



## 11 August 2023

The Portal and Repository for Information on Marine Renewable Energy ([PRIMRE](#)) provides access to marine energy data, information, and resources in the U.S. and internationally. The bi-weekly [PRIMRE Blast](#) highlights relevant announcements and upcoming events; new content in the [Knowledge Hubs](#); and international marine energy news. [Email us](#) to contribute!

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### Announcements

#### Photo and Video Contest

The U.S. Department of Energy's (DOE) Water Power Technologies Office (WPTO) [recently launched](#) the [Make A Splash Photo and Video Contest](#) to capture photos and videos of water power that transport viewers and showcase the scope and potential of water power as a renewable energy. Cash prizes are available. Submissions due 17 November 2023.

#### InDEEP Applications

The U.S. DOE WPTO also recently launched the [Innovating Distributed Embedded Energy Prize \(InDEEP\)](#), which will award up to \$2.3 million to competitors investigating novel technologies for harnessing and converting the power of ocean waves into usable types of energy. Phase I applications are due 25 August 2023.

#### Request for Information

The U.S. Office of Science and Technology Policy and Ocean Policy Committee are requesting information for the development of a [National Strategy for a Sustainable Ocean Economy](#). The request seeks public input on what the goals and outcomes of the National Strategy should be, and how the Federal Government can best advance sustainable management of ocean, coastal, and Great Lakes resources and ecosystems of the United States. Responses due 28 August 2023.

## WEC Seals Survey

Pacific Northwest National Laboratory (PNNL) is conducting a project to understand lifetime prediction of sealing materials in Wave Energy Converter (WEC) Hydraulic Power Take-Off Systems and requests your participation in this [brief survey](#) that will help gather information about different WECs, types of polymer sealing materials, and their applications, as well as exposures of these materials. Responses are due 31 August 2023.

## Request for Information

PNNL is also requesting information from developers, owners, and/or manufacturers of WECs capable of deployment and operation of their WEC to power offshore aquaculture operations. The [Request for Information](#) is now open through 31 August 2023.

## Calls for Abstracts

The Institute of Ocean Energy, Saga University (IOES) is hosting the [10th Program of International Platform on Ocean Energy for Young Researcher 2023](#) from 27 November to 2 December 2023 online and in Saga, Japan. Researchers under 36 years old are encouraged to apply to present by 18 August 2023. All travel fees will be paid by IOES.

The [Call for Abstracts](#) for the [104<sup>th</sup> American Meteorological Society \(AMS\) Annual Meeting](#) is now open through 24 August 2023. The event will take place from 28 January to 1 February 2024 in Baltimore, Maryland, U.S.

The Marine Alliance for Science and Technology for Scotland (MASTS) recently opened the [Call for Abstracts](#) for the [MASTS Annual Science Meeting](#) through 8 September 2023. The meeting will take place 5-7 December 2023 in Glasgow, Scotland.

The [Call for Abstracts](#) for the [Offshore Technology Conference \(OTC 2024\)](#) is open through 12 September 2023. OTC will take place 6-9 May 2024 in Houston, Texas, U.S.

The [Call for Abstracts](#) for the [Ocean Sciences Meeting \(OSM 2024\)](#) is open until 13 September 2023. OSM will take place 18-23 February 2024 in New Orleans, Louisiana, U.S. Abstracts are being considered for sessions on [Offshore Renewable Energy: Resource Characterization & Environmental Impacts](#) and [Making Waves with Communication: Approaches to Communication, Outreach, & Engagement for Ocean Sciences](#).

The [Call for Abstracts](#) for [OCEANS 2024 Singapore](#) are now open through 15 October 2023. OCEANS will take place in 14-18 April 2024 in Singapore.

## Funding & Testing Opportunities

The Horizon Europe Framework Programme has launched a [Call for Proposals](#) focused on the development of innovative power take-off and control systems for wave energy devices. Submissions are due 5 September 2023.

The Supergen Offshore Renewable Energy (ORE) Hub has launched its [4<sup>th</sup> Flexible Funding Call for Proposals](#) and is seeking proposals from eligible UK universities or other institutions to facilitate a program of coordinated UK-led ORE research projects. Expressions of interest are due 11 September 2023.

The U.S. Department of Commerce and National Oceanic and Atmospheric Administration [recently announced](#) the [Ocean-Based Climate Resilience Accelerators](#) program, which will foster public-private partnerships to help support small businesses that are developing sustainable technologies, including renewables. Applications are due 11 September 2023.

The U.S. DOE WPTO and the Minority-Serving Institutions STEM Research and Development Consortium have opened a [\\$1.2 million funding opportunity](#) to support promising, potentially high-impact water power research ideas from minority-serving colleges and universities. Concept papers are due 12 September 2023.

