

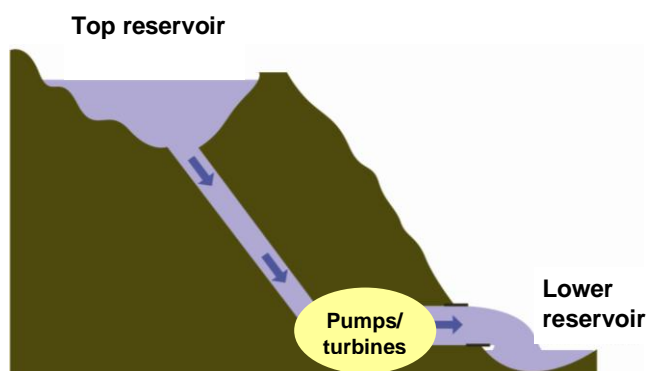


Llywodraeth Cymru
Welsh Government

A power station or not?

The following article is taken from information in literature on display at the Dinorwig site in North Wales.

Electric Mountain was built between 1976 and 1982 at Dinorwig in North Wales – a huge scheme to provide energy at short notice which feeds into the National Grid. The scheme was constructed in the abandoned Dinorwig slate quarry. To preserve the natural beauty of Snowdonia National Park, the scheme is located deep inside the mountain Elidir Fawr, inside tunnels and caverns. That is why there's little to see as you drive past, as most of it is deep inside a mountain. Water is pumped up to the top reservoir at night, when demand for electrical power across the country is low.



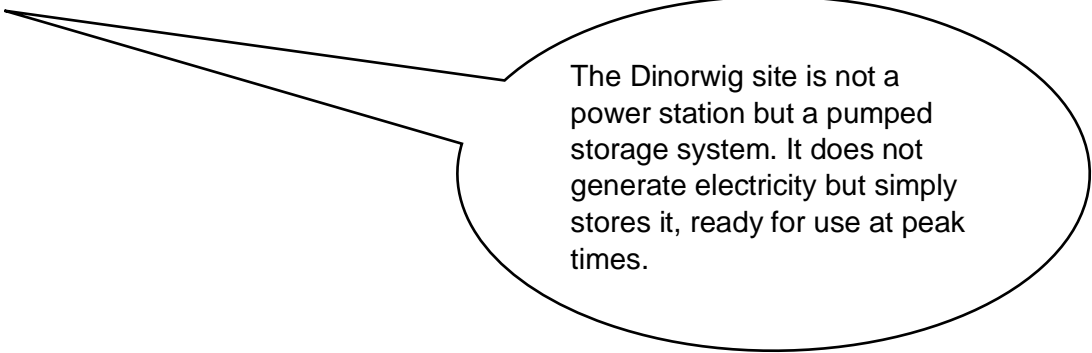
When there's a **sudden demand for power**, the 'headgates' (huge taps) are opened and water rushes down the tunnels to drive the turbines, which drive the powerful generators.

The water then collects in the bottom reservoir, ready to be pumped back up later when the demand for electricity is low again.

Dinorwig has the fastest 'response time' of any scheme of this type in the world. It can provide 1,320 MegaWatts in 12 seconds. That's a lot of cups of tea! It has an efficiency of between 70% and 75%.

