Floating Offshore Wind Projects Around the World

Gulf of Maine
Research Institute

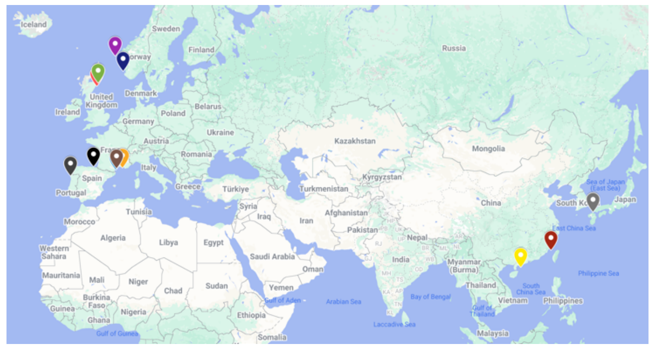
Overview

While floating offshore wind (FOW) technology remains relatively nascent compared to fixed-bottom wind technology, several floating developments are under construction or delivering power around the world. Dozens of commercial-scale projects are also in the permitting process. This resource provides a snapshot of both existing and planned FOW projects around the world.

Floating Offshore Wind Projects (Active and In Construction)

This list includes floating offshore wind projects that have been constructed and projects that are currently being constructed. Note, this resource reflects projects as of April 2025.

Click here to view an interactive map with approximate locations of the listed projects.



Project Name	Project Location	Developer	Capacity	Foundation Type	Mooring Details	Project Status
Kincardine	Aberdeen, Scotland	Principle Power	50 MW	Semi-submersible	4 mooring lines at depths of 60 - 80m	Active
Hywind Scotland	Peterhead, Scotland	Equinor	30 MW	Spar	3 mooring lines at depths of 95 - 120m	Active
Hywind Tampen	North Sea, Norway	Equinor	88 MW	Spar	3 mooring lines at depths of 260 - 300m	Active
WindFloat Atlantic	Viana do Castelo, Portugal	Windplus, S.A.	25 MW	Semi-submersible	3 catenary mooring lines at depths of 95m	Active
Provence Grand Large	Port Saint-Louis-du-Rhône, France	EDF Renewables	25 MW	Tension-leg Platform	3 tensioned mooring lines at depths of 100m	Active
Longyuan Demonstration Project	Putian, China	Longyuan Power Group	4 MW	Semi-submersible with 2 turbines	Installed at depths of 35m	Active

Hibiki Demonstration Project	Kitakyushu, Japan	BW Ideol	3 MW	Barge	4 mooring lines at depths of 50m	Active
TetraSpar Demonstration Project	Karmøy, Norway	RWE	3.6 MW	Spar	3 mooring lines at depths of 200m	Active
Three Gorges Demonstration Project	Guangdong Province, China	Minyang Smart Energy	5.5 MW	Spar	9 mooring lines at depths of 30m	Active
DemoSATH Demonstration Project	Bilbao, Spain	RWE	2 MW	Barge	6 "hybrid" mooring lines at depths of 85m	Active
Eoliennes Flottantes du Golfe du Lion (EFGL)	Leucate, France	Ocean Winds, Banque des Territoires	30 MW	Semi-submersible	3 catenary mooring lines at depths of 68 - 70m	Under Construction
Eolmed Pilot	Occitanie, France	EolMed	30 MW	Barge/Semi-submersible	Installed at depths of 60m	Under Construction

Wind Turbine Generation Potential

Wind Turbine/Array Capacity (in MW)	Daily Energy Production (in mWh)[1]	Annual Energy Production (in mWh/yr)[2]	Annual Energy Production with a 40% Capacity Factor[3]	Number of Homes Powered[4]
1 MW Turbine	24 mWh	8,760 mWh/yr	3,504 mWh/yr	~325 homes
10 MW Turbine	240 mWh	87,600 mWh/yr	35,040 mWh/yr	~ 14,016 homes
1000 MW (1 GW) Array	24000 mWh	8,760,000 mWh/yr	3,504,000 mWh/yr	~ 324,745 homes

