,234	3,423,099	37,228,123
Pennsylvania	2,548,858	1,413,963	2,237	657,976	-	175	729,425	2,803,776	5,352,634
Rhode Island	4,977	158,407	-	-	-	-	-	158,407	163,384
South Carolina	1,123,115	119,759	-	1,696,067	-	-	-	1,815,825	2,938,940
South Dakota	2,993,107	-	1,665	-	-	-	145,136	146,801	3,139,908
Tennessee	5,646,073	27,351	8,549	879,293	-	-	50,117	965,310	6,611,383
Texas	1,039,467	400,779	37,694	975,599	-	-	16,225,022	17,639,094	18,678,562
Utah	668,084	23,685	-	-	254,277	-	23,900	301,862	969,946
Vermont	1,492,904	-	-	415,103	-	-	10,235	425,338	1,918,242
Virginia	1,010,993	761,307	20,865	1,916,288	-	-	-	2,698,460	3,709,452
Washington	77,636,758	155,960	11,921	1,113,073	-	-	3,657,484	4,938,438	82,575,196
West Virginia	1,248,037	-	-	-390	-	-	391,910	391,520	1,639,557
Wisconsin	1,616,142	474,159	17,596	775,040	-	-	487,141	1,753,935	3,370,077
Wyoming	835,275	-	-	-	-	-	962,542	962,542	1,797,817
U.S. Total	254,831,385	15,253,142	2,480,617	37,299,853	14,951,348	864,315	55,363,100	126,212,374	381,043,759

¹Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass removed MSW non-biogenic and tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."

Table 1.21 Renewable Electric Power Sector Net Summer Capacity by Energy Source and State, 2007

(Megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW ¹	Other Biomass ²						
Alabama	3,272	-	-	-	-	-	-	-	3,272
Alaska	397	-	-	-	-	-	3	3	400
Arizona	2,720	4	-	3	-	9	-	16	2,736
Arkansas	1,321	5	4	-	-	-	-	9	1,330
California	10,035	367	47	435	1,940	404	2,312	5,504	15,538
Colorado	665	-	10	-	-	8	1,063	1,081	1,746
Connecticut	122	163	-	-	-	-	-	163	285
Delaware	-	7	-	-	-	-	-	7	7
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	55	463	105	67	-	-	-	635	690
Georgia	2,025	7	-	-	-	-	-	7	2,032
Hawaii	18	-	46	-	31	-	64	141	159
Idaho	2,367	-	-	12	-	-	75	87	2,454
Illinois	33	131	13	-	-	-	740	884	916
Indiana	60	30	-	-	-	-	-	30	90
Iowa	131	11	-	-	-	-	1,170	1,181	1,313
Kansas	3	-	-	-	-	-	363	363	366
Kentucky	817	15	-	-	-	-	-	15	833
Louisiana	192	-	11	-	-	-	-	11	203
Maine	601	30	36	220	-	-	42	328	929
Maryland	590	124	-	-	-	-	-	124	714
Massachusetts	253	264	-	26	-	-	2	292	545
Michigan	245	90	-	179	-	-	2	271	516
Minnesota	146	124	55	111	-	-	1,139	1,429	1,575
Mississippi	-	-	-	-	-	-	-	-	-
Missouri	552	3	-	-	-	-	57	60	612
Montana	2,620	-	-	-	22	-	149	171	2,792
Nebraska	273	6	2	-	-	-	25	32	305
Nevada	1,048	-	-	-	189	78	-	267	1,315
New Hampshire	494	29	-	139	-	-	-	168	662
New Jersey	4	182	19	-	-	2	8	210	215
New Mexico	82	-	6	-	-	-	494	500	582
New York	4,286	291	-	37	-	-	425	752	5,039
North Carolina	1,955	18	-	80	-	-	-	98	2,053
North Dakota	486	-	-	-	-	-	383	383	869
Ohio	101	41	-	7	-	-	7	56	157
Oklahoma	851	-	-	-	-	-	689	689	1,540
Oregon	8,385	17	3	37	-	-	885	942	9,327
Pennsylvania	748	351	-	28	-	-	293	673	1,421
Rhode Island	4	24	-	-	-	-	-	24	28
South Carolina	1,336	20	-	-	-	-	-	20	1,356
South Dakota	1,463	-	-	-	-	-	43	43	1,506
Tennessee	2,635	8	2	-	-	-	29	39	2,673
Texas	673	72	5	-	-	-	4,490	4,566	5,240
Utah	255	1	-	-	33	-	-	34	289
Vermont	304	-	-	72	-	-	5	77	381
Virginia	672	178	-	83	-	-	-	261	933
Washington	21,328	36	-	86	-	1	1,162	1,284	22,612
West Virginia	163	-	-	-	-	-	66	66	229
Wisconsin	444	65	1	73	-	-	44	183	626
Wyoming	303	-	-	-	-	-	287	287	590
U.S. Total	77,532	3,176	364	1,694	2,214	501	16,515	24,464	101,996

