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Administration

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# Trends in Renewable Energy Consumption and Electricity 2010

August 2012



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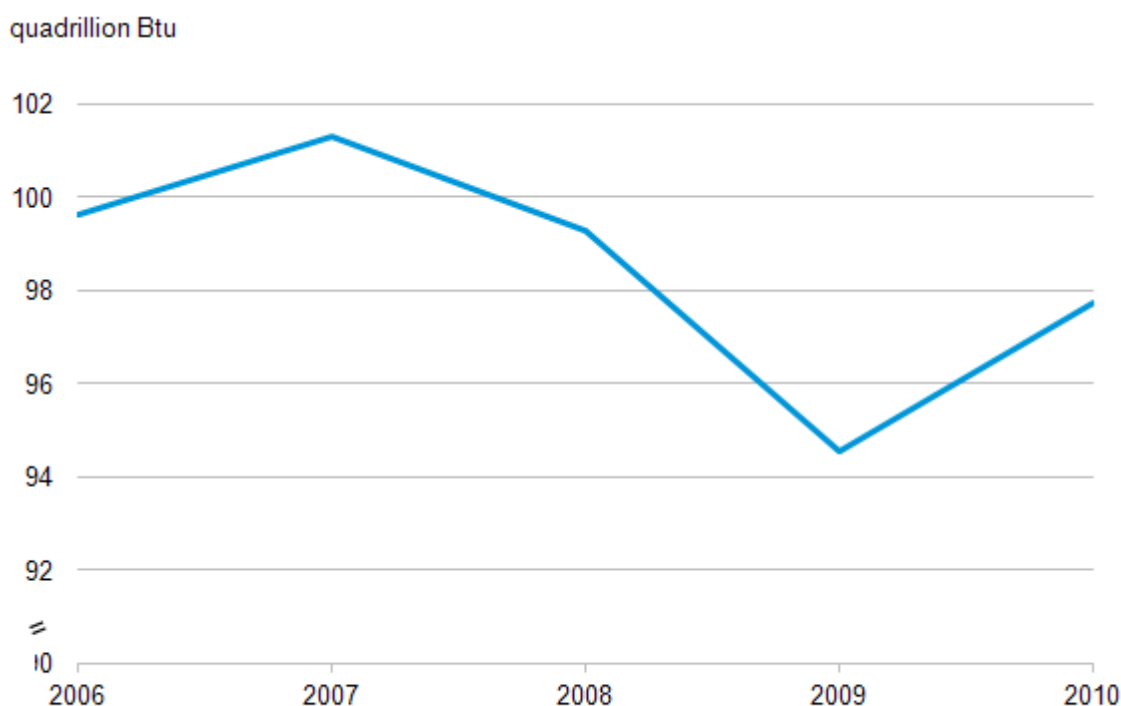
## Summary

Despite an economic recession and a significant fall in overall energy demand/consumption, the use of renewable fuels grew strongly in 2009. This growth has been supported by Federal and State programs, including federal tax credits, state renewable portfolio standards, and a federal renewable fuels standard. This chapter details renewable energy consumption in 2009 after explaining the unusual decrease in total energy consumption over the past two years.

### Total U.S. Energy Consumption

U.S. energy consumption declined for the second year in a row in 2009, falling 4.8 percent between 2008 and 2009 to 94.6 quadrillion British Thermal Units (Btus) (Table 1, Figure 1.1). This follows a 2.1-percent decline between 2007 and 2008. As a result, total energy consumption in 2009 dropped to its lowest level since 1996.<sup>1</sup>

**Figure 1. U.S. energy consumption, 2006-2010**



Source: U.S. Energy Information Administration

This is just the third time since 1949 that energy consumption has declined for two or more consecutive years. It declined between 1973 and 1974 and again in 1975. However, consumption rebounded in 1976 above the 1973 level. The longest and steepest decline occurred between 1979 and 1983, when total energy consumption dropped 9.7 percent and it did not reach the 1979 level again until 1988.

<sup>1</sup> U.S. Energy Information Administration, Annual Energy Review 2009, Table 1.1

In both of these earlier periods, oil prices that rose steeply and remained at high levels were a major factor in slowing down the economy and hence reducing energy consumption. This time, there has been no steep oil price increase that resulted in permanently higher oil prices; the average annual price per barrel of crude oil was \$60 in 2006, \$67 in 2007, \$94 in 2008, and \$56 in 2009.<sup>2</sup> Instead, the economy slowed down mainly due to factors outside the energy sector.

Consumption of all major fuels declined between 2008 and 2009, except for renewables. Coal dropped the most, falling 12 percent, while petroleum consumption fell nearly 5 percent, and natural gas consumption fell 2 percent. Even nuclear fuel consumption fell by nearly 1 percent. The decline in all of these sources of energy masks the switching of coal to natural gas for electricity generation due to low natural gas prices.

By sector, energy consumption dropped most in the industrial area (10.1 percent), followed by electric power (4.5 percent) and then transportation (3.5 percent).<sup>3</sup> The residential and commercial sectors each experienced declines of under 2 percent.

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<sup>2</sup> U.S. Energy Information Administration, Monthly Energy Review, November 2010, Table 9.1. Prices shown reflect the crude oil domestic "first purchase" price.

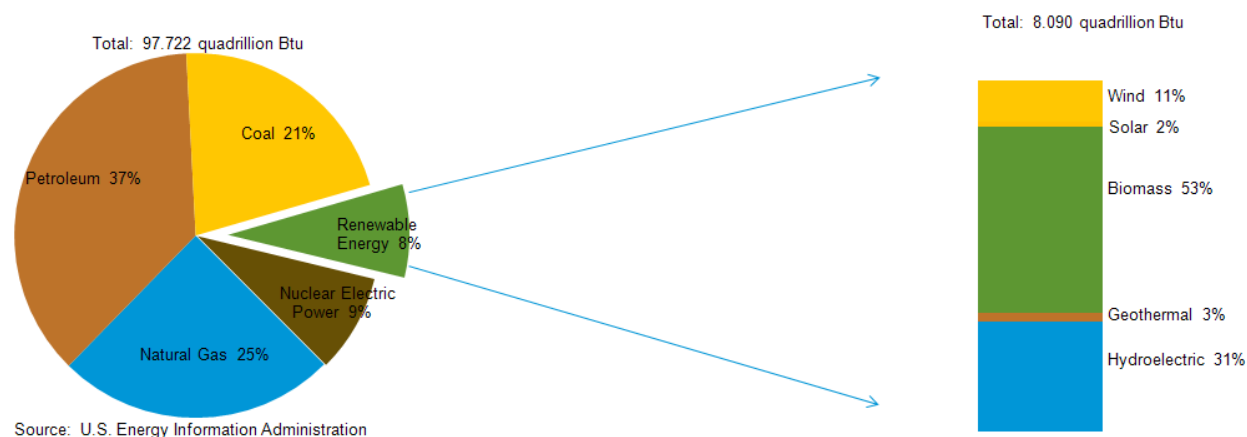
<sup>3</sup> U.S. Energy Information Administration, Annual Energy Review 2009, Table 2.1a.

## U.S Renewable Energy Consumption

### Total Consumption

Against this backdrop, it is noteworthy that renewable energy consumption increased by 5.4 percent in 2009 to 7.8 quadrillion Btus (Figure 1.2). This follows a 9.6-percent increase between 2007 and 2008. These two increases, coupled with the consecutive year decreases in total energy consumption, boosted renewable energy's share of total consumption from 6.6 percent in 2007 to 8.2 percent in 2009. This is renewable energy's greatest share of the U.S. energy pie since 1984 when there were near record levels of hydropower.<sup>4</sup>

**Figure 2. Renewable energy consumption in the nation's energy supply, 2010**



Wind energy grew 32 percent and has more than doubled since 2007, standing at 0.7 quadrillion Btus in 2009. While the gain in 2009 was strong, capacity additions and output might have been greater still except for the collapse of natural gas prices, which made lower capital cost natural gas-fired capacity more attractive than wind. Solar energy followed a pattern similar to that of wind energy for similar reasons. Consumption in 2009 jumped by 10 percent from 2008, about 60 percent of the rate of increase for the prior year. Biomass also grew just 1 percent between 2008 and 2009, when there was a 14 percent gain in biofuels (ethanol and biodiesel) consumption and an 8 percent decrease in wood and derived fuels consumption.

Hydropower consumption grew 6.3 percent in 2009, but even with the growth over the past 2 years, at 2.7 quadrillion Btus in 2009 hydropower energy consumption is still under the 30-year average of 2.9 quadrillion Btus.<sup>5</sup> This reflects the extended drought in the western United States.<sup>6</sup>

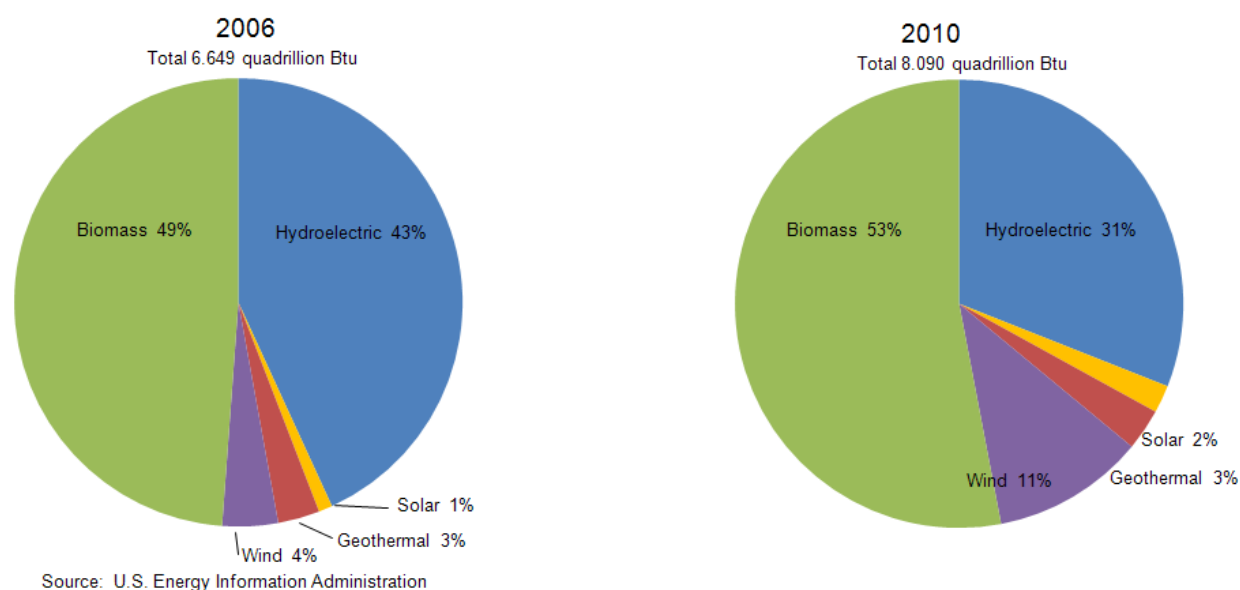
<sup>4</sup> The reason the share was so high in 1984 was that in the relatively wet years of the mid-1980s, hydropower output was around the same levels that it was in the late 1990s. U.S. Energy Information Administration, Annual Energy Review 2009, Table 10.1.

<sup>5</sup> The 30-year average is based on the period 1980 – 2009.

<sup>6</sup> Weather Warehouse, <http://weather-warehouse.com/?gclid=CO3K3-LxnqYCFcNM4AodVTSynw>.

The transformation in the mix of renewable energy provided between 2005 and 2009 is quite remarkable. Wind has come from a relatively minor renewable energy source to accounting for nearly 10 percent of total renewable energy consumption (Figure 1.3). Hydropower has dropped considerably, from 42 percent of renewable energy consumption in 2005 to 34 percent today, and biomass now represents over half of renewable energy consumption, the result of increased biofuel production.<sup>7</sup> Solar and geothermal shares remain relatively unchanged.

**Figure 3. Renewable energy consumption by energy source**



The continued growth of renewable energy is linked to various financial incentives and mandates.<sup>8</sup> Currently, 37 states and the District of Columbia have some sort of renewable mandates or "renewable portfolio standard," which requires electricity providers to produce or acquire a certain share of electricity from renewable energy sources (Table 1.28).<sup>9</sup> In 6 states, however, these standards are voluntary.

### Consumption by End-Use Sector

By sector, the greatest change in recent composition of renewable energy has occurred in transportation. Due to the growth in biofuels, transportation now consumes nearly 12 percent of renewable energy, compared with just over 5 percent in 2005 (Table 1.2). The shares of renewables in all other sectors have declined. It may seem strange that the electric power sector's share of renewable energy has decreased from 56 to 53 percent between 2005 and 2009, given the emphasis on renewables and the surge in wind generation. However, the energy source with the largest contribution to renewable electricity is hydropower—accounting for over 60 percent of renewable energy used to generate electricity. Its output fell slightly between 2005 and 2009, while most other renewable energy

<sup>7</sup> Hydropower's share declined because output remained static in the face of increasing overall renewable energy consumption.

<sup>8</sup> U.S. Energy Information Administration, Annual Energy Outlook 2011, Executive Summary.

<sup>9</sup> See the Database for State Incentives for Renewables and Efficiency, [www.dsireusa.org](http://www.dsireusa.org), for a description of each state's renewable portfolio standard or mandate.

sources increased (Table 1.3). As a result its share of increasing renewable energy consumption has declined, thus decreasing the electric power sector's contribution to total renewable energy. Other relevant factors contributing to the electric power sector's decreased contribution to total renewable energy probably include low natural gas prices and the focus on investment in wind plants with low (about 35%) capacity factors. Nonetheless, the electric power sector still consumed the majority--53 percent--of total renewable energy in 2009.

The industrial sector's share of renewable energy consumption has also declined. Consumption of wood and derived fuels, the largest renewable fuel in the industrial sector (about 60 percent in 2009), has declined since 2005. In 2009, the industrial sector consumed 26 percent of total renewable energy.

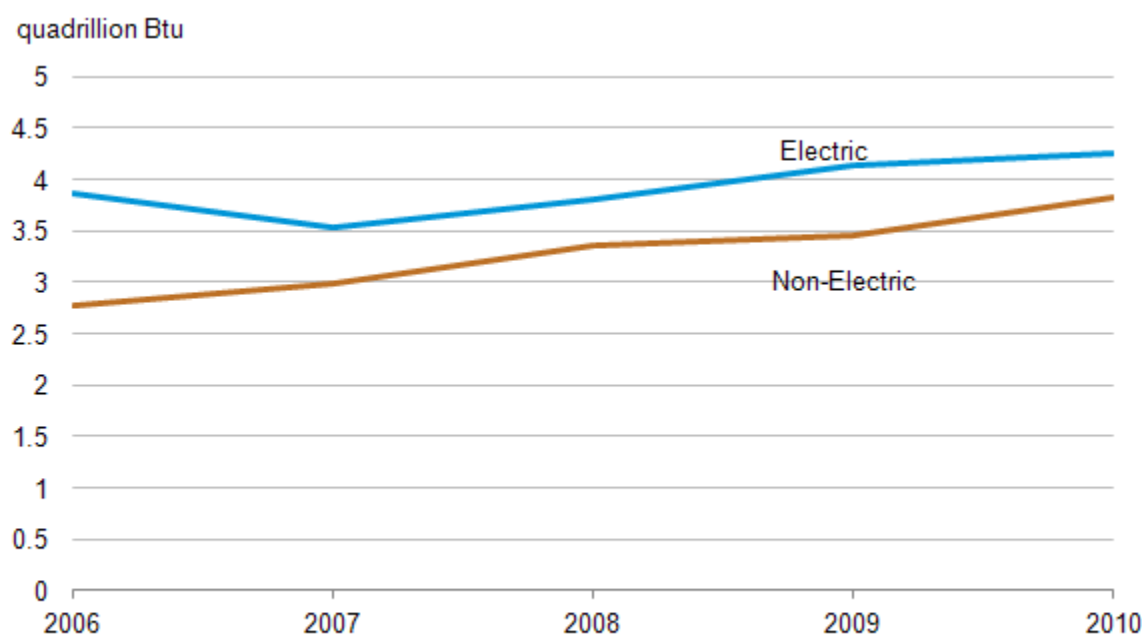
The residential and commercial sectors used 7.1 and 1.7 percent of total renewable energy in 2009, respectively. Geothermal energy consumed by the residential sector, though small, continues to grow, reflecting the increased use of geothermal heat pumps. Although commercial sector renewable energy consumption appears to be static, there have been many commercial photovoltaic rooftop projects of 1 megawatt (MW) or more placed into service over the past two years (especially in California).<sup>10</sup> Beginning with data collected for 2010, the Energy Information Administration's (EIA's) electricity data forms will collect information to enable EIA to estimate commercial sector solar consumption.

