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Trends in Renewable Energy Consumption and Electricity 2009

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Preface

The U.S. Energy Information Administration (EIA) reports detailed historical data on renewable energy consumption and electricity annually in its report, the Renewable Energy Annual. This report, Trends in Renewable Energy Consumption and Electricity 2009, provides an overview and tables with historical data spanning as far back as 1989 through 2009, including revisions. These tables correspond to identical tables to be presented in chapter 1 of the Renewable Energy Annual 2009 and are numbered accordingly. The renewable energy resources in the report include: biomass (wood and derived fuels, municipal solid waste (MSW) biogenic, landfill gas, ethanol, biodiesel and other biomass); geothermal; wind; solar (solar thermal and photovoltaic); and conventional hydropower. Hydroelectric pumped storage is excluded, because it is usually based on non-renewable energy sources. Prior editions of this report may be found on the EIA website at http://tonto.eia.gov/reports/reportsD_archived.cfm?title=Renewable Energy Annual. Definitions for terms used in this report can be found in EIA's Energy Glossary: http://www.eia.gov/glossary/index.html. General information about all the EIA surveys with data related to renewable energy and referenced in this report can be found here: http://www.eia.gov/oss/forms.html.

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Trends in Renewable Energy Consumption and Electricity 2009

Summary

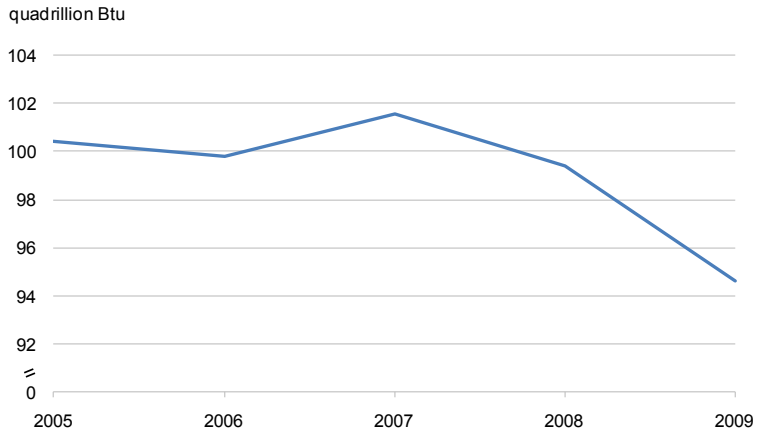
Despite an economic recession and a significant fall in overall energy demand/consumption, the use of renewable fuels grew strongly in 2009. This growth has been supported by Federal and State programs, including federal tax credits, state renewable portfolio standards, and a federal renewable fuels 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 94.7 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.[1]

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.

Figure 1.1 U.S. energy consumption, 2005-2009



Source: U.S. Energy Information Administration

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.[2] 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.

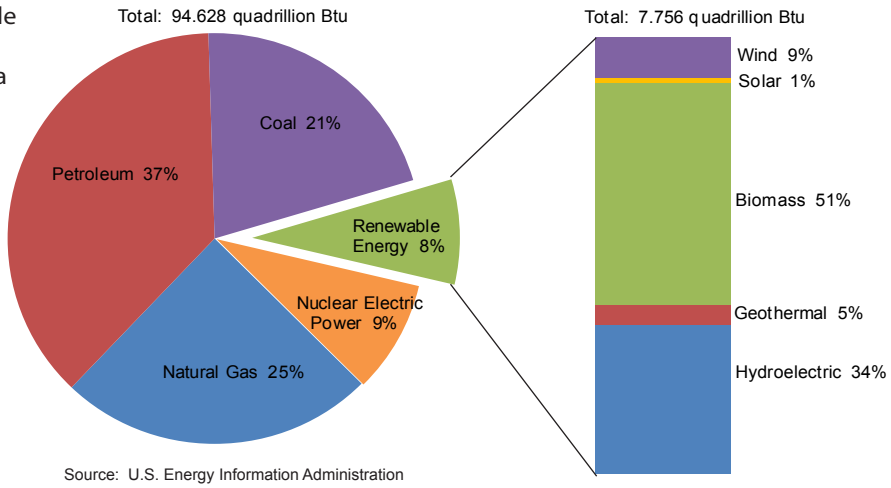
By sector, energy consumption dropped most in the industrial area (10.1 percent), followed by electric power (4.5 percent) and then transportation (3.5 percent).[3] The residential and commercial sectors each experienced declines of under 2 percent.

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.[4]

Figure 1.2 Renewable energy consumption in the nation's energy supply, 2009



Source: U.S. Energy Information Administration

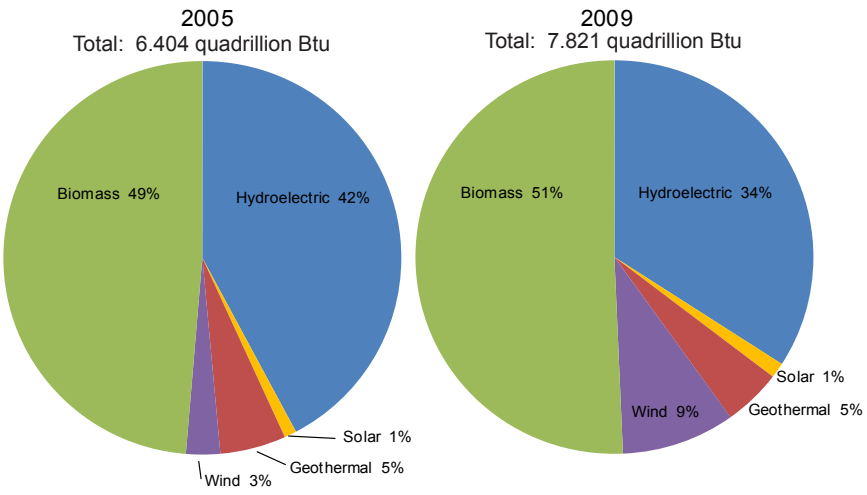
Wind energy grew 32 percent and has more than doubled since 2007, standing at 0.7 quadrillion Btus in 2009. While the gain in 2009 was strong, capacity additions and output might have been greater still except for the collapse of natural gas prices, which made lower capital cost natural gas-fired capacity 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.[5] This reflects the extended drought in the western United States.[6]

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.[7] Solar and geothermal shares remain relatively unchanged.

The continued growth of renewable energy is linked to various financial incentives and mandates.[8] 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).[9] In 6 states, however, these standards are voluntary.

Figure 1.3 U.S. energy consumption, 2005-2009



Source: U.S. Energy Information Administration

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 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.

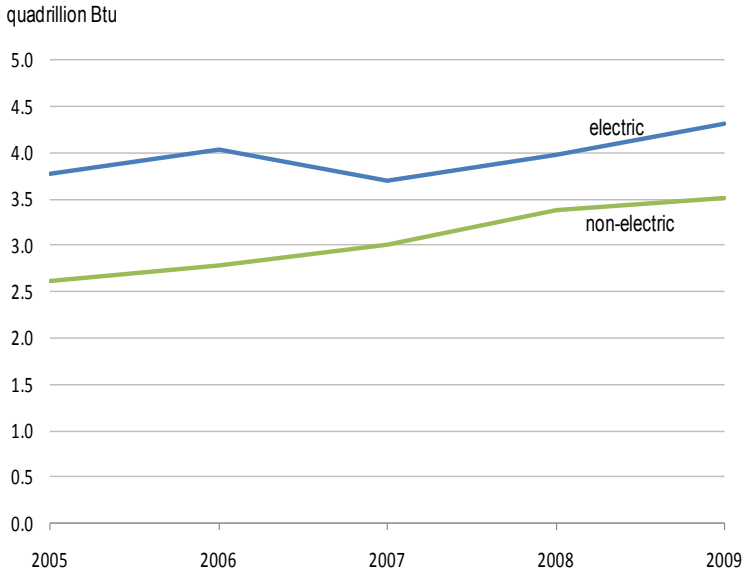
The residential and commercial sectors used 7.1 and 1.7 percent of total renewable energy in 2009, respectively. Geothermal energy consumed by the residential sector, though small, continues to grow, reflecting the increased use of geothermal heat pumps. Although commercial sector renewable energy consumption 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).[10] 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).

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.[11] Others have chosen to upgrade, while still others are converting to merchant biomass facilities.[12] While some are refurbishing to produce electricity, others plan to become bio-refineries with no electricity output.[13]

Figure 1.4 Renewable energy consumption by end-use 2005-2009



Source: U.S. Energy Information Administration

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 nonelectric 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.

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.[14] 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).[15] 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.[16]
- 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.[17] 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.[18]

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 nnergy

The industrial sector used 2.0 quadrillion Btus of biomass in 2009 to produce 26 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.[19]

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.[20]

U.S. capacity[21]

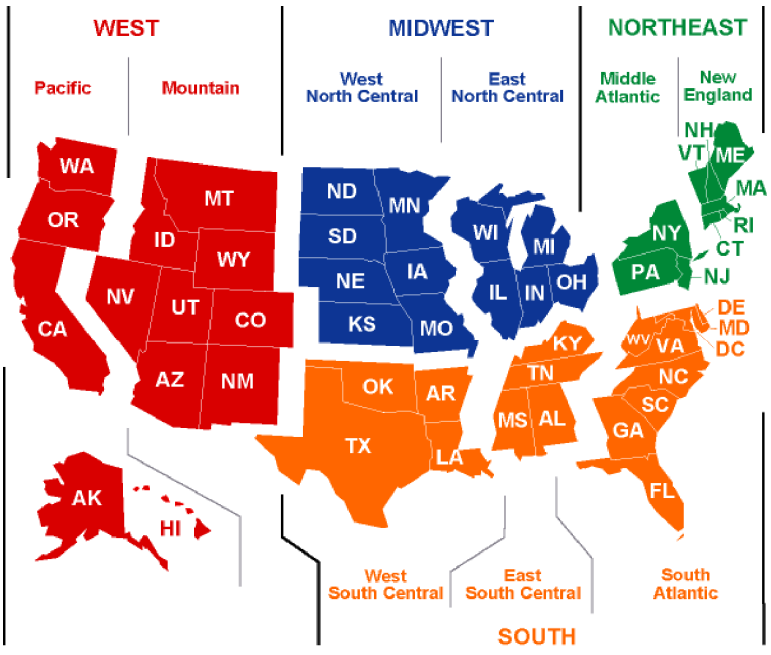
Renewable electricity capacity rose by 10.7 gigawatts (GW) in 2009 to 127.1 GW, up 9.2 percent from 2008 (Table 1.12).[22] By comparison, total U.S. electricity capacity rose only 1.5 percent, or 15.2 GW. Of the 10.7 GW renewable capacity increase, 9.6 GW came from wind.

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 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.[23] 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).

Figure 1.5 U.S. Census regions and divisions



Source: U.S. Energy Information Administration

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.[24]

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.[25]

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.

Notes

[1]U.S. Energy Information Administration, *Annual Energy Review 2009*, Table 1.1
[2]U.S. Energy Information Administration, *Monthly Energy Review, November 2010*, Table 9.1. Prices shown reflect the crude oil domestic "first purchase" price.
[3]U.S. Energy Information Administration, *Annual Energy Review 2009*, Table 2.1a.
[4]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.
[5]The 30-year average is based on the period 1980 – 2009.
[6]Weather Warehouse, http://weather-warehouse.com/?gclid=CO3K3-LxnqYCFcNM4AodVTSynw.
[7]Hydropower's share declined because output remained static in the face of increasing overall renewable energy consumption.
[8]U.S. Energy Information Administration, *Annual Energy Outlook 2011*, Executive Summary.
[9]See the Database for State Incentives for Renewables and Efficiency, www.dsireusa.org, for a description of each state's renewable portfolio standard or mandate.
[10]Data for some commercial PV rooftop projects greater than 1 MW were not available as of the time of this writing.
[11]See http://www.iaes.org/conferences/future/philadelphia_52/prelim_program/k10-1/shadbegian-akofio.htm.
[12]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.
[13]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.
[14]Waste energy includes MSW, LFG, sludge waste from wastewater treatment plants, food processing wastes, and other minor biomass wastes used to product energy.
[15]See also U.S. Energy Information Administration, "*Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy*," May 2007.
[16]As mentioned previously, some of the residential energy consumption may actually belong to the commercial or other sectors.
[17]See Table 1.10 for information on the heat content of various biomass fuels.
[18]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.
[19]Kentucky however, had more cofiring capacity in 2009, 536 MW, but only at a single plant.
[20]See http://www.mwra.state.ma.us/03sewer/html/renewableenergydi.htm.
[21]The capacity data refer to net summer capacity.
[22]1 Gigawatt = 1,000 megawatts.
[23]U.S. Energy Information Admnistration, *Renewable Energy Annual 2008*, Table 1.13.
[24]The "Southern United States" includes states in the East South Central and South Atlantic Census divisions, plus Virginia.
[25]Data from 2001 through 2005 were revised to reflect this reclassification.