The table above illustrates how many homes a wind turbine of varying capacities could power. Due to varying wind conditions, turbines do not operate at full capacity all the time. The capacity factor is the time in a year, expressed as a percentage, when a turbine would be operating at its full rated output. Thus, the annual energy production of a turbine is multiplied by the capacity factor to assume the

[1] Calculated with Turbine Capacity x 24 hours
[2] Calculated with Daily Energy Production x 365 days
[3] The Internal Energy Agency notes that offshore wind projects have an average energy capacity factor of 40% - 50%.
[4] The U.S. Energy Information Administration notes that the average annual amount of electricity used by a residential customer is 10.791 mWh.

expected power production of a turbine over a given year. This is then divided by the average annual consumption of a home in the U.S. to illustrate the number of homes a turbine or array could power.

Country Profiles and Relevant Research

Global floating offshore wind development is continuing at a rapid pace. In addition to those hosting projects listed in the tables of this resource, countries identified as having floating offshore wind potential include **Australia, Belgium, Brazil, Canada, Denmark, Greece, India, Ireland, Philippines, Poland, Singapore, Sweden, Taiwan, and Vietnam.**[5] Below, is a brief look at where some countries stand on floating offshore wind development, along with relevant research happening in each country.

United Kingdom: Scotland is leading the charge for floating wind development in the UK. The country is home to active floating projects, Hywind Scotland and Kincardine, and has a 50-year background developing floating infrastructure in the oil and gas industry. Scotland has 24.9 GW of floating offshore wind potential in the pipeline.[6]

Image of the Kincardine Offshore Wind Array, courtesy of Principle Power.

Relevant Research from the United Kingdom:

- Fisheries Engagement and Capacity Building (e.g. An overview of Scottish fisheries prepared for the floating offshore wind industry)
    - This report provides an overview of the Scottish commercial fisheries, providing baseline knowledge to facilitate the identification of potential interactions between fishing activities and FOW arrays in Scotland. It outlines the technology, marine operations, geographical distribution, lifecycle, port requirements, and commercial drivers of key Scottish fisheries. These include the scallop fishery, pelagic fishery, shellfish fishery, as well as the whitefish and squid fisheries. The document also offers insights from various Scottish fisheries organizations including the identification of preferred areas for development within sites offered under the ScotWind leasing process (see Figure 15 in the report).
- Fisheries Access and Gear Modification (e.g. Hywind Static Fishing Gear Trials)
    - Between 2022-2023, Equinor conducted SeaShare, a coexistence pilot study exploring the safety and viability of deploying three types of static commercial fishing gear – fish traps, crab and prawn creels, and electronic jiggers – within the floating offshore wind array, Hywind Scotland. The researchers used three test areas within the five spar turbine

[5] ORE Catapult. 2022. *PR12 Floating Offshore Wind International Markets International Market Projections Report.* https://cms.ore.catapult.org.uk/wp-content/uploads/2022/06/FOW-PR12-Int-Market-Projections-Report-May-22-AW.pdf

[6] Offshore Wind Scotland. 2025. *Information on floating wind projects, and their developers, in Scottish waters.* *https://www.offshorewindscotland.org.uk/the-offshore-wind-market-in-scotland/floating-wind-in-scotland/#*

wind array, each located at least 200 meters from the wind turbines and dynamic sections of both export and inter-array cables, and at a minimum of 50 meters from remaining subsea infrastructure. They fished these areas in rotation using all gear types in each area, finding that all gear was successfully operated with no safety issues, gear snagging, or fishing gear lost. Researchers concluded that under the right sea and weather conditions, with site-specific safety distances and other factors, one could fish static gear safely within the Hywind array. To date, it does not appear that trials for mobile gear have been conducted around active, commercial-scale floating offshore wind projects.

