



Renewable Energy Vermont

Woody biomass Factsheet: *Heat and power from the forest*

What is Biomass?

Biomass includes any biological material that can be used as fuel, and includes the chopped wood that many Vermonters already use to heat their homes.

How Do You Get Heat and Electricity From Woody Biomass?

Beyond conventional wood stoves, there are many options among modern, high-efficiency wood fired heating systems using wood chips or pellets as fuel. The wood fuel is typically stored in bulk and handled automatically all the way up to the point of combustion. Heat generated from the combustion process can be

used for hot water, steam, or hot air production. Generating hot water or air, woody biomass boilers are similar to traditional fossil fuel systems, and can be integrated with existing distributions piping or ductwork. The major difference is the storage and handling of wood fuel which requires larger bins or silo with mechanized feed systems. When generating high pressure steam with wood fuels, a turbine can be added to create electricity. Power generation is most efficient when large heating and cooling loads are present throughout the year. Utility applications generate steam, which turns a turbine to create electricity.



Wood chips and forrest wastes ready to be burned

Where is Woody Biomass Produced?

Woody biomass fuel can come from various sources: sawmills that chip wood as a by product, directly from harvesting operations in the woods, or from clean community wood wastes such as chipped urban tree trimmings, stumps, and discarded Christmas trees. In addition to these traditional sources, chips are increasingly being produced from chipped low-grade logs or “pulpwood” in dedicated chip yards and chip mills. Wood pellets are made from the same sources described above, with the wood



Wood chip boiler furnace

being reduced in size and moisture content while increased in its energy density, producing a very consistent refined fuel product.

Who uses Woody Biomass?

Woody biomass is suitable for a large range of applications from residential wood stoves and boilers up through large industrial or community scale heating biomass systems in the 1-to-10 million Btu per hour (output) range are used by colleges, universities, hospitals, public buildings, hotels and motels, commercial buildings, greenhouses, large-scale agricultural operations, manufacturing plants, power plants, schools, and community district energy systems in the USA and around the world. Electric generating biomass plants are likewise in use around the world.



Wood pellets being loaded into a wood chip hopper

What Are the Benefits of Using Woody Biomass?

Modern biomass systems have very low particulate matter emissions,

offer proven reliability, and when fed with responsibly harvested waste forestry and mill waste products contribute minimal additional CO₂ to the atmosphere. Biomass uses a locally produced fuel, reducing dependence on foreign fossil fuels and helping to support the forest products industry, creating markets, and forestry and agriculture jobs in the surrounding region.



Wood chips outside a biomass electricity plant

(bark, sawdust, wood chips, wood scrap, and paper mill residues) provide about 2% of the energy used in the USA today.

Did You know?

According to the US Department of Energy, wood and wood waste

Want to Find Out More About Biomass?

We've got more information, links and resources at <http://www.vermont.org/main/technology/bioenergy/biomass/>

Renewable Energy Vermont

Biomass Factsheet // www.vermont.org