



# Power from Renewable Resources - Biomass

As more and more consumers and organizations are searching for ways to decrease dependency on fossil fuels, the more likely direction is to turn toward alternative or renewable energy sources. The Office of the Ohio Consumers' Counsel (OCC), the residential utility consumer advocate, offers the following information on one of the forms of alternative energy: biomass.

## What is biomass energy?

Biomass is a renewable resource that can be used to generate electricity and liquid fuel. The sources for biomass energy are organic matter such as municipal and industrial waste, fumes from landfills, plants, unused vegetable crops and trees.

People have been using biomass for thousands of years, since wood was first burned to cook food and keep warm. Even now, wood is still the largest biomass source used. Biomass can be used for fuel, power production and products that typically would be derived from fossil fuels, such as natural gas or coal.

Today, there are five different methods for using biomass to generate energy. Those methods are:

- ▶ Direct combustion – the burning of dry organic matter, such as wood
- ▶ Chemical conversion – the conversion of soybean and canola oil to bio diesel
- ▶ Pyrolysis – the heating of organic compounds to produce gases
- ▶ Anaerobic digestion – the conversion of sewage and animal waste to methane
- ▶ Fermentation – the creation of ethanol by fermenting and distilling sugar solutions that can be used to fuel automobiles

Biomass is not just used for industrial purposes. Through converting methane from landfills to electricity, many electric utilities are purchasing biomass power to be sent to residential customers.

## Ohio - current and future outlook

In Columbus, there are two landfills that generate electricity from the methane released by the decomposing trash. One landfill rests below a golf course, but is still operational. With technology, a system was set up to capture the methane gas at this location generating nearly four megawatts of electricity. It is then sold to a municipal power consortium.

A second landfill, run by the Solid Waste Authority of Central Ohio, is slated to house the Green Energy Center. In partnership with FirmGreen, the Solid Waste Authority of Central Ohio's center will reduce greenhouse gases in an amount equal to the removal of nearly 2,000 cars from the road, represent the planting of 2,600 acres of trees and will replace 20,800 barrels of oil consumption.

According to the Landfill Methane Outreach Program, Ohio has developed 17 "Landfill Gas-to-Energy" projects with 24 more projects planned.

As of July 2007, an ethanol plant is being constructed in Coshocton. The plant capacity is expected to reach 60 million gallons of ethanol per year with full production scheduled to start in October.



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## National and international outlook

In June 2007, American Electric Power announced it would purchase 4.6 million carbon credits between 2010 and 2017 generated from capturing methane from livestock. One carbon credit is equal to the reduction of one ton of carbon dioxide.

Throughout the nation, there are 425 operational landfill biomass projects and more than 1,100 landfills considered for biomass projects that have yet to be developed.

Biofuels, such as biodiesel are widely used not only in the United States, but in other countries as well. In Brazil, ethanol from sugarcane provides 50 percent of automobile fuel. Germany uses about 450 million gallons of biodiesel a year, or about 3 percent of its total diesel consumption. In the United States, there has been a push to manufacture more vehicles that can use an ethanol/gasoline mixture, or E85. E85 is comparable in price to gasoline, but get slightly fewer miles per gallon.

## Pros and cons of biomass energy

Biomass is an environmentally friendly way to generate energy. Although it omits carbon dioxide when burned, the organic matter typically absorbs carbon dioxide while it is growing. It is considered a renewable resource since the plants used in biomass energy can be grown over and over again.

On the other hand, depending on the source of the biomass, the emissions from burning biomass for energy may emit a variety of pollutants into the air. This can cause health issues, especially respiratory. However, except for direct combustion "trash to energy" type power plants, biomass is considered more environmentally friendly than traditional fossil fuels. Also, there are some people who believe that biomass would be better used as food (as in the case of corn), fertilizers for crops and other items.

## Renewable energy resources

Consumers who have questions or would like additional information about renewable energy, including wind or solar power and hydroelectricity should contact the OCC at 1-877-PICKOCC (1-877-742-5622) or visit online at [www.pickocc.org](http://www.pickocc.org).

For additional information on biomass energy, visit these websites:

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

<http://www.nrel.gov/biomass/>

<http://www1.eere.energy.gov/biomass/>

The Office of the Ohio Consumers' Counsel (OCC), the residential utility consumer advocate, represents the interests of 4.5 million households in proceedings before state and federal regulators and in the courts. The state agency also educates consumers about electric, natural gas, telephone and water issues and resolves complaints from individuals. To receive utility information, brochures, schedule a presentation or file a utility complaint, residential consumers may call 1-877-PICKOCC (1-877-742-5622) toll free in Ohio or visit the OCC website at [www.pickocc.org](http://www.pickocc.org).

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**For additional information from the Office of the Ohio Consumers' Counsel:**

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