Hydro-Electric Power

History

Hydro-electricity is a renewable resource, which means that unlike non-renewable types of energy like fossil fuels such as coal and oil, it is will never run out. The word hydro comes from the Greek word for water. Hydro-electricity harnesses the energy created by moving water and uses it to generate electricity. One of the oldest forms of energy, hydro-power was used in ancient Rome to power grist mills used to grind grain to make flour for bread and other foods.

For more than a century, the technology for using falling water to create hydroelectricity has existed. The evolution of the modern hydropower turbine began in the mid-1700s when a French hydraulic and military engineer, Bernard Forest de Bélidor wrote *Architecture Hydraulique*. In this four volume work, he described using a vertical-axis machine to harness the power of water.

During the 1700s and 1800s, water turbine development continued. In 1880, a water turbine was used to provide theatre and storefront lighting in Grand Rapids, Michigan. In in 1881, a dynamo connected to a turbine in a flour mill provided street lighting at Niagara Falls, New York. These two projects used direct-current technology.

Alternating current is used today. That breakthrough came when the electric generator was coupled to the turbine, which resulted in the world's, and the United States', first hydroelectric plant located in Appleton, Wisconsin, in 1882. In 1920, hydropower accounted for an estimated 25% of United States electrical generation. In the early 1940s, Bureau of Reclamation dams ramped up power output to support America's efforts in World War II, producing enough electricity to make 69,000 airplanes and 5,000 ships and tanks during a five year period.

Even today, a vast expansion of hydropower's potential is possible through new technologies.

Pros and Cons

Hydro-electricity is a renewable resource which we tend to think of as being better than non-renewable types of energy that use fossil fuels. However, like any other resources, hydro-electric power has both pros and cons.

Pros:

❖ Water is a clean renewable resource.

❖ The creation and maintenance of hydro-electric facilities creates jobs.

❖ Dams create reservoirs, which provide safe recreational areas for people.

❖ Reservoirs are protected natural spaces where wildlife can live safely and people can boat, fish, hike and camp.

Cons:

- ❖ When rivers are dammed and reservoirs created, sometimes large areas of land where people and animals live are flooded and destroyed.

- ❖ Habitats for animals are disrupted.

- ❖ People lose their homes and are forced to relocate.

How It Becomes Usable Energy

Today we use hydro-power to create electricity. In order to harness the power of the water, engineers create a large body of water, called a reservoir by building a dam across a moving river. The water stored behind the dam in the reservoir flows downstream through the dam. Within the dam are turbines, which are large propeller-shaped objects. When energy from the water causes the turbines to spin they activate a generator, which produces electricity. The electricity can then be stored and used to power our cities and towns. Take a look at this link from the [Tennessee Valley Authority](#) to learn more about how the energy from water can be used to generate hydro-electricity.

Cool Facts

- ❖ Some countries in the world get almost all their energy from hydro-electric power. For example, Brazil, the Republic of Congo and Norway get 90% of their power from hydro-electricity.

- ❖ The first hydro-electric plant in the United States was on the Fox River in Wisconsin. It was small and was able to power two paper mills and one house.

- ❖ China has the largest hydro-electric plant at the Three Gorges Dam. This facility harnesses the power of the great Yangtze River and measures 607 feet tall and 377 feet thick. It is capable of generating more than a billion watts of electricity. To see more take a look at this link: [Three Gorges Dam.](#)

Activities

[Renewable Energy Project for Kids: Power from Water](#)

[Hydro Power Project](#)