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Table 1.1 U.S. energy Ccnsumption by energy source, 2005 - 2009

(quadrillion Btu)

Energy Source[1]	2005	2006	2007	2008	2009
Total	100.440	99.786	101.525	99.392	94.628
Fossil Fuels	85.790	84.687	86.251	83.497	78.406
Coal	22.797	22.447	22.749	22.385	19.761
Coal Coke Net Imports	0.045	0.061	0.025	0.040	-0.023
Natural Gas[2]	22.561	22.224	23.702	23.791	23.265
Petroleum[3]	40.388	39.955	39.774	37.280	35.403
Electricity Net Imports	0.084	0.063	0.106	0.113	0.117
Nuclear Electric Power	8.161	8.215	8.455	8.427	8.349
Renewable Energy	6.404	6.821	6.714	7.356	7.756
Biomass[4]	3.117	3.277	3.503	3.852	3.899
Biofuels	0.577	0.771	0.991	1.372	1.567
Waste	0.403	0.397	0.413	0.436	0.452
Wood and Derived Fuels	2.136	2.109	2.098	2.044	1.881
Geothermal Energy	0.343	0.343	0.349	0.358	0.369
Hydroelectric Conventional	2.703	2.869	2.446	2.512	2.669
Solar Thermal/PV Energy	0.063	0.068	0.076	0.089	0.098
Wind Energy	0.178	0.264	0.341	0.546	0.721

[1]Biodiesel primarily derived from soybean oil and ethanol primarily derived from corn.
[2]Includes supplemental gaseous fuels.
[3]Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.
[4]Biomass includes: biofuels, waste (landfill gas, MSW biogenic, and other biomass), wood and wood derived fuels.
PV = Photovoltaic.
Notes: Data revisions are discussed in the Highlights section.
Totals may not equal sum of components due to independent rounding.
Sources: Non-renewable energy: U.S. Energy Information Administration (EIA), Monthly Energy Review (MER) November 2010, DOE/EIA-0035 (2010/11) (Washington, DC, November 2010), Tables 1.3, 1.4a and 1.4b; Renewable Energy: Table 1.2 of this report.

Table 1.2 Renewable energy consumption by energy use sector and energy source, 2005 - 2009

(quadrillion Btu)

Sector and Source	2005	2006	2007	2008	2009
Total	6.404	6.821	6.714	7.356	7.756
Biomass	3.117	3.277	3.503	3.852	3.899
Biofuels	0.577	0.771	0.991	1.372	1.567
Biodiesel[1]	0.012	0.033	0.046	0.040	0.040
Ethanol[2]	0.335	0.453	0.569	0.800	0.910
Losses and Coproducts	0.230	0.285	0.377	0.532	0.617
Biodiesel Feedstock[3]	*	*	0.001	0.001	0.001
Ethanol Feedstock[4]	0.230	0.285	0.376	0.531	0.616
Waste	0.403	0.397	0.413	0.436	0.452
Landfill Gas	0.148	0.157	0.173	0.187	0.204
MSW Biogenic[5]	0.168	0.171	0.165	0.169	0.168
Other Biomass[6]	0.088	0.069	0.075	0.079	0.079
Wood and Derived Fuels[7]	2.136	2.109	2.098	2.044	1.881
Geothermal	0.343	0.343	0.349	0.358	0.369
Hydroelectric Conventional	2.703	2.869	2.446	2.512	2.669
Solar Thermal/PV	0.063	0.068	0.076	0.089	0.098
Wind	0.178	0.264	0.341	0.546	0.721
Residential	0.504	0.472	0.522	0.556	0.552
Biomass	0.430	0.390	0.430	0.450	0.430
Wood and Derived Fuels[8]	0.430	0.390	0.430	0.450	0.430
Geothermal	0.016	0.018	0.022	0.026	0.033
Solar Thermal/PV[9]	0.058	0.063	0.070	0.080	0.089
Commercial	0.119	0.117	0.118	0.125	0.129
Biomass	0.105	0.102	0.102	0.109	0.111
Biofuels	0.001	0.001	0.002	0.002	0.002
Ethanol[2]	0.001	0.001	0.002	0.002	0.002
Waste	0.034	0.036	0.031	0.034	0.036
Landfill Gas	0.003	0.004	0.003	0.003	0.003
MSW Biogenic[5]	0.025	0.026	0.021	0.026	0.028
Other Biomass[6]	0.007	0.007	0.007	0.005	0.005
Wood and Derived Fuels[7]	0.070	0.065	0.069	0.073	0.072
Geothermal	0.014	0.014	0.014	0.015	0.017
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	-	*	-
Wind	-	-	-	-	*
Industrial	1.873	1.930	1.964	2.053	2.005
Biomass	1.837	1.897	1.944	2.031	1.983
Biofuels	0.237	0.295	0.387	0.544	0.630
Ethanol[2]	0.007	0.010	0.010	0.012	0.013
Losses and Coproducts	0.230	0.285	0.377	0.532	0.617
Biodiesel Feedstock[3]	*	*	0.001	0.001	0.001
Ethanol Feedstock[4]	0.230	0.285	0.376	0.531	0.616
Waste	0.148	0.130	0.144	0.144	0.154
Landfill Gas	0.081	0.081	0.093	0.093	0.104
MSW Biogenic[5]	0.007	0.006	0.006	0.003	0.004
Other Biomass[6]	0.061	0.043	0.046	0.048	0.047
Wood and Derived Fuels[7]	1.452	1.472	1.413	1.344	1.198
Geothermal	0.004	0.004	0.005	0.005	0.004
Hydroelectric Conventional	0.032	0.029	0.016	0.017	0.018
Solar Thermal/PV	-	-	-	-	-
Wind	-	-	-	-	-
Transportation	0.339	0.475	0.603	0.827	0.934
Biomass	0.339	0.475	0.603	0.827	0.934
Biofuels	0.339	0.475	0.603	0.827	0.934
Biodiesel[1]	0.012	0.033	0.046	0.040	0.040
Ethanol[2]	0.328	0.442	0.557	0.786	0.894
Electric Power[10]	3.568	3.827	3.508	3.796	4.136
Biomass	0.406	0.412	0.423	0.435	0.441
Waste	0.221	0.231	0.237	0.258	0.261
Landfill Gas	0.065	0.073	0.077	0.092	0.097
MSW Biogenic[5]	0.136	0.139	0.138	0.141	0.137
Other Biomass[6]	0.020	0.019	0.022	0.026	0.027
Wood and Derived Fuels[7]	0.185	0.182	0.186	0.177	0.180
Geothermal	0.309	0.306	0.308	0.312	0.315
Hydroelectric Conventional	2.670	2.839	2.430	2.495	2.650
Solar Thermal/PV	0.006	0.005	0.006	0.009	0.009
Wind	0.178	0.264	0.341	0.546	0.721

Table 1.2 Renewable energy consumption by energy use sector and energy source, 2005 - 2009 (cont)

[1]Biodiesel primarily derived from soybean oil.
[2]Ethanol primarily derived from corn minus denaturant.
[3]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.
[4]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.
[5]Includes paper and paper board, wood, food, leather, textiles and yard trimmings.
[6]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[7]Black liquor, and wood/wood waste solids and liquids.
[8]Wood and wood pellet fuels.
[9]Includes small amounts of distributed solar thermal and photovoltaic energy used in the commercial, industrial and electric power sectors.
[10]The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
MSW = Municipal Solid Waste.
PV = Photovoltaic.
* = Less than 500 billion Btu.
- = No data reported.
Notes: Totals may not equal sum of components due to independent rounding.
Data revisions are discussed in the Highlights section.
Energy consumption for the noncombustible renewable energy sources (hydroelectric conventional, solar thermal, PV and wind) used in electricity generation is determined by mulitiplying generation times the fossil fuel equivalent heat rate. Energy consumption for geothermal energy used in electricity generation is determined by mulitiplying generation times the geothermal heat rate. See U.S. Energy Information Administratin (EIA), Annual Energy Review (AER) 2009, DOE/EIA-0384 (2009) (Washington, DC, August 2010), 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-63-A, "Annual Solar Thermal Collector Manufacturers Survey" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Commercial: U.S. Energy Information Administration, Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center. Industrial: U.S. Energy Information Administration, Form EIA-846 (A, B, C) "Manufacturing Energy Consumption Survey," Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center; U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and losses and coproducts from the production of biodiesel calculated as the difference between energy in feedstocks and production and from the production of ethanol calculated as the difference between energy feedstocks and production less denaturants. Biofuels for Transportation: Biodiesel: Consumption: 2005-2008: Calculated as biodiesel production plus net imports, 2009: January and February: EIA, Petroleum Supply Monthly, Table 1, data for refinery and blender net inputs of renewable fuels except ethanol. March through December: Calculated as biodiesel production plus biodiesel net imports minus biodiesel stock change; Production: 2001-2005: U.S. Department of Agriculture (USDA), Commodity Credit Corporation, Bioenergy Program, 2006: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for soybean oil in methyl esters (biodiesel), 2007: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for fats and oils in methyl esters, and 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey," 2009: 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 reports. Table 1 data for renewable fuels except ethanol; and Ethanol: 2005-2008: EIA Petroleum Supply Annual (Various Issues), Tables 1 and 15. Calculated as motor gasoline blending components adustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery and blender net inputs (Table 15). 2009: EIA Petroleum Supply Annual 2009, 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 1.3 Renewable energy consumption for electricity generation by energy use sector and energy source, 2005 - 2009

(quadrillion Btu)

Sector and Source	2005	2006	2007	2008	2009
Total	3.781	4.035	3.699	3.983	4.306
Biomass	0.585	0.591	0.598	0.606	0.592
Waste	0.230	0.241	0.245	0.267	0.272
Landfill Gas	0.068	0.076	0.080	0.094	0.100
MSW Biogenic[1]	0.144	0.147	0.146	0.148	0.147
Other Biomass[2]	0.018	0.018	0.019	0.024	0.025
Wood and Derived Fuels[3]	0.355	0.350	0.353	0.339	0.320
Geothermal	0.309	0.306	0.308	0.312	0.315
Hydroelectric Conventional	2.703	2.869	2.446	2.512	2.669
Solar Thermal/PV	0.006	0.005	0.006	0.009	0.009
Wind	0.178	0.264	0.341	0.546	0.721
Commercial	0.021	0.022	0.020	0.021	0.024
Biomass	0.020	0.021	0.020	0.021	0.023
Waste	0.020	0.021	0.019	0.020	0.023
Landfill Gas	0.002	0.003	0.002	0.003	0.003
MSW Biogenic[1]	0.013	0.013	0.013	0.014	0.016
Other Biomass[2]	0.005	0.004	0.004	0.004	0.004
Wood and Derived Fuels[3]	*	*	*	*	*
Geothermal	-	-	-	-	-
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	-	*	-
Wind	-	-	-	-	*
Industrial	0.226	0.219	0.208	0.200	0.182
Biomass	0.194	0.190	0.193	0.184	0.164
Waste	0.005	0.003	0.004	0.005	0.004
Landfill Gas	0.001	*	*	*	*
MSW Biogenic[1]	*	*	0.001	-	-
Other Biomass[2]	0.003	0.003	0.003	0.004	0.004
Wood and Derived Fuels[3]	0.189	0.187	0.188	0.179	0.160
Geothermal	-	-	-	-	-
Hydroelectric Conventional	0.032	0.029	0.016	0.017	0.018
Solar Thermal/PV	-	-	-	-	-
Wind	-	-	-	-	-
Electric Power[4]	3.534	3.794	3.470	3.762	4.100
Biomass	0.371	0.379	0.386	0.401	0.405
Waste	0.205	0.216	0.221	0.242	0.244
Landfill Gas	0.064	0.072	0.077	0.091	0.097
MSW Biogenic[1]	0.131	0.134	0.132	0.135	0.131
Other Biomass[2]	0.010	0.010	0.012	0.016	0.017
Wood and Derived Fuels[3]	0.166	0.163	0.165	0.159	0.160
Geothermal	0.309	0.306	0.308	0.312	0.315
Hydroelectric Conventional	2.670	2.839	2.430	2.495	2.650
Solar Thermal/PV	0.006	0.005	0.006	0.009	0.009
Wind	0.178	0.264	0.341	0.546	0.721

[1]Includes paper and paper board, wood, food, leather, textiles and yard trimmings.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]Black liquor, and wood/wood waste solids and liquids.
[4]The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
MSW = Municipal Solid Waste.
PV = Photovoltaic.
* = Less than 500 billion Btu.
- = No data reported.
Notes: Totals may not equal sum of components due to independent rounding. Starting with 2004 EIA adopted a new method of allocating fuel consumption between electric power generation and useful thermal out put (UTO) for combined heat and power (CHP) plants. The new method proportionately distributes a CHP plant`s losses between the two output products (electric power and UTO) assuming the same efficiency for production of electricity as UTO.
Energy consumption for the noncombustible renewable energy sources (hydroelectric conventional, solar thermal, PV and wind) used in electricity generation is determined by mulitiplying generation times the fossil fuel equivalent heat rate. Energy consumption for geothermal energy used in electricity generation is determined by mulitiplying generation times the geothermal heat rate. See U.S. Energy Information Administratin (EIA), Annual Energy Review (AER) 2009, DOE/EIA-0384 (2009) (Washington, DC, August 2010), Table A6.
Data revisions are discussed in the Highlights section.
Source: U.S. Energy Information Administration, Form EIA-923, “Power Plant Operations Report,” and predecessor forms: Form EIA-906, “Power Plant Report,” and Form EIA-920, “Combined Heat and Power Plant Report.”

