

Hydropower

Summary

Hydropower accounts for a significant portion of the nation's electricity supply and is an abundant source of renewable energy. Because the fuel (water) that turns the turbines to make electricity in a hydroelectric plant is essentially free, the cost of operating a hydropower facility is relatively low compared to other sources. There is a huge opportunity to develop additional hydropower resources throughout the nation, much of that at existing dams. There is also a wide and growing array of hydropower technologies and projects that have the potential to further increase this reliable, low-cost, non-emitting domestic source of energy. However, realizing the full potential of the United States' hydropower assets cannot be done without modernizing the processes for licensing and relicensing projects.

Background

Hydropower makes up a large portion of the nation's source of emissions-free, renewable energy, accounting for 36 percent of domestic renewable generation and 7 percent of total electricity generation according to the most recent Energy Information Administration data from 2020. It is a reliable source of energy, being available most of the time, unlike some other renewable resources. Furthermore, hydroelectric generators can be started or stopped quickly, which makes them more responsive than most other energy sources for meeting demand for electricity at its "peak" or highest volume. These units also often have "black start" capability that makes them especially valuable in restoring power when there are widespread outages or disruptions on the system—this capability allows the generating units to cycle back on quickly if they have been tripped off in a power outage. Given these characteristics, hydropower plays a significant part in ensuring reliable, zero-emissions electric service at low-cost.

Most dams were built decades ago for purposes other than power generation, such as for flood control, crop irrigation, or storage of municipal water supplies. There is substantial poten-

tial for adding renewable electric generation to non-powered dams: only three percent of the country's approximately 80,000 dams currently have facilities that generate electricity. Analysts at the Oak Ridge National Laboratory found that 12,000 megawatts (MW) of new, emissions-free hydropower can be generated at non-powered dams throughout the country.¹ Also, there is potential to dramatically increase the hydropower output in existing municipal, industrial, and agricultural water distribution conduits/canals in the U.S. This untapped potential could significantly increase the more than 101,865 MW of hydropower capacity currently operating in the U.S.² The modernizing of existing hydroelectric generation equipment to increase its capacity is also one of the most near-term, cost-effective, and environmentally friendly means of developing additional hydropower.

Other forms of hydropower can also be developed or further developed in the U.S. as well, including pumped storage, hydrokinetic turbines, tidal, and wave technologies.

The Licensing Process

The Federal Energy Regulatory Commission (FERC or Commission) is the primary federal agency responsible for the licensing and relicensing of non-federal hydroelectric projects. In issuing a license, FERC is required under the Federal Power Act (FPA) to give equal consideration to electric generation; fish and wildlife; water quality and supply; navigation; and recreation impacts of a project.

Resource agencies, such as the U.S. Fish and Wildlife Service, Bureau of Land Management, National Marine Fisheries Ser-

1 Hadjerioua, Boualem. 2012. An Assessment of Energy Potential at Non-Powered Dams in the United States. Report prepared for the U.S. Department of Energy Wind and Water Power Program. Oak Ridge National Laboratory. Retrieved from https://www.energy.gov/sites/prod/files/2013/12/t5/npd_report_0.pdf

2 2020 Energy Information Administration (EIA) data.

vice, and others, play a significant role in the licensing process as well. These agencies can require mandatory conditions that must be met for the project to proceed, which FERC cannot reject regardless of cost, impact, or whether the condition is directly relevant to the project. In some cases, the economic impacts of these mandatory conditions have stopped the development of projects.

The current licensing process constitutes a significant impediment to the development of new hydropower facilities and the relicensing of existing facilities. This is especially true for small hydropower projects. While it is appropriate to consider the broad array of potential impacts of a hydropower project, FERC must be given more authority to weigh costs and benefits and to impose timelines for resource agencies to weigh in. House Energy & Commerce Committee Ranking Member Cathy McMorris Rodgers (R-WA) introduced on March 3, 2021, H.R. 1588, the Hydropower Clean Energy Future Act. Similar to legislation (H.R. 3043) sponsored by Representative McMorris Rodgers in the 115th Congress that was approved by the House in 2017, H.R. 1588 would modernize the hydropower licensing process and affirm the role of hydropower as an essential renewable resource. APPA supports Ranking Member McMorris Rodgers' efforts to improve the hydropower licensing process. Modernizing and streamlining the licensing process is urgently needed: 281 licenses representing 13 gigawatts of power will expire by 2030.³

