

Hydro-electricity 101 - Resource sheet

Hydroelectricity explained

Hydro Tasmania provides electrical energy by using water from natural waterways throughout Tasmania. To build a hydroelectric power station, you need to make a dam on a river that has a good degree of slope.

What's the water for?

Water is used to provide the mechanical energy necessary for the operation to work. Gravity makes the water in the dam fall, turning huge turbine propellers. In this way, Hydro Tasmania is using only the forces of nature – the weight of the water released from the dammed river and gravity. Better still, the same water can be pumped back uphill into the dam and re-used again and again.

How can mechanical energy generate electrical energy?

When the water flows around the large turbines, it causes their propellers to turn. This is a simple, mechanical effect that creates the ongoing cyclic movement required to turn the shaft of an electrical generator - the engine that produces electricity. This brings us to the electrical aspect of the operation.

Where does the electrical power come from?

Simply explained, when a magnet moves past a metal object that conducts electricity, electrons flow between the magnet and the object. In a power station, this energy is collected and is carried along power lines that connect homes and businesses to the generator.

How do electromagnets work?

An electromagnet is a device that becomes magnetic when an electrical current is passed through it. In past centuries, the only way of utilising magnetism was to find an object or substance with naturally magnetic properties – a lodestone, for example. But about 200 years ago, it was discovered that passing an electrical current through a non-magnetic metal generates a magnetic field within that object, making it temporarily magnetic.

Simple electromagnets are made by placing a cylinder of iron, steel or another conductive metal inside a coil of wire – usually copper. The electricity makes the metal core become magnetic. When the electricity is turned off, the magnetic effect stops. Electromagnets can be manipulated to be stronger or weaker in force, depending upon the amount of electrical current that is passed through them.

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