

## Trends in Renewable Energy Consumption and Electricity 2010

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

(quadrillion Btu)

Sector and Source	2006	2007	2008	2009	2010
Total	6.649	6.523	<sup>R</sup> 7.186	<sup>R</sup> 7.600	8.090
Biomass	3.267	3.474	3.849	<sup>R</sup> 3.912	4.294
Biofuels	0.771	0.991	1.372	<sup>R</sup> 1.568	1.837
Biodiesel <sup>1</sup>	0.033	0.046	0.040	<sup>R</sup> 0.042	0.034
Ethanol <sup>2</sup>	0.453	0.569	0.800	0.910	1.061
Losses and Co-products	0.285	0.377	0.532	0.617	0.742
Biodiesel Feedstock <sup>3</sup>	*	0.001	0.001	0.001	0.001
Ethanol Feedstock <sup>4</sup>	0.285	0.376	0.531	0.616	0.741
Waste	0.397	0.413	0.436	0.453	0.469
Landfill Gas	0.157	0.173	0.187	0.204	0.213
MSW Biogenic <sup>5</sup>	0.171	0.165	0.169	0.168	0.165
Other Biomass <sup>6</sup>	0.069	0.075	0.080	0.080	0.091
Wood and Derived Fuels <sup>7</sup>	2.099	2.070	2.040	1.891	1.988
Geothermal	0.181	0.186	0.192	0.200	0.208
Hydroelectric Conventional	2.869	2.446	<sup>R</sup> 2.511	2.669	2.539
Solar Thermal/PV	0.068	0.076	0.089	0.098	0.126
Wind	0.264	0.341	0.546	0.721	0.923
Residential	0.462	0.502	0.557	0.552	0.571
Biomass	0.380	0.410	0.450	0.430	0.420
Wood and Derived Fuels <sup>8</sup>	0.380	0.410	0.450	0.430	0.420
Geothermal	0.018	0.022	0.026	0.033	0.037
Solar Thermal/PV <sup>9</sup>	0.063	0.070	0.080	0.089	0.114
Commercial	0.118	0.118	0.125	0.129	0.130
Biomass	0.103	0.103	0.109	0.112	0.111
Biofuels	0.001	0.002	0.002	0.003	0.003
Ethanol <sup>2</sup>	0.001	0.002	0.002	0.003	0.003
Waste	0.036	0.031	0.034	0.036	0.036
Landfill Gas	0.004	0.003	0.003	0.003	0.003
MSW Biogenic <sup>5</sup>	0.026	0.021	0.026	0.028	0.028
Other Biomass <sup>6</sup>	0.007	0.007	0.005	0.005	0.005
Wood and Derived Fuels <sup>7</sup>	0.065	0.070	0.073	0.072	0.072
Geothermal	0.014	0.014	0.015	0.017	0.019
Hydroelectric Conventional	0.001	0.001	0.001	0.001	0.001
Solar Thermal/PV	-	-	*	*	*
Wind	-	-	-	*	*
Industrial	1.930	1.956	2.049	2.016	2.250
Biomass	1.897	1.936	2.028	1.994	2.230
Biofuels	0.295	0.387	0.544	0.630	0.757

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

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

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

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

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

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

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

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

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

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

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

PV = Photovoltaic. R=Revised.

\* = Less than 500 billion Btu.

- = No data reported.

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

Energy consumption for the noncombustible renewable energy sources (hydroelectric conventional, solar thermal, PV and wind) used in electricity generation is determined by multiplying generation times the fossil fuel equivalent heat rate. Energy consumption for geothermal energy used in electricity generation is determined by multiplying generation times the geothermal heat rate. See U.S. Energy Information Administration (EIA), Annual Energy Review (AER) 2010, DOE/EIA-0384 (2010) (Washington, DC, October 2011), Table A6.

Sources: Analysis conducted by U.S. Energy Information Administration (EIA), Office of Electricity, Coal, Nuclear and Renewables Analysis and specific sources described as follows: Residential: U.S. Energy Information Administration, Form EIA-457A/G, "Residential Energy Consumption Survey;" Oregon Institute of Technology, Geo-Heat Center; and U.S. Energy Information Administration, Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey," Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey" (pre-2010 data) and "Annual Photovoltaic Cell/Module Shipments Report (2010); SEIA/GTM Research, U.S. Solar Market Insight: 2010 Year in Review. Commercial: U.S. Energy Information Administration, Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center. Industrial: U.S. Energy Information Administration, Form EIA-846 (A, B, C) "Manufacturing Energy Consumption Survey," Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report;" and Oregon Institute of Technology, Geo-Heat Center; U.S. Environmental Protection Agency, Landfill Methane Outreach Program estimates; and losses and co-products from the production of biodiesel calculated as the difference between energy in feedstocks and production and from the production of ethanol calculated as the difference between energy feedstocks and production less denaturants. Biofuels for Transportation: Biodiesel: Consumption: 2006-2008: Calculated as biodiesel production plus biodiesel net imports, 2009-2010: biodiesel production plus biodiesel net imports minus biodiesel stock change; Production: 2006-2007: U.S. Department of Commerce, Bureau of the Census, Current Industrial Reports, "M311K--Fats and Oils: Production, Consumption and Stocks," data for soybean oil consumed in methyl esters (biodiesel), 2008: U.S. Energy Information Administration, Form EIA-22S, "Supplement to the Monthly Biodiesel Production Survey," 2009-2010: U.S. Energy Information Administration, "Form EIA-22M, Monthly Biodiesel Production Survey;" Trade: USDA imports data for Harmonized Tariff Schedule code 3824.90.40.20 (Fatty Esters Animal/ Vegetable Mixture) and exports data for Schedule B code 3824.90.40.00 (Fatty Substances Animal/ Vegetable Mixture; Stock Change: EIA Petroleum Supply Annual (PSA) various issues. Table 1 data for renewable fuels except ethanol; and Ethanol: 2006-2008: EIA Petroleum Supply Annual (various issues), Tables 1 and 15. Calculated as motor gasoline blending components adjustments (Table 1), plus finished motor gasoline adjustments (Table 1), plus fuel ethanol refinery and blender net inputs (Table 15). 2009-2010; EIA Petroleum Supply Annual (various issues), Table 1. Calculated as fuel ethanol refinery and blender net inputs minus fuel ethanol adjustments. Small amounts of ethanol consumption are distributed to the commercial and industrial sectors according to those sector's shares of U.S. motor gasoline supplied. Electric Power: U.S. Energy Information Administration, Form EIA-906, "Power Plant Report," Form EIA-920, "Combined Heat and Power Plant Report," and Form EIA-923, "Power Plant Operations Report."