

TETHYS ENGINEERING BLAST



25 March 2022

Tethys Engineering is an online knowledge hub that facilitates the exchange and dissemination of information on the technical and engineering aspects of marine energy. The bi-weekly *Tethys Engineering Blast* highlights new publications in the [Tethys Engineering Knowledge Base](#); relevant announcements, opportunities, and upcoming events; and news articles of international interest. Email tethys@pnnl.gov to contribute!

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Announcements

UMERC Member Portal

The [University Marine Energy Research Community](#) (UMERC), which is led by the Pacific Ocean Energy Trust and aims to foster collaboration within the US marine energy research community and amplify the impacts of foundational research, recently launched its new Community Portal! The Portal features a live news feed, job board, and more! Join [here](#)!

MHKiT Survey

The [Marine and Hydrokinetic Toolkit \(MHKiT\)](#) team is conducting a short, online [survey](#) that will be used to shape future development, both in terms of architecture and content. MHKiT is an open-source marine energy software, developed in Python and MATLAB, that includes modules for ingesting, quality controlling, and managing data. Complete the survey by 8 April 2022.

OPIN Support

The Ocean Power Innovation Network (OPIN), an international network based in Europe, is offering a free, high-level [Technology Assessment Process](#) for small and medium-sized enterprises. OPIN is also offering support for [Collaborative Innovation Groups](#) working to solve specific problems which are barriers to deployment of ocean energy and offer opportunities for new products, services, or markets. Applications for both are due 10 April 2022.

ETIPP Applications

The US Department of Energy (DOE) is accepting applications from remote, island, and islanded communities for technical assistance to transform their energy systems and increase energy resilience through the [Energy Transitions Initiative Partnership Project \(ETIPP\)](#). Applications are due 15 April 2022.

BECS Proposals

The International Network on Offshore Renewable Energy's (INORE) [2022 Call for Blue Energy Collaborative Scholarships \(BECS\) Proposals](#) is now open through 15 April 2022. Sponsored by Ocean Energy Systems (OES), the BECS grant aims to advance research and promote collaboration amongst early-career professionals from diverse disciplines and nations.

BLUE DEAL

Interreg Mediterranean's BLUE DEAL project is launching "[BLUE DEAL for the Future](#)", an International Blue Energy contest, created to raise awareness and involve future generations in building a blue future. Participation is open to High School Institutions from European Members States and Instrument for Pre-accession Assistance countries. Proposals are due 30 April 2022.

Calls for Abstracts

The [Call for Abstracts](#) for the [Pan-American Marine Energy Conference \(PAMEC 2022\)](#) is now open through 27 March 2022. PAMEC is scheduled for 19-22 June 2022 in Ensenada, Mexico, with workshops on 17-18 June 2022.

The [Call for Abstracts](#) for the International Conference on Ocean Energy (ICOE) and Ocean Energy Europe (OEE)'s annual event is now open until 31 March 2022. The Basque Energy Cluster and OEE will host [ICOE-OEE 2022](#) on 18-20 October 2022 in San Sebastián, Spain.

The [Call for Research Posters](#) for Seanergy 2022 is now open. Poster information (name, organization, and poster title) is due 1 April, posters are due 2 May, and abstracts are due 13 May 2022. [Seanergy 2022](#) will take place 15-17 June 2022 in Le Harve-Normandy, France.

The [Call for Abstracts](#) for the [37th International Conference on Coastal Engineering \(ICCE\)](#) is now open until 6 May 2022. ICCE will take place on 4-9 December 2022 in Sydney, Australia.

Calls for Papers

The *Journal of Marine Science and Engineering* is accepting submissions for "[Renewable Energy Applications: Wind turbines, Marine Current Turbines, Hybrid Generation Systems, and Smart Grids](#)" (due 10 April 2022) and "[Wind and Wave Climate](#)" (due 20 May 2022).

Energies is accepting submissions for several Special Issues, including “[Wave Energy Technologies and Optimization Methods](#)” (due 30 April 2022) and “[Advanced Analysis and Techniques of Wave Energy Conversion and Integrated Storage](#)” (due 25 May 2022).