## Consumption by Use

Electricity generation accounted for 56 percent of renewable energy consumed in 2009, compared with 59 percent in 2005 (Table 1.2 and Table 1.3). The decreased share is due to the rapid increase in biomass used to produce biofuels (Figure 1.4).

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<sup>10</sup> Data for some commercial PV rooftop projects greater than 1 MW were not available as of the time of this writing.

**Figure 4. Renewable energy consumption by end-use, 2006-2010**

Source: U.S. Energy Information Administration

Even though the electric power sector has always consumed the vast majority of renewable energy for electricity, that percentage has increased in recent years, rising from 93 percent of renewable energy for electricity generation in 2005 to 95 percent in 2009. This is due to wind energy's rapid rise and use almost entirely within the electric power sector, coupled with slowly decreased electrical output in the industrial sector using biomass. Older paper and pulp plants are sometimes closing rather than refurbishing due to environmental regulations.<sup>11</sup> Others have chosen to upgrade, while still others are converting to merchant biomass facilities.<sup>12</sup> While some are refurbishing to produce electricity, others plan to become bio-refineries with no electricity output.<sup>13</sup>

Renewable energy for non-electric purposes increased by a net of 0.8 quadrillion Btus between 2005 and 2009. All of the increase was due to biofuels; the energy content of ethanol produced rose 0.6 quadrillion Btus, and another 0.4-quadrillion Btus increase was required by the industrial sector to produce biofuels. Biomass consumed for other non-electric purposes, principally process heat at paper and pulp plants, actually decreased by 0.2 quadrillion Btus between 2005 and 2009. Residential solar energy, though small, has increased consistently since 2005 but still represents less than 0.1 quadrillion Btus.

<sup>11</sup> See [http://www.iaes.org/conferences/future/philadelphia\\_52/prelim\\_program/k10-1/shadbegian-akofio.htm](http://www.iaes.org/conferences/future/philadelphia_52/prelim_program/k10-1/shadbegian-akofio.htm).

<sup>12</sup> For a comprehensive overview of the paper and pulp industry and the energy/environment issues it faces, see U.S. Department of Energy, Energy and Environmental Profile of the Pulp and Paper Industry, December 2005.

<sup>13</sup> An example of paper pulp mills converting to biorefineries may be found at <http://www.environmentalleader.com/2010/02/22/pulp-mills-invest-in-energy-efficiency-biorefinery-projects/>. Although the projects discussed are Canadian, the pulp and paper industry is essentially the same across North America.

## Long-term Historical View of Renewable Energy Consumption

Tables 1.5a and 1.5b present renewable energy consumption from 1989 through 2009. The beginning year 1989 was chosen because that was the first year that EIA began surveying "non-utilities" for electricity information. Some points worth noting are:

- Waste energy appears to have declined substantially in 2001.<sup>14</sup> This is an artifact of EIA's decision to split municipal solid waste (MSW) data into two components beginning in 2001, biogenic (renewable) and nonbiogenic (non-renewable), as well as remove tire-derived fuels from renewables. If non-biogenic MSW data is added to the 2002 waste values shown in Table 1.5b, the waste series increases between 2001 and 2002 (Table 1.A1).<sup>15</sup> Waste energy increased steadily except during 1996-2000. During that period, some mass-burn MSW plants ceased operating, and landfill gas (LFG) use for energy was minimal.
- Residential renewable energy decreased from 1.0 quadrillion Btus in 1989 to 0.4 quadrillion Btu in 2002 before beginning to increase steadily through 2009. This reflects decreased wood use throughout the time period and increased photovoltaic rooftop installations during the past decade.<sup>16</sup>
- Increases in biomass for biofuels have essentially offset decreases in wood and derived fuel use in the industrial sector.
- Hydropower average output from 1989-1999 was over 0.5 quadrillion Btus greater than from 2001-2009.
- Wind increased seven-fold from less than 0.1 quadrillion Btus in 1989 to 0.7 quadrillion Btus in 2009.

## Biomass Overview

### *Biofuels*

The total energy consumed in producing ethanol and biodiesel during 2009 was 1.6 quadrillion Btus (Table 1.6). Of that amount, 1.0 quadrillion Btus represents the energy value of biofuels consumed.<sup>17</sup> The remaining 0.6 quadrillion Btus represents the energy used to produce biofuels, losses and coproducts, and the denaturant added to ethanol. The apparent major decrease between 2008 and 2009 in biofuels consumed for biodiesel is due to counting "splash and dash" biodiesel "production" as U.S. consumption in 2008 rather than as exports.<sup>18</sup>

<sup>14</sup> Waste energy includes MSW, LFG, sludge waste from wastewater treatment plants, food processing wastes, and other minor biomass wastes used to produce energy.

<sup>15</sup> See also U.S. Energy Information Administration, "Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy," May 2007.

<sup>16</sup> As mentioned previously, some of the residential energy consumption may actually belong to the commercial or other sectors.

<sup>17</sup> See Table 1.10 for information on the heat content of various biomass fuels.

<sup>18</sup> Prior to 2009, U.S. law made eligible for the \$1.00-per-gallon blenders tax credit any pure biodiesel that was imported, "splash"-blended with conventional diesel, then re-exported. With European subsidies encouraging the use of biodiesel, this import/re-export process surged in 2008. Subsequently, U.S. law changed to make such "production" ineligible for the blenders tax credit.

### *Waste Energy*

Most biomass waste was consumed by the industrial sector and by independent power producers (IPPs) in 2009 (Table 1.7). IPPs operate almost all of the MSW energy facilities, while the industrial sector and IPPs operate most LFG facilities. Other biomass waste (mostly food waste and wastewater treatment facilities) are largely in the industrial sector.

### *Industrial Biomass Energy*

The industrial sector used 2.0 quadrillion Btus of biomass in 2009 to produce 25 billion kilowatt-hours (kWh) of electricity (Table 1.8). Around 90 percent of biomass energy went for useful thermal output (e.g., process heat and steam, space heating). Paper and allied products companies consumed about half of industrial sector biomass and generated 94 percent of its electricity. A decade ago, this sector consumed nearly 70 percent of industrial biomass. The main reason for the decline has been the introduction of bio-refineries, whose consumption has surged during the past 5 years.

### *Biomass/Coal Cofiring*

Sixty-seven plants reported in 2009 that they had the capability to cofire biomass with coal. These plants had a cofiring capacity of over 4,400 MW (Table 1.9). This is a substantial jump from 3,800 MW in 2008. Wisconsin led the nation with the most plants—13--having 448 MW capacity.<sup>19</sup>

## Renewable Electricity

### *U.S. Generation*

Renewable electricity generation increased 9.7 percent in 2009, led by a one-third increase in wind and a 7.3 percent increase in hydropower (Table 1.11). Even in absolute terms, wind-generated electricity accounted for almost as many kWh of increased generation as did hydropower. Generation from LFG increased 10.7 percent, while electricity from wood and derived fuels dropped 3.4 percent.

The decline in biomass power is consistent with the decrease in consumption data, owing to the status of the domestic pulp and paper business discussed earlier. Wind power appeared in the commercial sector for the first time in 2009 at a wastewater treatment plant in Massachusetts.<sup>20</sup>

### *U.S. Capacity<sup>21</sup>*

Renewable electricity capacity rose by 10.7 gigawatts (GW) in 2009 to 127.1 GW, up 9.2 percent from 2008 (Table 1.12).<sup>22</sup> By comparison, total U.S. electricity capacity rose only 1.5 percent, or 15.2 GW. Of the 10.7 GW renewable capacity increase, 9.6 GW came from wind.

### *Regional Electricity Generation*

The Pacific Contiguous Census Division (PC), California, Washington, and Oregon, leads the Nation in producing renewable electricity, with 40 percent of the total in 2009 (Table 1.13 and Figure 1.5). Nearly 80 percent of the PC Census Division's 169 billion kilowatthours of renewable electricity generation came from hydropower electricity. Also, the PC division produced over 85 percent of the Nation's

<sup>19</sup> Kentucky however, had more cofiring capacity in 2009, 536 MW, but only at a single plant.

<sup>20</sup> See <http://www.mwra.state.ma.us/03sewer/html/renewableenergydi.htm>.

<sup>21</sup> The capacity data refer to net summer capacity.

<sup>22</sup> 1 Gigawatt = 1,000 megawatts.

geothermal power and provided 8 percent of the PC division's renewable energy. Nonhydroelectric generation increased almost as much as hydroelectric generation between 2008 and 2009, but from a smaller base.<sup>23</sup> The largest increases were for wind generation in the West North Central and West South Central Census Divisions.

Excluding hydropower, the distribution of renewable generation was much more even. While the PC division still led, its share was only 24 percent, and several regions were close behind: West South Central (WSC, 19 percent) and West North Central (WNC, 15 percent). The latter two regions have substantial wind power. In fact, WSC led among all regions in wind power during 2009 (23 gWh), followed by WNC (20 gWh).

Generation from wood and derived fuels is fairly well spread out across many regions. LFG and MSW, however, are largely concentrated in 3 regions each. Both fuels have substantial generation in the Middle Atlantic region, while LFG has sizable generation in the East North Central and PC regions, and MSW has sizable output in New England and the South Atlantic. The concentration of MSW and LFG in these regions probably has more to do with state policies regarding trash management and trash disposal cost than with resource availability. State renewables data shown in Table 1.20, discussed later, indicates that MSW/LFG generation in 4 of the above-mentioned regions is highly concentrated in a single state—California (PC), Massachusetts (New England), New York (Middle Atlantic), and Florida (South Atlantic).

Table 1.14 shows biomass electricity generation by energy source and Census Division. Black liquor and wood waste solids, primarily in the South, provided 66 percent of biomass electricity generation.

## State Electricity Generation

Washington, California, and Oregon were the three leading states generating renewable electricity within the electric power sector in 2009 (Table 1.18). Combined, they produced 43 percent of the Nation's renewable electric power sector generation. This is a decreased concentration from 2008, when these 3 states produced 47 percent of the electric power sector's renewable electricity (Table 1.15). The states with the greatest increases in hydropower between 2008 and 2009 were 3 southern states—Alabama, Tennessee, and North Carolina—as well as California.

Excluding hydropower, however, the picture changes. California, Texas, and Minnesota were the leading states for electric power sector non-hydro renewable generation, accounting for 47 percent in 2008. In 2009, however, Iowa replaced Minnesota as the third-largest non-hydro renewable generator in the electric power sector, due to a major increase in wind generation. The 3 largest states' share of non-hydro renewables declined to 45 percent. The decreased 2009 share represents an increase in the diversity of wind power, dominated by Texas, Iowa, California, and Minnesota (50 percent). Generation from wood and derived fuels continues to be diverse state-wise, but the southern United States accounts for nearly half of generation from these sources.<sup>24</sup>

<sup>23</sup> U.S. Energy Information Administration, Renewable Energy Annual 2008, Table 1.13.

<sup>24</sup> The "Southern United States" includes states in the East South Central and South Atlantic Census divisions, plus Virginia.

Generation from the industrial and commercial sectors is tiny compared to the electric power sector--about 8 percent in 2008 and 7 percent in 2009 (Tables 1.16 and 1.19, respectively). While no state dominates generation in these sectors, six of the top seven States are in the southeastern region of the United States. The other state, Maine, consumed a relatively large amount of wood for industrial and commercial electricity generation. It also has a large portion of the Nation's commercial hydropower generation (39 percent in 2009).

All sectors combined, the generation picture is quite similar to the dominant electric power sector, except that the concentration of non-hydro renewables is not quite as great (35 percent in 2009, Table 1.20).

### State Electricity Capacity

Tables 1.21 through 1.23 present renewable energy capacity by sector and state for 2008, while Tables 1.24 through 1.26 do so for 2009. Texas led the Nation in increased renewables capacity, adding 1,974 MW between 2008 and 2009. Most of this was increased wind capacity, 1,951 MW, which led all states by a wide margin. The data indicates that Idaho added 336 MW of hydropower, but this was an up-rating of existing capacity due to increased water levels.

### Renewable Electricity Market Share

Idaho, Washington, Oregon, and South Dakota had the greatest market share of total renewable electricity generation in 2009 (Table 1.27). All generated over half of total electricity from renewables. In each case, the vast majority of renewable generation came from hydropower. Excluding hydropower, Maine, Iowa, California, and Minnesota had the greatest renewable electricity market shares, all exceeding 10 percent. Maine's renewable electricity is largely wood-based. Iowa and Minnesota rely mainly on wind, while California has a diversity of non-hydro renewable sources. The shares for Iowa and, to a lesser extent, Minnesota, rose sizably from 2008 due to increased wind penetration.

### Other Non-Renewable Energy: Classification Change for Certain Biomass Fuels

Until 2007, EIA included classified all MSW energy as renewable, as well as tire-derived fuel (TDF). Beginning with EIA's 2006 data reporting, however, renewables include only the biogenic portion of MSW and categorize TDF as non-renewable. Appendix Tables 1. A1 and 1.A2 show the energy consumption and electricity generation associated with non-biogenic MSW, TDF, and other minor fuels specified in those tables.<sup>25</sup>

### Data Revisions

Residential solar energy consumption was revised downward for 1989-2009 to account for losses in roof top PV installations when converting from DC to AC electric power. Geothermal energy in the electric power sector was revised downward due to a misclassification of some geothermal facilities in Montana as geothermal when they were consuming waste heat. As a result, geothermal electric capacity was revised downward slightly for 2008 and 2009. Geothermal electric generation and consumption were revised downwards for 2008, while electric power sector other non-biogenic generation and consumption were revised upwards.

<sup>25</sup> Data from 2001 through 2005 were revised to reflect this reclassification.

**Table 1. U.S. energy consumption by energy source, 2006 – 2010**

(quadrillion Btu)

Energy Source <sup>1</sup>	2006	2007	2008	2009	2010
Total	<sup>R</sup> 99.629	<sup>R</sup> 101.296	<sup>R</sup> 99.275	<sup>R</sup> 94.559	97.722
Fossil Fuels	<sup>R</sup> 84.702	<sup>R</sup> 86.211	<sup>R</sup> 83.549	<sup>R</sup> 78.488	81.109
Coal	22.447	22.749	22.385	19.692	20.850
Coal Coke Net Imports	0.061	0.025	0.041	-0.024	-0.006
Natural Gas <sup>2</sup>	<sup>R</sup> 22.239	<sup>R</sup> 23.663	<sup>R</sup> 23.843	<sup>R</sup> 23.416	24.256
Petroleum <sup>3</sup>	39.955	39.774	37.280	35.403	36.010
Electricity Net Imports	0.063	<sup>R</sup> 0.107	0.112	0.116	0.089
Nuclear Electric Power	8.215	8.455	8.427	8.356	8.434
Renewable Energy	6.649	6.523	<sup>R</sup> 7.186	<sup>R</sup> 7.600	8.090
Biomass <sup>4</sup>	3.267	3.474	3.849	<sup>R</sup> 3.912	4.294
Biofuels	0.771	0.991	1.372	<sup>R</sup> 1.568	1.837
Waste	0.397	0.413	0.436	0.453	0.469
Wood and Derived Fuels	2.099	2.070	2.040	1.891	1.988
Geothermal Energy	0.181	0.186	0.192	0.200	0.208
Hydroelectric Conventional	2.869	2.446	<sup>R</sup> 2.511	2.669	2.539
Solar Thermal/PV Energy	0.068	0.076	0.089	0.098	0.126
Wind Energy	0.264	0.341	0.546	0.721	0.923

<sup>1</sup>Biodiesel primarily derived from soybean oil and ethanol primarily derived from corn.<sup>2</sup>Includes supplemental gaseous fuels.<sup>3</sup>Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.<sup>4</sup>Biomass includes: biofuels, waste (landfill gas, MSW biogenic, and other biomass), wood and wood-derived fuels.

PV = Photovoltaic. R=Revised.

Notes: 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) July 2012, DOE/EIA-0035 (2012/07) (Washington, DC, July 2012), Tables 1.3, 1.4a and 1.4b; Renewable Energy: Table 2 of this report.