Table 1.4 Renewable energy consumption for nonelectric use by energy use sector and energy source, 2005 - 2009

(quadrillion Btu)

Sector and Source	2005	2006	2007	2008	2009
Total	2.623	2.786	3.015	3.373	3.450
Biomass	2.531	2.686	2.904	3.247	3.307
Biofuels	0.577	0.771	0.991	1.372	1.567
Biodiesel[1]	0.012	0.033	0.046	0.040	0.040
Ethanol[2]	0.335	0.453	0.569	0.800	0.910
Losses and Coproducts	0.230	0.285	0.377	0.532	0.617
Biodiesel Feedstock[3]	*	*	0.001	0.001	0.001
Ethanol Feedstock[4]	0.230	0.285	0.376	0.531	0.616
Waste	0.173	0.156	0.168	0.169	0.180
Landfill Gas	0.080	0.081	0.093	0.093	0.104
MSW Biogenic[5]	0.023	0.024	0.019	0.021	0.021
Other Biomass[6]	0.070	0.051	0.056	0.055	0.055
Wood and Derived Fuels[7]	1.781	1.759	1.745	1.705	1.560
Geothermal	0.034	0.037	0.041	0.046	0.054
Solar Thermal/PV	0.058	0.063	0.070	0.080	0.089
Residential	0.504	0.472	0.522	0.556	0.552
Biomass	0.430	0.390	0.430	0.450	0.430
Wood and Derived Fuels[8]	0.430	0.390	0.430	0.450	0.430
Geothermal	0.016	0.018	0.022	0.026	0.033
Solar Thermal/PV	0.058	0.063	0.070	0.080	0.089
Commercial	0.098	0.095	0.097	0.104	0.105
Biomass	0.085	0.081	0.083	0.089	0.088
Biofuels	0.001	0.001	0.002	0.002	0.002
Ethanol[2]	0.001	0.001	0.002	0.002	0.002
Waste	0.014	0.016	0.012	0.014	0.013
Landfill Gas	*	0.001	0.001	*	*
MSW Biogenic[5]	0.012	0.013	0.008	0.012	0.012
Other Biomass[6]	0.002	0.002	0.003	0.002	0.002
Wood and Derived Fuels[7]	0.069	0.064	0.069	0.073	0.072
Geothermal	0.014	0.014	0.014	0.015	0.017
Solar Thermal/PV	-	-	-	-	-
Industrial	1.647	1.711	1.756	1.852	1.823
Biomass	1.643	1.706	1.751	1.847	1.818
Biofuels	0.237	0.295	0.387	0.544	0.630
Ethanol[2]	0.007	0.010	0.010	0.012	0.013
Losses and Coproducts	0.230	0.285	0.377	0.532	0.617
Biodiesel Feedstock[3]	*	*	0.001	0.001	0.001
Ethanol Feedstock[4]	0.230	0.285	0.376	0.531	0.616
Waste	0.143	0.126	0.140	0.139	0.150
Landfill Gas	0.079	0.080	0.093	0.092	0.104
MSW Biogenic[5]	0.007	0.006	0.005	0.003	0.004
Other Biomass[6]	0.057	0.040	0.043	0.044	0.043
Wood and Derived Fuels[7]	1.262	1.286	1.225	1.165	1.038
Geothermal	0.004	0.004	0.005	0.005	0.004
Solar Thermal/PV	-	-	-	-	-
Transportation	0.339	0.475	0.603	0.827	0.934
Biomass	0.339	0.475	0.603	0.827	0.934
Biofuels[1]	0.339	0.475	0.603	0.827	0.934
Biodiesel	0.012	0.033	0.046	0.040	0.040
Ethanol[2]	0.328	0.442	0.557	0.786	0.894
Electric Power[9]	0.035	0.033	0.038	0.034	0.036
Biomass	0.035	0.033	0.038	0.034	0.036
Waste	0.015	0.014	0.016	0.016	0.017
Landfill Gas	0.001	*	*	*	*
MSW Biogenic[5]	0.005	0.005	0.006	0.006	0.006
Other Biomass[6]	0.010	0.009	0.010	0.010	0.010
Wood and Derived Fuels[7]	0.019	0.019	0.021	0.018	0.020
Geothermal	-	-	-	-	-
Solar Thermal/PV	-	-	-	-	-

Table 1.4 Renewable energy consumption for nonelectric use by energy use sector and energy source, 2005 - 2009 (cont)
(quadrillion Btu)

[1]Biodiesel primarily derived from soybean oil.
[2]Ethanol primarily derived from corn minus denaturant.
[3]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.
[4]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.
[5]Includes paper and paper board, wood, food, leather, textiles and yard trimmings.
[6]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[7]Black liquor, and wood/wood waste solids and liquids.
[8]Wood and wood pellet fuels.
[9]The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
MSW = Municipal Solid Waste.
PV = Photovoltaic.
* = Less than 500 billion Btu.
- = No data reported.
Notes: Totals may not equal sum of components due to independent rounding. Starting with 2004 EIA adopted a new method of allocating fuel consumption between electric power generation and useful thermal out put (UTO) for combined heat and power (CHP) plants. The new method proportionately distributes a CHP plant`s losses between the two output products (electric power and UTO) assuming the same efficiency for production of electricity as UTO.
Data revisions are discussed in the Highlights section.
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" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Commercial: U.S. Energy Information Administration, Form EIA-920, "Combined Heat and Power Plant Report" and Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center. Industrial: U.S. Energy Information Administration, Form EIA-846 (A, B, C) "Manufacturing Energy Consumption Survey," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report;" Oregon Institute of Technology, Geo-Heat Center;
U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and losses and coproducts from the production of biodiesel calculated as the difference between energy in feedstocks and production and from the production of ethanol calculated as the difference between energy feedstocks and production less denaturants. Biofuels for Transportation: Biodiesel: Consumption: 2005-2008: Calculated as biodiesel production plus net imports, 2009: January and February: EIA, Petroleum Supply Monthly, Table 1, data for refinery and blender net inputs of renewable fuels except ethanol. March through December: Calculated as biodiesel production plus biodiesel net imports minus biodiesel stock change; Production: 2001-2005: U.S. Department of Agriculture (USDA), Commodity Credit Corporation, Bioenergy Program, 2006: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for soybean oil in methyl esters (biodiesel), 2007: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for fats and oils in methyl esters, and 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey," 2009: 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 reports. Table 1 data for renewable fuels except ethanol; and Ethanol: 2005-2008: EIA Petroleum Supply Annual (Various Issues), Tables 1 and 15.
Calculated as motor gasoline blending components adustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery and blender net inputs (Table 15). 2009: EIA Petroleum Supply Annual 2009, 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 1.5a Historical renewable energy consumption by sector and energy source, 1989-1999

(quadrillion Btu)

Sector and Source	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total	6.391	6.206	6.237	5.992	6.261	6.153	6.702	7.166	7.174	6.653	6.676
Biomass	3.159	2.735	2.782	2.932	2.908	3.028	3.101	3.157	3.105	2.928	2.963
Biofuels[1]	0.125	0.111	0.128	0.145	0.169	0.188	0.200	0.143	0.184	0.201	0.209
Waste[2]	0.354	0.408	0.440	0.473	0.479	0.515	0.531	0.577	0.551	0.542	0.540
Wood and Derived Fuels[3]	2.680	2.216	2.214	2.313	2.260	2.324	2.370	2.437	2.371	2.184	2.214
Geothermal	0.317	0.336	0.346	0.349	0.364	0.338	0.294	0.316	0.325	0.328	0.331
Hydroelectric Conventional	2.837	3.046	3.016	2.617	2.892	2.683	3.205	3.590	3.640	3.297	3.268
Solar Thermal/PV[4]	0.055	0.059	0.062	0.064	0.066	0.068	0.069	0.070	0.070	0.069	0.068
Wind	0.022	0.029	0.031	0.030	0.031	0.036	0.033	0.033	0.034	0.031	0.046
Residential	0.977	0.641	0.673	0.706	0.618	0.589	0.591	0.612	0.502	0.452	0.461
Biomass	0.920	0.580	0.610	0.640	0.550	0.520	0.520	0.540	0.430	0.380	0.390
Wood and Derived Fuels	0.920	0.580	0.610	0.640	0.550	0.520	0.520	0.540	0.430	0.380	0.390
Geothermal	0.005	0.006	0.006	0.006	0.007	0.006	0.007	0.007	0.008	0.008	0.009
Solar Thermal/PV[4]	0.052	0.056	0.057	0.059	0.061	0.063	0.064	0.065	0.064	0.064	0.063
Commercial	0.102	0.098	0.100	0.109	0.114	0.112	0.118	0.135	0.138	0.127	0.129
Biomass	0.099	0.094	0.095	0.105	0.109	0.106	0.113	0.129	0.131	0.118	0.121
Biofuels[5]	0.001	*	*	*	*	*	*	*	*	*	*
Waste[2]	0.022	0.028	0.026	0.032	0.033	0.035	0.040	0.053	0.058	0.054	0.054
Wood and Derived Fuels[3]	0.076	0.066	0.068	0.072	0.076	0.072	0.072	0.076	0.073	0.064	0.067
Geothermal	0.003	0.003	0.003	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.007
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	-	-	-	-	-	-	-	-	-
Wind	-	-	-	-	-	-	-	-	-	-	-
Industrial	1.871	1.717	1.684	1.737	1.773	1.927	1.992	2.033	2.057	1.929	1.934
Biomass	1.841	1.684	1.652	1.705	1.741	1.862	1.934	1.969	1.996	1.872	1.882
Biofuels[6]	0.057	0.050	0.057	0.065	0.075	0.083	0.087	0.062	0.081	0.088	0.091
Waste[2]	0.200	0.192	0.185	0.179	0.181	0.199	0.195	0.224	0.184	0.180	0.171
Wood and Derived Fuels[3]	1.584	1.442	1.410	1.461	1.484	1.580	1.652	1.683	1.731	1.603	1.620
Geothermal	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004
Hydroelectric Conventional	0.028	0.031	0.030	0.031	0.030	0.062	0.055	0.061	0.058	0.055	0.049
Solar Thermal/PV	-	-	-	-	-	-	-	-	-	-	-
Wind	-	-	-	-	-	-	-	-	-	-	-
Transportation	0.068	0.060	0.070	0.080	0.094	0.105	0.113	0.081	0.102	0.113	0.118
Biomass	0.068	0.060	0.070	0.080	0.094	0.105	0.113	0.081	0.102	0.113	0.118
Biofuels[7]	0.068	0.060	0.070	0.080	0.094	0.105	0.113	0.081	0.102	0.113	0.118
Electric Power[8]	3.372	3.689	3.710	3.360	3.662	3.420	3.889	4.305	4.375	4.032	4.034
Electric Utilities	2.983	3.151	3.114	2.712	2.953	2.714	3.173	3.553	3.620	3.279	3.123
Biomass	0.020	0.022	0.021	0.022	0.021	0.021	0.017	0.020	0.020	0.021	0.020
Waste[2]	0.010	0.013	0.014	0.013	0.011	0.013	0.010	0.012	0.013	0.013	0.013
Wood and Derived Fuels[3]	0.010	0.008	0.008	0.008	0.009	0.008	0.007	0.008	0.008	0.007	0.007
Geothermal	0.197	0.181	0.170	0.169	0.158	0.145	0.099	0.110	0.115	0.109	0.036
Hydroelectric Conventional	2.765	2.948	2.923	2.521	2.774	2.549	3.056	3.423	3.485	3.149	3.067
Solar Thermal/PV	*	*	*	*	*	*	*	*	*	*	*
Wind	*	*	*	*	*	*	*	*	*	*	*
Independent Power Producers	0.389	0.538	0.596	0.648	0.709	0.705	0.716	0.752	0.754	0.753	0.910
Biomass	0.211	0.295	0.333	0.381	0.394	0.413	0.405	0.418	0.426	0.424	0.433
Waste[2]	0.122	0.175	0.215	0.249	0.253	0.269	0.286	0.288	0.296	0.294	0.302
Wood and Derived Fuels[3]	0.089	0.120	0.118	0.132	0.141	0.144	0.119	0.130	0.129	0.129	0.131
Geothermal	0.111	0.145	0.165	0.168	0.193	0.180	0.181	0.191	0.194	0.202	0.276
Hydroelectric Conventional	0.043	0.066	0.062	0.065	0.087	0.072	0.093	0.104	0.096	0.092	0.151
Solar Thermal/PV	0.003	0.004	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Wind	0.022	0.029	0.031	0.030	0.031	0.036	0.033	0.033	0.034	0.031	0.046