Funding & Testing Opportunities

The Horizon Europe Framework Programme has launched a funding opportunity titled, “[Demonstration of innovative rotor, blades and control systems for tidal energy devices](#)”. Proposals are due 26 April 2022.

The Centre for Advanced Sustainable Energy (CASE), an industry led, collaborative, sustainable energy research centre hosted at Queen’s University Belfast, is seeking applications from suitably qualified consortia for research and development funding to support the decarbonisation of the energy system. The [Call for CASE Project Applications](#) closes 13 May 2022.

The Interreg North-West Europe Programme has launched its first [Call for Projects](#) in the 2021-2027 period, and is looking for transnational cooperation initiatives that can deliver concrete results for the North-West Europe area. The Call for Projects will close on 15 June 2022.

Student & Employment Opportunities

Swansea University is seeking a [Research Assistant](#) to join the Marine Energy Engineering Centre of Excellence and support research on subsea polymers and composite testing for flexible membrane wave energy converters. Applications are due 5 April 2022.

The Dutch Marine Energy Centre (DMEC) looking for a [Business Data Analyst](#) who will work closely with various teams to collect, organize, and synthesize information and data about players and trends in different energy sectors. Applications are due 15 April 2022.

Nova Innovation is currently advertising vacancies for a [Project Engineer](#), [Mechanical Design Engineer](#), and [Junior Electrical Design Engineer](#) to join its team and work at the forefront of the tidal energy industry. All positions are open until filled.

Upcoming Events

Upcoming Webinars

OPIN is hosting a [webinar](#) from 9:30-11:15am BST (8:30-10:15am UTC) on 29 March 2022 to present information about its Technology Assessment Process and Collaboration Innovation Groups services. Register [here](#).

The [Portal and Repository for Information on Marine Renewable Energy \(PRIMRE\)](#) is hosting a webinar on the [Marine and Hydrokinetic Toolkit \(MHKiT\)](#) from 1:00-2:00pm EDT (5:00-6:00pm UTC) on 31 March 2022. During the webinar, National Renewable Energy Laboratory,

Sandia National Laboratories, and Pacific Northwest National Laboratory will introduce new functionality in the open-source package and give demonstrations in Python. Register [here](#).

Net Zero Atlantic is hosting a webinar, “[Tidal velocity measurements at turbine rotor height and with turbine blade resolution](#)”, from 1:00-2:00pm ADT (4:00-5:00pm UTC) on 21 April 2022. The webinar will discuss the *Vectron*, a wide-baseline, converging-beam acoustic Doppler profiler developed to enable velocity measurements at tidal energy sites. Register [here](#).

Upcoming Workshop

The Marine Offshore Renewable Energy Lab (MOREnergy Lab), in collaboration with the Centre for Ocean Energy Research (COER) Maynooth, is hosting the [7th Wave Energy Workshop](#) on 29 April 2022 in Turin, Italy. The workshop will cover a range of topics across wave energy conversion, with a broad focus on hydrodynamic modelling, control, and wave energy technology enhancement. Register [here](#).

Upcoming Conferences

The National Hydropower Association is hosting [Waterpower Week in Washington](#) on 5-7 April 2022 in Washington, DC, US. Register [here](#).

The [All-Energy Exhibition and Conference](#), and the co-located [Dcarbonise 2022](#), will take place 11-12 May 2022 in Glasgow, Scotland. Register for both events [here](#).

New Documents on *Tethys Engineering*

[IEC TC 114 Strategic Business Plan](#) – International Electrotechnical Commission (IEC) Technical Committee (TC) 114 2022

IEC TC 114 (Marine energy – Wave, tidal and other water current converters) recently approved an update to its Strategic Business Plan (SBP). The SBP is a critical document for TC 114 and the marine energy industry as it includes a prioritized list of the technical areas that require standardization for the industry to develop based on a consensus of National Committee (country) subject matter experts who represent several of the largest marine renewable energy industries globally. Further, the SBP outlines technology and market trends that provide the rationale and market relevance for the work of TC 114. For the first time, the SBP connects the work of TC 114, both directly and indirectly, to 10 of the 17 United Nations Sustainable Development Goals (SDGs).

