RECLAMATION

Managing Water in the West

Bureau of Reclamation Renewable Energy Update

Fiscal Year 2014, Q3

U.S. Department of the Interior
Bureau of Reclamation

July 2014

Contents

Executive Summary

The Bureau of Reclamation Renewable Energy Update identifies federal and non-federal renewable energy projects currently online or in development on Reclamation land, facilities, and water bodies and highlights current Reclamation renewable activities. The update provides Reclamation-wide and regional summaries, renewable energy portfolios, and project updates as well as a listing of WaterSMART Grant projects that have a renewable energy component.

The quarterly update is a compilation of monthly updates submitted by regional offices, with input received from area offices. Reclamation personnel, including Steve Melavic, Rick Clayton, Robert Ross, Jeffrey Ticknor, and James Stauffer, were instrumental in developing this document.

Renewable Activities

Clean Power Plan Proposed Rule

On June 2, 2014, the United States Environmental Protection Agency (EPA) proposed the "Clean Power Plan" to cut carbon pollution from existing power plants, the single largest source of carbon pollution in the United States. By building on existing state, city, and business efforts, the proposal seeks to maintain an affordable reliability energy system, while cutting carbon pollution and protecting public health and the environment.

The proposal is designed to cut power sector carbon pollution by 30 percent from 2005 levels by the year 2030. As written, the proposal will be implemented through state-federal partnerships, wherein states develop plans to meet state-specific carbon reduction goals, as set by the proposal. The proposal recommends states to consider the following measures when developing plans: (1) improve efficiencies at existing coal-fired powerplants, (2) expand the use of existing natural gas-fired powerplants, (3) expand the use of zero-emitting alternatives, and (4) increase energy efficiency at homes and businesses. Pertinent to Reclamation, the proposal indicates that incremental hydropower generation from existing facilities is an option for compliance with state goals.

The EPA is currently soliciting comments on the proposed rule and has organized public hearings in late July 2014. The proposed rule as well as other relevant information is available at: http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule.

Reclamation Renewable Energy Summary

Online Renewable Energy Projects

Hydropower				
Reclamation Owned and Operated[1]	53	Plants	14,725	MW[2]
Reclamation Owned and Operated by Others[3]	23	Plants	790	MW
Other Plants on Reclamation Facilities	7	Plants	85	MW
FERC[4] Plants on Reclamation Facilities	50	Plants	460	MW
LOPP[5] Plants[6]	9	Plants	35	MW
Total	**142**	**Plants**	**16,095**	**MW**

Other Renewables		
Solar		
Alamosa (UC, New Mexico)	10	kW[7]
Grand Coulee Warehouse (PN, Washington)	5	kW
Boulder City Regional Office Building (LC, Nevada)	276	kW
Boulder City Regional Office Building (Parking) (LC, Nevada)	6	kW
Hoover Spillway House Renovation (LC, Nevada)	48	kW
Total	**345**	**kW**

In-Progress Renewable Energy Projects

Reclamation Hydropower		
Generator Rewinds/Uprates[8]	2	Plants
Turbine Refurbishments/Replacements[9]	3	Plants
Optimization[10]	0	Plants
Total	**5**	**Plants**

[1] Generator rewinds completed at Lower and Upper Molina have yielded an additional 2 MW of capacity (in aggregate).
[2] Megawatt (MW).
[3] Power from five of the 23 plants is marketed by the Western Area Power Administration (Western): Deer Creek, Towaoc, McPhee, O'Neill, and San Luis.
[4] Non-federal hydropower facilities developed on Reclamation facilities, licensed by the Federal Energy Regulatory Commission (FERC).
[5] Non-federal hydropower facilities developed on Reclamation facilities, authorized through a Lease of Power Privilege (LOPP).
[6] Reclamation holds title to the Grand Valley Powerplant LOPP.
[7] Kilowatt (kW)
[8] A major generator overhaul is in progress at San Luis (G1) and Yellowtail (G3).
[9] Turbine refurbishment/replacement projects are in progress at Palisades (G4), Deer Creek (G2), and Glen Canyon (G3). Turbine refurbishment/replacement projects were completed at Estes (G2) and Hoover (A8) in May 2014 and Hoover (A1) in June 2014.
[10] Installation of the Reclamation optimization system, HydrOS, is scheduled to begin at the Glen Canyon Control Center and Elephant Butte in FY 2014.

FERC Licenses on Reclamation Facilities				
FERC Licenses	4	Plants	28	MW
FERC Exemptions	6	Plants	8	MW
FERC Preliminary Permits (Conventional)	17	Plants	46	MW
FERC Preliminary Permits (Pumped-storage)	11	Plants	8,827	MW
Total	**38**	**Plants**	**8,909**	**MW**

Lease of Power Privilege				
LOPP Contracts	1	Plant	3	MW
LOPP Preliminary Leases	5	Plants	27	MW
LOPP Posted Public Solicitations	1	Plant	0.1	MW
LOPP Requests for Development	12	Plants	21	MW
Total	**19**	**Plants**	**51**	**MW**

Other Renewables			
Wind			
Mohave Wind Farm (LC, Arizona)		500	MW
Total		**500**	**MW**
Solar			
First Solar (LC, Nevada)		50	MW
San Luis Facility (MP, California)[11]		9-25	MW
Total		**59-75**	**MW**

Pilot Projects

Hydrokinetic Installation on Roza Canal (Instream Energy)	10	kW
Low-head Technology Installation on Monroe Drop[12]	300	kW
Low-head Technology Installation on North Unit Irrigation Canal, Mile 45[13]	5,000	kW
Hydrodynamic Screw Technology Installation on South Canal, Drop 2[14]	987	kW
Total	**6,297**	**kW**

WaterSMART

Through WaterSMART Grants (formerly Challenge Grants), Reclamation provides 50/50 cost share funding to irrigation and water districts, tribes, states, and other entities with water or power delivery authority. Projects should seek to conserve and use water more efficiently, increase the use of renewable energy, protect endangered species, or facilitate water markets. Projects are selected through a competitive process and the focus is on projects that can be completed within 24 to 36 months that will help sustainable water supplies in the Western

[11] Capacity is dependent upon the amount of land available to be leased.
[12] The low-head technology installation on Monroe Drop has received a FERC Preliminary Permit and is included in the FERC Preliminary Permits (Conventional) statistic.
[13] The low-head technology installation on North Unit Irrigation Canal, Mile 45, has received a FERC Exemption and is included in the FERC Exemptions statistic.
[14] This pilot project is included in the LOPP Requests for Development statistic.

United States. For additional information regarding WaterSMART, visit: http://www.usbr.gov/WaterSMART/index.cfm.

On June 6, 2014, Reclamation awarded (in total) $17.8 million in water and energy efficiency grants to 36 projects. In aggregate, the 36 projects are expected to conserve more than 67,000 acre-feet of water and 22.9 million kilowatt-hours (kWh) of electricity, annually. Fiscal year (FY) 2011-2014 WaterSMART Grant projects that have a renewable energy component are listed below.

FY 2011

Recipient: Three Sisters Irrigation District
Capacity: 950 kW

The District will install a 950 kW turbine generator, projected to generate 3.1 million kWh annually between April and October. Included is an additional 54" HDPE pipe that will eventually deliver up to 80 cubic feet per second of pressurized water to the 4,000 acres between Watson and McKenzie Reservoirs. Project construction is ongoing.

Recipient: Pershing County Water Conservation District

The Pershing County Water Conservation District will automate its gates, install solar-powered ultrasonic meters, and install 750 kW capacity hydropower turbines to generate renewable energy at the Rye Patch Dam. The hydropower turbines installed as part of this project are expected to generate 2,900 megawatt-hours (MWh) of electricity annually. Project has been granted an extension through March 2015. On January 31, 2014, the District received a FERC license to construct, operate, and maintain the proposed project.

Recipient: Boise Project Board of Control

The Boise Project Board of Control will develop an 839 kW capacity powerplant at the "Fargo Drop," which will generate hydroelectric power that will be sold to the Idaho Power Company. The project will also include installation of a Supervisory Control and Data Acquisition system to improve regulation flows below the Fargo Drop diversion, in the Deer Flat Low Line Canal. The project is expected to result in 3,218 acre-feet of water savings annually that will be transferred to irrigation users to improve reliability in water short years. The Fargo Drop project came online in 2013.

FY 2012

Recipient: Consolidated Irrigation Company

The Consolidated Irrigation Company will convert six miles of unlined earthen canal with three and half miles of high-pressure pipe to address seepage and evaporation losses. In addition, advanced measuring devices are to be installed at each service connection. Annually, the completed project is expected to conserve 9,484 acre-feet of water. The project includes the installation of a 500 kW hydropower facility, utilizing pipeline drops feeding into the Glendale Reservoir outside Preston, Idaho.