- FOW Cost Reduction (e.g. Floating offshore wind cost reduction pathways)
    - This study by Offshore Renewable Energy Catapult, the UK's leading technology center for offshore renewable energy, outlines drivers that impact cost reduction pathways for FOW development in the UK and beyond. It intends to break down the processes needed to lower the cost of producing energy from FOW, reducing it to a level comparable to other energy sources. To achieve this, researchers used an economic model to capture a snapshot of project cost estimates for a small-scale demonstrator project and a commercial-scale wind array. They used this model to assess the reduction of the Levelized Cost of Energy (LCOE) attributed to different cost reduction drivers, including turbine design, substructure design, industrialization, and construction innovation, among others. Researchers concluded that demonstration projects are critical in driving initial cost reductions and incentivizing investment in the supply chain for future commercial-scale FOW projects.

China: China hosts more than half of the world's operational wind capacity and is making big strides in the engineering of floating offshore wind turbine technologies.[7] In 2024, Chinese developer, Minyang Group, deployed the largest floating wind turbine platform in the world. It supports two 8.3 MW offshore wind turbines and stands 219 meters tall.[8]

Image of Minyang's OceanX floating platform, courtesy of Mingyang Group.

Relevant Research:

- Environmental Impacts of Floating Offshore Wind (e.g. Floating wind power in deep-sea areas: A life cycle assessment of environmental impacts)
    - This comprehensive study assessed the environmental impacts of a floating wind array of 100 wind turbines with capacities of 6.7 MW by using a life cycle assessment method. A life

[7] Adrijana Buljan. 2025. *Half of Global Operational Offshore Wind Capacity in China.* https://www.offshorewind.biz/2025/02/07/half-of-global-operational-offshore-wind-capacity-in-china/

[8] Darrell Proctor. 2024. *Chinese Group Deploying Largest Floating Wind Turbine Platform.* https://www.powermag.com/chinese-group-deploying-largest-floating-wind-turbine-platform/

cycle assessment, in this context, is the process of evaluating the effects that an array may have on the environment throughout its life. Considering the life cycle of the floating array in four stages: 1) components manufacturing and transport, 2) wind array construction, 3) operations and maintenance, and 4) decommissioning, researchers found that the carbon footprint of the wind array was relatively low.

- Technology Innovation and Colocation of Floating Offshore Wind with Other Industries (e.g. Design and dynamic analysis of novel large-scale barge-type floating offshore wind turbine with aquaculture cage)
    - This study explores a novel offshore wind turbine design with an integrated aquaculture cage for deep-sea aquaculture activities in China. Researchers describe how aquaculture and FOW colocation is being explored to lower the construction costs of turbines by sharing infrastructure and providing electricity from the turbine directly to aquaculture operations. The study focuses on a theoretical platform concept that would support a 10 MW turbine in 100m of water. Researchers considered environmental conditions including wave, wind, and current loads in the East China Sea, finding that the sample platform is broadly stable based on their stability analysis, but faces issues with wave frequency, among other highly technical conclusions.

Japan: With active floating offshore wind projects in its territorial waters, and government targets to install 10 GW of offshore wind power capacity by 2030 and up to 45 GW (including floating offshore wind) by 2040, Japan is leaning into a mix of floating and fixed-bottom offshore wind developments.[9]

Image of the Hibiki floating platform, courtesy of NEDO/Ideol.

Relevant Research:

- Fisheries-focused Marine Spatial Planning (e.g. Crucial perspectives on the deployment of offshore wind power generation)
    - In a brief newsletter from the Sasakawa Peace Foundation, Hase Shingeto, former Director-General of the Fisheries Agency of Japan, outlines the challenges of fisheries' coexistence with FOW and how stakeholder engagement is crucial in all stages of any planned FOW developments. Mandated by the Japanese Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities, Japan must establish how to promote fishery cooperation in waters earmarked for FOW development, according to Shingeto. However, Shingeto fears that current discussions around FOW development are limited without equitable insights from the fishing industry. Shingeto also notes that, rather than leaving it up to individual

[9] International Trade Administration. 2024. *Japan Floating Offshore Wind Energy.* https://www.trade.gov/market-intelligence/japan-floating-offshore-wind-energy

developers, government intervention is necessary to identify which fishing practices cannot spatially coexist with FOW developments and plan accordingly around these realities. Spatial planning for marine renewables requires effective stakeholder engagement, private–public cooperation, science-based decisions, as well as clear guidance from the government.