Table 1.5b Historical renewable energy consumption by sector and energy source, 2000-2009

(quadrillion Btu)

Sector and Source	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total	6.259	5.309	5.886	6.139	6.245	6.404	6.821	6.714	7.356	7.756
Biomass	3.008	2.622	2.701	2.807	3.010	3.117	3.277	3.503	3.852	3.899
Biofuels[1]	0.236	0.253	0.303	0.404	0.500	0.577	0.771	0.991	1.372	1.567
Waste[2]	0.511	0.364	0.402	0.401	0.389	0.403	0.397	0.413	0.436	0.452
Wood and Derived Fuels[3]	2.262	2.006	1.995	2.002	2.121	2.136	2.109	2.098	2.044	1.881
Geothermal	0.317	0.311	0.328	0.331	0.341	0.343	0.343	0.349	0.358	0.369
Hydroelectric Conventional	2.811	2.242	2.689	2.825	2.690	2.703	2.869	2.446	2.512	2.669
Solar Thermal/PV[4]	0.065	0.064	0.063	0.062	0.063	0.063	0.068	0.076	0.089	0.098
Wind	0.057	0.070	0.105	0.115	0.142	0.178	0.264	0.341	0.546	0.721
Residential	0.489	0.438	0.448	0.470	0.481	0.504	0.472	0.522	0.556	0.552
Biomass	0.420	0.370	0.380	0.400	0.410	0.430	0.390	0.430	0.450	0.430
Wood and Derived Fuels	0.420	0.370	0.380	0.400	0.410	0.430	0.390	0.430	0.450	0.430
Geothermal	0.009	0.009	0.010	0.013	0.014	0.016	0.018	0.022	0.026	0.033
Solar Thermal/PV[4]	0.060	0.059	0.057	0.057	0.057	0.058	0.063	0.070	0.080	0.089
Commercial	0.128	0.101	0.104	0.113	0.118	0.119	0.117	0.118	0.125	0.129
Biomass	0.119	0.092	0.095	0.101	0.105	0.105	0.102	0.102	0.109	0.111
Biofuels[5]	*	*	*	0.001	0.001	0.001	0.001	0.002	0.002	0.002
Waste[2]	0.047	0.025	0.026	0.029	0.034	0.034	0.036	0.031	0.034	0.036
Wood and Derived Fuels[3]	0.071	0.067	0.069	0.071	0.070	0.070	0.065	0.069	0.073	0.072
Geothermal	0.008	0.008	0.009	0.011	0.012	0.014	0.014	0.014	0.015	0.017
Hydroelectric Conventional	0.001	0.001	*	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	-	-	-	-	-	-	*	-
Wind	-	-	-	-	-	-	-	-	-	*
Industrial	1.928	1.719	1.720	1.726	1.853	1.873	1.930	1.964	2.053	2.005
Biomass	1.881	1.681	1.676	1.679	1.817	1.837	1.897	1.944	2.031	1.983
Biofuels[6]	0.100	0.110	0.133	0.173	0.209	0.237	0.295	0.387	0.544	0.630
Waste[2]	0.145	0.129	0.146	0.142	0.132	0.148	0.130	0.144	0.144	0.154
Wood and Derived Fuels[3]	1.636	1.443	1.396	1.363	1.476	1.452	1.472	1.413	1.344	1.198
Geothermal	0.004	0.005	0.005	0.003	0.004	0.004	0.004	0.005	0.005	0.004
Hydroelectric Conventional	0.042	0.033	0.039	0.043	0.033	0.032	0.029	0.016	0.017	0.018
Solar Thermal/PV	-	-	-	-	-	-	-	-	-	-
Wind	-	-	-	-	-	-	-	-	-	-
Transportation	0.135	0.142	0.170	0.230	0.290	0.339	0.475	0.603	0.827	0.934
Biomass	0.135	0.142	0.170	0.230	0.290	0.339	0.475	0.603	0.827	0.934
Biofuels[7]	0.135	0.142	0.170	0.230	0.290	0.339	0.475	0.603	0.827	0.934
Electric Power[8]	3.579	2.910	3.445	3.601	3.503	3.568	3.827	3.508	3.796	4.136
Electric Utilities	2.607	2.063	2.529	2.615	2.522	2.530	2.688	2.356	2.404	2.586
Biomass	0.021	0.014	0.033	0.029	0.031	0.040	0.042	0.048	0.047	0.047
Waste[2]	0.014	0.008	0.022	0.012	0.011	0.013	0.015	0.016	0.018	0.017
Wood and Derived Fuels[3]	0.007	0.006	0.011	0.017	0.020	0.027	0.027	0.032	0.029	0.030
Geothermal	0.003	0.003	0.029	0.026	0.026	0.024	0.024	0.024	0.025	0.025
Hydroelectric Conventional	2.582	2.044	2.465	2.556	2.461	2.455	2.598	2.241	2.263	2.413
Solar Thermal/PV	*	*	*	*	*	*	*	*	*	*
Wind	*	0.001	0.002	0.004	0.004	0.010	0.023	0.043	0.068	0.101
Independent Power Producers	0.972	0.847	0.916	0.986	0.981	1.038	1.139	1.152	1.392	1.550
Biomass	0.432	0.323	0.347	0.368	0.357	0.365	0.370	0.376	0.388	0.394
Waste[2]	0.305	0.202	0.208	0.218	0.212	0.208	0.216	0.221	0.240	0.244
Wood and Derived Fuels[3]	0.127	0.121	0.140	0.151	0.145	0.158	0.154	0.154	0.148	0.150
Geothermal	0.293	0.286	0.275	0.277	0.285	0.285	0.282	0.284	0.287	0.291
Hydroelectric Conventional	0.185	0.165	0.185	0.224	0.196	0.215	0.242	0.189	0.231	0.237
Solar Thermal/PV	0.005	0.006	0.006	0.005	0.006	0.005	0.005	0.006	0.008	0.008
Wind	0.057	0.068	0.103	0.111	0.138	0.168	0.240	0.297	0.478	0.620

Table 1.5a and 1.5b Historical renewable energy consumption by sector and energy source, 2000-2009 (cont)
(quadrillion Btu)

[1]Biofuels and biofuel losses and coproducts.
[2]Municipal solid waste biogenic, landfill gases, agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases. Includes municipal solid waste nonbiogenic and tires for 1989-2000.
[3]Black liquor, and wood/wood waste solids and liquids.
[4]Includes small amounts of distributed solar thermal and photovoltaic energy used in the commercial, industrial and electric power sectors.
[5]Ethanol primarily derived from corn minus denaturant.
[6]Ethanol primarily derived from corn and losses and coproducts from production of biodiesel and ethanol.
[7]Biodiesel primarily derived from soybean oil and ethanol primarily derived from corn.
[8]The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
PV = Photovoltaic.
* = Less than 500 billion Btu.
- = No data reported.
Notes: Totals may not equal sum of components due to independent rounding.
Energy consumption for the noncombustible renewable energy sources (hydroelectric conventional, solar thermal, PV and wind) used in electricity generation is determined by mulitiplying generation times the
fossil fuel equivalent heat rate. Energy consumption for geothermal energy used in electricity generation is determined by mulitiplying generation times the geothermal heat rate. See U.S. Energy Information Administratin (EIA), Annual Energy Review (AER) 2009, DOE/EIA-0384 (2009) (Washington, DC, August 2010), Table A6.
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" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Commercial: U.S. Energy Information Administration, Form EIA-867, "Annual Nonutility Power Producer Report," Form EIA-860B, " Annual Electric Generator Report - Nonutility," Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center. Industrial: U.S Energy Information Administration, Form EIA-846 (A,B,C) "Manufacturing Energy Consumption Survey," Form EIA-867, "Annual Nonutility Power Producer Report," Form EIA-860B, "Annual Electric Generator Report - Nonutility," Form EIA-906, "Power Plant Report", Form EIA-920, "Combined Heat and Power Report," Form EIA-923, "Power Plant Operations Report;" Oregon Institute of Technology, Geo-Heat Center; Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook; U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and losses and coproducts from the production of biodiesel calculated as the difference between energy in feedstocks and production and from the production of ethanol calculated as the difference between energy feedstocks and production less denaturants. Biofuels for Transportation: Biodiesel Consumption: 2001-2008: Calculated as biodiesel production plus net imports, 2009: January and February: EIA, Petroleum Supply Monthly, Table 1, data for refinery and blender net inputs of renewable fuels except ethanol. March through December: Calculated as biodiesel production plus biodiesel net imports minus biodiesel stock change; Production: 2001-2005: U.S. Department of Agriculture (USDA), Commodity Credit Corporation, Bioenergy Program, 2006: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for soybean oil in methyl esters (biodiesel), 2007: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for fats and oils in methyl esters, and 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey," 2009: 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 reports. Table 1 data for renewable fuels except ethanol; and Ethanol: 1989: EIA, Estimates of U.S. Biofuels Consumption 1990, Table 10, 1990-1992: EIA, Estimates of U.S. Biomass Energy Consumption 1992, Table D2, 1993-2004: EIA, Petroleum Supply Monthly, Tables 2 and 16. Calculated as ten percent of oxygenated finished motor gasoline field production (Table 2) plus fuel ethanol refinery input (Table 16). 2005-2008: EIA Petroleum Supply Annual (Various Issues), Tables 1 and 15. Calculated as motor gasoline blending components adjustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery and blender net inputs (Table 15). 2009: EIA Petroleum Supply Annual 2009, 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-759, "Monthly Power Plant Report," Form EIA-867, "Annual Nonutility Power Producer Report," Form EIA-860B, " Annual Electric Generator Report - Nonutility," Form EIA-906, "Monthly Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report."