[Experimental study of wave energy converter arrays adapted to a semi-submersible wind platform](#) – Kamarlouei et al. 2022

The design of an offshore wind turbine floating platform seeks to minimize platform pitching motions that otherwise generate large accelerations and loads on the turbine, nacelle and blades, and decrease their lifetime. This objective is harder to achieve as the

upscaling to more powerful wind turbines amplify the effects of pitching motions since the wind turbines' height and mass are higher. Thus, innovative solutions to control the pitching motions should be developed. This study presents a solution based on a concentric array of wave energy converters which was originally designed to be attached on a floating platform to generate wave energy. Meanwhile, it was found that the concept may provide bigger restoring moments for platforms, amplified by its lever type arms, which are useful to control the pitching motions.

M2 tidal energy extraction in the Western Waters of Aceh, Indonesia – Ikhwan et al. 2022

The influence of the principal lunar semidiurnal tidal constituent M2 is significant in the Malacca Strait, the Andaman Sea, and the Bay of Bengal. However, in the Indian Ocean, due to depth, the influence is not as strong as in those regions. The Western Waters of Aceh are directly adjacent to the Indian Ocean, the Andaman Sea, and the Malacca Strait. This study aims to map the tidal energy potential of M2 along the west coast of Aceh. The energy derived from tides is used as renewable energy to support the government's development targets. This study considered a power formula produced by a tidal turbine. The current velocity and elevation results showed excellent results. The weak tidal currents are evenly distributed in the south of the domain, but the tidal currents are strong in the north of the research domain because of the shallower depths and narrow gaps.

Ocean Power Innovation Network Collaborative Innovation Group (CIG) Report: Corrosion in reinforced concrete structures used for offshore renewables – Macadre et al. 2022

Within the Ocean Power Innovation Network (OPIN), a Collaborative Innovation Group (CIG) has been set up to explore opportunities (alternative rebar materials, specific concrete formulations, etc.) to reduce the cost of corrosion and increase the lifetime of reinforced concrete structures in offshore renewables applications. The main objective of this CIG was to identify one or several future R&D collaboration opportunities within the CIG members (all or a subset) and start preparing the basis for associated grant applications. A state-of-the-art report has been prepared to support this final goal, collecting inputs from all CIG members on the activities identified in Table 1. The present report is not a comprehensive, international state-of-the-art study. The aim was to share knowledge, information and ideas amongst the CIG members.

Performance indicators for coupling desalination plants with wave energy – Rio-Gamero et al. 2022

This research work addresses the challenge of supplying desalination plants with electricity from waves. The vast majority of desalination plants are located in coastal areas, making wave energy a potential and viable cornerstone for the desalination sector. A series of performance indicators, such as freshwater production per sea covered area, are established and used in this study to evaluate different wave energy converters (WECs). Analyses of the performance of wave farms are undertaken. Some of the indicators are parameterized with the intention of extrapolating the results to other

desalination plants, using the specific energy consumption of the desalination plant or the sea surface area covered by WECs. The study is developed for mid-range wave climates, comparing two zones with different sea conditions in order to establish correlations.

[The public willingness to pay for the research and demonstration of tidal stream energy in South Korea](#) – Choi et al. 2022

South Korea has established a plan to install 700 MW of tidal stream energy (TSE) generation by 2030, and is pursuing the research and demonstration (R&D) of TSE. A significant amount of public funds will be invested in the R&D led by government-funded research institutes and public corporations. Thus, the government is seeking information about the aggregate willingness to pay (WTP) for the R&D. The purpose of this research is to explore the WTP by employing contingent valuation (CV). To this end, a CV survey of 1000 interviewees in South Korea was carried out using a closed-ended question during May 2020. Because 56.7% of all interviewees gave a zero WTP value, a spike model allowing for many zero values was adopted.

