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Prizes Power NREL Water Power Innovation

The National Renewable Energy Laboratory (NREL) administers several prizes designed to encourage and support innovation that could help the water power industry grow and improve. Funded and hosted by the U.S. Department of Energy (DOE) Water Power Technologies Office (WPTO), these competitions run throughout the year and tap into a diverse community of contributors who leverage prize money to craft and build solutions for targeted challenges.

The prizes support DOE's efforts to empower a variety of innovators to tackle the challenges of climate change, incentivize rapid prototype development, spur the transition to a sustainable and equitable clean energy economy, and propel the creation of new, energy-related jobs and opportunities. By administering and advising these prizes, NREL supports the water power industry, advances clean energy, and inspires the next generation of scientists, engineers, and entrepreneurs. These opportunities encourage novel innovation and collaboration between disciplines, private companies, academia, and federal agencies.

NREL is pivotal to the success of these competitions because the national laboratory provides competitors with comprehensive expertise, as well as administrative support, which includes organizing mentorship, trainings, and industry connections for participants. All competitors receive ongoing incentives to continue working on their products, ultimately aiding in the advancement of hydropower and marine renewable energy.

NREL administered and managed several DOE [American-Made Challenges](#) prizes in Fiscal Year (FY) 2021, which contribute to a number of DOE initiatives and administration goals. NREL's contributions to the success of these prizes included preparing and disseminating communications materials to and between competitors, partners, supporting institutions, sponsors, and the public. Over the past year, this involved: consultation of rules and regulations documentation; updating websites; coordinating support and [sponsorship](#); overseeing webinars and virtual and in-person events with safety and logistics management; providing testing facilities and research expertise; and producing videos, news articles, social media promotion materials, and media coverage of the prizes' goals, schedules, teams, and winners.



U.S. DEPARTMENT OF ENERGY

Marine Energy Prizes

Two of the prizes NREL supported in FY 2021 incentivized advancements in marine energy, the Ocean Observing Prize and the Waves to Water Prize.

Both prizes will continue into FY 2022, and NREL will continue to work with DOE, competitors, sponsors, and partners on these events and future marine energy prizes.



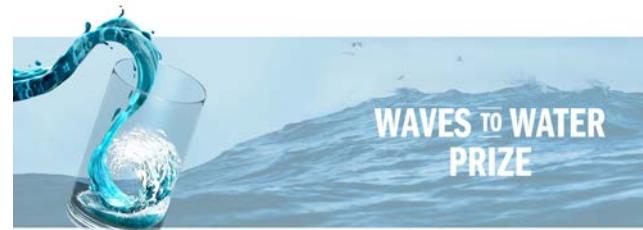
Ocean Observing Prize

Ocean observations enhance our ability to study the largest bodies of water on our planet; allowing us to discover the more than **80% of unexplored parts of the ocean**. The **Powering the Blue Economy™: Ocean Observing Prize** challenges participants to integrate marine renewable energy with ocean-observing platforms, ultimately revolutionizing our ability to collect the data needed to understand, map, and monitor the ocean.

As part of WPTO's **Powering the Blue Economy** initiative, the Ocean Observing Prize accelerates the development of new technologies that can help fill data gaps that make it difficult to predict the intensity of hurricanes, for example. Accurate forecasting could better protect coastal communities from the disastrous impacts of oncoming storms. The prize, in partnership with the National Oceanic and Atmospheric Administration and administered by NREL and the Pacific Northwest National Laboratory (PNNL), was launched in fall 2019. The prize involves a series of competitions, each offering cash awards, to incentivize accelerated advancement of ideas from concept to demonstration. The first competition, the **DISCOVER Competition**, for which competitors submitted concepts for novel, ocean observing technologies, closed in early 2020.

Following the DISCOVER Competition, the DEVELOP Competition, which focuses on a single theme—hurricane monitoring—challenged contestants to develop their ideas into a functioning, wave-energy-powered, unmanned underwater vehicle prototype through three contests: DESIGN, BUILD, and SPLASH. Together, the DISCOVER and DEVELOP competitions award participants with up to \$3 million in cash and other in-kind prizes.