**Table 2. Renewable energy consumption by energy use sector and energy source, 2006 – 2010**

(quadrillion Btu)

Sector and Source	2006	2007	2008	2009	2010
Total	6.649	6.523	R7.186	R7.600	8.090
Biomass	3.267	3.474	3.849	R3.912	4.294
Biofuels	0.771	0.991	1.372	R1.568	1.837
Biodiesel <sup>1</sup>	0.033	0.046	0.040	R0.042	0.034
Ethanol <sup>2</sup>	0.453	0.569	0.800	0.910	1.061
Losses and Co-products	0.285	0.377	0.532	0.617	0.742
Biodiesel Feedstock <sup>3</sup>	*	0.001	0.001	0.001	0.001
Ethanol Feedstock <sup>4</sup>	0.285	0.376	0.531	0.616	0.741
Waste	0.397	0.413	0.436	0.453	0.469
Landfill Gas	0.157	0.173	0.187	0.204	0.213
MSW Biogenic <sup>5</sup>	0.171	0.165	0.169	0.168	0.165
Other Biomass <sup>6</sup>	0.069	0.075	0.080	0.080	0.091
Wood and Derived Fuels <sup>7</sup>	2.099	2.070	2.040	1.891	1.988
Geothermal	0.181	0.186	0.192	0.200	0.208
Hydroelectric Conventional	2.869	2.446	R2.511	2.669	2.539
Solar Thermal/PV	0.068	0.076	0.089	0.098	0.126
Wind	0.264	0.341	0.546	0.721	0.923
Residential	0.462	0.502	0.557	0.552	0.571
Biomass	0.380	0.410	0.450	0.430	0.420
Wood and Derived Fuels <sup>8</sup>	0.380	0.410	0.450	0.430	0.420
Geothermal	0.018	0.022	0.026	0.033	0.037
Solar Thermal/PV <sup>9</sup>	0.063	0.070	0.080	0.089	0.114
Commercial	0.118	0.118	0.125	0.129	0.130
Biomass	0.103	0.103	0.109	0.112	0.111
Biofuels	0.001	0.002	0.002	0.003	0.003
Ethanol <sup>2</sup>	0.001	0.002	0.002	0.003	0.003
Waste	0.036	0.031	0.034	0.036	0.036
Landfill Gas	0.004	0.003	0.003	0.003	0.003
MSW Biogenic <sup>5</sup>	0.026	0.021	0.026	0.028	0.028
Other Biomass <sup>6</sup>	0.007	0.007	0.005	0.005	0.005
Wood and Derived Fuels <sup>7</sup>	0.065	0.070	0.073	0.072	0.072
Geothermal	0.014	0.014	0.015	0.017	0.019
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	*	*	*
Wind	-	-	-	*	*

Table 2. Renewable energy consumption by energy use sector and energy source, 2006 – 2010 (cont.)

(quadrillion Btu)

Sector and Source	2006	2007	2008	2009	2010
Industrial	1.930	1.956	2.049	2.016	2.250
Biomass	1.897	1.936	2.028	1.994	2.230
Biofuels	0.295	0.387	0.544	0.630	0.757
Ethanol <sup>2</sup>	0.010	0.010	0.012	0.013	0.017
Losses and Co-products	0.285	0.377	0.532	0.617	0.742
Biodiesel Feedstock <sup>3</sup>	*	0.001	0.001	0.001	0.001
Ethanol Feedstock <sup>4</sup>	0.285	0.376	0.531	0.616	0.741
Waste	0.130	0.144	0.144	0.155	0.169
Landfill Gas	0.081	0.093	0.093	0.104	0.107
MSW Biogenic <sup>5</sup>	0.006	0.006	0.003	0.004	0.004
Other Biomass <sup>6</sup>	0.043	0.046	0.049	0.048	0.059
Wood and Derived Fuels <sup>7</sup>	1.472	1.405	1.340	1.208	1.301
Geothermal	0.004	0.005	0.005	0.004	0.004
Hydroelectric Conventional	0.029	0.016	0.017	0.018	0.016
Solar Thermal/PV	-	-	-	-	*
Wind	-	-	-	-	-
Transportation	0.475	0.602	0.826	0.935	1.074
Biomass	0.475	0.602	0.826	0.935	1.074
Biofuels	0.475	0.602	0.826	0.935	1.074
Biodiesel <sup>1</sup>	0.033	0.046	0.040	0.042	0.034
Ethanol <sup>2</sup>	0.442	0.557	0.786	0.894	1.040
Electric Power <sup>10</sup>	3.665	3.345	3.630	3.967	4.064
Biomass	0.412	0.423	0.435	0.441	0.459
Waste	0.231	0.237	0.258	0.261	0.264
Landfill Gas	0.073	0.077	0.092	0.097	0.103
MSW Biogenic <sup>5</sup>	0.139	0.138	0.141	0.137	0.134
Other Biomass <sup>6</sup>	0.019	0.022	0.026	0.027	0.027
Wood and Derived Fuels <sup>7</sup>	0.182	0.186	0.177	0.180	0.196
Geothermal	0.145	0.145	0.146	0.146	0.148
Hydroelectric Conventional	2.839	2.430	2.494	2.650	2.521
Solar Thermal/PV	0.005	0.006	0.009	0.009	0.012
Wind	0.264	0.341	0.546	0.721	0.923

**Table 2. Renewable energy consumption by energy use sector and energy source, 2006 – 2010 (cont.)**

<sup>1</sup>Biodiesel primarily derived from soybean oil.

<sup>2</sup>Ethanol primarily derived from corn minus denaturant.

<sup>3</sup>Losses and co-products from the production of biodiesel. Does not include natural gas, electricity, and other non-biomass energy used in the production of biodiesel.

<sup>4</sup>Losses and co-products from the production of fuel ethanol. Does not include natural gas, electricity, and other non-biomass energy used in the production of fuel ethanol.

<sup>5</sup>Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

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

<sup>7</sup>Black liquor, and wood/wood waste solids and liquids.

<sup>8</sup>Wood and wood pellet fuels.

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

<sup>10</sup>The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Industry 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. R=Revised.

\* = 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 U.S. Energy Information Administration (EIA), Annual Energy Review (AER) 2010, DOE/EIA-0384 (2010) (Washington, DC, October 2011), Table A6.

Sources: Analysis conducted by U.S. Energy Information Administration (EIA), Office of Electricity, Coal, Nuclear and Renewables Analysis 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-63A, "Annual Solar Thermal Collector Manufacturers Survey," Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey" (pre-2010 data) and "Annual Photovoltaic Cell/Module Shipments Report (2010); SEIA/GTM Research, U.S. Solar Market Insight: 2010 Year in Review. 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;

U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and losses and co-products 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 feedstocks and production less denaturants. Biofuels for Transportation: Biodiesel: Consumption: 2006-2008: Calculated as biodiesel production plus biodiesel net imports, 2009-2010: biodiesel production plus biodiesel net imports minus biodiesel stock change; Production: 2006-2007: U.S. Department of Commerce, Bureau of the Census, Current Industrial Reports, "M311K--Fats and Oils: Production, Consumption and Stocks," data for soybean oil consumed in methyl esters (biodiesel), 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey," 2009-2010: U.S. Energy Information Administration, "Form EIA-22M, 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; Stock Change: EIA Petroleum Supply Annual (PSA) various issues. Table 1 data for renewable fuels except ethanol; and Ethanol: 2006-2008: 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). 2009-2010: EIA Petroleum Supply Annual (various issues), Table 1. Calculated as fuel ethanol refinery and blender net inputs minus fuel ethanol adjustments. 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 3. Renewable energy consumption for electricity generation by energy use sector and energy source, 2006 - 2010**

(quadrillion Btu)

Sector and Source	2006	2007	2008	2009	2010
<b>Total</b>	<b>3.873</b>	<b>3.536</b>	<b><sup>R</sup>3.817</b>	<b>4.137</b>	<b>4.253</b>
Biomass	0.591	0.598	0.606	0.592	0.630
Waste	0.241	0.245	0.267	0.272	0.281
Landfill Gas	0.076	0.080	0.094	0.100	0.106
MSW Biogenic <sup>1</sup>	0.147	0.146	0.148	0.147	0.145
Other Biomass <sup>2</sup>	0.018	0.019	0.024	0.025	0.030
Wood and Derived Fuels <sup>3</sup>	0.350	0.353	0.339	0.320	0.350
Geothermal	0.145	0.145	0.146	0.146	0.148
Hydroelectric Conventional	2.869	2.446	<b><sup>R</sup>2.511</b>	2.669	2.539
Solar Thermal/PV	0.005	0.006	0.009	0.009	0.012
Wind	0.264	0.341	0.546	0.721	0.923
<b>Commercial</b>	<b>0.022</b>	<b>0.020</b>	<b>0.021</b>	<b>0.024</b>	<b>0.025</b>
Biomass	0.021	0.020	0.021	0.023	0.024
Waste	0.021	0.019	0.020	0.023	0.024
Landfill Gas	0.003	0.002	0.003	0.003	0.003
MSW Biogenic <sup>1</sup>	0.013	0.013	0.014	0.016	0.017
Other Biomass <sup>2</sup>	0.004	0.004	0.004	0.004	0.004
Wood and Derived Fuels <sup>3</sup>	*	*	*	*	*
Geothermal	-	-	-	-	-
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	*	*	*
Wind	-	-	-	*	*
<b>Industrial</b>	<b>0.219</b>	<b>0.208</b>	<b>0.200</b>	<b>0.182</b>	<b>0.197</b>
Biomass	0.190	0.193	0.184	0.164	0.180
Waste	0.003	0.004	0.005	0.004	0.008
Landfill Gas	*	*	*	*	*
MSW Biogenic <sup>1</sup>	*	0.001	-	-	-
Other Biomass <sup>2</sup>	0.003	0.003	0.004	0.004	0.008
Wood and Derived Fuels <sup>3</sup>	0.187	0.188	0.179	0.160	0.172
Geothermal	-	-	-	-	-
Hydroelectric Conventional	0.029	0.016	0.017	0.018	0.016
Solar Thermal/PV	-	-	-	-	*
Wind	-	-	-	-	-
<b>Electric Power<sup>4</sup></b>	<b>3.632</b>	<b>3.307</b>	<b>3.596</b>	<b>3.931</b>	<b>4.031</b>
Biomass	0.379	0.386	0.401	0.405	0.426
Waste	0.216	0.221	0.242	0.244	0.249
Landfill Gas	0.072	0.077	0.091	0.097	0.103
MSW Biogenic <sup>1</sup>	0.134	0.132	0.135	0.131	0.128
Other Biomass <sup>2</sup>	0.010	0.012	0.016	0.017	0.018
Wood and Derived Fuels <sup>3</sup>	0.163	0.165	0.159	0.160	0.177
Geothermal	0.145	0.145	0.146	0.146	0.148
Hydroelectric Conventional	2.839	2.430	<b><sup>R</sup>2.494</b>	2.650	2.521
Solar Thermal/PV	0.005	0.006	0.009	0.009	0.012
Wind	0.264	0.341	0.546	0.721	0.923

**Table 3. Renewable energy consumption for electricity generation by energy use sector and energy source, 2006 – 2010 (cont.)**

<sup>1</sup>Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

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

<sup>3</sup>Black liquor, and wood/wood waste solids and liquids.

<sup>4</sup>The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Industry 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 output (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 U.S. Energy Information Administration (EIA), Annual Energy Review (AER) 2010, DOE/EIA-0384 (2010) (Washington, DC, October 2011), Table A6.

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 4. Renewable energy consumption for non-electric use by energy use sector and energy source, 2006 – 2010**

(quadrillion Btu)

Sector and Source	2006	2007	2008	2009	2010
<b>Total</b>	<b>2.776</b>	<b>2.987</b>	<b>3.369</b>	<b>R3.464</b>	<b>3.836</b>
Biomass	2.676	2.876	3.243	R3.321	3.662
Biofuels	0.771	0.991	1.372	R1.569	1.836
Biodiesel <sup>1</sup>	0.033	0.046	0.040	R0.042	0.034
Ethanol <sup>2</sup>	0.453	0.569	0.800	0.910	1.060
Losses and Co-products	0.285	0.377	0.532	0.617	0.742
Biodiesel Feedstock <sup>3</sup>	*	0.001	0.001	0.001	0.001
Ethanol Feedstock <sup>4</sup>	0.285	0.376	0.531	0.616	0.741
Waste	0.156	0.168	0.169	0.181	0.188
Landfill Gas	0.081	0.093	0.093	0.104	0.107
MSW Biogenic <sup>5</sup>	0.024	0.019	0.021	0.021	0.020
Other Biomass <sup>6</sup>	0.051	0.056	0.056	0.056	0.061
Wood and Derived Fuels <sup>7</sup>	1.749	1.717	1.702	1.571	1.638
Geothermal	0.037	0.041	0.046	0.054	0.060
Solar Thermal/PV	0.063	0.070	0.080	0.089	0.114
<b>Residential</b>	<b>0.462</b>	<b>0.502</b>	<b>0.557</b>	<b>0.552</b>	<b>0.571</b>
Biomass	0.380	0.410	0.450	0.430	0.420
Wood and Derived Fuels <sup>8</sup>	0.380	0.410	0.450	0.430	0.420
Geothermal	0.018	0.022	0.026	0.033	0.037
Solar Thermal/PV	0.063	0.070	0.080	0.089	0.114
<b>Commercial</b>	<b>0.096</b>	<b>0.097</b>	<b>0.103</b>	<b>0.105</b>	<b>0.105</b>
Biomass	0.082	0.083	0.089	0.088	0.086
Biofuels	0.001	0.002	0.002	0.003	0.003
Ethanol <sup>2</sup>	0.001	0.002	0.002	0.003	0.003
Waste	0.016	0.012	0.014	0.013	0.012
Landfill Gas	0.001	0.001	*	*	*
MSW Biogenic <sup>5</sup>	0.013	0.008	0.012	0.012	0.010
Other Biomass <sup>6</sup>	0.002	0.003	0.002	0.002	0.002
Wood and Derived Fuels <sup>7</sup>	0.065	0.070	0.073	0.072	0.071
Geothermal	0.014	0.014	0.015	0.017	0.019
Solar Thermal/PV	-	-	-	-	-

**Table 4. Renewable energy consumption for non-electric use by energy use sector and energy source, 2006 – 2010 (cont.)**

(quadrillion Btu)

Sector and Source	2006	2007	2008	2009	2010
Industrial	1.711	1.748	1.849	1.834	2.053
Biomass	1.706	1.743	1.844	1.829	2.049
Biofuels	0.295	0.387	0.544	0.630	0.759
Ethanol <sup>2</sup>	0.010	0.010	0.012	0.013	0.017
Losses and Co-products	0.285	0.377	0.532	0.617	0.742
Biodiesel Feedstock <sup>3</sup>	*	0.001	0.001	0.001	0.001
Ethanol Feedstock <sup>4</sup>	0.285	0.376	0.531	0.616	0.741
Waste	0.126	0.140	0.139	0.151	0.161
Landfill Gas	0.080	0.093	0.092	0.104	0.106
MSW Biogenic <sup>5</sup>	0.006	0.005	0.003	0.004	0.004
Other Biomass <sup>6</sup>	0.040	0.043	0.044	0.044	0.051
Wood and Derived Fuels <sup>7</sup>	1.286	1.217	1.161	1.049	1.129
Geothermal	0.004	0.005	0.005	0.004	0.004
Solar Thermal/PV	-	-	-	-	-
Transportation	0.475	0.602	0.826	0.935	1.074
Biomass	0.475	0.602	0.826	0.935	1.074
Biofuels <sup>1</sup>	0.475	0.602	0.826	0.935	1.074
Biodiesel	0.033	0.046	0.040	0.042	0.034
Ethanol <sup>2</sup>	0.442	0.557	0.786	0.894	1.040
Electric Power <sup>9</sup>	0.033	0.038	0.034	0.036	0.033
Biomass	0.033	0.038	0.034	0.036	0.033
Waste	0.014	0.016	0.016	0.017	0.015
Landfill Gas	*	*	*	*	0.001
MSW Biogenic <sup>5</sup>	0.005	0.006	0.006	0.006	0.006
Other Biomass <sup>6</sup>	0.009	0.010	0.010	0.010	0.008
Wood and Derived Fuels <sup>7</sup>	0.019	0.021	0.018	0.020	0.018
Geothermal	-	-	-	-	-
Solar Thermal/PV	-	-	-	-	-

**Table 4. Renewable energy consumption for non-electric use by energy use sector and energy source, 2006 – 2010 (cont.)**

<sup>1</sup>Biodiesel primarily derived from soybean oil.

