
Incorporating Small-Scale Hydropower Projects into Our Energy Future

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Hydropower is the largest source of renewable energy in the United States. Yet current domestic capacity represents only a fraction of the hydropower resources that could be developed. In fact, a recent Department of Energy study found that there may be enough untapped potential to double hydropower production across the country, and particularly in western states. U.S. Dept. of Energy, *New Stream-reach Development: A Comprehensive Assessment of Hydropower Energy Potential in the United States* (April 2014), available at http://nhaap.ornl.gov/sites/default/files/ORNL_NSD_FY14_Final_Report.pdf.

Hence, it should not be surprising that hydropower has experienced a renaissance aimed not only at installing generators at existing hydropower plants but also developing new hydropower projects. Small hydropower facilities that produce 1 to 20 megawatts (MW) of power have become especially attractive to lawmakers and developers alike because these projects use low-impact designs that have minimal cost and environmental impact compared to conventional hydropower facilities.

Unfortunately, until recently, hydropower development has been hindered by burdensome regulations. The end-of-the-twentieth-century hydropower boom was met with additional regulations to address environmental concerns expressed in the 1980s and 1990s regarding dams. The breadth and complexity of those regulations and uncoordinated agency involvement made hydropower licensing time-intensive and costly for developers.

In the past few years, however, lawmakers have worked to ease federal regulations and streamline requirements to promote the development of hydropower's untapped potential. In 2013, small-scale hydropower received a regulatory makeover when Congress unanimously passed two laws, the Hydropower Regulatory Efficiency Act (Pub. L. No. 113-23 (HREA)) and the Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act (Pub. L. No. 113-24 (Hydropower Development Act)) (collectively, 2013 Hydropower Acts or Acts). Signed into law on August 9, 2013, the Acts have paved the way for additional small-scale hydropower development by streamlining the federal regulatory approval processes.

HREA expedited the Federal Energy Regulatory Commission's (FERC) process for approving hydropower projects. In relevant part, the Act: (1) exempted hydropower projects with

a capacity of 10 MW or less from FERC licensing requirements; (2) directed FERC to explore the feasibility of a two-year licensing process for adding hydropower to existing dams and closed-loop pumped storage projects; and (3) promoted conduit hydropower by not requiring FERC licensing for "qualifying conduit hydropower projects." Qualifying conduit hydropower facilities are projects with an installed capacity of five MW or less that use existing water conveyance infrastructure—such as canals, irrigation ditches, aqueducts, and pipelines—that are primarily operated to distribute water for agricultural, municipal, or industrial consumption rather than to generate electricity. The Act's promotion of conduit hydropower was a particularly important legislative change for Rocky Mountain States, allowing FERC to grant exemptions for "qualifying conduit projects" and for conduit projects using infrastructure primarily operated for the distribution of water for agricultural, municipal, or industrial consumption, with an installed capacity of 40 MW or less. See Debbie A. Swanstrom & Andrea I. Sarmentero Garzón, *New Laws Promote Development of Small Hydropower Projects*, 2 Energy & Nat. Resources Litigation Committee 9, 9–11 (Dec. 2013).

The Hydropower Development Act changed the Bureau of Reclamation's permitting process for non-federal hydropower projects at Bureau of Reclamation facilities. The Act transferred licensing authority at Bureau of Reclamation conduit facilities from FERC to the Bureau of Reclamation. In addition, the Hydropower Development Act authorized the Bureau of Reclamation to develop all of its conduit facilities for non-federal development through a Lease of Power Privilege (LOPP), which was previously only available to Bureau of Reclamation facilities authorized for hydropower. The Act also required the Bureau of Reclamation to offer conduit hydropower development opportunities to local project operators, such as irrigation districts or water user associations, ahead of other private developers. Finally, the Hydropower Development Act granted LOPP projects a categorical exclusion from the environmental impact statement (EIS) requirement of the National Environmental Policy Act of 1969 (42 U.S.C. §§ 4321, *et seq.*). This exclusion codified an existing guidance determination in Bureau of Reclamation's LOPP Directives and Standards (D&S). This increased the certainty of the EIS exclusion for hydropower developers, and will incentivize new project development because it will save project proponents millions of dollars and years of time. See Swanstrom & Garzón, *supra*.

