PRIMRE BLAST

19 May 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!

Announcements

New OES Developments Highlight

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

InDEEP Applications

The U.S. Department of Energy (DOE) Water Power Technologies Office (WPTO) 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.

Workshop Recording Available

PRIMRE hosts several GIS and permitting tools that aim to support marine energy projects. On 18 April 2023, PRIMRE hosted a workshop that included three presentations on its support for marine energy projects, additional spatial datasets within the Marine Energy Atlas, and new and planned functionality for the Marine Energy Environmental Toolkit. View the recording here.

Calls for Abstracts

The Call for Sessions and Town Hall Proposals for Ocean Sciences Meeting 2024 is now open through 24 May 2023. Ocean Sciences Meeting 2024 will take place from 18-23 February 2024 in New Orleans, Louisiana, U.S. and online.

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

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.

Calls for Papers

The *Journal of Marine Science and Engineering* is accepting submissions for several Special Issues, including "Data-Driven Modeling for Offshore Energy Systems" (due 20 June 2023), "New Advances in Offshore Renewables" (due 25 June 2023), and "Advances in Offshore Wind and Wave Energies" (due 30 June 2023).

Energies is accepting submissions for several Special Issues, including "Tidal Turbines II (due 15 July 2023), "Ocean Energy Technologies for Power Generation" (due 30 August 2023), and "Wave Energy Potential, Behavior and Extraction II" (due 30 August 2023).

Funding & Testing Opportunities

The U.S. DOE's Office of Clean Energy Demonstrations has announced $15 million for the Energizing Rural Communities Prize to help rural communities build capacity needed for clean energy development and deployment. Submissions for the first round are due 24 May 2023.

The Marine Alliance for Science and Technology for Scotland (MASTS) has launched a Call for Proposals from Early Career Researchers to lead research on Nature Enhancement at Marine Offshore Energy Sites (NEMOES). Proposal submissions are due 9 June 2023.

The U.S. Ocean Energy Safety Institute has launched a Request for Proposals focused on two target areas: small-scale marine energy solutions that enhance the safety, security, and sustainability of offshore wind and oil & gas operations; and utility-scale marine energy solutions that enhance marine energy operations. Submissions are due 19 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. Applications for Open Water Support may be submitted at any time and will be reviewed as soon as possible.

The U.S. DOE WPTO also released a $45 million funding opportunity to support two projects focused on advancing the tidal and current energy industry. Topic area 1 will support a pilot tidal and/or current energy technology demonstration site in state waters and topic area 2 will support

a community-led tidal and/or current energy planning and development project. Concept papers are due by 5 June 2023 for topic area 1 and by 13 July 2023 for topic area 2. WPTO is hosting an informational webinar on 30 May 2023 at 3:00pm EDT (7:00pm UTC).

Student & Employment Opportunities

The U.S. DOE's Office of Science has opened Fall term applications for the Science Undergraduate Laboratory Internships (SULI) program, Community College Internships (CCI) program, and Visiting Faculty Program (VFP). Applications are due on 25 May 2023.

Upcoming Events

Upcoming Webinars

ETIP Ocean, the European Technology & Innovation Platform for Ocean Energy, is hosting a webinar, "Reducing costs & risks: Practical experience in the application of standards", on 22 May 2023 at 4:00pm CEST (2:00pm UTC). This webinar will explore ways to facilitate the use of specifications and showcase examples of practical use in ocean energy technology development. Register here.

ETIP Ocean is also hosting a webinar, "Resources & tools for faster permitting of ocean energy", on 5 June 2023 at 4:00pm CEST (2:00pm UTC). During the webinar, OES-Environmental will present the guidance and resources currently available and how both regulators and developers can use this information to accelerate the permitting of ocean energy. Register here.

Sandia National Laboratories is hosting a "WEC Design, Modeling, Control, and Testing Workshop Information Session" on 6 June 2023 to provide details on an upcoming workshop that will take place on 27-28 September 2023 in Bethesda, Maryland, U.S. at the Naval Surface Warfare Center – Carderock. Register for the information session here.

Upcoming Workshop

As part of the Ocean Renewable Energy Conference (OREC 2023), OES-Environmental is hosting a workshop to identify the key components of effective and efficient programs for environmental monitoring around marine energy projects, and explore whether there are elements that could be standardized among projects nationwide and worldwide. OREC will take place on 21-22 June 2023 in Portland, Oregon, U.S. Early bird registration is now open through 19 May 2023 here.

