



9 July 2021

[Tethys](#) is an online knowledge base that facilitates the exchange and dissemination of information on the environmental effects of wind and marine energy. The bi-weekly *Tethys Blast* highlights new publications in the [Tethys Knowledge Base](#); relevant announcements, opportunities, and upcoming events; and news articles of international interest. [ORJIP Ocean Energy](#) has partnered with OES-Environmental to provide additional content. If you have specific content you would like circulated to the greater wind and marine energy communities, please send it to tethys@pnnl.gov for consideration.

[Announcements](#)
[Upcoming Events](#)

[Marine Energy Documents](#)
[Wind Energy Documents](#)

[Marine Energy News](#)
[Wind Energy News](#)

Announcements

DOE Request for Information

The United States (US) Department of Energy (DOE) released a [Request for Information](#) to understand the current barriers and actions needed to make its funding opportunities and innovation and entrepreneurship activities more inclusive, just, and equitable. Responses are due by 5:00pm EDT (9:00pm UTC) on 6 August 2021.

EMEC Consultation

On behalf of Orbital Marine Power, the European Marine Energy Centre (EMEC) has opened a [consultation](#) on the decommissioning programme for the second 2 MW tidal turbine, the Orbital O2.2, planned for EMEC's Fall of Warness site in Orkney. Responses are due by 4 August 2021.

Calls for Papers

Energies is inviting submissions for the Special Issue, "[Marine Renewable Energies: From Technological Advancements to Environmental Impact Assessment](#)" (due 30 September 2021).

The *Journal of Marine Science and Engineering* is inviting submissions for several upcoming Special Issues, including “[Offshore and Onshore Wave Energy Converters: Engineering and Environmental Features](#)” (due 30 September 2021) and “[Impacts of Offshore Wind Farms on Marine Ecosystems, Fisheries and Societies](#)” (due 31 October 2021).

Funding & Testing Opportunities

The Offshore Renewable Energy (ORE) Catapult’s Marine Energy Engineering Centre of Excellence (MEECE) has launched an [Innovation Challenge](#) to support UK-based applicants developing monitoring methodologies for tracking underwater species behavior in and around tidal stream turbines. Applications are due 11 August 2021.

Innovate UK has also launched another round of [Smart Grants](#) for eligible UK organizations to apply for a share of up to £25 million for game-changing and commercially viable research and development innovation. Applications are due by 10:00am UTC on 25 August 2021.

Interreg North-West Europe recently launched the [4th Ocean DEMO](#) (Demonstration Programme for Ocean Energy Pilot Farms and Supporting Technologies) [Call for Applications](#). Successful applicants will receive free access to test their ocean energy products in real sea environments at the project’s network of test centers. Applications are due 10 September 2021.

[EuropeWave](#) has launched its Pre-Commercial Procurement (PCP) programme, which aims to accelerate the design, development, and demonstration of cost-effective wave energy converters. An [informational webinar](#) will be held at 8:30am UTC on 13 July 2021 and a [brokerage tool](#) will be available for applicants to help find the right partners until 20 July 2021. The Request for Tenders for EuropeWave’s PCP is open until 1 October 2021.

The US DOE has issued a Funding Opportunity Announcement (FOA) titled “[Advancing Wave Energy Technologies through Open Water Testing at PacWave](#)” to support research and development at PacWave South and advance wave energy technologies toward commercial viability. Concept papers are due 13 August 2021 and full applications are due 5 October 2021. An informational webinar will take place 22 July 2021. View the FOA for more details [here](#).

Student & Employment Opportunities

The Pacific Northwest National Laboratory (PNNL) is seeking a [Post Masters Research Associate](#) who will work primarily on projects associated with developing marine energy projects for coastal communities and other small-scale markets, such as aquaculture, mariculture and ocean observing. Applications are due by 9 July 2021.

The Environmental Research Institute (ERI), part of North Highland College, are now seeking to recruit a dynamic [Researcher](#) to support their ecology work within the [ROBINSON project](#) and to expand their portfolio of ornithology-related research. The project is developing an integrated energy system to help decarbonise industrialised islands, and part of ERI’s contribution is to evaluate its ecological effects. Applications are due by 28 July 2021.

The University of the Highlands and Islands, Scotland, are seeking an [Energy Knowledge Exchange Coordinator](#) to be the primary university interface into the energy business community enabling collaborative research projects. Applications are due by 30 July 2021.

Upcoming Events

Upcoming Courses

In collaboration with MaRINET2, EMEC, WavEC Offshore Renewables, and the Marine Engineering Institute – Italian National Research Council, are organizing an online course entitled “[Methods and environmental data collection in Marine Renewable Energy sites](#)” on 30 July and 3 September 2021. Register for free [here](#).