The National Science Foundation and U.S. DOE WPTO [recently announced](#) a special funding focus on new science and engineering proposals submitted to the [Engineering Research Initiation \(ERI\) solicitation](#) focused on marine energy and powering the blue economy. ERI supports eligible new researchers, educators, and innovators. Proposals are due 15 September 2023.

The European Commission is accepting proposals for the [Innovation Fund's Third Small-scale Call for Projects](#) through 19 September 2023. The call will provide grants to small-scale projects with a capital expenditure between €2.5 and €7.5 million in the areas of renewable energy, decarbonisation, energy storage, and carbon capture, use, and storage.

### Career Opportunities

Swansea University is advertising a fully-funded [PhD in Mechanical Engineering](#) on flexible polymer-based sensors for structural health monitoring in renewable energy-generating devices, with a particular focus on wave energy devices. Applications are due 16 August 2023.

The European Marine Energy Centre (EMEC) is looking for an [Environmental Specialist](#), [Hydrogen Development Coordinator](#), and a [Hydrogen R&D Engineer](#) to support EMEC research and development. Applications are due 14, 16, and 21 August 2023, respectively.

The University of Oxford is seeking to appoint a [Departmental Lecturer in Civil Engineering Fluid Mechanics](#) to teach and engage in advanced study and academic research applied to offshore renewable energy applications, with a particular focus on tidal stream energy. Applications are due 22 August 2023.

PNNL is seeking a [Post Masters Research Associate - Marine Energy](#) to support a large data management system known as [PRIMRE](#), which contains multiple databases about marine energy development in the United States and internationally. Responsibilities will include adding and curating content, assisting in system architecture and UX/UI development, analyzing and visualizing data, and supporting public outreach. Applications are due 7 September 2023.

The University of Edinburgh is seeking a [Research Associate in Hydro-environmental Modelling for Tidal Stream Energy](#) to study the interactions of tidal stream turbine devices with the environment and inform co-design. Applications are due 11 September 2023.

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## Upcoming Events

### Upcoming Webinars

The WPTO is hosting its WPTO Seedlings Showcase 2023 on 15 August 2023 from 1:00-4:00pm EDT (5:00-8:00pm UTC). During the virtual event, national lab researchers will present innovative research concepts from the office's Seedlings Program for DOE national laboratories. Register [here](#) to learn about emerging trends in marine energy and hydropower.

The PRIMRE team is hosting a webinar on 23 August 2023 from 10:00-11:00am MDT (4:00-5:00pm UTC). During the webinar, the [Modular Ocean Data Acquisition \(MODAQ\)](#) system, [Marine Energy Data Pipeline](#), and [Marine and Hydrokinetic ToolKit \(MHKiT\)](#) teams will provide a demonstration of how these data collection and processing tools can be utilized together collect, process, standardize, and analyze data. Register [here](#).

### Upcoming Conferences

The [15th European Wave and Tidal Energy Conference \(EWTEC 2023\)](#) will take place on 3-7 September 2023 in Bilbao, Spain. Register [here](#) by 20 August 2023.

The University Marine Energy Research Community (UMERC) is hosting the [2<sup>nd</sup> Annual UMERC Conference](#) on 4-6 October 2023 in Durham, New Hampshire, U.S. Register [here](#).

### Upcoming Workshop

OES-Environmental and PNNL are hosting a workshop, “[Environmental monitoring for marine energy: instrumentation for devices and arrays](#)”, on 6 September 2023 from 16:00-17:30 UTC as part of [EWTEC 2023](#) in Bilbao, Spain. This workshop will explore monitoring technologies and work towards recommendations for preferred sets of instruments and data systems that will support consenting decisions and post-installation monitoring programs, as well as guidance on the proper use of monitoring systems for tidal and wave installations when considering key environmental interactions. Registration not required.

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## New Documents on Tethys Engineering

*[Tethys Engineering](#) hosts thousands of documents on the technical aspects of marine energy research and development, including journal articles, conference papers, and reports.*

[Knowledge Management for the Marine Energy Industry: PRIMRE](#) – Whiting et al. 2023

In nearly 20 years of modern development, the marine energy industry has generated considerable knowledge around resource assessment, site selection, technology design, manufacturing, testing, environmental effects, and standardization. The Portal and Repository for Information on Marine Renewable Energy integrates and connects marine energy knowledge hubs into a comprehensive and connected knowledge ecosystem with the goal of progressing the industry. The seven knowledge hubs include the Marine and Hydrokinetic Data Repository for datasets, Tethys and Tethys Engineering for environmental and technical documents, Marine Energy Projects Database for deployment activities, Marine Energy Software for software, Marine Energy Atlas for geospatial data, and Telesto for development guidance.

