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[Tethys](#) is an online knowledge hub 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. Email tethys@pnnl.gov to contribute!

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Announcements

SSRS Now Available

The Stochastic Soaring Raptor Simulator (SSRS) is a generalizable, probabilistic, and predictive tool that can be used to estimate the potential for soaring raptors to interact with operating wind turbines, without the need for site-specific data collection. This software is a movement model that can simulate the individual flight paths of thousands of golden eagles during updraft-subsidized long-distance flight at turbine-scale spatial resolution with modest laptop resources to produce a relative presence density map. Learn more [here](#) and access the open-source code [here](#).

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. The Explore Phase will close on 31 January 2022.

BOEM Seeking Comments

The US Bureau of Ocean Energy Management (BOEM) is accepting comments to inform an Environmental Assessment for the [Morro Bay Wind Energy Area](#) through 11 January 2022.

Calls for Abstracts

The American Clean Power Association (ACP) is now [accepting submissions](#) for panel and poster presentation opportunities at the [Siting and Environmental Compliance Conference 2022](#) until 7 January 2022. The conference will take place on 29-30 March 2022 in Round Rock, US.

ACP has also extended the deadline to [submit a proposal](#) to speak at [CLEAPOWER 2022](#) to 7 January 2022. CLEANPOWER 2022 will take place on 16-18 May 2022 in San Antonio, US.

The [Call for Abstracts](#) for the 9th Partnership for Research in Marine Renewable Energy (PRIMaRE) Conference is now open through 14 February 2022. The conference will take place in Cornwall, UK on 6-7 July 2022.

Calls for Papers

Frontiers in Energy Research is accepting submissions for several Research Topics, including “[Offshore Wind Energy: Modeling and Measurements](#)” (due 28 January 2022), “[Next Generation Offshore Facilities: Offshore Renewable Energy](#)” (due 10 February 2022), and “[Offshore Wind and Wave Energy and Climate Change Impacts](#)” (due 23 February 2022).

The *Journal of Marine Science and Engineering* is accepting submissions for several Special Issues, including “[Offshore Wind Energy](#)” (due 21 February 2022), “[Research on Life Cycle Analysis of Ocean Engineering](#)” (due 28 February 2022), and “[Impacts of Offshore Wind Farms on Marine Ecosystems, Fisheries and Societies](#)” (due 15 March 2022).

Energies is accepting submissions for several Topical Collections, including “[Women's Research in Wind and Ocean Energy](#)”, “[Feature Papers on Wind, Wave and Tidal Energy](#)”, and “[Progress on Offshore Wind and Marine Energy](#)”.

Funding & Testing Opportunities

The New York State Energy Research and Development Authority recently launched a [Request for Proposals](#) to support the collection of data through acoustic and oceanographic surveys in the New York Bight Wind Energy Areas to facilitate the responsible development of offshore wind. Applications are due by 3:00pm EST (8:00pm UTC) on 10 January 2022.

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.

The US DOE’s [Established Program to Stimulate Competitive Research \(EPSCoR\)](#) is now accepting applications for [Building EPSCoR-State/DOE-National Laboratory Partnerships](#). These partnerships will advance understanding of the physical world by supporting fundamental, early-stage energy research collaborations with the DOE National Laboratories. Pre-applications are due by 5:00pm EST (10:00pm UTC) on 13 January 2022.

The US DOE's National Renewable Energy Laboratory (NREL) has extended the deadline for its [Request for Proposals](#) to support research into the behavior of bats at wind turbines and species-specific responses to deterrent stimuli. Proposals are now due by 12:00pm MST (7:00pm UTC) on 14 January 2022. Awardees will receive \$450k to \$700k each to fund the research.

Student & Employment Opportunities

The Association of Fish and Wildlife Agencies is recruiting a [Wildlife and Energy Program Manager](#) to support staffing; serve as a liaison to federal partners; and collaborate on solutions to avoid, reduce, or mitigate energy and wildlife conflicts. Applications are due 16 January 2022.

The University of the Highlands and Islands is seeking interdisciplinary candidates for a [fully-funded PhD studentship](#) focused on the impacts of floating offshore wind infrastructure on the distribution and behaviour of fish and marine mammals. Applications are due 31 January 2022.

The Electric Power Research Institute is seeking a [Principal Technical Leader](#) to be responsible for the day-to-day management of its Environmental Aspects of Renewables programs, which primarily focus on large-scale solar and wind energy (onshore and offshore).

