

The Water Power Program is committed to developing and deploying a portfolio of innovative technologies and market solutions for clean, domestic power generation from water resources across the United States (hydropower and marine and hydrokinetics).

What We Do

The Water Power Program strives to produce the next generation of water power technologies and jump-start private-sector innovation critical to the country's long-term economic growth, energy security, and international competitiveness by accelerating the development of markets for those technologies.

- ✓ **Providing Clean, Domestic Energy** such as hydropower, the largest source of renewable electricity in the United States. The Water Power Program leads the critical research and development efforts necessary to deploy technologies that will drive sustainable growth and economic opportunity.
- ✓ **Tapping New Sources of Clean, Renewable Energy** such as those that can generate energy from highly predictable waves, currents, and tides. With more than 50% of the American population living within 50 miles of the coast, marine and hydrokinetic (MHK) technologies could provide a substantial amount of electricity for the nation.
- ✓ **Supporting Renewable Energy with Stable Power Delivery** from pumped-storage hydropower will help to ensure that variable renewable power sources, such as wind and solar, can be integrated more efficiently and cost effectively onto the nation's electrical grid.
- ✓ **Enabling the Renewable Energy Market** through the development of low-carbon, environmentally sustainable energy infrastructure and technology.

Program Goals/Metrics

- **MHK:** Demonstrate component improvements that will allow an increase in wave energy conversion system power-to-weight ratio of 100% (baseline for wave is 0.25kW/ton).
- **Hydropower:** Invigorate hydropower industry innovation, identify or enable opportunities, and solve unique challenges in the United States to support the goal of expanding the contribution of hydropower and pumped-storage hydropower in all identified resource classes (non-powered dams, undeveloped streams, and pumped storage hydropower).

FY 2016 Priorities

- **Wave Energy Testing Infrastructure** will help ensure that domestic MHK technology developers have access to world-class testing infrastructure. This open water, fully energetic wave facility will enable rapid testing of MHK devices and reduce development timelines.
- **MHK Technology Advancement and Demonstration** activities will pursue improvements in existing MHK designs and seek to encourage the development of novel, innovative MHK devices for converting the various resources into energy.
- **Hydropower Technology Development** has the potential to provide up to 12 GW of new hydropower capacity from non-powered dams (NPD) and more than 60 GW from low-impact, new development. Activities funded under the HydroNEXT initiative will develop low-cost technologies for increased hydroelectric generation from both NPDs and undeveloped streams.
- **Market Acceleration and Deployment** activities will help lower the barriers to deployment of innovative water power technologies, including monitoring instrumentation for MHK devices and biological design tools for engineering more sustainable hydropower turbines.

(Dollars in Thousands)	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Request
Marine and Hydrokinetics	41,275	41,100	40,800
Hydropower	17,290	19,200	25,500
NREL User Facility	0	700	700
Total, Water Power	58,565	61,000	67,000

Key Accomplishments

- The **New Stream-Reach Development (NSD) Assessment** provides a national picture of the hydropower development potential in U.S. rivers and streams. This study leveraged recent advances in national geospatial datasets to provide the highest fidelity national study yet. The NSD Assessment identified social, economic, and environmental attributes of the nation’s stream reaches in addition to the technical power potential. The NSD Assessment concluded that the technical resource potential of these rivers and streams is 85 GW of capacity. When federally protected lands are excluded from the calculation, the potential is roughly 65 GW.
- The Water Power Program partnered with the U.S. Navy for several rounds of wave energy converter testing at the Navy’s **Wave Energy Test Site** at Marine Corps Base Hawaii. Through a competitive solicitation issued in April 2014, Ocean Energy USA and Northwest Energy Innovations were selected for testing in October 2014.
- In September 2014, the Water Power Program launched the **Wave Energy Prize Competition** and awarded \$6.5 million to Ricardo, Inc. to develop a design-build-test prize competition for wave energy converters. The contest has a prize purse and is intended to incentivize game-changing advances in wave energy conversion (WEC) device development. Further funds will be provided to national laboratories and the Naval Surface Warfare Center’s Carderock Division (which houses some of the nation’s premier wave-generating basins) to provide engineering and testing expertise for WEC Prize device design, building, and testing between 2015 and 2016.
- **Hydropower Vision Launch:** In April 2014, the Water Power Program announced that it was looking toward the future of the hydropower industry by initiating the development of a long-range national Hydropower Vision. This landmark vision will establish the analytical basis for an ambitious roadmap to usher in a new era of growth in sustainable domestic hydropower over the next half century.



Snohomish County Public Utility District – Youngs Creek Project. Photo Courtesy: Snohomish County Public Utility District. The project went online in October 2011 with an estimated capacity of 7.5 megawatts and an annual production of 18,000 MWh—enough to power about 1,500 homes. It is the first new hydro project in the State of Washington in nearly 20 years.

