

# **Renewable Energy Trends 2003**

## **With Preliminary Data For 2003**

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## Preface

The Energy Information Administration (EIA) reports detailed historical data on renewable energy annually in its report, the *Renewable Energy Annual*. This report, *Renewable Energy Trends With Preliminary Data For 2003*, provides an overview and tables with historical data for 1999-2002, including revisions, and preliminary data for 2003. In addition, table B1 includes data on renewable energy consumption starting in 1989 and going through 2003. These tables correspond to similar tables last

presented in *Renewable Energy Annual 2002* and planned for *Renewable Energy Annual 2003*; and are numbered accordingly. The *Renewable Energy Annual 2003* will also present information on solar and geothermal heat pump manufacturing activities. Definitions for terms used in this report can be found in EIA's Energy Glossary here: [http://www.eia.doe.gov/glossary/glossary\\_main\\_page.htm](http://www.eia.doe.gov/glossary/glossary_main_page.htm).

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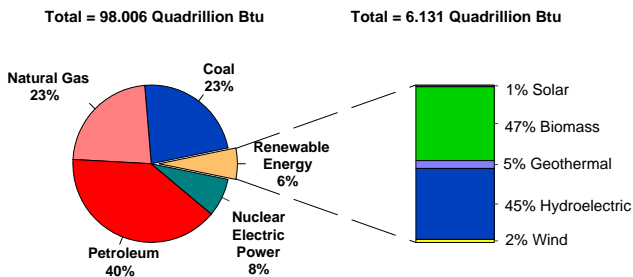
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# Overview

Renewable energy consumption in 2003 grew 3 percent to 6.1 quadrillion Btu (Table 1). More than half of the increase came from a 4 percent gain in conventional hydropower, which contributed 104 trillion Btu more to consumption than it did in 2002. A 3 percent increase in biomass accounted for most of the remaining growth. Wind, geothermal, and solar energy consumption changed only modestly. Overall, renewable energy contributed 6 percent of the Nation's total energy supply (Figure 1).

At 6.1 quadrillion Btu, renewable energy consumption in 2003 was at essentially the same level it was in 1989, the year the Energy Information Administration (EIA) first began tracking "non-utility" electricity facilities (Table B1 and Figure 2). Renewable energy consumption peaked in the mid-1990s at 7.1 quadrillion Btu, or 7.5 percent of total US energy, owing largely to record hydropower output. After its peak in 1997, hydropower production declined for 5

**Figure 1. The Role of Renewable Energy Consumption in the Nation's Energy Supply, 2003**

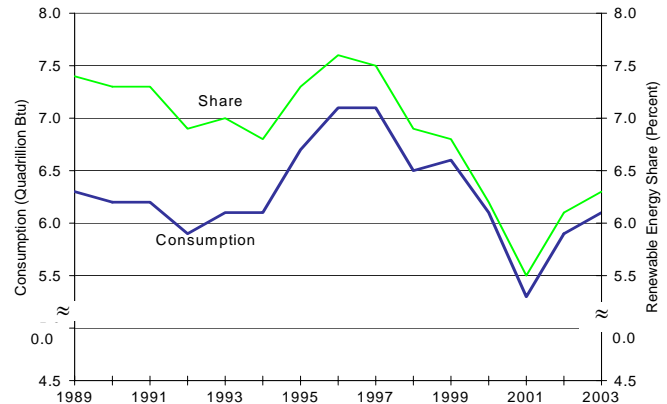


Source: Table 1 of this report

consecutive years and has been at normal or below-normal levels since 2000. Industrial and residential biomass consumption have declined slowly, while geothermal output has remained static. Wind and solar photovoltaics have expanded rapidly in recent years, but their share of the total is so small that this growth has not affected the renewable industry trend significantly.

Biomass energy consumption presented a complex picture in 2003. Although overall consumption rose 3 percent, there was great disparity among the components. Industrial and electric power sector biomass consumption declined 1 and 2 percent, respectively, compared to 2002 (Table 2). These two sectors account for over three-fourths of total biomass consumption. However, consumption during 2003 grew so fast in the smaller residential and transportation sectors, 15 and 41 percent, respectively, that their growth more than offset the major sector declines. Ethanol use increased from 133

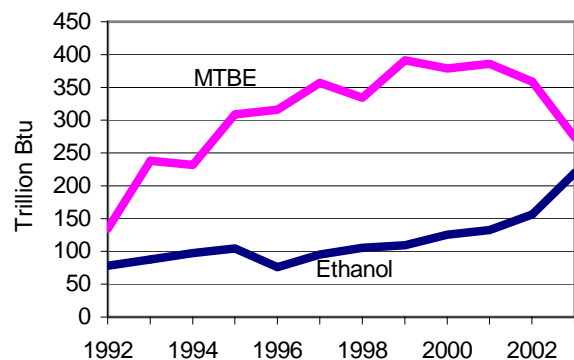
**Figure 2. Historical Renewable Energy Consumption, 1989-2003**



Source: Table B1 of this report

trillion Btu in 2001 to 156 trillion Btu in 2002 and surged to 220 trillion Btu in 2003 (Figure 2). Since ethanol's primary use is as an oxygenate in reformulated gasoline, its demand is tied to reformulated gasoline output and as a replacement for the other oxygenate additive, MTBE. Originally, MTBE was the overwhelming choice for oxygenating gasoline. Over the past few years, however, several states have passed bans on MTBE due to fears of groundwater contamination from leaky tanks.<sup>1</sup> As a result, MTBE consumption has declined since 2001, from 313 trillion Btu to 277 trillion Btu in 2002 and to 225 trillion Btu in 2003 (Figure 3).

**Figure 3. Ethanol and MTBE Consumption in the Transportation Sector, 1992-2003**



Sources: Ethanol: Table B1 of this report. MTBE: 1992-2001: Energy Information Administration, Alternatives to Traditional Transportation Fuels, 2003. Estimated Data (Washington, DC, February 2004), Table 10. (See: [http://www.eia.doe.gov/cneaf/alternate/page/datatables/atf1-13\\_03.html](http://www.eia.doe.gov/cneaf/alternate/page/datatables/atf1-13_03.html)). MTBE: 2002 and 2003: Energy Information Administration, Petroleum Supply Monthly February 2003, DOE/EIA-0109(2003/02) (Washington, DC, February 2003), Tables 34 and D3, and Office of Oil and Gas, unpublished data.

<sup>1</sup>For a discussion of states which have banned MTBE, see <http://www.eia.doe.gov/oiaf/servicrpt/mtbeban/table1.html>.

Geothermal energy consumption has remained largely unchanged for 5 years, as very little new generating capacity has come on line. During 2000, nearly 600 net megawatts of geothermal capacity were retired, and little new capacity has come on line since (Table 5). Non-electric applications represent only a tiny fraction of total geothermal energy consumption.

Wind energy consumption grew 3 percent during 2003 to 108 trillion Btu, far below the double-digit growth experienced in the last few years. The EIA and industry sources document a major increase in capacity at the end of 2003 in anticipation of the expiration of the production tax credit. However, the full effect of these plants on generation levels will not be felt until 2004 when they are in full operation and are reporting to the EIA.

Solar energy maintained its contribution of about 63 trillion Btu in 2003, as solar thermal energy consumption declined while photovoltaic use expanded.

The electric power sector (excluding industrial and commercial combined heat and power (CHP) plants) consumed the most renewable energy in 2003 of any energy use sector, using nearly 60 percent, or 3.6 quadrillion Btu, of total renewable energy consumption. Three-fourths of electric power sector renewable consumption is water for hydropower. The industrial sector is heavily dominated (over 95 percent) by biomass; specifically, wood and wood waste. Residential renewable energy consumption is also heavily dominated by biomass. Residential wood consumption has generally been declining over the past 15 years. Despite a 15 percent increase to 359 trillion Btu, 2003 residential consumption equals just 62 percent of its 1990 value. Commercial sector consumption experienced a 15 percent rate of growth in 2003, bringing consumption near levels of the late 1990's and 2000. As mentioned previously, ethanol consumption in the transportation sector surged during 2003.

Electricity generation (including generation from CHPs) accounted for 4.1 quadrillion Btu, or two-thirds of total renewable energy consumption in 2003 (Table 3). Over 90 percent of this amount came from biomass and water for hydropower. Renewable energy was also consumed for space heating, process heat, and steam (Table 6).

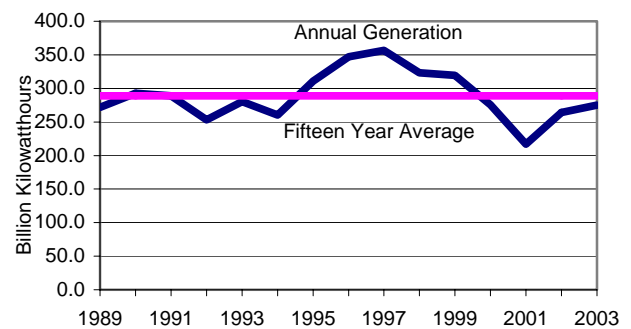
Renewable net electricity generation amounted to nearly 360 billion kilowatthours in 2003, up 2 percent from 2002 (Table 4). Ninety percent came from the electric power sector; its 322 billion kilowatthours was also up 2 percent from 2002. Industrial sector generation was essentially flat.

Geothermal generation dropped 9 percent between 2002 and 2003. The majority of geothermal generation comes from 21 plants at The Geysers field in California, one of the largest

geothermal fields in the world. Production at The Geysers fell sharply about 10 years ago because of a decline in underground pressure to produce steam. As a result, The Geysers, which have a total rated capacity of 1,650 megawatts, are currently achieving (according to industry measurements) an average annual net capacity of only 862 megawatts. The Santa Rosa Geysers Recharge Project, which became operative in December 2003, is designed to enhance steam production and produce 85 megawatts of additional generating capacity from this field by pumping about 11 million gallons of tertiary-treated wastewater daily into The Geysers geothermal reservoir.<sup>2</sup> The wastewater comes from the Santa Rosa regional sewage treatment plant and other cities through a 41-mile underground pipeline. The project also mitigates a major wastewater disposal problem. The project's final cost was just over \$200 million.

Hydroelectric generation, largely in the electric power sector, rose 4 percent and accounted for over three-fourths of renewable electricity generation in 2003. Despite increasing 27 percent since 2001, hydroelectric generation remains slightly below its average over the past 15 years (Figure 4). Generation from biomass in 2003 varied by detailed fuel category, with wood/wood waste-based generation declining 4 percent, but generation from "other biomass" jumping 17 percent.

**Figure 4. Historical Hydroelectric Generation Compared to 15 Year Average for 1989-2003**



Sources: 1989-1998: Energy Information Administration, Annual Energy Review 2002, DOE/EIA-0384(2002) (Washington, DC, October 2003), Table 8.2a. 1999-2003 Table 4 of this report.

There was a net addition of 560 megawatts of renewable electric generating capacity in 2003 (Table 5). Of this amount, 438 megawatts was additional wind capacity, and 110 megawatts was biomass. Industry sources indicate the increase for wind was closer to a total of 1,700 megawatts, but some new plants were not yet reporting to EIA.<sup>3</sup> At nearly 97,000 megawatts of capacity, renewable energy provided 10 percent of the 2003 total net summer electric generating

<sup>2</sup>For information on this project, see [http://www.energy.ca.gov/reports/2003-03-01\\_500-02-078V1.PDF](http://www.energy.ca.gov/reports/2003-03-01_500-02-078V1.PDF) and [http://www.corporate-ir.net/ireve/ir\\_site.zhtml?ticker=CPN&script=411&layout=6&item\\_id=475360](http://www.corporate-ir.net/ireve/ir_site.zhtml?ticker=CPN&script=411&layout=6&item_id=475360).

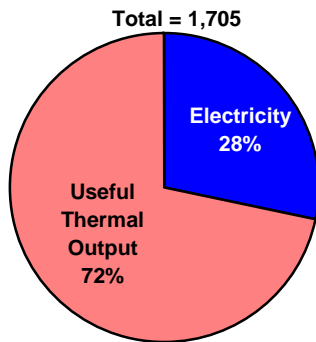
<sup>3</sup>See American Wind Energy Association News Release, "Boom: 2003 Close to Best Year Ever for New Wind Installations; Bust: Expiration of Key Incentive Lowers Hopes for 2004." January 22, 2004. See the website: <http://www.awea.org/news/news040122r03.html> (june 30, 2004).

capacity. Note that a considerable amount of renewable capacity typically operates at lower capacity factors than large baseload coal, gas, and nuclear plants.

Use of renewable energy for space heat, steam, and process heat grew 8 percent in 2003 to 2 quadrillion Btu (Table 6). Over 60 percent of this energy was consumed in the industrial sector. Over 95 percent of total non-electric renewable energy consumption, and nearly 97 percent of industrial sector non-electric consumption, is biomass. Most of the 1.1 quadrillion Btu of “Wood” consumed in the industrial sector for non-electric energy is a paper mill wood waste product, black liquor. Residential biomass use grew 15 percent in 2003, due mostly to a colder winter than in 2002. Commercial sector biomass use grew similarly. As mentioned previously, transportation sector non-electric consumption growth was rapid at 41 percent, due to increased ethanol usage as an oxygenate in gasoline.

A detailed examination of total biomass energy consumption reveals some interesting points. First, twice as much biomass was used for space, steam, and process heat (1.9 quads) as for electricity production in 2003. This contrasts with all other renewables, which are largely or entirely used to generate electricity. Since the industrial sector has by far the greatest demand for process heat and steam, the majority of total biomass (59 percent) was consumed there in 2003.

**Figure 5. Industrial Biomass Energy Consumption by End Use, 2002 (Trillion Btu)**



Source: Table 8 of this report.

Second, about 72 percent (1.2 quadrillion Btu) of industrial biomass was used for steam and process heat (also known as “useful thermal output”) in 2002 (Tables 8 and B3 and Figure 5). In addition to the Paper and Allied Products industry, the Lumber industry used a significant amount of biomass (248

trillion Btu) in 2002 to produce useful thermal output (Table 8). (Data for 2003 is not presently available for these detailed categories.) Third, after growing strongly between 2001 and 2002, waste and other biomass declined in 2003 by 3 and 7 percent, respectively (Table 7). Over half of biomass waste was consumed by independent power producers in 2002 (Table 9).

The Pacific “contiguous” (i.e., continental) Census Division generated nearly half, or 170 billion kilowatthours, of all renewable electricity in 2002 (Table B2). This included 144 billion kilowatthours of hydropower. Four other divisions (East South Central, Middle Atlantic, Mountain, and South Atlantic) generated roughly 30 billion kilowatthours each. The Pacific Contiguous division, which includes California and Washington, dominated generation from all renewable fuels except biomass. Black liquor- and wood/wood waste solids-based electricity were concentrated in the South Atlantic, South Central and Pacific Contiguous divisions (Table B4). New England also had substantial generation from black liquor.

