



**16 June 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**

### New OES Developments Highlight

The International Energy Agency's (IEA) Ocean Energy Systems (OES) recently published a new [Wave Energy Developments Highlight](#) brochure that highlights a few examples of projects developed across member countries of the IEA-OES.

### New Marine Energy Video Game

On World Oceans Day, Pacific Northwest National Laboratory launched a new [Marine Energy Adventure Game: Collision Risk](#)! Choose your own adventure and experience what it's like to be a fish encountering an underwater tidal turbine! Check out other educational resources [here](#).

### User Review Surveys

The [PRIMRE](#) team is requesting feedback on two of its Knowledge Hubs: the [Marine Energy Atlas](#) and the [Marine Energy Projects Database](#). Whether you are a new or experienced user, please complete the [Atlas User Review Survey](#) and/or [Projects Database User Review Survey](#)!

### Calls for Abstracts

The [Call for Extended Abstracts](#) for the [Pan American Marine Energy Conference \(PAMEC\)](#) is now open through 26 June 2023. PAMEC 2024 will take place on 22-24 January 2024 in Barranquilla, Columbia.

The [Call for Short Abstracts](#) for the [3rd International Congress on Marine Energy CEMIE-Océano](#) is now open through 30 June 2023. Extended abstracts will be due by 18 August 2023. The conference will take place 5-7 September 2023 in Puerto Morelos, Mexico.

The [Call for Abstracts](#) for the International Conference on Oceanography and 19th French-Japanese Symposium of Oceanography ([COAST CAEN](#)) is open through 7 July 2023. The event will take place on 24-27 October 2023 in Caen, France.

The [Call for Abstracts](#) for the Argentine Meeting on Marine Energies (ENAEM) and 8<sup>th</sup> Center for Ocean Energy Research (COER) Wave Energy Workshop is now open through 13 August 2023. [ENAEM-COER 2023](#) will take place on 6-8 November 2023 in Buenos Aires, Argentina.

### Funding & Testing Opportunities

The U.S. Ocean Energy Safety Institute has launched a [Request for Proposals](#) focused on marine and offshore wind energy solutions that enhance safety, security, and sustainability. Submissions are due 19 June 2023 (for marine energy) and 24 July 2023 (for wind energy).

The Lir-National Ocean Test Facility (Lir NOTF), in collaboration with the Sustainable Energy Authority of Ireland, has launched a [Call for Scaled Physical Testing](#) of offshore renewable energy devices, including wave, wind, and tidal. Applications are due 30 June 2023.

The U.S. Testing Expertise and Access for Marine Energy Research (TEAMER) program, sponsored by the DOE's WPTO, is now accepting [Request for Technical Support \(RFTS\) 10](#) applications until 7 July 2023.

The U.S. DOE Water Power Technologies Office (WPTO) has released a [funding opportunity](#) to support projects focused on advancing the tidal and current energy industry, including a community-led development project. Concept papers are due by 13 July 2023.

The Horizon Europe Framework Programme recently 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.

### Student & Employment Opportunities

Crown Estate Scotland is seeking to appoint a [Consultant to Manage Wave and Tidal Operators Panel](#) who will act as a technical authority to support decision making on how the Panel should progress and day-to-day management activities. Applications are due 19 June 2023.

Pembrokeshire Coastal Forum is hiring a [Communications Coordinator – Marine Energy](#) who will work with the Marine Energy Wales team and deliver the marketing and communications strategy for the pre-consented Marine Energy Test Area. Applications are due 19 June 2023.

Pacific Northwest National Laboratory is seeking a [Coastal Modeler](#) with a strong background in coastal oceanography and estuarine hydrodynamics and modeling experience with state-of-the-art coastal ocean models. Applications are due 6 July 2023.

The University of Strathclyde is advertising a [PhD studentship position](#) that will contribute to the project: AI-Based Approaches for Ocean Forecast and Development of Ensemble Ocean Climate Data. Applications are due 31 August 2023.