Upcoming Meeting

The US National Academies of Sciences, Engineering, and Medicine is hosting the [16th Meeting of the Bureau of Ocean Energy Management \(BOEM\) Standing Committee on Offshore Science and Assessment](#) on 9 and 12 July 2021 to showcase and provide feedback on BOEM’s recently released FY 2022-2023 Studies Development Plan. Register [here](#).

Upcoming Webinars

In collaboration with the International Energy Agency (IEA) Ocean Energy Systems Technology Collaboration Programme (OES TCP), the Ocean Power Innovation Network (OPIN) is hosting a [webinar](#) at 3:00pm CEST (1:00pm UTC) on 15 July 2021. This webinar will provide an overview of activities and highlight progress made by OPIN & IEA-OES in 2020. Register [here](#).

The US DOE Water Power Technologies Office (WPTO) is hosting its [Semiannual Stakeholder Webinar](#) at 3:30pm EDT (7:30pm UTC) on 15 July 2021. During the webinar, the new Acting Director of WPTO will share water power highlights from the President’s Fiscal Year 2022 budget request, and program representatives will highlight ongoing programs and open opportunities. Register [here](#).

Nova Scotia’s Offshore Energy Research Association (OERA) is hosting a webinar, “Marine Mammal Observer Program: Whale Tails & Other Stories of the Outer Bay of Fundy”, at 1:00pm ADT (4:00pm UTC) on 22 July 2021. Register [here](#).

As part of its *Learning from the Experts* series, the New York State Energy Research and Development Authority (NYSERDA) is hosting a webinar, “Offshore Wind Stakeholder Engagement”, at 1:00pm EDT (5:00pm UTC) on 28 July 2021. Register [here](#).

As part of its *R&D Deep Dive Webinar Series*, the US DOE WPTO is also hosting a webinar, “Contributing Data and Information to PRIMRE”, at 3:00pm EDT (7:00pm UTC) on 28 July 2021. This webinar will provide a brief introduction to [PRIMRE](#) (Portal and Repository for Information on Marine Renewable Energy), WPTO’s centralized system for storing, curating,

and disseminating data and information for all aspects of marine energy, and then focus on how you can contribute your data to the various knowledge hubs that make up PRIMRE, including the *MHK Data Repository*, *Tethys*, and *Tethys Engineering*. Register [here](#).

Upcoming Conferences

The American Clean Power Association (ACP) is hosting the [ACP Project Siting and Environmental Compliance Virtual Summit 2021](#) on 20-22 July 2021. Register [here](#).

The Business Network for Offshore Wind is hosting the [2021 International Partnering Forum \(IPF\) Together](#) on 24-26 August 2021 in Richmond, Virginia (US). Register [here](#).

The [14th European Wave and Tidal Energy Conference \(EWTEC 2021\)](#) will take place on 5-9 September 2021 in Plymouth, UK. Register [here](#) by 30 July 2021 for reduced rates.

The [Offshore Energy Exhibition & Conference 2021](#) will take place on 26-27 October 2021 in Amsterdam, Netherlands and virtually. Register [here](#).

New Documents on *Tethys*

Marine Energy

[Harbour porpoises exhibit localized evasion of a tidal turbine](#) – Gillespie et al. 2021

Tidal energy generators have the potential to injure or kill marine animals, including small cetaceans, through collisions with moving turbine parts. Information on the fine scale behaviour of animals close to operational turbines is required to inform regulators of the likely impact of these new technologies. Harbour porpoise movements were monitored in three dimensions around a tidal turbine for 451 days between October 2017 and April 2019 with a 12-channel hydrophone array. Echolocation clicks from 344 porpoise events were localized close to the turbine. The data show that porpoises effectively avoid the turbine rotors, with only a single animal passing through the rotor swept area while the rotors were stationary, and none passing through while rotating.

[A systemic view of potential environmental impacts of ocean energy production](#) – Martínez et al. 2021

Renewable ocean energy is an alternative that will help reduce carbon emissions into the atmosphere. However, there is uncertainty about potential environmental impacts of the technologies involved, because these are new and untested, and methods for the evaluation and monitoring of environmental impacts are scarce. We performed a systematic literature review (well-structured and organized, always looking for the same terms), followed by a systemic analysis in which we considered the interactions between environmental stressors, effects, receptors, and their responses. We found that most

studies are theoretical revisions and modelling exercises, although field and laboratory experiments and observations are beginning to accumulate.