Ninety-six electricity generating plants burned both biomass and coal in 2002 (Table B5). Plants for which biomass is only a small fraction of coal consumption are generally “co-firing” plants attempting to reduce emissions without making major retrofit investments. The remainder are genuine dual- or multi-fired plants consuming fuels based upon availability, demand, and price. For example, paper mills frequently require more energy than is available from the quantity of black liquor produced in the paper-making process.

State developments in renewable electricity generation complemented national trends in 2002. Washington, Oregon, California, and Montana (in descending order of importance) experienced major increases in hydroelectric generation as they recovered from the 2001 drought in the West (Tables C3 and C6). The net increase in renewable electric capacity was modest, less than 500 MW, led by expansion of wind in California, Iowa, and Texas and hydroelectric power in South Dakota and Tennessee (Tables C9 and C12). The western states and New York dominated hydroelectric capacity, while California was the leader in non-hydro electric capacity, with 30 percent of the national non-hydro total.

According to the Database of State Incentives for Renewable Energy (DSIRE), 18 states have renewable portfolio standards or state mandates with varying degrees of commitment to develop renewable energy in the future<sup>4</sup> (Table C14). The list includes recently added Colorado, Florida and Maryland.

<sup>4</sup> DSIRE is funded by the US Department of Energy and maintained by the North Carolina Solar Center.

**Table 1. U.S. Energy Consumption by Energy Source, 1999-2003**  
(Quadrillion Btu)

Energy Source	1999	2000	2001	2002	<sup>P</sup> 2003
<b>Total</b> .....	<b>96.763</b>	<b>98.891</b>	<b>96.258</b>	<b>97.633</b>	<b>98.006</b>
<b>Fossil Fuels</b> .....	<b>82.650</b>	<b>84.965</b>	<b>83.121</b>	<b>84.297</b>	<b>84.388</b>
Coal .....	21.623	22.580	21.897	<i>22.195</i>	22.773
Coal Coke Net Imports .....	0.058	0.065	<i>0.029</i>	<i>0.061</i>	0.051
Natural Gas <sup>a</sup> .....	23.010	<i>23.916</i>	<i>22.861</i>	<i>23.069</i>	22.490
Petroleum <sup>b</sup> .....	37.960	38.404	38.333	38.401	39.074
<b>Electricity Net Imports</b> .....	<b>0.099</b>	<b>0.116</b>	<b>0.075</b>	<b>0.078</b>	<b>0.019</b>
<b>Nuclear Electric Power</b> .....	<b>7.610</b>	<b>7.862</b>	<b>8.028</b>	<b>8.145</b>	<b>7.795</b>
<b>Hydroelectric Pumped Storage</b> <sup>c</sup> .....	<b>-0.062</b>	<b>-0.057</b>	<b>-0.090</b>	<b>-0.088</b>	<b>-0.088</b>
<b>Renewable Energy</b> .....	<b>6.587</b>	<b>6.145</b>	<b>5.272</b>	<b>5.946</b>	<b>6.131</b>
Conventional Hydroelectric.....	3.268	2.811	2.201	<i>2.675</i>	2.779
Geothermal Energy.....	0.331	0.317	0.311	<i>0.328</i>	0.314
Biomass .....	2.873	2.893	<i>2.626</i>	<i>2.773</i>	2.865
Solar Energy .....	0.069	0.066	0.065	<i>0.064</i>	0.063
Wind Energy .....	0.046	0.057	0.068	<i>0.105</i>	0.108

<sup>a</sup> Includes supplemental gaseous fuels.

<sup>b</sup> Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.

<sup>c</sup> Pumped storage facility production minus energy used for pumping.

P=Preliminary.

Note: Revised data are in italics. Totals may not equal sum of components due to independent rounding.

Sources: Non-renewable energy: Energy Information Administration (EIA), Monthly Energy Review April 2004, DOE/EIA-0035 (2004/04) (Washington, DC, April 2004.) Tables 1.3 and 1.4. Renewable Energy: Table 2 of this report.



**Table 2. Renewable Energy Consumption by Energy Use Sector and Energy Source, 1999-2003**  
(Quadrillion Btu)

Sector and Source	1999	2000	2001	2002	<sup>P</sup> 2003
<b>Total</b>	<b>6.587</b>	<b>6.145</b>	<b>5.272</b>	<b>5.946</b>	<b>6.131</b>
<b>Residential</b> .....	<b>0.486</b>	<b>0.503</b>	<b>0.439</b>	<b>0.382</b>	<b>0.435</b>
Biomass.....	0.414	0.433	<i>0.370</i>	<i>0.313</i>	0.359
Geothermal.....	0.009	0.009	0.009	0.010	0.018
Solar <sup>a</sup> .....	0.064	0.061	0.060	<i>0.059</i>	0.058
<b>Commercial</b> .....	<b>0.114</b>	<b>0.109</b>	<b>0.089</b>	<b>0.093</b>	<b>0.107</b>
Biomass.....	0.106	0.100	0.080	<i>0.084</i>	0.090
Wood/Wood Waste.....	0.052	0.053	<i>0.040</i>	<i>0.042</i>	0.042
MSW/Landfill Gas.....	0.049	0.041	0.035	<i>0.037</i>	0.042
Other Biomass <sup>b</sup> .....	0.005	0.006	0.004	0.005	0.007
Geothermal.....	0.007	0.008	0.008	0.009	0.015
Conventional Hydroelectric.....	0.001	0.001	0.001	*	0.001
<b>Industrial</b> .....	<b>1.843</b>	<b>1.828</b>	<b>1.630</b>	<b>1.748</b>	<b>1.750</b>
Biomass.....	1.791	1.781	1.593	<i>1.705</i>	1.689
Wood/Wood Waste.....	1.620	1.636	1.443	<i>1.531</i>	1.524
MSW/Landfill Gas.....	0.094	0.064	0.074	<i>0.087</i>	0.089
Other Biomass <sup>b</sup> .....	0.077	0.081	0.076	<i>0.087</i>	0.075
Geothermal.....	0.004	0.004	0.005	0.005	0.005
Conventional Hydroelectric.....	0.049	0.042	0.032	<i>0.039</i>	0.057
<b>Transportation</b> .....	<b>0.110</b>	<b>0.126</b>	<b>0.133</b>	<b>0.156</b>	<b>0.220</b>
Alcohol Fuels <sup>c</sup> .....	<b>0.110</b>	<b>0.126</b>	<b>0.133</b>	<b>0.156</b>	<b>0.220</b>
<b>Electric Power</b> <sup>d</sup> .....	<b>4.034</b>	<b>3.579</b>	<b>2.982</b>	<b>3.567</b>	<b>3.619</b>
Biomass.....	0.453	0.453	0.450	<i>0.516</i>	0.507
Wood/Wood Waste.....	0.138	0.134	0.126	<i>0.150</i>	0.161
MSW/Landfill Gas.....	0.292	0.295	0.310	<i>0.343</i>	0.322
Other Biomass <sup>b</sup> .....	0.023	0.023	0.014	<i>0.022</i>	0.024
Geothermal.....	0.312	0.296	0.289	<i>0.305</i>	0.276
Conventional Hydroelectric.....	3.218	2.768	2.169	<i>2.636</i>	2.722
Solar.....	0.005	0.005	0.006	<i>0.006</i>	0.005
Wind.....	0.046	0.057	0.068	<i>0.105</i>	0.108

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

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

<sup>c</sup> Ethanol primarily derived from corn.

<sup>d</sup> Includes electric utilities and independent power producers.

\* =Less than 500 billion Btu.

P=Preliminary.

Note: Revised data are in italics. Totals may not equal sum of components due to independent rounding.

Sources: Analysis conducted by Energy Information Administration, Office of Coal, Nuclear, Electric, and Alternate Fuels and specific sources described as follows. **Residential:** Energy Information Administration, Form EIA-457A/G, "Residential Energy Consumption Survey;" Oregon Institute of Technology, Geo-Heat Center; and Energy Information Administration, Form EIA-63-A, "Annual Solar Thermal Collector Manufacturers Survey" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." **Commercial:** Energy Information Administration, Form EIA-860B, "Annual Electric Generator Report - Nonutility," Form EIA-906, "Power Plant Report," and Oregon Institute of Technology, Geo-Heat Center. **Industrial:** Energy Information Administration, Form EIA-846 (A, B, C) "Manufacturing Energy Consumption Survey," Form EIA-860B, "Annual Electric Generator Report - Nonutility," and Form EIA-906, "Power Plant Report;" Oregon Institute of Technology, Geo-Heat Center; and Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook. **Transportation:** Energy Information Administration, Form-EIA-819M, "Monthly Oxygenate Telephone Report," and Form EIA-814, "Monthly Imports Report." **Electric Power:** Energy Information Administration, Form EIA-759, "Monthly Power Plant Report," Form EIA-860B, "Annual Electric Generator Report - Nonutility," and Form EIA-906, "Power Plant Report."

**Table 3. Renewable Energy Consumption for Electricity Generation by Energy Use Sector and Energy Source, 1999-2003**  
(Quadrillion Btu)

Sector/Source	1999	2000	2001	2002	<sup>P</sup> 2003
<b>Total</b> .....	<b>4.452</b>	<b>3.995</b>	<b>3.396</b>	<b>4.094</b>	<b>4.127</b>
Biomass .....	0.822	0.826	0.833	<i>1.004</i>	0.957
Wood/Wood Waste .....	0.490	0.496	0.486	<i>0.605</i>	0.576
MSW/Landfill Gas .....	0.301	0.297	0.323	<i>0.360</i>	0.344
Other Biomass <sup>a</sup> .....	0.031	0.033	0.023	<i>0.039</i>	0.037
Geothermal .....	0.312	0.296	0.289	<i>0.305</i>	0.276
Conventional Hydroelectric.....	3.268	2.811	2.201	<i>2.675</i>	2.779
Solar .....	0.005	0.005	0.006	0.006	0.005
Wind.....	0.046	0.057	0.068	<i>0.105</i>	0.108
<b>Commercial</b> .....	<b>0.035</b>	<b>0.028</b>	<b>0.023</b>	<b>0.029</b>	<b>0.033</b>
Biomass .....	0.033	0.026	0.023	<i>0.029</i>	0.032
Wood/Wood Waste.....	*	*	*	*	*
MSW/Landfill Gas .....	0.029	0.021	0.019	<i>0.024</i>	0.026
Other Biomass <sup>a</sup> .....	0.004	0.005	0.004	0.004	0.005
Conventional Hydroelectric.....	0.001	0.001	0.001	*	0.001
<b>Industrial</b> .....	<b>0.422</b>	<b>0.421</b>	<b>0.411</b>	<b>0.520</b>	<b>0.494</b>
Biomass .....	0.373	0.379	0.380	<i>0.482</i>	0.437
Wood/Wood Waste.....	0.364	0.369	0.370	<i>0.464</i>	0.424
MSW/Landfill Gas .....	*	*	0.003	<i>0.001</i>	0.002
Other Biomass <sup>a</sup> .....	0.008	0.009	0.007	<i>0.016</i>	0.011
Conventional Hydroelectric.....	0.049	0.042	0.032	<i>0.039</i>	0.057
<b>Electric Power</b> <sup>b</sup> .....	<b>3.996</b>	<b>3.547</b>	<b>2.962</b>	<b>3.545</b>	<b>3.600</b>
Biomass .....	0.416	0.421	0.430	<i>0.494</i>	0.488
Wood/Wood Waste.....	0.125	0.126	0.116	<i>0.141</i>	0.152
MSW/Landfill Gas .....	0.271	0.275	0.301	<i>0.334</i>	0.316
Other Biomass <sup>a</sup> .....	0.019	0.020	0.013	<i>0.019</i>	0.020
Geothermal .....	0.312	0.296	0.289	<i>0.305</i>	0.276
Conventional Hydroelectric.....	3.218	2.768	2.169	<i>2.636</i>	2.722
Solar .....	0.005	0.005	0.006	0.006	0.005
Wind.....	0.046	0.057	0.068	<i>0.105</i>	0.108

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

<sup>b</sup> Includes electric utilities and independent power producers.

\* =Less than 500 billion Btu.

P=Preliminary.

Note: Revised data are in italics. Totals may not add due to independent rounding.

Sources: Analysis conducted by Energy Information Administration, Office of Coal, Nuclear, Electric, and Alternate Fuels and the following specific sources. Energy Information Administration, Form EIA-759, "Monthly Power Plant Report," Form EIA-860B, "Annual Electric Generator Report - Nonutility," and Form EIA-906, "Power Plant Report."

