



**19 February 2021**

[Tethys](#) is an online knowledge base that facilitates the exchange and dissemination of information on the environmental effects of wind and marine renewable energy (MRE). 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 MRE communities, please send it to [tethys@pnnl.gov](mailto:tethys@pnnl.gov) for consideration.

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## **Announcements**

### WPTO Semiannual Stakeholder Webinar

Join the Department of Energy's (DOE's) Water Power Technologies Office (WPTO) on 1 March 2021 from 3:30-5:00pm ET (8:30-10:00pm UTC), for its [Semiannual Stakeholder Webinar](#), where staff will discuss some of the most pressing changes affecting water power research and development in 2021. Led by Acting Deputy Assistant Secretary for Renewable Power and WPTO Director Alejandro Moreno, the webinar will feature program managers and technical leads from across WPTO. Program representatives will provide an update on the administration transition and FY21 budget, highlight recent announcements and publications, share project updates, and discuss upcoming priorities. The presentation will close with Q&A. Register [here](#) and email questions ahead of time [here](#).

### PacWave Request for Information Deadline Extended

The development of the [PacWave open ocean wave energy test facility](#) is proceeding rapidly and the South test site is scheduled to be operational in the Spring of 2023. The PacWave and Pacific Marine Energy Center (PMEC) teams have extended the deadline for their [Request for Information](#) (RFI) to solicit feedback from the wave energy technology research and

development community, developers of related blue economy technologies, and other stakeholders. The information received will help the PacWave team understand how the facility can most effectively support testing needs. Responses are now due by 23 February 2021 and the submission deadline will not be extended further.

### WREN/Tethys Webinar Recording Now Available

The National Renewable Energy Laboratory (NREL) and Pacific Northwest National Laboratory (PNNL) held a webinar on 9 February 2021 to discuss how [WREN \(Working Together to Resolve the Environmental Effects of Wind Energy\)](#) and *Tethys* are facilitating the knowledge sharing needed to advance wind energy development in an environmentally responsible manner. View the presentation slides and a recording of the webinar [here](#).

### New *Tethys* Story

#### **Sustainable Alternatives for Wind Turbine Blade Disposal by Dorian Overhus**

Although wind turbine blades represent a tiny portion of U.S. landfill waste and are among the least environmentally harmful materials entering landfills, the disposition of fiberglass wind turbine blades is a significant challenge facing the industry. With an increasing number of wind turbine blades reaching the end of their service life, sustainable alternatives for turbine blade disposition are being developed that include recycled products and repurposing blades for additional uses. Read more [here](#).

### Call for Abstracts

The North American Wind Energy Academy (NAWEA) and Center for the Research in Wind (CReW) are accepting abstracts for the NAWEA Symposium and International Conference on Future Technologies in Wind Energy (WindTech) through 16 April 2021. [NAWEA/WindTech 2021](#) will take place in Newark, Delaware on 22-24 September 2021.

### Funding/Testing Opportunities

The UK government recently launched the [Energy Entrepreneurs Fund \(EEF\)](#), a competitive funding scheme to support the development and demonstration of technologies, products, and processes in energy efficiency, power generation, and storage. Register your interest by 12:00pm GMT on 26 February 2021 and submit your applications by 30 March 2021.

The Centre for Advanced Sustainable Energy (CASE) is currently seeking applications from qualified consortia for research and development funding to support the decarbonization of the energy system in Northern Ireland. Developers working in ocean energy, including wave, tidal, and offshore wind, are eligible to apply. The [Call for CASE Project Applications](#) closes at 5:00pm GMT on 26 February 2021.

The U.S. DOE has announced up to \$14.5 million for environmental research to support U.S. offshore wind development. This [Funding Opportunity Announcement](#) will support regionally-

focused, coordinated research efforts to increase understanding of the environmental impacts of offshore wind, as well as projects that advance and validate tools to monitor and minimize impacts. Concept papers are due by 5:00pm EST (10:00pm UTC) on 1 March 2021.

The U.S. DOE has also allocated \$100 million in funding through the Advanced Research Projects Agency-Energy's (ARPA-E) 2021 [OPEN Funding Opportunity](#) to support the development of potentially disruptive new technologies across the full spectrum of energy applications. Concept papers are due by 9:30am EDT (1:30pm UTC) on 6 April 2021.

In collaboration with Innovate UK, the Department for Business, Energy and Industrial Strategy (BEIS) will soon launch the next opportunity for businesses in England, Wales and Northern Ireland to bid for funding from the [Industrial Energy Transformation Fund](#) (IETF). IETF [Phase 1: Spring 2021](#) opens to applications on 8 March 2021 and runs to 14 July 2021.