<sup>2</sup>Ethanol primarily derived from corn minus denaturant.

<sup>3</sup>Losses and co-products from the production of biodiesel. Does not include natural gas, electricity, and other non-

<sup>4</sup>Losses and co-products from the production of fuel ethanol. Does not include natural gas, electricity, and other n

<sup>5</sup>Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

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

<sup>7</sup>Black liquor, and wood/wood waste solids and liquids.

<sup>8</sup>Wood and wood pellet fuels.

<sup>9</sup>The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North America

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 output (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: Analysis conducted by U.S. Energy Information Administration, Office of Electricity, Coal, Nuclear, and Renewables Analysis 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," Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey" (pre-2010) and "Annual Photovoltaic Cell/Module Shipments Report" (2010); SEIA/GTM Research, U.S. Solar Market Insight: 2010 Year in Review. 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;

U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and losses and co-products 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 feedstocks and production less denaturants. Biofuels for Transportation: Biodiesel: Consumption: 2006-2008: Calculated as biodiesel production plus net imports, 2009-2010: biodiesel production plus biodiesel net imports minus biodiesel stock change; Production: 2006-2007: U.S. Department of Commerce, Bureau of the Census, Current Industrial Reports, "M311K-Fats and Oils: Production, Consumption and Stocks," data for soybean oil consumed in methyl esters (biodiesel), 2008: U.S. U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey," 2009-2010: U.S. Energy Information Administration, "Form EIA-22M, 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; Stock Change: EIA Petroleum Supply Annual (PSA) various issues. Table 1 data for renewable fuels except ethanol; and Ethanol: 2006-2008: 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). 2009 -2010: EIA Petroleum Supply Annual (various issues), Table 1. Calculated as fuel ethanol refinery and blender net inputs minus fuel ethanol adjustments. 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-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report."

Table 5. Biofuels overview, 2006 – 2010

(trillion Btu)					
Type	2006	2007	2008	2009	2010
<b>Ethanol</b>					
Feedstock <sup>1</sup>	688	914	1300	1517	1839
Losses and Co-products <sup>2</sup>	285	376	531	616	742
Denaturant	11	14	21	26	30
Production <sup>3</sup>	414	553	790	928	1127
Net Imports <sup>4</sup>	62	37	45	17	-32
Stock Change <sup>5</sup>	11	6	13	8	5
Consumption	465	584	821	936	1090
Consumption minus Denaturant	453	569	800	910	1061
<b>Biodiesel</b>					
Feedstock <sup>6</sup>	32	63	88	R67	44
Losses and Co-products <sup>7</sup>	*	1	1	1	1
Production <sup>8</sup>	32	62	87	R66	44
Net Imports	1	-17	-46	-24	-10
Stock Change	-	-	-	4	-
Balancing Item	-	-	-	4	-
Consumption	33	46	40	R42	34

<sup>1</sup>Total corn and other biomass inputs to the production of undenatured ethanol used for fuel ethanol.

<sup>2</sup>Losses and co-products from the production of fuel ethanol. Does not include natural gas, electricity, and other non-biomass energy.

<sup>3</sup>Fuel ethanol production. Includes denaturant.

<sup>4</sup>Fuel ethanol imports. There are no exports.

<sup>5</sup>Fuel ethanol stock change. A negative number indicates a decrease in stocks and a positive number indicates an increase.

<sup>6</sup>Total soy bean oil and other biomass inputs to the production of biodiesel.

<sup>7</sup>Losses and co-products from the production of biodiesel. Does not include natural gas, electricity, and other non-biomass energy used in the production of biodiesel.

<sup>8</sup>Production of biofuels for use as diesel fuel substitutes or additives. Biodiesel consumption equals biodiesel production.

R= Revised. \* = 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 and for feedstock factors, see U.S. Energy Information Administration (EIA) Annual Energy Review 2010, Table A3.) Ethanol Feedstock: Calculated as fuel ethanol production multiplied by the feedstock factor for fuel ethanol. Ethanol Losses and Co-products: Calculated as ethanol feedstock plus denaturant minus fuel ethanol production. Denaturant: 2006-2008: Estimated as 2 percent of fuel ethanol production. 2009-2010: EIA, Petroleum Supply Annual, Table 1. Ethanol Production: 2006-2008: U.S. Energy Information Administration (EIA), Form EIA-819, "Monthly Oxygenate Report." 2010: EIA, Petroleum Supply Annual, Table 1 data for net production of fuel ethanol at renewable fuels and oxygenate plants. Ethanol Net Imports, Stocks and Stock Change: 2006-2010: EIA, Petroleum Supply Annual (PSA), various issues, Table 1. Ethanol Consumption: 2006-2008: EIA, Petroleum Supply Annual (various issues), Tables 1 and 15.

**Table 6. Waste energy consumption by type of waste and energy use sector, 2010****(trillion Btu)**

Type	Sector				
	Commercial	Industrial	Electric Power		Total
			Electric Utilities	Independent Power Producers	
Total	36	169	17	247	469
Landfill Gas	3	107	10	93	213
MSW Biogenic <sup>1</sup>	28	4	3	130	165
Other Biomass <sup>2</sup>	5	59	4	23	91

<sup>1</sup>Includes paper and paper board, wood, food, leather, textiles and yard trimmings.

<sup>2</sup>Agriculture 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.

Source: Analysis conducted by the U.S. Energy Information Administration, Office of Electricity, Coal, Nuclear, and Renewables Analysis and the following specific sources: Form EIA-923, "Power Plant Operations Report" and U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates.

**Table 7. Industrial biomass energy consumption and electricity net generation by industry and energy source, 2010**

Industry	Energy Source	Biomass Energy Consumption (trillion Btu)			Net Generation (Million Kilowatthours)
		Total	For Electricity	For Useful Thermal Output	
Total	Total	2,229.681	180.338	2,049.343	26,580
Agriculture, Forestry and Mining	Total	18.916	3.322	15.594	225
	Agricultural Byproducts/Crops	16.791	1.197	15.594	221
	Other Biomass Solids	2.125	2.125	-	4
Manufacturing	Total	2,084.491	177.016	1,907.475	26,355
Food and Kindred Products	Total	27.687	1.862	25.824	220
	Agricultural Byproducts/Crops	15.745	0.182	15.564	12
	Other Biomass Gases	0.174	0.047	0.126	4
	Other Biomass Liquids	0.065	0.065	-	6
	Other Biomass Solids	3.745	1.075	2.669892	107
	Sludge Waste	1.124	0.246	0.878	39
	Wood/Wood Waste Solids	6.834	0.247	6.587	50
Lumber	Total	234.300	10.838	223.462	1,298
	Sludge Waste	0.033	0.003	0.030	1
	Wood/Wood Waste Solids	234.268	10.836	223.432	1,298
Paper and Allied Products	Total	1,067.523	163.830	903.693	24,766
	Agricultural Byproducts/Crops	1.127	0.007	1.120	1
	Black Liquor	751.496	110.040	641.456	16,860
	Other Biomass Gases	0.157	0.013	0.144	3
	Other Biomass Liquids	0.004	0.001	0.003	-
	Other Biomass Solids	13.668	2.265	11.403	329
	Sludge Waste	3.396	0.688	2.708	90
	Wood/Wood Waste Liquids	2.934	0.420	2.514	80
	Wood/Wood Waste Solids	294.741	50.397	244.344	7,404
Chemicals and Allied Products	Total	2.554	0.125	2.429	24
	Other Biomass Liquids	0.035	0.001	0.034	0.217
	Sludge Waste	0.312	0.049	0.263	10
	Wood/Wood Waste Solids	2.207	0.075	2.132	14
Biorefineries	Total	742.020	-	742.020	-
	Biofuel Losses and Co-products <sup>3</sup>	742.020	-	742.020	-
	Biodiesel Feedstock	0.545	-	0.545	-
	Ethanol Feedstock	741.475	-	741.475	-
Other <sup>1</sup>	Total	10.407	0.360	10.047	48
Unspecified <sup>2</sup>	Total	126.274	-	126.274	-
	Ethanol <sup>4</sup>	17.412	-	17.412	-
	Landfill Gas	106.319	-	106.319	-
	Municipal Solid Waste Biogenic <sup>5</sup>	2.543	-	2.543	-

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

<sup>2</sup>Primary purpose of business is not specified.

<sup>3</sup>Losses and co-products from production of biodiesel and ethanol calculated as the difference between energy in feedstocks and production.

<sup>4</sup>Ethanol primarily derived from corn minus denaturant.

<sup>5</sup>Includes 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 output (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 co-products: Table 2 of this report; and analysis conducted by the U.S. Energy Information Administration, Office of Electricity, Coal, Nuclear, and Renewables analysis.

**Table 8. Electricity net generation from renewable energy by energy use sector and energy source, 2006 - 2010**

(thousand kilowatthours)

Sector/Source	2006	2007	2008	2009	2010
Total	385,771,908	352,747,486	380,932,388	417,723,797	427,376,076
Biomass	54,860,621	55,538,578	55,033,612	54,492,734	56,089,366
Waste	16,098,525	16,524,554	17,733,759	18,442,596	18,917,207
Landfill Gas	5,677,040	6,157,750	7,156,340	7,924,211	8,376,703
MSW Biogenic <sup>1</sup>	8,477,571	8,303,838	8,096,801	8,057,613	7,927,213
Other Biomass <sup>2</sup>	1,943,913	2,062,966	2,480,617	2,460,771	2,613,291
Wood and Derived Fuels <sup>3</sup>	38,762,096	39,014,024	37,299,853	36,050,138	37,172,160
Geothermal	14,568,029	14,637,213	14,839,977	15,008,658	15,219,213
Hydroelectric Conventional	289,246,416	247,509,974	254,831,385	273,445,094	260,203,069
Solar Thermal/PV	507,706	611,793	864,315	891,179	1,212,182
Wind	26,589,137	34,449,927	55,363,100	73,886,132	94,652,246
Commercial	1,712,691	1,691,439	1,614,986	1,839,466	1,794,278
Biomass	1,619,245	1,614,160	1,554,948	1,768,350	1,692,980
Waste	1,598,646	1,598,799	1,533,645	1,748,284	1,672,270
Landfill Gas	172,590	202,547	233,636	317,508	255,749
MSW Biogenic <sup>1</sup>	955,910	962,496	910,908	1,044,576	1,030,969
Other Biomass <sup>2</sup>	470,146	433,756	389,101	386,200	385,552
Wood and Derived Fuels <sup>3</sup>	20,599	15,361	21,303	20,066	20,710
Hydroelectric Conventional	93,446	77,279	59,957	70,866	80,456
Solar Thermal/PV	-	-	80	43	4,772
Wind	-	-	-	208	16,070
Industrial	31,871,511	30,508,807	29,138,172	27,900,961	28,243,802
Biomass	28,972,463	28,918,826	27,462,283	26,032,625	26,574,314
Waste	572,447	631,452	821,394	740,469	868,650
Landfill Gas	28,786	27,087	21,494	22,365	15,287
MSW Biogenic <sup>1</sup>	34,541	39,782	-	-	-
Other Biomass <sup>2</sup>	509,120	564,583	799,900	718,103	853,363
Wood and Derived Fuels <sup>3</sup>	28,400,016	28,287,374	26,640,889	25,292,157	25,705,664
Hydroelectric Conventional	2,899,048	1,589,981	1,675,889	1,868,336	1,667,690
Solar Thermal/PV	-	-	-	-	1798
Electric Power <sup>4</sup>	352,187,707	320,547,239	350,179,231	387,983,371	397,337,996
Biomass	24,268,913	25,005,592	26,016,380	26,691,759	27,822,072
Waste	13,927,432	14,294,304	15,378,719	15,953,844	16,376,286
Landfill Gas	5,475,664	5,928,117	6,901,211	7,584,338	8,105,666
MSW Biogenic <sup>1</sup>	7,487,120	7,301,560	7,185,893	7,013,037	6,896,244
Other Biomass <sup>2</sup>	964,648	1,064,627	1,291,615	1,356,468	1,374,376
Wood and Derived Fuels <sup>3</sup>	10,341,481	10,711,288	10,637,661	10,737,915	11,445,786
Geothermal	14,568,029	14,637,213	14,839,977	15,008,658	15,219,213
Hydroelectric Conventional	286,253,922	245,842,714	253,095,539	271,505,893	258,454,923
Solar Thermal/PV	507,706	611,793	864,235	891,137	1,205,611
Wind	26,589,137	34,449,927	55,363,100	73,885,924	94,636,176

<sup>1</sup>Includes paper and paper board, wood, food, leather, textiles and yard trimmings.<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black liquor, and wood/wood waste solids and liquids.

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.

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 9. Total renewable net generation by energy source and State, 2009

(thousand kilowatthours)

State	NonHydroelectric								Total
	Hydroelectric Conventional	Biomass			Geothermal	Solar Thermal/P V	Wind	Total	
		Waste		Wood and Derived Fuels <sup>3</sup>					
		Landfill Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>						
Alabama	12,535,373	-	14,482	3,035,375	-	-	-	3,049,857	15,585,230
Alaska	1,323,744	-	6,511	-	-	-	7,027	13,538	1,337,283
Arizona	6,427,345	18,299	3,691	136,641	-	14,145	29545	202,321	6,629,666
Arkansas	4,192,706	34,371	22,679	1,528,501	-	-	-	1,585,550	5,778,256
California	27,888,036	1,841,859	625,802	3,732,016	12,852,783	647,390	5,839,813	25,539,662	53,427,698
Colorado	1,885,724	17,463	38,701	388	-	25,585	3,163,836	3,245,973	5,131,697
Connecticut	509,546	758,108	-	622	-	-	-	758,730	1,268,276
Delaware	-	125,611	-	-	-	-	-	125,611	125,611
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	208,202	1,846,339	530,398	1,954,125	-	9470	-	4,340,332	4,548,534
Georgia	3,259,683	50,719	28,881	2,745,569	-	-	-	2,825,170	6,084,853
Hawaii	112,649	180,067	104,359	-	167,591	1,390	251,427	704,835	817,483
Idaho	10,434,264	-	-	477,948	75,950	-	313,418	867,316	11,301,580
Illinois	136,380	709,136	607	461	-	16	2,819,532	3,529,752	3,666,132
Indiana	503,470	302,644	-	-	-	-	1,403,192	1,705,836	2,209,306
Iowa	971,165	93,417	74,471	194	-	-	7,420,520	7,588,601	8,559,766
Kansas	12,798	-	-	-	-	-	2,863,267	2,863,267	2,876,065
Kentucky	3,317,641	96,393	4,481	262,660	-	-	-	363,534	3,681,175
Louisiana	1,236,351	-	67,186	2,296,773	-	-	-	2,363,959	3,600,310
Maine	4,211,679	232,254	40,618	3,366,750	-	-	298,623	3,938,244	8,149,923
Maryland	1,888,769	375,722	-	175,057	-	-	-	550,780	2,439,549
Massachusetts	1,201,076	1,103,995	3,880	115,384	-	43	5,956	1,229,257	2,430,334
Michigan	1,371,926	828,878	5,133	1,489,001	-	-	300,172	2,623,184	3,995,110
Minnesota	809,088	384,238	503,066	796,331	-	-	5,053,022	6,736,657	7,545,745
Mississippi	-	-	6,960	1,417,319	-	-	-	1,424,279	1,424,279
Missouri	1,816,693	49,808	23,530	2,090	-	-	499,377	574,805	2,391,498
Montana	9,505,940	-	-	94,642	-	-	820,924	915,566	10,421,506
Nebraska	433,690	47,449	18,746	-	-	-	382,634	448,829	882,519
Nevada	2,460,595	-	-	890	1,633,213	174,309	-	1,808,412	4,269,007
New Hampshire	1,680,492	151,278	-	984,181	-	-	62,477	1,197,936	2,878,428

Table 9 Total renewable net generation by energy source and State, 2009 (cont.)