In FY 2021, **NREL announced seven winners** of the Ocean Observing Prize DESIGN Contest. These winners are currently working on the BUILD Contest, the second of the three contests, for which they manufacture a working prototype to test at the **U.S. Navy's Carderock Maneuvering and Seakeeping Basin**. In the final contest of the competition, SPLASH, competitors will test their prototypes in the bays of the Olympic Peninsula, off western Washington. The SPLASH Contest is hosted by **PNNL**.



Waves to Water Prize

Wave-powered desalination technologies hold the potential to deliver clean water to remote communities around the globe as well as those needing disaster relief. The five-stage, \$3.3-million **Waves to Water Prize** is managed by NREL and aims to accelerate innovation in small, modular, cost-competitive, wave-powered desalination systems. This prize is also part of WPTO's **Powering the Blue Economy** initiative.

In FY 2021, NREL administered two of the competition's five stages, ADAPT and CREATE. NREL also supported the launch of the fifth and final stage, where competitors will test their devices in the ocean (the DRINK Stage).

Between June and November 2020, NREL administered the ADAPT Stage, during which competitors adapted their desalination system designs for open-ocean testing. Later, **NREL announced the 10 winning teams**, which included small businesses, rising entrepreneurs, professors and students, members of the U.S. military, both first-time applicants and previous winners of DOE funding, and experienced and new industry members alike, who went on to compete in the CREATE Stage between February and August of 2021.

In the final quarter of FY 2021, **NREL announced five finalists** who were selected to compete in the DRINK Stage. In early 2021, NREL designed a **hydraulic and electric reverse osmosis wave energy converter**, which provides an open-source design for a wave energy converter that can be used to de-risk the DRINK Stage for competitors and for future research and applications.

Through a **partnership** with the Coastal Studies Institute, NREL will assist the DRINK Stage finalists at local landmark Jennette's Pier in the spring of 2022. To help the teams prepare, NREL also facilitated additional competitor support from industry entities,

such as Engineering for Change, the International Desalination Association, and Janicki Industries.

Hydropower Prizes

Four of the prizes NREL administered in FY 2021 incentivized advancements in hydropower: the Groundbreaking Hydro Prize, the I AM Hydro Prize, the Fish Protection Prize, and the FAST Commissioning for Pumped Storage Hydropower Prize. Each aimed to address different challenges and areas of interest for hydropower research and growth.

To help plan future hydropower prizes, in the latter half of 2021, NREL opened a [request for information](#), seeking feedback from hydropower stakeholders that will help identify opportunities to refine future iterations of hydropower prizes.



FAST Commissioning for Pumped Storage Hydropower Prize

Pumped storage hydropower is a type of hydroelectric renewable energy that both generates and stores energy. To speed up the development and installation of pumped storage hydropower systems around the United States, DOE launched the [Furthering Advancements to Shorten Time \(FAST\) Commissioning for Pumped Storage Hydropower Prize](#), which is designed to connect participants with national laboratory resources and help accelerate the pumped storage hydropower industry by converting submitted ideas into full business concepts.

Administered by NREL, the FAST Commissioning for Pumped Storage Hydropower Prize is part of the Hydropower and Water Innovation for a Resilient Electricity System ([HydroWIRES](#)) Initiative. The prize is one of many ways NREL supports that initiative, which aims to understand, enable, and improve output and integration of hydropower's and pumped storage hydropower's reliable and resilient contributions to the grid. The prize solicited new ideas that identified ways to shorten timelines and reduce the costs and risks of pumped storage hydropower projects.

In FY 2021, [four grand prize winners](#)—who represented a mix of researchers, industry members, academics, and individual competitors—received \$550,000 in combined cash prizes and

in-kind vouchers. These vouchers are redeemable for technical support from one of four of DOE's national laboratories, including NREL, to develop their ideas.



Fish Protection Prize

With increasing interest and demand for hydropower and marine energy infrastructure, it is necessary to consider the potential impacts of these systems on natural fish habitats. Fish and their ecosystems can become threatened and recovery efforts impeded if they swim into water diversions, pipes, or dam intakes.

