

Table 17. Renewable Energy Consumption by Sector and Source  
(quadrillion Btu, unless otherwise noted)

|  | 2004        | 2005        | 2006        | 2007        | 2008        | 2009        | 2010        | 2011        | 2012        | 2013        | 2014        | 2015        | 2016        |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Marketed Renewable Energy 2/</b>    |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Residential (wood)                     | 0.40        | 0.41        | 0.40        | 0.43        | 0.43        | 0.43        | 0.43        | 0.42        | 0.42        | 0.41        | 0.41        | 0.41        | 0.41        |
| Commercial (biomass)                   | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        |
| Industrial 3/                          | 1.91        | 1.69        | 1.89        | 1.94        | 2.03        | 2.19        | 2.28        | 2.33        | 2.36        | 2.39        | 2.42        | 2.45        | 2.48        |
| Conventional Hydroelectric             | 0.05        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        |
| Municipal Waste 4/                     | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        |
| Biomass                                | 1.64        | 1.40        | 1.53        | 1.54        | 1.54        | 1.54        | 1.55        | 1.57        | 1.60        | 1.62        | 1.64        | 1.67        | 1.69        |
| Biofuels Heat and Coproducts           | 0.21        | 0.24        | 0.32        | 0.35        | 0.45        | 0.61        | 0.69        | 0.71        | 0.72        | 0.73        | 0.73        | 0.74        | 0.74        |
| Transportation                         | 0.30        | 0.34        | 0.46        | 0.62        | 0.74        | 0.87        | 0.95        | 0.96        | 0.98        | 0.99        | 0.98        | 1.01        | 1.04        |
| Ethanol used in E85 5/                 | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        |
| Ethanol used in Gasoline Blending      | 0.29        | 0.33        | 0.45        | 0.51        | 0.63        | 0.83        | 0.91        | 0.92        | 0.93        | 0.94        | 0.95        | 0.98        | 0.99        |
| Biodiesel used in Distillate Blending  | 0.00        | 0.00        | 0.00        | 0.11        | 0.11        | 0.04        | 0.04        | 0.04        | 0.04        | 0.04        | 0.03        | 0.03        | 0.04        |
| Electric Power 6/                      | 3.55        | 3.64        | 3.97        | 4.26        | 4.40        | 4.57        | 4.67        | 4.73        | 4.73        | 4.75        | 4.78        | 4.83        | 4.86        |
| Conventional Hydroelectric             | 2.66        | 2.68        | 2.81        | 2.79        | 2.86        | 2.92        | 2.99        | 3.04        | 3.04        | 3.04        | 3.04        | 3.04        | 3.05        |
| Geothermal                             | 0.31        | 0.32        | 0.34        | 0.35        | 0.36        | 0.36        | 0.36        | 0.36        | 0.36        | 0.36        | 0.36        | 0.37        | 0.39        |
| Municipal Waste 7/                     | 0.27        | 0.28        | 0.28        | 0.29        | 0.29        | 0.29        | 0.29        | 0.29        | 0.29        | 0.31        | 0.33        | 0.33        | 0.33        |
| Biomass                                | 0.16        | 0.21        | 0.23        | 0.34        | 0.39        | 0.49        | 0.51        | 0.51        | 0.51        | 0.50        | 0.51        | 0.55        | 0.55        |
| Dedicated Plants                       | 0.14        | 0.09        | 0.14        | 0.13        | 0.13        | 0.13        | 0.11        | 0.11        | 0.11        | 0.10        | 0.10        | 0.11        | 0.11        |
| Cofiring                               | 0.02        | 0.11        | 0.09        | 0.20        | 0.26        | 0.36        | 0.40        | 0.41        | 0.39        | 0.40        | 0.41        | 0.44        | 0.44        |
| Solar Thermal                          | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.02        | 0.02        | 0.02        |
| Solar Photovoltaic                     | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        |
| Wind                                   | 0.14        | 0.15        | 0.30        | 0.48        | 0.49        | 0.49        | 0.50        | 0.50        | 0.51        | 0.51        | 0.52        | 0.52        | 0.53        |
| <b>Total Marketed Renewable Energy</b> | <b>6.27</b> | <b>6.19</b> | <b>6.83</b> | <b>7.36</b> | <b>7.73</b> | <b>8.19</b> | <b>8.45</b> | <b>8.56</b> | <b>8.61</b> | <b>8.66</b> | <b>8.71</b> | <b>8.82</b> | <b>8.90</b> |
| <b>Sources of Ethanol</b>              |             |             |             |             |             |             |             |             |             |             |             |             |             |
| From Corn                              | 0.28        | 0.33        | 0.42        | 0.47        | 0.59        | 0.79        | 0.87        | 0.89        | 0.90        | 0.91        | 0.92        | 0.93        | 0.93        |
| From Cellulose                         | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.01        | 0.01        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        |
| Imports                                | 0.01        | 0.01        | 0.03        | 0.04        | 0.04        | 0.04        | 0.02        | 0.01        | 0.01        | 0.02        | 0.02        | 0.03        | 0.04        |
| <b>Total</b>                           | <b>0.29</b> | <b>0.33</b> | <b>0.45</b> | <b>0.51</b> | <b>0.63</b> | <b>0.83</b> | <b>0.91</b> | <b>0.92</b> | <b>0.94</b> | <b>0.95</b> | <b>0.95</b> | <b>0.98</b> | <b>0.99</b> |
| <b>Nonmarketed Renewable Energy</b>    |             |             |             |             |             |             |             |             |             |             |             |             |             |
| <b>Selected Consumption 8/</b>         |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Residential                            | 0.03        | 0.03        | 0.03        | 0.03        | 0.04        | 0.04        | 0.04        | 0.04        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        |
| Solar Hot Water Heating                | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.04        | 0.04        | 0.04        | 0.04        | 0.04        | 0.04        |
| Geothermal Heat Pumps                  | 0.00        | 0.00        | 0.00        | 0.00        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        |
| Solar Photovoltaic                     | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        |
| Commercial                             | 0.02        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        |
| Solar Thermal                          | 0.02        | 0.02        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        |
| Solar Photovoltaic                     | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        |