¹Total capacity whose primary energy source is landfill gas or MSW.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass capacity removed tires from renewable waste energy.

The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.22 Renewable Commercial and Industrial Sector Net Summer Capacity by Energy Source and State, 2007

(Megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW ¹	Other Biomass ²						
Alabama	-	-	-	574	-	-	-	574	574
Alaska	-	-	-	-	-	-	-	-	-
Arizona	-	-	-	-	-	-	-	-	-
Arkansas	-	-	2	292	-	-	-	293	293
California	6	13	56	162	-	-	-	230	236
Colorado	-	-	-	-	-	-	-	-	-
Connecticut	-	-	-	-	-	-	-	-	-
Delaware	-	-	-	-	-	-	-	-	-
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	-	-	71	287	-	-	-	358	358
Georgia	7	3	44	621	-	-	-	668	675
Hawaii	5	60	3	-	-	-	-	63	68
Idaho	-	-	-	60	-	-	-	60	60
Illinois	-	-	-	-	-	-	-	-	-
Indiana	-	9	-	-	-	-	-	9	9
Iowa	-	-	3	-	-	-	-	3	3
Kansas	-	-	-	-	-	-	-	-	-
Kentucky	-	-	-	47	-	-	-	47	47
Louisiana	-	-	3	380	-	-	-	383	383
Maine	117	24	-	392	-	-	-	416	533
Maryland	-	7	-	3	-	-	-	9	9
Massachusetts	6	-	9	-	-	-	-	9	15
Michigan	4	67	-	52	-	-	-	119	122
Minnesota	30	4	-	49	-	-	-	53	83
Mississippi	-	-	-	229	-	-	-	229	229
Missouri	-	-	-	-	-	-	-	-	-
Montana	-	-	-	17	-	-	-	17	17
Nebraska	-	-	3	-	-	-	-	3	3
Nevada	-	-	-	-	-	1	-	1	1
New Hampshire	s	-	-	1	-	-	-	1	2
New Jersey	-	-	1	-	-	-	-	1	1
New Mexico	-	-	-	-	-	-	-	-	-
New York	15	33	-	-	-	-	-	33	49
North Carolina	5	-	-	243	-	-	-	243	248
North Dakota	-	-	10	-	-	-	-	10	10
Ohio	-	-	-	57	-	-	-	57	57
Oklahoma	-	16	-	63	-	-	-	78	78
Oregon	-	3	15	178	-	-	-	196	196
Pennsylvania	-	28	-	80	-	-	-	108	108
Rhode Island	-	-	-	-	-	-	-	-	-
South Carolina	1	10	-	220	-	-	-	230	231
South Dakota	-	-	-	-	-	-	-	-	-
Tennessee	-	-	-	165	-	-	-	165	165
Texas	-	-	16	130	-	-	-	145	145
Utah	-	3	-	-	-	-	-	3	3
Vermont	5	-	-	4	-	-	-	4	8
Virginia	3	76	-	335	-	-	-	411	413
Washington	5	-	-	210	-	-	-	210	215
West Virginia	101	-	-	-	-	-	-	-	101
Wisconsin	44	7	-	159	-	-	-	165	210
Wyoming	-	-	-	-	-	-	-	-	-
U.S. Total	353	360	235	5,010	-	1	-	5,606	5,958