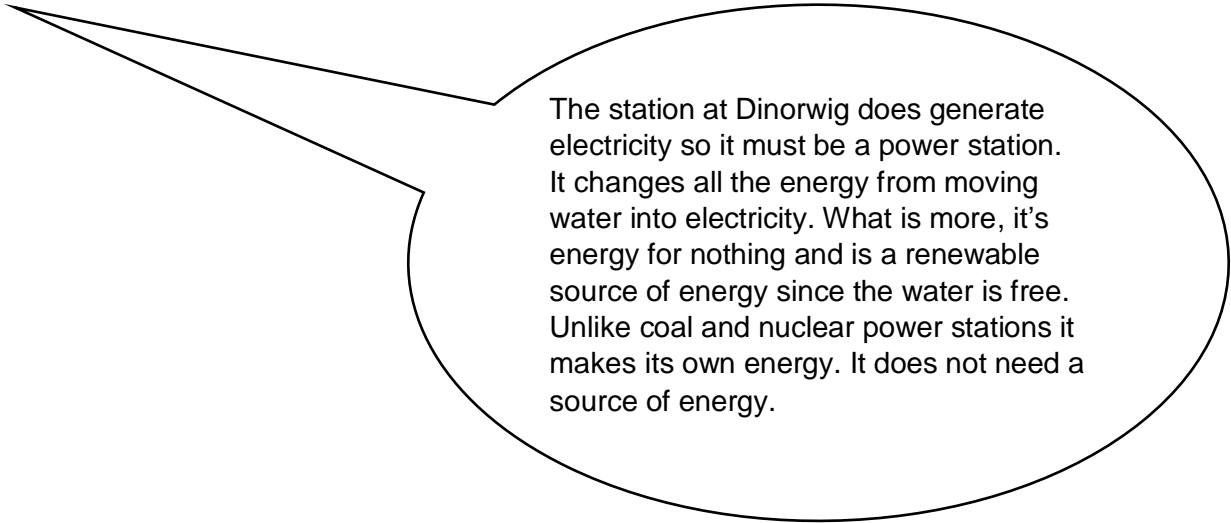
Task 1

Siân says:



The Dinorwig site is not a power station but a pumped storage system. It does not generate electricity but simply stores it, ready for use at peak times.

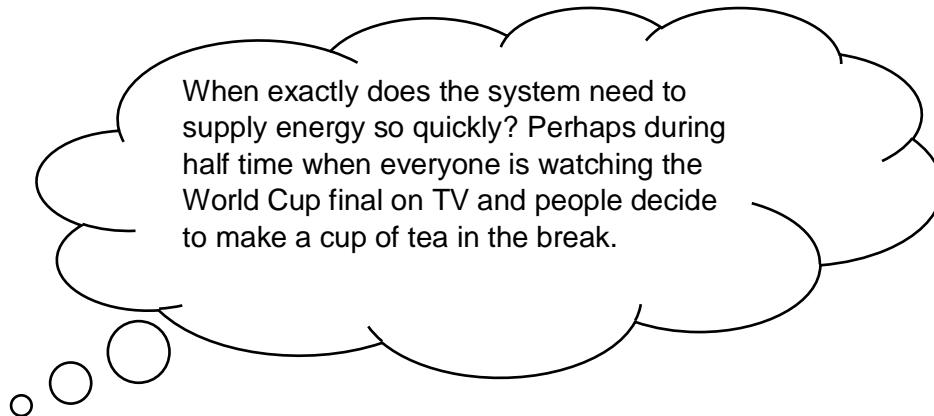
Rhodri says:



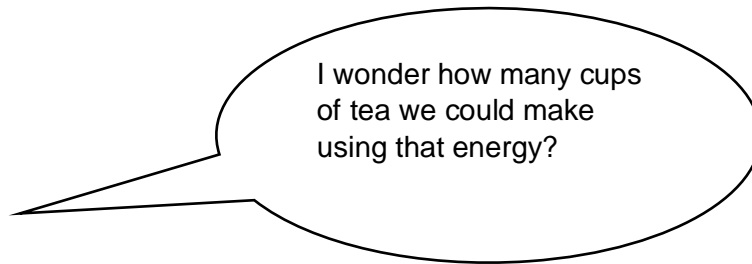
The station at Dinorwig does generate electricity so it must be a power station. It changes all the energy from moving water into electricity. What is more, it's energy for nothing and is a renewable source of energy since the water is free. Unlike coal and nuclear power stations it makes its own energy. It does not need a source of energy.

Task 2

Siân thinks:



Rhodri says:



Rhodri and Siân start to investigate the claim in the information:

‘ . . . it can provide 1,320 MegaWatts in 12 seconds. That’s a lot of cups of tea!’

They start by using a kettle, with a power rating of 3,000W and enough water to make 10 cups of tea.

How will they work out how many cups of tea can be made?

How accurate is this estimate and what might cause their value to be either too high or too low?