



A VISION FOR GROWTH AND VALUE

2016 ANNUAL REPORT

Key Facts



Hydropower Pumped Storage Marine Energy

HYDROPOWER IN AMERICA

- Approximately 22,000 MW across 179 projects of new hydropower projects are in the FERC regulatory pipeline.
- Hydropower provides over 30 million American homes with affordable renewable power each year.
- Hydropower currently supports over 140,000 American jobs annually and over 2,500 supply chain companies from coast to coast.
- Hydropower capacity exceeds 100,000 MW in the U.S. and generates nearly half of the nation's renewable electricity.

WATERPOWER'S POTENTIAL

- Only 3 percent of the 80,000 dams in the U.S. generate electricity.
- The Department of Energy's Hydropower Vision report finds that hydropower can sustainably grow by 50 GW by 2050.
- Energy Department reports show that 12,000 MW of capacity could be added to the nation's non-powered dams and 65,000 MW exists in the nation's stream reaches.
- Recent studies found that America's technically recoverable wave energy resource is estimated to range between 898–1,229 terawatt hours (TWh) per year, distributed across the coast of Alaska, the West Coast, the East Coast, the Gulf of Mexico, Hawaii, and Puerto Rico.

OUR CLEAN ENERGY FUTURE

- By increasing hydropower's capacity by 50 gigawatts by 2050, we can:
 1. reduce greenhouse gas emissions by 5.6 billion metric tons
 2. save \$209 billion in avoided global damages from greenhouse gas emissions
 3. reduce cases of acute respiratory symptoms by 5 million
 4. reduce cases of childhood asthma by 750,000
- Hydro avoids approximately 200 million tons of CO₂ emissions annually—that's like taking 42 million cars off the road!
- Hundreds of millions of dollars are invested each year in environmental enhancements at hydro facilities.
- Industry is constantly innovating and investing in research and development to improve fish passage and ensure greater water quality with enhanced technology.



Letter from the President and Executive Director

2016 was a watershed year for our industry. The release of the Department of Energy's Hydropower Vision report in many ways hit the reset button on the way hydropower is viewed. It reaffirmed the undeniable value of our hydropower system; from its role in the grid to maximizing its market and economic values. Most importantly, it serves as a comprehensive roadmap for our future growth and vitality.

Last year, we launched a legislative full court press dedicated towards modernizing the licensing process. And while the Energy Bill didn't reach the President's desk, we brought the industry one very large step closer to bringing the licensing process into the 21st century. Of the lessons learned, it became clear that, as an industry, when we speak with one powerful voice, we can make great strides toward unlocking the nation's largest source of clean, renewable energy.

2016 was also a big year for our regulatory efforts. In addition to successfully reversing the EPA's position on the Clean Power Plan's Clean Energy Incentive Program to include hydropower as an eligible resource, we held a Relicensing Summit in DC to identify solutions for existing projects. The Summit's findings will be used to develop a proactive administrative-focused action plan for the Regulatory Affairs Committee and Small Hydro Council to pursue over the next several years.

On many fronts, 2016 was a year of successes. Last year, our newly branded Waterpower Week in Washington hosted over 760 attendees. Meanwhile, our regional meetings throughout the country continued to receive record attendance. Operational Excellence also continues to grow, as the program exceeded its goal of event reports in the system. We are pleased to see the industry talking to and learning from each other. And our seamless integration of the marine energy sector has yielded record federal funding for research and development.

All of these successes were made possible by the continued engagement of our members.

As we look to 2017, with a new president, a new administration and a new Congress, we believe, as an industry, that legislative and regulatory gains are within our grasp. And we will continue working on your behalf to protect and value our existing system, while unlocking our potential for growth.

Sincerely,

Herbie Johnson
NHA President

Linda Church Ciocci
NHA Executive Director



Herbie Johnson
NHA President



Linda Church Ciocci
NHA Executive Director



Top of the Hill

Legislative & Regulatory Efforts



U.S. Senator Maria Cantwell speaking at NHA's 2016 Waterpower Week in Washington.



NHA's Jeff Leahey testifying before Congress.

Legislative Efforts

In 2016, Congress not only recognized that our licensing process is outdated and outmoded, it took steps to make significant improvements. Led by Senators Lisa Murkowski (R-AK) and Maria Cantwell (D-WA) and Representatives Cathy McMorris Rodgers (R-WA) and Jerry McNerney (D-CA), the U.S. House and Senate each passed comprehensive energy bills that contained hydropower licensing provisions.