Recipient: Sacramento Suburban Water District

The Sacramento Suburban Water District will install a hydroelectric turbine in an existing transmission pipeline. The 200 kW installation will allow the District to generate electricity as deliveries are received from the Folsom Reservoir. The project also includes the installation of a new booster pump, which will allow the District to reverse the flow of water when necessary, providing banked groundwater to other agencies connected to the pipeline. Together, the improvements are expected to increase water management flexibility so that groundwater can be used more effectively during dry periods. The project is no longer moving forward with renewable energy component, and will be removed from future Renewable Updates.

FY 2013

Recipient: Fremont Irrigation Company

The Fremont Irrigation Company in southern Utah will convert 5.8 miles of open ditch and earthen canals to enclosed pipe, an improvement that is expected to result in water savings of 5,352 acre-feet each year by avoiding seepage and evaporation losses. Water conserved as a result of the project will be used to meet the needs of water users during periods of shortage. The project also includes installation of a 2.5 MW capacity hydropower plant, taking advantage of the piping improvements to generate renewable energy at the Highline Ditch diversion. The project is no longer moving forward with renewable energy component, and will be removed from future Renewable Updates.

Recipient: Cub River Irrigation Company

The Cub River Irrigation Company in northern Utah will convert 6.5 miles of open ditch canal to pipe to address seepage and evaporation losses; improvements expected to result in 2,800 acre-feet of water savings each year. Water conserved as a result of the project will be left in the Bear River and is expected to benefit the Bear River Migratory Bird Refuge downstream. The project also includes installation of a 456 kW capacity hydropower plant to generate renewable energy once the pipeline is in place.

FY 2014

Recipient: Nevada Irrigation District

The Nevada Irrigation District in Grass Valley, California, will install a 1.4 MW hydroelectric generation station near the Loma Rica Water Treatment Plant at the terminus of the Banner-Cascade pipeline. The facility is expected to generate 5,110 MWh annually, thereby providing a 3,605 metric ton carbon offset. Generated power will serve the water treatment plant load and excess generation will be sold to Pacific Gas and Electric.

Recipient: Rosedale-Rio Bravo Water Storage District

The Rosedale-Rio Bravo Water Storage District in Bakersfield, California, will line one mile of the earthen West Intake Canal. The District will also retrofit three existing wells and one existing pumping plant with variable frequency drives and will install acoustic flow meters and three solar-powered pumping units in active irrigation wells. The project is expected to result in annual water savings of 2,867 acre-feet of water and will generate 250 kWh of solar energy annually. The conserved water will reduce groundwater pumping and will increase in-stream flow in the South Fork of the Kern River to benefit fish and wildlife habitat.

Recipient: Uncompahgre Valley Water Users Association

The Uncompahgre Valley Water Users Association in Montrose, Colorado, will install a 2.8 MW hydroelectric facility on the existing "Shavano Falls" irrigation canal drop structure located on the M&D Canal. The Association will also convert 3,000 feet of earthen canal to pipe and will line 1,200 linear feet of earthen laterals with a bentonite clay liner. In addition, the 1,200 stretch of lateral will be enlarged from a capacity of 90 cubic feet per second to 310 cubic feet per second. The project also includes the installation of headgate structures and sensors and flows will be realigned from portions of the M&D Canal and CQ Lateral, allowing for a more efficient conveyance process. The project is expected to result in annual water savings of 193 acre-feet that is currently being lost to seepage. The Association expects to generate 12,973,000 kWh annually from the hydroelectric facility. Energy revenues derived from the power facility will be provided locally to the City of Delta to offset project operation and maintenance expenses. The project implements adaptation strategies that were addressed in the 2012 WaterSMART Colorado River Basin Water Supply and Demand Study, which the Association participated in as a stakeholder.

A LOPP contract was executed for the Shavano Falls hydroelectric project on June 18, 2014.

Recipient: Oxford Reservoir and Irrigation Company

The Oxford Reservoir and Irrigation Company in southeastern Idaho will replace 4.5 miles of earthen canals with 4.1 miles of pipeline. The Company will install metering devices at service connections and will install two hydro turbines with a combined capacity of 58.45 kW. The project is expected to result in annual water savings of 1,080 acre-feet that is currently lost to seepage, evaporation, and on-farm flooding. The water conserved by this project will remain in the system to supplement existing water supplies.

Recipient: Elephant Butte Irrigation District

The Elephant Butte Irrigation District in Las Cruces, New Mexico, will complete multiple improvements as part of an integrated set of water conservation, habitat management, and energy efficiency activities. The District will convert 12,830 feet of open earthen lined channel to an aluminized steel pipeline with concrete check and diversion boxes. Piping the channel will virtually eliminate seepage and operational losses. The District will install improved metering equipment along the pipeline. The District will also install two high-volume, low-lift pumps into the Rio Grande at the District's Wasteway 18, which will improve water delivery and reduce seepage by avoiding transporting the water down 33 miles of unlined canal. Water pumped at this location will be metered. The project also includes widening the existing Rincon Drain to create "Tonuco Pond," a wetland which will be engineered to benefit wildlife and mitigate groundwater salinity issues in the area.

Solar-powered pumps will be installed to discharge drain water from the Pond to the Rio Grande to allow the groundwater to cycle and reduce shallow groundwater problems (e.g., E. Coli) for nearby irrigated agriculture and habitat. Further, two problematic arroyos will be channeled to discharge into the Rincon Drain to provide increased water to the Drain and Tonuco Pond, resolving flooding issues.

Lastly, the District will install photovoltaic solar panels over the channel to partially offset the electricity of the high-flow lift pumps. Approximately 10 kW of solar capacity is to be installed. In total, the project is expected to result in annual water savings of 7,053 acre-feet and will generate 18,250 kWh of electricity, annually. The water saved as a result of this project can be used to offset groundwater pumping, to meet shortages, and for environmental restoration.

Recipient: Davis and Weber Counties Canal Company

The Davis and Weber Counties Canal Company in northern Utah will meter 5 turn-outs on the main canal; replace 1,000 feet of unlined, open canal with 66-inch reinforced concrete pipe; and replace 3,430 feet of a deteriorating

concrete lined, open canal with two 72-inch reinforced concrete pipes. The Company will also install two 10 kW hydroelectric units on the canal, which together are expected to generate 86,400 kWh of power per year. The project is expected to result in annual water savings of 2,680 acre-feet that is currently lost to seepage. Conserved water will be made available to a growing municipal customer base and serve as a supply in times of drought. The Company is also committed to working with the Utah Department of Wildlife Resources to release between 5-10 percent of the conserved water at critical times to enhance the habitat for state sensitive species (Bonneville Cutthroat Trout and Bluehead Sucker). This project has been identified as a top priority in the Company's recently completed WaterSMART System Optimization Review grant.

Recipient: Fremont Irrigation Company

The Fremont Irrigation Company in southern Utah will convert 12,900 linear feet of existing open-ditch earthen canal to approximately 12,200 feet of pressurized steel pipe, and will install meters along the pipe. The pressurized steel pipe will allow on-farm systems, currently flood irrigating, to convert to sprinklers. The project is expected to result in annual water savings of 1,410 acre-feet that is currently lost to seepage and evaporation. Water conserved as a result of the project will be used to meet the needs of water users during periods of shortage. The project also includes the installation of a 1.5 MW hydroelectric facility, taking advantage of the available head provided by the proposed piping improvements, which is expected to generate approximately 5,553,000 kWh annually.

Recipient: Holmes Creek Irrigation Company

The Holmes Creek Irrigation Company in Layton, Utah, will convert an earthen canal and concrete pipe to 2.6 miles of PVC pipeline. The Company will also install six flow meters and a 131 kW hydroelectric facility on the pipeline. Addressing the seepage and evaporation losses is expected to conserve 800 acre-feet of water per year that will help the Company meet goals set in the Utah State Water Plan. The Company expects to generate approximately 575,000 kWh annually as a result of the project that will be sold to Rocky Mountain Power. Approximately 600 acre-feet of the conserved water will be made available to Layton City, Utah, and the remaining 200 acre-feet of water that is conserved by the project will be left in the Holmes Creek to benefit fish and migratory bird habitat.

