



## **Proposed Economic Stimulus and Infrastructure Investment Provisions for the Hydropower and Marine Energy Industry**

Investment in the waterpower sector is an investment in a critical piece of our nation's infrastructure. The U.S. water power industry, comprised of hydropower, pumped storage, conduit power and marine energy, has a tremendous impact on our nation's electric grid and economy. Hydropower delivers approximately 40 percent of U.S. renewable electricity and hydropower pumped storage projects provide 93 percent of energy storage in the country. Federal funding is critical and will help create high-quality employment and support the thousands of businesses that make up the U.S. industrial supply chain.

### **Increased Funding for Federal Hydropower Owners, Department of Energy and other Federal Agencies to Support Hydropower and Marine Energy Programs and Project Deployment**

#### **Hydropower/Pumped Storage**

While hydropower is a proven renewable electricity resource, accounting for nearly seven percent of all U.S. electricity production, more can be done to significantly expand sustainable generation from this resource. For example, only three percent of the approximately 80,000 existing dams in the U.S. currently generate electricity. Other examples include: increasing efficiencies and expanding capacity at existing projects, both federal and non-federal; new pumped storage facilities; and new stream-reach development, all modeled by the Department of Energy's 2016 Hydropower Vision. Pumped storage represents a significant opportunity because of increased grid reliability benefits, additional energy storage and support of integration for other variable renewable generation resources, like floating solar systems. Focus areas for the hydropower/pumped storage program include:

- **Modernizing the existing U.S. hydropower fleet (\$450 million)** – Hydropower projects are long-lived assets with lifetimes that span decades. Indeed, some active projects have been running reliably for over a century. This benefit of the industry also provides a timely opportunity – an energy infrastructure reinvestment in the federal (e.g. Corps of Engineers, Bureau of Reclamation) and non-federal hydropower systems. Such funding would increase generation and also improve environmental performance, all while creating thousands of good-paying jobs and supporting local economies across the country.<sup>1</sup>
- Examples include: deployment of new turbine, generator and other equipment ; installation of new fish passage technologies that increase water availability for generation and other uses while safely transporting fish; implementing data-driven operational decisions to reduce future

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<sup>1</sup>NHA members estimate an annual \$500 million funding need for the U.S. Corps of Engineers and Bureau of Reclamation hydropower projects combined over the next several years. For non-federal hydropower projects, a similar modernization program was included in the American Recovery and Reinvestment Act of 2009. That program, the Hydroelectric Facility Modernization Program, supported facility reinvestment initiatives in several states. NHA members estimate that \$500M per year for USBR and COE combined for major turbine generator rehabs

O&M costs; and development of new technologies to optimize for flexible operations in support of increased integration of variable renewable energy resources while maintaining grid reliability and resiliency.

- **Pumped storage development (\$275 million)** – Provide funding support to initiate construction of new pumped storage facilities, upgrades and expansions of existing facilities, and to develop advanced technologies that reduce up-front costs and the time for permitting of future projects. Funding additional research in materials and manufacturing will facilitate advanced modular designs that are faster to build and install, as well as provide new options for deployment.
- **Small hydropower systems (\$75 million)** – Standardization of new designs, as well as new advanced materials and manufacturing across the sector including applications at existing non-powered dams, run-of-river hydrokinetic systems, irrigation channels and other waterways would drive down costs for companies that have capitalization challenges to fund this work.
- **EPAct 2005 Section 242 Hydropower Production Incentive<sup>2</sup> (\$25 million)** – Funding for this incentive is designed to help bring down costs that in turn can determine the viability of a given project, particularly for small hydropower projects. Due to the oversubscription of the incentive, an additional investment will immediately be utilized to enhance hydropower production.
- **EPACT 2005 Section 243 Hydropower Efficiency Incentive (\$25 million)** – Section 243 created a program to encourage efficiency improvements at existing hydropower facilities. This program aims to encourage efficiency improvements at existing hydropower plants. The program provides payments for capital improvements directly related to improving efficiency by at least 3 percent.

By valuing this resource and funding these opportunities, Congress can better leverage the benefits of the public-private partnerships that exist with the hydropower industry today. Congress can also take a fresh look at new infrastructure investment and reinvestment strategies to build on this success and to expand public-private partnership models and programs, as appropriate. Collaboration and innovation have been, and will be into the future, critical for the growth of the hydropower resource, particularly with the economic challenges both the federal and non-federal hydropower systems are facing today.

### **Fund Department of Energy renewable energy, energy storage and grid reliability offices and programs**

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<sup>2</sup> The American Energy Innovation Act introduced by Senate Energy Natural Resources Committee Chairman Lisa Murkowski and Ranking Member Joe Manchin includes Section 1201, which extends the incentives for hydroelectric production and efficiency authorized in Sections 242 and 243 EPACT 2005 through FY 2036.

The Department's Water Power Technologies Office (WPTO), Office of Electricity, Advanced Research Projects Agency-Energy (ARPA-E), and Loan Guarantee Office have all been critical in supporting the transition to a low-carbon electric grid, while also ensuring system reliability and resilience. This includes support to grow the contributions of hydropower, pumped storage, marine energy, and conduit power projects.

As Congress seeks to provide both near-term and long-term stimulus to the U.S. economy, these offices have a significant role to play in meeting those goals. They can provide financial assistance, technical assistance, and other support for near-term project deployment, as well as fund both basic and applied research and development initiatives that otherwise may be out-of-reach for companies in this challenging economic environment. As such, NHA urges the Congress fund a robust additional investment, beyond that which is made through annual appropriations, in the work of the Department, as part of a larger stimulus measure for the American economy.