As part of this effort, NHA managed a highly-focused legislative effort to secure these provisions that would establish the Federal Energy Regulatory Commission (FERC) as the lead agency for purposes of coordinating all permits and authorizations. The bills would also have directed FERC and all other agencies to work together to develop a master schedule for all required reviews and authorizations, among other critical provisions.

In Congress, comprehensive energy bills are only worked on generally every eight years, because of their complexity. And unfortunately, members of Congress couldn't agree on the bill as a whole. However, with a new Congress and administration, we are optimistic about getting licensing reform over the finish line.

NHA also continued to advocate in Congress for the inclusion of hydropower and marine energy in clean energy and tax policies. Despite previously securing an extension of the PTC and ITC through 2016, Congress allowed these important tax incentives to elapse. In response, NHA is leading a Baseload Renewables Coalition to put hydropower back on a level playing field. Going forward, we will continue working to secure long-term extensions and improvements to the tax incentives for our technologies.

Regulatory Efforts

Last year, NHA stepped up its regulatory efforts on behalf of the industry. NHA was successful in reversing the EPA's position on the Clean Power Plan's Clean Energy Incentive Program to include hydropower as an eligible resource.

Among the regulatory filings NHA submitted in 2016, we provided comments on a DoE, USACE, and FERC proposal intended to improve coordination between the FERC and Corps' licensing and permitting processes for non-federal hydropower development on Corps infrastructure. The revised Memo of Understanding incorporated NHA's recommendations for a new two-step approach for conducting a coordinated and concurrent review process. The new process would allow for greater process certainty to developers and more appropriately spread their financial risk throughout the entire process, while reducing the amount of time the Corps and FERC expend conducting technical reviews on projects that do not move past licensing.

And with nearly 400 FERC licensed projects representing approximately 18,000 MWs entering relicensing within the next 13 years, NHA convened a national Relicensing Summit in Washington, D.C. The goal of the Summit was to bring industry practitioners together to discuss the issues and challenges, possible solutions, and new approaches to relicensing existing projects.

Throughout 2016, NHA worked tirelessly to position the hydropower industry for success. Legislative and regulatory improvements are our top priority. And we will continue engaging policymakers to champion hydropower's role in our clean energy future.

Timeline

2016 Legislative and Regulatory Timeline

Hydropower Licensing Reform and Improvements

January 17—Joint trade associations support letter on Senate Energy Committee bipartisan hydro provisions (NHA, APPA, EEI, LPPC, and NRECA).

April—Senate adoption of S. 2012, containing comprehensive hydro title.

May—House votes to go to Conference Committee with Senate.

June—NHA testifies before the House of Representatives Republican Policy Committee on all water power technologies and the need for regulatory reform, tax incentives, market policies and appropriations funding.

July—Senate votes to go to Conference Committee with House.

August 15—Joint trade associations letter on energy bill conference committee consideration of hydro provisions (NHA, APPA, EEI, LPPC, and NRECA).

September—Licensing reform discussed at House and Senate energy bill conference report meeting.

October—NHA holds NHA-member webinar on relicensing issues in preparation for NHA Relicensing Summit in DC.

November—NHA holds relicensing summit with close to 70 industry participants to discuss needs and solutions.

November/December—Lame duck session includes negotiations on energy bill conference report, including a substantial hydro title.

Tax Incentives

January—Baseload Renewables Coalition (NHA, ABC, BPA, GEA, ERC) letter to House and Senate leadership and Finance and Ways and Means Committee.

April—Second Baseload Renewables Coalition letter to House and Senate leadership and Finance and Ways and Means Committee leaders.

May—IRS issues new guidance on beginning of construction under the PTC and ITC with additional benefits for hydropower projects.

June—NHA Statement for the Record to Finance Committee on tax reform.

June—NHA testifies before the House of Representatives Republican Policy Committee on all water power technologies and the need for regulatory reform, tax incentives, market policies and appropriations funding.

September—Third Baseload Renewables Coalition to House and Senate leadership and Finance and Ways and Means Committee leaders.

September—NHA signs joins tax extenders coalition (50+ groups) letter to House and Senate leadership and Finance and Ways and Means Committee.

December—NHA joins the Business Council for Sustainable Energy and other groups in a letter to Congress in support of tax extenders.