**Table 4. Electricity Net Generation From Renewable Energy by Energy Use Sector and Energy Source, 1999-2003**  
(Thousand Kilowatthours)

Sector/Source	1999	2000	2001	2002	<sup>P</sup> 2003
<b>Total</b> .....	<b>398,959,030</b>	<b>356,478,569</b>	<b>294,946,110</b>	<b>351,250,924</b>	<b>359,181,305</b>
Biomass.....	59,612,909	60,726,180	56,964,468	<i>61,521,672</i>	59,761,936
Wood/Wood Waste.....	37,040,734	37,594,866	35,199,916	<i>38,665,040</i>	36,951,201
MSW/Landfill Gas.....	20,072,515	20,304,943	19,931,044	<i>20,184,615</i>	19,680,263
Other Biomass <sup>a</sup> .....	2,499,660	2,826,371	1,833,508	<i>2,672,017</i>	3,130,472
Geothermal.....	14,827,013	14,093,158	13,740,503	<i>14,491,310</i>	13,149,041
Conventional Hydroelectric.....	319,536,028	275,572,597	216,961,046	<i>264,328,832</i>	275,006,940
Solar.....	495,082	493,375	542,755	<i>554,831</i>	534,781
Wind.....	4,487,998	5,593,261	6,737,337	<i>10,354,279</i>	10,728,607
<b>Commercial</b> .....	<b>2,527,117</b>	<b>2,111,620</b>	<b>1,548,109</b>	<b>1,597,470</b>	<b>1,994,634</b>
Biomass.....	2,412,455	2,011,871	1,481,627	<i>1,584,673</i>	1,897,065
Wood/Wood Waste.....	19,671	26,958	17,626	<i>12,505</i>	9,187
MSW/Landfill Gas.....	2,041,933	1,601,152	1,181,827	<i>1,267,614</i>	1,451,182
Other Biomass <sup>a</sup> .....	350,851	383,761	282,174	<i>304,554</i>	436,696
Conventional Hydroelectric.....	114,663	99,749	66,482	<i>12,797</i>	97,569
<b>Industrial</b> .....	<b>33,505,006</b>	<b>33,626,303</b>	<b>30,848,324</b>	<b>34,572,015</b>	<b>34,568,959</b>
Biomass.....	28,746,698	29,491,148	27,703,056	<i>30,747,367</i>	28,948,096
Wood/Wood Waste.....	28,060,358	28,651,835	26,888,490	<i>29,643,207</i>	27,895,297
MSW/Landfill Gas.....	20,516	30,858	237,273	<i>202,209</i>	220,667
Other Biomass <sup>a</sup> .....	665,824	808,456	577,292	<i>901,951</i>	832,132
Conventional Hydroelectric.....	4,758,307	4,135,155	3,145,268	<i>3,824,648</i>	5,620,863
<b>Electric Power</b> <sup>b</sup> .....	<b>362,926,907</b>	<b>320,740,647</b>	<b>262,549,676</b>	<b>315,081,439</b>	<b>322,617,712</b>
Biomass.....	28,453,756	29,223,160	27,779,786	<i>29,189,632</i>	28,916,775
Wood/Wood Waste.....	8,960,705	8,916,073	8,293,800	<i>9,009,328</i>	9,046,717
MSW/Landfill Gas.....	18,010,065	18,672,933	18,511,944	<i>18,714,792</i>	18,008,414
Other Biomass <sup>a</sup> .....	1,482,985	1,634,155	974,042	<i>1,465,512</i>	1,861,644
Geothermal.....	14,827,013	14,093,158	13,740,503	<i>14,491,310</i>	13,149,041
Conventional Hydroelectric.....	314,663,058	271,337,693	213,749,295	<i>260,491,387</i>	269,288,508
Solar.....	495,082	493,375	542,755	<i>554,831</i>	534,781
Wind.....	4,487,998	5,593,261	6,737,337	<i>10,354,279</i>	10,728,607

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

<sup>b</sup> Includes electric utilities and independent power producers.

P=Preliminary.

Note: Revised data are in italics. Totals may not add due to independent rounding.

Sources: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report," Form EIA-860B, "Annual Electric Generator Report - Nonutility," and Form EIA-906, "Power Plant Report."

**Table 5. U.S. Electric Net Summer Capacity, 1999-2003**  
(Megawatts)

Source	1999	2000	2001	2002	<sup>P</sup> 2003
<b>Total</b> .....	<b>785,927</b>	<b>811,719</b>	<b>848,254</b>	<b>905,301</b>	<b>953,206</b>
<b>Renewable Total</b> .....	<b>95,335</b>	<b>94,931</b>	<b>95,664</b>	<b>96,109</b>	<b>96,669</b>
Biomass .....	10,454	<i>10,016</i>	9,709	<i>9,689</i>	9,799
Wood/Wood Waste .....	6,795	<i>6,147</i>	5,882	<i>5,844</i>	5,916
MSW/Landfill Gas .....	3,214	3,381	3,292	<i>3,330</i>	3,367
Other Biomass <sup>a</sup> .....	446	<i>488</i>	535	<i>515</i>	516
Geothermal .....	2,846	2,793	2,216	<i>2,252</i>	2,252
Conventional Hydroelectric .....	79,393	79,359	79,484	<i>79,354</i>	79,366
Solar .....	389	386	392	<i>397</i>	397
Wind .....	2,252	2,377	3,864	<i>4,417</i>	4,854
<b>Nonrenewable Total</b> .....	<b>690,592</b>	<b>716,788</b>	<b>752,590</b>	<b>809,193</b>	<b>856,537</b>

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

P=Preliminary.

Note: Revised data are in italics. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report," Form EIA-860A, "Annual Electric Generator Report - Utility," and Form EIA-860B, "Annual Electric Generator Report - Nonutility."

**Table 6. Renewable Energy Consumption for Nonelectric Use by Energy Use Sector and Energy Source, 1999-2003**  
(Quadrillion Btu)

Sector/Source	1999	2000	2001	2002	<sup>P</sup> 2003
<b>Total</b> .....	<b>2.134</b>	<b>2.149</b>	<b>1.875</b>	<b>1.852</b>	<b>2.004</b>
Biomass .....	2.051	2.067	1.793	1.769	1.908
Wood .....	1.734	1.761	1.494	1.431	1.511
MSW/Landfill Gas .....	0.135	0.104	0.095	0.108	0.108
Other Biomass <sup>a</sup> .....	0.074	0.077	0.071	0.075	0.069
Alcohol Fuels <sup>b</sup> .....	0.110	0.126	0.133	0.156	0.220
Geothermal .....	0.019	0.021	0.022	0.024	0.038
Solar <sup>c</sup> .....	0.064	0.061	0.060	0.059	0.058
<b>Residential</b> .....	<b>0.486</b>	<b>0.503</b>	<b>0.439</b>	<b>0.382</b>	<b>0.435</b>
Biomass .....	0.414	0.433	0.370	0.313	0.359
Wood .....	0.414	0.433	0.370	0.313	0.359
Geothermal .....	0.009	0.009	0.009	0.010	0.018
Solar <sup>c</sup> .....	0.064	0.061	0.060	0.059	0.058
<b>Commercial</b> .....	<b>0.079</b>	<b>0.082</b>	<b>0.065</b>	<b>0.064</b>	<b>0.074</b>
Biomass .....	0.073	0.074	0.057	0.055	0.059
Wood .....	0.052	0.053	0.040	0.041	0.042
MSW/Landfill Gas .....	0.020	0.020	0.016	0.013	0.015
Other Biomass <sup>a</sup> .....	0.001	0.001	0.001	0.001	0.001
Geothermal .....	0.007	0.008	0.008	0.009	0.015
<b>Industrial</b> .....	<b>1.422</b>	<b>1.407</b>	<b>1.218</b>	<b>1.228</b>	<b>1.256</b>
Biomass .....	1.418	1.402	1.213	1.223	1.252
Wood .....	1.255	1.267	1.073	1.067	1.101
MSW/Landfill Gas .....	0.094	0.063	0.071	0.086	0.087
Other Biomass <sup>a</sup> .....	0.069	0.072	0.069	0.071	0.064
Geothermal .....	0.004	0.004	0.005	0.005	0.005
<b>Transportation</b> .....					
Alcohol Fuels <sup>b</sup> .....	<b>0.110</b>	<b>0.126</b>	<b>0.133</b>	<b>0.156</b>	<b>0.220</b>
<b>Electric Power</b> <sup>d</sup> .....	<b>0.038</b>	<b>0.032</b>	<b>0.020</b>	<b>0.022</b>	<b>0.019</b>
Biomass .....	0.038	0.032	0.020	0.022	0.019
Wood .....	0.013	0.008	0.010	0.010	0.009
MSW/Landfill Gas .....	0.021	0.020	0.008	0.009	0.006
Other Biomass <sup>a</sup> .....	0.004	0.004	0.001	0.003	0.004

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

<sup>b</sup> Ethanol primarily derived from corn.

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

<sup>d</sup> Includes electric utilities and independent power producers.

P=Preliminary.

Note: Revised data are in italics. Totals may not equal sum of components due to independent rounding.

Sources: Analysis conducted by Energy Information Administration, Office of Coal, Nuclear, Electric, and Alternate Fuels and specific sources described as follows. Residential: Energy Information Administration, Form EIA-457A/G, "Residential Energy Consumption Survey;" Oregon Institute of Technology, Geo-Heat Center; and Energy Information Administration, Form EIA-63-A, "Annual Solar Thermal Collector Manufacturers Survey" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Commercial: Energy Information Administration, Form EIA-860B, "Annual Electric Generator Report - Nonutility," Form EIA-906, "Power Plant Report," and Oregon Institute of Technology, Geo-Heat Center. Industrial: Energy Information Administration, Form EIA-846 (A,B,C) "Manufacturing Energy Consumption Survey," Form EIA-860B, "Annual Electric Generator Report - Nonutility," and Form EIA-906, "Power Plant Report;" Oregon Institute of Technology, Geo-Heat Center; and Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook. Transportation: Energy Information Administration, Form-EIA-819M, "Monthly Oxygenate Telephone Report," and Form EIA-814, "Monthly Imports Report." Electric Power: Energy Information Administration, Form EIA-759, "Monthly Power Plant Report," Form EIA-860B, "Annual Electric Generator Report - Nonutility," and Form EIA-906, "Power Plant Report."

**Table 7. Biomass Energy Consumption by Energy Source and Energy Use Sector, 1999-2003**  
(Trillion Btu)

Source/Sector	1999	2000	2001	2002	<sup>P</sup> 2003
<b>Total</b> .....	<b>2,873</b>	<b>2,893</b>	<b>2,626</b>	<b>2,773</b>	<b>2,865</b>
<b>Wood Energy Total</b> .....	<b>2,224</b>	<b>2,257</b>	<b>1,980</b>	<b>2,036</b>	<b>2,087</b>
Residential .....	414	433	370	313	359
Commercial.....	52	53	40	42	42
Industrial .....	1,620	1,636	1,443	1,531	1,524
Electric Power <sup>a</sup> .....	138	134	126	150	161
<b>Waste Energy Total</b> .....	<b>540</b>	<b>511</b>	<b>514</b>	<b>581</b>	<b>559</b>
MSW/Landfill Gas .....	435	400	419	467	453
Commercial.....	49	41	35	37	42
Industrial .....	94	64	74	87	89
Electric Power <sup>a</sup> .....	292	295	310	343	322
<b>Other Biomass</b> <sup>b</sup> .....	<b>105</b>	<b>111</b>	<b>95</b>	<b>114</b>	<b>106</b>
Commercial.....	5	6	4	5	7
Industrial .....	77	81	76	87	75
Electric Power <sup>a</sup> .....	23	23	14	22	24
<b>Alcohol Fuels</b> <sup>c</sup> .....					
Transportation.....	110	126	133	156	220

<sup>a</sup> Includes electric utilities and independent power producers.

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

<sup>c</sup> Ethanol primarily derived from corn.

P=Preliminary.

Note: Revised data are in italics. Totals may not equal sum of components due to independent rounding.

Sources: Table 2 of this report.

**Table 8. Industrial Biomass Energy Consumption and Electricity Net Generation by Primary Purpose of Business, 2002**

Industry	Biomass Energy Consumption (Trillion Btus)			Net Generation (Million Kilowatthours)
	Total	For Electricity	For Useful Thermal Output	
<b>Total</b> .....	<b>1,705</b>	<b>482</b>	<b>1,223</b>	<b>30,747</b>
Agriculture, Forestry and Mining.....	11	3	8	205
Manufacturing .....	1,600	470	1,130	29,809
Food and Kindred Products.....	49	7	42	221
Lumber .....	248	17	231	1,389
Paper and Allied Products .....	1,249	444	805	28,057
Chemicals and Allied Products .....	23	1	22	36
Other <sup>a</sup> .....	31	1	30	106
Nonspecified <sup>b</sup> .....	93	8	85	733

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

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

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

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report;" Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook; and analysis conducted by the Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

**Table 9. Waste Energy Consumption by Type and Energy Use Sector, 2002**  
(Trillion Btu)

Type	Sector				Total
	Commercial	Industrial	Electric Power		
			Electric Utilities	Independent Power Producers	
<b>Total .....</b>	<b>42</b>	<b>174</b>	<b>38</b>	<b>327</b>	<b>581</b>
MSW and Landfill Gas .....	37	87	37	306	467
MSW .....	36	8	33	248	325
Landfill Gas .....	2	79	3	59	142
Other Biomass <sup>a</sup> .....	5	87	2	21	114

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

MSW = Municipal Solid Waste

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

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report," and Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook; and analysis conducted by the Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