(thousand kilowatthours)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass			Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind		
		Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>	Landfill						
New Jersey	32,081	924,671	3,535	-	-	10,707	20,918	959,831	991,912	
New Mexico	270,963	-	33,664	-	-	-	1,546,718	1,580,382	1,851,345	
New York	27,615,106	1,664,816	-	535,853	-	-	2,266,339	4,467,008	32,082,114	
North Carolina	5,171,257	120,191	11,300	1,757,350	-	4,563	-	1,893,404	7,064,660	
North Dakota	1,475,251	-	11,572	-	-	-	2,997,530	3,009,102	4,484,353	
Ohio	527,746	198,144	11,467	409,685	-	-	14,114	633,410	1,161,156	
Oklahoma	3,552,573	-	163,010	68,064	-	-	2,698,199	2,929,273	6,481,846	
Oregon	33,033,513	128,332	-	674,381	-	-	3,469,714	4,272,427	37,305,940	
Pennsylvania	2,682,866	1,576,577	2,759	694,242	-	3,562	1,074,788	3,351,928	6,034,794	
Rhode Island	4,736	144,600	-	-	-	-	-	144,600	149,336	
South Carolina	2,332,005	137,254	-	1,610,717	-	-	-	1,747,971	4,079,977	
South Dakota	4,432,451	-	5,775	-	-	-	420,981	426,756	4,859,207	
Tennessee	10,211,962	28,891	7,409	862,421	-	-	51,747	950,468	11,162,430	
Texas	1,028,657	398,259	30,816	649,298	-	-	20,026,103	21,104,476	22,133,134	
Utah	835,257	47,878	-	-	279,121	-	159,537	486,536	1,321,793	
Vermont	1,485,825	24190	-	393,266	-	-	11,589	429,045	1,914,871	
Virginia	1,478,630	694,807	14,396	1,708,316	-	-	-	2,417,519	3,896,149	
Washington	72,932,704	156,068	10,954	1,305,162	-	-	3,572,486	5,044,670	77,977,375	
West Virginia	1,645,927	-	-149	-689	-	-	742,439	741,602	2,387,529	
Wisconsin	1,393,988	489,095	30,079	769,156	-	-	1,051,965	2,340,295	3,734,284	
Wyoming	966,572	-	-	-	-	-	2,226,205	2,226,205	3,192,777	
U.S. Total	273,445,094	15,981,824	2,460,771	36,050,138	15,008,658	891,179	73,886,132	144,278,703	417,723,797	

<sup>1</sup>Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black 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 10. Renewable electric power sector net generation by energy source and State, 2009

(thousand kilowatthours)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass			Geothermal	Solar Thermal/ PV	Wind			
		Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>	Wood and Derived Fuels <sup>3</sup>						
								Waste		
Landfill										
Alabama	12,535,373	-	2,050	245,980	-	-	-	248,030	12,783,403	
Alaska	1,323,744	-	-	-	-	-	7,027	7,027	1,330,771	
Arizona	6,427,345	18,299	-	136,641	-	14,145	29545	198,630	6,625,975	
Arkansas	4,192,706	34,371	17,645	-	-	-	-	52,016	4,244,722	
California	27,887,707	1,636,022	353,959	3,051,079	12,852,783	647,390	5,839,813	24,381,046	52,268,752	
Colorado	1,885,724	17,463	38,701	388	-	25,585	3,163,836	3,245,973	5,131,697	
Connecticut	509,546	758,108	-	622	-	-	-	758,730	1,268,276	
Delaware	-	125,611	-	-	-	-	-	125,611	125,611	
District of Columbia	-	-	-	-	-	-	-	-	-	
Florida	208,202	1,846,339	187,079	325,226	-	9470	-	2,368,115	2,576,317	
Georgia	3,252,094	29,737	-	-	-	-	-	29,737	3,281,831	
Hawaii	77,259	-	93,983	-	167,591	1,390	251,427	514,391	591,650	
Idaho	10,434,264	-	-	75,613	75,950	-	313,418	464,981	10,899,245	
Illinois	136,380	709,136	44	-	-	16	2,819,532	3,528,728	3,665,108	
Indiana	503,470	259,483	-	-	-	-	1,403,192	1,662,674	2,166,144	
Iowa	971,165	93,417	27,388	194	-	-	7,420,520	7,541,518	8,512,683	
Kansas	12,798	-	-	-	-	-	2,863,267	2,863,267	2,876,065	
Kentucky	3,317,641	96,393	-	-	-	-	-	96,393	3,414,034	
Louisiana	1,236,351	-	66,166	-	-	-	-	66,166	1,302,517	
Maine	3,454,424	131,422	3,632	1,734,756	-	-	298,623	2,168,433	5,622,857	
Maryland	1,888,769	359,553	-	-	-	-	-	359,553	2,248,322	
Massachusetts	1,185,836	1,103,995	-	115,384	-	-	5,748	1,225,126	2,410,963	
Michigan	1,347,406	678,429	11	871,994	-	-	300,172	1,850,606	3,198,012	
Minnesota	675,103	376,490	495,419	319,243	-	-	5,053,022	6,244,174	6,919,276	
Mississippi	-	-	-	-	-	-	-	-	-	
Missouri	1,816,693	49,808	18,790	-	-	-	499,377	567,975	2,384,668	
Montana	9,505,940	-	-	-	-	-	820,924	820,924	10,326,864	
Nebraska	433,690	47,449	4,623	-	-	-	382,634	434,706	868,396	
Nevada	2,460,595	-	-	890	1,633,213	174,309	-	1,808,412	4,269,007	
New Hampshire	1,671,475	151,278	-	983,501	-	-	62,477	1,197,256	2,868,731	

Table 10. Renewable electric power sector net generation by energy source and State, 2009 (cont.)

(thousand kilowatthours)

(thousand kilowatt-hours)

State	NonHydroelectric									
	Hydroelectric Conventional	Biomass			Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/ PV	Wind	Total	Total
		Waste								
		Landfill Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>							
New Jersey	32,081	756,459	-	-	-	10,707	20,918	788,084	820,165	
New Mexico	270,963	-	33,664	-	-	-	1,546,718	1,580,382	1,851,345	
New York	27,490,361	1,549,036	-	249,926	-	-	2,266,339	4,065,301	31,555,662	
North Carolina	5,155,366	120,191	7,840	495,163	-	4,563	-	627,758	5,783,123	
North Dakota	1,475,251	-	-	-	-	-	2,997,530	2,997,530	4,472,781	
Ohio	527,746	198,144	-	23,041	-	-	14,114	235,299	763,045	
Oklahoma	3,552,573	-	-	-	-	-	2,698,199	2,698,199	6,250,772	
Oregon	33,033,513	109,965	-	218,833	-	-	3,469,714	3,798,512	36,832,025	
Pennsylvania	2,682,866	1,469,614	-	199,742	-	3,562	1,074,788	2,747,705	5,430,571	
Rhode Island	4,736	144,600	-	-	-	-	-	144,600	149,336	
South Carolina	2,330,770	115,050	-	281,612	-	-	-	396,662	2,727,432	
South Dakota	4,432,451	-	5,775	-	-	-	420,981	426,756	4,859,207	
Tennessee	10,211,962	28,891	8	-	-	-	51,747	80,646	10,292,608	
Texas	1,028,657	378,278	-	-	-	-	20,026,103	20,404,381	21,433,038	
Utah	835,257	47,878	-	-	279,121	-	159,537	486,536	1,321,793	
Vermont	1,460,853	24190	-	393,266	-	-	11,589	429,045	1,889,899	
Virginia	1,468,406	523,284	-	440,576	-	-	-	963,860	2,432,265	
Washington	72,885,620	156,068	-	358,563	-	-	3,572,486	4,087,117	76,972,737	
West Virginia	1,027,360	-	-149	-689	-	-	742,439	741,602	1,768,962	
Wisconsin	1,280,831	452,924	-161	216,371	-	-	1,051,965	1,721,098	3,001,929	
Wyoming	966,572	-	-	-	-	-	2,226,205	2,226,205	3,192,777	
U.S. Total	271,505,893	14,597,376	1,356,468	10,737,915	15,008,658	891,137	73,885,924	116,477,478	387,983,371	

<sup>1</sup>Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black 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.

The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Industry 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 11. Renewable commercial and industrial sector net generation by energy source and State, 2009**

(thousand kilowatthours)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind			
		Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>							
								Landfill Waste		
Alabama	-	-	12,432	2,789,395	-	-	-	2,801,827	2,801,827	
Alaska	-	-	6,511	-	-	-	-	6,511	6,511	
Arizona	-	-	3,691	-	-	-	-	3,691	3,691	
Arkansas	-	-	5,034	1,528,501	-	-	-	1,533,534	1,533,534	
California	330	205,837	271,843	680,936	-	-	-	1,158,616	1,158,946	
Colorado	-	-	-	-	-	-	-	-	-	
Connecticut	-	-	-	-	-	-	-	-	-	
Delaware	-	-	-	-	-	-	-	-	-	
District of Columbia	-	-	-	-	-	-	-	-	-	
Florida	-	-	343,319	1,628,898	-	-	-	1,972,217	1,972,217	
Georgia	7,589	20982	28,881	2,745,569	-	-	-	2,795,433	2,803,022	
Hawaii	35,390	180,067	10,376	-	-	-	-	190,443	225,833	
Idaho	-	-	-	402,335	-	-	-	402,335	402,335	
Illinois	-	-	563	461	-	-	-	1,024	1,024	
Indiana	-	43,161	-	-	-	-	-	43,161	43,161	
Iowa	-	-	47,082	-	-	-	-	47,082	47,082	
Kansas	-	-	-	-	-	-	-	-	-	
Kentucky	-	-	4,481	262,660	-	-	-	267,141	267,141	
Louisiana	-	-	1,020	2,296,773	-	-	-	2,297,793	2,297,793	
Maine	757,255	100,832	36,986	1,631,994	-	-	-	1,769,811	2,527,066	
Maryland	-	16,169	-	175,057	-	-	-	191,227	191,227	
Massachusetts	15,240	-	3,880	-	-	43	208	4,131	19,371	
Michigan	24,520	150,449	5,123	617,006	-	-	-	772,578	797,098	
Minnesota	133,985	7,748	7,647	477,088	-	-	-	492,484	626,469	
Mississippi	-	-	6,960	1,417,319	-	-	-	1,424,279	1,424,279	
Missouri	-	-	4,740	2,090	-	-	-	6,830	6,830	
Montana	-	-	-	94,642	-	-	-	94,642	94,642	
Nebraska	-	-	14,123	-	-	-	-	14,123	14,123	
Nevada	-	-	-	-	-	-	-	-	-	
New Hampshire	9,017	-	-	680	-	-	-	680	9,697	

**Table 11. Renewable commercial and industrial sector net generation by energy source and State, 2009**

(thousand kilowatthours)

NonHydroelectric									
State	Hydroelectric Conventional	Biomass			Geothermal	Solar Thermal/P V	Wind	Total	Total
		Waste		Wood and Derived Fuels <sup>3</sup>					
		Landfill Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>						
New Jersey	-	168212	3,535	-	-	-	-	171,747	171,747
New Mexico	-	-	-	-	-	-	-	-	-
New York	124,746	115,780	-	285,926	-	-	-	401,707	526,452
North Carolina	15,891	-	3459	1,262,187	-	-	-	1,265,646	1,281,537
North Dakota	-	-	11,572	-	-	-	-	11,572	11,572
Ohio	-	-	11,467	386,645	-	-	-	398,111	398,111
Oklahoma	-	-	163,010	68,064	-	-	-	231,074	231,074
Oregon	-	18,367	-	455,548	-	-	-	473,915	473,915
Pennsylvania	-	106,964	2,759	494,500	-	-	-	604,223	604,223
Rhode Island	-	-	-	-	-	-	-	-	-
South Carolina	1,235	22,204	-	1,329,106	-	-	-	1,351,310	1,352,545
South Dakota	-	-	-	-	-	-	-	-	-
Tennessee	-	-	7,401	862,421	-	-	-	869,822	869,822
Texas	-	19,981	30,816	649,298	-	-	-	700,095	700,095
Utah	-	-	-	-	-	-	-	-	-
Vermont	24,972	-	-	-	-	-	-	-	24,972
Virginia	10,224	171,523	14,396	1,267,740	-	-	-	1,453,659	1,463,883
Washington	47,084	-	10,954	946,599	-	-	-	957,553	1,004,637
West Virginia	618,567	-	-	-	-	-	-	-	618,567
Wisconsin	113,158	36,171	30,241	552,785	-	-	-	619,197	732,355
Wyoming	-	-	-	-	-	-	-	-	-
U.S. Total	1,939,201	1,384,449	1,104,304	25,312,223	-	43	208	27,801,226	29,740,427

<sup>1</sup>Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black 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 12. Total renewable net generation by energy source and State, 2010

(thousand kilowatthours)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass			Geothermal	Solar Thermal/P V	Wind	Total		
		Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>	Wood and Derived Fuels <sup>3</sup>						
Alabama	8,704,254	-	11,533	2,365,453	-	-	-	2,376,986	11,081,240	
Alaska	1,433,141	-	6,304	-	-	-	12,607	18,911	1,452,053	
Arizona	6,622,160	24,384	4,027	139,826	-	15,754	134,916	318,907	6,941,067	
Arkansas	3,658,962	38,323	18,636	1,566,984	-	-	-	1,623,943	5,282,905	
California	33,430,870	1,812,011	638,772	3,550,877	12,600,098	769,331	6,078,632	25,449,721	58,880,591	
Colorado	1,578,264	19,656	38,323	2,205	-	42,498	3,451,851	3,554,533	5,132,796	
Connecticut	390,667	739,246	-	414	-	-	-	739,660	1,130,327	
Delaware	-	135,641	-	-	-	-	2,556	138,197	138,197	
District of Columbia	-	-	-	-	-	-	-	-	-	
Florida	177,474	1,845,516	541,900	2,018,868	-	80,440	-	4,486,723	4,664,197	
Georgia	3,321,702	83,454	43,547	3,053,562	-	-	-	3,180,563	6,502,265	
Hawaii	70,423	174,445	109,028	9	200,595	1,770	261,120	746,968	817,391	
Idaho	9,154,244	-	23582	477,841	71,841	-	440,746	1,014,010	10,168,254	
Illinois	118,543	670,166	94	120	-	14,145	4,453,634	5,138,159	5,256,702	
Indiana	453,712	311,623	-	-	-	-	2,934,043	3,245,666	3,699,378	
Iowa	948,168	90,839	99,307	-	-	-	9,170,337	9,360,483	10,308,651	
Kansas	13,214	54286	-	-	-	-	3,405,065	3,459,351	3,472,565	
Kentucky	2,580,246	88,777	2,026	349,071	-	-	-	439,875	3,020,121	
Louisiana	1,108,794	-	74,367	2,393,409	-	-	-	2,467,776	3,576,570	
Maine	3,810,381	236,508	27,000	3,389,577	-	-	499,198	4,152,283	7,962,664	
Maryland	1,667,396	407,239	164	164,688	-	80	1494	573,665	2,241,061	
Massachusetts	996,339	1,124,693	633	125,412	-	928	22,068	1,273,734	2,270,073	
Michigan	1,250,553	794,502	7,874	1,669,736	-	-	360,340	2,832,452	4,083,005	
Minnesota	840,410	339,742	575,610	932,558	-	-	4,791,723	6,639,633	7,480,043	
Mississippi	-	-	991	1,503,279	-	-	-	1,504,270	1,504,270	
Missouri	1,539,347	57,526	4,462	119	-	-	925,490	987,597	2,526,944	
Montana	9,414,662	-	-	96,924	-	-	930,233	1,027,157	10,441,819	
Nebraska	1,313,856	53,497	18,011	-	-	-	421,645	493,153	1,807,009	
Nevada	2,157,296	-	-	-	2,069,730	216,917	-	2,286,647	4,443,943	
New Hampshire	1,477,583	126,644	128	1,029,758	-	-	75,688	1,232,218	2,709,801	

Table 12. Total renewable net generation by energy source and State, 2010 (cont.)

