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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

[Powering the Blue Economy: Power at Sea Prize](#)

The U.S. Department of Energy's (DOE) Water Power Technologies Office (WPTO) recently launched the [Powering the Blue Economy: Power at Sea Prize](#), which will award up to \$1.7 million to competitors to advance technologies that use marine energy to power ocean-based activities. Submissions for the Concept Phase are due 26 July 2024.

[Make A Splash Photo Contest](#)

The U.S. DOE's 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.

[Marine Energy Graduate Student Research Program](#)

The U.S. DOE's WPTO and the Oak Ridge Institute for Science and Education (ORISE) has opened applications for the [2024 Marine Energy Graduate Student Research Program](#), which supports graduate students working on marine energy by providing access to expertise, resources, and capabilities available at DOE offices, national laboratories, government and industry partners, and other approved facilities. Applications are due 1 December 2023.

Spatial Environmental Assessment Toolkit Releases Beta Version

A beta version of the [Spatial Environmental Assessment Toolkit](#) (SEAT) is now available. SEAT is an integrated series of open-source tools that support the assessment and mitigation of environmental risks associated with deploying marine energy devices. The beta release includes new tutorials and an updated user interface.

Calls for Abstracts

The [Call for Abstracts](#) for the [Environmental Interactions of Marine Renewables Congress 2024 \(EIMR 2024\)](#) is now open through 17 November 2023. EIMR 2024 will take place on 15-19 April 2024 in Orkney, Scotland.

The [Call for Abstracts](#) for the [International Conference on Ocean Energy \(ICOE 2024\)](#) is now open through 5 March 2024. ICOE 2024 will take place 17-19 September 2024 in Melbourne, Australia.

The [Call for Abstracts](#) for the [Asian Offshore Wind, Wave and Tidal Energy Conference \(AWTEC 2024\)](#) is now open through 20 March 2024. AWTEC will take place on 20-24 October 2024 in Busan, Korea.

Funding & Testing Opportunities

Menter Môm is [seeking partners or suppliers](#) to help develop and commercialize an environmental monitoring system to enable deployment of tidal turbines at the Morlas tidal stream site. The deadline to apply to the tender is 24 November 2023.

The U.S. DOE recently announced up to \$10 million in funding for the [Inspiring Generations of New Innovators to Impact Technologies in Energy 2024 \(IGNIITE 2024\)](#) program, led by the Advanced Research Projects Agency-Energy (ARPA-E). The new program will support early-career scientists and engineers seeking to develop impactful new energy technologies. Concept papers are due 5 January 2024.

The European Commission's Horizon Europe Framework Programme has opened a [Call for Additional Activities for the European Partnership for a Climate Neutral, Sustainable and Productive Blue Economy](#). This call is open to companies from European Union countries and a selected number of non-EU/non-Associated Countries. Applications are due 28 February 2024.

Career Opportunities

The Coastal Studies Institute (East Carolina University Outer Banks campus) is seeking a [Program Manager](#) for a portfolio of projects related to marine energy device and component testing at the Jennette's Pier Wave Energy Test Center. Applications are due 18 November 2023.

Met Office, the National Meteorological Service for the United Kingdom, is looking for a [Marine Applications Scientist](#), [Marine Applications Foundation Scientist](#), and [Marine Applications Senior Scientist](#). Applications are due 20 November 2023.

The Environmental Research Institute is advertising for a [funded PhD studentship](#) on “Validating next-generation biophysical and metocean monitoring techniques for offshore renewable energy”. Applications are due 30 November 2023.

The University of Oxford is seeking [doctoral students](#) with interests in turbine hydrodynamics and design, resource modelling, naval architecture and ocean engineering, system optimization, and/or control co-design to work on the new CoTide (Co-design to deliver Scalable Tidal Stream Energy) programme. Applications are due 1 December 2023.

The Marine Offshore Renewable Energy Lab (MOREnergy Lab) of Politecnico di Torino, Italy, is looking for a [Postdoctoral Research Fellow](#) to carry out activities related to the techno-economic modelling and optimization of offshore renewable energy systems. Applications are due 15 December 2023.

