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[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.

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Announcements

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[EnergyTech University Prize](#)

The US Department of Energy's (DOE) Office of Technology Transitions recently launched the [EnergyTech University Prize](#), a collegiate competition challenging multidisciplinary student teams to develop and present a business plan that leverages DOE national laboratory-developed and other energy technologies. Attend the [informational webinar](#) at 3:00pm EDT (7:00pm UTC) on 20 October 2021 to learn more about participating.

[BOEM Seeking Comments](#)

The US Bureau of Ocean Energy Management (BOEM) is [accepting public comments](#) to inform the preparation of an Environmental Impact Statement for the Atlantic Shores Offshore Wind projects offshore New Jersey through 1 November 2021.

USFWS Seeking Comments

The US Department of the Interior [recently announced](#) a series of actions to ensure that the Migratory Bird Treaty Act conserves birds today and into the future. As part of this effort, the US Fish and Wildlife Service (USFWS) is [seeking public comments](#) to help develop proposed regulations to authorize the incidental take of migratory birds through 3 December 2021.

Calls for Abstracts

The Call for Abstracts for the [VII Marine Energy Conference](#) will close on 20 October 2021. The conference will take place in Bilbao, Spain on 9 November 2021.

The [Call for Student Research Posters & Videos](#) for the [Marine Renewables Canada 2021 Annual Conference](#) is open through 25 October 2021. Marine Renewables Canada 2021 will take place in Halifax, Nova Scotia on 24-25 November 2021.

The Call for Abstracts for the [WindEurope Annual Event 2022](#) is now open through 31 October 2021. The event will take place in Bilbao, Spain on 5-7 April 2022.

The Call for Abstracts for the [Floating Wind Solutions Conference & Exhibition \(FWS 2022\)](#) will close on 1 November 2021. FWS 2022 will take place in Houston, US on 1-3 March 2022.

The Call for Abstracts for the [6th International Conference on Wind Energy and Wildlife Impacts \(CWW 2022\)](#) will close on 11 November 2021. CWW 2022 will take place in Egmond aan Zee, Netherlands on 4-8 April 2022. Early bird registration is now open until 31 January 2022.

Call for Workshops

The Business Network for Offshore Wind has opened the [Call for Workshops](#) for the [2022 International Partnering Forum \(IPF\)](#) through 29 October 2021. IPF 2022 will take place on 26-28 April 2022 in Atlantic City, US.

Funding & Testing Opportunities

The UK Supergen Offshore Renewable Energy Hub is inviting applications for the [Early Career Researcher \(ECR\) Research Fund](#), which is designed to support ECRs involved in offshore wind, wave, or tidal energy research with up to £5,000. Applications are due 18 October 2021.

The Danish Energy Agency opened a [Technology Neutral Tender](#) of aid for electricity generated by onshore wind turbines, open door offshore wind turbines, wave power plants, hydroelectric power plants, and solar installations. The deadline for bids is 22 October 2021.

The Basque Energy Agency, Ente Vasco de la Energía, launched a [Call for Applications](#) for its €2.5 million aid program, which aims to promote the demonstration and validation of emerging marine energy technologies within the Basque Country. The call closes on 29 October 2021.

Bat Conservation International has launched a Request for Proposals for the [Student Research Scholarship for Global Bat Conservation Priorities](#), which aims to provide financial support to graduate student researchers for bat conservation research. Proposals are due 31 October 2021.

The US DOE has announced a plan to provide \$37 million for small businesses pursuing climate and energy R&D projects through its Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Letters of intent for the [SBIR/STTR Phase 2 Release 1 FOA](#) are due by 5:00pm EST (10:00pm UTC) on 9 November 2021.

The US DOE's National Renewable Energy Laboratory has opened a [Request for Proposals](#) to support research into behavior of bats at wind turbines and responses by bats to deterrent stimuli. Goals for awarded projects include understanding bat-turbine interactions to help minimize collisions and improving deterrent effectiveness. Awardees will receive \$450k to \$700k each to fund the research. Applications are due 8 December 2021.