¹Total capacity whose primary energy source is landfill gas or MSW.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

s = Less than 500 kilowatts.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass capacity removed tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.23 Total Renewable Net Summer Capacity by Energy Source and State, 2007

(Megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW ¹	Other Biomass ²						
Alabama	3,272	-	-	574	-	-	-	574	3,846
Alaska	397	-	-	-	-	-	3	3	400
Arizona	2,720	4	-	3	-	9	-	16	2,736
Arkansas	1,321	5	6	292	-	-	-	302	1,623
California	10,041	380	102	596	1,940	404	2,312	5,734	15,774
Colorado	665	-	10	-	-	8	1,063	1,081	1,746
Connecticut	122	163	-	-	-	-	-	163	285
Delaware	-	7	-	-	-	-	-	7	7
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	55	463	176	354	-	-	-	993	1,048
Georgia	2,032	10	44	621	-	-	-	675	2,706
Hawaii	24	60	49	-	31	-	64	203	227
Idaho	2,367	-	-	71	-	-	75	146	2,514
Illinois	33	131	13	-	-	-	740	884	916
Indiana	60	39	-	-	-	-	-	39	99
Iowa	131	11	3	-	-	-	1,170	1,185	1,316
Kansas	3	-	-	-	-	-	363	363	366
Kentucky	817	15	-	47	-	-	-	63	880
Louisiana	192	-	14	380	-	-	-	394	586
Maine	718	53	36	612	-	-	42	744	1,462
Maryland	590	130	-	3	-	-	-	133	723
Massachusetts	259	264	9	26	-	-	2	301	560
Michigan	249	156	-	231	-	-	2	390	638
Minnesota	176	128	55	161	-	-	1,139	1,483	1,658
Mississippi	-	-	-	229	-	-	-	229	229
Missouri	552	3	-	-	-	-	57	60	612
Montana	2,620	-	-	17	22	-	149	189	2,809
Nebraska	273	6	5	-	-	-	25	35	308
Nevada	1,048	-	-	-	189	79	-	268	1,316
New Hampshire	494	29	-	140	-	-	-	169	663
New Jersey	4	182	20	-	-	2	8	211	215
New Mexico	82	-	6	-	-	-	494	500	582
New York	4,301	324	-	37	-	-	425	786	5,087
North Carolina	1,960	18	-	324	-	-	-	342	2,301
North Dakota	486	-	10	-	-	-	383	393	879
Ohio	101	41	-	64	-	-	7	112	213
Oklahoma	851	16	-	63	-	-	689	767	1,618
Oregon	8,385	20	18	215	-	-	885	1,138	9,523
Pennsylvania	748	379	-	108	-	-	293	781	1,529
Rhode Island	4	24	-	-	-	-	-	24	28
South Carolina	1,337	29	-	220	-	-	-	250	1,587
South Dakota	1,463	-	-	-	-	-	43	43	1,506
Tennessee	2,635	8	2	165	-	-	29	203	2,838
Texas	673	72	21	130	-	-	4,490	4,712	5,385
Utah	255	5	-	-	33	-	-	38	293
Vermont	308	-	-	76	-	-	5	81	389
Virginia	675	254	-	418	-	-	-	672	1,347
Washington	21,333	36	-	296	-	1	1,162	1,494	22,828
West Virginia	264	-	-	-	-	-	66	66	330
Wisconsin	488	71	1	232	-	-	44	348	836
Wyoming	303	-	-	-	-	-	287	287	590
U.S. Total	77,885	3,536	598	6,704	2,214	502	16,515	30,069	107,954

¹Total capacity whose primary energy source is landfill gas or MSW.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass capacity removed tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.24 Renewable Electric Power Sector Net Summer Capacity by Energy Source and State, 2008

(Megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW ¹	Other Biomass ²						
Alabama	3,272	-	-	-	-	-	-	-	3,272
Alaska	400	-	-	-	-	-	3	3	403
Arizona	2,720	4	-	29	-	9	-	42	2,762
Arkansas	1,321	5	4	-	-	-	-	9	1,330
California	10,117	362	47	456	1,940	416	2,368	5,588	15,705
Colorado	666	3	10	-	-	11	1,063	1,087	1,753
Connecticut	122	166	-	-	-	-	-	166	287
Delaware	-	7	-	-	-	-	-	7	7
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	55	470	105	67	-	-	-	642	697
Georgia	2,034	7	-	4	-	-	-	11	2,045
Hawaii	18	-	46	-	31	1	64	142	161
Idaho	2,346	-	-	12	10	-	117	138	2,484
Illinois	34	150	-	-	-	-	962	1,112	1,145
Indiana	60	30	-	-	-	-	131	161	220
Iowa	142	11	-	-	-	-	2,635	2,646	2,788
Kansas	3	-	-	-	-	-	812	812	815
Kentucky	824	15	-	-	-	-	-	15	839
Louisiana	192	-	11	-	-	-	-	11	203
Maine	610	30	36	220	-	-	47	332	942
Maryland	590	126	-	-	-	-	-	126	716
Massachusetts	252	263	-	26	-	-	2	290	542
Michigan	246	102	-	178	-	-	124	404	650
Minnesota	164	126	55	121	-	-	1,460	1,762	1,926
Mississippi	-	-	-	-	-	-	-	-	-
Missouri	566	5	-	-	-	-	163	168	734
Montana	2,660	-	-	-	28	-	255	283	2,942
Nebraska	278	6	2	-	-	-	25	32	310
Nevada	1,051	-	-	-	215	88	-	303	1,354
New Hampshire	500	29	-	139	-	-	24	192	692
New Jersey	4	184	19	-	-	4	8	214	218
New Mexico	82	-	6	-	-	-	496	502	584
New York	4,284	307	-	87	-	-	707	1,101	5,384
North Carolina	1,947	20	-	75	-	3	-	99	2,046
North Dakota	486	-	-	-	-	-	776	776	1,262
Ohio	101	41	-	7	-	-	7	56	157
Oklahoma	851	-	-	-	-	-	708	708	1,559
Oregon	8,364	17	3	34	-	-	1,059	1,113	9,477
Pennsylvania	751	369	-	28	-	2	361	759	1,510
Rhode Island	3	24	-	-	-	-	-	24	26
South Carolina	1,336	26	-	-	-	-	-	26	1,361
South Dakota	1,463	-	-	-	-	-	193	193	1,656
Tennessee	2,639	8	2	-	-	-	29	39	2,678
Texas	673	73	13	50	-	-	7,427	7,562	8,235
Utah	256	5	-	-	34	-	19	57	313
Vermont	317	3	-	72	-	-	5	80	398
Virginia	674	194	-	83	-	-	-	277	951
Washington	21,198	36	-	86	-	1	1,365	1,487	22,685
West Virginia	163	-	-	-	-	-	330	330	493
Wisconsin	441	66	-	73	-	-	231	369	810
Wyoming	303	-	-	-	-	-	680	680	983
U.S. Total	77,575	3,288	357	1,846	2,256	535	24,651	32,933	110,508

¹Total capacity whose primary energy source is landfill gas or MSW.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass capacity removed tires from renewable waste energy.