Combining acoustic tracking and hydrodynamic modelling to study migratory behaviour of Atlantic salmon (*Salmo salar*) smolts on entry into high-energy coastal waters – McIlvenny et al. 2021

Migration from fresh water to the marine environment is a crucial, transitional stage in the development of Atlantic salmon (*Salmo salar*). This study used a combination of acoustic tracking, instrument data, and hydrodynamic modelling to examine behaviour of juvenile salmon (smolts) during their transition from fresh water to the marine environment. The study focuses on a high-energy coastal environment in northern Scotland, which is currently being developed for renewable energy extraction and where there is potential for negative impacts on salmon with energy extraction devices and structures. Thirty-four smolts were captured in the River Wick in Caithness and tagged with acoustic tags transmitting at 69 kHz.

Wind Energy

Working Group on Marine Benthic and Renewable Energy Developments (WGMBRED) – International Council for the Exploration of the Sea (ICES) 2021

The aim of the Working Group on Marine Benthic and Renewable Energy Developments (WGMBRED) is to increase scientific exchange and efficiency of benthic renewable energy related research. In 2019–2021, the group discussed guidelines for data collection and methodologies and developed an integrated example dataset on benthos data of marine renewable energy devices. WGMBRED further investigated possible positive effects of renewable energy installations, developed the scientific basis for assessing the effect of different decommissioning scenarios and reviewed the available knowledge on the relationship between renewable energy installations and the provisioning of ecosystem services.

Changes in flight paths of large-bodied birds after construction of large terrestrial wind turbines – Therkildsen 2021

The proliferation of ever-larger wind turbines poses risks to wildlife, especially from avian collision, yet avoidance behaviour of large-bodied, long-lived bird species in relation to wind turbines remains little studied away from collision “black spots” and offshore marine environments. Here, three-dimensional flight trajectory data are reported from a laser range-finder study of local movements of large-bodied birds (e.g. swans, geese, gulls, cormorants, raptors and cranes, whose populations are relatively more demographically sensitive to collision mortality) in relation to seven terrestrial 150-222 m high (mean 182 m) wind turbines constructed in Denmark in a N-S line.

Spatial and temporal analysis of cumulative environmental effects of offshore wind farms in the North Sea basin – Guşatu et al. 2021

The North Sea basin is one of the busiest maritime areas globally with a considerable number of anthropogenic pressures impacting the functioning of the marine ecosystem. Due to growing EU ambitions for the deployment of large offshore wind farm projects (OWF), as part of the 2050 renewable energy roadmap, there is a key need for a holistic understanding of OWF potential impacts on the marine ecosystem. We propose a holistic Cumulative Effect Assessment methodology, applied using a geo-spatial open-source software, to assess impacts of OWF related pressures on selected seabed habitats, fish, seabird and mammal species. We take into account pressures specific to the three OWF development phases, spanning 1999–2050, for the entire North Sea basin.

News & Press Releases

Marine Energy

Sustainable Marine's New Tidal Turbine Rotors Pass '20-Year Test' at National University of Ireland, Galway – Sustainable Marine

Sustainable Marine's new turbine rotors have proven they can survive for two decades in the field, following rigorous tests at a leading European marine energy centre. The firm joined forces with the MaREI Centre at the National University of Ireland, Galway (NUI Galway), through German engineering partner SCHOTTEL Hydro, to test its new 'ultra-durable' turbine rotors. Sustainable Marine is currently preparing to deliver the world's first floating tidal energy array in the Bay of Fundy, Nova Scotia. Earlier this year, it launched its new 420kW PLAT-I 6.40 floating tidal energy platform, featuring the new 4m rotors, which is now undergoing commissioning and testing in Grand Passage.

Companies secure £1.8 million to demonstrate quick connection systems for wave energy – Wave Energy Scotland

Three companies, Apollo Offshore Engineering, Blackfish Engineering Design, and Quoceant, will share nearly £1.8 million for projects that aim to bring down the cost of wave energy. The teams have secured funding from Wave Energy Scotland to conduct physical demonstrations of their quick connection systems which will allow the connection and disconnection of wave devices from their mooring and power cables in a safe and efficient manner. The approach employed in this programme should enable de-risking of subsequent systems developed for use in commercial arrays in the future. The teams aim to demonstrate their designs during the Stage 3 of the programme, working with partners to test and model the technology prior to scale testing in the future.

New record-level and third-party verification of electricity generation in Minesto's Faroe Islands tidal energy project – Minesto

Minesto recently resumed operations with its tidal kite system DG100 in the company's project in the Faroe Islands, which Minesto is carrying out together with the electric utility company SEV. Following this spring's success with electricity production in Vestmannastrandur, Minesto has upgraded the DG100 system to increase production performance in terms of both maximum and average power. This has been made possible, among other things, by improved generator configuration and optimised rudder control. Furthermore, key aspects of test operations and electricity production with the DG100 power plant, most importantly the production power curve, have now been third-party verified by DNV in accordance with international standards.