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(quadrillion Btu, unless otherwise noted)

|  | 2017        | 2018        | 2019        | 2020        | 2021        | 2022        | 2023        | 2024        | 2025        | 2026        | 2027        | 2028        | 2029        | 2030        | 2005-2030   |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Marketed Renewable Energy 2/</b>    |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Residential (wood)                     | 0.40        | 0.40        | 0.40        | 0.40        | 0.40        | 0.40        | 0.40        | 0.40        | 0.40        | 0.40        | 0.39        | 0.39        | 0.39        | 0.39        | -0.2%       |
| Commercial (biomass)                   | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.12        | 0.0%        |
| Industrial 3/                          | 2.50        | 2.53        | 2.56        | 2.59        | 2.63        | 2.66        | 2.68        | 2.72        | 2.76        | 2.79        | 2.83        | 2.86        | 2.89        | 2.93        | 2.2%        |
| Conventional Hydroelectric             | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | N/A         |
| Municipal Waste 4/                     | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | N/A         |
| Biomass                                | 1.71        | 1.73        | 1.75        | 1.77        | 1.79        | 1.81        | 1.83        | 1.85        | 1.88        | 1.91        | 1.93        | 1.96        | 1.98        | 2.01        | 1.4%        |
| Biofuels Heat and Coproducts           | 0.75        | 0.76        | 0.77        | 0.78        | 0.79        | 0.80        | 0.81        | 0.82        | 0.83        | 0.84        | 0.85        | 0.86        | 0.87        | 0.88        | 5.2%        |
| Transportation                         | 1.05        | 1.07        | 1.09        | 1.10        | 1.12        | 1.14        | 1.15        | 1.17        | 1.19        | 1.21        | 1.22        | 1.24        | 1.25        | 1.27        | 5.5%        |
| Ethanol used in E85 5/                 | 0.00        | 0.00        | 0.00        | 0.00        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.02        | 11.8%       |
| Ethanol used in Gasoline Blending      | 1.00        | 1.02        | 1.04        | 1.05        | 1.07        | 1.09        | 1.10        | 1.11        | 1.14        | 1.15        | 1.16        | 1.17        | 1.19        | 1.20        | 5.3%        |
| Biodiesel used in Distillate Blending  | 0.04        | 0.04        | 0.04        | 0.04        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | N/A         |
| Electric Power 6/                      | 4.93        | 4.94        | 4.95        | 4.93        | 4.93        | 4.97        | 5.02        | 5.07        | 5.09        | 5.11        | 5.14        | 5.17        | 5.14        | 5.15        | 1.4%        |
| Conventional Hydroelectric             | 3.05        | 3.05        | 3.05        | 3.05        | 3.05        | 3.05        | 3.05        | 3.05        | 3.06        | 3.06        | 3.06        | 3.06        | 3.06        | 3.06        | 0.5%        |
| Geothermal                             | 0.40        | 0.41        | 0.43        | 0.44        | 0.44        | 0.45        | 0.46        | 0.47        | 0.48        | 0.49        | 0.50        | 0.51        | 0.52        | 0.53        | 2.1%        |
| Municipal Waste 7/                     | 0.33        | 0.33        | 0.33        | 0.33        | 0.33        | 0.33        | 0.33        | 0.33        | 0.33        | 0.33        | 0.34        | 0.34        | 0.34        | 0.34        | 0.8%        |
| Biomass                                | 0.60        | 0.60        | 0.59        | 0.56        | 0.55        | 0.59        | 0.62        | 0.67        | 0.68        | 0.68        | 0.69        | 0.71        | 0.67        | 0.67        | 4.8%        |
| Dedicated Plants                       | 0.11        | 0.11        | 0.11        | 0.12        | 0.12        | 0.14        | 0.15        | 0.16        | 0.17        | 0.18        | 0.19        | 0.21        | 0.22        | 0.26        | 4.1%        |
| Cofiring                               | 0.48        | 0.49        | 0.48        | 0.44        | 0.43        | 0.44        | 0.47        | 0.51        | 0.50        | 0.51        | 0.51        | 0.50        | 0.45        | 0.41        | 5.2%        |
| Solar Thermal                          | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 6.2%        |
| Solar Photovoltaic                     | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | N/A         |
| Wind                                   | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 0.53        | 5.2%        |
| <b>Total Marketed Renewable Energy</b> | <b>9.00</b> | <b>9.06</b> | <b>9.12</b> | <b>9.15</b> | <b>9.20</b> | <b>9.30</b> | <b>9.37</b> | <b>9.48</b> | <b>9.56</b> | <b>9.63</b> | <b>9.71</b> | <b>9.77</b> | <b>9.79</b> | <b>9.86</b> | <b>1.9%</b> |
| <b>Sources of Ethanol</b>              |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| From Corn                              | 0.94        | 0.96        | 0.97        | 0.99        | 1.01        | 1.02        | 1.03        | 1.05        | 1.07        | 1.08        | 1.09        | 1.10        | 1.12        | 1.13        | 5.1%        |
| From Cellulose                         | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | 0.02        | N/A         |
| Imports                                | 0.04        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.06        | 0.06        | 0.06        | 0.06        | 0.06        | 0.06        | 0.07        | 0.07        | 8.4%        |
| <b>Total</b>                           | <b>1.01</b> | <b>1.02</b> | <b>1.04</b> | <b>1.06</b> | <b>1.08</b> | <b>1.10</b> | <b>1.11</b> | <b>1.12</b> | <b>1.15</b> | <b>1.16</b> | <b>1.18</b> | <b>1.19</b> | <b>1.20</b> | <b>1.22</b> | <b>5.3%</b> |
| <b>Nonmarketed Renewable Energy</b>    |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| <b>  Selected Consumption 8/</b>       |             |             |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Residential                            | 0.06        | 0.06        | 0.06        | 0.06        | 0.06        | 0.07        | 0.07        | 0.07        | 0.07        | 0.07        | 0.07        | 0.08        | 0.08        | 0.08        | 4.0%        |
| Solar Hot Water Heating                | 0.04        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.05        | 0.06        | 0.06        | 0.06        | 0.06        | 0.06        | 0.06        | 3.5%        |
| Geothermal Heat Pumps                  | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.02        | 0.02        | 0.02        | 6.8%        |
| Solar Photovoltaic                     | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 11.1%       |
| Commercial                             | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.04        | 0.04        | 0.04        | 0.04        | 0.04        | 2.1%        |
| Solar Thermal                          | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.03        | 0.6%        |
| Solar Photovoltaic                     | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.00        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 0.01        | 11.3%       |