The US California Energy Commission (CEC) recently released a Grant Funding Opportunity titled, "[Propelling Offshore Wind Energy Research](#)", which will fund R&D projects to demonstrate, test, and validate innovative floating offshore wind components and tools. Applications are due 15 December 2021.

The US Testing Expertise and Access for Marine Energy Research (TEAMER) Program is now offering limited [open water support for marine energy testing](#) through its facility network. Applications for the next TEAMER Request for Technical Support are due 16 December 2021.

The European Maritime, Fisheries and Aquaculture Fund has launched a [Call for Proposals](#) to support strategic collaboration in the Atlantic, Black Sea, and Western Mediterranean. Proposals for Topic 1, "[Innovative multi-use projects combining offshore renewable energy with other activities and/or with nature protection in the Atlantic](#)", are due 12 January 2022.

Student & Employment Opportunities

The Fundy Ocean Research Center for Energy (FORCE) is looking to hire an [Environmental Program Manager](#), who will be responsible for managing all aspects of FORCE's environmental program including environmental effects monitoring and contributing towards ongoing sensor technology research. Applications are due by 4:00pm ADT (7:00pm UTC) on 22 October 2021.

The Selkie project is seeking candidates for a [Masters by Research](#) focused on geospatial site selection methods for wave and tidal energy technologies. Applications are due 22 October 2021.

The Environmental Research Institute at the University of the Highlands and Islands (UK) are recruiting for a [Research Fellow - Offshore Renewable Energy and the Environment](#) to work with Ørsted to design novel environmental and ecological monitoring techniques and next-generation oceanographic measurement platforms. Applications are due 22 November 2021.

Upcoming Events

Upcoming WESE Event

The Wave Energy in Southern Europe ([WESE](#)) project, which aimed to tackle non-technological barriers and address the environmental concerns of emerging wave energy technologies in Spain and Portugal, is coming to an end. The WESE team is hosting a Final Event online on 28 October 2021 from 9:30am-12:30pm CEST (7:30-10:30am UTC) to share the project's main outcomes, including decision support tools and a data sharing platform. Register [here](#).

Upcoming Webinars

Ocean Energy Europe is hosting a webinar titled, "[Looking beyond 2030: Driving innovation via the revised Renewable Energy Directive](#)", on 21 October 2021 from 10:30am-12:00pm CEST (8:30-10:00am UTC), as part of EU Sustainable Energy Week. Register [here](#).

The European Technology and Innovation Platform for Ocean Energy is hosting a webinar titled, "[Benefits & tips for local community engagement](#)", on 21 October 2021 at 10:00am BST (9:00am UTC). Register [here](#).

BOEM and the Oregon Department of Land Conservation and Development are hosting the [BOEM Oregon Intergovernmental Renewable Energy Task Force webinar](#) on 21 October 2021 from 8:30am-4:00pm PST (3:00-11:00pm UTC). Register [here](#).

The Nova Scotia Offshore Energy Research Association is hosting a webinar titled, "[Testing of 360-Degree Imaging Technologies for Improved Animal Detection around Tidal Energy Installations](#)", on 21 October 2021 from 1:00-2:00pm ADT (4:00-5:00pm UTC). Register [here](#).

Upcoming Conferences

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

The Leibniz Institute for Zoo and Wildlife Research is hosting the [1st International Bat Research Online Symposium: Towards solving the wind energy-bat conflict](#) on 2 November 2021. Register [here](#) by 31 October 2021.

The US National Offshore Wind Research and Development Consortium is hosting the [National Offshore Wind R&D Symposium 2021](#) online on 8-10 November 2021. Register [here](#).

Webinar Recording

A recording of the American Wind Wildlife Institute's recent webinar, "Minimizing Collision Impacts for Bats at Operational Wind Facilities, Part 1: Curtailment", is now available [here](#).

