Hydropower

Hydropower is the use of falling river water to generate electricity. The electricity made from hydropower is often called hydroelectricity. However, aside from the energy used to make it, hydroelectricity is exactly the same as all other electricity.

At a hydroelectric power plant, river water falls over a dam. The water turns turbines that generate electricity.

Hydropower is made at a dam. A **dam** is like a wall across a river. Much of the river water backs up behind the dam, forming an artificial lake called a **reservoir**. But some of the water is allowed to flow through the dam. It is channeled over **turbines**, which are like spinning wheels. The energy of the spinning turbines is used to generate electricity. Wires carry the electricity from the dam to places that need it.

Advantages of Hydropower

Hydropower has many advantages. It uses a renewable energy source, which is the rushing water of a river. After the dam and power plant are built, hydropower is inexpensive to generate. That's because the river is a free natural resource.

Another advantage is lack of pollution. Unlike the burning of fossil fuels, hydropower does not release soot or gases. There are no waste products of any kind.

Hydropower also can be generated close to the places that need it. Rivers flow in places all over the world, including near the busiest cities. A river also brings and takes away everything that hydropower needs to generate electricity. Unlike a power plant that burns coal or runs on uranium, no materials need to be transported to or from a hydropower plant to keep it running.

A dam can also bring other benefits besides hydropower. The reservoir it forms can be used to hold water for communities. The reservoir can also be used for swimming and boating.

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Disadvantages of Hydropower
However, hydropower has many disadvantages, too. A dam changes the way that the river flows. As a result, it can change the way that fish, birds, and other wildlife live in the river. Many fish swim downstream to feed, then back upstream to spawn or lay eggs. Channels in the dam are built to allow fish to pass through. But the fishes' lives are still changed.

A dam also stops the flow of silt down the river. In rivers without dams, the silt gathers on beaches along the river. When the river floods, the silt washes onto the nearby land. The silt makes the land very fertile, or able to support crops. Building a dam on a river stops these events from occurring.

Dams can also make rivers more difficult for people to use. Boats and barges would be destroyed if they fell over a dam. So along with a dam, engineers often build structures called locks. A **lock** is like a water elevator for carrying boats and barges. Locks work well, but they make travelling on the river more difficult and expensive.

Another disadvantage of dams is that they can break apart. This event is called a dam failure. When a dam fails, a huge amount of water rushes past it. The river below floods over its banks. The rush of water causes much damage to property. It also can take people's lives.
In the 1970s, the failure of five dams across the United States killed over 300 people. After the last of these failures, the U.S. Government began the National Dam Safety Program. Dams are now inspected for safety.

What Do You Think?
Should we continue to build more dams and generate more hydroelectric power in the United States? The question is not easy to answer.

Today, burning coal makes most electricity. Coal has many disadvantages as an energy source, and its supplies will someday run out. New hydropower plants could help us stop using coal. They might also provide electricity at a lower cost and for a longer period of time than a new coal-fired plant.

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However, engineers point out that most of the best sites for dams have already been taken. They also can show us how water levels are decreasing in many rivers. The Colorado River of the southwestern United States is one example. Over the past 50 years, more and more of its water has been used for farms, ranches, and cities. Today, very little water flows from the mouth of the river into the ocean.

Biologists may argue that dams harm river wildlife. An example is the Three Gorges Dam on the Yangtze River in China. The river is home to one of the largest, most diverse communities of living things on Earth. However, within a year after the dam was completed in 2012, scientists have identified falling populations of fish, birds, and other wildlife. A type of dolphin that lived in the river is now thought to be extinct.

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QUESTIONS

1. What are the advantages of using hydropower?

2. What are the disadvantages of using hydropower?

3. What kinds of scientists help us evaluate hydropower? Discuss the different ideas and knowledge they can provide.

RESEARCH PROJECT

Research more information about the advantages and disadvantages of hydropower. You may wish to research a specific example of a hydropower plant, either in operation now, under construction, or proposed. Present your findings in a short essay or oral report.