Together, HREA and the Hydropower Development Act aimed to reduce the cost of obtaining permits and remove some of the regulatory obstacles that hindered the development of small-scale hydropower. Hydropower developers responded by preparing and submitting projects to FERC

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and the Bureau of Reclamation that attempted to qualify for streamlined review.

Federal Agencies Respond to the 2013 Hydropower Acts

Since enactment of the 2013 Hydropower Acts, FERC and the Bureau of Reclamation have approved numerous new hydropower projects. The agencies have also refined their guidance, regulations, and policies to provide additional clarification and remove uncertainty. Consequently, more projects are being developed and approved in a shorter time frame.

Enacted in 2013, the Hydropower Regulatory Efficiency Act and the Hydropower Development Act have paved the way for additional small-scale hydropower development by streamlining the federal regulatory approval processes.

As of December 3, 2015, FERC has received seventy-one notices of intent to construct qualifying conduit hydropower facilities since enactment of HREA, sixty-three of which are located in western states. FERC, *Notice of Intent to Construct Qualifying Conduit Hydro Facilities*. Of these, FERC determined that fifty-seven qualify, and two more are pending approval. *Id.* In addition, FERC issued (1) licenses for twenty projects with a capacity of 10 MW or less (seven in western states); (2) one non-conduit exemption for a facility less than 10 MW; and (3) two conduit exemptions for facilities with a capacity of 10 MW or less (both of which are in western states). FERC, *Small/Low-Impact Hydropower Projects Active Licensing and Exemptions*. Since enactment of the Hydropower Development Act, eleven Bureau of Reclamation LOPPs have been initiated, and at least two in the West are already online. U.S. Department of Interior, Bureau of Reclamation, *Bureau of Reclamation Renewable Energy Update, Fiscal Year 2015, Q3* (July 2015).

In Order No. 800 issued on September 18, 2014, FERC amended its regulations to comply with HREA. *Revisions and Technical Corrections to Conform the Commission's Regulations to the Hydropower Regulatory Efficiency Act of 2013*, Order No. 800, 148 FERC ¶ 61,197 (2014). HREA and Order No. 800 work together to offer an easier regulatory path for developers of small hydropower projects. FERC has also clarified outstanding legal questions over the last two years. For instance, FERC determined the applicability of HREA's qualifying conduit provisions when reviewing the proposed Soldier Canyon

Filter Plant Micro Hydro Facility near Fort Collins, Colorado. *Soldier Canyon Filter Plant*, 151 FERC ¶ 61,228 (2015). FERC initially found that the project did not qualify for exclusion because the proposed facility was relying on the hydroelectric potential created by Horsetooth Reservoir rather than the conduit alone. On rehearing, FERC reversed course, determining that a qualifying small conduit hydropower project may be excluded from FERC jurisdiction if it utilizes the hydropower potential of a dam as long as the dam is not integral to the small conduit project. *Id.* This order clarified the meaning of "qualifying conduit hydropower facilities" in HREA, and thereby opened the license exclusions to conduit projects that take advantage of additional potential energy created by dams.

In a unanimous June 18, 2015, ruling, FERC interpreted statutory text to improve economic prospects for small-scale hydropower projects. In the ruling, FERC found that the Delta-Montrose Electric Association (Electric Association) and forty-three other electric cooperatives had the right and obligation to purchase electricity directly from "qualifying conduit hydropower facilities" above caps set in long-term power supply contracts. *Delta-Montrose Elec. Ass'n*, 151 FERC ¶ 61,238 (2015). By allowing the Electric Association and other cooperatives like it to contract directly with conduit hydropower providers, the FERC ruling creates a market for power produced by local, small-scale hydro plants.