The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.25 Renewable Commercial and Industrial Sector Net Summer Capacity by Energy Source and State, 2008
(Megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW ¹	Other Biomass ²						
Alabama	-	-	-	593	-	-	-	593	593
Alaska	-	-	-	-	-	-	-	-	-
Arizona	-	-	-	-	-	-	-	-	-
Arkansas	-	-	1	312	-	-	-	313	313
California	6	12	62	160	-	-	-	234	240
Colorado	-	-	-	-	-	-	-	-	-
Connecticut	-	-	-	-	-	-	-	-	-
Delaware	-	-	-	-	-	-	-	-	-
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	-	-	66	284	-	-	-	350	350
Georgia	7	3	-	587	-	-	-	590	597
Hawaii	5	60	3	-	-	-	-	63	68
Idaho	-	-	-	51	-	-	-	51	51
Illinois	-	-	-	-	-	-	-	-	-
Indiana	-	9	-	-	-	-	-	9	9
Iowa	-	-	3	-	-	-	-	3	3
Kansas	-	-	-	-	-	-	-	-	-
Kentucky	-	-	-	47	-	-	-	47	47
Louisiana	-	-	3	380	-	-	-	383	383
Maine	120	24	-	392	-	-	-	416	536
Maryland	-	7	-	3	-	-	-	9	9
Massachusetts	6	-	9	-	-	s	-	9	15
Michigan	4	67	-	52	-	-	-	119	122
Minnesota	30	4	-	49	-	-	-	53	83
Mississippi	-	-	-	229	-	-	-	229	229
Missouri	-	-	-	-	-	-	-	-	-
Montana	-	-	-	17	-	-	-	17	17
Nebraska	-	-	3	-	-	-	-	3	3
Nevada	-	-	-	-	-	1	-	1	1
New Hampshire	1	-	-	1	-	-	-	1	2
New Jersey	-	-	1	-	-	-	-	1	1
New Mexico	-	-	-	-	-	-	-	-	-
New York	15	33	-	-	-	-	-	33	49
North Carolina	5	-	-	243	-	-	-	243	248
North Dakota	-	-	10	-	-	-	-	10	10
Ohio	-	-	-	58	-	-	-	58	58
Oklahoma	-	16	-	63	-	-	-	78	78
Oregon	-	3	-	196	-	-	-	199	199
Pennsylvania	-	28	-	80	-	-	-	108	108
Rhode Island	-	-	-	-	-	-	-	-	-
South Carolina	1	10	-	220	-	-	-	230	231
South Dakota	-	-	-	-	-	-	-	-	-
Tennessee	-	-	-	165	-	-	-	165	165
Texas	-	-	16	130	-	-	-	145	145
Utah	-	-	-	-	-	-	-	-	-
Vermont	5	-	-	4	-	-	-	4	8
Virginia	3	76	-	339	-	-	-	415	417
Washington	5	-	-	228	-	-	-	228	233
West Virginia	101	-	-	-	-	-	-	-	101
Wisconsin	44	7	8	135	-	-	-	149	194
Wyoming	-	-	-	-	-	-	-	-	-
U.S. Total	356	357	184	5,018	-	1	-	5,560	5,916

¹Total capacity whose primary energy source is landfill gas or MSW.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

s = Less than 500 kilowatts.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass capacity removed tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.26 Total Renewable Net Summer Capacity by Energy Source and State, 2008

(Megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/PV	Wind	Total	
		Waste		Wood and Derived Fuels ³					
		Landfill Gas/MSW ¹	Other Biomass ²						
Alabama	3,272	-	-	593	-	-	-	593	3,865
Alaska	400	-	-	-	-	-	3	3	403
Arizona	2,720	4	-	29	-	9	-	42	2,762
Arkansas	1,321	5	5	312	-	-	-	322	1,643
California	10,122	374	109	616	1,940	416	2,368	5,822	15,945
Colorado	666	3	10	-	-	11	1,063	1,087	1,753
Connecticut	122	166	-	-	-	-	-	166	287
Delaware	-	7	-	-	-	-	-	7	7
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	55	470	171	351	-	-	-	992	1,046
Georgia	2,041	10	-	591	-	-	-	601	2,642
Hawaii	24	60	49	-	31	1	64	205	228
Idaho	2,346	-	-	63	10	-	117	189	2,535
Illinois	34	150	-	-	-	-	962	1,112	1,145
Indiana	60	39	-	-	-	-	131	170	229
Iowa	142	11	3	-	-	-	2,635	2,650	2,791
Kansas	3	-	-	-	-	-	812	812	815
Kentucky	824	15	-	47	-	-	-	63	886
Louisiana	192	-	14	380	-	-	-	394	586
Maine	730	53	36	612	-	-	47	748	1,478
Maryland	590	132	-	3	-	-	-	135	725
Massachusetts	258	263	9	26	-	s	2	299	557
Michigan	250	169	-	230	-	-	124	523	773
Minnesota	194	130	55	170	-	-	1,460	1,815	2,008
Mississippi	-	-	-	229	-	-	-	229	229
Missouri	566	5	-	-	-	-	163	168	734
Montana	2,660	-	-	17	28	-	255	300	2,960
Nebraska	278	6	5	-	-	-	25	35	313
Nevada	1,051	-	-	-	215	89	-	304	1,355
New Hampshire	500	29	-	140	-	-	24	193	694
New Jersey	4	184	20	-	-	4	8	215	219
New Mexico	82	-	6	-	-	-	496	502	584
New York	4,299	340	-	87	-	-	707	1,134	5,433
North Carolina	1,952	20	-	318	-	3	-	342	2,294
North Dakota	486	-	10	-	-	-	776	786	1,272
Ohio	101	41	-	65	-	-	7	113	214
Oklahoma	851	16	-	63	-	-	708	786	1,637
Oregon	8,364	20	3	230	-	-	1,059	1,312	9,676
Pennsylvania	751	397	-	108	-	2	361	868	1,619
Rhode Island	3	24	-	-	-	-	-	24	26
South Carolina	1,337	35	-	220	-	-	-	256	1,592
South Dakota	1,463	-	-	-	-	-	193	193	1,656
Tennessee	2,639	8	2	165	-	-	29	203	2,842
Texas	673	73	29	180	-	-	7,427	7,708	8,380
Utah	256	5	-	-	34	-	19	57	313
Vermont	322	3	-	76	-	-	5	84	406
Virginia	677	269	-	422	-	-	-	691	1,368
Washington	21,203	36	-	314	-	1	1,365	1,716	22,919
West Virginia	264	-	-	-	-	-	330	330	594
Wisconsin	485	72	8	208	-	-	231	518	1,003
Wyoming	303	-	-	-	-	-	680	680	983
U.S. Total	77,930	3,644	542	6,864	2,256	536	24,651	38,493	116,423

¹Total capacity whose primary energy source is landfill gas or MSW.

²Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.

³Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

s = Less than 500 kilowatts.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Revisions to biomass capacity removed tires from renewable waste energy.

Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.27 Renewable Market Share of Net Generation by State, 2007 and 2008

(Thousand Kilowatthours)

