

Hydroelectric Power: Energy Source Fact Sheet

A hydroelectric power plant uses a renewable source of energy that does not pollute the environment. It converts the kinetic energy contained in falling water into electricity. This energy is renewable because it is ultimately derived from the sun: energy contained in sunlight evaporates water from oceans and deposits it on land in the form of rain. Hydroelectric power accounts for 6% of the worldwide energy supply and 15% of the world's electricity.

How does it work?

Hydroelectric power plants capture energy released by water as it powers a turbine. The water powers the turbines by turning blades connected to a generator. The amount of electrical energy generated depends on the height that the water falls from and the quantity of water flowing. There are two types of hydroelectric power: High Head (uses dams, larger plants) and Low Head (uses the "run of the river", smaller plants).

How has this type of energy been used elsewhere in the U.S. and around the world?

- ◆ The largest hydroelectric power scheme in Australia, in the Snowy Mountains, generates about 50% of Australia's hydroelectric power. It has 7 power stations, 145 km of tunnels and 16 large dams. The largest dam, Lake Eucumbene, holds 9 times the water volume of the Sydney Harbor.
- ◆ In Canada, hydroelectric power supplies 60% of their electrical needs: The James Bay Project and the La Grande project in Quebec.
- ◆ In North America and Europe, a large percentage of hydroelectric power has been developed, and much of the remaining potential in the world exists in developing countries such as Africa and Asia.

Positive Effects:

- ◆ Plants do not emit any atmospheric pollutants (ex: carbon dioxide)
- ◆ Does not contribute to global warming or acid rain
- ◆ Plants do not have a risk of radioactive contamination associated with nuclear plants
- ◆ World's largest renewable source of energy
- ◆ "Low Head" power plants have a less of an effect on the environment

Negative Effects:

- ◆ Decaying vegetation, caused by the flooding of lands, may give off quantities of greenhouse gases
- ◆ Reservoirs used for holding water flood homelands and threaten rare ecosystems
- ◆ The damming of rivers, caused by "High Head" plants, prevents fish from migrating upstream and traps silt and deposits it in the bed of a reservoir. This silt decreases the amount of water available and deprives the downstream river of necessary fertilizers
- ◆ Bacteria and decaying vegetation can cause a high level of mercury present in the water; this affects the fish and poses a health hazard to those who depend on the fish for food.

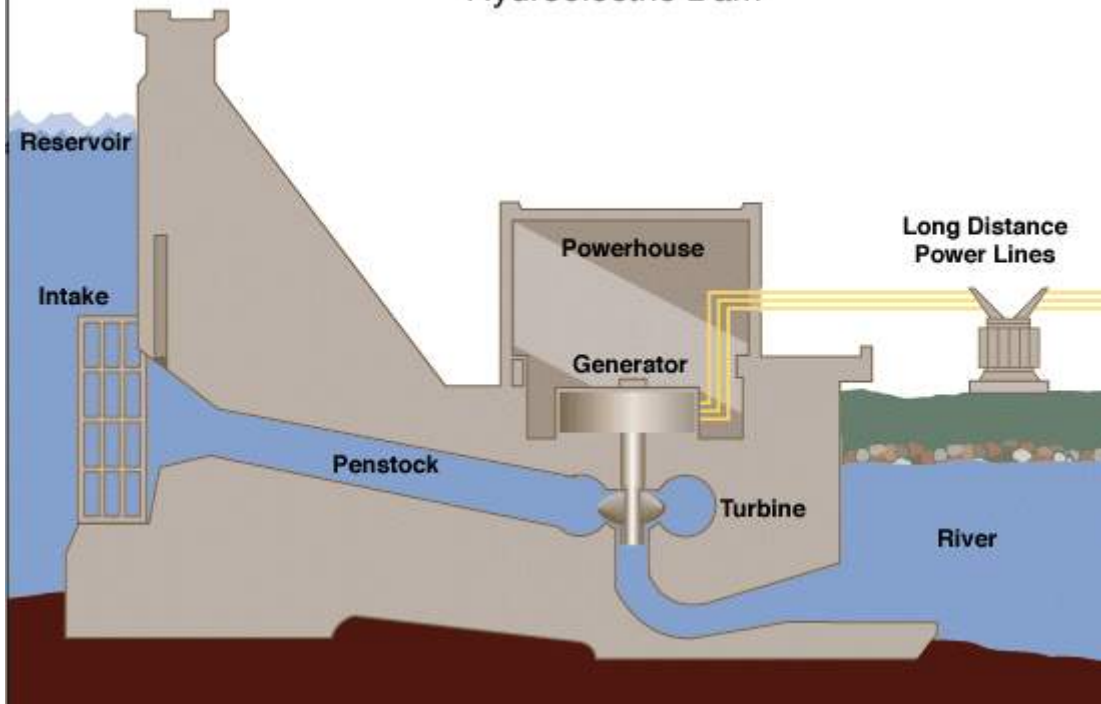
Costs of Hydroelectric Power:

- ◆ In countries such as Africa and Asia, where hydroelectric power plants have great potential, it costs billions of dollars due to high construction costs.
- ◆ The World Bank has spent billions of foreign aid dollars on hydroelectric projects in third world countries.
- ◆ The amount of money spent is restricted due to opposition from environmentalists and native people.

Sources:

- <http://www.ecology.com/archived-links/hydroelectric-energy/>
- http://www.sustainableenergy.qld.edu.au/fact/factsheet_9.html

Hydroelectric Dam



-<http://www.tva.gov/power/hydroart.htm>