### **[Performance and reliability study of China's first megawatt-scale horizontal-axis tidal turbine](#) – Wang et al. 2023**

The tidal current turbine is an innovative and emerging technology of marine renewable energies because it provides a steady and predictable energy source that can be extracted and used for commercial power generation. In this paper, the largest megawatt-scale horizontal axis tidal turbine (HATT) unit in China was designed and manufactured by LHD. The performance of this HATT was studied in detail, including numerical simulation, experiment and sea trial research. The hub is then used as an example to show how to analyze the strength and fatigue life of HATT parts under various working situations. This article aims to outline the design and research process for a big MW-scale HATT as well as the reliability check procedure for a HATT's essential parts.

### **[Assessing the impact of wave model calibration in the uncertainty of wave energy estimation](#) – Majidi et al. 2023**

The accuracy of estimated sea conditions, specifically wave height and peak/average wave periods, affects the estimation of electrical energy production from wave energy converters. This study investigates the uncertainty in wave energy harvesting estimated by the SWAN wave model and determines possible improvements by adjusting the model's tunable parameters. Three different wave energy converters (OEBuoy, WaveBob, and Pontoon) and ten different locations along the Atlantic coast of the Iberian Peninsula are used in the study. The SWAN model is calibrated using the ST6 term package based on both wave height and peak period wave parameters. Different wave hindcast data produced by different model settings are used to estimate the wave energy produced by the wave energy converters at ten buoy locations and compared to wave energy produced estimated based on wave observations.

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## **MHKDR Highlight**

*The Marine Hydrokinetic Data Repository ([MHKDR](#)) is the repository for all data collected using funds from the U.S. DOE's WPTO, including results from tank tests and open sea trials.*

## **MHK Levelized Cost of Energy (LCOE) Guidance and Techo Economic Analysis Materials** **– National Renewable Energy Laboratory (data from 2019, last updated 2023)**

Useful information and tools for calculating the Levelized Cost of Energy (LCOE) and MHK Cost Breakdown Structure. Includes a structure for calculating the capital expenditures and operating costs of a marine energy technology or device, reference resource data for both wave and tidal, and LCOE reporting guidance. These tools are meant to be used to help calculate the Levelized Cost of Energy (LCOE) for an MHK or MRE technology or device.

## **National Marine Renewable Energy Center Upgrades – LUPA** – Oregon State University **(data from 2022, last updated 2023)**

The data provided is part of a power take off damping optimization study. The power take off damping coefficient was swept from 0 to approximately 7000 N/m/s during a single regular wave test with a real time control of the motor/generator. The generated power from the LUPA (Lab Upgrade Point Absorber) wave energy converter is reported by the motor drive in watts. The csv files in this submission are the corresponding raw time series outputs for each mode of operation of LUPA (one body heave only, two body heave only, and two body six degrees of freedom). Data comes from testing in the Large WaveFlume at the O.H. Hinsdale Wave Research Laboratory in Corvallis, OR.

## **Wave Energy Prize - 1/20th Testing - AquaHarmonics Point Absorber** – Ricardo Detroit **Technical Center (data from 2016, last updated 2020)**

Data from the 1/20th scale testing data completed on the Wave Energy Prize for the AquaHarmonics team, including the 1/20th scale test plan, raw test data, video, photos, and data analysis results. The top level objective of the 1/20th scale device testing is to obtain the necessary measurements required for determining Average Climate Capture Width per Characteristic Capital Expenditure (ACE) and the Hydrodynamic Performance Quality (HPQ), key metrics for determining the Wave Energy Prize (WEP) winners.

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## **Marine Energy Software Highlight**

*[Marine Energy Software](#) is a collection of commercial and open-source software relevant to marine energy development, including simulating devices, and processing and analyzing data.*

### **New WEC-Sim Online Training Course**

The WEC-Sim team recently updated the online training course materials. These courses show users how to set up and run WEC-Sim models. [WEC-Sim \(Wave Energy Converter SIMulator\)](#) is an open-source software for simulating wave energy converters. The software is developed in MATLAB/SIMULINK using the multi-body dynamics solver Simscape Multibody. WEC-Sim can model devices that are comprised of bodies, joints, power take-off systems, and mooring systems. WEC-Sim can model both rigid bodies and flexible bodies with generalized body

modes. Simulations are performed in the time-domain by solving the governing wave energy converter equations of motion in the 6 Cartesian degrees-of-freedom, plus any number of user-defined modes. The [WEC-Sim Applications repository](#) contains a wide variety of scenarios that WEC-Sim can be used to model, including desalination, mooring dynamics, nonlinear hydrodynamic bodies, passive yawing, batch simulations and many others. The software is flexible and can be adapted to many scenarios within the wave energy industry.