The Bureau of Reclamation likewise has taken steps to bring its internal policies into line with the Hydropower Development Act. In February 2014, the Bureau of Reclamation revised the initial 2012 LOPP D&S to incorporate the process requirements mandated by the Hydropower Development Act. The Bureau of Reclamation published the revised D&S in September 2014. U.S. Department of Interior, Bureau of Reclamation, *Reclamation Manual, Directives and Standards, Lease of Power Privilege (LOPP) Processes, Responsibilities, Time-lines, and Charges*, FAC 04-08 (2014).

In summary, federal agency interpretations and policies issued in response to the 2013 Hydropower Acts have been supportive of the development of additional small hydropower. Agency actions in general have made the federal approval process easier to navigate and faster to complete. Implementation of the Acts is ongoing, and to date, the agencies have furthered the legislative goal of streamlining federal small hydropower approvals. However, federal action alone may be insufficient for hydropower to realize its full potential because hydropower developers may be required to consult with various state agencies as part of the federal regulatory process.

Initial Results of the 2013 Hydropower Acts in Rocky Mountain States

New hydropower development in response to the recent federal legislative and executive encouragement varies by state. The Acts have created momentum in at least one western state to take parallel steps to streamline hydropower development in state statutes and regulations, and another state has updated its renewable energy standards to be more inclusive of new, small hydropower projects. Other states, however, have not enacted new laws to enable small hydropower, and the success of new, small hydropower projects in these states has been varied.

Colorado has long been at the forefront of hydropower development. The world's first hydropower generating station

was engineered in 1891 near Telluride, Colorado, by Nikola Tesla. In the years leading up to the 2013 Hydropower Acts, Colorado had already attempted to minimize barriers to hydropower. In August 2010, the Colorado Energy Office signed a memorandum of understanding with FERC to create a streamlining program for small, low-impact hydropower projects in Colorado. Memorandum of Understanding between FERC and the State of Colorado through the Governor's Energy Office to Streamline and Simplify the Authorization of Small Scale Hydropower Projects (Aug. 2010). FERC agreed to review projects promptly after Colorado compiled the necessary paperwork and prescreened the projects to ensure they qualified for the 5 MW licensing exemptions in the Federal Power Act. While the agreement coordinated state and federal processes, it still required the state agency to act first, and the time and financial commitments for project proponents to comply with applicable regulations remained substantial.

Colorado lawmakers have been supportive of streamlining state-level approval processes as well. In 2014, the Colorado legislature passed a law that streamlined state agency review and permitting of small hydropower projects by synchronizing state processes with federal review. House Bill 14-1030 directed the Colorado Energy Office to facilitate parallel project review by state agencies on a time line consistent with federal agency time lines. 2014 Colo. Sess. Laws 1177 (West). The bill also streamlined the electrical inspection process by citing National Electrical Code standards that electricians should follow when installing small hydropower systems. This streamlining is substantial: the applicant for a "non-controversial" project—one for which no entity contests the facility's compliance with the qualifying conduit hydropower facility criteria—potentially can gain approval from both state and federal agencies simultaneously in only sixty days.

Developers in Colorado have taken advantage of these changes to federal and state hydropower laws. FERC has already approved ten qualifying conduit hydropower facilities in the state, and an additional project is pending. Shortly after the Hydropower Efficiency Act passed, the San Juan County Historical Society in Silverton, Colorado, applied for a FERC license for its Mayflower Mill hydropower project to generate 11 kilowatts (kW), enough power to offset the Mill's \$600-a-month electricity bill and sell surplus to the San Miguel Power Association. FERC approved the project in October 2013, making it among the first in the nation to qualify for the exclusion from federal permitting requirements under HREA. *San Juan County Historical Society*, 78 Fed. Reg. 61,958 (Oct. 8, 2013). In addition, since enactment of the Hydropower Development Act, two LOPP projects are now online—the Delta-Montrose Electric Association's 3.5 MW South Canal facility and Tri-County Water Conservancy District's 7 MW generator addition to Ridgway Dam.