Congressional & Regulatory Action

H.R. 3684, the Infrastructure Investment and Jobs Act, that was signed into law by President Biden in November 2021, contains several important hydropower provisions in subtitle D supported by APPA:

- **Sec. 40331. Hydroelectric Production Incentives.** This section authorizes \$125 million for hydroelectric production incentives under section 242 of the Energy Policy Act of 2005 (42 U.S.C. 15881) and raises the payment limit per facility from \$750,000 to \$1 million.
- **Sec. 40332. Hydroelectric Efficiency Improvement Incentives.** This section authorizes \$75 million for hydroelectric

efficiency improvement incentives under section 243 of the Energy Policy Act of 2005 (42 U.S.C. 15882) and raises the payment limit per facility from \$750,000 to \$5 million.⁴

- **Sec. 40333. Maintaining and Enhancing Hydroelectricity Incentives.** This section creates a new grant program (section 247 of the Energy Policy Act of 2005) that authorizes \$553,600,000 in funding to make incentive payments to the owners or operators of qualified hydroelectric facilities for capital improvements directly related to supporting grid resiliency, improving dam safety, and environmental enhancements. Incentive payments are limited to 30 percent of the cost of the capital improvement and only one incentive payment of no more than \$5 million can be made to a single qualified project per year.

On June 24, 2021, Senators Maria Cantwell (D-WA) and Lisa Murkowski (R-AK) introduced S. 2306, the Maintaining and Enhancing Hydroelectric and River Restoration Act of 2021. The bill would create a 30 percent tax credit to support upgrades at existing hydroelectric dams for qualified dam safety, environmental, and grid resilience improvements. Notably, this credit would be available as a direct payment to public power utilities (see APPA issue brief, "The Need for Direct Payment of Refundable Tax Credits for Public Power"). The bill would also create a 30 percent tax credit for the removal of obsolete river obstructions (powered and non-powered). The dam removal provisions do not apply to federal hydropower and must be done with the consent of the dam owner.

Senate Finance Committee Chairman Ron Wyden (D-OR) included a pared down version of the hydro tax credit in S. 2306 in the updated text of the tax title of the Build Back Better Act currently pending in Congress. Chairman Wyden's draft includes a provision establishing an investment tax credit (ITC) for five years for "hydropower environmental improvements" at existing hydropower facilities, defined to include investments to improve fish passage, water quality, and habitat maintenance. Importantly, this credit would be available to public power via "direct pay." Moreover, the draft includes the full value of the production tax credit for building new hydropower at existing dams, marine energy, and other incremental new hydropower, extended for ten years.

³ Pacific Northwest National Labs: An Examination of the Hydropower Licensing and Federal Authorization Process (2021).

⁴ Sections 242 and 243 of the Energy Policy Act of 2005 created two DOE programs that encourage utilizing existing dams for power generation: Section 242 created a hydropower production incentive program to spur new development on existing infrastructure (non-powered dams and conduits) and section 243 created a program to encourage efficiency improvements at existing hydropower facilities. Section 243 never received any appropriations and section 242, although originally authorized in 2005, did not receive appropriations until 2014. Both programs were reauthorized through FY 2036 in section 2005 of the Energy Act of 2020, which passed as part of the Consolidated Appropriations Act of 2020 in December.

APPA Position

APPA applauds the inclusion of incentives for hydropower production and improvements in the Infrastructure Investment and Jobs Act. The association urges Congress to include in the Build Back Better Act the full 30 percent tax credit to support upgrades at existing hydroelectric dams for qualified dam safety, environmental, and grid resilience improvements, with direct pay for public power, as delineated in S. 2306 by Senators Cantwell and Murkowski bill.

APPA strongly supports congressional action to cut the lengthy, duplicative, and at times, contradictory regulatory processes for relicensing existing hydropower projects. Provisions that should be included in comprehensive licensing reform include: (1) requiring all resource agencies with mandatory conditions for a facility to work together under the designated schedule thereby reducing waste, improving decision-making, and reducing the potential for conflict; (2) requiring resource agencies to clearly define the objective of each mandatory condition with an accompanying rationale and disclosure of impacts in an open and transparent manner, thereby adhering to the same standard of disclosure and explanation required of the licensee and other parties submitting mandatory conditions; and (3) streamlining the multi-agency inefficiencies associated with hydropower development at federal projects.

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