November/December—Lame duck session work on the continuing resolution (CR) and tax extenders.

Department of Energy Funding

January—House members issue support of DOE Water Power program support letter to President Obama.

March—NHA submits statement for the record to House and Senate Appropriations Committees.

March—Over two dozen House members send Water Power program support letter to House Appropriations Committee.

June—NHA testifies before the House of Representatives Republican Policy Committee on all water power technologies and the need for regulatory reform, tax incentives, market policies and appropriations funding.

December—House passes CR that continues funding for the Water Power program at historic FY 2016 level.

Promotion of Small Hydropower

December 2015—NHA comments on a DoE, USACE, and FERC proposal to improve coordination between the FERC and Corps' processes for non-federal hydropower development on Corps dams.

February—NHA testifies before the House Energy and Commerce Committee, Energy and Power Subcommittee in support of several NHA member company projects needing an extension of commence construction deadlines.

April—Senate adoption of S. 2012 contains reauthorization of EPAct of 2005 Section 242 and 243 programs.

July—FERC/USACE sign revised MOU, incorporating NHA process recommendations.

July—DOE releases the Hydropower Vision Report and a \$10 million funding opportunity for non-powered dams and pumped storage.

August—NHA comments on USACE NOPR to reissue the nationwide permit program (NWP) on expanding the capacity threshold of NWP 17 for small hydropower projects, and to a new NWP A (Removal of Low-Head Dams)

November/December—Lame duck session includes negotiations on energy bill conference report, including Section 242/243 program reauthorization. End of year CR continues appropriations funding for the program.

Promotion of Pumped Storage

February—NHA comments to IRS and Treasury Department on recognition of pumped storage under the ITC.

March—NHA comments on DOE request for information (RFI) on pumped storage development.

November—NHA comments on FERC NOI regarding electric storage participation in regions with organized wholesale energy markets.

December—NHA comments on the FERC energy storage technical conference.

EPA Clean Power Plan (CPP) and Clean Energy Incentive Program (CEIP)

January—NHA comments on original CEIP proposal, which excluded hydro as an eligible technology.

April/May—NHA-only meetings with members at EPA. Renewable Baseload Coalition meeting with OMB.

June—Proposed CEIP rule reversed position and expands the scope of the CEIP to include hydropower as an eligible CEIP resource.

November—NHA submits a second round of comments on the CEIP to strengthen hydropower's position.

Other Regulatory Issues

April—NHA comments on a Forest Service White Paper entitled Seeking Recommendations in Formulating Agency Policy on Mitigating Adverse Impacts on National Forests and Grasslands that will inform a proposed mitigation regulation in 2017.

May—NHA submits joint comments with APPA, NRECA, and NWRA, on the Department of Interior's Long-Term Experimental and Management Plan (LTEMP) for Glen Canyon Dam.

June—NHA filed comments on a U.S. Fish and Wildlife Service's proposal to revise its 1981 Mitigation Policy.

November 21—FWS issued Notice of Final Policy on the mitigation policy.

November 23—Departments of Agriculture, Commerce and Interior issue revised interim final rules implementing Trial-Type Hearings and Alternative Conditions, proposing no changes to the earlier rules.

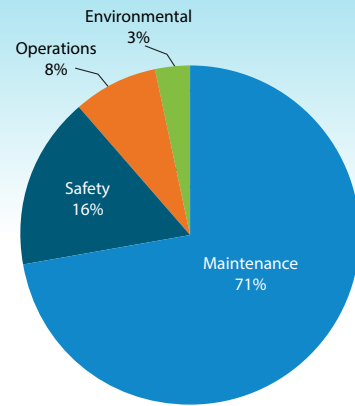


Pursuing operational excellence

NHA's Operational Excellence (OpEx) program is a member-only voluntary event reporting system that receives, distributes, archives, and catalogs hydro operating experiences and resulting best practices and lessons learned. OpEx scope and focus is on events related to safety (dam, employee, and public), operations, maintenance and environmental performance, and is intended to be a tool to help avoid events experienced by others, train a workforce in development, and assist in managing aging assets.

Since its launch in 2014, the event reports submitted to OpEx have described over 425 best practices, lessons learned and recommendations in order to prevent a reoccurrence.

As the only event reporting program and database available to the hydropower industry, we encourage you to visit www.hydroexcellence.org to sign up.



Hydropower panel at Waterpower Week.



