

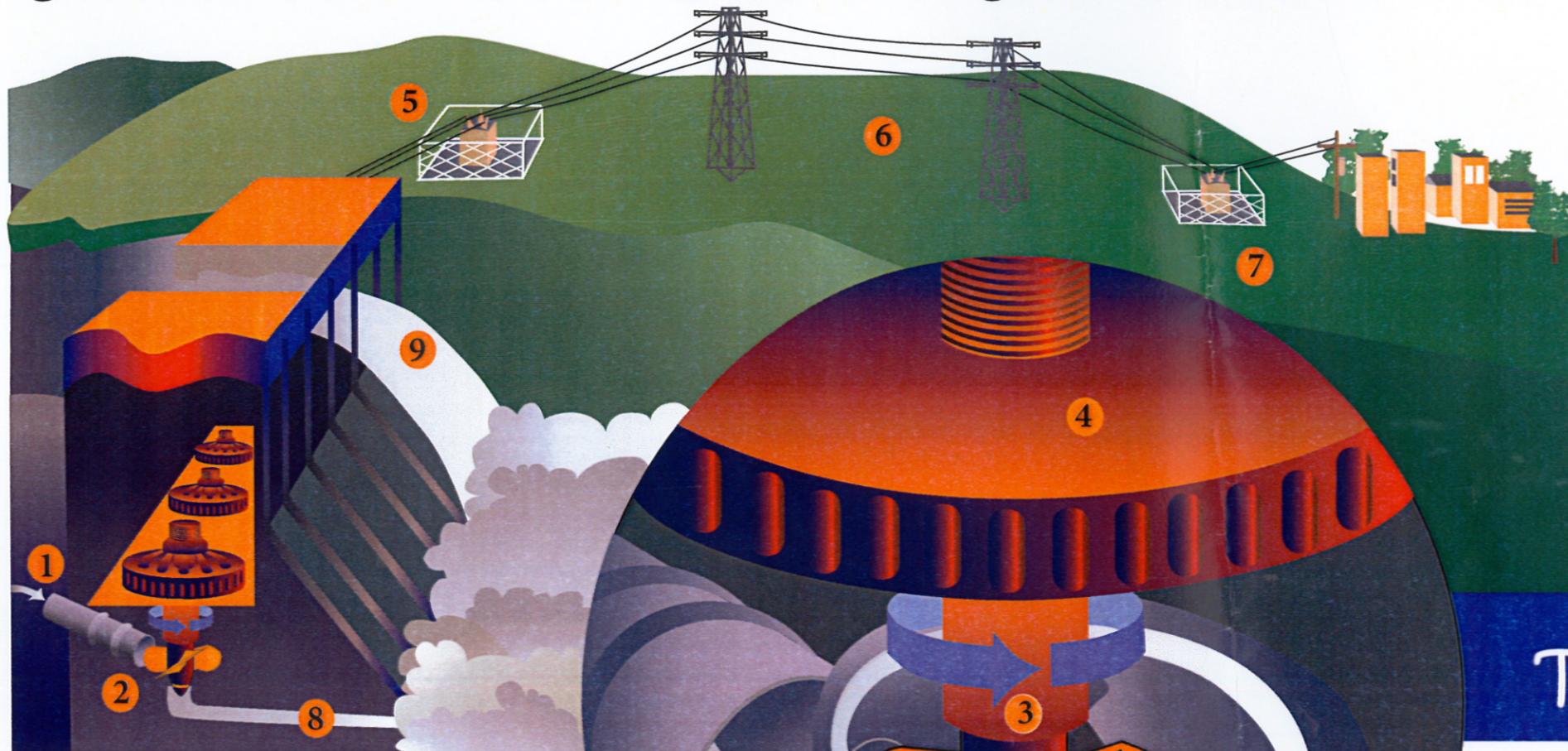
HYDROPOWER

Uses the force of falling water to generate electricity

FWEE
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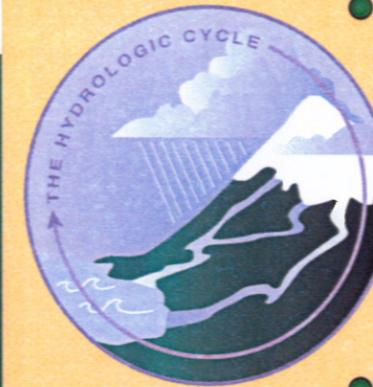


Partnering in the Renewable
Northwest Energy Future



WATER from a river or reservoir flows into a **1 PENSTOCK**, a large pipe above or below ground, that is commonly used to direct the water flow. **2 TURBINE BLADES** are pushed by the force of water exiting the penstock, causing them to transfer the energy of falling water to rotate the shaft. The **3 SHAFT** connects the turbine to the generator, turning at the same speed as the turbine. Inside the **4 GENERATOR**, the spinning shaft turns electromagnets (called a rotor) inside a stationary ring of copper (called a stator), moving electrons to produce electricity. **5 STEP UP TRANSFORMERS** increase the voltage of electricity produced by the generator. **6 TRANSMISSION LINES** carry high voltage electricity to substations in our communities. At **7 SUBSTATIONS** (which house step down transformers), the voltage is decreased. Electricity is then distributed to homes and businesses. **8 WATER FLOW** used to turn the turbines returns to the river. **9 SPILLWAYS** release water downstream that is not directed to the turbines to generate electricity.

The Hydrologic Cycle Naturally Renewable Energy



- Rain and runoff from the snowpack fills rivers and streams.
- Electricity is generated at hydroelectric projects by using the force of falling water.
- Water passes through the turbines and returns to the river.
- The sun draws moisture (evaporation) from the ocean, forming clouds.
- The cycle begins again ...

The Benefits of Hydro

- Hydroelectric projects take an unpredictable resource — rainfall and snowpack—and turn it into a reliable source of electricity.
- Hydropower is a clean, low cost and renewable energy source.
- With normal precipitation, hydropower produces about two-thirds of the Northwest's electricity annually.*
- Hydroelectric projects can also support recreation, irrigation, flood control, transportation and habitat needs.

* Source: Northwest Power and Conservation Council



US Army Corps
of Engineers
Northwestern Division