Recipient: Richmond Irrigation District

The Richmond Irrigation District in northern Utah will enclose approximately eight miles of the Upper High Creek Canal with High Density Polyethylene pipe, install nine water meters, and construct two hydropower facilities with a combined 300 kW capacity. The project is expected to result in annual water savings of

4,800 acre-feet that is currently lost to seepage and evaporation. 2,800 acre-feet will remain in High Creek for downstream users and environmental benefits. The remaining 2,000 acre-feet will be used to meet shortages of the District. Water meters will allow the District to better manage 9,600 acre-feet annually. Annual power generation from the project is estimated at 1,620,000 kWh and will be sold to help offset project operation and maintenance cost. The project will also reduce the amount of power required to pump from five existing wells, which the District estimates at 2,750,000 kWh of energy annually.

Great Plains Renewable Energy Summary

Online Renewable Energy Projects

Hydropower				
Reclamation Owned and Operated	21	Plants	1,008	MW
Reclamation Owned and Operated by Others	0	Plants	0	MW
Other Plants on Reclamation Facilities	0	Plants	0	MW
FERC Plants on Reclamation Facilities	7	Plants	29	MW
LOPP Plants	1	Plant	3	MW
Total	**29**	**Plants**	**1,040**	**MW**

Other Renewables				
Solar				
Total			**0**	**kW**

In-Progress Renewable Energy Projects

Reclamation Hydropower				
Generator Rewinds/Uprates[15]	1	Plant		
Turbine Refurbishments/Replacements[16]	0	Plants		
Optimization	0	Plants		
Total	**1**	**Plant**		

FERC Licenses on Reclamation Facilities				
FERC Licenses	2	Plants	20	MW
FERC Exemptions	1	Plant	1	MW
FERC Preliminary Permits (Conventional)	3	Plants	4	MW
FERC Preliminary Permits (Pumped-storage)	3	Plants	2,132	MW
Total	**9**	**Plants**	**2,157**	**MW**

Lease of Power Privilege				
LOPP Contracts	0	Plants	0	MW

[15] A major generator overhaul is in progress at Yellowtail (G3).
[16] A turbine refurbishment project was completed at Estes (G2) in May 2014.

LOPP Preliminary Leases	2	Plants	8	MW
LOPP Posted Public Solicitations	0	Plants	0	MW
LOPP Requests for Development	5	Plants	16	MW
Total	**7**	**Plants**	**24**	**MW**

Other Renewables

Wind

Total	**0**	**MW**

Solar

Total	**0**	**MW**

Pilot Projects

Total	**0**	**kW**

Great Plains Project Updates

Federal Energy Regulatory Commission Projects

Project: Clark Canyon Dam
Developer: Clark Canyon Hydro, LLC
Status: License (P-12429)

A complete design package was received by Reclamation on June 4, 2014. Reclamation is currently reviewing the final package for acceptance.

On June 27, 2014, FERC issued Clark Canyon Hydro, LLC, a "Notice of Probable Termination of the Clark Canyon Dam Hydroelectric Project License" due to the Licensee's failure to fulfill license requirements, including Start of Construction; Cofferdam Construction; and submission of Contract Plans and Specifications and Project Financing Plans. Reclamation will continue to monitor the project while reviewing the final design package.

Project: Black Canyon Pumped Storage Project
Developer: Black Canyon Hydro, LLC
Status: Preliminary Permit (P-14087)

FERC issued a Preliminary Permit to Black Canyon Hydro, LLC, on July 15, 2011, to study the feasibility of the proposed Black Canyon Pumped Storage Project in Carbon County, Wyoming. The proposed pumped storage project would consist of two developments and use as its upper reservoir two new, lined reservoirs. The lower reservoir for each of the developments would be either the

Reclamation Kortes or Seminoe reservoir. Gridflex Energy, LLC, (Gridflex) is acting as an agent for Black Canyon Hydro, LLC, on the proposed project.

Filed on June 30, 2014, the sixth six-month progress report reads, "During the sixth six-month period of the preliminary permit, Gridflex obtained from the Bureau of Reclamation a special study that included an appraisal of pumped storage sizing and cost at the site of the Black Canyon project. Gridflex has been comparing the findings of this study with its own evaluation to refine the project conceptually. In addition, a possible alternative involving an above-ground powerhouse was identified, which would reduce project costs. Finally, Gridflex continued to monitor transmission project developments that are essential to successful development of the Black Canyon Pumped Storage project."

On July 1, 2014, Black Canyon Hydro, LLC, filed a successive permit application for the proposed project.

Lease of Power Privilege Projects

Project: Granby Dam
Developer: Northern Water Conservancy District
Status: Preliminary Lease

A meeting with the Reclamation Technical Services Center (TSC), the Eastern Colorado Area Office (ECAO), the Northern Water Conservancy District, Mountain Parks Electric, and the United States Army Corps of Engineers (USACE) occurred on June 6, 2014, to discuss National Environmental Protection Act (NEPA) requirements, transmission details, plant location (in relationship to future safety of dams modifications), and drill locations for geotechnical evaluation (to be conducted by Northern).

Funding for a TSC service agreement has been approved, allowing the TSC to continue design review. The TSC report for the June meeting is scheduled to be completed in July.

Project: Pueblo Dam
Developer: Southeastern Colorado Water Conservancy District, Colorado Springs Utilities, and Board of Water Works of Pueblo, Colorado
Status: Preliminary Lease

On March 21, 2014, a project feasibility update was issued by Southeastern and consultant, CH2M Hill. Rated flows through the plant increased from 600 cubic feet per second (cfs) to 734 cfs and rated head decreased from 120 feet to 110 feet. Total projected project output (two units) increased from 5.684 MW to 7.010 MW.

On May 7, 2014, an on-site meeting was held with Southeastern, the ECAO, and Colorado Parks and Wildlife to discuss internal scoping for NEPA requirements. Southeastern has submitted a pre-construction notification to the USACE and has received Nationwide Permit 17 authorization for the project.

Internal scoping for NEPA requirements is ongoing. Southeastern is currently working with the ECAO and Colorado Fish and Wildlife to address endangered species that may be affected by the project. On June 9, 2014, Southeastern provided the ECAO preliminary renderings of the plant exterior. The ECAO is currently soliciting comments from interested parties.

Project: Helena Valley Pumping Plant
Developer: Helena Valley Irrigation District
Status: Request for Development

The District and consultants continue to revise the proposal for replacing the existing turbine pumping units with generating units. A meeting with project stakeholders has been scheduled for mid-July to discuss the status of the project, specifically, if the project as planned is economically feasible.

At this time, no Preliminary Lease has been awarded.

Project: Yellowtail Afterbay
Developer: Crow Tribe
Status: Request for Development

A draft agreement, "Initial Yellowtail Afterbay Hydropower Agreement," was developed by Reclamation and delivered to the Crow Tribe in April. The draft agreement addresses near-term planning and design activities, arranges a cost recovery agreement to provide advance funding to Reclamation for costs incurred by Reclamation related to the project, clarifies that the Tribe retains title to any Renewable Energy Credits generated at the project, and defines Tribe and Reclamation roles and responsibilities. The draft agreement also commits the Tribe and Reclamation to negotiate a subsequent agreement to include construction and operations and maintenance requirements once these activities are better defined.

The Tribe's legal counsel is questioning the draft agreement provision requiring the Tribe to reimburse Reclamation for costs incurred by Reclamation related to the project. To date, this issue has not yet been resolved.

The Tribe has been granted a conditional notice to proceed with a topographic survey of the site. Field work began in June and is expected to be complete in July.

Project: A Drop, Johnson Drop, and Woods Drop
Developer: Turnbull Hydro, LLC
Status: Request for Development

In April 2014, Turnbull Hydro, LLC, filed an application for a FERC Preliminary Permit on the A Drop, Johnson Drop, and Woods Drop sites. The three drops are located on the Greenfields Main Canal, a feature of the Reclamation Sun River Project, Greenfields Division. The Greenfields Division is operated by the Greenfields Irrigation District. FERC denied all three applications pursuant to the Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act (Pub. L. 113-24), which withdrew FERC's jurisdiction over non-federal hydropower development on Reclamation conduits.

Turnbull Hydro, LLC, has contacted Reclamation, expressing interest in developing these sites. No action has been taken yet while Turnbull Hydro, LLC, and the Greenfields Irrigation District determine roles and responsibilities for development.

Lower Colorado Renewable Energy Summary

Online Renewable Energy Projects

Hydropower				
Reclamation Owned and Operated	3	Plants	2,454	MW
Reclamation Owned and Operated by Others	10	Plants	297	MW
Other Plants on Reclamation Facilities	7	Plants	85	MW
FERC Plants on Reclamation Facilities	0	Plants	0	MW
LOPP Plants	0	Plants	0	MW
Total	**20**	**Plants**	**2,836**	**MW**

Other Renewables		
Solar		
Boulder City Regional Office Building (LC, Nevada)	276	kW
Boulder City Regional Office Building (Parking) (LC, Nevada)	6	kW
Hoover Spillway House Renovation (LC, Nevada)	48	kW
Total	**330**	**kW**

In-Progress Renewable Energy Projects

Reclamation Hydropower		
Generator Rewinds/Uprates	0	Plants
Turbine Refurbishments/Replacements[17]	0	Plants

[17] Turbine replacement projects were completed at Hoover Units A8 and A1 in May 2014 and June 2014, respectively.