**Table B1. Historical Renewable Energy Consumption by Sector and Energy Source, 1989-2003**  
(Quadrillion Btu)

Sector and Energy Source	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Total</b> .....	<b>6.294</b>	<b>6.152</b>	<b>6.150</b>	<b>5.902</b>	<b>6.148</b>	<b>6.053</b>	<b>6.657</b>	<b>7.129</b>	<b>7.065</b>	<b>6.549</b>	<b>6.587</b>	<b>6.145</b>	<b>5.272</b>	<b>5.946</b>	<b>6.131</b>
Biomass .....	3.062	2.681	2.694	2.842	2.795	2.928	3.056	3.120	2.996	2.823	2.873	2.893	2.626	2.773	2.865
Wood .....	2.637	2.191	2.190	2.290	2.228	2.315	2.420	2.467	2.349	2.175	2.224	2.257	1.980	2.036	2.087
Waste <sup>a</sup> .....	0.354	0.408	0.440	0.473	0.479	0.515	0.531	0.577	0.551	0.542	0.540	0.511	0.514	0.581	0.559
Alcohol Fuels <sup>b</sup> .....	0.071	0.082	0.065	0.078	0.088	0.097	0.105	0.076	0.096	0.105	0.110	0.126	0.133	0.156	0.220
Geothermal .....	0.317	0.336	0.346	0.349	0.364	0.338	0.294	0.316	0.325	0.328	0.331	0.317	0.311	0.328	0.314
Hydroelectric .....	2.837	3.046	3.016	2.617	2.892	2.683	3.205	3.590	3.640	3.297	3.268	2.811	2.201	2.675	2.779
Solar <sup>c</sup> .....	0.055	0.060	0.063	0.064	0.066	0.069	0.070	0.071	0.070	0.070	0.069	0.066	0.065	0.064	0.063
Wind .....	0.022	0.029	0.031	0.030	0.031	0.036	0.033	0.033	0.034	0.031	0.046	0.057	0.068	0.105	0.108
<b>Residential Sector</b> .....	<b>0.976</b>	<b>0.642</b>	<b>0.677</b>	<b>0.711</b>	<b>0.616</b>	<b>0.607</b>	<b>0.667</b>	<b>0.667</b>	<b>0.506</b>	<b>0.459</b>	<b>0.486</b>	<b>0.503</b>	<b>0.439</b>	<b>0.382</b>	<b>0.435</b>
Biomass .....	0.918	0.581	0.613	0.645	0.548	0.537	0.596	0.595	0.433	0.387	0.414	0.433	0.370	0.313	0.359
Wood .....	0.918	0.581	0.613	0.645	0.548	0.537	0.596	0.595	0.433	0.387	0.414	0.433	0.370	0.313	0.359
Geothermal .....	0.005	0.006	0.006	0.006	0.007	0.006	0.007	0.007	0.008	0.008	0.009	0.009	0.009	0.010	0.018
Solar <sup>c</sup> .....	0.053	0.056	0.058	0.060	0.062	0.064	0.065	0.065	0.065	0.065	0.064	0.061	0.060	0.059	0.058
<b>Commercial Sector</b> .....	<b>0.061</b>	<b>0.071</b>	<b>0.072</b>	<b>0.081</b>	<b>0.084</b>	<b>0.086</b>	<b>0.092</b>	<b>0.110</b>	<b>0.113</b>	<b>0.111</b>	<b>0.114</b>	<b>0.109</b>	<b>0.089</b>	<b>0.093</b>	<b>0.107</b>
Biomass .....	0.058	0.067	0.068	0.076	0.079	0.081	0.086	0.103	0.107	0.102	0.106	0.100	0.080	0.084	0.090
Wood .....	0.036	0.039	0.041	0.044	0.046	0.046	0.046	0.050	0.049	0.048	0.052	0.053	0.040	0.042	0.042
Waste <sup>a</sup> .....	0.022	0.028	0.026	0.032	0.033	0.035	0.040	0.053	0.058	0.054	0.054	0.047	0.039	0.042	0.048
Geothermal .....	0.003	0.003	0.003	0.003	0.003	0.004	0.005	0.005	0.006	0.007	0.007	0.008	0.008	0.009	0.015
Hydroelectric .....	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	*	0.001
<b>Industrial Sector</b> .....	<b>1.814</b>	<b>1.667</b>	<b>1.626</b>	<b>1.672</b>	<b>1.697</b>	<b>1.844</b>	<b>1.905</b>	<b>1.971</b>	<b>1.976</b>	<b>1.841</b>	<b>1.843</b>	<b>1.828</b>	<b>1.630</b>	<b>1.748</b>	<b>1.750</b>
Biomass .....	1.784	1.634	1.595	1.640	1.666	1.779	1.847	1.907	1.915	1.784	1.791	1.781	1.593	1.705	1.689
Wood .....	1.584	1.442	1.410	1.461	1.484	1.580	1.652	1.683	1.731	1.603	1.620	1.636	1.443	1.531	1.524
Waste <sup>a</sup> .....	0.200	0.192	0.185	0.179	0.181	0.199	0.195	0.224	0.184	0.180	0.171	0.145	0.150	0.174	0.164
Geothermal .....	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.005	0.005	0.005
Hydroelectric .....	0.028	0.031	0.030	0.031	0.030	0.062	0.055	0.061	0.058	0.055	0.049	0.042	0.032	0.039	0.057
<b>Transportation Sector</b> .....	<b>0.071</b>	<b>0.082</b>	<b>0.065</b>	<b>0.078</b>	<b>0.088</b>	<b>0.097</b>	<b>0.105</b>	<b>0.076</b>	<b>0.096</b>	<b>0.105</b>	<b>0.110</b>	<b>0.126</b>	<b>0.133</b>	<b>0.156</b>	<b>0.220</b>
Alcohol Fuels <sup>b</sup> .....	0.071	0.082	0.065	0.078	0.088	0.097	0.105	0.076	0.096	0.105	0.110	0.126	0.133	0.156	0.220
<b>Electric Power Sector</b> .....	<b>3.372</b>	<b>3.689</b>	<b>3.710</b>	<b>3.360</b>	<b>3.662</b>	<b>3.420</b>	<b>3.889</b>	<b>4.305</b>	<b>4.375</b>	<b>4.032</b>	<b>4.034</b>	<b>3.579</b>	<b>2.982</b>	<b>3.567</b>	<b>3.619</b>
Electric Utilities .....	2.983	3.151	3.114	2.712	2.953	2.714	3.173	3.553	3.620	3.279	3.123	2.607	2.030	2.532	2.551
Biomass .....	0.020	0.022	0.021	0.022	0.021	0.021	0.017	0.020	0.020	0.021	0.020	0.021	0.019	0.049	0.043
Wood .....	0.010	0.008	0.008	0.008	0.009	0.008	0.007	0.008	0.008	0.007	0.007	0.007	0.006	0.011	0.012
Waste <sup>a</sup> .....	0.010	0.013	0.014	0.013	0.011	0.013	0.010	0.012	0.013	0.013	0.013	0.014	0.013	0.038	0.031
Geothermal .....	0.197	0.181	0.170	0.169	0.158	0.145	0.099	0.110	0.115	0.109	0.036	0.003	0.003	0.029	0.006
Hydroelectric .....	2.765	2.948	2.923	2.521	2.774	2.549	3.056	3.423	3.485	3.149	3.067	2.582	2.007	2.452	2.498
Solar .....	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Wind .....	*	*	*	*	*	*	*	*	*	*	*	*	*	0.001	0.002

See footnotes at end of table.



**Table B1. Historical Renewable Energy Consumption by Sector and Energy Source, 1989-2003 (Continued)**  
(Quadrillion Btu)

Sector and Energy Source	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Independent Power Producers</b>	<b>0.389</b>	<b>0.538</b>	<b>0.596</b>	<b>0.648</b>	<b>0.709</b>	<b>0.705</b>	<b>0.716</b>	<b>0.752</b>	<b>0.754</b>	<b>0.753</b>	<b>0.910</b>	<b>0.972</b>	<b>0.951</b>	<b>1.034</b>	<b>1.069</b>
Biomass .....	0.211	0.295	0.333	0.381	0.394	0.413	0.405	0.418	0.426	0.424	0.433	0.432	0.432	<i>0.467</i>	0.464
Wood .....	0.089	0.120	0.118	0.132	0.141	0.144	0.119	0.130	0.129	0.129	0.131	0.127	0.121	<i>0.140</i>	0.149
Waste <sup>a</sup> .....	0.122	0.175	0.215	0.249	0.253	0.269	0.286	0.288	0.296	0.294	0.302	0.305	0.311	<i>0.327</i>	0.315
Geothermal .....	0.111	0.145	0.165	0.168	0.193	0.180	0.181	0.191	0.194	0.202	0.276	0.293	0.286	<i>0.275</i>	0.270
Hydroelectric.....	0.043	0.066	0.062	0.065	0.087	0.072	0.093	0.104	0.096	0.092	0.151	0.185	0.162	<i>0.184</i>	0.224
Solar .....	0.003	0.004	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	<i>0.006</i>	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	0.057	0.067	<i>0.103</i>	0.105

<sup>a</sup> Municipal solid waste, landfill gases, agriculture byproducts/crops, sludge waste, tires, and other biomass solids, liquids and gases.

<sup>b</sup> Ethanol primarily derived from corn.

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

\*=Less than 500 billion Btu.

P=Preliminary.

Note: Revised data are in italics. Totals may not equal sum of components due to independent rounding.

Sources: Analysis conducted by Energy Information Administration, Office of Coal, Nuclear, Electric, and Alternate Fuels and specific sources described as follows. Residential: Energy Information Administration, Form EIA-457A/G, "Residential Energy Consumption Survey;" Oregon Institute of Technology, Geo-Heat Center and Energy Information Administration, Form EIA-63-A, "Annual Solar Thermal Collector Manufacturers Survey" and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Commercial: 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," and Oregon Institute of Technology, Geo-Heat Center. Industrial: 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," and Form EIA-906, "Power Plant Report", Oregon Institute of Technology, Geo-Heat Center and Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook. Transportation: Bureau of Alcohol, Tobacco and Firearms, fuel ethanol production and import data, U.S. Bureau of Census, Schedule B, Commodity Number 2207.20.0000, "Ethyl Alcohol, Denatured of Any Strength," Energy Information Administration, Form-EIA-819M, "Monthly Oxygenate Telephone Report," and Form EIA-814, "Monthly Imports Report." Electric Power: 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," and Form EIA-906, "Power Plant Report."

**Table B2. Renewable Electricity Net Generation by Energy Source and Census Division, 2002**  
(Thousand Kilowatthours)

Census Division	Geothermal	Conventional Hydroelectric	MSW/Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/Wood Waste	Total
<b>Total .....</b>	<b>14,491,310</b>	<b>264,328,833</b>	<b>20,184,615</b>	<b>2,672,017</b>	<b>554,831</b>	<b>10,354,279</b>	<b>38,665,039</b>	<b>351,250,924</b>
East North Central .....		5,212,690	2,079,968	418,754		46,509	2,245,566	10,003,487
East South Central .....		20,835,327	37,956	32,407		4,068	5,780,443	26,690,201
Middle Atlantic .....		27,270,488	5,368,372	24,746		139,394	1,178,507	33,981,507
Mountain .....	1,344,934	30,545,941	60,801	140,698	459	586,336	571,774	33,250,941
New England .....		6,225,430	4,086,402	512,390		10,372	4,885,812	15,720,405
Pacific Contiguous .....	13,073,615	143,720,459	2,170,131	454,550	554,372	4,595,385	5,707,819	170,276,331
Pacific Noncontiguous .....	72,761	1,534,419	301,177	149,971		1,614	1,031	2,060,973
South Atlantic .....		11,376,577	5,157,590	506,359		9,023	12,274,446	29,323,995
West North Central .....		10,168,897	868,882	103,062		2,305,474	377,626	13,823,941
West South Central .....		7,438,606	53,336	329,081		2,656,104	5,642,015	16,119,143

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

Note: Blank cell indicates the division has no data to report for that energy source. Totals may not add due to independent rounding.

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table B3. Industrial Biomass Energy Consumption and Electricity Net Generation by Primary Purpose of Business and Energy Source, 2002**

Industry	Energy Source	Code	Biomass Energy Consumption (Trillion Btus)			Net Generation (Million Kilowatthours)
			Total	For Electricity	For Useful Thermal Output	
<b>Total</b> .....			<b>1,704.712</b>	<b>481.501</b>	<b>1,223.211</b>	<b>30,747</b>
<b>Agriculture, Forestry, and Mining</b> <b>Total</b>			<b>11.336</b>	<b>3.126</b>	<b>8.210</b>	<b>205</b>
	Agricultural Byproducts/Crops	AB	11.23821	3.071883	8.166	200
	Other Biomass Gases	OBG	0.098	0.054	0.043	5
<b>Manufacturing</b> .....	<b>Total</b>		<b>1,600.046</b>	<b>469.893</b>	<b>1,130.153</b>	<b>29,809</b>
Food and Kindred Industry Products .....	<b>Total</b>					
	Agricultural Byproducts/Crops	AB	49.261	7.219	42.042	221
	Other Biomass Gases	OBG	42.669	4.200	38.469	25
	Other Biomass Liquids	OBL	0.529	0.154	0.375	20
	Other Biomass Solids	OBS	0.143	0.142	0.001	11
	Tires	TI	3.228	2.055	1.174	108
	Wood/Wood Waste Solids	WDS	0.303	0.090	0.213	8
			2.389	0.579	1.810	48
Lumber .....	<b>Total</b>		247.840	17.066	230.774	1,389
	Sludge Waste	SLW	*	*	*	**
	Wood/Wood Waste Liquids	WDL	0.151	0.151	-	7
	Wood/Wood Waste Solids	WDS	247.690	16.916	230.774	1,382
Paper and Allied Products .....	<b>Total</b>		1,248.900	444.004	804.896	28,057
	Black Liquor	BL	832.658	301.345	531.314	18,653
	Landfill Gas	LG	0.159	0.056	0.103	3
	Municipal Solid Waste	MW	2.484	0.613	1.870	122
	Other Biomass Liquids	OBL	0.223	0.091	0.132	8
	Other Biomass Solids	OBS	0.432	0.274	0.158	39
	Sludge Waste	SLW	9.459	3.965	5.494	269
	Tires	TI	7.257	1.863	5.394	192
	Wood/Wood Waste Liquids	WDL	18.711	5.829	12.882	412
	Wood/Wood Waste Solids	WDS	377.518	129.968	247.550	8,358
Chemicals and Allied Products ...	<b>Total</b>		22.676	0.720	21.956	36
	Municipal Solid Waste	MW	1.273	0.101	1.172	9
	Other Biomass Liquids	OBL	0.190	0.031	0.158	3
	Other Biomass Solids	OBS	*	*	*	**
	Sludge Waste	SLW	0.173	0.040	0.133	5
	Wood/Wood Waste Solids	WDS	21.040	0.547	20.493	19
Other <sup>a</sup> .....	<b>Total</b>		31.369	0.884	30.485	106
<b>Nonspecified</b> <sup>b</sup> .....	<b>Total</b>		<b>93.330</b>	<b>8.482</b>	<b>84.848</b>	<b>733</b>
	Black Liquor	BL	4.897	4.897	-	460
	Landfill Gas	LG	78.000	-	78.000	-
	Municipal Solid Waste	MW	4.650	-	4.650	-
	Wood/Wood Waste Liquids	WDL	1.456	0.490	0.965	53
	Wood/Wood Waste Solids	WDS	4.328	3.095	1.233	220

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

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

- = Not Applicable.

\* = Less than 500 million Btu.

\*\* = Less than 500 thousand kilowatthours.

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

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report," Government Advisory Associates, Resource Recovery Yearbook and Methane Recovery Yearbook; and analysis conducted by the Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

**Table B4. Industrial Biomass Electricity Net Generation by Census Division and Energy Source, 2002**  
(Thousand Kilowatthours)

Census Region											
Energy Source	East North Central	East South Central	Middle Atlantic	Mountain	New England	Pacific Contiguous	Pacific Noncontiguous	South Atlantic	West North Central	West South Central	Total
<b>Total</b>	<b>1,267,249</b>	<b>5,603,410</b>	<b>687,034</b>	<b>498,490</b>	<b>2,403,330</b>	<b>2,182,635</b>	<b>138,347</b>	<b>11,813,991</b>	<b>389,338</b>	<b>5,763,542</b>	<b>30,747,367</b>
Agricultural Byproducts/Crops ...						42,000	18,769	146,559	410	17,119	224,857
Black Liquor.....	647,810	3,710,004	580,528	318,530	1,072,243	663,578		8,257,677	153,328	3,710,029	19,113,727
Landfill Gases.....	66,085					2,035		2,762			70,882
Municipal Solid Waste .....								131,327			131,327
Other Biomass Gases .....	7,450	5,276	11,029						8,557		32,312
Other Biomass Liquids .....			1,867		7,896	367	11,124	563			21,816
Other Biomass Solids.....		2			38,146		108,454	1,179	3		147,784
Sludge Waste .....	5,689	22,534	4,726		45,043	6,004		153,986	2,886	33,916	274,783
Tires.....	8,398	4,595	3,410		81,003			32,501		70,492	200,399
Wood/Wood Waste Liquids .....	31,541				52,668	80,458		101,985		204,779	471,431
Wood/Wood Waste Solids.....	500,277	1,860,999	85,474	179,960	1,106,331	1,388,194		2,985,452	224,154	1,727,207	10,058,048

Note: Blank cell indicates the division has no data to report for that energy source. Totals may not add due to independent rounding.