- Fisheries Engagement (e.g. Consensus building with fishermen on offshore wind farms in Japan: Current status and policy recommendations)
    - Through a series of interviews with fishermen in Akita Prefecture, Japan, this study highlights the current state of consensus-building with fishermen in offshore wind arrays in Japan and proposes policy recommendations to enable constructive and equitable FOW development. Broadly, researchers found uncertainty among fishermen regarding offshore wind developers' fisheries mitigation and compensation commitments. To address this, the study outlines three policy recommendations: 1) the government should establish unified standards for operators' financial commitments to fishermen; 2) the government should disclose the details of the commitments proposed by preceding operators engaged in consensus building, and 3) the government should mandate the fulfilment of these commitments by the appointed operator, regardless of whether the preceding operators were selected for development.
- Exploring Challenges to Deploying FOW (e.g. Challenges and solutions to deploying floating offshore wind power in Japan)
    - This study focuses on outlining the challenges of developing and deploying commercial-scale floating offshore wind in Japan. Challenges included technical barriers such as high infrastructure costs, the reliance on emerging technologies, and other challenges like the high cost of effectively burying transmission cables; supply chain challenges such as building a domestic supply chain that is not vulnerable to security threats (e.g. maintaining access to rare earth metals required for wind turbines); and, the need to develop local industrial hubs capable of transmitting and delivering wind energy to consumers.

United States: As of May 2024, the U.S. floating offshore wind energy market has approximately 25.1 GW of wind potential in the pipeline.[10] This includes areas leased for floating developments near California and in the Gulf of Maine. Several active commercial-scale fixed-bottom developments, including South Fork Wind Farm and Vineyard Wind 1 are also situated in the United States, demonstrating the country's

Image of the University of Maine's VolturnUS 1:8 scale platform.

[10] McCoy, Angel et al. 2024. *Offshore Wind Market Report: 2024 Edition*. National Renewable Energy Laboratory. https://www.nrel.gov/docs/fy24osti/90525.pdf

interest in both fixed and floating offshore wind development.

Relevant Research:

- Siting and Fisheries Engagement (e.g. BOEM: Siting the Gulf of Maine Wind Energy Areas)
    - As part of the siting process for future floating offshore wind developments in the Gulf of Maine, the Bureau of Ocean Energy Management engaged a wide variety of stakeholders by convening or participating in a range of external meetings focused on the Gulf of Maine. Additionally, the National Centers for Coastal Ocean Science (NCCOS) used marine spatial science to support BOEM in deciding places suitable for offshore energy development. Through their suitability modeling process, NCCOS leveraged a range of data points and extensive input from stakeholders including fishermen to find areas for offshore wind development with the least potential for spatial conflict. BOEM used the data produced by NCCOS to identify the Final Sale Notice Lease Areas, consisting of 8 potential lease areas. In late 2024, four areas were leased for future floating offshore wind development.
    - During BOEM's Draft Wind Energy Area Public Comment period, the Gulf of Maine Research Institute also worked with the nonprofit Consensus Building Institute (CBI) and SAMBAS Consulting to convene diverse groups of stakeholders for a series of port meetings across the Northeast. In 15 port locations, the team met with over 160 fishermen, community leaders, and state and federal agency staff, soliciting insights and specific feedback from local voices and on-the-water experts from Maine, New Hampshire, and Massachusetts. Key issues raised at these meetings included the potential displacement of lobster and groundfish fishermen from their traditional fishing areas, gear conflicts, and loss of waterfront access due to offshore wind development. Stakeholders also questioned the accuracy of models used to plan wind energy sites and stressed the economic and cultural impact on local communities reliant on fishing. They called for more accurate data representation, environmental protections in lease agreements, and additional research on the impacts of wind farms on fishing and marine ecosystems. These concerns were summarized and highlighted to inform the federal offshore wind development process, with summaries from each port meeting submitted into the federal record and accounted for as public comment — a meaningful step to include these important insights and perspectives in the decision-making process.
- Supply Chain Development, Cost Reductions, and Workforce Development (e.g. Advancing offshore wind energy in the United States)
    - In 2023, the U.S. Department of Energy released a summary of its strategies to advance offshore wind energy in the country. These strategies include reducing offshore wind energy costs, supporting optimized siting and regulation, investing in supply chain development, and planning the grid integration of offshore wind energy. With regard to FOW development, the strategy notes that more research, development, and