### **[WecOptTool Tutorials Available](#)**

Over the past year, Sandia National Labs' [Water Power Team](#) has released three new [WecOptTool tutorials](#) to help users learn and take advantage of the software's many capabilities. [WecOptTool](#) is an open-source software for conducting optimization studies of wave energy converters and their control strategies.

### **[Next-Generation Marine Energy Software Needs Assessment](#)**

A team led by Sandia National Laboratories (SNL) and the National Renewable Energy Laboratory (NREL) recently published the [Next-Generation Marine Energy Software Needs Assessment](#) report. The purpose of the Next-Generation Marine Energy Software effort is to understand the existing software landscape, and to prioritize development of the next-generation of WPTO-sponsored software that will best support the needs of the marine energy community. To better understand the marine energy software landscape, a review of existing software applicable to marine energy was completed. This software landscape was then presented during two workshops, led by SNL and NREL, to frame discussions regarding existing software gaps and identify areas of need. This report details the findings from the needs assessment, and highlights opportunities for future marine energy software development. The authors of the report welcome feedback from the broader marine energy community on the needs assessment.

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## **News & Press Releases**

### **[Crown Estate Scotland launches market engagement survey for tidal and wave energy sectors](#) – Crown Estate Scotland**

An in-depth survey of developers working in the tidal and wave energy sectors is to be carried out by Offshore Renewable Energy (ORE) Catapult on behalf of Crown Estate Scotland. Views and ideas will be sought from a range of developers who are working to produce and bring to market the next generation of wave and tidal technologies. This information will help inform Crown Estate Scotland's plans to support future leasing. This engagement survey will assess appetite amongst developers for future leasing opportunities; request individual project updates; seek to understand development plans and schedules; and, gather views on how improvements could be made to facilitate development of the tidal and wave sectors.

### **[Sustainable Marine Energy sinks into administration](#) – Offshore Energy**

The Edinburgh-based tidal energy company Sustainable Marine Energy has been placed into administration, appointing joint administrators of accountancy and business advisory firm Johnston Carmichael to lead the process. The marine renewables solution provider, which was founded in 2012, sought to deliver clean, reliable, and predictable tidal energy, mainly for island and coastal communities. Last year its Canadian subsidiary was successful in harnessing tidal currents in the country's Bay of Fundy, in Nova Scotia, using its innovative, floating in-stream tidal PLAT-I platform. However, in May this year its Canadian subsidiary was placed into an insolvency process due to permitting issues with Fisheries and Oceans Canada, resulting in the suspension of its operations in Canada. The Edinburgh-based company has also now been placed into administration.

### **[It Is Finally Here! New Water-Free Technology Can Imitate Ocean Waves](#) – NREL**

Before pilots take to the real skies, they must first master the virtual ones. Luckily, there is a capability for that: A flight simulator replicates air flight—with all its choppy weather and turbulence—so pilots can practice on safe, solid ground. Researchers at the National Renewable Energy Laboratory (NREL) recently installed a technology that can replicate another choppy and turbulent environment: the ocean. The laboratory's new large-amplitude motion platform—known as LAMP for short—is like a flight simulator for offshore energy technologies. With LAMP, researchers can learn how wave energy devices, as well as offshore wind turbines and floating solar panels, might fare out on the ocean—all from the safety of landlocked Colorado.

### **[Active Sonar Deployed on Tidal Energy Converter](#) – Marine Energy Wales**

Groundbreaking underwater active sonar technology has been deployed on the Magallanes Renewables ATIR tidal energy converter as part of Menter Môn's Marine Characterisation Research Project (MCRP). The MCRP is an innovative research and development project designed to support the safe implementation of tidal energy converters in the Morlais Demonstration Zone (MDZ), off the coast of Holy Island, Anglesey. Using technical solutions being developed by the Sea Mammal Research Unit at the University of St Andrews, the active sonar has been mounted beneath the hull on the Magallanes ATIR tidal energy converter, currently deployed at the European Marine Energy Centre (EMEC) in Orkney.

### **[Visible work on OSU-led wave energy testing facility to begin in August](#) – Oregon State University**

The next step in Oregon State University's construction of a wave energy testing facility off the Oregon Coast is likely to be visible to residents and visitors to the area in August. Crews will work on shore and from a vessel anchored about a mile offshore from Driftwood Beach State Recreation Site south of Newport. The work is part of the construction of PacWave South, which will be the first pre-permitted, utility-scale, grid-connected wave energy test site in the United States. Workers aboard a 265-foot vessel anchored just off the coast and additional crews at the recreation site will inspect and prepare cable conduits for next summer's planned installation of power and data cables.