Table 1.6 Biofuels overview, 2005 - 2009

(trillion Btu)

Type	2005	2006	2007	2008	2009
Ethanol					
Feedstock[1]	552	688	914	1,300	1,517
Losses and Coproducts[2]	230	285	376	531	616
Denaturant	9	11	14	21	26
Production[3]	331	414	553	790	928
Net Imports[4]	12	62	37	45	17
Stock Change[5]	-2	11	6	13	8
Consumption	344	465	584	821	936
Consumption minus Denaturant	335	453	569	800	910
Biodiesel					
Feedstock[6]	12	32	63	88	65
Losses and Coproducts[7]	*	*	1	1	1
Production[8]	12	32	62	87	65
Net Imports	*	1	-17	-46	-24
Stock Change	-	-	-	-	4
Balancing Item	-	-	-	-	4
Consumption	12	33	46	40	40

[1]Total corn and other biomass inputs to the production of undenatured ethanol used for fuel ethanol.
[2]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.
[3]Fuel ethanol production. Includes denaturant.
[4]Fuel ethanol imports. There are no exports.
[5]Fuel ethanol stock change. A negative number indicates a decrease in stocks and a positive number indicates an increase.
[6]Total soy bean oil and other biomass inputs to the production of biodiesel.
[7]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.
[8]Production of biofuels for use as diesel fuel substitutes or additives. Biodiesel consumption equals biodiesel production.
* = Less than 0.5 trillion Btu.
- = No data reported.
Note: Totals may not equal sum of components due to independent rounding.
Sources: (Note: For ethanol and biodiesel heat contents, see Table 1.10. For feedstock factors, see U.S. Energy Information Administration (EIA) Annual Energy Review 2009, 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: 2005-2008: Estimated as 2 percent of fuel ethanol production. 2009: EIA, Petroleum Supply Annual, Table 1. Ethanol Production: 2005-2008: U.S. Energy Information Administration (EIA), Form EIA-819, "Monthly Oxygenate Report." 2009: 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: 2005-2009: EIA, Petroleum Supply Annual (PSA), annual reports, Table 1. Ethanol Consumption: 2005-2008: EIA, Petroleum Supply Annual annual reports, Tables 1 and 15. Calculated as motor gasoline blending components adjustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery blender net inputs (Table 15). 2009: EIA, Petroleum Supply Annual, Table1. Calculated as fuel ethanol refinery and blender net inputs minus fuel ethanol adjustments. Biodiesel Feedstock: Calculated as biodiesel production multiplied by the biodiesel feedstock factor. Biodiesel Losses and Co-products: Calculated as biodiesel feedstock minus biodiesel production. Biodiesel Production: 2005: U.S. Department of Agriculture, Commodity Credit Corporation, Bioenergy Program records, 2006: U.S. Department of Commerce, Bureau of Census, Current Industrial Reports, Fats and Oils - Production, Consumption and Stocks, data for soy bean oil consumed in methyl esters, 2007: U.S. Department of Commerce, Bureau of Census, "M311K-Fats and Oils: Production, Consumption, and Stocks, data for all fats and oils consumed in methyl esters, 2008 and 2009: EIA, Monthly Biodiesel Production Report, December 2009, and analysis conducted by the EIA, Office of Electricity, Coal, Nuclear, and Renewables Analysis. Balancing Item: Calculated as biodiesel consumption and biodiesel stock change minus biodiesel production and biodiesel net imports. Consumption: 2001-2008: Calculated biodiesel production plus biodiesel net imports, January and February 2009: EIA, Petroleum Supply Annual, Table 1, data for refinery and blender net inputs of renewable fuels except fuel ethanol, March 2009 and forward: Calculated as biodiesel production plus biodiesel net imports minus biodiesel stock change.

Table 1.7 Waste energy consumption by type of waste and energy use sector, 2009

(trillion Btu)

Type	Sector				
			Electric Power		
	Commercial	Industrial	Electric Utilities	Independent Power Producers	Total
Total	36	154	17	244	452
Landfill Gas	3	104	10	87	204
MSW Biogenic[1]	28	4	4	133	168
Other Biomass[2]	5	47	4	24	79

[1]Includes paper and paper board, wood, food, leather, textiles and yard trimmings.
[2]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 1.8 Industrial biomass energy consumption and electricity net generation by industry and energy source, 2009

Industry	Energy Source	Biomass Energy Consumption (Trillon Btu)			Net Generation (Million Kilowatthours)
		Total	For Electricity	For Useful Thermal Output	
Total	Total	1,982.521	164.189	1,818.332	26,033
Agriculture, Forestry and Mining	Total	15.508	1.258	14.250	208
	Agricultural Byproducts/Crops	15.340	1.089	14.250	204
	Other Biomass Solids	0.169	0.169	-	3
Manufacturing	Total	1,847.485	162.932	1,684.553	25,825
Food and Kindred Products	Total	22.901	0.779	22.122	124
	Agricultural Byproducts/Crops	15.070	0.184	14.886	38
	Other Biomass Gases	0.207	0.060	0.147	5
	Other Biomass Liquids	0.071	0.071	-	7
	Sludge Waste	0.800	0.175	0.625	22
	Wood/Wood Waste Solids	6.753	0.289	6.465	53
Lumber	Total	210.715	10.218	200.496	1,273
	Sludge Waste	0.030	0.002	0.027	1
	Wood/Wood Waste Solids	210.685	10.216	200.469	1,273
Paper and Allied Products	Total	984.914	151.415	833.499	24,361
	Agricultural Byproducts/Crops	1.316	0.049	1.267	7
	Black Liquor	686.588	101.040	585.548	16,322
	Other Biomass Gases	0.176	0.014	0.162	3
	Other Biomass Liquids	0.128	0.018	0.110	3
	Other Biomass Solids	9.419	1.532	7.887	293
	Sludge Waste	3.459	0.689	2.770	108
	Wood/Wood Waste Liquids	2.601	0.387	2.215	74
	Wood/Wood Waste Solids	281.226	47.687	233.540	7,552
Chemicals and Allied Products	Total	2.810	0.100	2.710	18
	Other Biomass Liquids	0.022	0.001	0.021	s
	Sludge Waste	0.238	0.035	0.203	7
	Wood/Wood Waste Solids	2.550	0.064	2.486	11
Biorefineries	Total	616.844	-	616.844	-
	Biofuel Losses and Coproducts[3]	616.844	-	616.844	-
	Biodiesel Feedstock	0.892	-	0.892	-
	Ethanol Feedstock	615.952	-	615.952	-
Other[1]	Total	9.301	0.420	8.881	48
Nonspecified[2]	Total	119.528	-	119.528	-
	Ethanol[4]	13.247	-	13.247	-
	Landfill Gas	103.739	-	103.739	-
	Municipal Solid Waste Biogenic[5]	2.542	-	2.542	-

[1]Other includes Apparel; Petroleum Refining; Rubber and Misc. Plastic Products; Transportation Equipment; Stone, Clay, Glass, and Concrete Products; Furniture and Fixtures; and related industries.
[2]Primary purpose of business is not specified.
[3]Losses and coproducts from production of biodiesel and ethanol calculated as the difference between energy in feedstocks and production.
[4]Ethanol primarily derived from corn minus denaturant.
[5]Includes paper and paper board, wood, food, leather, textiles and yard trimmings.
s = Value is less than 0.5 of the table metric, but value is included in any associated total.
- = No data reported.
Note: Totals may not equal sum of components due to independent rounding. Starting with 2004 EIA adopted a new method of allocating fuel consumption between electric power generation and useful thermal out put (UTO) for combined heat and power (CHP) plants. The new method proportionately distributes a CHP plant`s losses between the two output products (electric power and UTO) assuming the same efficiency for production of electricity as UTO.
Sources: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report;" Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook; U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; ethanol and biofuel losses and coproducts: table 1.2 of this report; and analysis conducted by the U.S. Energy Information Administration, Office of Electricity, Coal, Nuclear, and and Renewables analysis.

Table 1.9 Net summer capacity of plants with the capability to cofire biomass and coal, 2008 and 2009

(megawatts)

State	Company Name	Plant I.D.	Plant Name	County	2008		2009	
					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	43	78	46	84
AR	Domtar Industries Inc	54104	Ashdown	Little River	128	128	128	128
AZ	Tucson Electric Power Co	126	H Wilson Sundt Generating Station	Pima	156	472	156	472
CA	Air Products Energy Enterprise	10640	Stockton Cogen	San Joaquin	54	54	-	-
CA	Air Products Energy Enterprises LP	10640	Stockton Cogen	San Joaquin	-	-	54	54
CA	Mt Poso Cogeneration Co	54626	Mt Poso Cogeneration	Kern	-	-	52	52
DE	Conectiv Delmarva Gen Inc	593	Edge Moor	New Castle	260	718	260	718
FL	International Paper Co-Pensacola	50250	International Paper Pensacola	Escambia	76	76	76	76
FL	Jefferson Smurfit Corp	10202	Jefferson Smurfit Fernandina Beach	Nassau	50	80	50	80
FL	Stone Container Corp-Panama Ci	50807	Stone Container Panama City Mill	Bay	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	35	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	105	105
IA	Archer Daniels Midland Co	10860	Archer Daniels Midland Clinton	Clinton	-	-	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	268	1,103	536	1,346
LA	International Paper Co	54090	International Paper Louisiana Mill	Morehouse	63	63	63	63
MD	NewPage Corporation	50282	Luke Mill	Allegany	60	60	60	60
ME	NewPage Corporation	10495	Rumford Cogeneration	Oxford	85	85	85	85
ME	S D Warren Co.- Westbrook	50447	S D Warren Westbrook	Cumberland	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
MI	NewPage Corporation	10208	Escanaba Paper Company	Delta	77	100	77	100
MI	S D Warren Co	50438	S D Warren Muskegon	Muskegon	37	37	37	37
MI	TES Filer City Station LP	50835	TES Filer City Station	Manistee	60	60	60	60
MN	Willmar Municipal Utilities	2022	Willmar	Kandiyohi	16	23	-	-
MN	Minnesota Power Inc	10686	Rapids Energy Center	Itasca	29	29	27	27
MN	Minnesota Power Inc	1897	M L Hibbard	St Louis	59	59	67	67
MN	Willmar Municipal Utilities	2022	Willmar	Kandiyohi	-	-	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
MO	University of Missouri-Columba	50969	University of Missouri Columbia	Boone	18	77	51	77
MS	Weyerhaeuser Co	50184	Weyerhaeuser Columbus MS	Lowndes	123	123	123	123
NC	CPI USA NC LLC	10378	Primary Energy Southport	Brunswick	-	-	54	107
NC	CPI USA NC LLC	10379	Primary Energy Roxboro	Person	-	-	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
NC	Primary Energy of North Carolina LLC	10379	Primary Energy Roxboro	Person	56	56	-	-
NY	AES Greenidge	2527	AES Greenidge LLC	Yates	104	156	108	108
NY	Black River Generation LLC	10464	Black River Generation	Jefferson	55	55	55	55
NY	Niagara Generation LLC	50202	WPS Power Niagara	Niagara	50	50	-	-
PA	Domtar LLC	54638	Johnsonburg Mill	Elk	49	49	49	49
SC	International Paper Co-Eastovr	52151	International Paper Eastover Facility	Richland	46	103	46	103
SC	Smurfit-Stone Container Enterprises Inc	50806	Stone Container Florence Mill	Florence	75	103	75	103
SC	South Carolina Electric&Gas Co	7737	Cogen South	Charleston	90	90	90	90
TN	Bowater Newsprint Calhoun Ops	50956	Bowater Newsprint Calhoun Operation	McMinn	-	-	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	89	108	81	106
VA	MeadWestvaco Corp	50900	Covington Facility	Covington	102	102	97	97
VA	Smurfit-Stone Container Enterprises Inc	50813	Stone Container Hopewell Mill	Hopewell City	41	41	41	41
WA	Weyerhaeuser Co	50187	Weyerhaeuser Longview WA	Cowlitz	-	-	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	97	187	101	188
WI	Manitowoc Public Utilities	4125	Manitowoc	Manitowoc	116	126	116	121
WI	NewPage Corporation	10234	Biron Mill	Wood	22	62	22	62
WI	NewPage Corporation	10476	Whiting Mill	Portage	4	4	4	4
WI	NewPage Corporation	10477	Wisconsin Rapids Pulp Mill	Wood	67	67	67	67
WI	NewPage Corporation	54857	Niagara Mill	Marinette	12	25	12	25
WI	Northern States Power Co - Minnesota	3982	Bay Front	Ashland	-	-	44	73
WI	Northern States Power Co	3982	Bay Front	Ashland	44	73	-	-
WI	State of Wisconsin	54407	Waupun Correctional Central Heating Plt	Dodge	1	1	1	1
WI	State of Wisconsin	54408	Univ of Wisc Madison Charter Sreet Plant	Dane	6	6	6	6
WI	Thilmany LLC	54098	International Paper Kaukauna Mill	Outagamie	45	45	45	45
WI	Wausau Paper Specialty Products LLC	50614	Mosinee Paper	Marathon	18	21	18	21
Total					3,772	6,147	4,434	6,911

- = No data reported.