The three-stage [Fish Protection Prize](#), launched in 2020 and sponsored jointly by WPTO and the Bureau of Reclamation, inspired innovators to help protect fish from water infrastructure. Administered by NREL in collaboration with PNNL, the prize brought together members from industry, academics, entrepreneurs, and everyone in between to catalyze new solutions, designs, and strategies for fish protection.

In FY 2021, on Sept. 25, 2020, the [three winners of the final PITCH CONTEST](#) were announced. Now, those winners are working with researchers at PNNL to advance their technologies and bring them closer to commercialization. NREL set the groundwork for a documentary-style video to be released in early 2022, which highlights the progress and accomplishments competitors have made on their projects since the competition concluded.



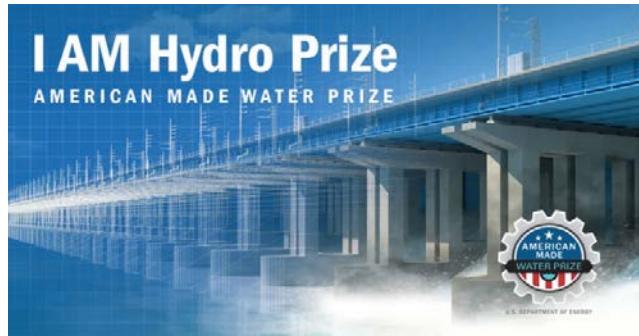
Groundbreaking Hydro Prize

Hydropower development benefits from advancements in the very foundations of water power, such as site inspections, system design, and construction of system foundations. Administered

by NREL, WPTO's [Groundbreaking Hydro Prize](#) challenged participants to rethink the first steps of hydropower development. Competitors were invited to suggest low-head, soil-foundation solutions for new stream development and encouraged to consider low cost, efficient, time-reducing methods to decrease installation costs and environmental impacts, as well as reduce maintenance costs or project failure.

In FY 2021, between September 2020 and January 2021, NREL coordinated the prize submissions. [NREL announced two winning teams](#), who shared a \$75,000 prize pool, in April 2021.

For this prize, NREL coordinated [support from partners](#)—including the American Institute of Chemical Engineers, the Manufacturing Leadership Council, and Women in Manufacturing—to improve outreach efforts and encourage creativity and multidisciplinary teams in the submissions. In FY 2021, [eleven teams won](#) \$175,000 in cash prizes for their developed concepts.



I AM Hydro Prize

Advanced manufacturing can help hydropower technologies become more efficient, versatile, and widespread by revolutionizing the design and production of the materials and components for hydropower technologies. DOE's [Innovations in Advanced Manufacturing for Hydropower \(I AM Hydro\) Prize](#), administered by NREL, challenged competitors to integrate advanced manufacturing technologies with hydropower.

[NREL helped launch the I AM Hydro Prize](#) in the summer of 2020. The single-stage competition spurred novel input from a national community of visionaries who may not normally affiliate with the hydropower industry. The prize invited participants to compete for up to \$175,000 in cash prizes as a reward for presenting solutions that decrease costs of hydropower components and systems, as

well as leverage advancements in manufacturing and materials to reduce leveled cost of electricity in design, manufacturing, operation, and maintenance.



Inclusive Energy Innovation Prize

Eight offices within DOE's Office of Energy Efficiency and Renewable Energy and the Office of Economic Impact and Diversity recently launched the new [Inclusive Energy Innovation Prize](#), a \$2.5 million competition that will fund up to 10 organizations or groups that support entrepreneurship and innovation in communities historically underserved in climate and energy technology funding. This prize, which is administered by NREL, supports the Biden administration's [Justice40 initiative](#) to put environmental and economic justice at the center of America's transition to a net-zero economy by 2050.

[NREL announced the launch of the two-phase prize](#) at the end of FY 2021; the competition will run through 2023. The prize will award up to 10 winners a cash prize of up to \$200,000 each in Phase One and up to three winners a pool of \$500,000 in Phase Two. These awards are intended to support, create, and identify activities that provide incubation, acceleration, and community-based opportunities in climate and clean energy technologies.

More information

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