New Documents on *Tethys*

Marine Energy

[The rebirth and eco-friendly energy production of an artificial lake: A case study on the tidal power in South Korea](#) – Park & Lee 2021

In light of climate change and greenhouse gas reduction, countries around the world are doing their part to develop various types of eco-friendly energy. In this context, the Shihwa Tidal Power Plant is an advanced energy generation infrastructure which uses the resources of the sea, a project that pioneers and practices low-carbon, green growth engineering. Not only as an advanced energy generation infrastructure but also it is an eco-friendly infrastructure that resurrected ‘the dead lake’, which had suffered extreme water pollution due to cutoff in seawater circulation after the completion of the tide embankment in 1994. This article therefore presents the review of Shihwa Lake’s environmental issues and eco-friendly energy production process with the aim to identify the good practices, the challenges as well as the lessons learnt from their experience.

[Fast & Flexible: streamlining a simulation- based approach to collision risk assessments](#) – Horne et al. 2021

To address collision risk between marine mammals and tidal energy devices a simulation-based approach was developed to create a robust system that can adapt to any typical scenario and include novel device designs and ecological parameters. The approach here makes use of an open-source game-engine, Blender, to simulate a tidal energy device, the animal, and its movement in 3D to calculate collision probabilities. The aim of this current study was to streamline the simulation-based approach and outline a more efficient process so that the time to produce results is greatly reduced. Simulation runtime has been significantly reduced by employing increased parallelisation and enabling running the software on a high-performance computer. The end-to-end runtime was reduced by a factor of 17 to greatly improve efficiency.

[Acoustic risk balancing by marine mammals: anthropogenic noise can influence the foraging decisions by seals](#) – Hastie et al. 2021

Avoidance of anthropogenic sounds has been measured in many species. The results, which are typically based on observations in limited exposure contexts, are frequently used to inform policy and the regulation of industrial activities. However, the occurrence and magnitude of avoidance may be a consequence of complex risk-balancing decisions made by animals. The importance of the factors in decision-making, such as perceived risks associated with the sounds or prey quantity and quality during sound exposure, is unknown. Here we address this knowledge gap by measuring the relative influence of perceived – risk of a sound (silence, pile driving, and a tidal turbine) and prey patch quality on decision-making and foraging success in grey seals *Halichoerus grypus*.

Wind Energy

[Wind Turbine Interactions with Wildlife and Their Habitats: A Summary of Research Results and Priority Questions](#) – American Wind Wildlife Institute 2021

Wind energy provides environmental benefits including ability to generate electricity without carbon emissions, water use, or emissions of water and air pollutants. However, the siting and operation of wind energy can present a risk of adverse impacts to wildlife, particularly individual birds and bats. Wind Turbine Interactions with Wildlife and Their Habitats: A Summary of Research Results and Priority Questions summarizes publicly available information about the adverse impacts of land-based wind power on wildlife in North America and the status of our knowledge regarding how to avoid or minimize these impacts. The information in this summary is updated and undergoes expert review annually to incorporate new results as they become publicly available.

[Life Cycle Assessment of a Barge-Type Floating Wind Turbine and Comparison with Other Types of Wind Turbines](#) – Yildiz et al. 2021

The use of renewable energy sources has gained importance in reducing and eliminating the effect of global warming. To this end, new technologies are being developed to facilitate the use of these resources. One of these technological developments is the floating wind turbine. In order to evaluate the respective environmental footprint of these systems, a life cycle assessment (LCA) is herein applied. In this study, the environmental impact of floating wind turbines is investigated using a life cycle assessment approach and the results are compared with the respective ones of onshore and jacket offshore wind turbines of the same power capacity. The studied floating wind turbine has a square foundation that is open at its centre and is connected to the seabed with a synthetic fibre-nylon anchorage system.