Upcoming Events

Upcoming Webinar

The US DOE and NREL are hosting an informational webinar on the [Inclusive Energy Innovation Prize](#) on 12 January 2022 at 1:00pm MST (8:00pm UTC). The webinar will cover details about the prize and strategies for developing a successful submission. Register [here](#).

Upcoming Summit

The International Energy Agency Ocean Energy Systems (IEA-OES) is hosting a Funders' Summit: Adoption of the IEA-OES Evaluation and Guidance Framework for Ocean Energy Technology on 26 January 2022 at 7:30am UTC (register [here](#)) and 4:00pm UTC (register [here](#)).

Upcoming Conferences

The Supergen Offshore Renewable Energy (ORE) Hub is hosting the [4th Supergen ORE Hub Annual Assembly](#) on 18-20 January 2022 in Plymouth, UK and online. To accompany the event, the Hub is also hosting an [Early Career Researcher Forum](#) on 18 January 2022. Register for free.

The European Energy Research Alliance (EERA) is hosting [EERA DeepWind 2022 Research & Innovation Conference](#) from 19-21 January 2022 online. Register [here](#) by 12 January 2022.

The Marine Technology Society and the Oceanic Engineering Society are hosting the [OCEANS 2022 Chennai Conference & Exhibition](#) from 21-24 February 2022 in Chennai, India and online. Early bird registration is available [here](#) until 10 January 2022.

New Documents on *Tethys*

Marine Energy

[Biological Consequences of Marine Energy Development on Marine Animals](#) – Hemery et al. 2021

Marine energy devices harness power from attributes of ocean water to form a sustainable energy source. Knowledge gaps remain about whether marine energy systems can affect the environment, adding another threat to animal populations and habitats already under pressure from climate change and anthropogenic activities. To date, potential environmental effects have been studied under the scope of stressor–receptor interactions, where moving parts of, or emissions from, a system could harm the animals, habitats, and natural processes. While crucial for understanding effects and identifying knowledge gaps, this approach misses a holistic view of what animals may experience in the presence of marine energy systems.

[Managing stakeholder perception and engagement for marine energy transitions in a decarbonising world](#) – Lange & Cummins 2021

Transition measures need to address the concerns of communities that will host renewable energy infrastructure. Despite this, the consequences of energy transitions at the community level and in coastal environments have not received adequate attention. The case of the Corrib Gas field development in Ireland provides valuable insights into stakeholder issues surrounding strategic infrastructure developments. Material from case study work with over 70 stakeholders in a rural coastal region in Ireland's West is used to identify the cause of disputes in energy governance. Given the need for decarbonisation and the potential for marine renewable energy, lessons from the past, as documented in this paper, can help to inform better governance of common pool marine resources.

[Life cycle assessment of salinity gradient energy recovery using reverse electro dialysis](#) – Mueller et al. 2021

This study is the first comprehensive life cycle assessment (LCA) of reverse electro dialysis (RED), a technology that converts salinity gradient energy into electricity. Our goal is to identify RED system components of environmental concern and provide insights on potential environmental impacts. We conduct an attributional LCA of two RED scenarios: large-scale energy generation from natural bodies of water and smaller-scale energy generation from industrial processes. A functional unit of 1 MWh of net electricity production enables comparison to existing renewable energy technologies, including wind and solar photovoltaics. Under theoretical, favorable conditions, environmental impacts from RED are found to be comparable to, and often lower than, established renewable energy technologies.

Wind Energy

[A risk-based method to prioritize cumulative impacts assessment on marine biodiversity and research policy for offshore wind farms in France](#) – Brignon et al. 2022

This study developed the “ECUME” risk-based approach to identify and prioritize critical impact pathways to be considered in cumulative impact assessment of offshore windfarms, and for future research. The prioritization framework has been tested on two offshore windfarms projects located in the French part of the English Channel off the coast of Normandy, those of Fécamp and Courseulles-sur-Mer. The approach is based on a complete inventory of impact pathways, prioritizing those for which an impact assessment will be carried out. The aim was to avoid a “quantification bias” and elaborate a systemic vision. The novelty of the study is to apply a combination of expert judgement, consensus building, and a scoring system, to prioritize the pairs of pressures and receptors of the marine environment to work on.