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## Upcoming Events

### Upcoming Webinar

The International Energy Agency's Ocean Energy Systems (IEA-OES) is hosting a webinar, “[Ocean Energy Outlook in Europe](#)”, on 27 June 2023 at 11:00am UTC. During the webinar, OES speakers will provide valuable insights into the ocean energy landscape in Europe, including the latest developments, challenges, and opportunities. Register [here](#).

### Upcoming Workshops

As part of the Ocean Renewable Energy Conference ([OREC 2023](#)), PRIMRE is hosting a workshop on 21 June 2023 focused on [Marine Energy Data: PRIMRE, Data Pipelines, and the Marine Energy Environmental Toolkit](#). All OREC attendees are welcome to attend.

OES-Environmental is also hosting workshop at [OREC 2023](#) focused on [Environmental Monitoring Around Deployed Marine Energy Devices](#) on 22 June 2023. Join to identify the key components of effective and efficient programs for environmental monitoring around marine energy projects and explore elements that could be standardized.

The U.S. WPTO is hosting a [Water-Energy Nexus Strategy Workshop](#) on 25 July 2023 from 11:00am-5:00pm EDT (3:00-9:00pm UTC) to discuss the interdependent linkage of water and energy resources. Join to learn more about WPTO’s strategy development and to provide input on the objectives, questions, and directions being explored.

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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.*

### **[Tidal turbine power performance assessments following IEC TS 62600-200 using measured and modelled power outputs](#) – Evans et al. 2023**

Demonstrating power performance in real conditions is vital for verifying tidal turbine design. The International Electrotechnical Commission’s Technical Specification IEC TS 62600-200 provides guidance for tidal developers to evaluate machine performance. This

study evaluates the performance of the operational 1 MW DEEP-Gen IV commercial-scale tidal turbine deployed during the ReDAPT project at the European Marine Energy Centre's tidal test site in Orkney, Scotland. IEC TS 62600-200 states that the power performance should be measured relative to two independently located current profilers deployed in one of two orientations; 'in-line' (preferred) or 'adjacent' (least preferred), relative to the turbine. Two measurement campaigns are used to assess the impact of instrument placement on the measured power curve and annual energy production (AEP).

### [A large-scale review of wave and tidal energy research over the last 20 years](#) – Khojasteh et al. 2023

Over the last two decades, a large body of academic scholarship has been generated on wave and tidal energy related topics. It is therefore important to assess and analyse the research direction and development through horizon scanning processes. To synthesise such large-scale literature, this review adopts a bibliometric method and scrutinises over 8000 wave/tidal energy related documents published during 2003–2021. A thorough analysis on documents marked the emergence of four broad research themes (dominated by wave energy subjects): (A) resource assessment, site selection, and environmental impacts/benefits; (B) wave energy converters, hybrid systems, and hydrodynamic performance; (C) vibration energy harvesting and piezoelectric nanogenerators; and (D) flow dynamics, tidal turbines, and turbine design.

### [Influence of distinct bottom geometries on the hydrodynamic performance of an OWC device](#) – Mohapatra et al. 2023

The hydrodynamic performance of a shore-fixed oscillating water column (OWC) device in the presence of convex, concave and sloped step-type bottom profiles is investigated. The present study employs two different numerical approaches viz. Boundary Element Method (BEM) and Computational Fluid Dynamics (CFD) to carry out the task. BEM computations in a two-dimensional (2D) Cartesian coordinate system using linear water wave theory are compared with CFD simulations using a numerical wave tank (NWT) built with a multiphase volume of fluid (VOF) approach. Hydrodynamic efficiency analysis was carried out for different curved bottom geometries. In both models, the resonating behaviour and the performance curve follow similar trends for the device.

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## Telesto Highlight

*Telesto provides information and guidance for testing, measurement, and data analysis for marine energy research, development, and demonstration, as well as additional resources.*

### [Levelized Cost of Energy Guidance](#)

Telesto features useful information and tools for calculating the Levelized Cost of Energy (LCOE) and Cost Breakdown Structure for marine energy technologies, including: 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. Learn more and access additional LCOE Guidance resources [here](#).

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## Marine Energy Atlas Highlight

The [Marine Energy Atlas](#) is an interactive mapping tool that maps high-resolution, spatially comprehensive data on global wave, tidal, riverine, ocean current, and ocean thermal resources.