### Student/Employment Opportunities

Vineyard Wind is looking for a [Manager of Environmental Affairs](#) and a [Senior Manager of Environmental Affairs](#) to join its team in support of the company's efforts to develop and permit well-sited offshore wind projects with minimal environmental impact.

Aquatera is seeking a [Senior Consultant](#) with an engineering background and marine renewable energy expertise to join its newly established Aquatera Sustainability Ireland team.

PNNL is currently seeking a [Coastal and Marine Sciences Technical Intern](#) to join projects within one of three focus areas: (1) understanding the national laboratories' role and the unique place they have to accelerate work in coastal and marine ecosystems; (2) research and development of technologies focused on monitoring coastal ecosystems; and (3) MRE technologies and powering the blue economy. Applications are due by 25 February 2021.

Oregon State University's Northwestern Bat Hub is seeking to hire [Crew Leads](#) and [Student Assistant Field Techs](#) to conduct North American bat stationary acoustic monitoring surveys in Oregon, Washington, and Idaho during the 2021 summer season. Applications for the Crew Lead positions are due 30 June 2021. Applications for the Tech positions are due 26 February 2021.

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## **Upcoming Events**

### Upcoming Webinars

As part of its webinar series, the Selkie Project will host a [webinar](#) on skills in the marine energy sector at 10:00am UTC on 23 February 2021. The webinar will outline the importance of a skilled workforce in coastal communities, highlight the skills shortages and the needs of the marine energy industry, and gather suggestions on how to address gaps. Register [here](#).

In collaboration with the Tidal Stream Industry Energiser (TIGER) project, the Multi-model Investigation of Tidal Energy Converter Reliability (MONITOR) project will host a [webinar](#)

from 11:00am-12:30pm GMT on 24 February 2021. The event will focus on improvements to reliability modelling for tidal turbines, drawing on numerical and laboratory models, as well as real case studies. Register [here](#).

The U.S. Bureau of Ocean Energy Management (BOEM) and the Oregon Department of Land Conservation and Development's introductory webinar on the [Oregon Offshore Wind Mapping Tool \(OROWindMap\)](#) has been rescheduled to 11 March 2021 from 10:00-11:30am PT (6:00-7:30pm UTC). OROWindMap is a planning tool within the [West Coast Ocean Data Portal](#) that accesses relevant datasets and provides data visualization capabilities to inform the planning process for offshore wind energy leasing in federal waters offshore Oregon. Register [here](#).

### Upcoming Conferences

The Business Network for Offshore Wind's [2021 International Partnering Forum \(IPF\)](#) will be held as a two-part series: virtual and in-person. IPF Virtual will be held online on 7 April, 13 May, and 17 June 2021. The main conference, IPF Together, will be held 24-26 August 2021 in Richmond, Virginia. Registration opens 15 March.

The [International Conference on Ocean Energy \(ICOE\)](#) will be held online from 28-30 April 2021. The theme for ICOE 2021 is "Energizing a Powerful Blue Economy". Register [here](#) by 31 March 2021 for early bird rates.

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## **New Documents on *Tethys***

### **Marine Renewable Energy**

#### **[Environmental impact index for tidal power plants in amazon region coast](#) – Progênio et al. 2020**

In some coastal areas, tidal ranges represent an important energy potential. This energy is harnessed through tidal power plants (TPPs), which cause environmental impacts during the construction and operation phases. The objective is to propose an environmental impact potential (EIP) index to be used as a tool to select suitable areas for the installation of TPPs. The EIP is based on a combination of geographic information systems and multicriteria analysis, which take into account the degrees of vulnerability of the following environmental variables: land use, geomorphology, geology, slope, pedology and vegetation.

#### **[Marine Renewable Energy in the Greek Seas](#) – Soukissian et al. 2020**

The objective of this chapter is to present and discuss the various aspects that are directly related to marine renewable energy development in the Greek Seas with the aim of describing the current status and identifying future potential conflicts and challenges. In order to assess the spatial context in which marine renewable energy technologies could be installed in Greece, some key factors are addressed. Specifically, the

geomorphological and metocean characteristics are discussed along with the most prevalent economic activities encountered in the area of interest. Some suggestions and guidelines are also provided including policy, funding and legislation issues for the efficient exploitation of the marine resources.

### **The soundscape of the Anthropocene ocean – Duarte et al. 2021**

Ocean soundscapes are rapidly changing because of massive declines in the abundance of sound-producing animals, increases in anthropogenic noise, and altered contributions of geophysical sources, such as sea ice and storms, owing to climate change. As a result, the soundscape of the Anthropocene ocean is fundamentally different from that of preindustrial times, with anthropogenic noise negatively impacting marine life. Noise from vessels, active sonar, synthetic sounds (artificial tones and white noise), and acoustic deterrent devices are all found to affect marine animals, as are noise from energy and construction infrastructure and seismic surveys.