State	2007			2008		
	Total Generation	Percent Renewable	Percent NonHydro Renewable	Total Generation	Percent Renewable	Percent NonHydro Renewable
Alabama	143,826,271	5.5	2.6	145,869,895	6.5	2.3
Alaska	6,821,392	19.1	0.2	6,774,834	17.4	0.1
Arizona	113,340,970	5.9	*	119,459,172	6.2	0.1
Arkansas	54,596,236	8.9	3.0	55,050,528	11.2	2.7
California	210,847,581	24.7	11.8	207,984,263	23.5	11.9
Colorado	53,907,492	5.7	2.5	53,441,594	10.0	6.1
Connecticut	33,171,209	3.3	2.2	30,409,473	4.2	2.4
Delaware	8,534,163	0.6	0.6	7,523,839	2.2	2.2
District of Columbia	75,251	-	-	72,316	-	-
Florida	225,416,060	2.0	1.9	219,636,818	2.1	2.0
Georgia	145,155,158	3.9	2.4	136,173,395	3.6	2.0
Hawaii	11,533,350	7.3	6.5	11,376,385	7.6	6.8
Idaho	11,484,091	84.2	5.7	11,970,553	84.5	6.3
Illinois	200,260,681	0.7	0.6	199,475,178	1.6	1.5
Indiana	130,637,999	0.5	0.2	129,510,294	0.7	0.4
Iowa	49,789,217	7.8	5.8	53,086,786	9.6	8.0
Kansas	50,122,196	2.3	2.3	46,630,321	3.8	3.8
Kentucky	97,225,319	2.2	0.5	97,863,340	2.4	0.5
Louisiana	92,578,329	4.1	3.2	92,453,141	4.1	2.9
Maine	16,128,567	49.3	26.1	17,094,919	49.8	23.7
Maryland	50,197,924	4.5	1.2	47,360,953	5.5	1.3
Massachusetts	47,075,975	4.3	2.6	42,505,478	5.7	3.0
Michigan	119,309,936	3.1	2.0	114,989,806	3.4	2.3
Minnesota	54,477,646	8.4	7.2	54,763,360	12.0	10.7
Mississippi	50,043,686	3.0	3.0	48,205,711	2.9	2.9
Missouri	91,153,081	1.4	*	91,028,795	2.5	0.3
Montana	28,931,493	34.5	2.1	29,637,137	36.5	2.8
Nebraska	32,442,699	1.9	0.9	32,373,522	1.9	0.8
Nevada	32,669,736	10.1	4.0	35,089,974	9.4	4.4
New Hampshire	23,277,171	10.3	4.8	22,876,992	12.3	5.1
New Jersey	62,671,245	1.4	1.3	63,674,789	1.5	1.4
New Mexico	35,985,333	4.7	3.9	37,009,837	5.3	4.5
New York	145,878,687	19.2	1.9	140,322,100	21.4	2.4
North Carolina	130,115,301	3.6	1.3	125,239,063	4.0	1.5
North Dakota	31,224,105	6.2	2.0	32,734,579	9.0	5.2
Ohio	155,155,545	0.5	0.3	153,412,251	0.7	0.4
Oklahoma	72,819,095	7.1	2.9	76,328,908	8.3	3.3
Oregon	55,077,794	65.0	4.0	58,718,438	63.4	5.8
Pennsylvania	226,088,340	2.1	1.1	222,350,925	2.4	1.3
Rhode Island	7,049,844	2.3	2.2	7,387,266	2.2	2.1
South Carolina	103,402,142	3.4	1.9	100,978,005	2.9	1.8
South Dakota	6,136,605	50.0	2.4	7,082,672	44.3	2.1
Tennessee	95,113,409	6.2	1.0	90,663,312	7.3	1.1
Texas	405,492,296	2.9	2.5	404,787,781	4.6	4.4
Utah	45,372,575	1.6	0.4	46,578,763	2.1	0.6
Vermont	5,823,582	19.1	8.0	6,820,216	28.1	6.2
Virginia	78,360,507	4.9	3.3	72,678,531	5.1	3.7
Washington	106,990,217	77.2	3.5	110,828,451	74.5	4.5
West Virginia	93,933,109	1.5	0.2	91,123,097	1.8	0.4
Wisconsin	63,390,630	4.5	2.1	63,479,555	5.3	2.8
Wyoming	45,633,486	3.3	1.7	46,500,448	3.9	2.1
U.S. Total	4,156,744,724	8.5	2.5	4,119,387,760	9.3	3.1

* = Less than 0.05 percent.

- = No data reported.

Note: Totals may not equal sum of components due to independent rounding.

Source: Electric Power: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."

Table 1.28 Renewable Portfolio Standards and State Mandates by State, 2008

State	RPS or Mandate
Alabama	-
Alaska	-
Arizona	X
Arkansas	-
California	X
Colorado	X
Connecticut	X
Delaware	X
District of Columbia	X
Florida ¹	X
Georgia	-
Hawaii	X
Idaho	-
Illinois	X
Indiana	-
Iowa	X
Kansas	X
Kentucky	-
Louisiana	-
Maine	X
Maryland	X
Massachusetts	X
Michigan	X
Minnesota	X
Mississippi	-
Missouri	X
Montana	X
Nebraska	-
Nevada	X
New Hampshire	X
New Jersey	X
New Mexico	X
New York	X
North Carolina	X
North Dakota	X
Ohio	X
Oklahoma	-
Oregon	X
Pennsylvania	X
Rhode Island	X
South Carolina	-
South Dakota	X
Tennessee	-
Texas	X
Utah	X
Vermont	X
Virginia	X
Washington	X
West Virginia ²	X
Wisconsin	X
Wyoming	-

¹In Florida the RPS is not statewide.