Optimization	0	Plants		
Total	**0**	**Plants**		

FERC Licenses on Reclamation Facilities				
FERC Licenses	0	Plants	0	MW
FERC Exemptions	0	Plants	0	MW
FERC Preliminary Permits (Conventional)	0	Plants	0	MW
FERC Preliminary Permits (Pumped-storage)	4	Plants	3,645	MW
Total	**4**	**Plants**	**3,645**	**MW**

Lease of Power Privilege				
LOPP Contracts	0	Plants	0	MW
LOPP Preliminary Leases	0	Plants	0	MW
LOPP Posted Public Solicitations	0	Plants	0	MW
LOPP Requests for Development	2	Plants	3	MW
Total	**2**	**Plants**	**3**	**MW**

Other Renewables			
Wind			
Mohave Wind Farm (LC, Arizona)		500	MW
Total		**500**	**MW**
Solar			
First Solar (LC, Nevada)		50	MW
Total		**50**	**MW**

Pilot Projects

Total	**0**	**kW**

Lower Colorado Project Updates

Solar Projects

Project: First Solar
Developer: First Solar Development, LLC
Status: In Development

The Lower Colorado Region received an application from First Solar Development, LLC, to develop a nominal 50 MW photovoltaic solar facility on approximately 575 acres of Reclamation land in Henderson, Nevada. The proposed project would interconnect to the transmission system via Nevada Energy's 69-kilovolt Magic Way Substation, located adjacent to the proposed project site.

Mid-Pacific Renewable Energy Summary

Online Renewable Energy Projects

Hydropower				
Reclamation Owned and Operated	10	Plants	1,910	MW
Reclamation Owned and Operated by Others[18]	3	Plants	452	MW
Other Plants on Reclamation Facilities	0	Plants	0	MW
FERC Plants on Reclamation Facilities	13	Plants	60	MW
LOPP Plants	1	Plant	1	MW
Total	**27**	**Plants**	**2,423**	**MW**

Other Renewables				
Solar				
Total			**0**	**kW**

In-Progress Renewable Energy Projects

Reclamation Hydropower		
Generator Rewinds/Uprates[19]	1	Plant
Turbine Refurbishments/Replacements	0	Plants
Optimization	0	Plants
Total	**1**	**Plant**

FERC Licenses on Reclamation Facilities				
FERC Licenses	2	Plants	8	MW
FERC Exemptions	0	Plants	0	MW
FERC Preliminary Permits (Conventional)	0	Plants	0	MW
FERC Preliminary Permits (Pumped-storage)	1	Plant	1,250	MW
Total	**3**	**Plants**	**1,258**	**MW**

Lease of Power Privilege				
LOPP Contracts	0	Plants	0	MW
LOPP Preliminary Leases	0	Plants	0	MW
LOPP Posted Public Solicitations	0	Plants	0	MW
LOPP Requests for Development	2	Plants	.4	MW
Total	**2**	**Plants**	**.4**	**MW**

Other Renewables				
Wind				
Total			**0**	**MW**

[18] Power from two of the three plants is marketed by Western: O'Neill and San Luis.
[19] A major generator overhaul is in progress at San Luis (G1).

Solar		
San Luis Facility (MP, California)[20]	9-25	MW
Total	**9-25**	**MW**

Pilot Projects

Total	**0**	**kW**

Mid-Pacific Project Updates

Federal Energy Regulatory Commission Projects

Project: Humboldt River Hydropower Project
Developer: Pershing County Water Conservation District
Status: License (P-14327)

On June 26, 2013, the Pershing County Water Conservation District filed and supplemented on September 9, 2013, an application for an original minor license to construct, operate, and maintain the Humboldt River Hydropower Project. On January 31, 2014, FERC issued a license for the project.

The 750 kW project will be located on the Reclamation Rye Patch Dam, located on the Humboldt River in Pershing County, Nevada. The Pershing County Water Conservation District received a FY 2011 WaterSMART grant to develop the project.

Lease of Power Privilege Projects

Project: A-C3 (Panicker Drop) and V-C2 (Lewis Wasteway)
Developer: Truckee Carson Irrigation District
Status: Request for Development

125 kW and 250 kW turbines are to be installed at A-Line and V-Line Canal check structures, respectively. NEPA compliance and cultural resource documentation activities are in progress. Reclamation is currently drafting LOPP documents and discussions with the District are ongoing.

[20] Capacity is dependent upon the amount of land available to be leased.

Pacific Northwest Renewable Energy Summary

Online Renewable Energy Projects

Hydropower				
Reclamation Owned and Operated	10	Plants	7,537	MW
Reclamation Owned and Operated by Others	0	Plants	0	MW
Other Plants on Reclamation Facilities	0	Plants	0	MW
FERC Plants on Reclamation Facilities	25	Plants	321	MW
LOPP Plants	0	Plants	0	MW
Total	**35**	**Plants**	**7,858**	**MW**

Other Renewables			
Solar			
Grand Coulee Warehouse (PN, Washington)		5	kW
Total		**5**	**kW**

In-Progress Renewable Energy Projects

Reclamation Hydropower		
Generator Rewinds/Uprates	0	Plants
Turbine Refurbishments/Replacements[21]	1	Plant
Optimization	0	Plants
Total	**1**	**Plant**

FERC Licenses on Reclamation Facilities				
FERC Licenses	0	Plants	0	MW
FERC Exemptions	5	Plants	7	MW
FERC Preliminary Permits (Conventional)	14	Plants	42	MW
FERC Preliminary Permits (Pumped-storage)	1	Plant	1,000	MW
Total	**20**	**Plants**	**1,049**	**MW**

Lease of Power Privilege				
LOPP Contracts	0	Plants	0	MW
LOPP Preliminary Leases	0	Plants	0	MW
LOPP Posted Public Solicitations	0	Plants	0	MW
LOPP Requests for Development	0	Plants	0	MW
Total	**0**	**Plants**	**0**	**MW**

Other Renewables		
Wind		
Total	**0**	**MW**
Solar		
Total	**0**	**MW**

[21] A turbine refurbishment/replacement project is in progress at Palisades (G4).

Pilot Projects

Hydrokinetic Installation on Roza Canal (Instream Energy)	10	kW
Low-head Technology Installation on Monroe Drop[22]	300	kW
Low-head Technology Installation on North Unit Irrigation Canal, Mile 45[23]	5,000	kW
Total	**5,310**	**kW**

Pacific Northwest Project Updates

Federal Energy Regulatory Commission Projects

Project: McKay Dam
Developer: Houtama Hydropower, LLC
Status: Preliminary Permit (P-14546)

On August 14, 2013, Houtama Hydropower, LLC, filed an application for a FERC Preliminary Permit proposing to study the feasibility of the McKay Dam hydroelectric project to be located at the McKay Dam in Umatilla County, Oregon.

The proposed project would consist of a single 2.3 MW unit. The estimated annual generation of the project would be 5,000 MWh. FERC awarded the Preliminary Permit on February 6, 2014.

Project: Unity Dam by Warm Springs Hydro
Developer: Warm Springs Hydro, LLC
Status: Preliminary Permit (P-14576)

On January 13, 2014, Warm Springs Hydro, LLC, filed an application for a FERC Preliminary Permit proposing to study the feasibility of the Unity Dam hydroelectric project to be located at the Unity Dam in Baker County, Oregon.

The proposed project would consist of two units with a combined rated capacity of 800 kW. The estimated annual generation of the project would be 3,400 MWh. FERC awarded the Preliminary Permit on June 16, 2014.

[22] The low-head technology installation on Monroe Drop has received a FERC Preliminary Permit and is included in the FERC Preliminary Permits (Conventional) statistic.
[23] The low-head technology installation on North Unit Irrigation Canal, Mile 45, has received a FERC Exemption and is included in the FERC Exemptions statistic.

