

How hydroelectricity works

IN-DEPTH STUDY

Hydroelectric power, or hydroelectricity, is generated by the force of falling water (hydro comes from the Greek word for water). It is one of the cleanest sources of energy, it is also the most reliable one and costs the least.

1 Answer the questions before watching the video.

1. Has Italy got any hydroelectric power stations? If so, where?
2. Is there a hydroelectric power station near the area where you live?
3. Have you ever seen a dam? What is the main purpose of a dam?
4. Why Hydroelectricity can be considered one of the cheapest forms of energy?

▶ How hydroelectricity works *posted by Robert Woodman*

One hundred and seventy thousand cubic meters of water flow past here, every minute at almost sixty kilometers per hour, that's enough water to fill about a hundred thousand Olympic swimming pools every day. Standing here you can actually feel the power of the water.

Premising that power is what hydroelectric stations have been designed to do for over a hundred years in Ontario.

In essence they are factories that convert the energy of falling water into the flow of electrons or what is commonly called electricity, the electricity that powers the province.

Most hydroelectric stations use either water diverted around the natural drop of the river, such as a waterfall or rapids, or a dam is built across the river to raise the water level and provide the drop needed to create a driving force.

Water at the higher level is collected in the forebay. It flows through the plant intake into a pipe called the PENSTOCK, which carries it down to a TURBINE WATER WHEEL at the lower water level; the water pressure increases as it flows down the penstock.

It is this pressure and flow that drives the turbine that is connected to the GENERATOR. Inside the generator is the ROTOR that is spun by the turbine.

Large electro magnets are attached to the rotor located within coils of copper wire called the STATOR.

As the generator rotor spins the magnets, a flow of electrons is spread in the coils of the stator. This produces electricity that can be stepped up in voltage through the station transformers and sent across transmission lines.

The falling water, having served its purpose, exits the generating station to the tailrace where (it) rejoins the mainstream of the river to continue the cycle of creating clean renewable energy for Ontario.



Sir Adam Beck Hydro Power Station (Niagara Falls)

2 Fill in the gaps with a word taken from the video.

1. One hundred and thousand cubic meters of water flow past here every minute at almost kilometers per hour.
2. They are that convert the energy of falling water into the flow of electrons.
3. Most hydroelectric stations use either water diverted around the natural of the river such as a waterfall or rapids or a built across the river.
4. Water at the level is collected in the forebay.
5. The water flows through into a which carries it down to a turbine water
6. Water pressure as it flows down the penstock. It is this pressure and flow that the turbine that is connected to the GENERATOR.
7. The stator is made up of coils of Wire.
8. Electricity can be stepped up in through the station transformers and sent across transmission

3 Now watch the video again and answer the following questions.

1. What Canadian Province is mentioned in the video?
2. Do you know the name of these famous waterfalls between the USA and Canada?
3. What is inside the generator?
4. What happens to the falling water after having served its purpose?



Hoover Dam in the black canyon of the Colorado River on the border of Arizona and Nevada (US).