Source: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table B5. Net Generation and Fuel Consumption at Power Plants Consuming Coal and Biomass by State and Plant Name, 2002**

State	Company Name	Plant I.D.	Plant Name	County	Net Electricity Generation (kilowatthours)	Energy Consumed (MMBTU)	Energy Consumed from Biomass (MMBTU)	Percent of Energy Consumed from		
								Biomass	Coal	Other
AK	U S Air Force-Eielson AFB	50392	Eielson AFB Central Heat & Pow	Fairbanks North Star	83,787,000	2,917,084	36,400	1.25	98.09	0.66
AL	Bowater Nwprt Coosa Pines Op	54216	U S Alliance Coosa Pines	Talladega	161,268,436	11,203,995	4,929,720	44.00	56.00	
AL	Georgia-Pacific Corp	10699	Georgia Pacific Naheola Mill	Choctaw	398,788,000	20,398,450	17,035,166	83.51	8.65	7.84
AL	Gulf States Paper Corp	54763	Gulf States Paper	Marengo	150,612,553	8,169,032	7,531,381	92.19	3.59	4.21
AL	International Paper Co	52140	International Paper Prattville	Autauga	467,368,475	17,381,492	12,500,933	71.92	10.07	18.01
AL	Mobile Energy Service Holdings	50407	Mobile Energy Services LLC	Mobile	427,709,000	6,365,342	3,102,894	48.75	51.25	
AL	Weyerhaeuser Co	54752	Weyerhaeuser Pine Hill Operati	Wilcox	489,890,275	13,497,702	10,679,962	79.12	3.84	17.04
AR	Domtar Industries Inc	54104	Ashdown	Little River	889,211,858	47,225,200	37,991,074	80.45	11.74	7.81
AZ	Tucson Electric Power Co	126	Irvington	Pima	1,403,955,000	14,970,685	170,095	1.14	48.13	50.74
CA	Air Products Energy Enterprise	10640	Stockton Cogen	San Joaquin	397,849,000	5,598,342	354,560	6.33	52.98	40.69
CA	FPL Energy Operating Servs Inc	54238	Port of Stockton District Ener	San Joaquin	324,544,000	3,941,778	1,260	0.03	93.52	6.44
CT	Covanta Mid-Connecticut Inc	54945	Covanta Mid-Connecticut Energy	Hartford	492,677,002	8,265,700	8,195,969	99.16	0.84	
FL	International Paper Co-Escambi	50250	International Paper Pensacola	Escambia	153,947,000	8,839,013	6,691,324	75.70	11.78	12.52
FL	JEA	667	Northside Generating Station	Duval	3,713,143,000	39,453,184	88,774	0.23	18.53	81.25
FL	Jefferson Smurfit Corp	10202	Jefferson Smurfit Fernandina B	Nassau	376,768,000	18,812,607	12,350,391	65.65	33.32	1.03
FL	Lakeland City of	676	C D McIntosh Jr	Polk	4,065,193,000	39,257,683	127,750	0.33	52.18	47.50
FL	Orlando Utilities Comm	564	Stanton Energy Center	Orange	6,070,495,000	60,455,660	821,352	1.36	98.53	0.11
FL	Stone Container Corp-Panama Ci	50807	Stone Container Panama City Mi	Bay	255,683,000	23,447,984	19,382,521	82.66	7.05	10.28
GA	Durango-Georgia Paper Co	54428	Durango Georgia Paper	Camden	45,112,634	3,327,617	2,346,672	70.52	18.57	10.91
GA	Fort James Operating Co	10361	Savannah River Mill	Effingham	651,660,706	10,647,223	41,982	0.39	9.84	89.76
GA	Georgia Pacific Corp	54101	Georgia Pacific Cedar Springs	Early	4,761,360,000	140,555,393	104,454,684	74.32	19.13	6.55
GA	Inland Paperboard & Pack'g Inc	10426	Inland Paperboard Packaging Ro	Floyd	397,827,000	19,401,922	12,905,646	66.52	27.03	6.45
GA	International Paper Co	50398	International Paper Savanna Mi	Chatham	835,384,572	23,407,619	13,329,707	56.95	35.76	7.30
GA	International Paper Co-Augusta	54358	International Paper Augusta Mi	Richmond	527,548,000	23,937,860	16,383,989	68.44	20.03	11.52
GA	Riverwood Intl USA Inc	54464	Riverwood International Macon	Bibb	268,227,621	10,461,065	7,901,127	75.53	11.46	13.01
GA	Southeast Paper Mfg Co Inc	54004	SP Newsprint	Laurens	347,987,000	9,860,585	6,289,253	63.78	18.63	17.59
HI	Hawaiian Com & Sugar Co Ltd	10604	Puueene Mill	Maui	158,533,516	4,393,136	3,228,212	73.48	18.58	7.93
HI	AES Hawaii Inc	10673	AES Hawaii	Oahu	1,479,427,000	15,118,533	118,978	0.79	98.41	0.80
IA	Ag Processing Inc	10223	AG Processing	Wright	39,977,580	1,550,923	3,019	0.19	99.81	
IA	Interstate Power and Light	1058	Sixth Street	Linn	202,333,000	4,249,641	200,288	4.71	72.20	23.09
IA	Interstate Power and Light	1073	Prairie Creek	Linn	861,343,000	8,950,115	137,604	1.54	95.43	3.04
IA	University of Iowa	54775	University of Iowa Main Power	Johnson	91,324,000	3,319,748	61,022	1.84	86.84	11.33
IL	Archer Daniels Midland Co	10865	Archer Daniels Midland Decatur	Macon	1,102,488,739	40,282,747	302,801	0.75	99.25	
IL	Dynegy Midwest Generation Inc	889	Baldwin Energy Complex	Randolph	12,444,339,000	128,738,542	1,212,657	0.94	98.95	0.10
LA	International Paper Co	54090	International Paper Louisiana	Morehouse	385,124,000	15,173,423	12,953,449	85.37	1.56	13.07
LA	IPC-Mansfield Mill	54091	Mansfield Mill	Desota	768,742,000	24,867,534	19,631,087	78.94	2.74	18.32
MD	MeadWestvaco Corp	50282	Luke Mill	Allegheny	520,663,000	5,421,878	1,813,714	33.45	66.55	
ME	Mead Paper Corp	10244	Mead Custom Paper	Ross	586,713,000	16,453,389	8,945,453	54.37	44.44	1.20
ME	Rumford Cogeneration Co	10495	Rumford Cogeneration	Oxford	767,374,169	17,326,665	11,662,354	67.31	32.69	
ME	S D Warren Co - Somerset	50447	S D Warren Somerset	Cumberland	345,874,000	6,542,661	4,351,878	66.52	28.49	5.00

See footnotes at end of table.

**Table B5. Net Generation and Fuel Consumption at Power Plants Consuming Coal and Biomass by State and Plant Name, 2002 (Continued)**

State	Company Name	Plant I.D.	Plant Name	County	Net Electricity Generation (kilowatthours)	Energy Consumed (MMBTU)	Energy Consumed from Biomass (MMBTU)	Percent of Energy Consumed from		
								Biomass	Coal	Other
ME	S D Warren Co - Somerset	50447	S D Warren Somerset	Cumberland	345,874,000	6,542,661	4,351,878	66.52	28.49	5.00
MI	International Paper Co-Quinnes	50251	International Paper Quinnesec	Dickinson	207,851,000	10,043,963	9,679,889	96.38	0.70	2.92
MI	Louisiana Pacific Co	10149	Louisiana Pacific	Alpena	51,822,000	164,726	56,042	34.02	33.76	32.22
MI	Mead Paper Corp	10208	Mead Paper	Delta	615,144,789	9,359,106	2,787,943	29.79	45.45	24.76
MI	S D Warren Co	50438	S D Warren Muskegon	Muskegon	260,453,000	8,009,730	2,774,032	34.63	58.03	7.34
MI	TES Filer City Station LP	50835	TES Filer City Station	Manistee	268,901,882	3,506,511	169,480	4.83	95.17	
MI	Wyandotte Municipal Serv Comm	1866	Wyandotte	Wayne	279,315,000	3,855,299	288,112	7.47	86.79	5.73
MN	Hibbing Public Utilities Comm	1979	Hibbing	St Louis	19,565,000	519,034	80	0.02	99.98	*
MN	Rapids Energy Center	10686	Rapids Energy Center	Itasca	132,108,000	4,322,121	2,508,968	58.05	15.00	26.95
MO	Anheuser-Busch Inc	10430	Anheuser Busch St Louis	St Louis City	108,738,509	4,345,554	342,352	7.88	83.85	8.28
MO	Empire District Electric Co	2076	Asbury	Jasper	1,213,990,000	12,766,118	78,428	0.61	99.30	0.08
MO	Hercules Inc	10207	Hercules Missouri Chemical Wor	Pike	77,510,000	2,810,003	204	0.01	99.80	0.20
MO	Marshall City of	2144	Marshall	Saline	43,511,000	720,712	4,838	0.67	92.32	7.01
MO	Union Electric Co	2107	Sioux	St Charles	6,296,711,000	62,614,668	476,441	0.76	92.36	6.88
MO	University of Missouri-Columba	50969	University of Missouri Columbi	Boone	139,431,000	3,276,270	61,747	1.88	86.12	12.00
NC	Blue Ridge Paper Products Inc	50244	Canton North Carolina	Haywood	317,470,968	20,165,872	9,323,611	46.23	53.12	0.64
NC	Cogentrix Eastern Carolina LLC	10382	Lumberton	Robeson	90,662,000	1,447,671	180,341	12.46	87.54	
NC	Corn Products Intl Inc	54618	Corn Products Winston Salem	Fosyth	52,974,000	2,622,632	2,385,772	90.97	8.97	0.06
NC	International Paper Co-Riegel	54656	International Paper Riegelwood	Columbus	475,375,070	26,096,174	19,298,184	73.95	2.37	23.68
NC	Weyerhaeuser Co	50189	Weyerhaeuser Plymouth NC	Martin	816,440,000	29,134,970	21,922,996	75.25	21.57	3.19
NY	AES Greenidge	2527	AES Greenidge LLC	Yates	1,035,604,000	11,544,550	163,432	1.42	98.39	0.19
PA	International Paper Co	54089	International Paper Lock Haven	Clinton	14,827,032	710,741	128,991	18.15	81.85	
PA	Kimberly-Clark Corp	50410	Chester Operations	Deleware	367,076,655	6,251,041	59,590	0.95	54.36	44.69
PA	Northampton Generating Co LP	50888	Northampton Generating LP	Northampton	852,156,000	9,737,811	1,449,737	14.89	50.66	34.45
PA	Northeastern Power Co	50039	Kline Township Cogen Facility	Schuylkill	408,666,000	6,257,830	6,568	0.10	99.61	0.29
PA	P H Glatfelter Co	50397	P H Glatfelter	York	644,742,277	16,258,640	8,077,601	49.68	49.83	0.48
PA	Willamette Industries-Johnsnbg	54638	Johnsonburg Mill	Elk	286,374,957	8,606,382	4,901,116	56.95	38.61	4.45
SC	International Paper Co-Eastovr	52151	International Paper Eastover F	Calhoun	522,873,000	21,668,622	16,851,091	77.77	15.48	6.76
SC	International Paper Co-GT Mill	54087	International Paper Georgetown	Georgetown	548,459,000	22,402,453	17,656,110	78.81	13.11	8.08
SC	Stone Container Corp	50806	Stone Container Florence Mill	Florence	597,329,000	19,561,312	12,711,596	64.98	23.81	11.21
TN	Bowater Newsprint Calhoun Ops	50956	Bowater Newsprint Calhoun Oper	MnMinn	509,947,587	34,329,683	24,031,860	70.00	28.54	1.46
TN	Eastman Chemical Co-TN Ops	50481	Tennessee Eastman Operations	Sullivan	1,255,653,778	41,562,683	173,155	0.42	97.89	1.70
TN	Packaging Corp of America	50296	Packaging Corp of America	Hardin	377,728,244	20,707,960	16,892,133	81.57	8.82	9.61
TN	Willamette Industries Inc	10252	Weyerhaeuser Kingsport Mill	Sullivan	124,671,000	4,491,819	3,405,726	75.82	24.18	
VA	Georgia Pacific Corp	50479	Georgia Pacific Big Island	Bedford	59,487,861	5,376,987	2,590,206	48.17	20.93	30.90
VA	International Paper	52152	International Paper Franklin M	Isle of Wight	808,602,000	32,656,724	5,733,283	17.56	33.50	48.94
VA	Smurfit-Stone Container Corp	10017	St Laurent Paper West Point	King William	569,944,773	19,384,150	13,977,065	72.11	19.29	8.60
VA	Stone Container Corp	50813	Stone Container Hopewell Mill		317,910,821	8,624,858	6,471,872	75.04	22.93	2.03

See footnotes at end of table.