demonstration is needed to lower costs to the point where the technology can be widely cost competitive across coastal regions (viii). It also points to the need to expand coastal infrastructure for floating offshore wind, advance manufacturing practices, and build a domestic supply chain to pave the way for widespread deployment. Importantly, a pillar of one of the document's strategic initiatives, Floating Offshore Wind Advanced Research and Development, is also to inform just, sustainable, and timely development of floating offshore wind energy in deep waters. This can be achieved in part through funding research to characterize, avoid, minimize, and mitigate potential environmental impacts and promote co-use of ocean space, including for fisheries, according to the report (xiii).

- Environmental Impacts of Floating Offshore Wind Development (e.g. U.S. Offshore Wind Synthesis of Environmental Effects Research)
    - The U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER) effort synthesizes key issues and disseminates existing knowledge about environmental effects, informs applicability to U.S. waters, and prioritizes future research needs. With focus areas including risks to marine life from marine debris and floating cable systems, underwater noise effects on marine life, electromagnetic field effects on marine life, and many other topics, SEER offers valuable information on a range of topics relevant to the impacts of FOW.

Floating Offshore Wind Projects (In Progress)

This list includes a selection of projects that have been approved or consented through an official process (e.g. a developer has been a given lease area for development) but have not yet initiated construction. Note, dozens of projects around the world may fit this category and this is by no means an all-inclusive list.

Project Name	Project Location	Developer	Capacity	Foundation Type	Project Status
Gulf of Maine Lease Areas OCS-A 0562, OCS-A 0567	Gulf of Maine, United States	Invenergy NE Offshore Wind, LLC	6800 MW	TBD	In progress
Gulf of Maine Lease Areas OCS-A 0564, OCS-A 0568	Gulf of Maine, United States	Avangrid Renewables, LLC		TBD	In progress
UMaine Research Array / New England Aquaventus	Gulf of Maine, United States	Diamond Offshore Wind, LLC	144 MW	Semi-submersible	In progress

Northern California Lease Areas (OCS-P 0561, OCS-P 0562)	California, United States	RWE Offshore Wind Holdings, LLC; California North Floating, LLC	4600 MW	TBD	In progress
Central California Lease Areas (OCS-P 0563, OCS-P 0564, OCS-P 0565)	California, United States	Atlas Offshore Wind, LLC; Golden State Wind, LLC; Invenergy California Offshore, LLC		TBD	In progress
CADEMO Demonstration Project	California, United States	Floventis Energy	60 MW	TBD	In progress
Pentland Floating Offshore Wind Farm	Dounreay, Scotland	Highland Wind Limited	100 MW	Semi-submersible	In progress
Green Volt	Peterhead, Scotland	Flotation Energy & Vårgrønn	560 MW	Semi-submersible	In progress
Pennavel Project	Brittany, France	Elicio & BayWar.e	270 MW	TBD	In progress
Med Wind	Sicily, Italy	Renexia	2800 MW	Semi-submersible	In Progress
MunmuBaram	Ulsan, South Korea	Munmu Baram Co. Ltd	750 MW	Semi-submersible	In Progress
Eoliennes Méditerranée Grand Large	Fos-sur-Mer, France	EDF Renewables/ Maple Power	250 MW	Barge/Semi-submersible	In Progress

Additional Resources

For additional information on the state of floating offshore wind around the world, explore the following resources:

- International Renewable Energy Agency's 2024 Floating Offshore Wind Outlook
- TGS 4C Global Offshore Renewables Map

- Energy Sector Energy Assistance Program: Analysis and Maps of Global Offshore Wind Technical Potential