Upper Colorado Renewable Energy Summary

Online Renewable Energy Projects

Hydropower				
Reclamation Owned and Operated[24]	9	Plants	1,816	MW
Reclamation Owned and Operated by Others[25]	10	Plants	41	MW
Other Plants on Reclamation Facilities	0	Plants	0	MW
FERC Plants on Reclamation Facilities	5	Plants	50	MW
LOPP Plants[26]	7	Plants	31	MW
Total	**31**	**Plants**	**1,938**	**MW**

Other Renewables			
Solar			
Alamosa (UC, New Mexico)		10	kW
Total		**10**	**kW**

In-Progress Renewable Energy Projects

Reclamation Hydropower		
Generator Rewinds/Uprates	0	Plants
Turbine Refurbishments/Replacements[27]	2	Plants
Optimization	0	Plants
Total	**2**	**Plants**

FERC Licenses on Reclamation Facilities				
FERC Licenses	0	Plants	0	MW
FERC Exemptions	0	Plants	0	MW
FERC Preliminary Permits (Conventional)	0	Plants	0	MW
FERC Preliminary Permits (Pumped-storage)	2	Plants	800	MW
Total	**2**	**Plants**	**800**	**MW**

Lease of Power Privilege				
LOPP Contracts	1	Plant	3	MW
LOPP Preliminary Leases	3	Plants	19	MW
LOPP Posted Public Solicitations	1	Plant	0.1	MW
LOPP Requests for Development	3	Plants	2	MW
Total	**8**	**Plants**	**24.1**	**MW**

[24] Generator rewinds completed at Lower and Upper Molina have yielded an additional 2 MW of capacity (in aggregate).
[25] Power from three of the 10 plants is marketed by Western: Deer Creek, Towaoc, and McPhee.
[26] Reclamation holds title to the Grand Valley Powerplant LOPP.
[27] Turbine refurbishments/replacements projects are in progress at Deer Creek (G2) and Glen Canyon (G3).

Other Renewables		
Wind		
Total	**0**	**MW**
Solar		
Total	**0**	**MW**

Pilot Projects

Hydrodynamic Screw Technology Installation on South Canal, Drop 2[28]	987	kW
Total	**987**	**kW**

Upper Colorado Project Updates

Lease of Power Privilege Projects

Project: San Juan Chama Project
Developer: N/A
Status: Posted Public Solicitation

A notice of intent to accept proposals, select lessee, and contract for hydroelectric power development on the Reclamation San Juan-Chama Project was posted to the Federal Register on August 7, 2013. Written proposals were due January 6, 2014 (150 days removed from the posting).

One proposal was received from Albuquerque Bernalillo County Water Utility Authority. The Authority qualifies as a preference entity pursuant to Pub. L. 113-24. Following review of the proposal, Reclamation requested clarification and additional information from The Authority. The Authority has provided the requested information and Reclamation is currently working on a draft Preliminary Lease and Funding Agreement with the Authority.

Project: Shavano Falls
Developer: Uncompahgre Valley Water Users Association
Status: Lease Contract

On August 21, 2013, Reclamation received a request from the Uncompahgre Valley Water Users Association to develop hydropower on the Shavano Falls conduit drop site. Reclamation executed a Preliminary Lease and Funding Agreement with the Association on January 27, 2014.

[28] This pilot project is included in the LOPP Requests for Development statistic.

NEPA activities have been completed and a Finding of No Significant Impact has been signed. A LOPP contract was executed on June 18, 2014. Pre-construction requirements have been satisfied and the Association was granted permission to commence construction on June 25, 2014.

Project: South Canal (Drop 4)
Developer: Uncompahgre Valley Water Users Association
Status: Preliminary Lease

On August 21, 2013, the Association requested to develop hydropower on the South Canal Drop 4 site. A Preliminary Lease and Funding Agreement were executed on May 14, 2014, and a LOPP kick-off meeting was held on May 27, 2014. A draft LOPP contract has been negotiated with the Lessee and has been reviewed by the Solicitor's Office and Upper Colorado Power Manager. The contract will be signed upon completion of NEPA requirements.

Project: South Canal (Drop 2)
Developer: Percheron Power, LLC, and the Uncompahgre Valley Water Users Association
Status: Request for Development

On April 21, 2014, Percheron Power, LLC, and the Association entered into a Memorandum of Agreement that defined a collaborative, partnership arrangement between the parties. On May 27, 2014, Reclamation received a formal request to develop South Canal (Drop 2) along with information described in FAC TRMR-61, *Lease of Power Privilege (LOPP) Processes, Responsibilities, Timelines, and Charges*, necessary to develop a Preliminary Lease and Funding Agreement.

Reclamation has reviewed the documents and has developed a draft Preliminary Lease and Funding Agreement which has been reviewed by the Solicitor's Office and Upper Colorado Power Manager. The Preliminary Lease and Funding Agreement will be sent for signature in the near future.

Appendix – Regional Renewable Energy Portfolios

Great Plains Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED												
WY	Online	Alcova		Wyoming	USBR	Conventional	41,400.00					1955
CO	Online	Big Thompson		Eastern Colorado	USBR	Conventional	4,500.00					1959
WY	Online	Boysen		Wyoming	USBR	Conventional	15,000.00					1952
WY	Online	Buffalo Bill		Wyoming	USBR	Conventional	18,000.00					1992
MT	Online	Canyon Ferry		Montana	USBR	Conventional	50,001.00					1953
CO	Online	Estes		Eastern Colorado	USBR	Conventional	45,000.00					1950
CO	Online	Flatiron (Unit 1, 2, 3)		Eastern Colorado	USBR	Conventional/Pump Storage	98,500.00					1954
WY	Online	Fremont Canyon		Wyoming	USBR	Conventional	66,800.00					1960
WY	Online	Glendo		Wyoming	USBR	Conventional	38,000.00					1959
CO	Online	Green Mountain		Eastern Colorado	USBR	Conventional	26,000.00					1943
WY	Online	Guernsey		Wyoming	USBR	Conventional	6,400.00					1928
WY	Online	Heart Mountain		Wyoming	USBR	Conventional	5,000.00					1948
WY	Online	Kortes		Wyoming	USBR	Conventional	36,000.00					1950
CO	Online	Marys Lake		Eastern Colorado	USBR	Conventional	8,100.00					1951
CO	Online	Mt. Elbert PS		Eastern Colorado	USBR	Pump Storage	200,000.00					1981
WY	Online	Pilot Butte		Wyoming	USBR	Conventional	1,600.00					1929
CO	Online	Pole Hill		Eastern Colorado	USBR	Conventional	38,238.00					1954
WY	Online	Seminoe		Wyoming	USBR	Conventional	51,750.00					1939
WY	Online	Shoshone		Wyoming	USBR	Conventional	3,000.00					1992
WY	Online	Spirit Mountain		Wyoming	USBR	Conventional	4,500.00					1994
MT	Online	Yellowtail		Montana	USBR	Conventional	250,000.00					1966
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
WY	Online	Garland Canal	3031	Wyoming	Shoshone I.D.	Conventional	2,610.00				10/9/1981	1980
MT	Online	Lower Turnbull Drop	12597	Montana	Turnbull Hydro, LLC	Conventional	7,700.00	6/21/2005			7/28/2006	6/22/2011
OK	Online	McGee Creek Dam	8492	Oklahoma Texas	McGee Creek Authority	Conventional	175.00	7/26/1984	3/14/1985		6/23/1986	1980
CO	Online	Ruedi Dam	3603	Western Colorado	City of Aspen	Conventional	3,200.00				9/8/1983	1980
CO	Online	Sugarloaf Dam	3819	Eastern Colorado	STS Hydropower Ltd.	Conventional	2,800.00				11/18/1982	1980
MO	Online	Tiber Dam	3574	Montana	Tiber Montana LLC	Conventional	7,500.00		11/20/1990		6/2/1997	6/14/2004
MT	Online	Upper Turnbull Drop	12598	Montana	Turnbull Hydro, LLC	Conventional	5,300.00	6/24/2005			7/28/2006	6/24/2011
MT	License	Clark Canyon Dam	12429	Montana	Clark Canyon Hydro, LLC	Conventional	4,700.00	1/1/2003	8/15/2003		8/26/2009	
MT	License	Gibson Dam	12478	Montana	Gibson Dam Hydroelectric Company, LLC.	Conventional	15,000.00	10/28/2003	4/20/2004		1/12/2012	
MT	Exemption	Mary Taylor Drop	14294	Montana	Turnbull Hydro, LLC	Conventional	890.00	9/23/2011		6/28/2012		
WY	Preliminary	Deer Creek Drop	14370	Wyoming	Willwood Irrigation District	Conventional	780.00	3/6/2012	9/19/2012			
NE	Preliminary	Medicine Creek Dam	13648	Nebraska-Kansas	Twin Valleys Public Power District	Conventional	800.00	12/30/2009	6/15/2010			
WY	Preliminary	Willwood Diversion Dam	13423	Wyoming	Willwood Irrigation District	Conventional	2,000.00	4/6/2009	7/7/2009			
WY	Preliminary	Black Canyon Pumped Storage Project	14087	Wyoming	Black Canyon Hydro, LLC	Pump Storage	700,000.00	1/25/2011	7/15/2011			
WY	Preliminary	Medicine Bow Pumped Storage	13836	Wyoming	Medicine Bow Hydro, LLC	Pump Storage	400,000.00	8/30/2010	12/3/2010			
MT	Preliminary	Square Butte Pumped Storage	13349	Montana	Square Butte Hydro LLC	Pump Storage	1,032,000.00	12/23/2008	7/23/2012			
LEASE OF POWER PRIVILEGE PROJECTS												
CO	Online	Carter Lake Outlet		Eastern Colorado	Northern Water Conservancy District	Conventional	2,600.00	5/7/2009	11/24/2009		4/22/2011	5/18/2012
CO	Preliminary	Granby Dam	LP11-3	Eastern Colorado	Northern Water Conservancy District	Conventional	700.00	4/20/2011	6/26/2012			
CO	Preliminary	Pueblo Dam	LP11-4	Eastern Colorado	Southeastern Colorado Water Conservancy District, Colorado Springs Utilities, and Board of Water Works of Pueblo, Colorado	Conventional	7,010.00	4/20/2011	2/27/2012			
MT	Request for Development	Helena Valley Pumping Plant		Montana	Helena Valley Irrigation District	Conventional	4,800.00	9/13/2013				
MT	Request for Development	Yellowtail Afterbay		Montana	Crow Tribe	Conventional	9,000.00	1/11/2012				
MT	Request for Development	A Drop		Montana	Turnbull Hydro, LLC	Conventional	1,000.00	6/1/2014				
MT	Request for Development	Johnson Drop		Montana	Turnbull Hydro, LLC	Conventional	700.00	6/1/2014				

