

The role of hydropower in the Northwest



Hydropower:
clean,
renewable, and
ready when we
need it



Our country's valued energy resource

Hydropower is a clean, truly renewable and reliable energy source that serves national environmental and energy policy objectives. Hydropower accounts for 80 percent of the nation's total renewable electricity generation, making it the nation's leading renewable energy source.

The federal hydropower dams on the Columbia Snake River System have helped to win wars, build industries and make a better life for millions of people. As conservation, biomass, cogeneration, geothermal, wind, coal and nuclear power are all being called upon to meet the growing needs of the region, hydropower remains the most efficient, clean and renewable energy source .

How hydropower works

Hydropower converts kinetic energy from falling water into electricity without consuming more water than is produced by nature. Water entering a powerhouse powers a turbine, which turns a shaft that rotates a series of magnets past copper coils in a generator to create electricity. The water then returns to the river. From the powerhouse, transmission lines carry electricity to Northwest communities.

Hydropower produces firm, base-load energy. But one of the major benefits of hydropower is peaking capacity. Peaking capacity is maximum power production that can be sustained for one hour to meet emergency generation needs.

Hydropower can respond to emergency power needs because it can be turned on and off quickly. Other forms of electricity production, such as coal or gas power plants require a great deal of time to start or stop producing electricity. And solar or wind power may not be available when it is needed.

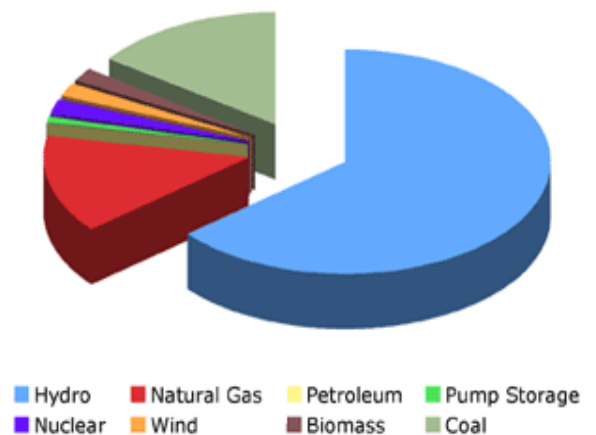
Hydropower in the Pacific Northwest

Hydropower has a very proud tradition in the Pacific Northwest. It plays an integral role in the success of the Northwest by providing power for the region's homes, businesses and industries. It also supports agriculture by providing power for farms and pumping water for irrigation. The hydropower projects in our rivers have also provided effective flood control for Northwest communities, and created new recreational opportunities.

- Up to 70 percent of the region's electricity is generated from hydropower.
- 40 percent of all U.S. hydropower is derived from the Columbia and Snake Rivers.

Since clean, renewable hydropower plays such a significant role in Pacific Northwest power production, many Northwest residents and businesses enjoy lower power bills when compared to other regions of the United States.

Northwest Energy Sources



Source: Northwest RiverPartners

Economic & Environmental benefits

- Water from rivers is a purely domestic resource that cannot be interrupted by foreign suppliers, production strikes or transportation issues.
- Hydropower is responsive in that it can be turned on and off when the need arises.
- Hydropower turbines are capable of converting 90 percent of available energy into electricity, which is more efficient than any other form of generation. Even the best fossil fuel power plant is only about 50 percent efficient. Wind has about 30% efficiency.

The following table shows how hydropower dams on the Snake River compare to other energy sources.

	Four Snake River Dams	Coal Plant	Gas Turbine (Combined Combustion)	Nuclear Plant
Average Annual Power Production*	1191 MW	502 MW	223 MW	877 MW
Peak	3489 MW	590 MW	248 MW	1150 MW

- It would take 2 nuclear, 3 coal-fired, or 6 gas-fired power plants to replace the average annual power produced by the four Snake River dams.
- It would take 3 nuclear, 6 coal-fired, or 14 gas-fired power plants to provide the peaking capacity of the four Snake River dams.

Data from Northwest Power Conservation Council & PNUCC (Pacific Northwest Utilities Conference Committee) * Average Annual: The seventy-year average annual power production

- Hydropower is clean, renewable and does not produce greenhouse gasses or other air pollutants.
- Hydropower is one of the least costly and most environmentally friendly sources of power in the United States.
- Hydropower generates carbon-free electricity, and helps our country to avoid burning fossil fuels, which would release an amount of carbon dioxide equal to the annual exhaust of 62.2 million passenger cars, or half of the cars on the U.S. roads.

Carbon dioxide emitted during energy production

	Coal Plant	Combined Cycle Combustion Turbine
CO2 produced per GW Hour	1012 tons	411 tons
CO2 produced to equal annual power generated by Snake River Dams	10558k tons	4288k tons

Data from Northwest Power Conservation Council & PNUCC (Pacific Northwest Utilities Conference Committee)

Looking toward the future

The region and the nation should continue to maintain and improve the Federal Columbia River Power System's hydropower production capability while meeting the region's fish and wildlife needs. PNWA also supports the designation of hydropower as renewable energy.

PNWA is a regional association representing ports, steamship and towboat operators, grain and forest products shippers, electric utilities and other economic development interests and local government interests in Washington, Oregon, Idaho, Alaska, and California. PNWA addresses federal policy affecting transportation, trade, tourism, energy and the environment before Congress and federal agencies. For additional information, please visit www.pnwa.net.

Data Sources: Hydropower Association, Bonneville Power Association, Pacific Northwest Utilities Conference Committee, Northwest RiverPartners, Northwest Hydroelectric Association, National Hydropower Association