People have used moving water to create energy for thousands of years. Today, pumped hydro is the most common form of grid-connected energy storage in the world .

This technology is in the spotlight because it pairs so well with solar and wind renewable energy. During the day, when solar panels and wind farms may be generating their highest level of energy, people don't need really need much electricity. Unless it is stored somewhere the energy is lost.

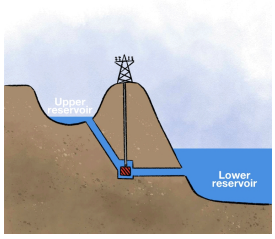
Read more: ***Snowy hydro scheme will be left high and dry unless we look after the mountains***

Pumped hydro can cheaply and easily store the excess energy, releasing it again at night when demand rises.

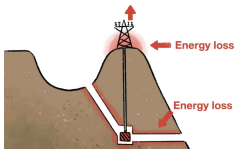
Here's how it all works:

How it works

Put as simply as possible, it involves pumping water to a reservoir at the top of a hill when energy is in plentiful supply, then letting it flow back down through a turbine to generate electricity when demand increases.



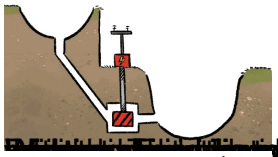
Like all storage systems, you get less energy *out* than you put *in* – in this case, generally around 80% of the original input – because you lose energy to friction in the pipes and turbine as well as in the generator. For comparison, lithium ion batteries are around 90-95% efficient, while hydrogen energy storage is less than 50% efficient

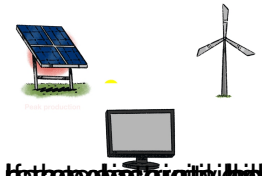


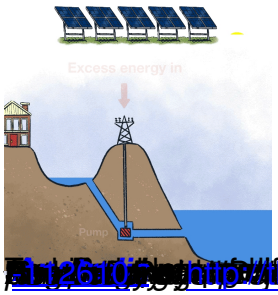
The benefit is we can store a lot of energy at the top of the hill and keep it there in a reservoir until we need the energy back again. Then it can be released through the pipes (this is called "penstock") to generate electricity. This means pumped hydro can create a lot of additional electricity when demand is high (for example, during a heatwave).

The disadvantage of pumped hydro is you need to have two reservoirs separated by a significant elevation difference (more than 200m is typically required, more than 300m is ideal). So it doesn't work where you don't have hills. However, research has identified 22,000 potential sites in Australia.

Read more: ***Want energy storage? Here are 22,000 sites for pumped hydro across Australia***






Excess energy in
Pump