Upcoming Events

Upcoming Webinars

The Portal and Repository for Information on Marine Renewable Energy ([PRIMRE](#)) team is hosting a webinar, “[Introducing Telesto: PRIMRE’s Knowledge Hub for Marine Energy Development Resources and Guidance](#)”, on 28 November 2023 from 10:00-11:00am MST (5:00-6:00pm UTC). The new and improved version of [Telesto](#) is home to open-source wiki pages, structured databases, and tools that provide information about the development life cycle of marine energy. Register [here](#).

ETIP Ocean, the European Technology & Innovation Platform for Ocean Energy, is hosting a webinar, “[Best practices for local community engagement](#)”, on 6 December 2023 at 3:00pm CET (2:00pm UTC). Register [here](#).

The [IMPACT](#) and [VALID](#) projects are jointly hosting a webinar, “[Harnessing Ocean Power: Progressing with Wave Energy Converter Technology through Rig Testing](#)”, on 31 January 2024 from 2:00-3:00pm CET (1:00-2:00pm UTC). Register [here](#).

Upcoming Conferences

Marine Renewables Canada is hosting the [Marine Renewables Canada 2023 Conference](#) on 4-6 December 2023 in Ottawa, Canada. Register [here](#).

WavEC Offshore Renewables, in collaboration with the Netherlands Embassy, is hosting the [2023 WavEc Seminar](#) on 6 December 2023 in Lisbon, Portugal. Register for free [here](#).

The [Pan American Marine Energy Conference \(PAMEC 2024\)](#) will take place on 22-24 January 2024 in Barranquilla, Colombia. Registration is now open [here](#).

Upcoming Workshops

In addition to the PAMEC 2024 Conference Program, PAMEC in partnership with key partners, is hosting several workshops prior to the conference. Pacific Northwest National Laboratory is hosting an [Ocean Thermal Energy Conversion \(OTEC\) Workshop](#) on 19 January to review OTEC technologies, discuss potential environmental effects, and examine additional uses of deep cold water. Register [here](#).

The PRIMRE team is also hosting a workshop a [Marine Energy Data Organized – PAMEC Workshop on PRIMRE and International Data Sharing](#) on 20 January to present on the resources available within PRIMRE and discuss opportunities for international databases to connect to the system. 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.

[Enhancing Islanded Power Systems: Microgrid Modeling and Evaluating System Benefits of Ocean Renewable Energy Integration](#) – Vicente et al. 2023

The energy transition hinges on the effective integration of renewable energy sources into the power grid. Islands can provide invaluable insights into the challenges and opportunities of integrating variable renewable energy into the grid due to their relatively small power systems, isolated grids, and diverse availability of renewable energy resources. This paper presents a study on the system benefits and challenges of marine energy integration in insular power systems, focusing on the Orkney Islands as a case study. A microgrid modeling approach that optimizes the mix of renewable sources and energy storage systems for future scenarios considering strategic time horizons (2030, 2040, and 2050) was employed.

[CMIP6 projections for global offshore wind and wave energy production \(2015–2100\)](#) – Ibarra-Berastegui et al. 2023

Three-hourly CMIP6 projections have been used in conjunction with the CSIRO WaveWatchIII wave model to calculate the global trends in offshore wind and wave energy for the SSP585 and SSP126 scenarios until 2100. The results indicate that moderate yet significant changes are expected in the theoretical electricity generated from wind and waves at fewer than 10–15% of coastal locations. While this implies a generally stable outlook for the future, certain coastal regions with existing or planned wind farms may experience a slight reduction in production by 2100. Regarding wave energy, given

its early stage of development, a more cautious approach is advisable, although a similar conclusion may be reached.

Vibrational Responses of an Ultra-Large Cold-Water Pipe for Ocean Thermal Energy Conversion: A Numerical Approach – Tan et al. 2023

The transportation of seawater on a grand scale via an ultra-large cold-water pipe situated within the context of ocean thermal energy conversion (OTEC) floating installations inherently presents challenges associated with instability and potential malfunction in the face of demanding operational circumstances. This study endeavors to augment the stability and security of cold-water pipe (CWP) operations by scrutinizing their vibrational attributes across diverse boundary configurations. Initially, we invoke Euler–Bernoulli beam theory to forge the analytical framework and proffer a semi-analytical resolution by utilizing the generalized integral transform technique (GITT). Subsequently, we authenticate the convergence and precision of our proposed approach through comparative analysis with extant theories.