News & Press Releases

[SAE Successfully Re-deploys World's Most Powerful Tidal Turbine](#) – Simec Atlantis Energy (SAE)

SAE is pleased to announce the successful re-deployment of its AR1500, 1.5MW turbine, at its MeyGen site. The turbine has been out of the water for upgrade and maintenance work. It is now back generating green, predictable electricity, with no visual impact. The MeyGen site is the largest fully consented tidal stream site in the world and SAE is continuing to work with Government and industry partners to unlock its full potential, delivering a 400MW green and predictable power station. With two of the four turbines now fully operational SAE is continuing work on the re-deployment of the other turbines, which are out the water for maintenance and repair, and expect them to be back in the water within the next 12 months.

[Sustainable Marine gets busy on tidal power connection in Nova Scotia](#) – Offshore Energy

Sustainable Marine has intensified operations to connect its floating tidal energy platform to the Canadian power grid. Sustainable Marine's staff is preparing to connect the subsea cable to the PLAT-I 6.40 floating tidal energy platform, expected to take place later in the week. Having restarted the operations in Grand Passage in January 2022, Sustainable Marine completed the installation of the cable that will connect the platform to its substation early in February. The 420kW PLAT-I 6.40 platform will be deployed at the Fundy Ocean Research Centre for Energy (FORCE) site as part of the first phase of the Pempaq In-stream Tidal Energy Project. The total project will deliver up to 9MW of electricity to the Nova Scotia grid, which is expected to reduce greenhouse gas emissions by 17,000 tonnes of carbon dioxide a year and power around 3000 homes in Nova Scotia.

Crown Estate invests in Welsh tidal demo zone – reNEWS

The Crown Estate is to invest over £1m in a Welsh tidal stream energy demonstration project site, located off the coast of Anglesey in north Wales. The Morlais tidal stream demonstration zone, being developed by Menter Mon, covers an area of 35 sq km in the Irish Sea and aims to attract developers and investors to Anglesey, to develop early-scale tidal energy projects. The Crown Estate's £1.2m investment will support the project to deliver its environmental monitoring and mitigation package (EMMP). In addition, Mentor Mon has awarded Jones Bros Civil Engineering a contract worth £23.5m to build onshore infrastructure for Anglesey marine energy project, Morlais. The announcement comes at the same time as confirmation of £31m by the European Regional Development fund through the Welsh Government for the first phase of construction work.

Novige starts new offshore testing campaign for NoviOcean wave device – Offshore Energy

Swedish wave energy company Novige has deployed its NoviOcean wave energy device offshore Stockholm for a new round of testing. The 1:5 scale NoviOcean device has been deployed in the Stockholm archipelago earlier in March, where it will remain for 10 weeks and be put to various try-outs. According to Novige, the tests will be focused around durability and wear of the device, its upgraded control system, output, moorings and the ability to operate fully remotely controlled. The main goal is to confirm that all systems can function without any major problem, as well as to validate the performance data from test rig at KTH University where it has been running on/off since the fall of 2021. Novige plans to have the first full-scale NoviOcean unit developed and ready for deployment by 2024/25 with a total cost of €5 million.

Six Wave-Powered Prototypes to Set Sail: Ocean Observing Prize DESIGN Contest Winners Advance to BUILD Contest – National Renewable Energy Laboratory

Six teams of marine energy innovators are angling to free their ocean-observing technologies from their tethers and set sail to test their recharging abilities. The multistage Powering the Blue Economy: Ocean Observing Prize challenges competitors to integrate marine renewable energy into ocean observation platforms. The end goal? To devise tomorrow's hurricane-monitoring devices and protect coastal communities from dangerous storms by revolutionizing the United States' ability to understand, map, and monitor the ocean. Over the course of a year, BUILD Contest competitors have been preparing to test their prototypes in the nation's largest wave tank at the U.S. Navy's Maneuvering and Seakeeping Basin in Carderock, Md., in the summer of 2022.