In addition to the legislative and regulatory streamlining, the Colorado Supreme Court recently eliminated a perceived water law barrier to hydropower development under Colorado's prior appropriation system. In a June 2015 decision, *Frees v. Tidd*, the court held that a junior hydropower right holder could use water diverted pursuant to its neighbor's senior water right for a hydropower unit as long as the senior rights holder was not injured. *Frees v. Tidd*, 349 P.3d 259 (Colo. 2015). The Tidds were awarded a junior water right to install a micro-hydropower generator in the Frees' irrigation ditch where it crossed their land. The Tidds would complete the delivery

of the Frees' water after using it for generation. Before the decision, a new conduit hydropower right holder on an overappropriated (water short) stream might have been limited to the irregular and meager water supply available under the junior water right, making a hydropower project less economically viable. *In re Application of Hines Highlands Ltd. P'ship*, 929 P.2d 718, 724 (Colo. 1996) (generally discussing curtailment of junior water users at times when senior water users need water and that junior water users may only divert water when senior water users are satisfied). *Frees* appears to have enhanced the economic feasibility of small hydropower projects in Colorado because it allows new hydropower rights to access the reliable, predictable flows previously believed to be available only to more senior water rights holders. However, *Frees* also requires no injury to the senior water right owner, and this requirement may limit the scope of projects that can take advantage of the ruling. *Frees*, 349 P.3d at 263.

Despite these successes, small hydropower facilities in Colorado still have obstacles to overcome. For example, even as the City of Aspen became the third U.S. city to rely exclusively on renewable energy, it faced community resistance to a small hydropower project within city limits and ultimately decided not to complete the project. Allen Best, *Hydro Energy Divides Aspen* (June 9, 2013). Despite this setback, a number of new hydropower bills will be up for consideration during the Colorado legislature's 2016 session, indicating that the trend line in Colorado remains positive for the development of small hydropower.

The Hydropower Development Act categorically excluded LOPP projects from the EIS requirement of the National Environmental Policy Act, which will incentivize new project development by saving proponents millions of dollars and years of time.

Idaho is another success story following enactment of the 2013 Hydropower Acts. Although Idaho does not have a renewable portfolio standard, hydropower has long been a major component of Idaho's energy generation portfolio. In fact, 60 percent of net electricity generation was produced by hydroelectric power in 2014. U.S. Energy Information Administration, *Idaho State Profile and Energy Estimates*. While the 2009 Idaho Hydropower Task Force identified opportunities for the state to streamline state hydropower licensing, the 2013 Hydropower Acts further opened the door for new projects in the state. Compare Idaho Strategic Energy Alliance, *Hydropower Task Force Report* (May 2009). FERC has approved six

qualifying conduit hydropower facilities in Idaho as a result of HREA. Only months after the passage of the Hydropower Efficiency Act, FERC granted final approval to exclude Sandpoint Idaho's 65 kW Little Sand Creek project on city water treatment plant pipeline. *City of Sandpoint, Idaho*, 78 Fed. Reg. 53,752 (Aug. 30, 2013). Another project, the North Side Canal Company's 1.28 MW generating facility on the Main Canal north of Jerome Butte—exempted pursuant to HREA—took only two years from concept to completion. Mychel Matthews, *North Side Canal Installs Hydropower Plan*, Twin Falls Times-News (Feb. 18, 2015).

As in Colorado, some proposed projects in Idaho have been unable to move forward. Recently, FERC released a draft EIS on the Bear River Narrows Project in Franklin County, Idaho, that recommended denial of a license. FERC cited the loss of 425 acres of wildlife habitat and 4.5 miles of the Bear River as its primary reasons for denial. FERC, *Draft EIS for the Bear River Narrows Hydroelectric Project*, P-12486-008 (Sept. 30, 2015). Project proponents, who have been working on the 10 MW powerhouse for the past ten years, will continue to seek FERC's approval in the coming months. The FERC Draft EIS shows that HREA preserved aspects of the environmental review process and indicates a federal attempt to rebalance, rather than completely restructure, federal hydropower regulation.