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.

Larantuka 10MW project – SBS

The Larantuka Strait is located in between the Flores and Adonara islands and has one of the strongest and most reliable tidal currents in Indonesia. SBS, in partnership with State-owned Enterprise, PT. Indonesia Power, are jointly developing the first utility-scale tidal turbine generator facility as part of State-owned electrical offtaker, PLN’s De-Dieselisation Plan, where the existing 5,200 diesel-fuelled generators located in 2,100 locations around the Archipelago are to be replaced with a mix of renewable energy devices, one of which is zero-emission tidal turbine generators.

AltaSea Eco Wave Power – Eco Wave Power

Eco Wave Power entered a collaboration agreement with AltaSea in 2022 and announced plans to relocate the energy conversion unit from Gibraltar to AltaSea’s 35-acre campus located at the Port of Los Angeles, the nation’s busiest seaport. In just over a year, Eco Wave Power has successfully modified, upgraded, and transported the conversion unit to Los Angeles. AltaSea at the Port of Los Angeles is a sprawling 35-acre nonprofit center devoted to accelerating scientific collaboration and advancing the emerging blue economy through innovation and job creation.

Green Hydrogen and Oxygen Supply from Tidal Energy – Nova Innovation

The GHOST project (Green Hydrogen and Oxygen Supply from Tidal Energy) will look at the potential of producing green hydrogen and oxygen from Nova's tidal energy projects in Shetland. The GHOST Project will assess the potential for tidal energy projects around Yell, one of Scotland's Carbon Neutral Islands, to deliver the predictable electricity required by electrolyzers to make hydrogen and oxygen for Shetland. The study will also explore the use of hydrogen and oxygen for transport, domestic heating and industry in Shetland including the Saxavord Space Centre.

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.

Wave and Offshore Wind Resource in the U.S. Pacific Ocean Minor Outlying Islands – Pacific Northwest National Laboratory (data from 2020, last updated 2023)

Coastal environments such as islands have unique opportunities for renewable energy resources. This work explores the wave and offshore wind energy potential for the U.S. Pacific Ocean Minor Outlying Islands, including Baker Island, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Palmyra Atoll, and Wake Island. A numerical wave model based on WAVEWATCH III and SWAN (both are NWS / NOAA models) was developed, validated, and executed to generate a 32-year hindcast dataset suitable for resource characterization for each island. A complementary offshore wind resource characterization is provided for the same time period based on the European Centre for Medium-Range Weather Forecasts (ECMWF) Reanalysis v5 (ERA5).

UNH TDP - Concurrent Measurements of Inflow, Power Performance, and Loads for a Grid-Synchronized Vertical Axis Cross-Flow Turbine Operating in a Tidal Estuary – National Renewable Energy Laboratory (data from 2021, last updated 2023)

This data was collected between October 12 and December 15 of 2021 at the University of New Hampshire (UNH) and Atlantic Marine Energy Center (AMEC) turbine deployment platform (TDP). This data set includes over 29 days of grid connected turbine operation during this 65 day time frame. The priority for this measurement campaign was to collect data while the turbine was electrically connected to the grid by means of a rectifier and inverter. The TDP is a floating structure moored on the Portsmouth facing side of Memorial Bridge pier #2, which spans the Piscataqua River between Portsmouth, New Hampshire and Kittery, Maine.

Optimization of Marine Energy Conversion Systems Through Modeling, Optimization, and CHIL Validation – Stony Brook University (data from 2023, last updated 2023)

The work aims to achieve optimal tidal energy conversion through a comprehensive approach of modeling, optimization, and control hardware-in-the-loop (CHIL) validation. By developing accurate models and employing optimization techniques, it seeks to

identify efficient system configurations and control strategies. HIL validation will ensure the performance and reliability of the optimized tidal energy conversion system. The preparation of the present manual has been supported by the U.S. Department of Energy.