**Table B5. Net Generation and Fuel Consumption at Power Plants Consuming Coal and Biomass by State and Plant Name, 2002 (Continued)**

State	Company Name	Plant I.D.	Plant Name	County	Net Electricity Generation (kilowatthours)	Energy Consumed (MMBTU)	Energy Consumed from Biomass (MMBTU)	Percent of Energy Consumed from		
								Biomass	Coal	Other
VA	Stone Container Corp	50813	Stone Container Hopewell Mill		317,910,821	8,624,858	6,471,872	75.04	22.93	2.03
VA	Westvaco Corp	50900	Covington Facility	Covington	610,852,000	6,557,790	4,051,561	61.78	38.22	
WA	Weyerhaeuser Co	50187	Weyerhaeuser Longview WA	Cowlitz	297,484,000	17,929,521	13,414,241	74.82	7.64	17.54
WI	Fraser Paper Co	50620	Fraser Paper	Price	37,761,620	1,724,828	1,263,992	73.28	26.72	0.00
WI	Georgia-Pacific Corp	50395	Georgia Pacific Nekoosa Mill	Wood	221,556,000	6,679,515	3,682,704	55.13	38.93	5.93
WI	International Paper Co-Thilmny	54098	International Paper Kaukauna M	Outagamie	207,308,000	8,060,466	2,150,678	26.68	39.67	33.65
WI	Madison Gas & Electric Co	3992	Blount Street	Dane	472,206,000	6,360,563	100,812	1.58	83.51	14.90
WI	Mosinee Paper Corp	50614	Wausau Mosinee Paper Pulp	Marathon	123,712,000	4,016,632	2,413,430	60.09	33.86	6.05
WI	Northern States Power Co	3982	Bay Front	Ashland	260,223,000	4,062,065	2,243,840	55.24	40.31	4.45
WI	Packaging Corp of America	50476	Packaging of America Tomahawk	Lincoln	129,474,000	8,593,082	4,747,354	55.25	37.17	7.59
WI	State of Wisconsin	54407	Waupun Correctional Central He	Dodge	4,093,630	271,121	23,753	8.76	91.24	
WI	State of Wisconsin	54408	Univ of Wisc Madison Charter S	Dane	52,917,583	5,182,065	397,714	7.67	67.68	24.65
WI	Stora Enso North America	10234	Biron Mill	Wood	236,028,000	4,778,350	328,258	6.87	88.17	4.96
WI	Stora Enso North America	10476	Whiting Mill	Portage	25,800,000	1,503,959	221,531	14.73	77.20	8.07
WI	Stora Enso North America	10477	Wisconsin Rapids Pulp Mill	Wood	361,733,000	12,080,955	8,018,488	66.37	26.73	6.90
WI	Stora Enso North America	54857	Niagara Mill	Marinette	123,609,000	2,968,751	348,265	11.73	66.74	21.53
WI	Wisconsin Power & Light Co	4050	Edgewater	Sheboygan	4,786,914,000	48,050,722	306,048	0.64	99.20	0.16
WV	Monongahela Power Co	3942	Albright	Preston	1,374,335,000	15,541,824	705	*	99.73	0.27
WV	Monongahela Power Co	3946	Willow Island	Pleasants	1,151,588,000	12,601,777	185,299	1.47	98.26	0.27
WV	Union Carbide C&P-Charleston	50151	Union Carbide South Charleston	Kanawha	28,724,000	3,340,049	65,451	1.96	57.52	40.52
<b>Total</b>					<b>79,188,600,172</b>	<b>1,550,408,567</b>	<b>621,851,818</b>			

\* = Less than .005 percent.

MMBtu = One million British thermal units.

Note: State abbreviations are documented on the United States Postal Service website: [http://www.usps.com/ncsc/lookups/usps\\_abbreviations.htm](http://www.usps.com/ncsc/lookups/usps_abbreviations.htm). Blank cell indicates the plant had no consumption or other energy to report.

Source: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report," and Form EIA-906, "Power Plant Report."

**Table B6. Average Heat Content of Selected Biomass Fuels**

<b>Fuel Type</b>	<b>Heat Content</b>	<b>Units</b>
Agricultural Byproducts .....	8.248	Million Btu/Short Ton
Black Liquor .....	11.758	Million Btu/Short Ton
Digester Gas .....	0.619	Million Btu/Thousand Cubic Feet
Landfill Gas .....	0.490	Million Btu/Thousand Cubic Feet
Methane .....	0.841	Million Btu/Thousand Cubic Feet
Municipal Solid Waste.....	9.945	Million Btu/Short Ton
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
Tires .....	26.865	Million Btu/Short Ton
Utility Poles .....	12.500	Million Btu/Short Ton
Waste Alcohol .....	3.800	Million Btu/Barrel
Wood/Wood Waste .....	9.961	Million Btu/Short Ton

Source: Energy Information Administration, Form EIA-860B (1999),  
"Annual Electric Generator Report - Nonutility 1999."



**Table C1. Renewable Electric Power Sector Net Generation by Source by State, 2001**  
(Thousand Kilowatthours)

	Geothermal	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/ Wood Waste	Total
Alabama.....		8,356,382					217,434	8,573,816
Alaska.....		1,345,665				950		1,346,615
Arizona.....		7,623,565	33,601		489			7,657,655
Arkansas.....		2,548,251						2,548,251
California.....	12,181,295	25,541,782	1,761,134	257,735	542,271	3,499,738	2,103,213	45,887,167
Colorado.....		1,494,704		32,103		48,640		1,575,447
Connecticut.....		286,373	1,566,661	211,403				2,064,436
Delaware.....								
District of Columbia.....								
Florida.....		147,718	2,984,991	55,474			217,388	3,405,571
Georgia.....		2,567,158	19,407					2,586,565
Hawaii.....	206,592	50,282	282,481			2,125		541,480
Idaho.....		7,223,127					38,147	7,261,274
Illinois.....		141,017	572,158	69,108				782,283
Indiana.....		570,692	89,188					659,880
Iowa.....		845,153	96,733			487,864		1,429,750
Kansas.....		25,561				39,832		65,393
Kentucky.....		3,855,508						3,855,508
Louisiana.....		732,217		60,053				792,270
Maine.....		1,710,244	227,986	55,565			1,702,579	3,696,373
Maryland.....		1,183,518	590,841					1,774,359
Massachusetts.....		694,267	1,929,386	202			129,768	2,753,623
Michigan.....		1,535,575	733,956	43,887		280	1,102,876	3,416,574
Minnesota.....		645,392	761,617			897,017		2,304,026
Mississippi.....								
Missouri.....		1,104,135		51,592				1,155,727
Montana.....		6,613,472						6,613,472
Nebraska.....		1,124,122		8,347		2,630		1,135,099
Nevada.....	1,199,874	2,513,722						3,713,596
New Hampshire.....		897,883	225,933				754,196	1,878,012
New Jersey.....		18,001	1,290,277					1,308,278
New Mexico.....		237,320		18,652				255,972
New York.....		23,014,433	1,856,366			20,540	322,903	25,214,242
North Carolina.....		1,861,019	99,503				359,711	2,320,233
North Dakota.....		1,332,076						1,332,076
Ohio.....		510,785	27,888				38,971	577,644
Oklahoma.....		2,344,690						2,344,690
Oregon.....		28,644,556	87,408			88,587	327,243	29,147,794
Pennsylvania.....		1,650,004	1,821,467	2,047		11,174	198,000	3,682,692
Rhode Island.....		3,143	103,616					106,759
South Carolina.....		1,224,923						1,224,923
South Dakota.....		3,431,865				871		3,432,736
Tennessee.....		6,542,616	33,824				167	6,576,607
Texas.....		1,200,331	51,151		-5	1,187,510		2,438,987
Utah.....	152,742	508,407	9,642					670,791
Vermont.....		868,281				12,133	351,073	1,231,487
Virginia.....		1,012,892	671,611				5,018	1,689,521
Washington.....		54,674,085	174,845	30,272			400,841	55,280,043
West Virginia.....		513,309	25,139				1,198	539,646
Wisconsin.....		1,899,964	383,134	77,602		72,284	23,073	2,456,057
Wyoming.....		879,111				365,162		1,244,273
<b>Total.....</b>	<b>13,740,503</b>	<b>213,749,295</b>	<b>18,511,944</b>	<b>974,042</b>	<b>542,755</b>	<b>6,737,337</b>	<b>8,293,800</b>	<b>262,549,676</b>

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

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding. Electric power sector includes electric utilities and independent power producers.

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table C2. Renewable Commercial and Industrial Sector Net Generation by State, 2001**  
(Thousand Kilowatthours)

	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Wood/ Wood Waste	Total
Alabama.....		3,353	21,094	3,954,822	3,979,269
Alaska.....					
Arizona.....			5,347		5,347
Arkansas.....			7,375	1,504,696	1,512,071
California.....		99,454	151,822	1,220,565	1,471,841
Colorado.....			32,101		32,101
Connecticut.....					
Delaware.....					
District of Columbia.....					
Florida.....		4,727	169,851	1,610,851	1,785,429
Georgia.....	29,267	9,352	6,213	2,974,339	3,019,170
Hawaii.....	50,468	119,045	55,657		225,170
Idaho.....				495,186	495,186
Illinois.....	3,012	68,519	18,281		89,812
Indiana.....		37,064	4,264		41,328
Iowa.....			15,465		15,465
Kansas.....					
Kentucky.....				9,552	9,552
Louisiana.....			46,839	2,640,656	2,687,495
Maine.....	934,879	171,912	102,812	1,827,564	3,037,167
Maryland.....		17,908	29	11,939	29,876
Massachusetts.....	8,237		23,982		32,219
Michigan.....	26,343	8,824	20,335	597,385	652,887
Minnesota.....	186,230	18,394	7,041	574,709	786,374
Mississippi.....			146	1,432,117	1,432,264
Missouri.....			10,835		10,835
Montana.....				65,425	65,425
Nebraska.....			8,374		8,374
Nevada.....					
New Hampshire.....	92,698			104,573	197,271
New Jersey.....			12,745		12,745
New Mexico.....					
New York.....	69,510	230,778		179,783	480,071
North Carolina.....	734,689	29,888	8,889	1,282,619	2,056,084
North Dakota.....			7,665		7,665
Ohio.....				364,101	364,101
Oklahoma.....				230,696	230,696
Oregon.....				373,877	373,877
Pennsylvania.....		198,005	32,365	398,736	629,106
Rhode Island.....					
South Carolina.....	520	49,202	537	866,107	916,366
South Dakota.....					
Tennessee.....	403,914	15,395		779,259	1,198,568
Texas.....			58,815	897,605	956,420
Utah.....					
Vermont.....	15,930			19,335	35,265
Virginia.....	1,330	319,266	4,896	1,143,088	1,468,581
Washington.....	59,807		17,172	664,252	741,231
West Virginia.....	438,635				438,635
Wisconsin.....	156,281	18,013	8,519	682,281	865,095
Wyoming.....					
<b>Total.....</b>	<b>3,211,750</b>	<b>1,419,100</b>	<b>859,466</b>	<b>26,906,116</b>	<b>32,396,433</b>

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

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table C3. Total Renewable Net Generation by State, 2001**  
(Thousand Kilowatthours)

	Geothermal	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/ Wood Waste	Total
Alabama.....		8,356,382	3,353	21,094			4,172,256	12,553,086
Alaska.....		1,345,665				950		1,346,615
Arizona.....		7,623,565	33,601	5,347	489			7,663,002
Arkansas.....		2,548,251		7,375			1,504,696	4,060,322
California.....	12,181,295	25,541,782	1,860,588	409,557	542,271	3,499,738	3,323,777	47,359,008
Colorado.....		1,494,704		64,204		48,640		1,607,548
Connecticut.....		286,373	1,566,661	211,403				2,064,436
Delaware.....								
District of Columbia.....								
Florida.....		147,718	2,989,718	225,325			1,828,239	5,191,000
Georgia.....		2,596,425	28,759	6,213			2,974,339	5,605,735
Hawaii.....	206,592	100,750	401,526	55,657		2,125		766,650
Idaho.....		7,223,127					533,333	7,756,460
Illinois.....		144,029	640,677	87,389				872,095
Indiana.....		570,692	126,252	4,264				701,208
Iowa.....		845,153	96,733	15,465		487,864		1,445,215
Kansas.....		25,561				39,832		65,393
Kentucky.....		3,855,508					9,552	3,865,060
Louisiana.....		732,217		106,892			2,640,656	3,479,765
Maine.....		2,645,123	399,898	158,376			3,530,143	6,733,541
Maryland.....		1,183,518	608,749	29			11,939	1,804,235
Massachusetts.....		702,504	1,929,386	24,184			129,768	2,785,842
Michigan.....		1,561,918	742,780	64,222		280	1,700,261	4,069,461
Minnesota.....		831,622	780,011	7,041		897,017	574,709	3,090,400
Mississippi.....				146			1,432,117	1,432,264
Missouri.....		1,104,135		62,427				1,166,562
Montana.....		6,613,472					65,425	6,678,897
Nebraska.....		1,124,122		16,721		2,630		1,143,473
Nevada.....	1,199,874	2,513,722						3,713,596
New Hampshire.....		990,581	225,933				858,769	2,075,283
New Jersey.....		18,001	1,290,277	12,745				1,321,023
New Mexico.....		237,320		18,652				255,972
New York.....		23,083,943	2,087,144			20,540	502,686	25,694,313
North Carolina.....		2,595,708	129,391	8,889			1,642,330	4,376,317
North Dakota.....		1,332,076		7,665				1,339,741
Ohio.....		510,785	27,888				403,072	941,745
Oklahoma.....		2,344,690					230,696	2,575,386
Oregon.....		28,644,556	87,408			88,587	701,120	29,521,671
Pennsylvania.....		1,650,004	2,019,472	34,412		11,174	596,736	4,311,798
Rhode Island.....		3,143	103,616					106,759
South Carolina.....		1,225,443	49,202	537			866,107	2,141,289
South Dakota.....		3,431,865				871		3,432,736
Tennessee.....		6,946,530	49,219				779,426	7,775,175
Texas.....		1,200,331	51,151	58,815	-5	1,187,510	897,605	3,395,407
Utah.....	152,742	508,407	9,642					670,791
Vermont.....		884,211				12,133	370,408	1,266,752
Virginia.....		1,014,222	990,877	4,896			1,148,106	3,158,102
Washington.....		54,733,892	174,845	47,444			1,065,093	56,021,274
West Virginia.....		951,944	25,139				1,198	978,281
Wisconsin.....		2,056,245	401,147	86,121		72,284	705,354	3,321,152
Wyoming.....		879,111				365,162		1,244,273
<b>Total.....</b>	<b>13,740,503</b>	<b>216,961,046</b>	<b>19,931,044</b>	<b>1,833,508</b>	<b>542,755</b>	<b>6,737,337</b>	<b>35,199,916</b>	<b>294,946,109</b>

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

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table C4. Renewable Electric Power Sector Net Generation by State, 2002**  
(Thousand Kilowatthours)

