

Biomass Power for Rural Development



The Benefits of Biomass

The U.S. Departments of Energy and Agriculture are partnering to further the development of electricity generation systems that use biomass instead of fossil fuels.

Using biomass, such as energy crops and processing and agricultural residues, for energy production is beneficial to the nation, and especially to rural areas. The national benefits include lower acid rain-producing emissions, reductions in greenhouse gas emissions, and less dependence on fossil fuels. Rural benefits start with new sources of income for farmers, more jobs, and economic development, all achieved while preserving the high quality of life, local control, and lack of pollution that help make rural America a good place to live.

When economic development happens without harming the environment or jeopardizing our children's future well-being, we call it sustainable development. In the four projects established throughout the nation to demonstrate and validate biopower production, we hope to embody the principles of sustainable development at its best.



Northern States Power / PIX03744

With electricity production as an option, farmers can be more confident that their crops will have stable and profitable markets.

New Life for Old Ways

Of course, using biomass to generate heat or to drive steam engines is nothing new. Historical methods of burning wood and agricultural or forest residues were not environmentally sound because they emitted smoke and volatile organic carbon compounds into the air. Today, scientists and engineers are creating new methods to burn biomass cleanly. For more information about this new technology, see the fact sheets: "Advanced Biomass Gasification" and "Biomass Cofiring."

Living Examples of Biomass at Work

Switchgrass Binds Prairie: Underutilized, marginal land will be put to work through a public/private partnership to grow switchgrass for energy generation in Iowa. Currently, switchgrass is grown to reduce soil erosion or for feed. By cofiring the switchgrass in an existing coal boiler, this native crop can generate about 35 megawatts of electrical power, enough to light some 40,000 homes.

Fourteen organizations, representing a broad cross-section of business, community, public utility and governmental interests, will work with hundreds of farmers and landowners to develop a biopower system that will reduce acid rain. The partners plan a 4,000-acre demonstration project that will help farmers harvest new and sustainable income as a lasting alternative to traditional federal farm subsidies. In addition, increased use of home-grown renewable energy will keep more energy dollars in Iowa, concentrating the benefits.

Other important environmental benefits will also be realized, including the protection and improvement of the local watershed and surrounding wildlife habitats, and reduction in the use of chemical pesticides and fertilizers.

Farmers Dedicate Crops to Energy in New York: The first dedicated crop for energy production in the United States is growing near Syracuse, New York. Under the care of the Salix Consortium, with 25 university, association, corporate, and government partners, willow trees are grown on land set aside by 26 farmers and landowners. These trees produce a crop every three years that can be efficiently harvested using existing machinery. Several power plants will participate in this project, cofiring the harvested feedstock with other fuels to produce electricity and reduce emissions. Projections indicate that willow crops like this one could be competitive with coal for producing energy without government subsidies.

BIOWATER PROGRAM



Daniel Peck / PIX05802

Tim Volk examines a willow plantation growing in New York that can be used for co-firing in coal plants or may go to modern electricity generation facilities to create clean, renewable energy.

Farmed Trees Grow Energy: In Upper Minnesota, 1,870 acres of hybrid poplar have been established on Conservation Reserve Program land by a consortium led by the WesMin Resource Conservation and Development District. These four-year-old trees are being managed and studied extensively by scientists to learn how to grow dedicated crops for future energy uses.

Coproducts from the Heartland: In Southern Minnesota, alfalfa markets weren't strong enough to justify hauling the crop off the farm—until now. A partnership of the Minnesota Valley Alfalfa Producers cooperative, Carbona, Great River Energy, Westinghouse Electric Corporation, the University of Minnesota and DOE has been planning a biomass gasification and power generation facility in Granite

Falls, MN. Between 50,000 and 75,000 homes may be served with electricity, and companion products like feed pellets, protein supplements, and other bioproducts. The farmers would get more local control and stability in their business, and there will be beneficial side effects, like an economic cushion against the devastating effects of rain damage to crops.

Energy for the Country

Rural areas need energy. In fact, many rural areas are growing again and experiencing increasing energy demand. But building big baseload power plants is no longer desirable. Smaller facilities have less environmental impact and can operate with locally produced feedstocks. Using biomass delivers a triple benefit to rural people, by keeping the wealth nearby, paying farmers for the production of biomass feedstocks, and by providing clean energy to fuel a rural renaissance. With clean energy, rural people can be more productive, work near home, and enjoy the clean, high quality of life that attracted them to the country.



Warren Gretz, NREL / PIX00083

Even marginal lands can produce value when community leaders, conservation officials, and technical experts work together to develop biomass crops, such as switchgrass, that also prevent erosion and supply wildlife habitats.

For More Information:

Visit the BioPower Web site:

<http://www.eren.doe.gov/biower>

For copies of print documents on renewable energy, call DOE's Energy Efficiency and Renewable Energy Clearinghouse (EREC) 1-800-DOE-EREC (1-800-363-3732)