US Army Corps of Engineers Major General Ed Jackson, Jr. speaks with Waterpower Week attendees.

Connecting the Hydropower Industry

NHA prides itself on being a service to the industry and our membership. And one of the most important roles we play is bringing hydropower professionals from all segments of the industry together. To that end, we worked hard to provide members with a multitude of opportunities to learn, network and share best practices.

The 2016 Waterpower Week in Washington brought in over 760 members of the hydropower and marine energy industry to shape the course.

Waterpower Week is comprised of three co-located events: NHA's Annual Conference, International Marine Renewable Energy Conference (IMREC) and the Marine Energy Technology Symposium (METS).

NHA's regional meetings program continues to be an essential part of the hydropower industry's calendar every year. In 2016, we held meetings in California, Alaska, Tennessee, Colorado, Pennsylvania and New Hampshire, with panels on issues ranging from fish passage to dam safety. And we are pleased to announce that attendance nearly doubled for HPC Fall Retreat in Green Bay, WI, with 154 attendees participating.

Are you interested in attending a regional event? Go to Hydro.org for more information.

For more information go to: waterpowerweek.com

HYDROPOWER VISION REPORT

Recognizing the untapped potential of hydropower to lessen the nation's carbon footprint, the U.S. Department of Energy released the **Hydropower Vision: A New Chapter for America's 1st Renewable Electricity Source** report—a comprehensive, first-of-its-kind roadmap that offers a 360-degree view of the hydropower industry.

Breaking long held misconceptions, the report hits the reset button on the current perception of hydropower in America. It found that hydropower's capacity can sustainably increase by nearly **50 gigawatts** by 2050—more than doubling our nation's energy storage.

The Hydropower Vision report identifies growth potential in the following areas:

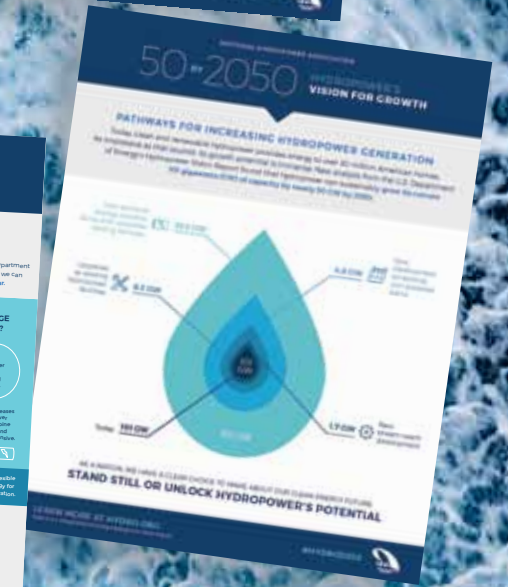
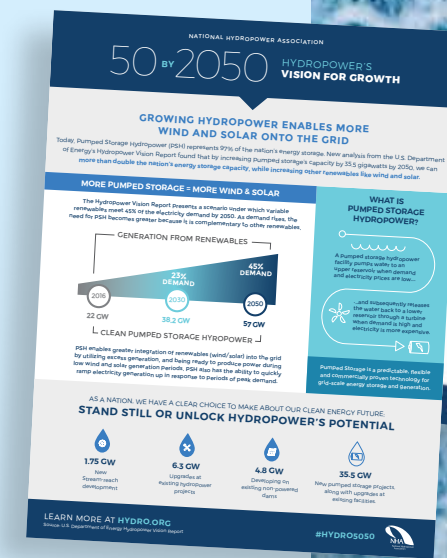
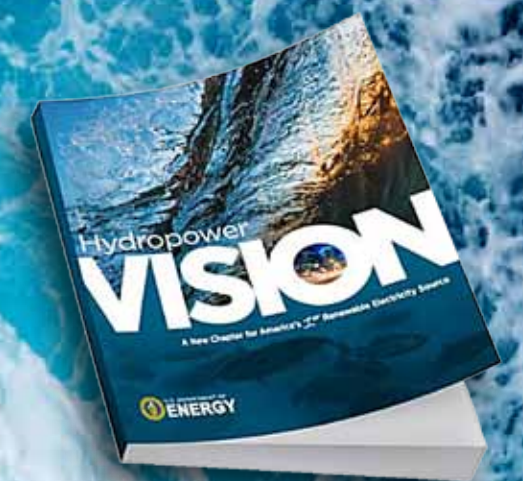
- 4.8 GW of new development on non-powered dams
- 6.3 GW in upgrades on existing hydropower
- 35.5 GW of new pumped storage projects
- 1.75 GW in new stream-reach development

Reaching 50 GW by 2050, however, isn't an abstract concept. It has real-world implications. According to the Hydropower Vision report, we could reduce greenhouse gases and other emissions by **5.6 billion metric tons**, support **195,000 jobs** and avoid **30 trillion gallons of water use**—the equivalent of 45 million Olympic-size pools.