	Geothermal	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/ Wood Waste	Total
Alabama.....		8,824,787					209,290	9,034,077
Alaska.....		1,439,351					1,031	1,440,382
Arizona.....		7,427,180	49,604	87,714	459			7,564,957
Arkansas.....		3,435,829						3,435,829
California.....	13,073,615	31,140,628	1,770,944	205,044	554,372	3,802,645	2,841,739	53,388,987
Colorado.....		1,209,007		29,834		139,006		1,377,847
Connecticut.....		335,088	1,437,402	188,266				1,960,756
Delaware.....								
District of Columbia.....								
Florida.....		184,114	3,305,749	95,047			286,187	3,871,097
Georgia.....		2,686,692	18,754					2,705,446
Hawaii.....	72,761	34,840	301,177	11,624		1,614		422,016
Idaho.....		8,769,321					73,284	8,842,605
Illinois.....		128,589	525,731	240,334				894,654
Indiana.....		411,270	88,589					499,859
Iowa.....		946,383	77,904	9,607		918,835		1,952,729
Kansas.....		12,746				466,679		479,425
Kentucky.....		4,024,749						4,024,749
Louisiana.....		891,441		59,087				950,528
Maine.....		1,831,118	235,692	125,533			1,534,241	3,726,584
Maryland.....		1,660,989	593,416					2,254,405
Massachusetts.....		853,159	1,917,587	851			106,687	2,878,284
Michigan.....		1,640,403	717,965	81,298		329	992,199	3,432,194
Minnesota.....		763,851	772,666			905,839	1	2,442,357
Mississippi.....		12,129						12,129
Missouri.....		1,356,928		55,055			143	1,412,126
Montana.....		9,566,909						9,566,909
Nebraska.....		1,097,486		6,455		8,078		1,112,019
Nevada.....	1,127,283	2,267,586						3,394,869
New Hampshire.....		1,087,979	225,290				659,358	1,972,627
New Jersey.....		12,030	1,314,587					1,326,617
New Mexico.....		264,591		19,408				283,999
New York.....		24,980,784	1,899,258			81,626	228,209	27,189,877
North Carolina.....		2,421,157	105,609	14,365			354,151	2,895,282
North Dakota.....		1,592,616						1,592,616
Ohio.....		488,329	23,041				42,679	554,049
Oklahoma.....		1,987,844						1,987,844
Oregon.....		34,413,167	86,675			376,159	230,997	35,106,998
Pennsylvania.....		2,210,563	1,709,033	781		57,768	284,296	4,262,441
Rhode Island.....		3,685	97,752					101,437
South Carolina.....		1,389,429	15,522					1,404,951
South Dakota.....		4,353,653				6,043		4,359,696
Tennessee.....		7,317,487	33,190			4,068	150	7,354,895
Texas.....		1,123,492	52,513	132,223		2,656,104		3,964,332
Utah.....	217,651	457,732	11,197					686,580
Vermont.....		1,098,925				10,372	352,053	1,461,350
Virginia.....		866,686	720,646				280,210	1,867,542
Washington.....		77,988,869	225,117	14,538		416,581	502,854	79,147,959
West Virginia.....		598,963		21,737		9,023	51	629,774
Wisconsin.....		2,297,218	382,183	66,711		46,180	29,518	2,821,810
Wyoming.....		583,615				447,330		1,030,945
<b>Total.....</b>	<b>14,491,310</b>	<b>260,491,387</b>	<b>18,714,793</b>	<b>1,465,512</b>	<b>554,831</b>	<b>10,354,279</b>	<b>9,009,328</b>	<b>315,081,440</b>

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

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding. Electric power sector includes electric utilities and independent power producers.

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table C5. Renewable Commercial and Industrial Sector Net Generation by State, 2002**  
(Thousand Kilowatthours)

	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Wood/ Wood Waste	Total
Alabama.....			22,857	3,518,203	3,541,060
Alaska.....			11,124		11,124
Arizona.....			3,742		3,742
Arkansas.....			4,658	1,580,608	1,585,266
California.....		87,395	228,964	1,115,850	1,432,209
Colorado.....					
Connecticut.....					
Delaware.....					
District of Columbia.....					
Florida.....		2,762	186,952	1,266,704	1,456,418
Georgia.....	29,030	9,319	168,036	6,218,978	6,425,363
Hawaii.....	60,228		127,223		187,451
Idaho.....				435,019	435,019
Illinois.....	233	66,085	13,211		79,529
Indiana.....		35,549	7,450		42,999
Iowa.....			10,965	91	11,056
Kansas.....					
Kentucky.....				365,465	365,465
Louisiana.....			54,804	2,748,900	2,803,704
Maine.....	936,729	172,680	172,088	2,189,518	3,471,015
Maryland.....		316	29	182,904	183,249
Massachusetts.....	9,788		25,652		35,440
Michigan.....	28,849	227,247	13	482,353	738,462
Minnesota.....	45,233	18,312	2,886	377,391	443,822
Mississippi.....			2	936,593	936,595
Missouri.....			11,147		11,147
Montana.....				63,470	63,470
Nebraska.....			6,538		6,538
Nevada.....					
New Hampshire.....	52,961			40,409	93,370
New Jersey.....			15,829		15,829
New Mexico.....					
New York.....	67,111	230,009		184,009	481,129
North Carolina.....	1,070,891		15,501	1,328,653	2,415,045
North Dakota.....			410		410
Ohio.....			2,203	83,388	85,591
Oklahoma.....				239,045	239,045
Oregon.....				393,089	393,089
Pennsylvania.....		215,485	8,136	481,993	705,614
Rhode Island.....					
South Carolina.....	322			1,228,895	1,229,217
South Dakota.....					
Tennessee.....	656,175	4,766	9,548	750,742	1,421,231
Texas.....		823	78,310	1,073,462	1,152,595
Utah.....					
Vermont.....	15,997			3,546	19,543
Virginia.....	1,530	385,498	4,129	1,127,712	1,518,869
Washington.....	177,795		6,004	623,291	807,090
West Virginia.....	466,773		563		467,336
Wisconsin.....	217,799	13,578	7,534	615,429	854,340
Wyoming.....					
<b>Total.....</b>	<b>3,837,444</b>	<b>1,469,824</b>	<b>1,206,508</b>	<b>29,655,710</b>	<b>36,169,486</b>

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

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table C6. Total Renewable Net Generation by State, 2002**  
(Thousand Kilowatthours)

	Geothermal	Hydroelectric Conventional	MSW /Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/ Wood Waste	Total
Alabama.....		8,824,787		22,857			3,727,493	12,575,137
Alaska.....		1,439,351		11,124			1,031	1,451,506
Arizona.....		7,427,180	49,604	91,456	459			7,568,699
Arkansas.....		3,435,829		4,658			1,580,608	5,021,095
California.....	13,073,615	31,140,628	1,858,339	434,008	554,372	3,802,645	3,957,589	54,821,196
Colorado.....		1,209,007		29,834		139,006		1,377,847
Connecticut.....		335,088	1,437,402	188,266				1,960,756
Delaware.....								
District of Columbia.....								
Florida.....		184,114	3,308,511	281,999			1,552,891	5,327,515
Georgia.....		2,715,722	28,073	168,036			6,218,978	9,130,809
Hawaii.....	72,761	95,068	301,177	138,847		1,614		609,467
Idaho.....		8,769,321					508,303	9,277,624
Illinois.....		128,822	591,816	253,545				974,183
Indiana.....		411,270	124,138	7,450				542,858
Iowa.....		946,383	77,904	20,572		918,835	91	1,963,785
Kansas.....		12,746				466,679		479,425
Kentucky.....		4,024,749					365,465	4,390,214
Louisiana.....		891,441		113,891			2,748,900	3,754,232
Maine.....		2,767,847	408,372	297,621			3,723,759	7,197,599
Maryland.....		1,660,989	593,732	29			182,904	2,437,654
Massachusetts.....		862,947	1,917,587	26,503			106,687	2,913,724
Michigan.....		1,669,252	945,212	81,311		329	1,474,552	4,170,656
Minnesota.....		809,084	790,978	2,886		905,839	377,392	2,886,179
Mississippi.....		12,129		2			936,593	948,724
Missouri.....		1,356,928		66,202			143	1,423,273
Montana.....		9,566,909					63,470	9,630,379
Nebraska.....		1,097,486		12,993		8,078		1,118,557
Nevada.....	1,127,283	2,267,586						3,394,869
New Hampshire.....		1,140,940	225,290				699,767	2,065,997
New Jersey.....		12,030	1,314,587	15,829				1,342,446
New Mexico.....		264,591		19,408				283,999
New York.....		25,047,895	2,129,267			81,626	412,218	27,671,006
North Carolina.....		3,492,048	105,609	29,866			1,682,804	5,310,327
North Dakota.....		1,592,616		410				1,593,026
Ohio.....		488,329	23,041	2,203			126,067	639,640
Oklahoma.....		1,987,844					239,045	2,226,889
Oregon.....		34,413,167	86,675			376,159	624,086	35,500,087
Pennsylvania.....		2,210,563	1,924,518	8,917		57,768	766,289	4,968,055
Rhode Island.....		3,685	97,752					101,437
South Carolina.....		1,389,751	15,522				1,228,895	2,634,168
South Dakota.....		4,353,653				6,043		4,359,696
Tennessee.....		7,973,662	37,956	9,548		4,068	750,892	8,776,126
Texas.....		1,123,492	53,336	210,533		2,656,104	1,073,462	5,116,927
Utah.....	217,651	457,732	11,197					686,580
Vermont.....		1,114,922				10,372	355,599	1,480,893
Virginia.....		868,216	1,106,144	4,129			1,407,922	3,386,411
Washington.....		78,166,664	225,117	20,542		416,581	1,126,145	79,955,049
West Virginia.....		1,065,736		22,300		9,023	51	1,097,110
Wisconsin.....		2,515,017	395,761	74,245		46,180	644,947	3,676,150
Wyoming.....		583,615				447,330		1,030,945
<b>Total.....</b>	<b>14,491,310</b>	<b>264,328,831</b>	<b>20,184,617</b>	<b>2,672,020</b>	<b>554,831</b>	<b>10,354,279</b>	<b>38,665,038</b>	<b>351,250,926</b>

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table C7. Renewable Electric Power Sector Net Summer Capacity by State, 2001**  
(Megawatts)

	Geothermal	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/ Wood Waste	Total
Alabama.....		3,014						3,014
Alaska.....		399						399
Arizona.....		2,705	4		1			2,710
Arkansas.....		1,392						1,392
California.....	2,003	10,326	241	58	390	1,558	424	14,998
Colorado.....		642		10		46		698
Connecticut.....		138	234	26				398
Delaware.....								
District of Columbia...								
Florida.....		47	437	140			67	691
Georgia.....		2,334	2					2,336
Hawaii.....	33	19	62	62		11		187
Idaho.....		2,637					12	2,648
Illinois.....		34	110	40				184
Indiana.....		58	11					70
Iowa.....		131	109			318		559
Kansas.....		2				112		114
Kentucky.....		821						821
Louisiana.....		192		12				204
Maine.....		458	30				279	766
Maryland.....		530	118					648
Massachusetts.....		809	273				26	1,108
Michigan.....		253	100			1	160	513
Minnesota.....		145	114			303	92	654
Mississippi.....								
Missouri.....		543						543
Montana.....		2,680						2,680
Nebraska.....		264		2		4		269
Nevada.....	148	1,052						1,199
New Hampshire.....		398	31				92	521
New Jersey.....		12	181					194
New Mexico.....		82		2				84
New York.....		4,098	276			18	37	4,429
North Carolina.....		1,501	14	2			45	1,561
North Dakota.....		497						497
Ohio.....		163	94				7	264
Oklahoma.....		793						793
Oregon.....		9,118	14	3		158	36	9,329
Pennsylvania.....		687	310			34	28	1,059
Rhode Island.....		4	15					19
South Carolina.....		1,294						1,294
South Dakota.....		1,576				3		1,579
Tennessee.....		2,239	5			2	7	2,253
Texas.....		697	9		1	925		1,632
Utah.....	33	254	1					288
Vermont.....		272				0	72	345
Virginia.....		754	93				84	930
Washington.....		21,422	38	4		180	136	21,781
West Virginia.....		190						190
Wisconsin.....		451	59	1		45	29	586
Wyoming.....		297				146		443
<b>Total</b> .....	<b>2,216</b>	<b>78,424</b>	<b>2,985</b>	<b>362</b>	<b>392</b>	<b>3,864</b>	<b>1,631</b>	<b>89,874</b>

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

\* =Less than 500 kilowatts.

Note: Revised data are in italics. Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding. Electric power sector includes electric utilities and independent power producers.

Sources: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

**Table C8. Renewable Commercial and Industrial Sector Net Summer Capacity by State, 2001**  
(Megawatts)

	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Wood/ Wood Waste	Total
Alabama.....				432	432
Alaska.....					
Arizona.....					
Arkansas.....			2	269	270
California.....	5	12	36	207	260
Colorado.....			1		1
Connecticut.....					
Delaware.....					
District of Columbia.....					
Florida.....			73	245	318
Georgia.....	7	5		403	415
Hawaii.....	7		20		27
Idaho.....				70	70
Illinois.....	1	12	4		16
Indiana.....		10			10
Iowa.....			3		3
Kansas.....					
Kentucky.....				51	51
Louisiana.....			2	239	241
Maine.....	224	23		388	635
Maryland.....		3		62	65
Massachusetts.....	5		16		21
Michigan.....	4	67		128	198
Minnesota.....	29	3		77	108
Mississippi.....				255	255
Missouri.....					
Montana.....				11	11
Nebraska.....			3		3
Nevada.....					
New Hampshire.....	31			9	40
New Jersey.....			1		1
New Mexico.....					
New York.....	15	33			49
North Carolina.....	366			194	560
North Dakota.....			10		10
Ohio.....				7	7
Oklahoma.....		16		60	75
Oregon.....				123	123
Pennsylvania.....		28		56	84
Rhode Island.....					
South Carolina.....	1	10		222	233
South Dakota.....					
Tennessee.....	165	7		56	227
Texas.....			1	100	101
Utah.....					
Vermont.....	5			4	8
Virginia.....	4	76		318	397
Washington.....	31			158	189
West Virginia.....	101				101
Wisconsin.....	62	4		109	174
Wyoming.....					
<b>Total.....</b>	<b>1,060</b>	<b>307</b>	<b>173</b>	<b>4,250</b>	<b>5,790</b>

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

Note: Revised data are in italics. Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."



**Table C9. Total Renewable Net Summer Capacity by State, 2001**  
(Megawatts)

	Geothermal	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/ Wood Waste	Total
Alabama.....		3,014					432	3,446
Alaska.....		399						399
Arizona.....		2,705	4		1			2,710
Arkansas.....		1,392		2			269	1,662
California.....	2,003	10,331	253	94	390	1,558	631	15,259
Colorado.....		642		11		46		699
Connecticut.....		138	234	26				398
Delaware.....								
District of Columbia.....								
Florida.....		47	437	213			312	1,009
Georgia.....		2,341	7				403	2,751
Hawaii.....	33	25	62	82		11		214
Idaho.....		2,637					81	2,718
Illinois.....		35	122	44				200
Indiana.....		58	21					79
Iowa.....		131	109	3		318		562
Kansas.....		2				112		114
Kentucky.....		821					51	872
Louisiana.....		192		15			239	445
Maine.....		681	53				667	1,401
Maryland.....		530	121				62	713
Massachusetts.....		814	273	16			26	1,129
Michigan.....		256	166			1	288	711
Minnesota.....		173	117			303	169	762
Mississippi.....							255	255
Missouri.....		543						543
Montana.....		2,680					11	2,691
Nebraska.....		264		5		4		272
Nevada.....	148	1,052						1,199
New Hampshire.....		429	31				101	561
New Jersey.....		12	181	1				195
New Mexico.....		82		2				84
New York.....		4,113	309			18	37	4,477
North Carolina.....		1,867	14	2			239	2,122
North Dakota.....		497		10				507
Ohio.....		163	94				14	271
Oklahoma.....		793	16				60	868
Oregon.....		9,118	14	3		158	160	9,453
Pennsylvania.....		687	338			34	83	1,143
Rhode Island.....		4	15					19
South Carolina.....		1,295	10				222	1,526
South Dakota.....		1,576				3		1,579
Tennessee.....		2,404	12			2	62	2,480
Texas.....		697	9	1	1	925	100	1,732
Utah.....	33	254	1					288
Vermont.....		277				*	76	353
Virginia.....		758	168				402	1,328
Washington.....		21,453	38	4		180	294	21,970
West Virginia.....		292						292
Wisconsin.....		513	63	1		45	138	760
Wyoming.....		297				146		443
<b>Total.....</b>	<b>2,216</b>	<b>79,484</b>	<b>3,292</b>	<b>535</b>	<b>392</b>	<b>3,864</b>	<b>5,882</b>	<b>95,664</b>

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

\* =Less than 500 kilowatts.

