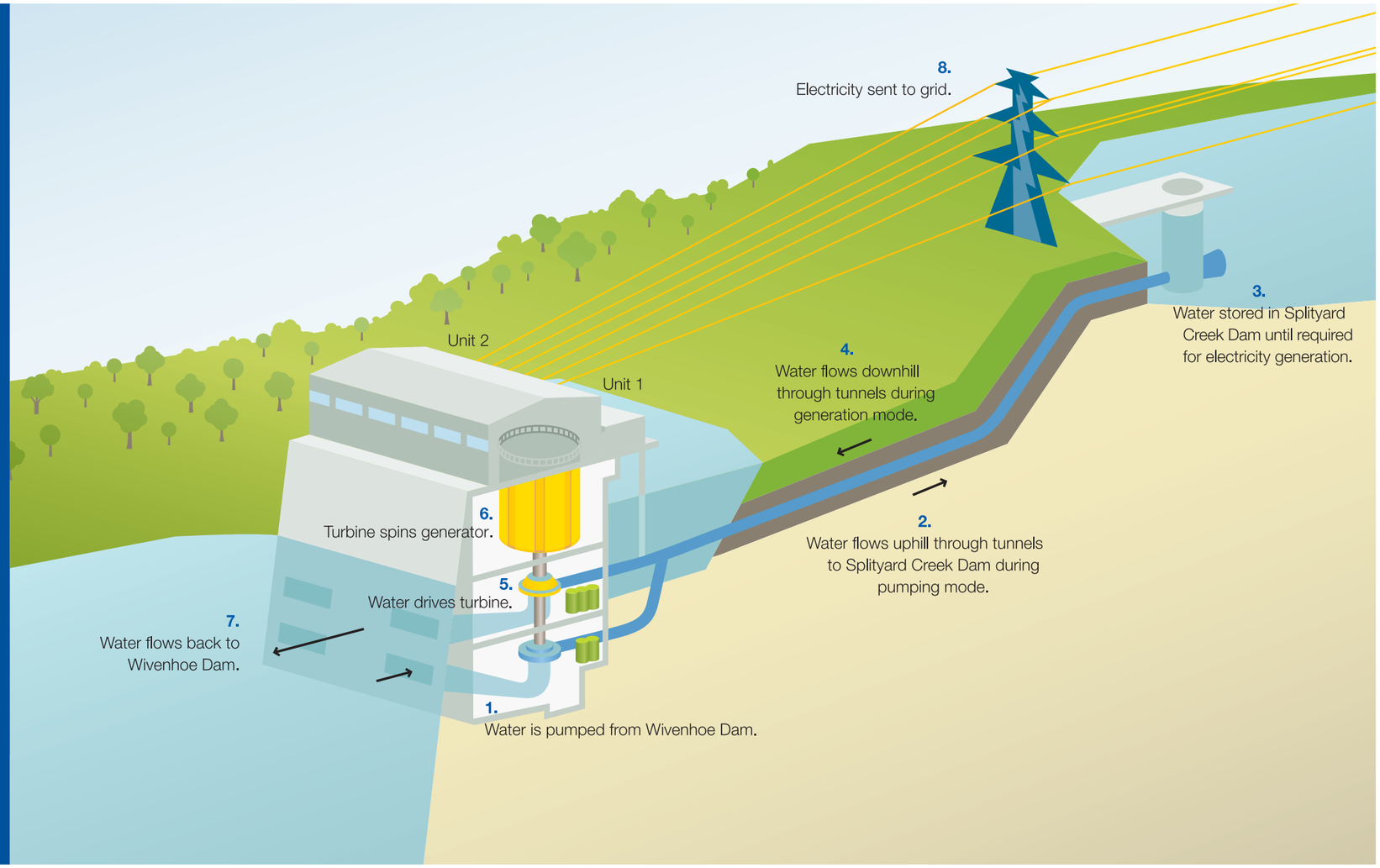
Electricity generation at Wivenhoe Power Station

The electricity generation process

Electricity is generated, absorbed and stored at Wivenhoe Power Station by cycling water between an upper reservoir (Splityard Creek Dam) and a lower reservoir (Wivenhoe Dam).

1. Using electricity from the grid, Wivenhoe Power Station pumps water from the lower reservoir (Wivenhoe Dam). The two generators in Wivenhoe Power Station double as motors, pumping water the through tunnels into the upper reservoir (Splityard Creek Dam).
2. The two tunnels connecting the lower and upper reservoir are steel and concrete lined, measuring up to 8.5 metres in diameter and are 420 metres long. The pumps at the power station force the water uphill through the tunnels into Splityard Creek Dam.
3. Splityard Creek Dam stores the water that has been pumped from Wivenhoe Dam until it is required for electricity generation. This is how Wivenhoe Power Station is able to store electrical energy. Splityard Creek Dam has a capacity of 23,300 megalitres, which is enough to generate up to 5,000 megawatt hours of electricity.
4. The stored water is released from Splityard Creek Dam downhill through the tunnels to the turbines at the power station.
5. At the power station, the kinetic energy of the water drives the two turbines. Guide vanes control the rate of water flow.
6. The turbine, pump and generator are on the same vertical shaft, rotating as one. The rotation of the turbines spins the generator, producing electricity. Wivenhoe Power Station has the largest hydromachines in Australia, each having a rotating mass of approximately 1,500 tonnes.
7. The water flows back into Wivenhoe Dam, where it will be reused to generate electricity again.
8. Electricity is transported to customers via high voltage transmission lines.



Technical Information

General

Capacity	500 MW (2 x 250 MW)
Units	2
Transmission voltage	275 kV
Fuel	Water
Height of power station	90 metres (up to 60 m is below water level)

Turbine

Type	Hydro
Manufacturer	Toshiba
Pump capacity	207 m^3/s
Mass of rotating parts per unit	1,450 tonnes
Generator speed	120 revolutions per minute

Tunnels

Length	420 metres
Diameter	6.8 – 8.5 metres

Splityard Creek Dam

Storage capacity	23,300 ML
Catchment area	360 ha