



Power from Renewable Resources - Hydroelectricity

What is hydroelectricity?

Hydroelectricity is the process of generating electricity from water currents. In order to use water to generate electricity, dams are built to create slow-moving bodies of water. When the water is released, its force spins a generator. The generator creates electricity and sends it to power lines.

There are three types of hydropower.

- ▶ Impoundment – typically a large system that uses a dam to store river water in a reservoir.
- ▶ Diversion – a facility that channels a portion of a river through a canal to turn the blades of a generator, also called a turbine, that creates electricity. It may or may not need the use of a dam to force water through turbines.
- ▶ Pumped Storage - pumped storage facilities store energy by pumping water from a lower reservoir to an upper reservoir when the need for electricity is low. During periods of high electrical demand, the water is released back to the lower reservoir to generate electricity.

Ohio's Current and future outlook

Ohio currently has 15 conventional hydroelectric plants representing 171 megawatts of electricity. In Central Ohio, the City of Columbus uses hydropower to generate electricity for its residential and commercial customers. Over 10,000 gallons of water a minute are forced through the O'Shaughnessy Hydroelectric plant, fueling the turbine, which generates electricity to send to the power lines. The water then is discharged back into the Scioto River below the dam.

At Stockport Mill Inn located along the Muskingum River between Zanesville and Marietta, Ohio, two antique turbine engines were recently restored. The two turbines had been severely damaged in November 2006. They have since been restored and are again powering the inn.

National outlook

The United States is the second largest producer of hydropower in the world, with Canada leading the way. About one-fifth of the world's electricity is generated from hydropower. As of 2005, the United States was producing about 8.4 percent of its energy through hydroelectricity, representing about 10 percent of its generating capacity.

Pros and cons of hydroelectricity

Hydroelectricity is a reusable resource that does not emit any hazardous byproducts. In many cases, the water that has been used to generate electricity may be cleaner when it leaves the turbines due to the majority of the sediment being separated out in the turbine. The National Hydropower Association estimated that by using



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hydroelectric generation instead of electricity from coal burning and natural gas power plants, 77 million metric tons of carbon was not emitted in 1999. This would equal the burning of 121 million tons of coal, 27 million barrels of oil and 741 billion cubic feet of natural gas combined.

In some cases hydroelectric plants can harm the environment by blocking or altering fish migrations. When an area is designated for a hydroelectric plant, some residents may be displaced due to the necessary flooding to create a reservoir for water. Also, in times of droughts, there may be limited amounts of water to be used for the generation of electricity.

Additional Resources

For additional information on hydroelectricity, visit these websites:

www.greenenergyohio.org

www.hydro.org

www.eere.energy.gov/RE/hydropower.html

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.

The Office of the Ohio Consumers' Counsel is an equal opportunity employer and provider of services.

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

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