### [Capacity Factor Tool](#)

The capacity factor represents the ratio of the actual time-averaged power generation to the maximum possible power generation of a particular power plant. The Marine Energy Atlas' Capacity Factor Tool offers the ability to create Capacity Factor maps of specific wave energy converters (WEC)s based on their power matrices. By uploading a power matrix that is representative of a particular WEC, the Capacity Factor will be calculated, displayed and the result made available for download. Learn more [here](#).

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## News & Press Releases

### [Wavepiston makes progress on wave-powered desalination system in Canary Islands](#) – Offshore Energy

Danish company Wavepiston has informed it is on a good track to deploy its first full-scale wave energy system for power generation and desalination off Canary Islands. Wavepiston has started with the offshore installation operations for its wave energy system that will be deployed at the Oceanic Platform of the Canary Islands (PLOCAN) test platform and used for power production and desalination. According to the company, Trames Diez vessel and its crew assisted Wavepiston in laying down the pressure pipe, which is part of the pipeline system that was manufactured by the supplier SoluForce. It is used to transport the high-pressure water from the wave energy converter to Wavepiston's station at PLOCAN for power conversion and desalination.

### [After Successful In-Harbor Testing, C-Power Ready to Launch Hawaii Ocean Energy Test](#) – C-Power

In the turquoise waters of Honolulu, C-Power recently completed an in-water harbor test of the SeaRAY autonomous offshore power system (AOPS) that will soon be deployed for a six-month pilot project at the U.S. Navy's Wave Energy Test Site (WETS) off the Hawaii coast. With support from Sea Engineering Inc., C-Power tested the components of the AOPS — a SeaRAY wave power system and the Halo subsea battery storage system and gravity anchor from Verlume — in the water to ensure proper system deployment and operation. The successful test marks the final milestone before C-Power's groundbreaking pilot project begins. In partnership with the U.S. DOE and

Navy, C-Power is launching the world's first field test of an ocean energy device purpose built to provide power and real-time data communications to mobile and static assets.

### **CRIMSON tidal energy project enters next phase – Offshore Energy**

The European Union-backed CRIMSON (Commercialisation of a Recyclable and Innovative Manufacturing Solution for an Optimised Novel marine turbine) project has moved to the next stage with the delivery of new foils for Ocean Renewable Power Company (ORPC)'s tidal energy turbine. The €3.9 million CRIMSON project brings together ÉireComposites and four other organizations including NUI Galway, Mitsubishi Chemical Advanced Materials, Consiglio Nazionale delle Ricerche, and ORPC. As the project reaches month 25 of 30, the ÉireComposites team has manufactured a new turbine foil for ORPC. The turbine foil was then equipped with a new fiber optic strain measurement system installed by PhotonFirst. After that, the test rig was loaded up and delivered to University of Galway, where it will be put through its paces.

### **Project update Vestmanna: Electricity production during load test interrupted – Minesto**

During the summer, Minesto carries out a series of load tests with new system configurations to increase and secure the Dragon 4 system performance and robustness when exposed to high loads at maximal tidal stream velocities. Recently, an unplanned surface recovery was carried out in collaboration with Minesto's local installation partner. "Unplanned production stops are unwanted but a natural consequence of the load tests we carry out to verify and push the load limits at maximized production. The Dragon 4 is now undergoing analysis, service and preparations for re-installation", said Dr Martin Edlund, CEO of Minesto.

### **Norwegian wave energy company sets out to explore large-scale projects in India – Offshore Energy**

Norwegian wave energy company Havkraft and Indian independent power producer Opera Energy have entered into strategic agreement to investigate the potential for the deployment of wave energy farms across various sites in India. The collaboration aligns with India's comprehensive strategy for sustainable development and supports the nation's increasing demand for renewable energy solutions, according to Havkraft. The partners will focus on evaluating the feasibility and viability of large-scale wave energy farms at multiple sites across India. By leveraging Havkraft's advanced Havkraft N-class wave power plant technology, the parties will seek to harness the untapped potential of the Indian Ocean to generate clean and renewable electricity.