

U.S. Department of Energy - Energy Efficiency and Renewable Energy Wind and Hydropower Technologies Program

Advantages and Disadvantages of Hydropower

Hydropower offers advantages over other energy sources but faces unique environmental challenges.

Advantages

Hydropower is fueled by water, so it's a clean fuel source. Hydropower doesn't pollute the air like power plants that burn fossil fuels, such as coal or natural gas.

Hydropower is a domestic source of energy, produced in the United States.

Hydropower relies on the water cycle, which is driven by the sun, thus it's a renewable power source.

Hydropower is generally available as needed; engineers can control the flow of water through the turbines to produce electricity on demand.

Hydropower plants provide benefits in addition to clean electricity. Impoundment hydropower creates reservoirs that offer a variety of recreational opportunities, notably fishing, swimming, and boating. Most hydropower installations are required to provide some public access to the reservoir to allow the public to take advantage of these opportunities. Other benefits may include water supply and flood control.

Disadvantages

Fish populations can be impacted if fish cannot migrate upstream past impoundment dams to spawning grounds or if they cannot migrate downstream to the ocean. Upstream fish passage can be aided using fish ladders or elevators, or by trapping and hauling the fish upstream by truck. Downstream fish passage is aided by diverting fish from turbine intakes using screens or racks or even underwater lights and sounds, and by maintaining a minimum spill flow past the turbine.

Hydropower can impact water quality and flow. Hydropower plants can cause low dissolved oxygen levels in the water, a problem that is harmful to riparian (riverbank) habitats and is addressed using various aeration techniques, which oxygenate the water. Maintaining minimum flows of water downstream of a hydropower installation is also critical for the survival of riparian habitats.

Hydropower plants can be impacted by drought. When water is not available, the hydropower plants can't produce electricity.

New hydropower facilities impact the local environment and may compete with other uses for the land. Those alternative uses may be more highly valued than electricity generation. Humans, flora, and fauna may lose their natural habitat. Local cultures



This fish ladder on the Ice Harbor Dam on the lower Snake River provides safe passage for migrating fish.

and historical sites may be impinged upon. Some older hydropower facilities may have historic value, so renovations of these facilities must also be sensitive to such preservation concerns and to impacts on plant and animal life.

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