



## Woody Biomass

### What is Biomass?

Biomass is any organic matter that is available on a renewable/sustainable basis for energy or products. Carbohydrates are the organic matter that makes up biomass. They are formed through photosynthesis as sunlight converts CO<sub>2</sub> and water into carbohydrates, including sugars, starches and cellulose.

### Biomass for Heat and Power

Biomass can be combusted directly for heating and/or to produce steam for electricity. Woody biomass can also be converted into a gas to power any generator capable of using the gas. Such gas is called biogas or syngas. It can also be converted into a fuel oil substitute called bio-oil.

Biomass power can be generated at stand-alone power plants, at cogeneration power plants or in microgeneration applications. A biomass power or cogeneration system typically consists of a combustor or a gasifier and a prime mover that uses steam from a boiler or combustible gas from a gasifier to produce heat and/or power. Installations range in size from less than 50 kW electric capacity to over 50 megawatts. Most biomass facilities producing electricity are collocated at pulp and paper mills or large sawmills where there is a plentiful supply of mill waste residues.

### Biofuels

Biomass can be converted into ethanol or biodiesel and used as a transportation fuel. Ethanol is made by fermenting a biomass source high in carbohydrates and is mostly used as a fuel additive to reduce emissions. The primary feedstock for ethanol is corn (starch-based), but research is focusing on converting cellulosic materials (wood, paper, and crop residues) to ethanol. Biodiesel, an ester, is made using vegetable oils, animal fats, algae or recycled cooking greases. Liquid fuels can also be made from any carbonaceous material, including manure or municipal garbage. It too can be used as a fuel or a fuel additive to diesel.

### Biobased Chemicals and Materials

Research is being conducted to turn biobased chemicals into anti-freeze, plastics, and personal care items that are now made from petroleum products. For more information on this subject please visit one of the following web sites: <http://www.aboutbioenergy.info/>

## **Economic Benefits**

For biomass power systems, it is estimated that six full time jobs are created for each megawatt of capacity. For corn-based ethanol plants, 100 jobs per year are created for every 15 million-gallon/year facility. Other benefits include:

- Reduced dependence on foreign oil
- The utilization of an otherwise waste product or residue
- Reduced material going to local landfills
- Community-based biomass collection programs

For more information on this subject please review one of the following web sites:

**[http://www.epa.gov/cleanrgy/pdf/eere\\_fun.pdf](http://www.epa.gov/cleanrgy/pdf/eere_fun.pdf)**

**<http://www.harvestenergy.org/biofuels.html>**

**<http://www.woodgas.com/biomass.htm>**

## **Policies**

### Colorado Renewable Energy Standard (RES)

Biomass is an eligible resource under Colorado's recently enacted Renewable Energy Standard (Amendment 37) if used to produce electricity. Biomass for thermal energy (heat) does not currently apply to Colorado's RES.

For information related to alternative fuel incentives, please visit one of the following web sites:

**<http://www.eere.energy.gov/afdc/>**

**<http://www.harvestenergy.org/biofuels.html>**

**<http://www.state.co.us/oemc/programs/transportation/index.htm>**



## OEMC Activities

OEMC is actively promoting ethanol use through its **E-85 Coalition**. OEMC also helps coordinate activities of the **Woody Biomass Working Group**. This group is made up of partners from both the public and private sector including non-profits, NGO's and forest industry personnel. There are several programs underway to support the use of woody biomass for a variety of purposes. Some of these include:

- A state-wide supply study
- A sustainability report on the long-term supply of biomass
- A co-firing study to determine the potential for co-firing biomass with coal
- Facility heating projects to provide thermal energy to schools, municipal or other public facilities
- Assisting Biomass Working Group partners in finding other uses of woody biomass for bio-based products

Details on these programs can be found by visiting the following web sites:

[www.state.co.us/oemc/](http://www.state.co.us/oemc/)

[www.coloradobiomass.org](http://www.coloradobiomass.org)

For more information on woody biomass or the Woody Biomass Program at OEMC, contact:  
**Craig Jones at 303 443-2088 or [craig.jones@state.co.us](mailto:craig.jones@state.co.us)**

