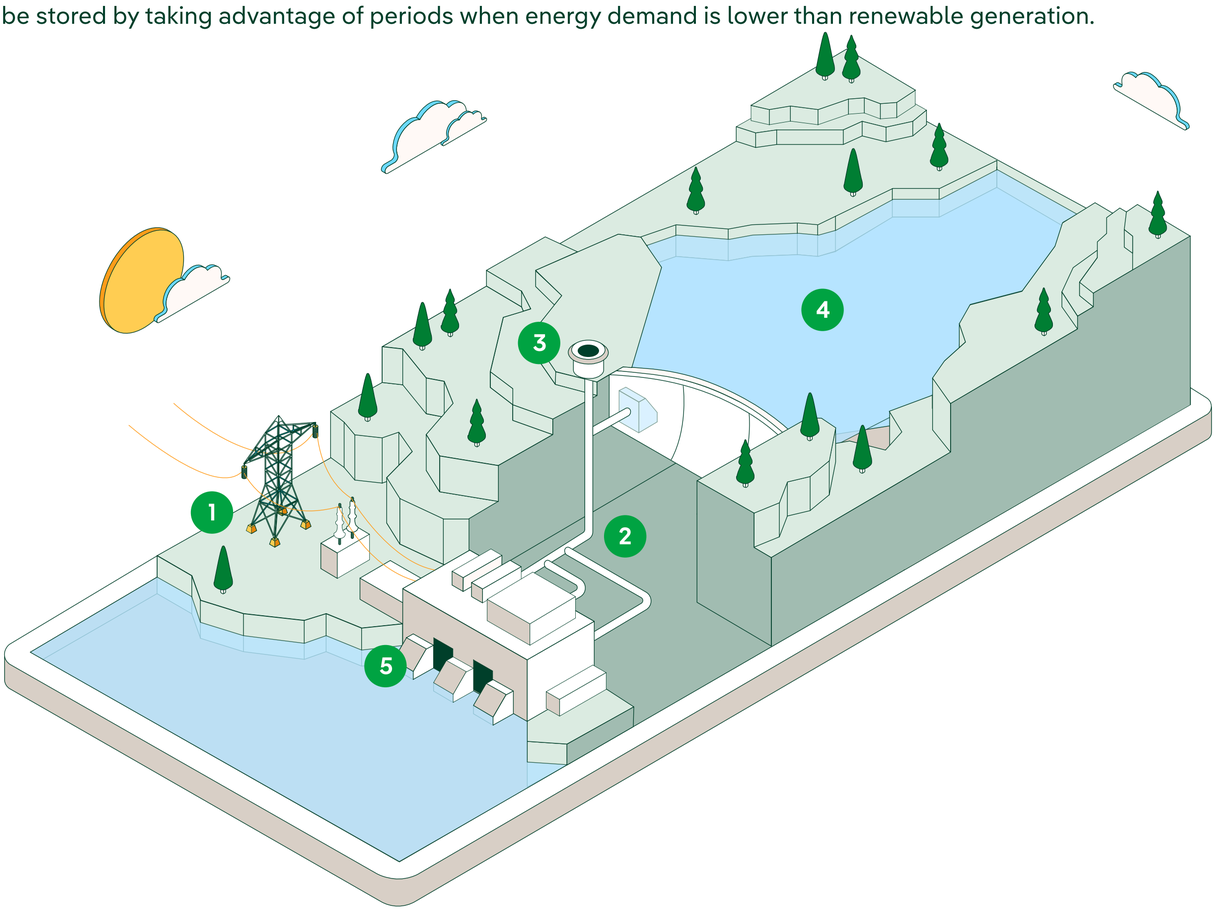
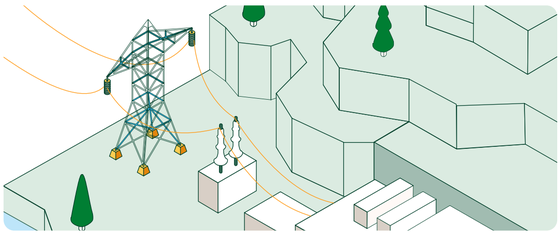
How does a **pumped-storage hydroelectric power plant** work?

Pumped-storage hydroelectric power plants have two reservoirs at different elevations that allow water to be stored by taking advantage of periods when energy demand is lower than renewable generation.



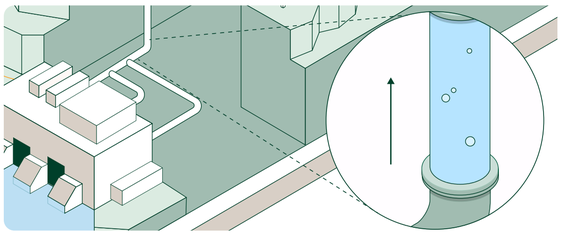
1 Excess renewable energy

When non-dispatchable renewable generation (photovoltaic or wind, which must be consumed when generated) exceeds electrical demand, **the pumped-storage plant begins operating to make use of that surplus energy.**



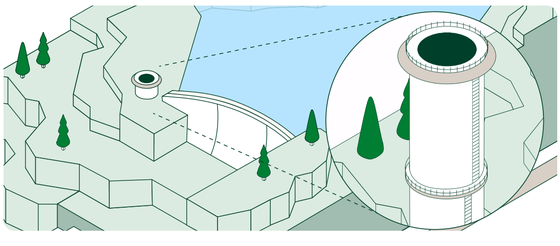
2 Pumping the water

Hydraulic pumps drive water from the lower reservoir up to the upper reservoir through a pressurised pipe and a conveyance tunnel.



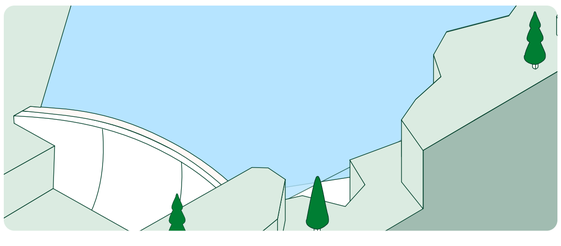
3 Hydraulic system regulation

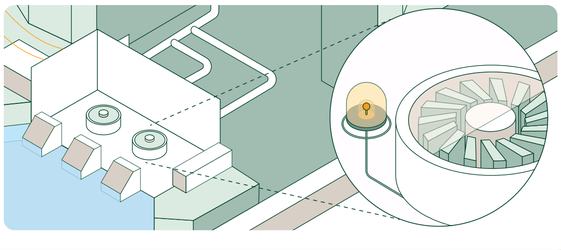
To control water pressure during pumping and avoid overpressure, **some plants feature a surge shaft or pressure-relief valve systems.**



4 Storage in the upper reservoir

The pumped water accumulates in the upper reservoir, which acts as a large store of potential energy ready to be used when electricity generation is required.



5 Ready to generate power

Once the water is stored, the plant can remain idle until the power system needs more energy. **At that point, the flow is reversed and the facility operates like a conventional hydroelectric power plant.**