#### **Workforce Development - Training and Work Co-op Programs (\$100 million)**

Many jobs in the water power sector require a STEM or technical background – electrical engineers, equipment operators, etc. The industry has seen, and continues to see, increased retirements in the workforce and a growing need to train the next generation of workers. Additionally, there are opportunities, working with the DOE and other agencies, to transition veterans, whose backgrounds align with the needs of the industry, into jobs in the sector through public-private partnerships. NHA recommends investment in university and community college technical training grants, paid internships, and placement programs at businesses and National Labs.

#### **Marine Energy**

Marine energy represents the next generation of renewable power generation technologies and can provide significant amounts of clean electricity while creating high-value employment, especially in rural coastal areas that have seen downturns in fishing, shipbuilding and tourism. In addition, marine energy is reliable, predictable and environmentally friendly. The resource is close to population centers and can provide power to many different maritime markets, including newly emerging Blue Economy opportunities such as remote vehicle charging, autonomous sensors and deep-water aquaculture. There is also a significant defense and security opportunity to be realized in support of Navy and Homeland Security priorities related to at-sea power needs for persistent surveillance. Finally, marine energy can also help to revitalize our nation's ports and shipyards as devices can be built and maintained near these sites.

The International Energy Agency Ocean Energy Systems, of which the U.S. is a member country, predicts that by 2050 over 300 GW of marine energy capacity will be installed globally. This would represent \$35 billion in investment, 680,000 direct jobs and an annual savings of 500 million tons of CO<sub>2</sub> emissions. The marine energy industry has significant exportation of technology and services potential, which contribute to the job creation forecast above. As with other more mature power generation technologies, a significant and consistent level of federal support is key to attracting private capital and igniting commercialization of the marine energy industry. These funds provide risk mitigation, technical advancement and review, and early market growth opportunities. Focus areas for the marine energy program include:

- **Build and Test Pre-Commercial Marine Energy Devices - System Design, Fabrication, and Validation (\$300 million)** – Build, test and validate for commercial acceptance, multiple pre-commercial wave, tidal, and offshore current devices and deploy at permitted sites. Individual marine energy technologies are at an early stage of development and dominated by small companies with limited sources of external funding. In addition, there are wide ranges of design approaches to marine energy systems, and it is likely that different designs will be most effective in diverse resource areas or for various market applications. Funding is requested to support the design, construction and testing of prototype and commercial-scale systems in open water deployments, with a balanced approach across the technical readiness spectrum that reflects the higher funding needs of more mature designs.
- **Expanding Testing Infrastructure and Grid Connections (\$100 million)** – Establishing and expanding critical testing infrastructure (including grid connection/deployment equipment) for pre-commercial marine energy devices along with support for technology validation activities to reduce the cost of energy. In addition to engineering challenges, a key barrier to marine energy development is the difficulty of demonstrating and testing new designs. Where land-based technologies can field-test quickly, cheaply, and in many locations including private land, marine technologies must field test each device in carefully-selected, highly-regulated public waters where access is difficult and grid connections do not exist. Likewise, wave and tidal tanks and flumes appropriate to test smaller-scale marine energy devices are relatively limited, expensive and often require long wait times to access. Funding will support testing infrastructure across the range of technology readiness levels (TRLs) (dry docks, tanks, open-water test centers). Funds will also include support to conduct the tests – important to ensure accuracy and consistency – and environmental monitoring technologies and research to expedite permitting and in-water demonstration.
- **Funding for Powering the Blue Economy Initiatives (\$75 million)** – In order to accelerate cost reductions for larger devices – and meet significant emerging power needs in the ocean – wave and current designs must be adapted for lower-power applications at sea where they are likely in the near term to be the most cost-effective and reliable power source. Successfully serving these markets simultaneously reduces costs – by providing real in-water experience that drives down learning curves – and increases near-term investment. But various technologies will have to be tailored to specific applications and their performance demonstrated at sea. These systems represent the clearest near-term value proposition and are critical to unlocking private investment in the sector. Additional funding is also needed for technical assistance, planning for the decarbonization of our coastal ports, and analysis activities, including activities that support expanding access to advanced water power technologies for rural, Tribal, and low-income communities.
- **Applied Engineering Support for Technology Validation (\$75 million)** – Funding for the continuation and expansion of the engineering support activities for technology developers and related “Powering the Blue Economy” initiatives at the National Marine Energy Centers and other qualified non-profit institutions. Marine energy technologies have large promise, but present unique engineering and operational challenges that are significantly greater than those for other renewable energy technologies. In addition, marine energy involves construction and

long-term operations in a corrosive environment. But these challenges also offer real opportunities for innovation supported by foundational research split between National Labs and universities, with a focus on capabilities that can apply to wide ranges of marine energy devices. These funds should support teams of researchers in cross-institution collaboration while creating a pipeline of well-trained students to supply the needed workforce for the Labs and industry.

### **Suspend Other Federal Agency (OFA) Annual Charges at the Federal Energy Regulatory Commission**

To provide financial relief to hydropower licensees, who continue to provide power for essential services despite impacts from the COVID-19 pandemic, NHA proposes to include a provision to suspend FERC's OFA annual charges program as part of the stimulus bill. The suspension of the program would continue until FERC reports to Congress that it has put in place a program meeting certain key criteria, as set forth in the legislation, to ensure appropriate transparency and oversight over agency costs. This proposal would deliver the dual benefits of providing respite for operators of critical energy infrastructure and addressing longstanding transparency issues in FERC's OFA annual charges program. Because OFA annual charges paid by hydropower licensees are deposited into the U.S. Treasury, and are not paid directly to the agencies, the proposal would not affect the agencies' appropriations. The proposal also would not affect FERC's funding, as it would only suspend the OFA component of the annual charges program. The proposal is also consistent with policies implemented by the Nuclear Regulatory Commission to defer the collection of fees and charges from nuclear licensees in light of the pandemic.