Under Colorado's 2014 legislation that streamlined state approval processes, non-controversial hydropower projects may potentially gain both state and federal agency approval simultaneously in only 60 days.

Hydropower accounts for approximately 36 percent of electricity generation in Montana, and the state's renewable portfolio standard recently has been amended to encourage small hydropower. Specifically, the standard allows renewable portfolio credit for power from hydroelectric projects of 10 MW or less and hydroelectric projects up to 15 MW installed at an existing reservoir or irrigation system that did not have hydroelectric generation as of 2009. After enactment of the 2013 Hydropower Acts, the Montana state legislature passed Senate Bill 45 in October 2013 to allow forthcoming expansions to existing hydroelectric projects that increase generation capacity to qualify as an eligible renewable resource. Accordingly, there has been substantial interest in LOPP projects since the enactment of the Hydropower Development Act. Over the past two years, five Montana projects have been initiated and are either in the preliminary stage or have submitted requests for development. These projects embrace

facilities with capacities of 700 kW to 9 MW.

Despite a Wyoming senator's cosponsorship of one of the Acts, the 2013 Hydropower Acts have not resulted in the same momentum in Wyoming as in Colorado, Idaho, or Montana. In 2011, the Bureau of Reclamation's Power Resources Office identified seventeen potential hydropower sites on reservoir dams, diversion dams, and canals in Wyoming with a potential to generate 47,187 megawatt-hours (MWh) of electricity annually at existing Bureau of Reclamation facilities. U.S. Department of Interior, Bureau of Reclamation, Office of Power Resources, *Hydropower Resource Assessment at Existing Reclamation Facilities* (2011). The next year, the Bureau of Reclamation identified capacity and generation potential in thirteen western states, and the most identified sites were located in Wyoming. Specifically, the study identified 121 canal sites in Wyoming with a potential installed capacity of 23,460 kW and annual energy generation of 82,548 MWh. U.S. Department of Interior, Bureau of Reclamation, Office of Power Resources, *Site Inventory and Hydropower Energy Assessment of Reclamation Owned Conduits: Supplement to the "Hydropower Resource Assessment at Existing Reclamation Facilities Report"* (2012). After the completion of these two studies, Wyoming's untapped hydropower potential at Bureau of Reclamation facilities alone was determined to be over 129,000 MWh. In total, Wyoming's estimated untapped hydropower potential from small hydropower is over 540 MW of generation capacity.

Since the passage of the 2013 Hydropower Acts, only one notice of intent to construct a "qualifying hydropower facility" has been submitted from Wyoming—for the Sherard Hydroelectric Generation Facility in Cheyenne, Wyoming. In September 2015, FERC issued a notice in the *Federal Register* making a preliminary determination that the proposal satisfies the qualifying conduit hydropower facility requirements and requesting comments and motions to intervene, but the regulatory process for this facility was ongoing as of publication. *City of Cheyenne, Wyoming*, 80 Fed. Reg. 57,804 (Sept. 25, 2015). While the 2013 Hydropower Acts made the development of small hydropower projects in Wyoming more feasible, state policies do not incentivize renewable energy, including hydropower, and state processes associated with hydropower licensing still present significant hurdles. It is promising that Wyoming seems to be assessing possible methods of incentivizing development and simplifying the licensing and permitting processes for small hydropower projects and is discussing opportunities for agricultural producers, irrigation districts, and other water users to develop small hydropower utilizing existing water infrastructure. These state hydropower conversations may evolve into future legislative and regulatory changes that aid hydropower development.

Hydropower does not play a large part in New Mexico's total generating capacity. The state's Renewable Portfolio Standard incentivizes utilities such as Public Service Company of New Mexico and El Paso Electric to purchase renewable energies such as hydropower. However, the heat and aridity of New Mexico's climate results in significant evaporative water losses from storage reservoirs and fluctuating water levels in reservoirs, both of which negatively impact output and, consequently, the economic feasibility of projects. No new small hydropower projects have been proposed in New Mexico since the passage of the 2013 Hydropower Acts.

