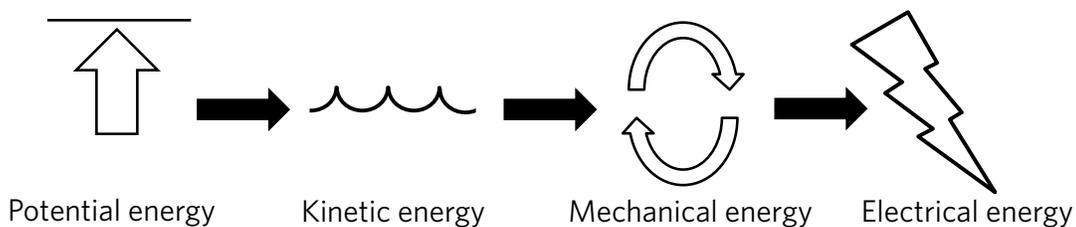




Hydroelectric Power

Hydroelectric power (or ‘hydropower’) uses the energy of moving water to generate electricity. But how exactly can we capture and transform this energy into usable electricity? One of the main ways to do this is by building a dam on a river. By trapping water behind a dam, we can increase the level of the water behind the dam, building up its potential energy. When special gates in the dam are opened, the water—pulled by gravity—flows down through the dam and through turbines connected to a generator. The potential energy of the water is turned into kinetic energy as it flows, and then mechanical energy that turns the turbines. The generator converts the mechanical energy of the spinning turbines into electrical energy that can be transmitted to homes and buildings through transmission lines.



The water reservoirs (lakes and ponds) created behind dams can serve as recreational spaces for people who enjoy fishing, swimming, or boating. The water in these reservoirs can also be used for irrigation in agricultural areas.

Hydropower does not pollute the water nor the air. It also produces no direct carbon dioxide or other greenhouse gases that can cause damage to the climate. However, building a dam on a river can have significant impacts on ecosystems. Some fish species like salmon that migrate seasonally up rivers and streams to spawn are blocked from reaching their spawning destinations by dams¹. The reservoir created behind a dam often floods land that wasn’t originally underwater. In addition to impacting the plants and animals living on this land, this can displace people too.

Hydropower is reliable as long as there is enough available water. During a drought, this can be a problem. And while flowing water is free, building a dam can be expensive. Dams also don’t just trap water, but anything being moved by the river. Sand and rocks can build up behind a dam over time, not only decreasing the amount of water the dam can store and release, but reducing the amount of sand that is carried into the coastal ocean to supply beaches².

¹ [NOAA Fisheries: About Dams & Fish](#)

² [CoastalCare.org: Dams-Cutting Off Our Beach Sand](#)





Weighing the Benefits and Drawbacks of Hydroelectric Power

For a complex problem, we need to evaluate how a solution fares across multiple dimensions:

Benefits

Drawbacks

**Environmental
Factors**

**Social & Cultural
Factors**

**Economic
Factors**



Exploring Energy



Weighing the Benefits and Drawbacks of Hydroelectric Power

For a complex problem, we need to evaluate how a solution fares across multiple dimensions:	Benefits	Drawbacks
Environmental Factors	<ul style="list-style-type: none">Hydroelectric dams do not pollute the water nor air and do not directly produce carbon dioxide.	<ul style="list-style-type: none">Hydroelectric dams can block fish migrations up and downstream.The reservoirs created by dams can flood sensitive and important habitats and ecosystems.Dams can prevent sand from being carried down rivers and out to beaches along the coast.
Social & Cultural Factors	<ul style="list-style-type: none">The reservoirs created by dams can often be used for recreational purposes, like fishing, boating, or swimming.The reservoirs created by dams can often be used for agricultural irrigation.	<ul style="list-style-type: none">Dams can flood land where people are living, forcing them to move elsewhere.
Economic Factors	<ul style="list-style-type: none">Flowing water is a free and renewable source of energy.	<ul style="list-style-type: none">Building a dam can be very expensive.Dams might not be a reliable source of energy when there is a drought.Dams can become less useful over time as the reservoirs fill up with sand and rocks.

Additional resources

KQED News: [California Plumbing: A Mind-Boggling Web](#)