## **Wind Energy**

### **Peaks in bat activity at turbines and the implications for mitigating the impact of wind energy developments on bats – Richardson et al. 2021**

Wind turbines are a relatively new threat to bats, causing mortalities worldwide. Reducing these fatalities is essential to ensure that the global increase in wind-energy facilities can occur with minimal impact on bat populations. Although individual bats have been observed approaching wind turbines, and fatalities frequently reported, it is unclear whether bats are actively attracted to, indifferent to, or repelled by, the turbines at large wind-energy installations. In this study, we assessed bat activity at paired turbine and control locations at 23 British wind farms. The research focused on *Pipistrellus* species, which were by far the most abundant bats recorded at these sites.

### **Validation of a Hydrodynamics and Sediment Transport Modeling Framework for the Evaluation of Offshore Wind Farms – Jones et al. 2020**

As technology continues to improve, the ability to deploy offshore wind turbines in deeper waters becomes increasingly feasible; however, differences in deployment environments bring unique challenges. This work aims to help reduce time and costs associated with planning, development, and permitting by accurately predicting environmental responses to the presence of offshore wind arrays. We demonstrate that interactions between offshore wind infrastructure and the environment can be accurately assessed through a focused model development and validation process that considers the interrelationships between ocean waves, circulation, and seabed dynamics. Best practices are recommended to help guide future model development.

### **Wind turbine blade material in the United States: Quantities, costs, and end-of-life options – Cooperman et al. 2021**

Wind energy has experienced enormous growth in the past few decades; as a result, there are thousands of wind turbines around the world that will reach the end of their design lifetimes in the coming years. In the United States, turbine blades may be disposed of in landfills, adding a new solid waste stream to the material already being landfilled. This paper presents a spatially resolved estimate of the mass and volume of wind turbine blade waste in each state by 2050 and compares these amounts to estimates of the remaining landfill capacity by state. We estimate costs for each stage of the disposal process to indicate cost levels for alternatives. Assuming a 20-year turbine lifetime, the cumulative blade waste in 2050 is approximately 2.2 million tons.

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## **News & Press Releases**

### **Marine Renewable Energy**

#### **[BOEM Issues Lease for First Wave Energy Research Project in Federal Waters Offshore the U.S. West Coast](#) – BOEM**

BOEM recently announced that they have issued a lease for the first wave energy research project in federal waters off the U.S. West Coast. The federal marine hydrokinetic energy research lease was offered to Oregon State University (OSU) for the PacWave South project, a proposed open ocean wave energy test center, to be located approximately six nautical miles off Newport, Oregon. The project area is approximately 1,696 acres or 2.65 square miles. The project will consist of four test berths to support the testing of up to 20 wave energy converter devices, with an installed capacity not to exceed 20 megawatts, to demonstrate the viability of wave energy.

#### **[SAE Achieves Another Tidal Milestone with Installation and Successful Generation of Tidal Turbine in Japan](#) – Simec Atlantis Energy (SAE)**

SAE recently announced that its Scottish built tidal turbine and generation equipment have been successfully installed in the Goto Island chain in Japan. The tidal turbine clocked its first 10MWh of generation within the first ten days of operation and is now producing clean electricity in Japan. The SAE designed and manufactured AR500 tidal turbine was assembled at SAE's operations and maintenance base at Nigg Energy Park in Scotland. Offshore construction of the tidal generation equipment took just five days to complete, beginning with the laying of the cable, landing of the foundation structure and ballast to the sea floor, connection of the cable, and finally the installation of the turbine to the foundation.

#### **[C-Power Announces Groundbreaking Demonstration of Saab Sabertooth Autonomous Underwater Vehicle with SeaRAY Autonomous Offshore Power System](#) – C-Power**

C-Power today announced the addition of a groundbreaking demonstration of a Saab double-hull Sabertooth hybrid autonomous underwater vehicle (AUV) to the six-month sea trial of the SeaRAY autonomous offshore power system (AOPS). The sea trial will

take place later this year, in partnership with the U.S. Department of Energy's Water Power Technologies Office and National Renewable Energy Laboratory and the U.S. Navy, to test and validate the technical and economic capabilities of the SeaRAY AOPS at the Navy's Wave Energy Testing Site in Hawaii. From shore, operator Hibbard Inshore will remotely program and monitor the Saab Sabertooth AUV during this first ever instance of an in situ renewable energy system supporting a subsea resident vehicle.