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

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

Table 1.10 Average heat content of selected biomass fuels

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

MSW = Municipal Solid Waste.
Note: For detailed characteristics of biomass feedstocks, see the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, website here: http://www1.eere.energy.gov/biomass/for_researchers.html .
Sources: Biodiesel and ethanol: U.S. Energy Information Administration, Monthly Energy Review, November 2010, DOE/EIA-0035 (2010/11) (Washington, DC, November 2010), Table A3; MSW Biogenic: U.S. Energy Information Administration, Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenic Energy (Washington, DC, May 2007); and all other fuel types: U.S. Energy Information Administration, Form EIA-860B (1999), "Annual Electric Generator Report - Nonutility 1999."

Table 1.11 Electricity net generation from renewable energy by energy use sector and energy source, 2005 - 2009

(thousand kilowatthours)

Sector/Source	2005	2006	2007	2008	2009
Total	357,650,653	385,771,908	352,747,486	380,932,388	417,723,797
Biomass	54,276,810	54,860,621	55,538,578	55,033,612	54,492,734
Waste	15,420,393	16,098,525	16,524,554	17,733,759	18,442,596
Landfill Gas	5,142,111	5,677,040	6,157,750	7,156,340	7,924,211
MSW Biogenic[1]	8,330,471	8,477,571	8,303,838	8,096,801	8,057,613
Other Biomass[2]	1,947,810	1,943,913	2,062,966	2,480,617	2,460,771
Wood and Derived Fuels[3]	38,856,417	38,762,096	39,014,024	37,299,853	36,050,138
Geothermal	14,691,745	14,568,029	14,637,213	14,839,977	15,008,658
Hydroelectric Conventional	270,321,255	289,246,416	247,509,974	254,831,385	273,445,094
Solar Thermal/PV	550,294	507,706	611,793	864,315	891,179
Wind	17,810,549	26,589,137	34,449,927	55,363,100	73,886,132
Commercial	1,758,789	1,712,691	1,691,439	1,614,986	1,839,466
Biomass	1,672,752	1,619,245	1,614,160	1,554,948	1,768,350
Waste	1,656,755	1,598,646	1,598,799	1,533,645	1,748,284
Landfill Gas	217,632	172,590	202,547	233,636	317,508
MSW Biogenic[1]	953,093	955,910	962,496	910,908	1,044,576
Other Biomass[2]	486,031	470,146	433,756	389,101	386,200
Wood and Derived Fuels[3]	15,997	20,599	15,361	21,303	20,066
Hydroelectric Conventional	86,037	93,446	77,279	59,957	70,866
Solar Thermal/PV	-	-	-	80	43
Wind	-	-	-	-	208
Industrial	32,198,528	31,871,511	30,508,807	29,138,172	27,900,961
Biomass	29,003,087	28,972,463	28,918,826	27,462,283	26,032,625
Waste	732,553	572,447	631,452	821,394	740,469
Landfill Gas	113,155	28,786	27,087	21,494	22,365
MSW Biogenic[1]	34,441	34,541	39,782	-	-
Other Biomass[2]	584,957	509,120	564,583	799,900	718,103
Wood and Derived Fuels[3]	28,270,534	28,400,016	28,287,374	26,640,889	25,292,157
Hydroelectric Conventional	3,195,441	2,899,048	1,589,981	1,675,889	1,868,336
Solar Thermal/PV	-	-	-	-	-
Electric Power[4]	323,693,336	352,187,707	320,547,239	350,179,231	387,983,371
Biomass	23,600,971	24,268,913	25,005,592	26,016,380	26,691,759
Waste	13,031,084	13,927,432	14,294,304	15,378,719	15,953,844
Landfill Gas	4,811,325	5,475,664	5,928,117	6,901,211	7,584,338
MSW Biogenic[1]	7,342,938	7,487,120	7,301,560	7,185,893	7,013,037
Other Biomass[2]	876,822	964,648	1,064,627	1,291,615	1,356,468
Wood and Derived Fuels[3]	10,569,886	10,341,481	10,711,288	10,637,661	10,737,915
Geothermal	14,691,745	14,568,029	14,637,213	14,839,977	15,008,658
Hydroelectric Conventional	267,039,777	286,253,922	245,842,714	253,095,539	271,505,893
Solar Thermal/PV	550,294	507,706	611,793	864,235	891,137
Wind	17,810,549	26,589,137	34,449,927	55,363,100	73,885,924

[1]Includes paper and paper board, wood, food, leather, textiles and yard trimmings.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]Black liquor, and wood/wood waste solids and liquids.
[4]The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
MSW = Municipal Solid Waste.
PV = Photovoltaic.
- = No data reported.
Notes: Totals may not equal sum of components due to independent rounding.
Data revisions are discussed in the Highlights section.
Source: Electric Power: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report," and predecessor forms: Form EIA-906, "Power Plant Report," and Form EIA-920, "Combined Heat and Power Plant Report."

Table 1.12 U.S. Electric net summer capacity, 2005 - 2009

(megawatts)

Source	2005	2006	2007	2008	2009
Total	978,020	986,215	994,888	1,010,171	1,025,400
Renewable Total	98,746	101,934	107,954	116,396	127,070
Biomass	9,802	10,100	10,839	11,050	11,256
Waste	3,609	3,727	4,134	4,186	4,317
Landfill Gas	887	978	1,319	1,429	1,418
MSW[1]	2,167	2,188	2,218	2,215	2,227
Other Biomass[2]	554	561	598	542	671
Wood and Derived Fuels[3]	6,193	6,372	6,704	6,864	6,939
Geothermal	2,285	2,274	2,214	2,229	2,382
Hydroelectric Conventional	77,541	77,821	77,885	77,930	78,518
Solar Thermal/PV	411	411	502	536	619
Wind	8,706	11,329	16,515	24,651	34,296
Nonrenewable Total	879,274	884,281	886,934	893,775	898,331

[1]Includes total capacity whose primary energy source is MSW.
[2]Agriculture byproducts/crops, sludge waste and other biomass solids, liquids and gases. Does not include tires.
[3]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.
Data revisions are discussed in the Highlights section.
Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.13 Renewable electricity net generation by energy source and census division, 2009

(thousand kilowatthours)

Census Division	Biomass				Geothermal	Hydroelectric Conventional	Solar Thermal/ PV	Wind	Total
	Waste			Wood and Derived Fuels[3]					
	Landfill Gas	MSW Biogenic[1]	Other Biomass[2]						
Total	7,924,211	8,057,613	2,460,771	36,050,138	15,008,658	273,445,094	891,179	73,886,132	417,723,797
New England	428,002	1,986,423	44,498	4,860,203	-	9,093,354	43	378,645	16,791,167
Middle Atlantic	1,581,813	2,584,252	6,294	1,230,095	-	30,330,053	14,269	3,362,045	39,108,820
East North Central	2,285,274	242,623	47,286	2,668,303	-	3,933,510	16	5,588,975	14,765,988
West North Central	292,176	282,736	637,159	798,615	-	9,951,136		-19,637,330	31,599,152
South Atlantic	935,630	2,415,013	584,827	9,950,445	-	15,984,472	14,033	742,439	30,626,861
East South Central	125,284	-	33,333	5,577,775	-	26,064,976	-	51,747	31,853,114
West South Central	432,630	-	283,691	4,542,635	-	10,010,287		-22,724,302	37,993,546
Mountain	78,037	5,603	76,056	710,510	1,988,284	32,786,660	214,039	8,260,182	44,119,371
Pacific Contiguous	1,765,364	360,895	636,756	5,711,558	12,852,783	133,854,253	647,390	12,882,012	168,711,012
Pacific Noncontiguous	-	180,067	110,871	-	167,591	1,436,393	1,390	258,454	2,154,766

[1]Includes paper and paper board, wood, food, leather, textiles and yard trimmings.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.14 Total Biomass Electricity Net Generation by Census Division and Energy Source, 2009

(thousand kilowatthours)

Energy Source	Census Division										
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific Contiguous	Pacific Non-contiguous	Total
Total	7,319,126	5,402,453	5,243,486	2,010,686	13,885,916	5,736,391	5,258,957	870,206	8,474,574	290,938	54,492,734
Agricultural Byproducts/ Crops	-	-	-	93,215	390,236	9,010	82,985	-	193,658	10,376	779,480
Black Liquor	1,067,781	559,235	994,699	318,054	5,900,988	3,802,734	2,905,986	358,453	627,023	-	16,534,952
Landfill Gases	428,002	1,581,813	2,285,274	292,176	935,630	125,284	432,630	78,037	1,765,364	-	7,924,211
MSW Biogenic	1,986,423	2,584,252	242,623	282,736	2,415,013	-	-	5,603	360,895	180,067	8,057,613
Other Biomass Gases	3,880	3,535	9,593	39,193	40,384	-	34,753	76,056	432,143	-	639,537
Other Biomass Liquids	91	-	1,187	-	179	8	1,255	-	-	9,788	12,508
Other Biomass Solids	-	-	22,167	475,121	137,169	-	163,010	-	-	90,706	888,173
Sludge Waste	40,526	2,759	14,340	29,631	16,859	24,314	1,689	-	10,954	-	141,073
Wood/Wood Waste Liquids	-	73,801	-	-	-	-	-	-	-	-	73,801
Wood/Wood Waste Solids	3,792,422	597,059	1,673,604	480,561	4,049,457	1,775,040	1,636,649	352,057	5,084,535	-	19,441,385

MSW = Municipal Solid Waste.

- = No data reported.

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

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

Table 1.15 Renewable electric power sector net generation by energy source and State, 2008

thousand kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW Biogenic[1]	Other Biomass[2]						
Alabama	6,136,148	-	3,882	163,097	-	-	-	166,979	6,303,127
Alaska	1,171,801	-	-	-	-	-	68	68	1,171,869
Arizona	7,285,902	19,050	-	75,947	-	14,724	-	109,721	7,395,623
Arkansas	4,660,297	35,751	6,092	-	-	-	-	41,843	4,702,140
California	24,127,810	1,583,714	369,659	2,820,899	12,883,000	670,481	5,384,955	23,712,708	47,840,517
Colorado	2,039,327	8,366	36,753	135	-	18,354	3,220,843	3,284,451	5,323,778
Connecticut	556,177	731,881	-	1,633	-	-	-	733,514	1,289,691
Delaware	-	163,375	-	-	-	-	-	163,375	163,375
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	206,158	1,725,470	233,611	368,795	-	-	-	2,327,877	2,534,035
Georgia	2,122,606	31,427	-	-	-	-	-	31,427	2,154,033
Hawaii	45,073	-	112,273	-	234,333	18	240,023	586,647	631,720
Idaho	9,362,501	-	-	69,395	85,547	-	207,472	362,414	9,724,915
Illinois	138,549	697,186	34	-	-	-	2,336,996	3,034,215	3,172,764
Indiana	436,780	229,247	-	-	-	-	238,356	467,603	904,383
Iowa	819,047	98,298	35,194	49	-	-	4,083,787	4,217,327	5,036,374
Kansas	10,574	-	-	-	-	-	1,759,412	1,759,412	1,769,986
Kentucky	1,917,470	105,094	-	-	-	-	-	105,094	2,022,564
Louisiana	1,064,373	-	69,878	-	-	-	-	69,878	1,134,251
Maine	3,695,396	108,042	7,702	1,779,596	-	-	131,621	2,026,961	5,722,357
Maryland	1,974,078	391,349	-	-	-	-	-	391,349	2,365,427
Massachusetts	1,142,180	1,127,529	-	122,580	-	-	3,672	1,253,781	2,395,961
Michigan	1,338,568	613,778	63	1,004,059	-	-	141,182	1,759,081	3,097,649
Minnesota	609,428	389,752	364,492	259,120	-	-	4,354,620	5,367,984	5,977,412
Mississippi	-	-	-	44	-	-	-	44	44
Missouri	2,046,773	29,899	3,704	-	-	-	203,313	236,916	2,283,689
Montana	9,999,557	-	-	-	-	-	593,138	593,138	10,592,695
Nebraska	346,456	44,559	3,508	-	-	-	214,184	262,251	608,707
Nevada	1,750,620	-	-	-	1,382,820	156,013	-	1,538,833	3,289,453
New Hampshire	1,625,546	155,025	-	1,009,322	-	-	10,319	1,174,666	2,800,212
New Jersey	25,773	878,731	-	-	-	2,669	20,885	902,285	928,058
New Mexico	312,288	-	18,885	-	-	-	1,642,787	1,661,672	1,973,960
New York	26,654,569	1,384,394	-	316,021	-	-	1,250,700	2,951,115	29,605,684
North Carolina	3,023,577	101,952	18,530	399,357	-	1,801	-	521,639	3,545,217
North Dakota	1,252,790	-	-	-	-	-	1,693,458	1,693,458	2,946,248
Ohio	386,435	182,666	-	29,076	-	-	15,084	226,826	613,261
Oklahoma	3,811,273	5,443	-	-	-	-	2,358,080	2,363,523	6,174,796
Oregon	33,805,024	108,945	-	216,278	-	-	2,575,234	2,900,458	36,705,482
Pennsylvania	2,548,858	1,303,110	-150	206,096	-	175	729,425	2,238,656	4,787,514
Rhode Island	4,977	158,407	-	-	-	-	-	158,407	163,384
South Carolina	1,122,544	86,942	-	291,448	-	-	-	378,390	1,500,934
South Dakota	2,993,107	-	1,665	-	-	-	145,136	146,801	3,139,908
Tennessee	5,646,073	27,351	-	-	-	-	50,117	77,468	5,723,541
Texas	1,039,467	384,736	3,083	-	-	-	16,225,022	16,612,841	17,652,308
Utah	668,084	23,685	-	-	254,277	-	23,900	301,862	969,946
Vermont	1,471,808	-	-	415,103	-	-	10,235	425,338	1,897,146
Virginia	1,002,083	560,856	41	506,781	-	-	-	1,067,678	2,069,761
Washington	77,588,810	155,960	-	377,996	-	-	3,657,484	4,191,440	81,780,251
West Virginia	820,765	-	-	-390	-	-	391,910	391,520	1,212,285
Wisconsin	1,452,763	435,133	2,719	205,223	-	-	487,141	1,130,216	2,582,979
Wyoming	835,275	-	-	-	-	-	962,542	962,542	1,797,817
U.S. Total	253,095,539	14,087,104	1,291,615	10,637,661	14,839,977	864,235	55,363,100	97,083,692	350,179,231

