

BIOMASS

Fact Sheet Developed by the Pioneer Valley Planning Commission and the Franklin Regional Council of Governments

AT A GLANCE

Commercial \$ / kWh: 6 cents to 11 cents

Average Size: 10-75 MW

Residential \$ / kWh: ????

Average Size: ????

Energy Returned on Energy Invested: Dependant on location of biomass material and transportation costs

Ease of Development: Low

Benefit to the Environment: Medium

Benefit to Local Economy: High

What goes in: Organic matter, like wood or agricultural products

What comes out: Electricity or heat



What is Biomass and how does it work?

The term biomass means any plant derived organic matter available on a renewable basis, including wood, agricultural food and feed crops, and waste from consumer, municipal, industrial, and agricultural processes. Wood, the largest source of biomass, has been used for thousands of years. Biomass technologies use renewable biomass resources to produce an array of energy

related products, such as electricity, heat, liquid, solid, and gaseous fuels, and other materials. In the future, biomass resources may be replenished through the cultivation of energy crops, such as fast-growing trees and grasses.

Why is Biomass considered a clean renewable energy technology?

Biomass is considered a renewable resource because it uses rapidly renewable materials like wood and crops as fuel as opposed to natural resources like coal, oil, and natural gas that takes thousands of years to regenerate. Some forms of biomass rely on waste from consumers, construction, landfills and other sources. These forms are considered renewable because they are produced on a continual basis, and using them as fuel is an effective way to put them to use.

Where is Biomass technology typically used?

Biomass ranks second in renewable U.S. primary energy production and accounts for three percent of the primary energy production in the United States, or about 11,000 MW. Biomass is most commonly used for heating purposes, with applications ranging in scale from cooking and home heating to industrial process heating. At large facilities, such as pulp and paper

mills, biomass is used for electricity generation as well. To generate electricity using biomass, the fuel is burned to produce steam that is run through a turbine like those at fossil and nuclear power plants. Cogeneration is the combined production of electricity and process heat.

What are the production and maintenance costs of Biomass?

Actual costs of production and maintenance of biomass varies greatly depending on the type of generation, fuel used, proximity to the fuel source, storage and handling costs, and other site specific factors.

Does a Biomass installation have any environmental impacts?

The environmental impacts of biomass can be influenced by fuel sources and energy conversion technologies. Biomass represents a “greenhouse neutral” option for generating electricity because biofuels are derived from replenishable organic materials. All biofuels can replace or substitute dirtier fuel sources, and most biofuels release very little sulfur and no toxic chemicals, thus reducing emissions of sulfur dioxide and air toxics. However, emissions will vary depending on the precise fuel and technology used.

What is the quality of the power produced by Biomass?

Dependant on the availability of the biofuel, biomass has the opportunity to produce a continuous supply of energy.

Sources:

- Massachusetts Technology Collaborative (www.mtpc.org)
- US Department of Energy, Energy Efficiency and Renewable Energy (www.eere.energy.gov)
- Renewable Energy Access (www.renewableenergyaccess.com)
- Oregon Department of Energy (www.energy.state.or.us/biomass/costs.htm)
- Power Scorecard (www.powerscorecard.org/tech_detail?resource_id=1)
- USDA Forest Product Laboratory (www.fpl.fs.fed.us)