²West Virginia has an Alternative and Renewable Energy Portfolio Standard and does not require a minimum contribution from renewable energy.

- = No RPS or state mandate for that state.

Note: In some states, including North Dakota, South Dakota, Vermont and Virginia, the renewable portfolio standard (RPS) is voluntary.

Source: North Carolina Solar Center, Database of State Incentives for Renewable Energy (DSIRE) website: <http://www.dsireusa.org> (January 4, 2010).

Table 1.A1 Other Non-Renewable Energy Consumption by Energy Use Sector and Energy Source, 2004 - 2008
(Quadrillion Btu)

Sector and Source	2004	2005	2006	2007	2008
Total	0.273	0.259	0.259	0.276	0.245
Commercial	0.021	0.020	0.021	0.017	0.021
MSW Non-Biogenic ¹	0.021	0.020	0.020	0.017	0.021
Other Non-Biogenic ²	0.001	*	*	0.001	*
Industrial	0.113	0.116	0.114	0.135	0.096
MSW Non-Biogenic ¹	0.005	0.005	0.005	0.004	0.002
Other Non-Biogenic ²	0.109	0.110	0.109	0.130	0.094
Electric Power ³	0.138	0.123	0.125	0.124	0.128
MSW Non-Biogenic ¹	0.109	0.107	0.109	0.108	0.110
Other Non-Biogenic ²	0.029	0.016	0.015	0.016	0.018

¹Includes glass, steel, aluminum, other nonferrous metals, plastic, rubber, other materials, and miscellaneous inorganic wastes.

²Tires and other (nonspecified).

³The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

MSW = Municipal Solid Waste.

* = Less than 500 billion Btu.

Note: Details of EIA's analysis that revised MSW consumption are found in the U.S. Energy Information Administration (EIA) report, Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy (Washington, DC, May 2007). After 2003 small amounts of other non-renewable energy consumption in the industrial sector for certain plants, including those that capture energy from exothermic chemical and manufacturing processes, are no longer included due to a change in EIA survey reporting requirements.

Sources: Analysis conducted by U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels and the following specific sources:

U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."

Table 1.A2 Other Non-Renewable Net Electricity Generation by Energy Use Sector and Energy Source, 2004 - 2008
(Thousand Kilowatthours)

Sector and Source	2004	2005	2006	2007	2008
Total	14,232,401	12,821,059	12,974,399	12,231,131	11,692,294
Commercial	780,803	755,987	758,464	764,083	719,532
MSW Non-Biogenic ¹	773,464	748,861	751,077	756,260	715,716
Other Non-Biogenic ²	7,340	7,126	7,388	7,823	3,815
Industrial	5,129,158	5,136,905	5,103,173	4,690,087	4,124,817
MSW Non-Biogenic ¹	24,722	27,059	27,138	31,258	-
Other Non-Biogenic ²	5,104,436	5,109,845	5,076,035	4,658,829	4,124,817
Electric Power ³	8,322,440	6,928,167	7,112,762	6,776,960	6,847,945
MSW Non-Biogenic ¹	5,870,804	5,769,465	5,882,743	5,736,991	5,646,076
Other Non-Biogenic ²	2,451,636	1,158,702	1,230,019	1,039,970	1,201,869

¹Includes glass, steel, aluminum, other nonferrous metals, plastic, rubber, other materials, and miscellaneous inorganic wastes.

²Tires and other (nonspecified).

³The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.

MSW = Municipal Solid Waste.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding.

Details of EIA's analysis that revised MSW consumption are found in the U.S. Energy Information Administration (EIA) report, Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy (Washington, DC, May 2007).

Sources: Analysis conducted by U.S. Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels and the following specific sources:

U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."