

Renewable Energy

Note. Renewable Energy Production and Consumption. In Table 10.1, renewable energy consumption consists of: conventional hydroelectricity net generation (converted to Btu using the fossil-fueled plants heat rate); geothermal electricity net generation (converted to Btu using the geothermal plants heat rate), and geothermal heat pump and geothermal direct use energy; solar thermal and photovoltaic electricity net generation (converted to Btu using the fossil-fueled plants heat rate), and solar thermal direct use energy; wind electricity net generation (converted to Btu using the fossil-fueled plants heat rate); wood and wood-derived fuels consumption; biomass waste (municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural byproducts, and other biomass) consumption; fuel ethanol and biodiesel consumption; and losses and co-products from the production of fuel ethanol and biodiesel. Production is assumed to equal consumption for all renewable energy sources except biofuels (biofuels production comprises biomass inputs to the production of fuel ethanol and biodiesel).

Table 10.2a Sources

Residential Sector, Geothermal

Oregon Institute of Technology, Geo-Heat Center. Monthly estimates are created by dividing the annual estimates by the number of days in the year and then multiplying by the number of days in the month. (The annual estimate for the current year is set equal to that of the previous year.)

Residential Sector, Solar/PV

Energy Information Administration (EIA), Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), estimates based on Form EIA-63A, "Annual Solar Thermal Collector Manufacturers Survey," and Form EIA-63B, "Annual Photovoltaic Module/Cell Manufacturers Survey." Monthly estimates are created by dividing the annual estimates by the number of days in the year and then multiplying by the number of days in the month. (The annual estimate for the current year is set equal to that of the previous year.)

Residential Sector, Wood

1973–1979: EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2.

1980 forward: EIA, Form EIA-457, "Residential Energy Consumption Survey"; and EIA, CNEAF, estimates based on Form EIA-457 and regional heating degree-day data. Monthly estimates are created by dividing the annual estimates by the number of days in the year and then multiplying by the number of days in the month. (The annual estimate for the current year is set equal to that of the previous year.)

Commercial Sector, Hydroelectric Power

EIA, *Monthly Energy Review (MER)*, Tables 7.2a–7.2c and A6. Calculated as total conventional hydroelectric power minus conventional hydroelectric power in the electric power and industrial sectors, multiplied by the fossil-fueled plants heat rate.

Commercial Sector, Geothermal

Oregon Institute of Technology, Geo-Heat Center. Monthly estimates are created by dividing the annual estimates by the number of days in the year and then multiplying by the number of days in the month. (The annual estimate for the current year is set equal to that of the previous year.)

Commercial Sector, Wood

1973–1979: EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2.

1980–1983: EIA, *Estimates of U.S. Wood Energy Consumption 1980-1983*, Table ES1.

1984: EIA, CNEAF, estimate.

1985–1988: Values interpolated.

1989 forward: EIA, *MER*, Tables 7.4a–c; and EIA, CNEAF, estimates based on Form EIA-871, "Commercial Buildings Energy Consumption Survey." Data for wood consumption at commercial combined-heat-and-power (CHP) plants are calculated as total wood consumption at electricity-only and CHP plants (*MER*, Table 7.4a) minus wood consumption in the electric power sector (*MER*, Table 7.4b) and at industrial CHP plants (*MER*, Table 7.4c). Annual estimates for wood consumption at other commercial plants are based on Form EIA-871 (the annual estimate for the current year is set equal to that of the previous year); monthly estimates are created by dividing the annual estimates by the number of days in the year and then multiplying by the number of days in the month.

Commercial Sector, Biomass Waste

EIA, *MER*, Table 7.4c.

Commercial Sector, Fuel Ethanol

EIA, *MER*, Tables 3.5, 3.7a, and 10.3. Calculated as commercial sector motor gasoline consumption (Table 3.7a) divided by total motor gasoline product supplied (Table 3.5), and then multiplied by fuel ethanol consumption (Table 10.3).

Table 10.2b Sources

Industrial Sector, Hydroelectric Power

Energy Information Administration (EIA), *MER* Tables 7.2c and A6.

Industrial Sector, Geothermal

Oregon Institute of Technology, Geo-Heat Center. Monthly estimates are created by dividing the annual estimates by the number of days in the year and then multiplying by the

number of days in the month. (The annual estimate for the current year is set equal to that of the previous year.)

Industrial Sector, Wood

1973–1979: EIA, *Estimates of U.S. Wood Energy Consumption from 1949 to 1981*, Table A2.

1980–1983: EIA, *Estimates of U.S. Wood Energy Consumption 1980-1983*, Table ES1.

1984: EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 1.

1985 and 1986: Values interpolated.

1987: EIA, *Estimates of Biofuels Consumption in the United States During 1987*, Table 2.

1988: Value interpolated.

1989 forward: EIA, *MER*, Table 7.4c; and EIA, Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), estimates based on Form EIA-846, “Manufacturing Energy Consumption Survey.” Data for wood consumption at industrial combined-heat-and-power (CHP) plants are from *MER*, Table 7.4c. Annual estimates for wood consumption at other industrial plants are based on Form-EIA-846 (the annual estimate for the current year is set equal to that of the previous year); monthly estimates are created by dividing the annual estimates by the number of days in the year and then multiplying by the number of days in the month.

Industrial Sector, Biomass Waste

1981: EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 8; and EIA, *MER*, Table 10.2c. Estimates are calculated as total waste consumption minus electric power sector waste consumption.

1982 and 1983: EIA, CNEAF, estimates for total waste consumption; and EIA, *MER*, Table 10.2c. Estimates are calculated as total waste consumption minus electric power sector waste consumption.

1984: EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 8; and EIA, *MER*, Table 10.2c. Estimates are

calculated as total waste consumption minus electric power sector waste consumption.

1985 and 1986: Values interpolated.

1987: EIA, *Estimates of U.S. Biofuels Consumption 1990*, Table 8; and EIA, *MER*, Table 10.2c. Estimates are calculated as total waste consumption minus electric power sector waste consumption.

1988: Value interpolated.

1989 forward: EIA, *MER*, Table 7.4c; and EIA, CNEAF, estimates based on information presented in Government Advisory Associates, *Resource Recovery Yearbook* and *Methane Recovery Yearbook*, and information provided by the U.S. Environmental Protection Agency, Landfill Methane Outreach Program. Data for waste consumption at industrial CHP plants are from *MER*, Table 7.4c. Annual estimates for waste consumption at other industrial plants are based on the non-EIA sources listed above (the annual estimate for the current year is set equal to that of the previous year); monthly estimates are created by dividing the annual estimates by the number of days in the year and then multiplying by the number of days in the month.

Industrial Sector, Fuel Ethanol

EIA, *MER*, Tables 3.5, 3.7b, and 10.3. Calculated as industrial sector motor gasoline consumption (Table 3.7b) divided by total motor gasoline product supplied (Table 3.5), and then multiplied by fuel ethanol consumption (Table 10.3).

Industrial Sector, Losses and Co-products

EIA, *MER*, Tables 10.3 and 10.4.

Transportation Sector, Fuel Ethanol

EIA, *MER*, Tables 3.5, 3.7c, and 10.3. Calculated as transportation sector motor gasoline consumption (Table 3.7c) divided by total motor gasoline product supplied (Table 3.5), and then multiplied by fuel ethanol consumption (Table 10.3).

Transportation Sector, Biodiesel

EIA, *MER*, Table 10.4. Transportation sector biodiesel consumption is assumed to equal total biodiesel consumption.