[Are the impacts of wind energy reversible? Critically reviewing the research literature, the governance challenges and presenting an agenda for social science](#) – Windemer & Cowell 2021

The extent to which the impacts of renewable energy development might be reversible is an important dimension of debates about environmental acceptability, magnified in significance by the sector's rapid expansion and the inexorable ageing of facilities. However, despite frequent claims that the impacts of renewable energy are reversible, the complex realities of impact (ir)reversibility have attracted minimal systematic research. This paper addresses this gap with the first review of the research literature on impact (ir)reversibility, focused on onshore wind, and makes a number of contributions. Firstly, it shows that determining whether impacts are reversible or not inevitably entails selective, value-laden judgements about what matters and why.

News & Press Releases

Marine Energy

[WESE rolls out ecological risk assessment tool for wave energy](#) – Offshore Energy

Wave Energy in Southern Europe (WESE) project, whose goal is to improve the current knowledge on the potential environmental effects of wave energy, has released an open access ecological risk assessment tool for wave energy converters. The open access tool, dubbed WEC-ERA, is aimed at managers, decision makers and industry when assessing the suitability of wave energy projects, in terms of the potential impacts that they can cause. The tool is based on the ecosystem risk assessment of three different wave energy converter technologies during their life-cycle stages – from installation to operation and decommissioning. WEC-ERA tool offers interactive assessment and visualisation of the pressures and ecological risks of oscillating water columns, oscillating wave surge converters, and wave turbine technologies.

[Is the tide turning on renewable marine power? Entrepreneurs test wave-powered energy systems](#) – GeekWire

For years, the development of marine energy—and particularly power from waves—has lagged behind the solar and land-based wind power that has taken off. But now the tide, perhaps, is turning. Two Pacific Northwest companies are launching groundbreaking tests of wave-powered energy systems. This fall, Seattle’s Oscilla Power and Oregon State University spinout C-Power are for the first time testing their technologies at the U.S. Navy Wave Energy Test Site in Hawaii. And in July, the U.S. Department of Energy announced \$27 million in funding for wave energy research and development at the new PacWave South test facility located off the coast of Newport, Ore.

[São Tomé and Príncipe Prime Minister Publicly Backs Global OTEC Plans](#) – Global OTEC Resources

The Prime Minister of the Democratic Republic of São Tomé and Príncipe recently announced a partnership with the United Kingdom-based Global OTEC, for the deployment of the first commercial Floating OTEC Platform. Ocean Thermal Energy Conversion (OTEC) technology is based on converting incoming solar radiation into electricity, is continuously available in almost all ocean locations between the tropics, and therefore represents an unlimited source of baseload electricity for the blue-green economy. The Prime Minister noted that the private sector has already invested significant resources in developing the world’s first commercial Floating OTEC Platform, and very shortly, a prefeasibility study, part-funded by the United Nations Industrial Development Organization, will begin.

[CalWave Successfully Commissioned Open-water Wave Energy Pilot](#) – CalWave

CalWave (“CalWave Power Technologies Inc.”) successfully commissioned its CalWave x1™ on September 16th off the coast of San Diego. This milestone event marks the beginning of California’s first at-sea, long-duration wave energy pilot operating fully

submerged. The CalWave x1™ will be tested for six months with the goal of validating the performance and reliability of the system in open ocean. This project is supported by a US Department of Energy award with the goal to demonstrate CalWave's scalable and patented xWave™ technology. Following this demonstration, CalWave plans to prepare for deployment of a larger unit at PacWave, the first commercial-scale, utility grid-connected wave energy test site in the US rated at 20 MW.

Franco-British partnership: Syndicat des Energies Renouvelables and the UK Marine Energy Council sign a cooperation agreement for the development of renewable marine energies – Tidal Stream Industry Energiser

The French Renewable Energies Trade Association (SER) and the UK Marine Energy Council (UK MEC) recently signed a memorandum of understanding, making it possible to affirm and to organise their next collaboration for the development of the tidal energy sector. To strengthen the sector development, the UK MEC and the SER have agreed to share their analyses, good practices, and feedback to support these technologies as quickly and efficiently as possible towards technical and economic maturity to benefit the energy transition in both countries. Thus, this agreement provides for cross-promotion and communication actions between the SER and UK MEC and structure the exchange of information and documentation on our shared issues and, in particular, improve their respective knowledge.