Great Plains Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
MT	Request for Development	Woods Drop		Montana	Turnbull Hydro, LLC	Conventional	900.00	6/1/2014				

Lower Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED												
AZ	Online	Davis		Yuma	USBR	Conventional	255,000.00					1951
AZ/NV	Online	Hoover		Lower Colorado	USBR	Conventional	2,078,800.00					1936
AZ	Online	Parker		Yuma	USBR	Conventional	120,000.00					1943
RECLAMATION OWNED AND OPERATED BY OTHERS												
AZ	Online	Arizona Falls Powerplant		Phoenix	Salt River Valley Water User's Association	Conventional	750.00					1902
AZ	Online	Cross Cut Powerplant		Phoenix	Salt River Valley Water User's Association	Conventional	3,000.00					1914
AZ	Online	Horse Mesa Powerplant		Phoenix	Salt River Valley Water User's Association	Conventional/Pump Storage	129,000.00					1927
AZ	Online	Mormon Flat Powerplant		Phoenix	Salt River Valley Water User's Association	Conventional/Pump Storage	60,000.00					1926
AZ	Online	New Waddell Pump/Generating Plant		Phoenix	Central Arizona Water Conservation District	Pump Storage	45,000.00					1993
CA	Online	Senator Wash Pump/Generating Plant		Yuma	Imperial Irrigation District	Pump Storage	7,200.00					1966
AZ	Online	Siphon Drop Powerplant		Yuma	Yuma County Water User's Association	Conventional	4,600.00					1926
AZ	Online	South Consolidated Powerplant		Phoenix	Salt River Valley Water User's Association	Conventional	1,400.00					1912
AZ	Online	Stewart Mountain Powerplant		Phoenix	Salt River Valley Water User's Association	Conventional	10,400.00					1930
AZ	Online	Theodore Roosevelt Powerplant		Phoenix	Salt River Valley Water User's Association	Conventional	36,020.00					1973
OTHER PLANTS ON RECLAMATION FACILITIES												
AZ	Online	C.C. Craigin Dam and Powerplant	2304	Phoenix	Salt River Project	Conventional	3,000.00					1965
AZ	Online	Drop Five Powerplant		Yuma	Imperial Irrigation District	Conventional	4,000.00					1982
AZ	Online	Drop Four Powerplant		Yuma	Imperial Irrigation District	Conventional	19,600.00					1941
AZ	Online	Drop One Powerplant		Yuma	Imperial Irrigation District	Conventional	6,000.00					1984
AZ	Online	Drop Three Powerplant		Yuma	Imperial Irrigation District	Conventional	9,800.00					1941
AZ	Online	Drop Two Powerplant		Yuma	Imperial Irrigation District	Conventional	10,000.00					1953
AZ	Online	Pilot Knob Powerplant		Yuma	Imperial Irrigation District	Conventional	33,000.00					1961
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
NV	Preliminary	Blue Diamond Pumped Storage Project	14344	Regional Office	The International Consortium of Energy Managers	Pump Storage	450,000.00	1/6/2012	7/11/2012			
NV	Preliminary	Eldorado Pumped Storage Project	13861	Regional Office	Eldorado Pumped Storage, LLC	Pump Storage	400,000.00	10/13/2010	2/3/2012			
AZ	Preliminary	Longview Pumped Storage Project	14341	Regional Office	Longview Energy Exchange, LLC	Pump Storage	2,000,000.00	1/3/2012	5/4/2012			
AZ	Preliminary	Verde Pumped Storage Project	14061	Phoenix	Arizona Independent Power	Pump Storage	795,000.00	1/12/2011	8/15/2011			
LEASE OF POWER PRIVILEGE PROJECTS												
AZ	Request for Development	Laguna Dam		Yuma		Conventional	2,200.00	1/28/2013				
AZ	Request for Development	Santa Rosa Canal		Phoenix	Maricopa-Stanfield Irrigation and Drainage District	Conventional	375.00	9/4/2012				
SOLAR PROJECTS												
NV	Online	Boulder City Regional Office Building		Regional Office	Boulder City Regional Office Building		276.36					
NV	Online	Boulder City Regional Office Building (parking)		Regional Office	Boulder City Regional Office Building		5.97					
NV	Online	Hoover Spillway House Renovation		Regional Office	Boulder City Regional Office Building		48.00					Aug-13
NV	In Development	First Solar		Regional Office	First Solar Development, LLC		50,000.00	Jun-14				
WIND PROJECTS												
AZ	In Development	Mohave County Wind Farm		Regional Office	Mohave County		500,000.00					

Mid-Pacific Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED												
CA	Online	Folsom		Central California	USBR	Conventional	207,000.00					1955
CA	Online	Judge Francis Carr		Northern California	USBR	Conventional	154,400.00					1963
CA	Online	Keswick		Northern California	USBR	Conventional	117,000.00					1950
CA	Online	Lewiston		Northern California	USBR	Conventional	350.00					1964
CA	Online	New Melones		Central California	USBR	Conventional	380,000.00					1979
CA	Online	Nimbus		Central California	USBR	Conventional	13,500.00					1955
CA	Online	Shasta		Northern California	USBR	Conventional	714,000.00					1944
CA	Online	Spring Creek		Northern California	USBR	Conventional	180,000.00					1964
CA	Online	Stampede		Lahontan Basin	USBR	Conventional	3,650.00					1988
CA	Online	Trinity		Northern California	USBR	Conventional	140,000.00					1964
RECLAMATION OWNED AND OPERATED BY OTHERS												
CA	Online	San Luis/Gianelli Pumping-Generating Plant		South Central California	California Department of Water Resources	Pump Storage	424,000.00					1968
NV	Online	Lahontan Powerplant		Lahontan Basin	Truckee-Carson Irrigation District	Conventional	2,400.00					1911
CA	Online	O'Neill Pumping-Generating Plant		South Central California	San Luis Delta-Mendota Water Authority	Pump Storage	25,200.00					1967
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
OR	Online	East Side	2082	Klamath Basin	Scottish Power (PacifiCorp)	Conventional	3,200.00					
CA	Online	Friant Fishwater Release	11068	South Central California	Orange County Irrigation District	Conventional	510.00				5/16/1991	
CA	Online	Friant Power	2892	South Central California	Friant Power Authority	Conventional	27,360.00				9/30/1982	6/13/1905
CA	Online	High Line Canal	7252	Northern California	Santa Clara	Conventional	530.00				7/17/1984	
CA	Online	Madera Canal	5765	South Central California	Madera-Chowchilla Water & Power Authority	Conventional	440.00	11/16/1981	4/27/1982		9/8/1983	
CA	Online	Madera Canal Water Power STA 1174+84	2958	South Central California	Madera-Chowchilla Water & Power Authority	Conventional	563.00	11/23/1981			6/8/1982	
CA	Online	Madera Canal Water Power STA 1923+10	2958	South Central California	Madera-Chowchilla Water & Power Authority	Conventional	916.00	11/23/1981			6/8/1982	
CA	Online	Madera Canal Water Power STA 980+65	2958	South Central California	Madera-Chowchilla Water & Power Authority	Conventional	2,125.00	11/23/1981			6/8/1982	
CA	Online	Monticello	2780	Central California	Solano I.D.	Conventional	11,500.00				1/29/1981	Jun-83
NV	Online	New Lahontan	7828	Lahontan Basin	Truckee-Carson I.D.	Conventional	4,000.00				12/26/1985	6/12/1989
CA	Online	Stony Gorge Hydroelectric	3193	Northern California	Santa Clara, City of	Conventional	4,900.00				8/31/1982	Apr-86
OR	Online	West Side	2082	Klamath Basin	Scottish Power (PacifiCorp)	Conventional	600.00					
CA	Online	Whiskey Dam Power Project	2888	Northern California	City of Redding	Conventional	3,530.00	2/17/1982			3/10/1983	6/8/1905
CA	License	Friant Fishwater Release	11068	South Central California	Orange County Irrigation District	Conventional	7,000.00				5/16/1991	
CA	License	Humboldt River Hydropower Project (Rye Patch)	14327	Lahontan Basin	Pershing County Water Conservation District	Conventional	750.00	1/22/2011			1/31/2014	
OR	Preliminary	Bryant Mountain (Pumped Storage)	13680	Klamath Basin	Bryant Mountain LLC	Pump Storage	1,250,000.00	3/1/2010	9/24/2010			
LEASE OF POWER PRIVILEGE PROJECTS												
OR	Online	Klamath Canal Drop C		Klamath Basin	Klamath Irrigation District	Conventional	900.00	2/8/2011			11/8/2011	5/3/2012
CA	Request for Development	A-C3 (Panicker Drop)		Lahontan Basin	Truckee Carson Irrigation District	Conventional	125.00	2014				