(thousand kilowatthours)

State	NonHydroelectric									Total
	Hydroelectric Conventional	Biomass			Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar		Total	
		Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>	Thermal/P V			Wind			
								Waste		
New Jersey	18,119	816,317	-	-	-	21,084	12,653	850,054	868,173	
New Mexico	217,010	-	13,680	-	-	8,930	1,832,182	1,854,792	2,071,802	
New York	25,471,697	1,671,090	-	547,304	-	-	2,596,154	4,814,548	30,286,245	
North Carolina	4,756,549	135,637	59,672	1,876,492	-	11,340	-	2,083,142	6,839,691	
North Dakota	2,042,118	-	12,387	-	-	-	4,095,641	4,108,028	6,150,146	
Ohio	429,024	263,696	12,159	398,810	-	12848	12,576	700,089	1,129,113	
Oklahoma	2,808,788	-	97,043	254,829	-	-	3,808,083	4,159,956	6,968,744	
Oregon	30,542,260	204,932	-	631,941	-	-	3,920,007	4,756,880	35,299,140	
Pennsylvania	2,332,201	1,705,789	2,567	674,878	-	7,910	1,854,032	4,245,175	6,577,376	
Rhode Island	3,706	136,949	-	-	-	-	3124	140,073	143,779	
South Carolina	2,376,444	130,997	-	1,742,067	-	-	-	1,873,064	4,249,508	
South Dakota	5,238,801	-	-	-	-	-	1,371,750	1,371,750	6,610,551	
Tennessee	8,137,795	22,595	10,528	913,856	-	-	40,570	987,550	9,125,345	
Texas	1,261,832	448,820	96,316	900,074	-	8,208	26,251,410	27,704,828	28,966,660	
Utah	695,512	56,338	-	-	276,949	-	447,680	780,967	1,476,479	
Vermont	1,346,887	25,081	-	443,366	-	-	13,892	482,339	1,829,226	
Virginia	1,500,182	801,755	13,589	1,404,304	-	-	-	2,219,649	3,719,831	
Washington	68,288,383	185,207	11,163	1,675,915	-	-	4,744,679	6,616,963	74,905,346	
West Virginia	1,367,361	-	-	-	-	-	939,172	939,172	2,306,533	
Wisconsin	2,111,852	469,993	37,866	877,632	-	-	1,088,464	2,473,956	4,585,808	
Wyoming	1,023,887	-	-	-	-	-	3,246,793	3,246,793	4,270,680	
U.S. Total	260,203,069	16,303,916	2,613,291	37,172,160	15,219,213	1,212,182	94,652,246	167,173,007	427,376,076	

<sup>1</sup>Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black 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 13. Renewable electric power sector net generation by energy source and State, 2010

(thousand kilowatthours)

State	NonHydroelectric								Total	Total
	Biomass				Geothermal	Solar Thermal/P V	Wind			
	Waste		Wood and Derived Fuels <sup>3</sup>							
	Landfill	Other								
Hydroelectric Conventional	Gas/MSW Biogenic <sup>1</sup>	Biomass <sup>2</sup>								
Alabama	8,704,254	-	1,190	259,956	-	-	-	261,146	8,965,400	
Alaska	1,433,141	-	-	-	-	-	12,607	12,607	1,445,748	
Arizona	6,622,160	24,384	-	139,826	-	15,754	134,916	314,880	6,937,040	
Arkansas	3,658,962	38,323	14,012	-	-	-	-	52,335	3,711,297	
California	33,424,213	1,682,490	362,176	2,890,259	12,600,098	765,397	6,078,632	24,379,052	57,803,264	
Colorado	1,578,264	19,656	38,323	2,205	-	42,498	3,451,851	3,554,533	5,132,796	
Connecticut	390,667	739,246	-	414	-	-	-	739,660	1,130,327	
Delaware	-	135,641	-	-	-	-	2556	138,197	138,197	
District of Columbia	-	-	-	-	-	-	-	-	-	
Florida	177,474	1,845,516	179,378	390,525	-	80,440	-	2,495,859	2,673,333	
Georgia	3,299,258	63,294	41	87889	-	-	-	151,224	3,450,482	
Hawaii	28,606	-	1,615	-	200,595	1,770	261,120	465,100	493,706	
Idaho	9,154,244	-	23582	69,468	71,841	-	440,746	605,637	9,759,881	
Illinois	118,543	670,166	43	-	-	14,145	4,453,634	5,137,988	5,256,531	
Indiana	453,712	273,992	-	-	-	-	2,931,952	3,205,944	3,659,656	
Iowa	948,168	90,839	33,351	-	-	-	9,170,337	9,294,527	10,242,695	
Kansas	13,214	54286	-	-	-	-	3,405,065	3,459,351	3,472,565	
Kentucky	2,580,246	88,777	371	-	-	-	-	89,148	2,669,394	
Louisiana	1,108,794	-	73,359	-	-	-	-	73,359	1,182,153	
Maine	3,104,876	137,867	5,372	1,834,769	-	-	499,198	2,477,206	5,582,082	
Maryland	1,667,396	383,835	164	-	-	80	1494	385,573	2,052,969	
Massachusetts	986,472	1,124,693	-	125,412	-	656	19,838	1,270,599	2,257,071	
Michigan	1,222,440	638,317	-	986,751	-	-	360,340	1,985,408	3,207,848	
Minnesota	713,192	335,879	564,533	420,952	-	-	4,779,974	6,101,337	6,814,529	
Mississippi	-	-	5	1532	-	-	-	1538	1538	
Missouri	1,539,347	57,526	717	-	-	-	925,490	983,733	2,523,080	
Montana	9,414,662	-	-	-	-	-	930,233	930,233	10,344,895	
Nebraska	1,313,856	53,497	5,665	-	-	-	421,645	480,807	1,794,663	
Nevada	2,157,296	-	-	-	2,069,730	215,223	-	2,284,953	4,442,249	
New Hampshire	1,472,415	126,644	128	1,029,318	-	-	75,688	1,231,778	2,704,193	
New Jersey	18,119	650,567	-	-	-	20,867	12,653	684,087	702,206	

Table 13. Renewable electric power sector net generation by energy source and State, 2010 (cont.)

(thousand kilowatthours)

State	NonHydroelectric									Total
	Biomass									
	Hydroelectric Conventional	Waste		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind	Total		
		Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>							
New Mexico	217,010	-	13,680	-	-	8930	1,832,182	1,854,792	2,071,802	
New York	25,411,168	1,559,462	-	291,829	-	-	2,596,154	4,447,445	29,858,613	
North Carolina	4,743,466	135,637	56,673	573,393	-	11,340	-	777,044	5,520,510	
North Dakota	2,042,118	-	-	-	-	-	4,095,641	4,095,641	6,137,759	
Ohio	429,024	263,696	-	27,537	-	12848	12,576	316,657	745,681	
Oklahoma	2,808,788	-	-	-	-	-	3,808,083	3,808,083	6,616,871	
Oregon	30,542,260	183,969	-	169,586	-	-	3,920,007	4,273,562	34,815,822	
Pennsylvania	2,332,201	1,595,479	-	204,573	-	7,455	1,854,032	3,661,540	5,993,741	
Rhode Island	3,706	136,949	-	-	-	-	3124	140,073	143,779	
South Carolina	2,375,431	130,997	-	294,284	-	-	-	425,281	2,800,712	
South Dakota	5,238,801	-	-	-	-	-	1,371,750	1,371,750	6,610,551	
Tennessee	8,137,795	22,595	-	-	-	-	40,570	63,165	8,200,960	
Texas	1,261,832	422,255	-	-	-	8208	26,251,410	26,681,873	27,943,705	
Utah	695,512	56,338	-	-	276,949	-	447,680	780,967	1,476,479	
Vermont	1,321,579	25,081	-	443,366	-	-	13,892	482,339	1,803,918	
Virginia	1,488,235	614,121	-	422,794	-	-	-	1,036,915	2,525,150	
Washington	68,232,978	185,207	-	507,021	-	-	4,744,679	5,436,906	73,669,884	
West Virginia	868,950	-	-	-	-	-	939,172	939,172	1,808,122	
Wisconsin	1,976,191	434,689	-	272,127	-	-	1,088,464	1,795,280	3,771,471	
Wyoming	1,023,887	-	-	-	-	-	3,246,793	3,246,793	4,270,680	
U.S. Total	258,454,923	15,001,910	1,374,376	11,445,786	15,219,213	1,205,611	94,636,176	138,883,073	397,337,996	

<sup>1</sup>Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black 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.

The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Industry 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 14. Renewable commercial and industrial sector net generation by energy source and State, 2010**

(thousand kilowatthours)

NonHydroelectric									
State	Hydroelectric Conventional	Biomass			Geothermal	Solar Thermal/P V	Wind	Total	Total
		Waste		Wood and Derived Fuels <sup>3</sup>					
		Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>						
Alabama	-	-	10,342	2,105,498	-	-	-	2,115,840	2,115,840
Alaska	-	-	6,304	-	-	-	-	6,304	6,304
Arizona	-	-	4,027	-	-	-	-	4,027	4,027
Arkansas	-	-	4,624	1,566,984	-	-	-	1,571,608	1,571,608
California	6,657	129,521	276,596	660,619	-	3,934	-	1,070,669	1,077,327
Colorado	-	-	-	-	-	-	-	-	-
Connecticut	-	-	-	-	-	-	-	-	-
Delaware	-	-	-	-	-	-	-	-	-
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	-	-	362,521	1,628,343	-	-	-	1,990,865	1,990,865
Georgia	22,444	20,160	43,506	2,965,672	-	-	-	3,029,338	3,051,782
Hawaii	41,817	174,445	107,414	9	-	-	-	281,868	323,685
Idaho	-	-	-	408,373	-	-	-	408,373	408,373
Illinois	-	-	51	120	-	-	-	171	171
Indiana	-	37,632	-	-	-	-	2,090	39,722	39,722
Iowa	-	-	65,955	-	-	-	-	65,955	65,955
Kansas	-	-	-	-	-	-	-	-	-
Kentucky	-	-	1,655	349,071	-	-	-	350,727	350,727
Louisiana	-	-	1,008	2,393,409	-	-	-	2,394,417	2,394,417
Maine	705,505	98,642	21,628	1,554,807	-	-	-	1,675,077	2,380,582
Maryland	-	23,405	-	164,688	-	-	-	188,092	188,092
Massachusetts	9,867	-	633	-	-	271	2,230	3,135	13,002
Michigan	28,113	156,185	7,874	682,985	-	-	-	847,044	875,157
Minnesota	127,218	3,863	11,077	511,606	-	-	11,749	538,295	665,513
Mississippi	-	-	986	1,501,747	-	-	-	1,502,732	1,502,732
Missouri	-	-	3,746	119	-	-	-	3,865	3,865
Montana	-	-	-	96,924	-	-	-	96,924	96,924
Nebraska	-	-	12,347	-	-	-	-	12,347	12,347
Nevada	-	-	-	-	-	1694	-	1694	1694
New Hampshire	5,168	-	-	440	-	-	-	440	5,608

**Table 14. Renewable commercial and industrial sector net generation by energy source and State, 2010 (cont.)**

(thousand kilowatthours)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass			Geothermal	Solar Thermal/P V	Wind			
		Waste		Wood and Derived Fuels <sup>3</sup>						
		Gas/MSW Biogenic <sup>1</sup>	Other Biomass <sup>2</sup>							
New Jersey	-	165,749	-	-	-	217	-	165,966	165,966	
New Mexico	-	-	-	-	-	-	-	-	-	
New York	60,529	111,627	-	255,475	-	-	-	367,102	427,631	
North Carolina	13,083	-	2,999	1,303,099	-	-	-	1,306,098	1,319,181	
North Dakota	-	-	12,387	-	-	-	-	12,387	12,387	
Ohio	-	-	12,159	371,273	-	-	-	383,432	383,432	
Oklahoma	-	-	97,043	254,829	-	-	-	351,872	351,872	
Oregon	-	20,963	-	462,356	-	-	-	483,319	483,319	
Pennsylvania	-	110,310	2,567	470,305	-	454	-	583,636	583,636	
Rhode Island	-	-	-	-	-	-	-	-	-	
South Carolina	1,013	-	-	1,447,783	-	-	-	1,447,783	1,448,796	
South Dakota	-	-	-	-	-	-	-	-	-	
Tennessee	-	-	10,528	913,856	-	-	-	924,385	924,385	
Texas	-	26,565	96,316	900,074	-	-	-	1,022,955	1,022,955	
Utah	-	-	-	-	-	-	-	-	-	
Vermont	25,308	-	-	-	-	-	-	-	25,308	
Virginia	11,947	187,634	13,589	981,510	-	-	-	1,182,734	1,194,681	
Washington	55,405	-	11,163	1,168,894	-	-	-	1,180,058	1,235,463	
West Virginia	498,411	-	-	-	-	-	-	-	498,411	
Wisconsin	135,661	35,304	37,866	605,505	-	-	-	678,675	814,336	
Wyoming	-	-	-	-	-	-	-	-	-	
U.S. Total	1,748,146	1,302,005	1,238,915	25,726,374	-	6,570	16,070	28,289,934	30,038,080	

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

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

<sup>3</sup>Black 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 15. Renewable market share of net generation by State, 2009 and 2010

(thousand kilowatthours)

State	2009			2010		
	Total Generation	Percent Renewable	Percent NonHydro Renewable	Total Generation	Percent Renewable	Percent NonHydro Renewable
Alabama	143,255,556	10.9	2.1	152,150,512	7.3	1.6
Alaska	6,702,159	20.0	0.2	6,759,576	21.5	0.3
Arizona	111,971,250	5.9	0.2	111,750,957	6.2	0.3
Arkansas	57,457,739	10.1	2.8	61,000,185	8.7	2.7
California	204,776,132	26.1	12.5	204,125,596	28.8	12.5
Colorado	50,565,952	10.1	6.4	50,720,792	10.1	7.0
Connecticut	31,206,222	4.1	2.4	33,349,623	3.4	2.2
Delaware	4,841,563	2.6	2.6	5,627,645	2.5	2.5
District of Columbia	35,499	-	-	199,858	-	-
Florida	217,952,308	2.1	2.0	229,095,935	2.0	2.0
Georgia	128,698,376	4.7	2.2	137,576,941	4.7	2.3
Hawaii	11,010,533	7.4	6.4	10,836,036	7.5	6.9
Idaho	13,100,152	86.3	6.6	12,024,564	84.6	8.4
Illinois	193,864,357	1.9	1.8	201,351,872	2.6	2.6
Indiana	116,670,280	1.9	1.5	125,180,739	3.0	2.6
Iowa	51,860,063	16.5	14.6	57,508,721	17.9	16.3
Kansas	46,677,308	6.2	6.1	47,923,762	7.2	7.2
Kentucky	90,630,427	4.1	0.4	98,217,658	3.1	0.4
Louisiana	90,993,676	4.0	2.6	102,884,940	3.5	2.4
Maine	16,349,849	49.8	24.1	17,018,660	46.8	24.4
Maryland	43,774,832	5.6	1.3	43,607,264	5.1	1.3
Massachusetts	38,966,651	6.2	3.2	42,804,824	5.3	3.0
Michigan	101,202,605	3.9	2.6	111,551,371	3.7	2.5
Minnesota	52,491,849	14.4	12.8	53,670,227	13.9	12.4
Mississippi	48,701,484	2.9	2.9	54,487,260	2.8	2.8
Missouri	88,354,272	2.7	0.7	92,312,989	2.7	1.1
Montana	26,712,735	39.0	3.4	29,791,181	35.1	3.4
Nebraska	34,001,892	2.6	1.3	36,630,006	4.9	1.3
Nevada	37,705,133	11.3	4.8	35,146,248	12.6	6.5
New Hampshire	20,164,122	14.3	5.9	22,195,912	12.2	5.6

Table 15. Renewable market share of net generation by State, 2009 and 2010 (cont.)