Wind Energy

DOE Announces \$13.5 Million for Sustainable Development of Offshore Wind – US DOE

The U.S. Department of Energy (DOE) recently announced \$13.5 million in funding to provide critical environmental and wildlife data to support offshore wind development. In support of a joint interagency goal to develop 30 gigawatts of offshore wind by 2030, DOE is funding four projects that will inform offshore wind siting, permitting and help protect wildlife and fisheries as offshore wind deployment increases. Two selected projects will support wildlife and fisheries monitoring efforts on the East Coast. The other two projects are focused on preparing the West Coast for floating offshore wind development by collecting wildlife distribution data and developing tools to monitor the environmental effects of floating offshore wind energy.

GE Renewable Energy's Haliade-X prototype starts operating at 14 MW – General Electric

GE Renewable Energy recently announced that its Haliade-X prototype in Rotterdam, a port city in the Netherlands, has started operating at 14 MW. With this new milestone, GE Renewable Energy becomes the first industry player to operate a turbine at this power output. The Haliade-X 14 MW is an updated version of the Haliade-X 13 MW, which received its type certification in January 2021. One turbine can generate up to 74 GWh of gross annual energy production, saving up to 52,000 metric tons of CO₂, which is the equivalent of the emissions generated by 11,000 vehicles in one year. The Haliade-X 14

MW will make its commercial debut at the Dogger Bank C offshore wind farm, which is located over 130 km off the north-east coast of England and, together with Dogger Bank A and Dogger Bank B, is due to become the largest offshore wind farm in the world.

Secretary Haaland Outlines Ambitious Offshore Wind Leasing Strategy – US Department of the Interior

Secretary of the Interior Deb Haaland recently outlined the path forward for future offshore wind leasing to meet the Biden-Harris administration's goal to deploy 30 gigawatts (GW) of offshore wind energy by 2030. During a speech at the American Clean Power's Offshore WINDPOWER Conference & Exhibition in Boston, Mass., the Secretary announced plans for the Bureau of Ocean Energy Management (BOEM) to potentially hold up to seven new offshore lease sales by 2025 in the Gulf of Maine, New York Bight, Central Atlantic, and Gulf of Mexico, as well as offshore the Carolinas, California, and Oregon. BOEM is working on refining its process for identifying additional Wind Energy Areas (areas that may be suitable for leasing).

X1 Wind completes rotor assembly for pioneering 'downwind' floating platform – X1 Wind

X1 Wind has completed the rotor assembly for its pioneering floating wind platform. The firm's X30 prototype is now fully assembled in Las Palmas, Gran Canaria, ready for installation. Fitted with a specially adapted V29 Vestas turbine, the unique 'downwind' system is able to 'weathervane' and orientate passively with the wind to maximise energy yields. The novel 'tripod-like' platform also features greater structural efficiency, with a lighter and more scalable design, while minimising environmental impact on the ocean. X1 Wind's platform utilizes the best features of a semi-submersible – with a low draft – and the ability to reach deeper waters by a Tension Leg Platform mooring system – with a small seabed footprint. X1 Wind's X30 deployment is being delivered in conjunction with the ground-breaking PivotBuoy Project backed by a pan-European consortium.

Giant China Project Leads the Rise of Renewable Mega-Hubs – Bloomberg Green

China, already a global leader in renewable energy, is seeking to raise the bar dramatically on wind and solar capacity with a massive new project in the desert. The initiative, which is at least twice the size of the next-largest planned global development, comes as the nation attempts to quickly ramp up the pace of its transition to carbon neutrality ahead of global climate talks. As China leads the way in adopting wind and solar power, other countries are striving to keep pace. Australia has several large projects planned, while South Korea and Oman are also emerging as strong players. The first phase of the China Desert Project would create capacity that's more than the total currently installed in India, according to BloombergNEF, and it would be able to generate four times as much power as the Three Gorges Dam.