



Collegiate competitions provide students with real-world experience and industry connections that will help them prepare for future clean energy careers. Pictured are the third-place winners of the 2022 Marine Energy Collegiate Competition. *Photo from University of New Hampshire.*

Collegiate Competitions Spark Curiosity and Careers in Water Power

Hydropower is the oldest renewable energy source, and marine energy may be the youngest. Regardless of whether they are old or young, both forms of water power will play a significant role in helping the United States reach a 100% carbon-free energy sector by 2035. To meet the challenge, we need a strong water power workforce.

To inspire and grow a new generation of skilled workers to lead the country’s energy revolution, the National Renewable Energy Laboratory (NREL) partners with the U.S. Department of Energy’s Water Power Technologies Office (WPTO) to run two competitions—one for hydropower and the other for marine energy. Both provide undergraduate and graduate students with hands-on experience in each industry as well as the opportunity to devise innovative solutions to complex challenges that pave the way to a clean energy future.

NREL Kicks Off Inaugural Hydropower Collegiate Competition

WPTO launched the [2023 Hydropower Collegiate Competition](#) (HCC) in April 2022.¹ In its inaugural year, NREL recruited 11 teams from eight states across the country, including three minority-serving institutions, to participate. The competition, which runs the full academic year, is designed to attract a new set of skilled and diverse workers to modernize the U.S. hydropower fleet and position this



The first cohort of HCC competitors represent both U.S. coastlines and several states in between. *Graphic by John Frenzl, NREL.*

renewable energy source as a keystone of a 100% clean energy grid.

The first HCC invited interdisciplinary teams of undergraduate and graduate students to offer solutions to complex hydropower challenges. Participating teams develop a hydropower technology concept design, participate in two contests—the Case Study Contest and Connections Creation Contest—and ultimately present their work at Waterpower Week in spring 2023. Through the HCC, students also gain industry experience, a window into potential hydropower career pathways, and greater knowledge of hydropower’s potential to contribute to a clean energy future.

In 2022, NREL established the HCC Steering Committee. Consisting of 11 hydropower professionals from industry and government, the committee delivers educational presentations, provides feedback on the competition, and serves as mentors for the students.

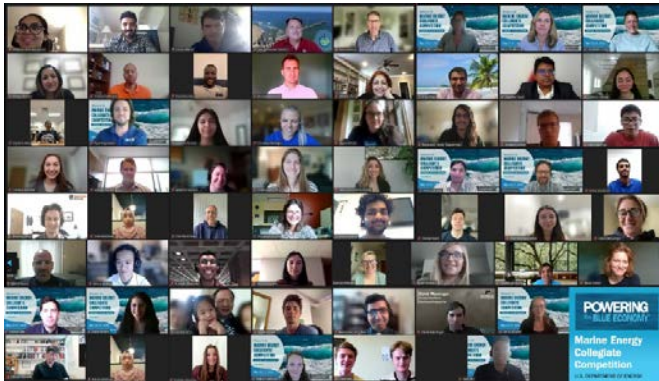
¹ U.S. Department of Energy. 2022. "U.S. Department of Energy Hydropower Collegiate Competition (HCC)." Last updated: June 2022. [https://openet.org/wiki/Hydropower/Prizes_and_Competitions/Hydropower_Collegiate_Competition_\(HCC\)](https://openet.org/wiki/Hydropower/Prizes_and_Competitions/Hydropower_Collegiate_Competition_(HCC)).

2022 Marine Energy Collegiate Competition Sails to Victory

In 2022, NREL managed the third **Marine Energy Collegiate Competition** (MECC) and hosted the final competition virtually.² The competition challenges **interdisciplinary teams of undergraduate and graduate students** to offer unique solutions for the growing marine energy industry and embolden its vital role in powering the blue economy.³ This includes generating clean power for isolated coastal communities, underwater autonomous vehicles, biofuel processing plants, and more.

The **2022 MECC Final Event hosted 17 teams**, each of which developed designs and business plans to power blue economy activities using a diverse range of marine energy technologies.⁴ Of those, 13 teams built and tested their designs in wave tanks, and the Virginia Tech team tested their prototype in a lake by creating their own waves. The competition also held a virtual poster session, which brought students together with industry representatives.

MECC alumni have directly benefited from participating in the competition. Four alumni have secured jobs with ocean energy companies; one earned a prestigious U.S. Department of Energy Oak Ridge Institute for Science and Education fellowship; and 11 received internships with national laboratories. Because these statistics are based on alumni who report their job status, the number of participants who secured jobs is likely higher. And, as the marine energy industry grows, job opportunities will continue to increase.



Industry, academia, and the national labs joined NREL and MECC students at the virtual 2022 MECC Final Competition. *Image courtesy of Betsy Stratton, NREL.*

² U.S. Department of Energy. 2022. "U.S. Department of Energy Marine Energy Collegiate Competition (MECC)." Last modified: June 2022. [https://openei.org/wiki/PRIMRE/Prizes_and_Competitions/Marine_Energy_Collegiate_Competition_\(MECC\)](https://openei.org/wiki/PRIMRE/Prizes_and_Competitions/Marine_Energy_Collegiate_Competition_(MECC)).

³ National Renewable Energy Laboratory. "Meet The 2022 Marine Energy Collegiate Competition Teams." May 20, 2022. <https://youtu.be/DuHUNBkldWI>.

⁴ Office of Energy Efficiency & Renewable Energy. 2022. "DOE Announces Winners of 2022 Marine Energy Collegiate Competition." U.S. Department of Energy. June 1, 2022. <https://www.energy.gov/eere/articles/doe-announces-winners-2022-marine-energy-collegiate-competition>.

NREL Attracts More Diverse Teams in Fourth Marine Energy Collegiate Competition

In April 2022, WPTO launched the fourth annual MECC, and NREL, who manages the competition, engaged 19 teams from 11 states and one partner institution in Portugal. The cohort for 2023, **announced in June 2022**, includes the most teams to participate in the competition to date.⁴

The 2023 cohort represents six minority-serving institutions, one historically Black university, four Hispanic-serving institutions, three Asian American and Native American Pacific Islander-serving institutions, and one international institution.

MECC organizers not only aim to advance promising marine energy technologies; they also hope to boost student interest in the marine energy industry, expand marine energy's presence in academic curricula, and collaborate with industry partners to understand how to best prepare students to meet their workforce needs. The 2023 MECC will be held in person at Waterpower Week alongside the first HCC.



In 2022, NREL welcomed the fourth wave of marine energy innovators to the 2023 MECC, including an international partner organization from Portugal. *Graphic by John Frenzl, NREL*

More information

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