As this brief Rocky Mountain state survey shows, despite

the progress on the federal level to incentivize development, regulatory processes still can be improved in most states to synchronize state permitting with the newly streamlined federal permitting processes. Even then, development of new hydropower may be limited due to non-regulatory factors.

The Future

With the potential for sixty-five gigawatts in new hydropower development and 80,000 nonpowered dams across the nation, many of which are smaller scale facilities, hydropower can contribute additional renewable energy to the United States' energy generation portfolio. Legislation is pending in Congress to further streamline FERC processes, including two bills introduced by Senator Lisa Murkowski of Alaska, S. 1583 and S. 2046, and one bill by Senator Richard Burr of North Carolina, S. 2083. These ongoing federal efforts may soon be complemented by additional state level encouragement for small hydropower.

Although the 2013 Hydropower Acts have not incentivized many Rocky Mountain States to alter hydropower regulations on the state level, this may change due to the U.S. Environmental Protection Agency's Clean Power Plan (the Plan) announced on August 3, 2015. The Plan establishes national standards to limit carbon pollution from power plants to slow the pace of climate change. Under the Plan, eventually 28 percent of the United States' electricity-generating capacity must come from renewable sources. The Plan includes new post-2012 hydropower capacity and relicensing of existing facilities to increase output as eligible renewable energy resources to meet the Plan's state planning goals. Thus, it provides states—even those that do not currently have a renewable energy standard, such as Idaho and Wyoming—with a new incentive to promote hydropower development. On a regulatory level, the Plan could incentivize additional states through the synchronization of state hydropower permitting with federal processes, similar to what Colorado has accomplished.

Further, state and federal governments continue to make small hydropower more economically feasible. The American Reinvestment and Recovery Act of 2009 (Pub. L. No. 111-5) substantially benefitted project economics by helping public and private owners leverage other funding and incentive resources to support small hydropower development. The grant program supported more than \$1.6 billion of hydropower development activity by private owners as well as additional investment by public power entities. Further, in 2013, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) clarified that it had the authority to provide financial assistance for the installation of micro-hydropower components as part of irrigation system improvements through the Environmental Quality Incentives Program. Letter from Phyllis Ann Philipps, State Conservationist, NRCS, to Kurt

Johnson, Colorado Small Hydro Association (Nov. 19, 2013).

Early in 2015, NRCS awarded a \$1.8 million EQIP grant through the Regional Conservation Partnership Program to the Colorado Department of Agriculture and its partners to facilitate the development of integrated hydropower projects. See Colorado Department of Agriculture ACRE3—Agricultural Hydro, www.colorado.gov/pacific/agconservation/agriculturalhydro.

The Environmental Protection Agency's Clean Power Plan requires that eventually 28 percent of the United States' electricity-generating capacity must come from renewable sources.

Through its Regional Conservation Partnership Program, NRCS also recently awarded a \$1.8 million grant to the Colorado Department of Agriculture and its partners to facilitate the development of integrated hydropower projects. The grant will help farmers and ranchers install micro-hydropower units in pressurized pipes connected to water-efficient irrigation systems. The generated energy is then used to power the water-efficient irrigation system, reducing the cost of irrigation. With Colorado farmers spending an average of \$33,000 per year on electricity, 50 percent of which is dedicated to irrigation pumps, this project appears to offer significant savings.

The momentum created by the passage of the 2013 Hydropower Acts is ongoing. The Acts provide important exemptions for small hydropower facilities and eliminated a number of the most duplicative and time-consuming regulations that have slowed the development of small hydropower. The Acts spurred Colorado to enact complementary laws to facilitate hydropower, and Montana has updated the definition of eligible renewable resource to include hydroelectric project expansions since enactment of the 2013 Hydropower Acts. With additional legislation on the horizon and regulatory emphasis on renewable energy, small hydropower appears to be making a big comeback. But this new hydropower movement differs greatly from its twentieth century predecessor, and massive federal dam projects have been replaced by numerous proposals that add turbines to existing dams and small hydropower to serve local communities. 🌳

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