Mid-Pacific Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
CA	Request for Development	V-C2 (Lewis Wasteway)		Lahontan Basin	Truckee Carson Irrigation District	Conventional	250.00	2014				
SOLAR PROJECTS												
CA	In Development	San Luis Facility		South Central California			9,000.00 - 25,000.00	8/5/2011	12/13/2011			

Pacific Northwest Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED												
ID	Online	Anderson Ranch		Snake River	USBR	Conventional	40,000.00					1950
ID	Online	Black Canyon		Snake River	USBR	Conventional	10,200.00					1925
ID	Online	Boise River Diversion		Snake River	USBR	Conventional	3,450.00					1912
WA	Online	Chandler		Columbia Cascades	USBR	Conventional	12,000.00					1956
WA	Online	Grand Coulee		Columbia Cascades	USBR	Conventional/Pump Storage	6,809,000.00					1941
OR	Online	Green Springs		Columbia Cascades	USBR	Conventional	17,290.00					1960
MT	Online	Hungry Horse		Columbia Cascades	USBR	Conventional	428,000.00					1952
ID	Online	Minidoka		Snake River	USBR	Conventional	27,700.00					1942
ID	Online	Palisades		Snake River	USBR	Conventional	176,564.00					1957
WA	Online	Roza		Columbia Cascades	USBR	Conventional	12,937.00					1958
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
ID	Online	American Falls	2736	Snake River	Idaho Power Co	Conventional	92,400.00				3/31/1975	1975
ID	Online	ARROWROCK DAM	4656	Snake River	Big Bend Irrigation District, et. al.	Conventional	15,000.00		8/15/1983		3/27/1989	Mar-10
ID	Online	CASCADE	2848	Snake River	Idaho Power Co.	Conventional	12,420.00				2/17/1981	3/4/1985
WA	Online	COWICHE	7337	Columbia Cascades	Yakima-Tieton ID	Conventional	1,470.00				7/6/1984	1986
ID	Online	Dietrich Drop	8909	Snake River	Big Wood Canal Company	Conventional	4,770.00	3/7/1985			5/22/1987	1989
WA	Online	ELTOPIA BRANCH CANAL	3842	Columbia Cascades	East, Quincy, & South, Columbia Basin ID's	Conventional	2,200.00				12/9/1981	1982
WA	Online	ESQUATZEL POWER	12638	Columbia Cascades	Green Energy Today LLC	Conventional	900.00	1/4/2006		6/6/2008		Apr-12
ID	Online	FARGO DROP NO. 1	5042	Snake River	Boise Project Board of Control	Conventional	1,100.00			10/23/1981		Jun-13
ID	Online	FELT HYDRO	5089	Snake River	Fall River Rural Cooperative	Conventional	7,450.00				9/9/1983	1985
ID	Online	ISLAND PARK	2973	Snake River	Fall River Rural Electric	Conventional	4,800.00		7/8/1983		10/19/1988	1982
ID	Online	Little Wood Reservoir	7427	Snake River	Little Wood Irrigation District	Conventional	3,000.00			4/13/1984		1989
ID	Online	LOW LINE NO. 8 ARENA DROP	5056	Snake River	Boise Project Board of Control	Conventional	385.00	6/10/1981		10/23/1981		Apr-12
WA	Online	MAIN CANAL HEADWORKS	2849	Columbia Cascades	East, Quincy, & South, Columbia Basin I.D.'s	Conventional	26,000.00				11/16/1981	1987
ID	Online	Mile 28	10552	Snake River	Contractor's Power Group	Conventional	1,500.00	12/2/1987	9/15/1988		8/12/1992	1996
OR	Online	MITCHELL BUTTE LATERAL	5357	Snake River	Owyhee ID et. al.	Conventional	1,880.00		2/26/1982		12/14/1984	1990
ID	Online	Mora Drop Hydro	3403	Snake River	Boise Kuna Irrigation District et. Al	Conventional	1,900.00			12/18/1980		9/15/2006
WA	Online	ORCHARD AVENUE	7338	Columbia Cascades	Yakima-Tieton ID	Conventional	1,441.00				7/6/1984	1986
OR	Online	OWYHEE DAM	4354	Snake River	Gem I.D., Owyhee I.D., & Ridgeview I.D	Conventional	4,340.00				5/9/1984	1985
OR	Online	OWYHEE TUNNEL NO. 1	4359	Snake River	Gem ID et. al.	Conventional	8,120.00				2/28/1986	6/1/1983
WA	Online	POTHOLES EAST CANAL	3843	Snake River	East, Quincy, & South, Columbia Basin ID's	Conventional	2,400.00				12/9/1981	1982
WA	Online	POTHOLES EAST CANAL HEADWORKS	2840	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	6,500.00				9/21/1982	1991
WA	Online	QUINCY CHUTE	2937	Columbia Cascades	East, Quincy, & South, Columbia Basin I.D.'s	Conventional	9,367.00				8/20/1982	1983
WA	Online	RUSSEL D SMITH PEC 22.7	2926	Columbia Cascades	East, Quincy, & South, Columbia Basin I.D.'s	Conventional	6,100.00				3/27/1980	1982
WA	Online	SUMMER FALLS	3295	Columbia Cascades	East, Quincy, & South, Columbia Basin I.D.'s	Conventional	92,000.00				8/14/1981	1983
WA	Online	TIETON DAM	3701	Columbia Cascades	Yakima-Tieton Irrigation District	Conventional	13,600.00				6/27/1991	2007
OR	Exemption	45-Mile	13817	Columbia Cascades	Earth by Design	Conventional	5,000.00	7/16/2010		12/17/2010		
ID	Exemption	FARGO DROP NO. 2	5040	Snake River	Boise Project Board of Control	Conventional	175.00			10/23/1981		