[Acoustic and Genetic Data Can Reduce Uncertainty Regarding Populations of Migratory Tree-Roosting Bats Impacted by Wind Energy](#) – Hale et al. 2021

Wind turbine-related mortality may pose a population-level threat for migratory tree-roosting bats, such as the hoary bat (*Lasiurus cinereus*) in North America. These species are dispersed within their range, making it impractical to estimate census populations size using traditional survey methods. Nonetheless, understanding population size and trends is essential for evaluating and mitigating risk from wind turbine mortality. Using various sampling techniques, including systematic acoustic sampling and genetic analyses, we argue that building a weight of evidence regarding bat population status and trends is possible to (1) assess the sustainability of mortality associated with wind turbines; (2) determine the level of mitigation required; and (3) evaluate the effectiveness of mitigation measures to ensure population viability for these species.

[Bird Displacement by Wind Turbines: Assessing Current Knowledge and Recommendations for Future Studies](#) – Marques et al. 2021

Wind energy developments can be responsible for negative impacts on birds, including displacement. In this study we performed a systematic review of the literature available on bird displacement due to wind turbines, both onshore and offshore, to: (i) assess overall trends in scientific research; (ii) review the existing knowledge; and (iii) outline recommendations for future studies on this topic in order to overcome the major gaps and limitations found. Our results are based on 286 trials extracted from 71 peer-reviewed studies. The literature on this topic has increased in the past decade but is concentrated in Europe and United States, despite the fact that the wind industry has worldwide coverage. We provide a list of recommendations, focused on study design, reporting and result dissemination, that should contribute to more robust conclusions of future studies.

News & Press Releases

Marine Energy

Eco Wave Power Announces Key Milestone, Progresses Toward the Final Stages of the EWP-EDF One Project Installation – Eco Wave Power

Eco Wave Power recently announced the first set of floaters and supporting structures for Eco Wave Power's grid-connected EWP-EDF One project have been delivered to the Jaffa Port project site in Israel, marking a key milestone in the development of this innovative wave energy array. Actual installation of the first set of floaters and the surrounding test setup infrastructure is expected to commence later this month, with the system functionality and capacity tests to be conducted in the second quarter of this year. Eco Wave Power delivered the floaters and supporting structures to the project site with trucks, as opposed to the traditional use of expensive ships and divers for equipment delivery for offshore wave energy installations. This further emphasizes the simplicity of the onshore nature in the work programming of Eco Wave Power's floaters shipment.

UMACK Anchor Completes On-land Trials Paving Way for Full-scale Production and Ocean Demonstration – UMACK

A pioneering marine anchor solution has successfully completed on-land trials validating the technology and sealing approval for full-scale production and ocean deployment. The UMACK (Universal Mooring, Anchor & Connectivity Kit) Project has developed a unique mooring and anchoring solution in a bid to supersede traditional 'gravity-based' and tubular monopile anchors – reducing CAPEX, installation and O&M (Operational & Maintenance) costs by more than 50%. After undergoing rigorous field trials in northern Portugal, the novel technology is now rapidly advancing through full-scale production ahead of ocean deployment. The UMACK system will be integrated with wave energy developer, CorPower Ocean's first commercial-scale WEC (Wave Energy Converter), as a key part of the overall flagship HiWave-5 Ocean Demonstration Project.

Minesto announces commercially relevant power production for its next-generation Dragon Class tidal energy kites – Minesto

Minesto recently announced that, based on analysed production data and verified simulations, its utility-scale Dragon Class tidal energy power plants are each projected to produce 3.5 GWh of clean electricity per year at identified sites. The power output projection is based on analysis of continuous electricity production runs with Minesto's grid-connected power plant in Vestmannastrandir, Faroe Islands during the autumn, combined with new record-level performance data from offshore testing with a Dragon Class scale model, D2, in Strangford Lough, Northern Ireland. The projected annual output of 3.5 GWh for a D12 tidal kite system is based on installations at identified sites such as the Hestfjord strait in the Faroe Islands where Minesto is working towards installation of a proposed first 10 MW commercial array.

MPS tackles recyclability and environmental impacts of marine energy tech – Offshore Energy

Welsh marine energy company Marine Power Systems (MPS) has launched a research project, in collaboration with the Swansea University, to help understand the whole life costs and recyclability of its marine energy technology. Whilst Levelised Cost of Energy is fundamental to understanding and comparing how renewable energy technologies deliver return on investment, there is very little research on the recyclability and environmental impact of renewable energy technology, according to MPS. Therefore, with the support of the cross-border marine energy project SELKIE, the company has partnered up with the Swansea University to undertake a project to help understand the whole life costs and recyclability of its technology.

