

BIOMASS CONVERSION FACTORS AND GLOSSARY

Summarized below are some woody biomass conversion factors that are commonly used by natural resource managers in the Pacific Northwest:

1 green ton (GT) of chips	= 2000 lbs.(not adjusted for moisture)
1 bone dry ton (BDT) of chips,	= 2000 dry lbs.(assumes no moisture content)
1 bone dry unit (BDU) of chips,	= 2400 dry lbs. (assumes no moisture content)
1 unit of chips	= 200 cubic feet

1 BDT chips	= 2.0 GT (assuming 50% moisture content)
1 unit of chips	= 1.0 BDT 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 units of chips
1 ccf roundwood (logs)	= 1.2 cords roundwood (@ 85 cu. ft. wood/cord)
1 BF = board foot lumber measure equivalent to wood volume of 12" x 12" x 1" thick	
1 MBF = 1,000 BF	
1 GT of logs = 160 BF of lumber	
6 GT of logs = 1 MBF	

1 standard chip van carries 25 green tons, or approximately 12.5 BDT assuming 50% moisture content.

When woody biomass is utilized in a commercial (10+ MW electrical output) scale power generation facility the following energy output rules of thumb apply:

1 BDT fuel will produce 10,000 lbs. of steam
10,000 lbs. of steam will generate 1 megawatt hour (MWH) of electricity
1 MW = 1,000 horsepower
1 MW = power for approximately 750 to 1,000 homes

GLOSSARY OF COMMON TERMS

Listed below are some of the more common terms/abbreviations frequently used by resource managers. These definitions are from a variety of sources including the USDA Forest Products Lab, and the Society of American Foresters – Forestry Dictionary.

Biomass – Organic matter in trees, agricultural crops and other living plant material. Carbohydrates are the organic compounds that make up biomass. These compounds are formed in growing plant life through photosynthesis, a natural process by which energy from the sun converts carbon dioxide and water into carbohydrates, including sugars, starches and cellulose.

Board Foot – The amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide. Abbreviated “BF”. Common units as related to saw log volume measurement include - 1,000 BF or MBF and 1,000,000 BF or MMBF.

Bone Dry Ton – Traditional unit of measure used by industries (pulp/paper, biomass power) that utilize biomass as a primary raw material. One bone dry ton (BDT) is 2,000 pounds of biomass (usually in chip form) at zero percent moisture. Typically biomass collected and processed in the forest is delivered “green” to the end use facility at 50% moisture. One BDT at 50% moisture content is two green tons (4,000 pounds at 50% moisture content).

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

Chip – A small piece of wood typically used in the manufacture of pulp/paper, composite panels, fuel for power/heat generation, and landscape cover/soil amendment.

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.

Cull log – Logs that do not meet certain minimum specifications for usability or grade. A cull log typically has very little value in the production of lumber products.

Gasification - the 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.

Gasifier – A combustion device that produces biogas from solid biomass.

Generation – The process of creating electricity. Typically generation is accomplished to supply electricity to an on site facility and/or for sale to an electric utility.

Kilowatt – A standard unit for expressing the rate of electrical output.

Megawatt – One thousand kilowatts. Enough electricity to support approximately 1,000 households.

Moisture content – The amount of moisture contained in biomass material. Typically expressed as a percentage of total weight.

Saw log – A log that meets minimum regional standards of diameter, length, and defect, intended for sawing into lumber products.

Volume – Gross - Measurement of log content in log-scale board foot (see board foot definition – above) without deduction for defect.

Volume – Net – Measurement of the actual amount of merchantable wood in log-scale board foot – after deductions for defect.

(Provided courtesy of TSS Consultants – www.tssconsultants.com)