(thousand kilowatthours)

State	2009			2010		
	Total Generation	Percent Renewable	Percent NonHydro Renewable	Total Generation	Percent Renewable	Percent NonHydro Renewable
New Jersey	61,811,239	1.6	1.6	65,682,494	1.3	1.3
New Mexico	39,674,339	4.7	4.0	36,251,542	5.7	5.1
New York	133,150,550	24.1	3.4	136,961,654	22.1	3.5
North Carolina	118,407,403	6.0	1.6	128,678,483	5.3	1.6
North Dakota	34,196,467	13.1	8.8	34,739,542	17.7	11.8
Ohio	136,090,225	0.9	0.5	143,598,337	0.8	0.5
Oklahoma	75,066,809	8.6	3.9	72,250,733	9.6	5.8
Oregon	56,690,856	65.8	7.5	55,126,999	64.0	8.6
Pennsylvania	219,496,144	2.7	1.5	229,752,306	2.9	1.8
Rhode Island	7,696,824	1.9	1.9	7,738,719	1.9	1.8
South Carolina	100,125,486	4.1	1.7	104,153,133	4.1	1.8
South Dakota	8,196,531	59.3	5.2	10,049,636	65.8	13.6
Tennessee	79,716,889	14.0	1.2	82,348,625	11.1	1.2
Texas	397,167,910	5.6	5.3	411,695,046	7.0	6.7
Utah	43,542,946	3.0	1.1	42,249,355	3.5	1.8
Vermont	7,282,348	26.3	5.9	6,619,990	27.6	7.3
Virginia	70,082,066	5.6	3.4	72,966,456	5.1	3.0
Washington	104,470,133	74.6	4.8	103,472,729	72.4	6.4
West Virginia	70,782,514	3.4	1.0	80,788,947	2.9	1.2
Wisconsin	59,959,060	6.2	3.9	64,314,067	7.1	3.8
Wyoming	46,029,212	6.9	4.8	48,119,254	8.9	6.7
U.S. Total	3,950,330,926	10.6	3.7	4,125,059,899	10.4	4.1

- = 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 16. U.S. electric net summer capacity, 2006 – 2010

(megawatts)					
Source	2006	2007	2008	2009	2010
Total	986,215	994,888	1,010,171	1,025,400	1,039,137
Renewable Total	101,934	107,954	116,396	127,070	132,711
Biomass	10,100	10,839	11,050	11,256	11,406
Waste	3,727	4,134	4,186	4,317	4,369
Landfill Gas	978	1,319	1,429	1,418	1,471
MSW <sup>1</sup>	2,188	2,218	2,215	2,227	2,220
Other Biomass <sup>2</sup>	561	598	542	671	678
Wood and Derived Fuels <sup>3</sup>	6,372	6,704	6,864	6,939	7,037
Geothermal	2,274	2,214	2,229	2,382	2,405
Hydroelectric Conventional	77,821	77,885	77,930	78,518	78,825
Solar Thermal/PV	411	502	536	619	941
Wind	11,329	16,515	24,651	34,296	39,135
Nonrenewable Total	884,281	886,934	893,775	898,331	906,426

<sup>1</sup>Includes total capacity whose primary energy source is MSW.

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

<sup>3</sup>Black 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.

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

Table 17. Total renewable net summer capacity by energy source and State, 2009

(megawatts)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass			Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind		
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>	Waste						
Alabama	3,272	-	-	591	-	-	-	591	3,863	
Alaska	414	-	-	-	-	-	7	7	422	
Arizona	2,720	4	-	29	-	11	63	106	2,826	
Arkansas	1,337	5	6	312	-	-	-	323	1,659	
California	10,144	306	96	646	2,004	450	2,650	6,152	16,295	
Colorado	666	3	10	-	-	14	1,238	1,265	1,931	
Connecticut	122	166	-	-	-	-	-	166	287	
Delaware	-	7	-	-	-	-	-	7	7	
District of Columbia	-	-	-	-	-	-	-	-	-	
Florida	55	492	171	351	-	25	-	1,038	1,093	
Georgia	2,046	15	-	587	-	-	-	602	2,648	
Hawaii	24	60	162	-	31	1	64	318	341	
Idaho	2,682	-	5	68	7	-	146	227	2,909	
Illinois	34	139	-	-	-	9	1,596	1,744	1,777	
Indiana	60	45	-	-	-	-	1,037	1,081	1,141	
Iowa	144	11	3	-	-	-	3,352	3,367	3,511	
Kansas	3	-	-	-	-	-	1,011	1,011	1,014	
Kentucky	824	17	-	52	-	-	-	69	893	
Louisiana	192	-	14	373	-	-	-	387	579	
Maine	738	57	36	606	-	-	170	868	1,606	
Maryland	590	135	-	3	-	-	-	137	727	
Massachusetts	261	264	9	26	-	s	5	304	564	
Michigan	251	168	-	230	-	-	143	541	792	
Minnesota	194	132	75	177	-	-	1,615	1,999	2,192	
Mississippi	-	-	-	229	-	-	-	229	229	
Missouri	564	8	-	-	-	-	309	316	880	
Montana	2,692	-	-	17	-	-	369	386	3,078	
Nebraska	278	6	5	-	-	-	105	115	393	
Nevada	1,051	-	-	-	306	89	-	395	1,446	
New Hampshire	498	29	-	140	-	-	24	193	691	

Table 17. Total renewable net summer capacity by energy source and State, 2009 (cont.)

(megawatts)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind	Total		
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>							
New Jersey	6	175	20	-	-	13	8	215	221	
New Mexico	82	-	6	-	-	-	597	604	686	
New York	4,310	344	-	86	-	-	1,274	1,704	6,013	
North Carolina	1,952	20	-	318	-	3	-	342	2,294	
North Dakota	508	-	10	-	-	-	1,202	1,212	1,720	
Ohio	101	41	1	65	-	-	7	115	216	
Oklahoma	854	16	-	58	-	-	1,130	1,203	2,057	
Oregon	8,430	26	3	241	-	-	1,659	1,929	10,359	
Pennsylvania	747	419	-	108	-	2	696	1,224	1,971	
Rhode Island	3	24	-	-	-	-	-	24	26	
South Carolina	1,337	23	-	220	-	-	-	244	1,580	
South Dakota	1,594	-	-	-	-	-	320	320	1,914	
Tennessee	2,614	8	2	165	-	-	29	203	2,817	
Texas	689	79	28	180	-	-	9,378	9,665	10,354	
Utah	256	9	-	-	34	-	222	265	521	
Vermont	322	3	-	76	-	-	5	84	406	
Virginia	716	278	-	409	-	-	-	687	1,403	
Washington	21,088	41	-	369	-	1	2,006	2,416	23,504	
West Virginia	264	-	-	-	-	-	330	330	594	
Wisconsin	492	72	11	208	-	-	430	720	1,212	
Wyoming	304	-	-	-	-	-	1,104	1,104	1,408	
U.S. Total	78,518	3,645	671	6,939	2,382	619	34,296	48,552	127,070	

<sup>1</sup>Total capacity whose primary energy source is landfill gas or MSW.<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

s = Less than 500 kilowatts.

- = No data reported.

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

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

Table 18. Renewable electric power sector net summer capacity by energy source and State, 2009

(megawatts)

State	NonHydroelectric								Total
	Hydroelectric Conventional	Biomass		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind	Total	
		Waste	Other Biomass <sup>2</sup>						
Alabama	3,272	-	-	-	-	-	-	3,272	
Alaska	414	-	-	-	-	-	7	422	
Arizona	2,720	4	-	29	-	11	63	106	2,826
Arkansas	1,337	5	4	-	-	-	-	9	1,346
California	10,138	292	33	489	2,004	450	2,650	5,918	16,056
Colorado	666	3	10	-	-	14	1,238	1,265	1,931
Connecticut	122	166	-	-	-	-	-	166	287
Delaware	-	7	-	-	-	-	-	7	7
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	55	492	105	67	-	25	-	689	743
Georgia	2,039	12	-	-	-	-	-	12	2,050
Hawaii	18	-	159	-	31	1	64	255	274
Idaho	2,682	-	5	12	7	-	146	170	2,852
Illinois	34	139	-	-	-	9	1,596	1,744	1,777
Indiana	60	36	-	-	-	-	1,037	1,072	1,132
Iowa	144	11	-	-	-	-	3,352	3,363	3,507
Kansas	3	-	-	-	-	-	1,011	1,011	1,014
Kentucky	824	17	-	-	-	-	-	17	841
Louisiana	192	-	11	-	-	-	-	11	203
Maine	613	33	36	214	-	-	170	452	1,065
Maryland	590	128	-	-	-	-	-	128	718
Massachusetts	255	264	-	26	-	-	3	293	548
Michigan	247	101	-	178	-	-	143	422	670
Minnesota	164	129	75	127	-	-	1,615	1,946	2,110
Mississippi	-	-	-	-	-	-	-	-	-
Missouri	564	8	-	-	-	-	309	316	880
Montana	2,692	-	-	-	-	-	369	369	3,060
Nebraska	278	6	2	-	-	-	105	112	390
Nevada	1,051	-	-	-	306	88	-	394	1,445
New Hampshire	497	29	-	138	-	-	24	192	689

**Table 18. Renewable electric power sector net summer capacity by energy source and State, 2009 (cont.)**

(megawatts)

State	NonHydroelectric								Total	Total
	Biomass			Wood and Derived Fuels <sup>3</sup>	Solar					
	Hydroelectric Conventional	Waste			Thermal/P V	Wind				
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>							
New Jersey	6	137	19	-	-	13	8	177	183	
New Mexico	82	-	6	-	-	-	597	604	686	
New York	4,294	310	-	86	-	-	1,274	1,670	5,965	
North Carolina	1,947	20	-	75	-	3	-	99	2,046	
North Dakota	508	-	-	-	-	-	1,202	1,202	1,710	
Ohio	101	41	-	7	-	-	7	56	157	
Oklahoma	854	-	-	-	-	-	1,130	1,130	1,984	
Oregon	8,430	23	3	48	-	-	1,659	1,733	10,163	
Pennsylvania	747	391	-	28	-	2	696	1,116	1,863	
Rhode Island	3	24	-	-	-	-	-	24	26	
South Carolina	1,336	23	-	-	-	-	-	23	1,359	
South Dakota	1,594	-	-	-	-	-	320	320	1,914	
Tennessee	2,614	8	2	-	-	-	29	39	2,653	
Texas	689	79	-	50	-	-	9,378	9,508	10,197	
Utah	256	9	-	-	34	-	222	265	521	
Vermont	317	3	-	72	-	-	5	80	398	
Virginia	713	202	-	83	-	-	-	285	999	
Washington	21,083	41	-	86	-	1	2,006	2,133	23,216	
West Virginia	163	-	-	-	-	-	330	330	493	
Wisconsin	450	66	-	73	-	-	430	568	1,018	
Wyoming	304	-	-	-	-	-	1,104	1,104	1,408	
U.S. Total	78,159	3,259	469	1,889	2,382	617	34,295	42,910	121,070	

<sup>1</sup>Total capacity whose primary energy source is landfill gas or MSW.

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

<sup>3</sup>Black 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.

The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Industry 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 19. Renewable commercial and industrial sector net summer capacity by energy source and State, 2009**

(megawatts)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind			
		Waste								
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>							
Alabama	-	-	-	591	-	-	-	591	591	
Alaska	-	-	-	-	-	-	-	-	-	
Arizona	-	-	-	-	-	-	-	-	-	
Arkansas	-	-	2	312	-	-	-	314	314	
California	6	13	64	156	-	-	-	233	239	
Colorado	-	-	-	-	-	-	-	-	-	
Connecticut	-	-	-	-	-	-	-	-	-	
Delaware	-	-	-	-	-	-	-	-	-	
District of Columbia	-	-	-	-	-	-	-	-	-	
Florida	-	-	66	284	-	-	-	350	350	
Georgia	7	3	-	587	-	-	-	590	597	
Hawaii	5	60	3	-	-	-	-	63	68	
Idaho	-	-	-	57	-	-	-	57	57	
Illinois	-	-	-	-	-	-	-	-	-	
Indiana	-	9	-	-	-	-	-	9	9	
Iowa	-	-	3	-	-	-	-	3	3	
Kansas	-	-	-	-	-	-	-	-	-	
Kentucky	-	-	-	52	-	-	-	52	52	
Louisiana	-	-	3	373	-	-	-	376	376	
Maine	125	24	-	392	-	-	-	416	541	
Maryland	-	7	-	3	-	-	-	9	9	
Massachusetts	6	-	9	-	-	s	1	10	16	
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	

Table 19. Renewable commercial and industrial sector net summer capacity by energy source and State, 2009 (cont.)

(megawatts)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind			
		Waste								
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>							
New Jersey	-	38	1	-	-	-	-	38	38	
New Mexico	-	-	-	-	-	-	-	-	-	
New York	15	33	-	-	-	-	-	33	49	
North Carolina	5	-	-	243	-	-	-	243	248	
North Dakota	-	-	10	-	-	-	-	10	10	
Ohio	-	-	1	58	-	-	-	59	59	
Oklahoma	-	16	-	58	-	-	-	73	73	
Oregon	-	3	-	193	-	-	-	196	196	
Pennsylvania	-	28	-	80	-	-	-	108	108	
Rhode Island	-	-	-	-	-	-	-	-	-	
South Carolina	1	-	-	220	-	-	-	220	221	
South Dakota	-	-	-	-	-	-	-	-	-	
Tennessee	-	-	-	165	-	-	-	165	165	
Texas	-	-	28	130	-	-	-	157	157	
Utah	-	-	-	-	-	-	-	-	-	
Vermont	4	-	-	4	-	-	-	4	8	
Virginia	3	76	-	326	-	-	-	402	404	
Washington	5	-	-	283	-	-	-	283	288	
West Virginia	101	-	-	-	-	-	-	-	101	
Wisconsin	42	7	11	135	-	-	-	152	194	
Wyoming	-	-	-	-	-	-	-	-	-	
U.S. Total	358	386	203	5,051	-	1	1	5,642	6,000	

<sup>1</sup>Total capacity whose primary energy source is landfill gas or MSW.<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

s = Less than 500 kilowatts.

- = No data reported.

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

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

Table 20. Total renewable net summer capacity by energy source and State, 2010

(megawatts)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass			Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind		
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>	Waste						
Alabama	3,272	-	-	583	-	-	-	583	3,855	
Alaska	414	-	-	-	-	-	7	7	422	
Arizona	2,720	4	-	29	-	20	128	181	2,901	
Arkansas	1,341	9	6	312	-	-	-	326	1,667	
California	10,141	292	97	639	2,004	475	2,812	6,319	16,460	
Colorado	662	3	10	-	-	41	1,294	1,348	2,010	
Connecticut	122	159	-	-	-	-	-	159	281	
Delaware	-	8	-	-	-	-	2	10	10	
District of Columbia	-	-	-	-	-	-	-	-	-	
Florida	55	491	171	344	-	123	-	1,128	1,182	
Georgia	2,052	17	4	617	-	-	-	637	2,689	
Hawaii	24	60	162	-	31	2	62	316	340	
Idaho	2,704	-	6	68	10	-	352	436	3,140	
Illinois	34	123	-	-	-	9	1,946	2,078	2,112	
Indiana	60	53	s	-	-	-	1,340	1,393	1,452	
Iowa	144	11	3	-	-	-	3,569	3,584	3,728	
Kansas	3	7	-	-	-	-	1,072	1,079	1,082	
Kentucky	824	17	-	52	-	-	-	69	893	
Louisiana	192	-	14	311	-	-	-	325	517	
Maine	738	57	35	600	-	-	263	954	1,692	
Maryland	590	135	-	3	-	1	70	209	799	
Massachusetts	262	255	9	26	-	4	10	304	566	
Michigan	237	176	-	232	-	-	163	571	807	
Minnesota	193	134	75	177	-	-	2,009	2,395	2,588	
Mississippi	-	-	-	235	-	-	-	235	235	
Missouri	564	8	-	-	-	-	459	466	1,030	
Montana	2,705	-	-	-	-	-	379	379	3,085	
Nebraska	278	6	5	-	-	-	154	165	443	
Nevada	1,051	-	-	-	319	137	-	456	1,507	
New Hampshire	489	29	-	129	-	-	24	182	671	

Table 20. Total renewable net summer capacity by energy source and State, 2010 (cont.)

(megawatts)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind			
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>							
								Waste		
New Jersey	4	171	20	-	-	-	8	226	230	
New Mexico	82	-	6	-	-	-	700	736	818	
New York	4,314	359	-	86	-	-	1,274	1,719	6,033	
North Carolina	1,956	27	-	481	-	-	-	543	2,499	
North Dakota	508	-	10	-	-	-	1,423	1,433	1,941	
Ohio	101	48	2	60	-	-	7	130	231	
Oklahoma	858	16	-	58	-	-	1,480	1,553	2,412	
Oregon	8,425	31	3	221	-	-	2,004	2,260	10,684	
Pennsylvania	747	424	-	108	-	-	696	1,237	1,984	
Rhode Island	3	24	-	-	-	-	2	25	28	
South Carolina	1,340	29	-	255	-	-	-	284	1,623	
South Dakota	1,594	-	-	-	-	-	629	629	2,223	
Tennessee	2,624	6	2	185	-	-	29	222	2,847	
Texas	689	88	28	215	-	-	9,952	10,295	10,985	
Utah	255	9	-	-	-	42	222	273	528	
Vermont	324	3	-	76	-	-	5	84	408	
Virginia	866	290	-	331	-	-	-	621	1,487	
Washington	21,181	39	-	368	-	-	2,296	2,703	23,884	
West Virginia	285	-	-	-	-	-	431	431	715	
Wisconsin	492	76	12	239	-	-	449	775	1,267	
Wyoming	307	-	-	-	-	-	1,415	1,415	1,722	
U.S. Total	78,825	3,690	678	7,037	2,405	941	39,135	53,886	132,711	

<sup>1</sup>Total capacity whose primary energy source is landfill gas or MSW.<sup>2</sup>Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.<sup>3</sup>Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

s = Less than 500 kilowatts.

