

WOODY BIOMASS DEFINITIONS AND CONVERSION FACTORS

Biomass – Organic matter in trees, agricultural crops and other living plant material.

Woody Biomass – Trees, shrubs, bushes, or products derived from these woody plants that accumulate to an amount that is a hazard or disposal problem

Roundwood – wood in its original round (or near round) form, such as small logs, branches, etc.

Sawlog – A log that meets minimum standards of diameter, length, and defect for sawing into lumber.

Volume - Gross – Measurement of log without any deduction for defect.

Volume - Net – actual amount of merchantable wood in after deductions for defect.

Small Diameter – logs generally less than 10-inches in diameter at the large end

Chips – a generic term used to describe woody materials broken down into small particles by mechanical means.

- a. Pulp chips – bark free, produced by chippers that produce a uniform sized particles
- b. Fuel chips – particles produced by hammermills, chippers or grinders of varying sizes and shapes
- c. Furnish – particle sizes defined specifically for a type of manufacturing process

Weight measure – amount of wood measured in pounds or tons (Kg or mt)

Green Ton (GT) = 2,000 lbs of fresh cut woody material at a “green” moisture content

Bone Dry Ton (BDT or DT) = 2,000 lbs of woody material at 0% moisture content

Bone Dry Unit (BDU) = 2,400 lbs of wood chips at 0% moisture content

Volume measure – amount of wood measured in cubic feet, board feet, or cubic meters

Board Foot (BF) – wood measuring 1 inch thick, 12 inches long, and 12 inches wide.

MBF = 1,000 BF, MMBF = 1,000,000 BF

Moisture Content – a measure of the amount of water in wood, expressed as a percentage. The forest products industry general uses a dry wood basis, the energy industry uses a wet wood basis.

MC dry basis – mass of water in wood divided by the oven dry mass of wood (0 – 150%)

MC wet basis – mass of water in wood divided by the original (green) mass (0 – 100%)

Typical Energy Terms

British Thermal Unit – The quantity of heat required to raise the temperature of one pound of water, 1 degree F (Fahrenheit).

Cogeneration – The combined generation of both heat and power at one facility using the same fuel source. Typically the heat is used to generate steam that is utilized on site (process steam).

Power generated is in the form of electricity that is utilized on site or sold to a local utility.

Gasification - a thermochemical conversion of organic solids and liquids into a producer or synthetic gas (syngas) under very controlled conditions of heat and strict control of air or oxygen.

Kilowatt = 1,000 watts, a watt is the measure of the rate of energy use at any moment (a 100 watt bulb uses 100 watts at any given moment)

Kilowatt-hr (kWh) – amount of energy used in an hour, a 100 watt light bulb burning for one hour uses 1Wh. Ten 100 watt light bulbs burning for one hour uses 1,000 watts or 1 kWh

Megawatt – One thousand kilowatts or enough electricity to support 800 to 1,000 households.

COMMON CONVERSION FACTORS

1 BDT = 2 GT (assuming a moisture content on a wet basis of 50%)

1 BDT of chips, = 200 cubic feet (a.k.a 1 unit of chips)

1 ccf (hundred cubic feet) roundwood = 1.0 BDU chips

1 ccf roundwood (logs) = 1.2 BDT chips

1 ccf roundwood (logs) = 1.2 cords roundwood (@ 85 cu. ft.wood/cord)

1 GT of logs = 160 BF of lumber

1 MBF = 6 GT of logs

1 standard chip van carries 25 green tons, or approximately 12.5 BDT at 50% MC

1 BDT ~ 1 MWH

- 1 BDT burned in a typical commercial boiler fuel will produce 10,000 lbs. of steam
- 10,000 lbs. of steam will produce about 1,000 horsepower or generate 1 megawatt hour (MWH) of electricity