



# Hydropower

Hydro comes from the Greek word meaning water. **Hydropower** is the energy we make with moving water. Moving water has a lot of energy. We use that energy to make electricity.

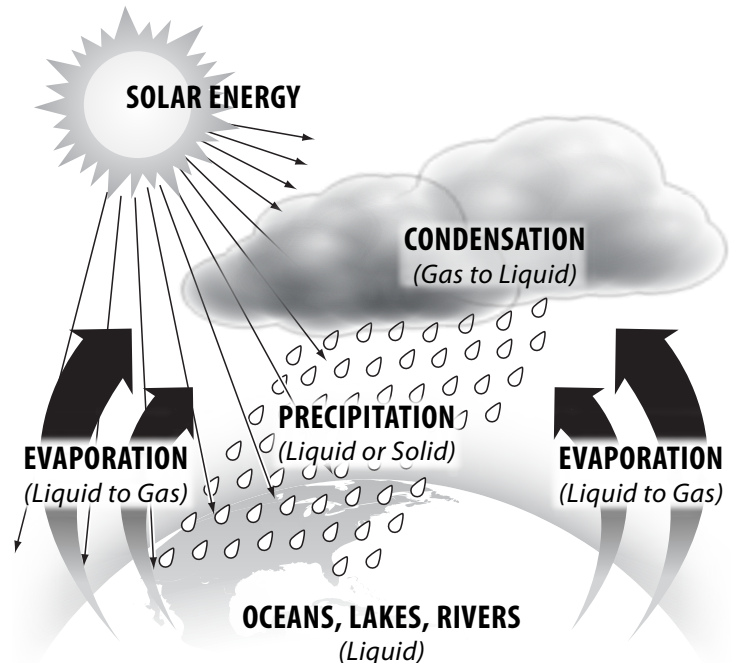
**Gravity**—the force of attraction between all objects—makes the water move. Gravity pulls the water from high ground to low ground. The rain that falls in the mountains flows down the valleys to the oceans.

## Hydropower Is Renewable

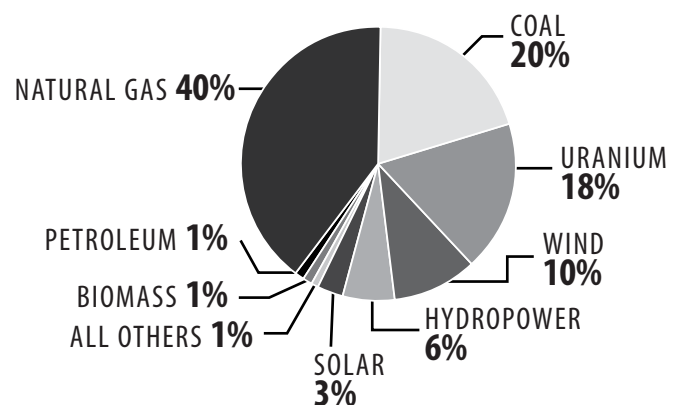
The sun heats the water in the oceans, lakes, and rivers, turning some of it into **water vapor**, a gas, almost like steam. This is called **evaporation**. The water vapor rises and turns into clouds. When it reaches the cold air above the Earth, it turns back into liquid water. This is called **condensation**. The clouds release the water as **precipitation**—rain or snow—that falls to the Earth. The water flows back into rivers, lakes, and the oceans, and the cycle starts again. This process is called the **water cycle**.

The water cycle will keep going forever. The water on Earth will always be there. We won't run out of it. That's why we call hydropower a **renewable** energy source.

### The Water Cycle



### U.S. Electricity Generation by Source, 2022



## People Can Use Hydropower

Early settlers used **water wheels** to grind grain and run sawmills. Factories used water wheels to run their machines. In many countries, water wheels are still used.

Water wheels can use the energy of moving water. A water wheel has buckets around a big wheel. The buckets fill with water at the top of the wheel. The weight of the water turns the wheel and dumps the water at the bottom.

## Moving Water Can Make Electricity

Moving water can be used to make **electricity**. First, a **dam** is built across a river. This stops the water and makes a big lake, called a **reservoir**, behind the dam.

When gates in the dam are opened, water flows down big pipes called **penstocks** and turns giant wheels, called turbines. The **turbines** power **generators** to make electricity. The first hydropower plant was built on the Fox River in Appleton, Wisconsin, in 1882. Today, there are more than 2,500 dams in the United States that make about 6 percent of our electricity.

## Hydropower Is Clean Energy

Hydropower is a clean source of energy. No fuel is burned, so the air is not polluted. It is the cheapest source of electricity because the water is free to use. And because we won't run out of water, it is renewable.

The reservoirs are used for swimming, fishing, boating, and other sports. When dams are built, the reservoirs flood a lot of land. They change the flow of the rivers. Sometimes, fish can't swim up the rivers and lay their eggs like they could before, so dams must create **fish ladders**, elevators, and other devices to help fish move up the river.