Ocean Energy Needs a Lift to Go Mainstream – The Wall Street Journal

Oceans contain energy that is both renewable and predictable—an appealing combination given the challenges posed by fluctuating wind and solar power. But the technologies for harvesting marine energy will need a boost if they are to go mainstream. Marine energy's big challenge is cost. Building reliable machines that can survive the extremely harsh ocean environment created by saltwater and big storms makes it many times more expensive than wind or solar energy. That will change only with government backing. Some small ocean-energy machines are already cost-competitive in locations where power is expensive or challenging to obtain, such as remote communities and distant offshore platforms, says Brian Polagye, engineering professor and director of the Pacific Marine Energy Center.

Wind Energy

China Three Gorges Connects 3.1 GW of Offshore Wind Capacity in One Day – Offshore Wind

China Three Gorges fully connected to the Chinese grid three offshore wind projects with a combined capacity of 3.1 GW on 25 December. The three projects in question are the 1.1 GW Jiangsu Rudong and the 1.7 GW Yangjiang Shapa, the first two gigawatt-scale offshore wind farms in China to be commissioned, and the 300 MW Jiangsu Dafeng H8-2, China's farthest offshore wind farm. In July, China Three Gorges announced that its Shapa offshore wind project, having a total of five phases, had surpassed an installed capacity of 1 GW, making it China's first gigawatt-range offshore wind farm. Yangjiang Shapa is expected to generate 4.7 TWh of electricity annually. The wind farm is also the first in the world to feature a floating wind turbine connected to a fixed-bottom turbine.

BlueFloat Energy and Energy Estate announce first 3 offshore wind projects in Australia – BlueFloat Energy

BlueFloat Energy and Energy Estate recently announced the first 3 offshore wind projects that they are developing together in Australia. The projects are the (1) Hunter Coast

Offshore Wind Project – a 1.4 GW project which will use floating wind technology and will be located off the coast south of Newcastle in the Hunter Coast region of NSW; (2) Wollongong Offshore Wind Project – a 1.6 GW project which will also use floating wind technology and will be located across 2 sites off the coast from Wollongong in the Illawarra region of NSW; and (3) Greater Gippsland Offshore Wind Project – a 1.3 GW project which will use bottom-fixed technology and will be located off the coast of the Gippsland region of Victoria. The partnership is also assessing sites in Victoria, South Australia, and Tasmania and plan to announce further projects in early 2022.

Governor Hochul Announces Nation Leading \$500 Million Investment in Offshore Wind – New York State Energy Research and Development Authority

Governor Kathy Hochul recently announced a plan to strengthen New York's renewable energy leadership and make a nation-leading \$500 million investment in offshore wind as part of the 2022 State of the State. This plan will directly invest in offshore wind manufacturing and supply chain infrastructure, create thousands of good-paying green jobs, deliver billions in economic impact, and generate enough energy to power millions of homes. Governor Hochul's offshore wind plan will build on more than 6,800 direct high-paying jobs, a combined economic impact of \$12.1 billion statewide, and more than 4.3 gigawatts of energy, which is enough to power nearly 3 million New York homes, representing half of New York's 2035 goal. New York will begin construction on the state's first offshore wind project, the South Fork Wind Farm, in early 2022.

RWE and Northland Power to jointly develop 1.3 GW offshore wind cluster off the German coast – RWE

RWE and Northland Power have joined forces to co-develop a 1.3 gigawatts cluster of offshore wind farms in the German North Sea. The partners have established a joint venture structure through which they plan to jointly develop and construct three wind farms, which are all expected to start commercial operation between 2026 and 2028. The new offshore wind cluster includes a total of three offshore wind leases, which are located north of the island of Juist. One offshore site (N-3.8) with a capacity of 433 megawatts (MW) was already secured by the partners in the latest German offshore wind auction. The other two leases will add a further 900 MW of capacity and are expected to be auctioned in 2023. For both sites the Joint Venture holds step-in rights.

Kites powered by offshore wind preparing for lift-off – Offshore Energy

Tech startup Hydro Wind Energy is in the process of developing scaled prototypes of high-altitude kites powered by offshore wind with the goal to “disrupt global energy and desalination markets”. The technologies for power generation and energy storage, OceanHydro Wind, and water desalination, SubSea RO Wind, are powered by high-altitude, ocean-based kites and vertical axis wind rotors rather than turbines. The technology ultimately uses wind for mechanical lift rather than converting directly to electricity. The company plans to have both scale prototypes completed by the end of 2022, with full-scale commercialization planned for 2023.