- = No data reported.

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

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

Table 21. Renewable electric power sector net summer capacity by energy source and State, 2010

(megawatts)

State	NonHydroelectric								Total
	Hydroelectric Conventional	Biomass		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind	Total	
		Waste	Other						
	Gas/MSW <sup>1</sup>								
Alabama	3,272	-	-	-	-	-	-	-	3,272
Alaska	414	-	-	-	-	-	7	7	422
Arizona	2,720	4	-	29	-	20	128	181	2,901
Arkansas	1,341	9	4	-	-	-	-	13	1,354
California	10,135	279	34	481	2,004	473	2,812	6,082	16,216
Colorado	662	3	10	-	-	39	1,289	1,340	2,002
Connecticut	122	159	-	-	-	-	-	159	281
Delaware	-	8	-	-	-	-	2	10	10
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	55	491	105	67	-	123	-	785	840
Georgia	2,045	13	-	17	-	-	-	30	2,075
Hawaii	14	-	113	-	31	2	62	208	222
Idaho	2,704	-	6	12	10	-	352	380	3,084
Illinois	34	123	-	-	-	9	1,946	2,078	2,112
Indiana	60	44	-	-	-	-	1,339	1,382	1,442
Iowa	144	11	-	-	-	-	3,569	3,581	3,725
Kansas	3	7	-	-	-	-	1,072	1,079	1,082
Kentucky	824	17	-	-	-	-	-	17	841
Louisiana	192	-	11	-	-	-	-	11	203
Maine	613	33	35	208	-	-	263	538	1,151
Maryland	590	128	-	-	-	1	70	199	789
Massachusetts	256	255	-	26	-	4	9	294	550
Michigan	233	94	-	180	-	-	163	436	669
Minnesota	164	125	75	127	-	-	2,005	2,332	2,496
Mississippi	-	-	-	-	-	-	-	-	-
Missouri	564	8	-	-	-	-	459	466	1,030
Montana	2,705	-	-	-	-	-	379	379	3,085
Nebraska	278	6	2	-	-	-	154	162	440
Nevada	1,051	-	-	-	319	136	-	455	1,506
New Hampshire	488	29	-	127	-	-	24	181	669

**Table 21. Renewable electric power sector net summer capacity by energy source and State, 2010 (cont.)**

(megawatts)

State	NonHydroelectric								Total	Total
	Hydroelectric Conventional	Biomass		Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind			
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>							
								Waste		
New Jersey	4	133	19	-	-	28	8	187	191	
New Mexico	82	-	6	-	-	30	700	736	818	
New York	4,299	326	-	86	-	-	1,274	1,685	5,984	
North Carolina	1,951	27	-	238	-	35	-	300	2,251	
North Dakota	508	-	-	-	-	-	1,423	1,423	1,931	
Ohio	101	48	-	7	-	13	7	75	177	
Oklahoma	858	-	-	-	-	-	1,480	1,480	2,338	
Oregon	8,425	28	3	52	-	-	2,004	2,087	10,512	
Pennsylvania	747	396	-	28	-	7	696	1,127	1,874	
Rhode Island	3	24	-	-	-	-	2	25	28	
South Carolina	1,339	29	-	-	-	-	-	29	1,368	
South Dakota	1,594	-	-	-	-	-	629	629	2,223	
Tennessee	2,624	6	2	-	-	-	29	37	2,662	
Texas	689	88	-	50	-	14	9,952	10,103	10,792	
Utah	255	9	-	-	42	-	222	273	528	
Vermont	320	3	-	72	-	-	5	80	400	
Virginia	864	214	-	83	-	-	-	297	1,161	
Washington	21,176	39	-	86	-	1	2,296	2,421	23,598	
West Virginia	184	-	-	-	-	-	431	431	614	
Wisconsin	451	69	-	106	-	-	449	624	1,075	
Wyoming	307	-	-	-	-	-	1,415	1,415	1,722	
U.S. Total	78,463	3,284	424	2,082	2,405	934	39,122	48,250	126,713	

<sup>1</sup>Total capacity whose primary energy source is landfill gas or MSW.

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

<sup>3</sup>Black 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.

The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Industry 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 22. Renewable commercial and industrial sector net summer capacity by energy source and State, 2010**

(megawatts)

State	NonHydroelectric								Total	Total
	Biomass			Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind			
	Waste									
	Hydroelectric Conventional	Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>							
Alabama	-	-	-	583	-	-	-	583	583	
Alaska	-	-	-	-	-	-	-	-	-	
Arizona	-	-	-	-	-	-	-	-	-	
Arkansas	-	-	2	312	-	-	-	314	314	
California	6	13	64	159	-	2	-	238	244	
Colorado	-	-	-	-	-	2	6	8	8	
Connecticut	-	-	-	-	-	-	-	-	-	
Delaware	-	-	-	-	-	-	-	-	-	
District of Columbia	-	-	-	-	-	-	-	-	-	
Florida	-	-	66	277	-	-	-	343	343	
Georgia	7	3	4	600	-	-	-	607	614	
Hawaii	10	60	49	-	-	-	-	109	118	
Idaho	-	-	-	57	-	-	-	57	57	
Illinois	-	-	-	-	-	-	-	-	-	
Indiana	-	9	5	-	-	-	1	10	10	
Iowa	-	-	3	-	-	-	-	3	3	
Kansas	-	-	-	-	-	-	-	-	-	
Kentucky	-	-	-	52	-	-	-	52	52	
Louisiana	-	-	3	311	-	-	-	314	314	
Maine	125	24	-	392	-	-	-	416	541	
Maryland	-	7	-	3	-	-	-	9	9	
Massachusetts	6	-	9	-	-	5	1	10	16	
Michigan	4	82	-	52	-	-	-	134	138	
Minnesota	30	8	-	49	-	-	5	62	92	
Mississippi	-	-	-	235	-	-	-	235	235	
Missouri	-	-	-	-	-	-	-	-	-	
Montana	-	-	-	-	-	-	-	-	-	
Nebraska	-	-	3	-	-	-	-	3	3	
Nevada	-	-	-	-	-	1	-	1	1	
New Hampshire	1	-	-	1	-	-	-	1	2	

**Table 22. Renewable commercial and industrial sector net summer capacity by energy source and State, 2010 (cont.)**

(megawatts)

State	NonHydroelectric									Total
	Hydroelectric Conventional	Biomass			Wood and Derived Fuels <sup>3</sup>	Geothermal	Solar Thermal/P V	Wind	Total	
		Landfill Gas/MSW <sup>1</sup>	Other Biomass <sup>2</sup>	Waste						
New Jersey	-	38	1	-	-	s	-	39	39	
New Mexico	-	-	-	-	-	-	-	-	-	
New York	15	33	-	-	-	-	-	33	49	
North Carolina	5	-	-	243	-	-	-	243	248	
North Dakota	-	-	10	-	-	-	-	10	10	
Ohio	-	-	2	53	-	-	-	55	55	
Oklahoma	-	16	-	58	-	-	-	73	73	
Oregon	-	3	-	170	-	-	-	173	173	
Pennsylvania	-	28	-	80	-	2	-	110	110	
Rhode Island	-	-	-	-	-	-	-	-	-	
South Carolina	1	-	-	255	-	-	-	255	256	
South Dakota	-	-	-	-	-	-	-	-	-	
Tennessee	-	-	-	185	-	-	-	185	185	
Texas	-	-	28	165	-	-	-	192	192	
Utah	-	-	-	-	-	-	-	-	-	
Vermont	4	-	-	4	-	-	-	4	8	
Virginia	3	76	-	248	-	-	-	323	326	
Washington	5	-	-	282	-	-	-	282	286	
West Virginia	101	-	-	-	-	-	-	-	101	
Wisconsin	41	7	12	133	-	-	-	151	192	
Wyoming	-	-	-	-	-	-	-	-	-	
U.S. Total	362	407	254	4,956	-	7	12	5,636	5,998	

<sup>1</sup>Total capacity whose primary energy source is landfill gas or MSW.

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

<sup>3</sup>Black liquor, and wood/wood waste solids and liquids.

MSW = Municipal Solid Waste.

PV = Photovoltaic.

s = Less than 500 kilowatts.

- = No data reported.

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

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

**Table 23. Net summer capacity of plants with the capability to cofire biomass and coal, 2009 and 2010**

(megawatts)								
State	Company Name	Plant I.D.	Plant Name	County	2009		2010	
					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	84	45	76
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 Enterprises LP	10640	Stockton Cogen	San Joaquin	54	54	54	54
CA	Mt Poso Cogeneration Co	54626	Mt Poso Cogeneration	Kern	52	52	52	52
DE	Calpine Mid-Atlantic Generation LLC	593	Edge Moor	New Castle	260	718	260	723
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	22	36	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	40	40
GA	SP Newsprint Company	54004	Dublin Mill	Laurens	44	84	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	105	105	104	104
IA	Archer Daniels Midland Co	10860	Archer Daniels Midland Clinton	Clinton	180	180	180	180
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	536	1,346	536	1,346
LA	International Paper Co	54090	International Paper Louisiana Mill	Morehouse	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	56	65	56	65
ME	Verso Bucksport LLC	50243	Verso Paper	Hancock	93	250	93	250
MI	Decorative Panels International, Inc.	10149	Decorative Panels Intl	Alpena	7	7	7	7
MI	Michigan State University	10328	T B Simon Power Plant	Ingham	21	97	21	97
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	.	.
MI	TES Filer City Station LP	50835	TES Filer City Station	Manistee	60	60	60	60
MN	Minnesota Power Inc	1897	M L Hibbard	St Louis	67	67	67	67
MN	Minnesota Power Inc	10686	Rapids Energy Center	Itasca	27	27	27	27
MN	Willmar Municipal Utilities	2022	Willmar	Kandiyohi	16	26	16	26
MO	Anheuser-Busch Inc	10430	Anheuser Busch St Louis	St Louis City	26	26	26	26
MO	City of Marshall	2144	Marshall	Saline	6	55	6	55
MO	Curators of the University of Missouri	50969	MU Combined Heat and Power Plant	Boone	51	77	51	77
MS	Weyerhaeuser Co	50184	Weyerhaeuser Columbus MS	Lowndes	123	123	129	129
NC	CPI USA NC LLC	10378	CPI USA NC Southport	Brunswick	54	107	107	107
NC	CPI USA NC LLC	10379	CPI USA NC Roxboro	Person	56	56	56	56
NC	Carlyle/Riverstone Renewable Energy	10381	Coastal Carolina Clean Power	Duplin	27	27	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
NE	Archer Daniels Midland Co	57046	Archer Daniels Midland Columbus	Platte	.	.	61	61
NY	AES Greenidge	2527	AES Greenidge LLC	Yates	108	108	108	108

**Table 23. Net summer capacity of plants with the capability to cofire biomass and coal, 2009 and 2010 (cont.)**

(megawatts)

State	Company Name	Plant I.D.	Plant Name	County	2009		2010	
					Biomass/ Coal Cofiring Capacity	Total Plant Capacity	Biomass/ Coal Cofiring Capacity	Total Plant Capacity
NY	Black River Generation LLC	10464	Black River Generation	Jefferson	55	55	55	55
PA	Domtar LLC	54638	Johnsonburg Mill	Elk	49	49	49	49
SC	International Paper Co-Eastovr Smurfit-Stone Container Enterprises	52151	International Paper Eastover Facility	Richland	46	103	46	103
SC	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
TN	Bowater Newsprint Calhoun Ops	50956	Bowater Newsprint Calhoun Operation	McMinn	66	66	66	66
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	81	106	100	138
VA	MeadWestvaco Corp Smurfit-Stone Container Enterprises	50900	Covington Facility	Covington	97	97	97	97
VA	Inc	50813	Stone Container Hopewell Mill	Hopewell City	41	41	41	41
WA	Weyerhaeuser Co	50187	Weyerhaeuser Longview WA	Cowlitz	29	57	29	57
WI	Flambeau River Papers	50620	Flambeau River Papers	Price	5	5	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	101	188	101	188
WI	Manitowoc Public Utilities	4125	Manitowoc	Manitowoc	116	121	116	121
WI	NewPage Corporation	10234	Biron Mill	Wood	22	62	20	55
WI	NewPage Corporation	10476	Whiting Mill	Portage	4	4	4	4
WI	NewPage Corporation	10477	Wisconsin Rapids Pulp Mill	Wood	67	67	65	65
WI	NewPage Corporation	54857	Niagara Mill	Marinette	12	25	12	25
WI	Northern States Power Co - Minnesota	3982	Bay Front	Ashland	44	73	33	56
WI	State of Wisconsin	54407	Waupun Correctional Central Heating Univ of Wisc Madison Charter Sreet	Dodge	1	1	1	1
WI	State of Wisconsin	54408	Plant	Dane	6	6	6	6
WI	Thilmany LLC	54098	International Paper Kaukauna Mill	Outagamie	45	45	45	45
WI	Wausau Paper Specialty Products LLC	50614	Mosinee Paper	Marathon	18	21	18	21
Total					4,434	6,911	4,462	6,880

- = No data reported.

Note: State abbreviations are documented on the United States Postal Service website: [http://www.usps.com/ncsc/lookups/usps\\_abbreviations.htm](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 A1. Other non-renewable energy consumption by energy use sector and energy source, 2006 – 2010**

(quadrillion Btu)

Sector and Source	2006	2007	2008	2009	2010
Total	R0.258	0.276	0.248	R0.265	0.275
Commercial	0.021	0.017	0.021	0.022	0.022
MSW Non-Biogenic <sup>1</sup>	0.020	0.017	0.021	0.022	0.022
Other Non-Biogenic <sup>2</sup>	*	0.001	*	*	*
Industrial	R0.113	0.135	R0.097	R0.119	0.129
MSW Non-Biogenic <sup>1</sup>	0.005	0.004	0.002	0.003	0.003
Other Non-Biogenic <sup>2</sup>	R0.108	0.130	R0.095	R0.116	0.126
Electric Power <sup>3</sup>	0.125	0.124	0.131	0.124	0.124
MSW Non-Biogenic <sup>1</sup>	0.109	0.108	0.110	0.108	0.105
Other Non-Biogenic <sup>2</sup>	0.015	0.016	0.020	0.016	0.019

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

<sup>2</sup>Tires and other (nonspecified).

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

MSW = Municipal Solid Waste.

R=Revised. \* = 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.

Source: Analysis conducted by the U.S. Energy Information Administration (EIA), Office of Electricity, Coal, Nuclear, and Renewables Analysis, and specific sources: 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 A2. Other non-renewable net electricity generation by energy use sector and energy source, 2006 – 2010**

(thousand kilowatthours)

Sector and Source	2006	2007	2008	2009	2010
Total	12,974,399	12,231,131	11,803,665	11,928,334	12,855,342
Commercial	758,464	764,083	719,532	841,850	834,069
MSW Non-Biogenic <sup>1</sup>	751,077	756,260	715,716	820,737	810,045
Other Non-Biogenic <sup>2</sup>	7,388	7,823	3,815	21,113	24,024
Industrial	5,103,173	4,690,087	4,124,817	4,457,306	5,213,564
MSW Non-Biogenic <sup>1</sup>	27,138	31,258	-	-	-
Other Non-Biogenic <sup>2</sup>	5,076,035	4,658,829	4,124,817	4,457,306	5,213,564
Electric Power <sup>3</sup>	7,112,762	6,776,960	6,959,316	6,629,179	6,807,708
MSW Non-Biogenic <sup>1</sup>	5,882,743	5,736,991	5,646,076	5,510,271	5,418,509
Other Non-Biogenic <sup>2</sup>	1,230,019	1,039,970	1,313,240	1,118,908	1,389,200

<sup>1</sup>Includes glass, steel, aluminum, other nonferrous metals, plastic, rubber, other materials, and miscellaneous inorganic wastes.<sup>2</sup>Tires and other (nonspecified).

<sup>3</sup>The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Industry 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).

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."