50 by 2050 also means nearly **5 million** fewer cases of acute respiratory symptoms, and over **300,000** fewer cases of childhood upper respiratory symptoms.

Clean and renewable hydropower is available and can play a larger role in securing our clean energy future. As a nation, we can look to this report as a roadmap for unlocking hydro's potential.

For more information on the report, visit www.hydropowervision.org



BY THE NUMBERS HYDROPOWER IN 2016

U.S. Hydropower Fleet Ownership Mix

- 176 plants owned by federal agencies account for 49% of the capacity but only 8% of the plants.
- Publicly owned utilities, state agencies, and cooperatives own an additional 24% of total capacity.
- The remaining quarter of installed capacity belongs to private owners and corresponds to 62% of hydropower plants.

NHA 2016 Events

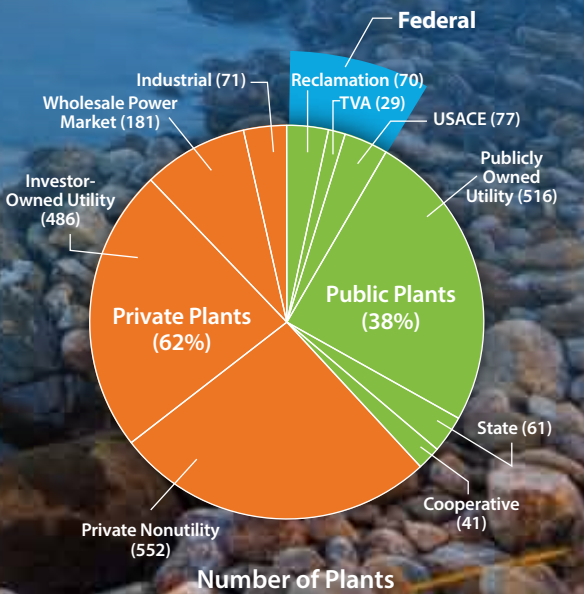
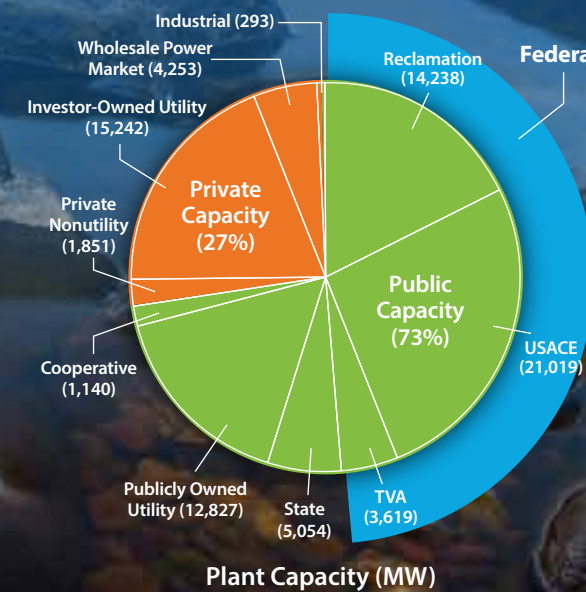
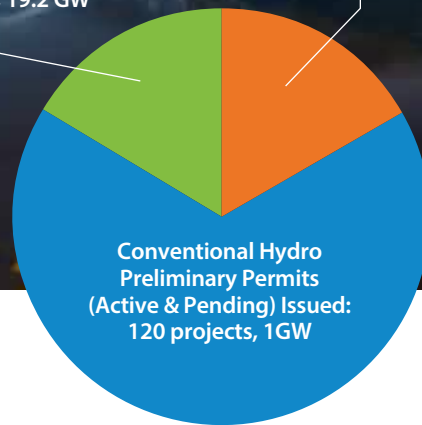
- NHA Southwest Regional Meeting, Denver, CO
- NHA Southeast Regional Meeting, Knoxville, TN
- NHA Northeast Regional Meeting, Philadelphia, PA
- NHA Alaska Regional Meeting, Cordova, AK
- NHA California Regional Meeting, San Diego, CA
- NHA Relicensing Summit, Washington, DC
- NHA Negotiation Workshop, Manchester, NH
- HPC Fall Retreat/MHUG Meeting, Green Bay, WI

