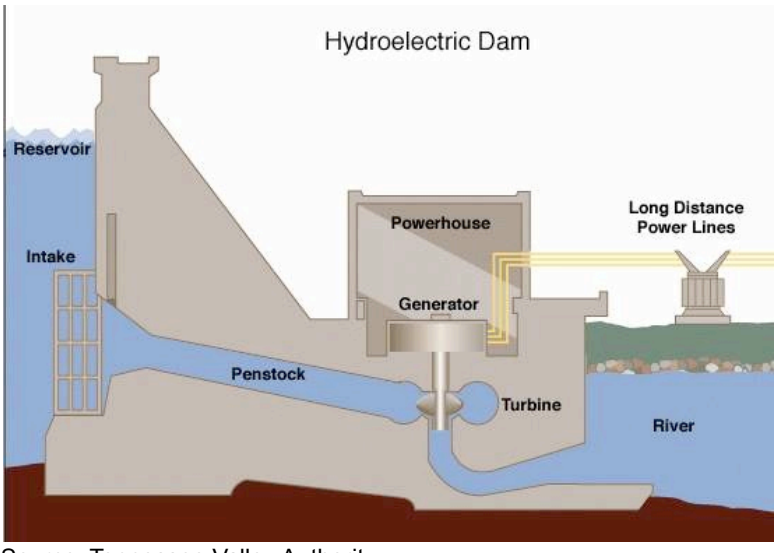
Renewable Energy Vermont

Hydropower Factsheet: *Power from water*

What is Hydropower?

The force of running water has been harnessed for ages; irrigation, hydration and transportation all developed to take advantage of this natural source of energy. Old mills built next to waterfalls relied on the force of flowing water to turn large wooden paddles, which powered cranks that ground grain and performed other mechanical tasks. Modern hydropower dams take this concept to a huge scale— massive dams and gigantic metal turbines produce the largest amount of electricity, worldwide, of any type of renewable energy.



Source: Tennessee Valley Authority

How Do You Get Electricity From Water?

Hydropower is produced with the help of two elements: the force of running water, and a turbine connected to an electric generator. The most common form of hydropower relies on a dam to hold a large supply of water. This is important in order to produce a steady, reliable supply of power, and to amplify and control the water flow; the build up of all that water behind a dam produces an effect like putting your finger on the end of a garden hose, making the water flow much faster than in a river alone. Below the dam, or sometimes far downstream, is the “powerhouse,” with the turbine and electric generator. Water from the bottom of the dam (where the pressure is greatest) is funneled through a narrow “penstock” to further intensifying the flow, and moves past a turbine with large metal rotors. The force of the water turns the rotors, which are attached to a shaft that spins an electric generator, producing electricity.

Where is Hydropower Produced and Consumed?
Large-scale hydropower projects can be found in many different countries, but the growth of the technology is limited to rivers that are suitable to damming, most of which have been by now. Still, hydropower is by far the most used form of renewable energy in the world, accounting for approximately 20% of the world's used electricity in 2006. In Vermont, hydro provides nearly 30% of the state's demand for electricity, while community-scale hydro provides for several cities' municipal power needs.

What Are the Benefits of Hydropower?
Compared to fossil fuel based sources of electricity, hydropower provides a zero-emissions solution, producing no climate-warming carbon dioxide, and no polluting, harmful gasses. Hydropower projects can be expensive, but once installed, this technology is a long-term, *free* source of electricity.

Green Mountain Power's dam in Winooski, VT

Did You know?
You may have read about the Hoover Dam — at the time it was completed in 1935 it was the largest dam in the world, producing 1,345 Megawatts of electricity. Hydropower projects have really grown since then: the recently completed Three Gorges Dam in China is now the world's largest, with a production capacity of *22,500* Megawatts!

Want to Find Out More About hydropower?
We've got more information, links and resources at http://www.revermont.org/main/technology/hydro/