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# About HYDROELECTRICITY

## HOW HYDROELECTRICITY IS GENERATED

Providing about 7% of all renewable energy in the U.S., and about 11% of New Hampshire's electricity, hydroelectric power is generated by a reusable force of water—rivers, oceans, even reservoir-to-reservoir—that drives a turbine in a hydroelectric plant. The turbine then turns a generator rotor, which converts the energy into electricity.

The amount of power produced depends on the volume of water, as well as the difference in height between the water source and the water's outflow at the hydroelectric facility. This difference is known as the "head." Dams, which store water for release as power needs arise, typically create the head from which water flows. The higher the head, the faster the water falls and the more force it exerts on the turbine blades. Flowing through a pipe (or penstock) from the reservoir behind the dam to the turbine at the hydroelectric plant, the force of water on the turbine's blades turns the rotor on the generator, producing electricity.

As a reusable energy source in longer rivers, water exiting one plant is commonly used again by another hydroelectric plant downstream.

## TRANSMITTING CANADIAN HYDRO POWER TO NEW HAMPSHIRE HOMES

With installed capacity and available supply totalling more than 40,000 megawatts (MW) of renewable power—more than all of New England's power plants combined—the Hydro-Québec system includes 62 hydroelectric-generating stations, 27 reservoirs, more than 668 dams and control structures. Less than 2 percent of its energy is produced at wind, thermal, and nuclear power facilities. The system will provide 1,000 MW of electricity to New England, helping to significantly reduce the region's greenhouse gas emissions.

For The Northern Pass project, a direct current (DC) transmission line will link Hydro-Québec's vast power-generating system to New Hampshire's electricity grid, passing through a converter terminal that will convert DC power to AC (alternating current) for use in home and industry.

## A NEW CHAPTER IN HYDROELECTRIC HISTORY

In New Hampshire, forms of hydroelectric technology have been in use for many years, most prominently as power sources for lighting and production at textile, grain, and paper mills— including the Amoskeag station on the Merrimack River to power Manchester's mills in the 1920s and the Dodge Falls station in Bath to power a paper mill across the Connecticut River in Ryegate, VT. In the 1930s, Berlin was the first community in the state to have electric street lights, thanks to power generated by a hydroelectric power station at the Furbish Forest Fiber Mill.

Although many of the mills have long since closed, small-scale hydroelectricity generation continues to this day as part of the region's renewable energy efforts. In general, while these smaller systems can generate small amounts of clean power for a localized use, the Northern Pass project promises to provide clean hydroelectric energy to thousands of users in New Hampshire and beyond.

## SOURCES


U.S. Energy Information Administration **http://www.eia.gov/state**

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City of Berlin, NH **www.berlinnh.gov**

Power Plants Around the World **www.industcards.com/ppworld/htm**

Québec Hydropower: Energy for the Future **www.hydroforthefuture.com**


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