In the FERC Pipeline 179 projects

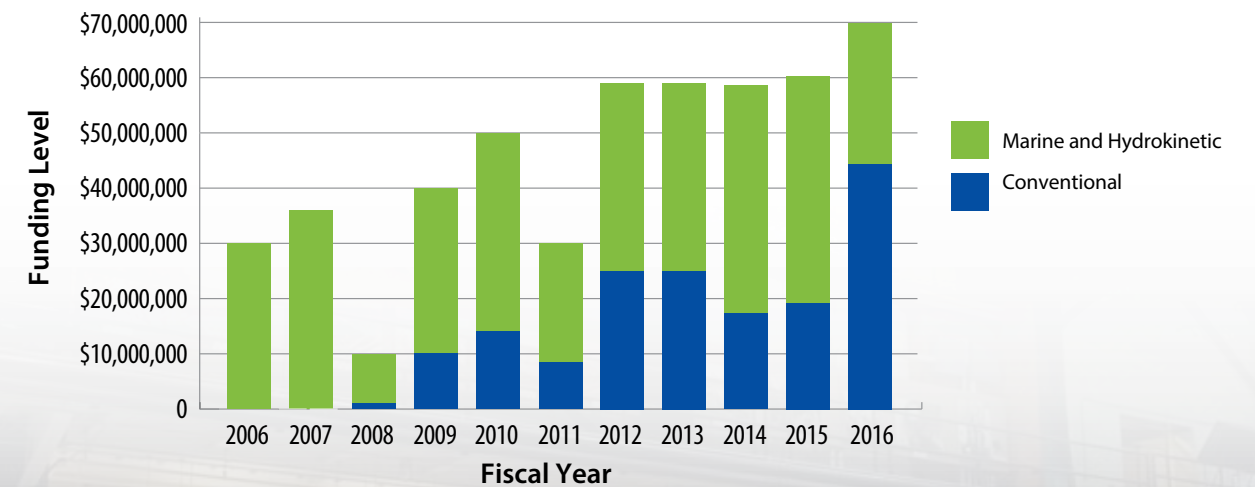
(conventional & pump storage)
totaling approximately 22GW

Pumped Storage Preliminary Permits (Active & Pending): 29 projects, 19.2 GW

Pending Original Licenses: 30 projects, 2.4 GW filed license

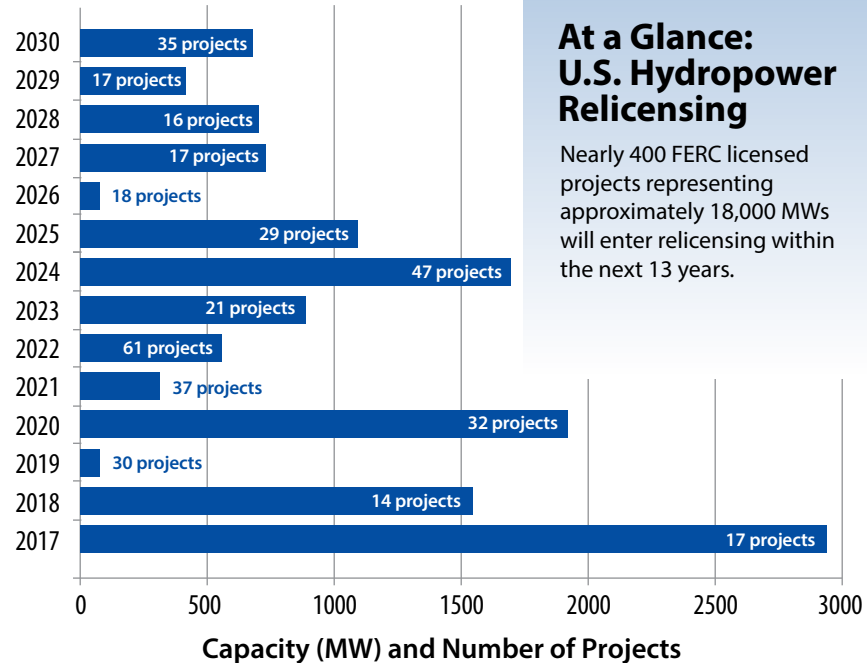


Energy Department Water Power Program Funding



Economic Activity

Today, hydropower supports **143,000 jobs** with over **\$20 billion** in economic output.