News & Press Releases

[Onshore testing of kite system Dragon 12 completed – now being shipped for installation and commissioning in Faroe Islands – Minesto](#)

Minesto, leading ocean energy developer, recently announced that the Dragon 12 kite (1.2 MW) is now being shipped from the Uddevalla port to Faroe Islands for final stage of commissioning in Vestmanna. Shipment is now underway for the final stage of system integration at quayside in Vestmanna, Faroe Islands. Work remains to be done regarding installation of the drilled and grouted foundation, this work must be completed before offshore installation of powerplant and start of electricity production. Extensive subsystem verification and testing at the Minesto workshop in Göteborg has been completed with satisfactory results. After service and upgrades the 100kW Dragon 4 is in stable electricity production mode at the site in Vestmanna.

[After OTEC and tidal, Shell sets sights on wave energy as well – Offshore Energy](#)

Danish wave energy company Waveston has partnered up with Shell Technology – Marine Renewable Program to identify opportunities and potential avenues for collaboration on ocean energy developments. The move follows the signing of the contract between the U.S.-based marine energy technology developer ORPC and Shell Technology – Marine Renewable Program for the purchase of two next-generation Modular RivGen devices, signed in October 2023. In addition, Shell Technology – Marine Renewable Program last week signed a deal with Makai Ocean Engineering to further develop and test potentially transformative proprietary technologies that advance the engineering and economic viability of an offshore ocean thermal energy conversion (OTEC) system.

[HydroWing unveils plans for its next generation tidal energy project in Wales – HyrdoWing](#)

HydroWing is gearing up for deployment of its next generation tidal energy technology, following the recent announcement that HydroWing has been awarded a contract for a 10MW tidal stream energy project in Wales. HydroWing was the largest tidal stream project in Wales to be successful in the UK government's latest Contracts for Difference round. The project will be located at the Morlais tidal energy site in Anglesey, which is managed by the social enterprise Menter Môn. The Morlais site is the UK's largest consented tidal energy scheme. HydroWing is now starting intensive work on delivering the project, including engaging with local stakeholders and supply chain companies while also establishing a presence in Anglesey. A comprehensive research project has already

been conducted in partnership with Bangor University to assess the velocity of local tide currents.

Jacobs to Advance Development of New Water Tidal Turbine Technology – Jacobs

A Jacobs-led consortium of industry and academic organizations has been awarded funding from the U.K. government to help develop a new type of water turbine designed to improve the viability and potential of U.K. tidal range power projects. The \$1 million U.K. Research and Innovation fund SMART grant will support Jacobs' industrial research with Severn Estuary Tidal Bar Limited, in collaboration with Cardiff University, Liverpool John Moores University and the Tidal Range Alliance (part of the British Hydro Association BHA). Combined with further investment from the consortium, the grant will help progress optimization and testing of the Very Low Head turbine (VLHT). It will fund a program of computational fluid dynamics modeling, a large-scale test rig and the manufacture of a fully functioning prototype turbine at Jacobs' Technology & Innovation Center in Warrington, U.K.

The CorPower C4 set a new storm survivability record. – CorPower Ocean

CorPower Ocean's C4 device has set a new record in Storm Survivability during late evening of Saturday November 4th – withstanding waves up to 18metres (60ft) – as Portugal's coastline was placed on Red Alert due to rough seas brought by the Domingos storm. The C4 system was monitored from our control centre in Stockholm, where reliable operation was confirmed with motion and loads well within design limits. C4 has since its deployment in Agucadoura endured storms Babet, Aline, Ciarán and Domingos, with Domingos storm conditions recorded by Instituto Hidrográfico as the historical record for northern Portugal. One of the step change innovations brought to wave energy by CorPower allows the wave energy converter to be tuned and detuned, altering the system's response to the conditions.

Boost for offshore wind as government raises maximum prices in renewable energy auction – UK Government

The government has increased the maximum price for offshore wind projects in its flagship renewables scheme to further cement the UK as a world leader in clean energy. Following an extensive review of the latest evidence, including the impact of global events on supply chains, the government has raised the maximum price offshore wind and other renewables projects can receive in the next Contracts for Difference (CfD) auction to ensure it is performing effectively. The government is also increasing maximum bid prices for other technologies, offering certainty for developers, and keeping the UK at the cutting edge of all renewables. These include geothermal by 32% (from £119/MWh to £157/MWh), solar by 30% (from £47/MWh to £61/MWh), and tidal by 29% (from £202/MWh to £261/MWh).