Pacific Northwest Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
ID	Exemption	MAIN CANAL NO. 10	5041	Snake River	East, Quincy, & South, Columbia Basin I.D.'s	Conventional	500.00			10/23/1981		
ID	Exemption	MAIN CANAL NO. 6	5038	Snake River	East, Quincy, & South, Columbia Basin I.D.'s	Conventional	1,055.00			10/23/1981		
ID	Exemption	WALDVOGEL BLUFF	5043	Snake River	Boise Project Board of Control	Conventional	300.00	6/30/1981		12/23/1981		
WA	Preliminary	16.4 Wasteway	14349	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	1,750.00	7/29/2011	3/26/2013			
WA	Preliminary	46A Wasteway	14351	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	1,600.00	7/29/2011	3/26/2013			
ID	Preliminary	Mason Dam Hydro	12686	Snake River	Baker County	Conventional	3,400.00	4/25/2006	5/26/2010			
WA	Preliminary	McKay Dam	14546	Columbia Cascades	Houtama Hydropower, LLC	Conventional	2,300.00	8/13/2013	2/6/2014			
OR	Preliminary	Monroe Drop	14430	Columbia Cascades	Natel	Conventional	300.00	7/2/2012	3/28/2013			
WA	Preliminary	PEC 1973 Drop	14316	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	2,200.00	11/8/2011	3/26/2013			
WA	Preliminary	Pinto Dam	14380	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	3,400.00	4/4/2012	10/10/2012			
WA	Preliminary	Rocky Coulee Wasteway	14372	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	12,000.00	3/13/2012	7/11/2012			
State	**Project Status**	**Project Name**	**FERC ID**	**Area Office**	**Operating Entity**	**Hydropower Type**	**Capacity (kW)**	**Project Initiation Date**	**Preliminary Permit or Lease Date**	**Exemption or CE Date**	**License or Lease Date**	**Online Date**
WA	Preliminary	Scooteney Outlet Drop	14317	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	1,300.00	5/31/2011	3/26/2013			
WA	Preliminary	Scooteney Wasteway	14352	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	1,110.00	7/28/2011	3/26/2013			
WA	Preliminary	Scooteney Inlet Drop	14318	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Conventional	1,700.00	5/31/2011	3/26/2013			
OR	Preliminary	Unity Dam by Warm Springs Hydro	14576	Snake River	Warm Springs Hydro, LLC	Conventional	800.00	1/13/2014	6/16/2014			
ID	Preliminary	Warm Springs Dam	13570	Snake River	Ted Sorenson	Conventional	2,700.00	8/12/2009	2/22/2010			
WA	Preliminary	Wickiup Dam Hydro	12965	Columbia Cascades	Symbiotics	Conventional	7,150.00	8/17/2007	5/15/2008			
WA	Preliminary	Banks Lake Pumped Storage Project	14329	Columbia Cascades	Grand Coulee Project Hydroelectric Authority	Pump Storage	1,000,000.00	11/30/2011	8/22/2013			
SOLAR PROJECTS												
WA	Online	Grand Coulee Solar		Columbia Cascades	Grand Coulee		4.70					Oct-12
PILOT PROJECTS												
WA	Testing	Instream Energy Roza Division Hydrokinetics		Columbia Cascades	Instream Energy	Hydrokinetics	10.00					Aug-13

Upper Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
RECLAMATION OWNED AND OPERATED												
CO	Online	Blue Mesa		Western Colorado	USBR	Conventional	86,400.00					1967
CO	Online	Crystal		Western Colorado	USBR	Conventional	31,500.00					1978
NM	Online	Elephant Butte		Albuquerque	USBR	Conventional	27,945.00					1940
UT	Online	Flaming Gorge		Provo	USBR	Conventional	151,500.00					1963
WY	Online	Fontenelle		Provo	USBR	Conventional	10,000.00					1968
AZ	Online	Glen Canyon		Western Colorado	USBR	Conventional	1,320,000.00					1965
CO	Online	Lower Molina		Western Colorado	USBR	Conventional	5,589.00					1962
CO	Online	Morrow Point		Western Colorado	USBR	Conventional	173,334.00					1971
CO	Online	Upper Molina		Western Colorado	USBR	Conventional	9,936.00					1962
RECLAMATION OWNED AND OPERATED BY OTHERS												
UT	Online	Causey Powerplant		Provo	Weber Basin Water Conservancy District	Conventional	1,900.00					1999
UT	Online	Deer Creek Powerplant		Provo	Provo River Water Users Association	Conventional	4,950.00					1958
UT	Online	Gateway Powerplant		Provo	Weber Basin Water Conservancy District	Conventional	4,275.00					1958
UT	Online	Lower Spanish Fork Powerplant		Provo	Strawberry Water User's Association	Conventional	250.00					1937
CO	Online	McPhee Powerplant		Western Colorado	Dolores Water Conservancy District	Conventional	1,283.00					1992
UT	Online	Olmsted Powerplant		Provo	Purchased from PacifiCorp in 1990	Conventional	10,300.00					1904
UT	Online	Payson Powerplant		Provo	Strawberry Water User's Association	Conventional	400.00					1941
CO	Online	Towaoc Powerplant		Western Colorado	Dolores Water Conservancy District	Conventional	11,495.00					1994
UT	Online	Upper Spanish Fork		Provo	Strawberry Water User's Association	Conventional	3,900.00					1909
UT	Online	Wanship Powerplant		Provo	Weber Basin Water Conservancy District	Conventional	1,900.00					1958
FEDERAL ENERGY REGULATORY COMMISSION PROJECTS												
UT	Online	Echo Dam	3755	Provo	City of Bountiful	Conventional	4,500.00		11/30/1981		12/7/1984	6/9/1905
NM	Online	El Vado Dam	5226	Albuquerque	County of Los Alamos	Conventional	8,000.00		1/4/1982		10/31/1985	7/1/1988
CO	Online	Navajo Dam	4720	Western Colorado	City of Farmington	Conventional	30,000.00				10/15/1985	2/1/1988
UT	Online	Pineview Dam	4597	Provo	Weber-Box Elder Conservancy District	Conventional	1,800.00				3/16/1984	6/13/1905
CO	Online	Vallecito Dam	3174	Western Colorado	Ptarmigan Resources & Energy, Inc.	Conventional	5,880.00				10/5/1983	5/1/1989
UT	Preliminary	Lake Powel Hurricane Cliffs Pumping Plant	12966	Regional Office	State of Utah	Pump Storage	300,000.00	8/21/2007	5/20/2011			
CO	Preliminary	Plateau Creek Pumped Storage	14426	Western Colorado	Dolores Water Conservancy District	Pump Storage	500,000.00	5/10/2012	10/1/2012			
LEASE OF POWER PRIVILEGE PROJECTS												
CO	Online	Grand Valley Project		Western Colorado	Grand Valley Water Users Assoc., Orchard Mesa Irrigation Dist., PSCO	Conventional	3,000.00				1933	1938
CO	Online	Jackson Gulch Dam		Western Colorado	Mancos Water Conservancy Dist.	Conventional	260.00				1955	1995
UT	Online	Jordanelle Dam		Provo	Central Utah Water Conservancy Dist., Heber Light and Power	Conventional	13,000.00	7/2/1999			2008	7/1/2008
CO	Online	Lemon Dam		Western Colorado	Florida Water Conservancy District	Conventional	120.00				1989	9/1/1988
CO	Online	South Canal (Drop 1)		Western Colorado	Uncompahgre Valley Water Users and the Delta-Montrose Electric Association	Conventional	4,000.00	8/26/2009			3/16/2012	6/3/2013
CO	Online	South Canal (Drop 3)		Western Colorado	Uncompahgre Valley Water Users and the Delta-Montrose Electric Association	Conventional	3,500.00	8/26/2009			3/16/2012	8/1/2013
CO	Online	Ridgway Dam		Western Colorado	Tri-County Water Conservancy District	Conventional	7,000.00	6/2/2010			2/6/2012	4/3/2014
CO	License	Shavano Falls		Western Colorado	Uncompahgre Valley Water Users Association	Conventional	2,800.00	8/21/2013	1/27/2014		6/18/2014	
NM	Preliminary	Caballo Dam		Albuquerque	HydroPower Capital	Conventional	5,900.00	9/22/2011	12/4/2012			
CO	Preliminary	South Canal (Drop 4)		Western Colorado	Uncompahgre Valley Water Users Association	Conventional	4,800.00	8/21/2013	5/14/2014			
UT	Preliminary	Spanish Fork Flow Control Structure	LP11-2	Provo	Central Utah Water Conservancy District, Strawberry Water Users Association and South Utah Valley Electric Service District	Conventional	8,000.00	5/11/2011	3/9/2012			
NM	Posted Solicitation	San Juan Chama Project	LP12-1-000	Albuquerque	Albuquerque Bernalillo County Water Utility Authority	Conventional	100.00	7/6/2012				
CO	Request for Development	Rifle Gap Dam		Western Colorado		Conventional	341.00	4/1/2013				

Upper Colorado Renewable Portfolio

State	Project Status	Project Name	FERC ID	Area Office	Operating Entity	Hydropower Type	Capacity (kW)	Project Initiation Date	Preliminary Permit or Lease Date	Exemption or CE Date	License or Lease Date	Online Date
CO	Request for Development	South Canal (Drop 5)		Western Colorado	Uncompahgre Valley Water Users Association	Conventional	291.00	8/21/2013				
PILOT PROJECTS												
CO	Request for Development	South Canal (Drop 2)		Western Colorado	Percheron Power, LLC, Delta-Montrose Electric Association, Uncompahgre Valley Water Users Association	Hydrodynamic Screw	987.00	5/27/2014				