At a Glance: U.S. Hydropower Relicensing

Nearly 400 FERC licensed projects representing approximately 18,000 MWs will enter relicensing within the next 13 years.



Attendees at NHA's HPC meeting tour Holyoke Gas and Electric's Hadley Falls facility.

Outlook

Why isn't hydropower being valued properly? With so many upcoming relicensings, how can we improve the process? Hydropower technology has come so far, but where is it going? For 2017, NHA seeks to tackle these and other pressing questions.

Compensation for hydropower generation in power and environmental markets is critically important. To that end, NHA has created the Value Recognition Taskforce which is charged with identifying market barriers and gaps.

And when it comes to relicensings, we don't need a crystal ball. Over the next 13 year, nearly 400 projects will be up for relicensing. This year, we will be leveraging the results and recommendations from our Relicensing Summit to develop a proactive administrative-focused implementation plan to engage FERC, resource agencies, and the new administration.

We also recognize that research and development is critical to hydropower's future. As such, we have created a new Waterpower

Innovation Council to foster the advancement of technology. The Council is charged with tracking and evaluating major RD&D currently underway at national laboratories, government agencies and academia, as well as identifying industry needs and developing recommendations to promote focused technological and environmental research.

In addition to answering these questions, we are still laser focused on modernizing the licensing process. As part of our legislative strategy, we will be working to educate the new administration and new members of Congress.

Each of these efforts is also in keeping with the implementation of the Hydropower Vision report, as we seek to grow the hydro by 50GW by 2050.

As always, we encourage you to be involved in every aspect of NHA's work in 2017, as we look forward to another exceptional year for the industry.



NHA's Past President John McCormick and Vice President Debbie Mursch present Rick Miller with the 2016 Dr. Kenneth Henwood Award.

Awards

2016 Awards

Outstanding Stewards of America's Waters

Tacoma Power: Floating Fish Collector

Duke Energy: Pines Recreation Area and High Falls Trail Project

Avista Corporation: Huntington Park and Spokane Tribal Gathering Place Renovation

Ocean Renewable Power Company: RivGen® Power System Commercialization Project

Grant County PUD: Wanapum Dam Video Tour

NHA Past Presidents' Legacy Scholarship

Andrew Shea, Ohio State University



2016 New Members

American Babbitt
Aquanovis
Azura Wave
BioSonics, Inc.
Burns & McDonnell
Canadian Hydro Components
Cardinal Engineering LLC
Coatings Unlimited, Inc.
Copper River Energy LLC
EBC Inc.

Emrgy, Inc.
ERM
Gracon LLC
H2O EcoPower
Independent Consultant
JHP Hydro/JHP & Associates, Inc.
JSG Communications
LaBella Associates, DPC
Leidos Maritime Solutions
Puget Sound Energy

Re Vision Consulting
Scottish Development International
Sherwin-Williams
SMI, Inc.
Stewart Machine Co. Inc.
TCB Industrial, Inc.
TurbinePROs
University of North Carolina—
Coastal Studies Institute

Leadership

2016 NHA Leadership

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Steve Wenke, Avista Utilities
Pamela Williams, Santee Cooper
Wendy Bley, TRC Companies (advisory)
Frankie McDermott, Sacramento Municipal Utility District (Advisory)

SAVE THE DATES!

2017 NHA REGIONAL MEETINGS

- NHA Northeast Regional Meeting • Portland, ME – July 25
- NHA Midwest Regional Meeting • Des Moines, IA – August 29–30
- NHA Alaska Regional Meeting • Girdwood, AK – September 19
- NHA Southeast Regional Meeting • Atlanta, GA – November 1–2
- NHA California Regional Meeting • San Ramon, CA – December 5

2017 NHA HYDRAULIC POWER COMMITTEE (HPC) MEETING

HPC Fall Retreat • Sacramento, CA • October 17–19

NHA CONFERENCES & SYMPOSIUMS

2018 Waterpower Week • April 20–May 2

2018 NHA Annual Conference

2018 International Marine Renewable Energy Conference (IMERC)

2018 Marine Energy Technology Symposium (METS)



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