Biomass Energy

Good numbers for biomass energy

Energy in wood: 8,500 – 9,500 btu/lb for oven dry wood (varies by species)
  7,750 btu/lb for wood pellets
  4,300 btu/lb for green wood
12,000 green tons/year/megawatt required for biomass-to-electricity
65 - 115 gallons Ethanol/ton oven dry wood

More details concerning biomass-to-electricity:

One 50 MW power plant will use between 550,000 and 650,000 tons of green wood per year using an
80-90% operation capacity, 8,000 hrs per year, and 4,300 btu/lb green wood.

A large coal plant has a process with a heat rate that requires 10,000 btu/kWhr. Smaller wood plants
have lower heat rates and require 13,000 btu per kWhr.

Source: Bulpitt, Georgia Institute of Technology

Biomass-to-electricity calculations:

4,300 btu per pound of green wood chips = 8,600,000 btu/green ton

8,600,000 btu / 13,000 btu = 661 kWhr per green ton = 1.5128 green tons per MWhr

1.5128 green tons per MWhr x 8,000 hours = 12,102 tons per MW per year

12,102 tons x 50 MW = 605,120 green tons per year for a 50 MW biopower plant

Source: Nathan McClure, Georgia Forestry Commission

Paying $200/ton for wood pellets is the same as paying:

• $1.67 per gallon for heating oil
• $1.18 per gallon for propane
• $12.50 per (1,000 ft³) for natural gas
• $0.04 per kWhr for electricity

Source: The Wood Pellet Heating Guidebook, Massachusetts Department of Energy