Upcoming Conference

The Partnership for Research in Marine Renewable Energy (PRIMaRE) is hosting the 10th PRIMaRE Conference on 27-28 June 2023 in Bath, England. Register here.

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.

Modeling of a hinged-raft wave energy converter via deep operator learning and wave tank experiments – Zhang et al. 2023

> Model identification for a hinged-raft wave energy converter (WEC) is investigated in this paper, based on wave tank experiments and deep operator learning. Different from previous works which all formulated this issue as a function approximation task, this work, for the first time, formulates it as an operator approximation task (which learns the mapping from a function space to another function space). As such, a continuous-time WEC model is identified from data, greatly expanding the horizon of data-based WEC modeling because previous works were limited to discrete-time model identification. The error accumulation for multi-step predictions in the discrete-time formulation is thus also addressed. The model is developed by first carrying out a set of wave tank experiments to generate the training data, and then the deep operator learning model, i.e., the DeepONet, is constructed and trained based on the experimental data.

Study on fast prediction method of hydrodynamic load of floating horizontal axis tidal current turbine with pitching motion under free surface – Wang et al. 2023

> The floating horizontal-axis tidal current turbine (HATCT) moves with the floating carrier while rotating, resulting in a change in its relative inflow velocity at any time. If the rotating speed of the HATCT is fixed, the HATCT cannot work at the optimum tip speed ratio, resulting in the failure to achieve the optimum power generation efficiency. Therefore, this paper proposes a control strategy for the rotating speed of the HATCT, and obtains the hydrodynamic loads of the HATCT with variable speed rotation and pitching motion under free surface conditions based on the CFD method. Compared with the hydrodynamic load of the HATCT under the same situation but with fixed speed control, the variable speed control can effectively improve the power coefficient of the HATCT, but the load fluctuation in terms of the inflow direction load, power, and pitch moment coefficients are more significant than those with fixed speed control.

Improved hydrodynamic performance of an OWC device based on a Helmholtz resonator – Rodríguez et al. 2023

> A numerical assessment was made of the hydrodynamic performance of a fixed Oscillating Water Column (OWC) device based on a Helmholtz resonator under regular and random wave conditions. The associated boundary value problem (BVP) was solved using the multi-domain three-dimensional boundary element method (BEM). Two configurations of the OWC device were evaluated: cylindrical and rectangular, and the effect of the neck design on the hydrodynamic performance for each was studied under regular wave conditions. Then, specific chamber configurations are selected to analyse their annual average plant efficiencies under the sea conditions of three sites that are

suitable for OWC installation. The results showed that changing the neck parameters can significantly improve the hydrodynamic efficiency of the OWC device for various wave periods.

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.

Marine Energy Atlas User Review Survey

We want your feedback! Please complete this short Marine Energy Atlas User Review Survey by 2 June 2023 to help us understand how researchers, developers, and other stakeholders use the Atlas and how we can continue to improve and expand the site.

If you're not familiar with the site, taking the survey is a great way to learn more! A brief overview of the Marine Energy Atlas can also be found here, and a step-by-step guide of how to use the site can be found here.

Marine Energy Projects Database Highlight

The Marine Energy Projects Database provides up-to-date information on marine energy projects, test sites, devices, organizations, and technologies around the world.

Projects Database User Review Survey

We want your feedback! Please complete this short Marine Energy Projects Database User Review Survey by 2 June 2023 to help us understand how researchers, developers, and other stakeholders use the Projects Database and how we can keep this resource up-to-date and useful for the international marine energy community.

Again, if you're not familiar with the site, taking the survey is a great way to learn more! A brief demonstration of the database, and how users can contribute information, can also be found here.

News & Press Releases

Global Ocean Energy Alliance Approved by Pacific Leaders Highlighting Global OTEC Projects – Global OTEC

Leaders from 20 Pacific Island Countries and Territories (PICTs) announced that they approved the Global Ocean Energy Alliance (GLOEA), highlighting the implementation of the 1.5MW Ocean Thermal Energy Conversion (OTEC) platform being developed for

deployment in São Tomé and Príncipe, in partnership with Global OTEC, as the basis for the implementation of an Ocean Energy Programme in the Pacific. The announcement was made during the Fifth Pacific Regional Energy and Transport Ministers' Meeting (PRETMM), hosted by the Government of Vanuatu, in Port Vila, from 8-12 May 2023, under the theme of "Accelerating Decarbonisation in the Blue Pacific". A major outcome of the meeting was an agreement to develop an ocean readiness programme preparing the PICTs for future ocean renewable energy technologies. This measure aims to mitigate barriers and brings latest innovations to the Pacific.