Table 17. Renewable Energy Consumption by Sector and Source  
(quadrillion Btu, unless otherwise noted)

1/ Actual heat rates used to determine fuel consumption for all renewable fuels except hydropower, solar, and wind. Consumption at hydroelectric, solar, and wind facilities determined by using the fossil fuel equivalent of 10,280 Btu per kilowatthour.

2/ Includes nonelectric renewable energy groups for which the energy source is bought and sold in the marketplace, although all transactions may not necessarily be marketed, and marketed renewable energy inputs for electricity entering the marketplace on the electric power grid. Excludes electricity imports; see Table 2.

3/ Includes all electricity production by industrial and other combined heat and power for the grid and for own use.

4/ Includes municipal solid waste, landfill gas, and municipal sewage sludge. All municipal solid waste is included, although a portion of the municipal solid waste stream contains petroleum-derived plastics and other non-renewable sources.

5/ Excludes motor gasoline component of E85.

6/ Includes consumption of energy by electricity-only and combined heat and power plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes small power producers and exempt wholesale generators.

7/ Includes municipal solid waste, landfill gas, and municipal sewage sludge. Incremental growth is assumed to be for landfill gas facilities. All municipal solid waste is included, although a portion of the municipal solid waste stream contains petroleum-derived plastics and other non-renewable sources.

8/ Includes selected renewable energy consumption data for which the energy is not bought or sold, either directly or indirectly as an input to marketed energy. The Energy Information Administration does not estimate or project total consumption of nonmarketed renewable energy.

N/A = Not applicable.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2004 and 2005 are model results and may differ slightly from official EIA data reports.

Sources: 2004 and 2005 ethanol: Energy Information Administration (EIA), Annual Energy Review 2005, DOE/EIA-0384(2005) (Washington, DC, July 2006). 2004 and 2005 electric power sector: EIA, Form EIA-860, "Annual Electric Generator Report" (preliminary). Other 2004 and 2005 values: EIA, Office of Integrated Analysis and Forecasting. Projections: EIA, AEO2007 National Energy Modeling System run aeo2007.d112106a.