### **Exowave to demonstrate wave energy plant at DanWEC – Offshore Energy**

Clean energy technology start-up Exowave has signed an agreement with DanWEC (Danish Wave Energy Center) to demonstrate its multi-use wave energy device off Hanstholm in Denmark. The demonstration is planned to take place in the autumn of 2021, according to the information provided by the Thisted municipality, where the DanWEC test site is located. The project is expected to demonstrate Exowave technology's capabilities to combine wave energy extraction with desalination for pure water production that can be used for hydrogen generation. The Exowave wave energy device is an oscillating wave surge converter that extracts the kinetic energy from the ocean waves through bottom-hinged flaps.

### **New insurance fund to accelerate ocean energy's roll-out – Ocean Energy Europe**

The design of a brand-new European insurance fund for the ocean energy sector is underway, to slash the costs of the first commercial projects and accelerate the roll-out of this exciting new industry. Ocean Energy Europe (OEE) has appointed risk and insurance consultancy, Renewable Risk Advisers, to carry out the work as part of the EU-funded OceanSET project. A well-designed insurance fund will mitigate the early risks of innovative ocean energy projects, for which investors typically demand returns of 10-12%. Access to project finance is a significant obstacle for wave and tidal developers, looking to leverage equity and crack a €53bn per annum market. De-risking projects through an insurance fund can act as a 'golden ticket' for the scale-up of ocean energy.

## **Wind Energy**

### **South Korea Fast-Tracks Plan to Build World's Largest Offshore Wind Farm – The Maritime Executive**

The government of South Korea has pledged to put its support behind a \$43 billion plan to build the world's biggest offshore wind farm. As part of President Moon Jae-In's "Green New Deal" plan for reducing the nation's carbon emissions, the administration is backing a proposed 8.2 gigawatt wind farm off the coast of Sinan, a small archipelago just west of Mokpo. If fully built out, it would be the largest single offshore wind project in the world, and it would double the nation's existing wind power capacity. The objective behind the project is to jump-start South Korea's renewable energy industry and make the nation a leader in offshore wind power by 2030.

### **Luxcara and GE Renewable Energy to deliver 753 MW to Sweden with Europe's largest single onshore wind farm – General Electric (GE)**

Luxcara and GE Renewable Energy recently announced an agreement to deliver 753 MW of onshore wind capacity with the Önusberget wind farm in northern Sweden. The project will be the largest single onshore wind farm in Europe and GE's largest onshore wind farm contract outside of the US. Luxcara has already started infrastructure work, and GE will begin installing turbines as early as July of this year. GE Renewable Energy will supply 137 of its Cypress 5.5 MW turbines, a powerful turbine with a 158-meter rotor, ideally suited for the project site's wind speeds and climate. The parties also agreed on a 25-year full-turbine maintenance and service contract.

### **Iberdrola plans first industrial-scale floating offshore wind farm in Spain with an investment of more than €1 billion – Iberdrola**

Iberdrola is planning what will be the first industrial scale floating offshore wind farm in Spain, to which it would allocate more than €1 billion of investment to commission 300 MW of clean energy off the Spanish coast. The renewable facility would become a driver of the country's industrialisation and job creation. The study, design and engineering could begin this year and it could generate more than 2,800 jobs per year until it becomes operational in 2026. This innovative and pioneering project would spearhead the development of up to 2,000 MW of floating offshore wind projects identified by the company off the coasts of Galicia, Andalusia and the Canary Islands.

### **Siemens Gamesa Rolls Out Record-Breaking Wind Turbine Blade – Offshore Wind**

Siemens Gamesa has completed the first Siemens Gamesa B108 wind turbine blade. The 108-metre IntegralBlade® was cast in one piece using patented Siemens Gamesa blade technologies. This process eliminates weaker areas at glued joints and produces blades of optimum quality, strength, and reliability, the turbine maker said. The record-setting blade will be installed on the prototype SG 14-222 DD wind turbine at the test centre in Østerild, Denmark later in 2021. The blade is one metre longer than the previous record holder, the LM 107.0 P featured on the GE Haliade-X wind turbine. Apart from the world's longest blades, the SG 14-222 DD turbine model has a capacity of 14 MW, reaching up to 15 MW using the company's Power Boost function, a 222-metre diameter rotor, and a 39,000 m<sup>2</sup> swept area.

### **Middle East Could Get Its First Offshore Wind Turbine with New Desalination Project – Offshore Wind**

A new technology development could soon bring a floating offshore wind turbine to Middle East as part of a desalination project that combines a seawater desalination plant and a wind turbine, both supported by a floating semi-submersible structure. The development of Floating WINDdesal (FWD), a “floating water utility” supplying potable water to coastal regions, is being carried out by a European industry initiative. A first FWD project implementation is most likely going to take place in the Middle East this

year, according to a press release from SYNLIFT. The FWD systems, which will use extra-long blade wind technology, are being developed in three module sizes, with the largest module being capable of providing drinking water for up to half a million people.