OceanEnergy Sign Up to EMEC Wave Energy Test Berth – European Marine Energy Centre (EMEC)

Irish wave energy developer, OceanEnergy, has signed up to demonstrate its OE35 floating wave energy converter at EMEC in Orkney, Scotland. OceanEnergy intends to demonstrate the OE35 over two winter periods from 2024 at EMEC's Billia Croo wave energy test site off the west coast of Orkney, Scotland. The OE35 incorporates well-proven ship-building techniques and has only one moving part which is above sea level, increasing survivability, reliability and availability. EMEC will support OceanEnergy with environmental monitoring. A series of field campaigns will include underwater and airborne acoustics, biophysical assessment of wave dynamics, fish aggregation and seabird analysis to assess the potential interactions between local species and the operation of the technology.

U.S. Department of Energy Announces Winners of the 2023 Hydropower and Marine Energy Collegiate Competitions – U.S. DOE

The U.S. DOE recently announced the winners of the 2023 Hydropower Collegiate Competition (HCC) and Marine Energy Collegiate Competition (MECC). Endicott College and University of New Hampshire were the overall winners of the inaugural HCC and the fourth annual MECC, respectively. DOE also announced the teams selected to participate in the 2024 HCC and MECC. Both the 2023 HCC and MECC culminated in a final event during Waterpower Week 2023 in Washington, D.C. The marine energy teams pitched their business plans and detailed technology designs to panels of judges and presented their approaches to creating connections among the industry and their local communities. The 19 student-led marine energy teams developed designs and business plans to power blue economy activities using a range of marine energy technologies and 18 eighteen competitors also tested prototypes of their designs in test-tanks across the country.

TIGER project is driving growth of tidal energy in UK and France – Tidal Stream Industry Energiser Project (TIGER)

The Tidal Stream Industry Energiser Project (TIGER) that launched in 2019 to drive tidal energy growth in the UK and France, has successfully demonstrated the significant value tidal stream energy can bring to the future energy mix, economies and supply chains in both the UK and France. TIGER is the largest project funded by the Interreg France

(Channel) England Programme, with €48.4 million invested to drive collaboration and cost reduction through tidal turbine installations in the UK and France. The project, led by the Offshore Renewable Energy (ORE) Catapult, has enabled installation of four new tidal stream energy devices at test sites in and around the Channel region, with a further 16 in development. This has created a total of 3.6 MW new tidal capacity, with a further 57.4 MW in the pipeline. Check out the video here.

Lloyd's Register awards Approval in Principle to Quoceant's Q-Connect System – Quoceant

Announcing the award at the All-Energy and Dcarbonise event in Glasgow, Quoceant Director, Beth Dickens, said: "Obtaining Approval in Principle from Lloyd's Register is an important step for Quoceant as it provides validation of our rigorous approach to the design process and gives confidence in our onward path both for future commercial deployments within the wave and tidal sector and our ongoing work to scale-up the technology for the floating wind market." Q-Connect is an adaptable, subsea, quick connection system that provides rapid mechanical and electrical connection of a marine energy device to its mooring and electrical infrastructure. Developed through three Stages of Wave Energy Scotland's Quick Connection System R&D programme, Q-Connect has moved from concept design through detailed design to fabrication and testing with the system recently completing a set of full-scale qualification tests.

As tidal power firms ebb, Fisheries minister strikes task force to smooth regulation – The Canadian Press

The Canadian government is creating a task force to clarify regulations for projects attempting to harness the tidal energy of the Bay of Fundy, after a key player sought bankruptcy protection last week — and blamed Ottawa. Following recent meetings with representatives from the tidal-power industry, federal Fisheries Minister Joyce Murray said government officials and the private sector would make recommendations on how her department could better communicate environmental requirements and reduce turnaround times for approvals. Last Thursday, U.K.-based Sustainable Marine Energy wound up operations, with its chief executive, Jason Hayman, estimating up to $40 million in private losses and predicting a chill on investment in Canadian tidal projects. Hayman has said that despite peer-reviewed science suggesting fish tend to avoid the rotating underwater blades of tidal turbines, the Fisheries Department spent several years jousting with his firm over the details, timing and scope of his proposals, and his investors ended the project.