[1]Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."

Table 1.16 Renewable commercial and industrial sector net generation by energy source and state, 2008

(thousand kilowatthours)

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

[1]Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.17 Total renewable net generation by energy source and state, 2008

(thousand kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW Biogenic[1]	Other Biomass[2]						
Alabama	6,136,148	-	33,698	3,323,616	-	-	-	3,357,313	9,493,461
Alaska	1,171,801	-	4,682	-	-	-	68	4,750	1,176,551
Arizona	7,285,902	19,050	3,936	75,947	-	14,724	-	113,658	7,399,560
Arkansas	4,660,297	35,751	11,019	1,466,063	-	-	-	1,512,833	6,173,130
California	24,127,810	1,717,046	644,900	3,483,555	12,883,000	670,481	5,384,955	24,783,937	48,911,746
Colorado	2,039,327	8,366	36,753	135	-	18,354	3,220,843	3,284,451	5,323,778
Connecticut	556,177	731,881	-	1,633	-	-	-	733,514	1,289,691
Delaware	-	163,375	-	-	-	-	-	163,375	163,375
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	206,158	1,726,284	607,843	1,968,741	-	-	-	4,302,868	4,509,026
Georgia	2,144,618	31,427	90,258	2,660,285	-	-	-	2,781,970	4,926,588
Hawaii	84,343	184,005	118,418	-	234,333	18	240,023	776,797	861,140
Idaho	9,362,501	-	-	455,393	85,547	-	207,472	748,412	10,110,913
Illinois	138,549	697,186	184	611	-	-	2,336,996	3,034,977	3,173,526
Indiana	436,780	273,038	-	-	-	-	238,356	511,393	948,173
Iowa	819,047	98,298	68,966	49	-	-	4,083,787	4,251,099	5,070,146
Kansas	10,574	-	-	-	-	-	1,759,412	1,759,412	1,769,986
Kentucky	1,917,470	105,094	3,786	350,740	-	-	-	459,619	2,377,089
Louisiana	1,064,373	-	70,886	2,638,789	-	-	-	2,709,675	3,774,048
Maine	4,457,405	205,608	52,187	3,668,569	-	-	131,621	4,057,985	8,515,390
Maryland	1,974,078	414,781	-	197,704	-	-	-	612,485	2,586,563
Massachusetts	1,155,811	1,127,529	1,517	122,580	-	80	3,672	1,255,378	2,411,189
Michigan	1,364,378	738,167	1,370	1,710,423	-	-	141,182	2,591,141	3,955,519
Minnesota	727,061	399,003	372,039	725,220	-	-	4,354,620	5,850,882	6,577,943
Mississippi	-	-	5,051	1,386,275	-	-	-	1,391,326	1,391,326
Missouri	2,046,773	29,899	11,200	1,613	-	-	203,313	246,026	2,292,799
Montana	9,999,557	-	-	110,958	-	-	593,138	704,096	10,703,653
Nebraska	346,456	44,559	16,370	-	-	-	214,184	275,113	621,569
Nevada	1,750,620	-	-	-	1,382,820	156,013	-	1,538,833	3,289,453
New Hampshire	1,633,224	155,025	-	1,009,640	-	-	10,319	1,174,984	2,808,208
New Jersey	25,773	878,731	3,004	-	-	2,669	20,885	905,290	931,063
New Mexico	312,288	-	18,885	-	-	-	1,642,787	1,661,672	1,973,960
New York	26,723,131	1,512,860	-	555,097	-	-	1,250,700	3,318,657	30,041,788
North Carolina	3,033,642	101,952	18,530	1,799,930	-	1,801	-	1,922,213	4,955,855
North Dakota	1,252,790	-	12,927	-	-	-	1,693,458	1,706,385	2,959,175
Ohio	386,435	182,666	7,509	418,117	-	-	15,084	623,376	1,009,811
Oklahoma	3,811,273	5,443	164,175	23,006	-	-	2,358,080	2,550,704	6,361,977
Oregon	33,805,024	130,747	-	717,117	-	-	2,575,234	3,423,099	37,228,123
Pennsylvania	2,548,858	1,413,963	2,237	657,976	-	175	729,425	2,803,776	5,352,634
Rhode Island	4,977	158,407	-	-	-	-	-	158,407	163,384
South Carolina	1,123,115	119,759	-	1,696,067	-	-	-	1,815,825	2,938,940
South Dakota	2,993,107	-	1,665	-	-	-	145,136	146,801	3,139,908
Tennessee	5,646,073	27,351	8,549	879,293	-	-	50,117	965,310	6,611,383
Texas	1,039,467	400,779	37,694	975,599	-	-	16,225,022	17,639,094	18,678,562
Utah	668,084	23,685	-	-	254,277	-	23,900	301,862	969,946
Vermont	1,492,904	-	-	415,103	-	-	10,235	425,338	1,918,242
Virginia	1,010,993	761,307	20,865	1,916,288	-	-	-	2,698,460	3,709,452
Washington	77,636,758	155,960	11,921	1,113,073	-	-	3,657,484	4,938,438	82,575,196
West Virginia	1,248,037	-	-	-390	-	-	391,910	391,520	1,639,557
Wisconsin	1,616,142	474,159	17,596	775,040	-	-	487,141	1,753,935	3,370,077
Wyoming	835,275	-	-	-	-	-	962,542	962,542	1,797,817
U.S. Total	254,831,385	15,253,142	2,480,617	37,299,853	14,839,977	864,315	55,363,100	126,101,003	380,932,388

[1]Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.18 Renewable electric power sector net generation by energy source and state, 2009

(thousand kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW Biogenic[1]	Other Biomass[2]						
Alabama	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	29,545	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	-	9,470	-	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
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	24,190	-	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

[1]Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
Source: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report."

Table 1.19 Renewable commercial and industrial sector net generation by energy source and state, 2009

(thousand kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW Biogenic[1]	Other Biomass[2]						
Alabama	-	-	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	20,982	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
New Jersey	-	168,212	3,535	-	-	-	-	171,747	171,747
New Mexico	-	-	-	-	-	-	-	-	-
New York	124,746	115,780	-	285,926	-	-	-	401,707	526,452
North Carolina	15,891	-	3,459	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

[1]Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.20 Total renewable net generation by energy source and state, 2009

(thousand kilowatthours)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW Biogenic[1]	Other Biomass[2]						
Alabama	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	29,545	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	-	9,470	-	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
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	24,190	-	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

[1]Includes landfill gas and MSW biogenic (paper and paper board, wood, food, leather, textiles and yard trimmings).
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.21 Renewable electric power sector net summer capacity by energy source and state, 2008

(megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW[1]	Other Biomass[2]						
Alabama	3,272	-	-	-	-	-	-	-	3,272
Alaska	400	-	-	-	-	-	3	3	403
Arizona	2,720	4	-	29	-	9	-	42	2,762
Arkansas	1,321	5	4	-	-	-	-	9	1,330
California	10,117	362	47	456	1,940	416	2,368	5,588	15,705
Colorado	666	3	10	-	-	11	1,063	1,087	1,753
Connecticut	122	166	-	-	-	-	-	166	287
Delaware	-	7	-	-	-	-	-	7	7
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	55	470	105	67	-	-	-	642	697
Georgia	2,034	7	-	4	-	-	-	11	2,045
Hawaii	18	-	46	-	31	1	64	142	161
Idaho	2,346	-	-	12	10	-	117	138	2,484
Illinois	34	150	-	-	-	-	962	1,112	1,145
Indiana	60	30	-	-	-	-	131	161	220
Iowa	142	11	-	-	-	-	2,635	2,646	2,788
Kansas	3	-	-	-	-	-	812	812	815
Kentucky	824	15	-	-	-	-	-	15	839
Louisiana	192	-	11	-	-	-	-	11	203
Maine	610	30	36	220	-	-	47	332	942
Maryland	590	126	-	-	-	-	-	126	716
Massachusetts	252	263	-	26	-	-	2	290	542
Michigan	246	102	-	178	-	-	124	404	650
Minnesota	164	126	55	121	-	-	1,460	1,762	1,926
Mississippi	-	-	-	-	-	-	-	-	-
Missouri	566	5	-	-	-	-	163	168	734
Montana	2,660	-	-	-	-	-	255	255	2,915
Nebraska	278	6	2	-	-	-	25	32	310
Nevada	1,051	-	-	-	215	88	-	303	1,354
New Hampshire	500	29	-	139	-	-	24	192	692
New Jersey	4	184	19	-	-	4	8	214	218
New Mexico	82	-	6	-	-	-	496	502	584
New York	4,284	307	-	87	-	-	707	1,101	5,384
North Carolina	1,947	20	-	75	-	3	-	99	2,046
North Dakota	486	-	-	-	-	-	776	776	1,262
Ohio	101	41	-	7	-	-	7	56	157
Oklahoma	851	-	-	-	-	-	708	708	1,559
Oregon	8,364	17	3	34	-	-	1,059	1,113	9,477
Pennsylvania	751	369	-	28	-	2	361	759	1,510
Rhode Island	3	24	-	-	-	-	-	24	26
South Carolina	1,336	26	-	-	-	-	-	26	1,361
South Dakota	1,463	-	-	-	-	-	193	193	1,656
Tennessee	2,639	8	2	-	-	-	29	39	2,678
Texas	673	73	13	50	-	-	7,427	7,562	8,235
Utah	256	5	-	-	34	-	19	57	313
Vermont	317	3	-	72	-	-	5	80	398
Virginia	674	194	-	83	-	-	-	277	951
Washington	21,198	36	-	86	-	1	1,365	1,487	22,685
West Virginia	163	-	-	-	-	-	330	330	493
Wisconsin	441	66	-	73	-	-	231	369	810
Wyoming	303	-	-	-	-	-	680	680	983
U.S. Total	77,575	3,288	357	1,846	2,229	535	24,651	32,906	110,480

[1]Total capacity whose primary energy source is landfill gas or MSW.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.22 Renewable commercial and industrial sector net summer capacity by energy source and state, 2008

(megawatts)

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

[1]Total capacity whose primary energy source is landfill gas or MSW.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.23 Total renewable net summer capacity by energy source and state, 2008

(megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW[1]	Other Biomass[2]						
Alabama	3,272	-	-	593	-	-	-	593	3,865
Alaska	400	-	-	-	-	-	3	3	403
Arizona	2,720	4	-	29	-	9	-	42	2,762
Arkansas	1,321	5	5	312	-	-	-	322	1,643
California	10,122	374	109	616	1,940	416	2,368	5,822	15,945
Colorado	666	3	10	-	-	11	1,063	1,087	1,753
Connecticut	122	166	-	-	-	-	-	166	287
Delaware	-	7	-	-	-	-	-	7	7
District of Columbia	-	-	-	-	-	-	-	-	-
Florida	55	470	171	351	-	-	-	992	1,046
Georgia	2,041	10	-	591	-	-	-	601	2,642
Hawaii	24	60	49	-	31	1	64	205	228
Idaho	2,346	-	-	63	10	-	117	189	2,535
Illinois	34	150	-	-	-	-	962	1,112	1,145
Indiana	60	39	-	-	-	-	131	170	229
Iowa	142	11	3	-	-	-	2,635	2,650	2,791
Kansas	3	-	-	-	-	-	812	812	815
Kentucky	824	15	-	47	-	-	-	63	886
Louisiana	192	-	14	380	-	-	-	394	586
Maine	730	53	36	612	-	-	47	748	1,478
Maryland	590	132	-	3	-	-	-	135	725
Massachusetts	258	263	9	26	-	s	2	299	557
Michigan	250	169	-	230	-	-	124	523	773
Minnesota	194	130	55	170	-	-	1,460	1,815	2,008
Mississippi	-	-	-	229	-	-	-	229	229
Missouri	566	5	-	-	-	-	163	168	734
Montana	2,660	-	-	17	-	-	255	272	2,932
Nebraska	278	6	5	-	-	-	25	35	313
Nevada	1,051	-	-	-	215	89	-	304	1,355
New Hampshire	500	29	-	140	-	-	24	193	694
New Jersey	4	184	20	-	-	4	8	215	219
New Mexico	82	-	6	-	-	-	496	502	584
New York	4,299	340	-	87	-	-	707	1,134	5,433
North Carolina	1,952	20	-	318	-	3	-	342	2,294
North Dakota	486	-	10	-	-	-	776	786	1,272
Ohio	101	41	-	65	-	-	7	113	214
Oklahoma	851	16	-	63	-	-	708	786	1,637
Oregon	8,364	20	3	230	-	-	1,059	1,312	9,676
Pennsylvania	751	397	-	108	-	2	361	868	1,619
Rhode Island	3	24	-	-	-	-	-	24	26
South Carolina	1,337	35	-	220	-	-	-	256	1,592
South Dakota	1,463	-	-	-	-	-	193	193	1,656
Tennessee	2,639	8	2	165	-	-	29	203	2,842
Texas	673	73	29	180	-	-	7,427	7,708	8,380
Utah	256	5	-	-	34	-	19	57	313
Vermont	322	3	-	76	-	-	5	84	406
Virginia	677	269	-	422	-	-	-	691	1,368
Washington	21,203	36	-	314	-	1	1,365	1,716	22,919
West Virginia	264	-	-	-	-	-	330	330	594
Wisconsin	485	72	8	208	-	-	231	518	1,003
Wyoming	303	-	-	-	-	-	680	680	983
U.S. Total	77,930	3,644	542	6,864	2,229	536	24,651	38,466	116,396

[1]Total capacity whose primary energy source is landfill gas or MSW.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.24 Renewable electric power sector net summer capacity by energy source and state, 2009

(megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW[1]	Other Biomass[2]						
Alabama	3,272	-	-	-	-	-	-	-	3,272
Alaska	414	-	-	-	-	-	7	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
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

[1]Total capacity whose primary energy source is landfill gas or MSW.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Table 1.25 Renewable commercial and industrial sector net summer capacity by energy source and state, 2009

(megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW[1]	Other Biomass[2]						
Alabama	-	-	-	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
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

[1]Total capacity whose primary energy source is landfill gas or MSW.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.26 Total renewable net summer capacity by energy source and state, 2009

(megawatts)

State	Hydroelectric Conventional	NonHydroelectric							Total
		Biomass			Geothermal	Solar Thermal/ PV	Wind	Total	
		Waste		Wood and Derived Fuels[3]					
		Landfill Gas/MSW[1]	Other Biomass[2]						
Alabama	3,272	-	-	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
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

[1]Total capacity whose primary energy source is landfill gas or MSW.
[2]Agriculture byproducts/crops, sludge waste, and other biomass solids, liquids and gases.
[3]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 1.27 Renewable market share of net generation by state, 2008 and 2009

(thousand kilowatthours)

State	2008			2009		
	Total Generation	Percent Renewable	Percent NonHydro Renewable	Total Generation	Percent Renewable	Percent NonHydro Renewable
Alabama	145,869,895	6.5	2.3	143,255,556	10.9	2.1
Alaska	6,774,834	17.4	0.1	6,702,159	20.0	0.2
Arizona	119,459,172	6.2	0.1	111,971,250	5.9	0.2
Arkansas	55,050,528	11.2	2.7	57,457,739	10.1	2.8
California	207,984,263	23.5	11.9	204,776,132	26.1	12.5
Colorado	53,441,594	10.0	6.1	50,565,952	10.1	6.4
Connecticut	30,409,473	4.2	2.4	31,206,222	4.1	2.4
Delaware	7,523,839	2.2	2.2	4,841,563	2.6	2.6
District of Columbia	72,316	-	-	35,499	-	-
Florida	219,636,818	2.1	2.0	217,952,308	2.1	2.0
Georgia	136,173,395	3.6	2.0	128,698,376	4.7	2.2
Hawaii	11,376,385	7.6	6.8	11,010,533	7.4	6.4
Idaho	11,970,553	84.5	6.3	13,100,152	86.3	6.6
Illinois	199,475,178	1.6	1.5	193,864,357	1.9	1.8
Indiana	129,510,294	0.7	0.4	116,670,280	1.9	1.5
Iowa	53,086,786	9.6	8.0	51,860,063	16.5	14.6
Kansas	46,630,321	3.8	3.8	46,677,308	6.2	6.1
Kentucky	97,863,340	2.4	0.5	90,630,427	4.1	0.4
Louisiana	92,453,141	4.1	2.9	90,993,676	4.0	2.6
Maine	17,094,919	49.8	23.7	16,349,849	49.8	24.1
Maryland	47,360,953	5.5	1.3	43,774,832	5.6	1.3
Massachusetts	42,505,478	5.7	3.0	38,966,651	6.2	3.2
Michigan	114,989,806	3.4	2.3	101,202,605	3.9	2.6
Minnesota	54,763,360	12.0	10.7	52,491,849	14.4	12.8
Mississippi	48,205,711	2.9	2.9	48,701,484	2.9	2.9
Missouri	91,028,795	2.5	0.3	88,354,272	2.7	0.7
Montana	29,637,137	36.1	2.4	26,712,735	39.0	3.4
Nebraska	32,373,522	1.9	0.8	34,001,892	2.6	1.3
Nevada	35,089,974	9.4	4.4	37,705,133	11.3	4.8
New Hampshire	22,876,992	12.3	5.1	20,164,122	14.3	5.9
New Jersey	63,674,789	1.5	1.4	61,811,239	1.6	1.6
New Mexico	37,009,837	5.3	4.5	39,674,339	4.7	4.0
New York	140,322,100	21.4	2.4	133,131,476	24.1	3.4
North Carolina	125,239,063	4.0	1.5	118,407,403	6.0	1.6
North Dakota	32,734,579	9.0	5.2	34,196,467	13.1	8.8
Ohio	153,412,251	0.7	0.4	136,090,225	0.9	0.5
Oklahoma	76,328,908	8.3	3.3	75,066,809	8.6	3.9
Oregon	58,718,438	63.4	5.8	56,690,856	65.8	7.5
Pennsylvania	222,350,925	2.4	1.3	219,496,144	2.7	1.5
Rhode Island	7,387,266	2.2	2.1	7,696,824	1.9	1.9
South Carolina	100,978,005	2.9	1.8	100,125,486	4.1	1.7
South Dakota	7,082,672	44.3	2.1	8,196,531	59.3	5.2
Tennessee	90,663,312	7.3	1.1	79,716,889	14.0	1.2
Texas	404,787,781	4.6	4.4	397,167,910	5.6	5.3
Utah	46,578,763	2.1	0.6	43,542,946	3.0	1.1
Vermont	6,820,216	28.1	6.2	7,282,348	26.3	5.9
Virginia	72,678,531	5.1	3.7	70,082,066	5.6	3.4
Washington	110,828,451	74.5	4.5	104,470,133	74.6	4.8
West Virginia	91,123,097	1.8	0.4	70,782,514	3.4	1.0
Wisconsin	63,479,555	5.3	2.8	59,959,060	6.2	3.9
Wyoming	46,500,448	3.9	2.1	46,029,212	6.9	4.8
U.S. Total	4,119,387,760	9.2	3.1	3,950,311,852	10.6	3.7

- = No data reported.

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

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

Table 1.28 Renewable portfolio standards and state mandates by state, 2009

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

[1]In Florida the RPS is not statewide.
- = No RPS or state mandate for that state.
Note: In some states, including Oklahoma, North Dakota, South Dakota, Utah, Vermont, and Virginia, the renewable portfolio standard (RPS) is voluntary.
Source: North Carolina Solar Center, Database of State Incentives for Renewable Energy (DSIRE) website: http://www.dsireusa.org (January 4, 2011).

Table 1.A1 Other Non-Renewable Energy Consumption by Energy Use Sector and Energy Source, 2005 - 2009

(quadrillion Btu)

Sector and Source	2005	2006	2007	2008	2009
Total	0.259	0.259	0.276	0.248	0.262
Commercial	0.020	0.021	0.017	0.021	0.022
MSW Non-Biogenic[1]	0.020	0.020	0.017	0.021	0.022
Other Non-Biogenic[2]	*	*	0.001	*	*
Industrial	0.116	0.114	0.135	0.096	0.116
MSW Non-Biogenic[1]	0.005	0.005	0.004	0.002	0.003
Other Non-Biogenic[2]	0.110	0.109	0.130	0.094	0.113
Electric Power[3]	0.123	0.125	0.124	0.131	0.124
MSW Non-Biogenic[1]	0.107	0.109	0.108	0.110	0.108
Other Non-Biogenic[2]	0.016	0.015	0.016	0.020	0.016

[1]Includes glass, steel, aluminum, other nonferous metals, plastic, rubber, other materials, and miscellaneuos inorganic wastes.
[2]Tires and other (nonspecified).
[3]The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
MSW = Municipal Solid Waste.
* = Less than 500 billion Btu.
Note: Details of EIA`s analysis that revised MSW consumption are found in the U.S. Energy Information Administration (EIA) report, Methodology for Allocating Municipal Solid Waste to Biogenic and Non-Biogenenic 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 1.A2 Other non-renewable net electricity generation by energy use sector and energy source, 2005 - 2009

(thousand kilowatthours)

Sector and Source	2005	2006	2007	2008	2009
Total	12,821,059	12,974,399	12,231,131	11,803,665	11,928,334
Commercial	755,987	758,464	764,083	719,532	841,850
MSW Non-Biogenic[1]	748,861	751,077	756,260	715,716	820,737
Other Non-Biogenic[2]	7,126	7,388	7,823	3,815	21,113
Industrial	5,136,905	5,103,173	4,690,087	4,124,817	4,457,306
MSW Non-Biogenic[1]	27,059	27,138	31,258	-	-
Other Non-Biogenic[2]	5,109,845	5,076,035	4,658,829	4,124,817	4,457,306
Electric Power[3]	6,928,167	7,112,762	6,776,960	6,959,316	6,629,179
MSW Non-Biogenic[1]	5,769,465	5,882,743	5,736,991	5,646,076	5,510,271
Other Non-Biogenic[2]	1,158,702	1,230,019	1,039,970	1,313,240	1,118,908

[1]Includes glass, steel, aluminum, other nonferous metals, plastic, rubber, other materials, and miscellaneuos inorganic wastes.
[2]Tires and other (nonspecified).
[3]The electric power sector comprises electricity-only and combined-heat-power (CHP) plants within North American Classification System (NAICS) 22 category whose primary business is to sell electricity, or electricity and heat, to the public.
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-Biogenenic 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.”

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