Note: Revised data are in italics. Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

**Table C10. Renewable Electric Power Sector Net Summer Capacity Source by State, 2002**  
(Megawatts)

	Geothermal	Hydroelectric Conventional	MSW/ Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/ Wood Waste	Total
Alabama.....		3,002						3,002
Alaska.....		396						396
Arizona.....		2,703	4		1			2,707
Arkansas.....		1,388		4				1,392
California.....	2,018	10,358	245	55	390	1,701	422	15,190
Colorado.....		643		10		37		690
Connecticut.....		146	228	26				400
Delaware.....								
District of Columbia.....								
Florida.....		50	439	140			67	696
Georgia.....		2,318	2					2,321
Hawaii.....	33	17	60	46		11		167
Idaho.....		2,665					12	2,677
Illinois.....		20	122	19				161
Indiana.....		59	11					70
Iowa.....		131	109			416		657
Kansas.....		2				112		114
Kentucky.....		821						821
Louisiana.....		192		12				204
Maine.....		494	30				270	793
Maryland.....		530	118					648
Massachusetts.....		246	258				26	530
Michigan.....		253	109			1	160	523
Minnesota.....		147	140			312	81	679
Mississippi.....								
Missouri.....		543						543
Montana.....		2,717						2,717
Nebraska.....		167	3	2		3		174
Nevada.....	168	1,052						1,220
New Hampshire.....		482	31				90	604
New Jersey.....		13	180					194
New Mexico.....		82		6				88
New York.....		4,094	271			48	37	4,451
North Carolina.....		1,548	19	2			45	1,614
North Dakota.....		497						497
Ohio.....		164	94				7	265
Oklahoma.....		796						796
Oregon.....		9,089	14	3		182	36	9,324
Pennsylvania.....		751	317			34	28	1,129
Rhode Island.....		4	15					19
South Carolina.....		1,383						1,383
South Dakota.....		1,678				3		1,681
Tennessee.....		2,348	5			2	7	2,361
Texas.....		697	9		6	1,085		1,797
Utah.....	33	254	1					288
Vermont.....		300				1	72	373
Virginia.....		754	93				80	926
Washington.....		21,442	38	4		225	86	21,795
West Virginia.....		134				66		200
Wisconsin.....		432	64	1		36	29	563
Wyoming.....		300				141		441
<b>Total.....</b>	<b>2,252</b>	<b>78,302</b>	<b>3,029</b>	<b>331</b>	<b>397</b>	<b>4,417</b>	<b>1,554</b>	<b>90,280</b>

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

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding. Electric power sector includes electric utilities and independent power producers.

Sources: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

**Table C11. Renewable Commercial and Industrial Sector Net Summer Capacity by State, 2002**  
(Megawatts)

	Hydroelectric Conventional	MSW /Landfill Gas	Other Biomass <sup>a</sup>	Wood/ Wood Waste	Total
Alabama.....				543	543
Alaska.....					
Arizona.....					
Arkansas.....			2	295	297
California.....	6	13	50	207	276
Colorado.....					
Connecticut.....					
Delaware.....					
District of Columbia.....					
Florida.....			73	249	322
Georgia.....	7	5		395	407
Hawaii.....	7				7
Idaho.....				70	70
Illinois.....	1	12	1		14
Indiana.....		10			10
Iowa.....			3		3
Kansas.....					
Kentucky.....				51	51
Louisiana.....			5	153	158
Maine.....	224	23		375	622
Maryland.....		3		62	65
Massachusetts.....	5		21		26
Michigan.....	4	67		51	121
Minnesota.....	29	3		43	75
Mississippi.....				279	279
Missouri.....					
Montana.....				11	11
Nebraska.....			3		3
Nevada.....					
New Hampshire.....	31			9	40
New Jersey.....			1		1
New Mexico.....					
New York.....	15	33			48
North Carolina.....	366			202	568
North Dakota.....			10		10
Ohio.....				7	7
Oklahoma.....		16		60	76
Oregon.....				122	122
Pennsylvania.....		28		71	99
Rhode Island.....					
South Carolina.....	1	10		222	233
South Dakota.....					
Tennessee.....	165			101	266
Texas.....			9	100	108
Utah.....					
Vermont.....	5			4	8
Virginia.....	4	76		336	415
Washington.....	22			166	188
West Virginia.....	101				101
Wisconsin.....	62	4	7	109	181
Wyoming.....					
<b>Total.....</b>	<b>1,052</b>	<b>301</b>	<b>184</b>	<b>4,290</b>	<b>5,828</b>

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

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

**Table C12. Total Renewable Net Summer Capacity by State, 2002**  
(Megawatts)

	Geothermal	Hydroelectric Conventional	MSW /Landfill Gas	Other Biomass <sup>a</sup>	Solar	Wind	Wood/ Wood Waste	Total
Alabama.....		3,002					543	3,544
Alaska.....		396						396
Arizona.....		2,703	4		1			2,707
Arkansas.....		1,388		6			295	1,689
California.....	2,018	10,364	258	105	390	1,701	629	15,466
Colorado.....		643		10		37		690
Connecticut.....		146	228	26				400
Delaware.....								
District of Columbia.....								
Florida.....		50	439	213			316	1,017
Georgia.....		2,325	7				395	2,727
Hawaii.....	33	23	60	46		11		174
Idaho.....		2,665					81	2,747
Illinois.....		21	134	20				175
Indiana.....		59	21					79
Iowa.....		131	109	3		416		660
Kansas.....		2				112		114
Kentucky.....		821					51	872
Louisiana.....		192		17			153	362
Maine.....		718	53				645	1,416
Maryland.....		530	121				62	713
Massachusetts.....		251	258	21			26	556
Michigan.....		257	176			1	211	644
Minnesota.....		176	142			312	124	754
Mississippi.....							279	279
Missouri.....		543						543
Montana.....		2,717					11	2,728
Nebraska.....		167	3	5		3		177
Nevada.....	168	1,052						1,220
New Hampshire.....		514	31				99	644
New Jersey.....		13	180	1				195
New Mexico.....		82		6				88
New York.....		4,109	305			48	37	4,499
North Carolina.....		1,914	19	2			247	2,182
North Dakota.....		497		10				507
Ohio.....		164	94				14	271
Oklahoma.....		796	16				60	872
Oregon.....		9,089	14	3		182	158	9,446
Pennsylvania.....		751	345			34	98	1,228
Rhode Island.....		4	15					19
South Carolina.....		1,384	10				222	1,615
South Dakota.....		1,678				3		1,681
Tennessee.....		2,513	5			2	107	2,627
Texas.....		697	9	9	6	1,085	100	1,905
Utah.....	33	254	1					288
Vermont.....		305				1	76	381
Virginia.....		757	168				415	1,341
Washington.....		21,464	38	4		225	252	21,983
West Virginia.....		235				66		301
Wisconsin.....		494	68	8		36	138	744
Wyoming.....		300				141		441
<b>Total.....</b>	<b>2,252</b>	<b>79,354</b>	<b>3,330</b>	<b>515</b>	<b>397</b>	<b>4,417</b>	<b>5,844</b>	<b>96,109</b>

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

Note: Blank cell indicates the state has no data to report for that energy source. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

**Table C13. Renewable Market Share of Net Generation by State, 2001 and 2002**  
(Thousand Kilowatthours)

	2001			2002		
	Total State Generation	Percent Renewable	Percent Nonhydro Renewable	Total State Generation	Percent Renewable	Percent Nonhydro Renewable
Alabama.....	125,345,122	10.0	3.3	132,920,670	9.5	2.8
Alaska.....	6,743,770	20.0	*	6,767,326	21.4	0.2
Arizona.....	89,911,270	8.5	*	94,131,666	8.0	0.2
Arkansas.....	47,192,036	8.6	3.2	47,611,645	10.5	3.3
California.....	198,596,086	23.8	11.0	184,210,031	29.8	12.9
Colorado.....	46,876,013	3.4	0.2	45,600,388	3.0	0.4
Connecticut.....	30,490,640	6.8	5.8	31,311,220	6.3	5.2
Delaware.....	6,807,686	-	-	6,002,489	-	-
District of Columbia.....	123,239	-	-	261,980	-	-
Florida.....	190,945,341	2.7	2.6	203,352,774	2.6	2.5
Georgia.....	118,316,772	4.7	2.5	126,512,215	7.2	5.1
Hawaii.....	10,633,095	7.2	6.3	11,663,070	5.2	4.4
Idaho.....	9,346,940	83.0	5.7	9,786,933	94.8	5.2
Illinois.....	179,249,272	0.5	0.4	188,054,449	0.5	0.4
Indiana.....	122,569,679	0.6	0.1	125,608,139	0.4	0.1
Iowa.....	40,658,513	3.6	1.5	42,528,385	4.6	2.4
Kansas.....	44,748,522	0.1	0.1	47,188,446	1.0	1.0
Kentucky.....	95,417,624	4.1	*	92,106,668	4.8	0.4
Louisiana.....	87,894,382	4.0	3.1	94,970,963	4.0	3.0
Maine.....	19,564,815	34.4	20.9	22,535,034	31.9	19.7
Maryland.....	49,062,340	3.7	1.3	48,279,088	5.0	1.6
Massachusetts.....	38,478,433	7.2	5.4	42,015,688	6.9	4.9
Michigan.....	111,845,612	3.6	2.2	117,889,087	3.5	2.1
Minnesota.....	48,523,228	6.4	4.7	52,777,967	5.5	3.9
Mississippi.....	53,446,452	2.7	2.7	42,900,941	2.2	2.2
Missouri.....	79,544,875	1.5	0.1	81,162,197	1.8	0.1
Montana.....	24,232,483	27.6	0.3	25,473,705	37.8	0.2
Nebraska.....	30,485,214	3.8	0.1	31,618,494	3.5	0.1
Nevada.....	33,875,970	11.0	3.5	32,088,935	10.6	3.5
New Hampshire.....	15,074,629	13.8	7.2	15,953,078	13.0	5.8
New Jersey.....	59,421,254	2.2	2.2	61,569,386	2.2	2.2
New Mexico.....	33,611,642	0.8	0.1	30,661,707	0.9	0.1
New York.....	143,914,537	17.9	1.8	139,591,689	19.8	1.9
North Carolina.....	117,495,853	3.7	1.5	124,468,029	4.3	1.5
North Dakota.....	30,332,072	4.4	*	31,306,312	5.1	*
Ohio.....	142,261,810	0.7	0.3	147,068,849	0.4	0.1
Oklahoma.....	55,249,448	4.7	0.4	59,183,419	3.8	0.4
Oregon.....	45,051,910	65.5	1.9	47,099,368	75.4	2.3
Pennsylvania.....	196,576,594	2.2	1.4	204,322,878	2.4	1.3
Rhode Island.....	7,501,894	1.4	1.4	7,056,765	1.4	1.4
South Carolina.....	89,158,988	2.4	1.0	96,563,498	2.7	1.3
South Dakota.....	7,400,743	46.4	*	7,721,958	56.5	0.1
Tennessee.....	96,221,985	8.1	0.9	96,114,262	9.1	0.8
Texas.....	372,580,008	0.9	0.6	385,628,541	1.3	1.0
Utah.....	35,853,751	1.9	0.5	36,608,003	1.9	0.6
Vermont.....	5,480,612	23.1	7.0	5,456,190	27.1	6.7
Virginia.....	74,104,744	4.3	2.9	75,005,652	4.5	3.4
Washington.....	83,048,665	67.5	1.6	102,765,047	77.8	1.7
West Virginia.....	81,836,725	1.2	*	94,761,753	1.2	*
Wisconsin.....	58,763,433	5.7	2.2	58,431,438	6.3	2.0
Wyoming.....	44,776,941	2.8	0.8	43,783,839	2.4	1.0
<b>Total</b> .....	<b>3,736,643,659</b>	<b>7.9</b>	<b>2.1</b>	<b>3,858,452,254</b>	<b>9.1</b>	<b>2.3</b>

\* = Less than .05 percent.

- = Not applicable.

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

Source: Energy Information Administration, Form EIA-906, "Power Plant Report."

**Table C14. Renewable Portfolio Standards and State Mandates by State, 2004**

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

<sup>a</sup> In Colorado and Florida the RPS is not statewide.

Note: In a few states, such as Hawaii and Illinois, the renewable portfolio standard (RPS) is voluntary. Blank cell indicates there is no RPS or state mandate for that state.

Source: North Carolina Solar Center, Database of State Incentives for Renewable Energy (DSIRE) website: <http://www.dsireusa.org> (June 30, 2004).

**Table D1. Geothermal Direct Use of Energy and Heat Pumps, 1990-2003**  
(Quadrillion Btu)

	Direct Use	Heat Pumps	Total
1990.....	0.0048	0.0054	0.0102
1991.....	0.0050	0.0060	0.0110
1992.....	0.0051	0.0067	0.0118
1993.....	0.0053	0.0072	0.0125
1994.....	0.0056	0.0076	0.0132
1995.....	0.0058	0.0083	0.0141
1996.....	0.0059	0.0093	0.0152
1997.....	0.0061	0.0101	0.0162
1998.....	0.0063	0.0115	0.0178
1999.....	0.0079	0.0114	0.0193
2000.....	0.0084	0.0122	0.0206
2001.....	0.0090	0.0135	0.0225
2002.....	0.0090	0.0147	0.0237
2003.....	0.0090	0.0289	0.0379

**Source:** John Lund, Oregon Institute of Technology, Geo-Heat Center (Klamath Falls, Oregon, March 2004), unpublished data.