Halifax company building its first commercial Fundy tidal power unit – CBC

A Halifax-based company is building its first commercial tidal power generator in Cape Breton and it expects to begin selling electricity soon after it installs its technology in the Bay of Fundy later this year. Jamie MacNeil, executive vice-president of BigMoon Power, said the first of 18 units is being assembled at East Coast Metal Fabrication in the Sydport Industrial Park. Each unit has a large wheel suspended between the pontoons of a 30-metre barge anchored to the ocean floor. The barge can swivel to remain facing the current. BigMoon has been in operation since 2015, testing its theories and prototypes in the Bay of Fundy, and now has a contract to supply electricity to Nova Scotia Power.

MeyGen delivers record-breaking 37GWh to UK grid as SIMEC Atlantis trims year-end losses – Offshore Energy

SIMEC Atlantis Energy, the developer of the MeyGen tidal energy project, has reduced the financial losses for 2020 – the year in which MeyGen tidal array exported over 37GWh of clean power to the UK grid, breaking every record for tidal energy production set so far. Aside from its record-breaking power production achievement, the 6MW Phase 1 of the MeyGen project generated revenues of £3.2 million from the sales of power and Renewables Obligations Certificates, SIMEC Atlantis informed. The energy generated by the MeyGen project during 2020 is equivalent to the annual consumption of around 12,000 UK households.

Wind Energy

Biodiversity Action Plan To Be Developed To Maximise Biodiversity Benefits Of Wind Farms – MaREI

The Nature+Energy project will develop new ways of accounting for the value of nature on wind farms and establish a state-of-the-art environmental monitoring system across the country that will revolutionise how we measure and monitor biodiversity. The project, led by MaREI, the SFI Research Centre for Energy, Climate and Marine teams in Trinity College Dublin and Maynooth University, aims to maximise the benefits of biodiversity

on wind farms. Nature+Energy will develop Natural Capital Accounts and a Biodiversity Action Plan for the wind sector to facilitate the development of biodiversity enhancement measures and help to mitigate the effects of wind farms on key species.

RWE joins ORE Catapult to reduce offshore wind's carbon footprint – Offshore Renewable Energy (ORE) Catapult

Offshore wind developer RWE Renewables has joined the ORE Catapult's new Circular Economy for the Wind Sector joint industry programme (CEWS JIP). The programme aims to lead the way in embedding a circular economy approach at the heart of the offshore wind sector as it strives to achieve Net Zero: creating a zero-carbon, zero-waste economy for materials and manufacturing. CEWS will bring together industry, academia, research and development organisations, and government agencies to tackle the critical challenges identified in achieving zero waste, including decommissioning costs, recycling, end-of-life and repowering strategies.

Oz offshore project uses new tech to map bird flight – reNEWS

Australian offshore wind project Star of the South is using new technology to collect important data on migrating bird flight paths to inform the project's environmental assessments and design. Specialist equipment with a high-resolution camera will capture data on the types of birds and their behaviours in and around the proposed site off the south coast of Gippsland, Victoria. When fully operational Star of the South will have a capacity of up to 2.2GW. This is the first time in the world this custom-built measuring technology is being used for monthly baseline surveys. In addition, Star of the South has taken an important next step in its environmental assessment process with draft scopes released for public review and comment.

Tremendous technology: second Siemens Gamesa offshore turbine awarded typhoon-resistant type certificate – Siemens Gamesa

Siemens Gamesa recently became one of the first turbine manufacturers worldwide to receive a second rotor-nacelle assembly (RNA) IEC type certificate covering resistance to extreme wind conditions. Issued by TÜV NORD, the SG 11.0-200 DD offshore wind turbine joins the SG 8.0-167 DD offshore wind turbine with this certification. Both Siemens Gamesa machines are thus able to withstand Typhoon- or T-class wind speeds as determined by the IEC reaching 57 meters per second for 10 minutes and three-second gusts of up to 79.8 meters per second. As of today, over 1,200 units of the offshore Direct Drive platform are installed and operating across the globe, including in Asia Pacific on Formosa 1 project in Taiwan.

Spain targets 3GW floater push for 2030 – reNEWS

Spain's Ministry for the Ecological Transition and the Demographic Challenge (MITECO) has released a roadmap for the development of up to 3GW of floating offshore wind by 2030. Spain aims to install 1-3GW of floating offshore wind and up to

60MW of pre-commercial wave tidal and other clean marine energy over the next decade. The roadmap lays out four objectives to enable Spain to deliver on its targets. The first is to establish Spain as a European point of reference for the design, scale-up and demonstration of new technologies, for existing platforms and for new prototypes. At least €200m in public funds will be activated between 2021 and 2023 under the country's Recovery, Transformation and Resilience Plan (PRTR).