IEA Support to Accelerating Renewable Energy Permitting (ARPE)

Accelerating Offshore Wind Deployment

Virtual workshop

25 April 2024

Main findings

International Energy Agency

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Introduction

Workshop background

The workshop on **Accelerating Offshore Wind Deployment** was the second of a series of four events scheduled within the IEA Support to Accelerating Renewable Energy Permitting (ARPE) action. This is a project funded by the European Union via the Technical Support Instrument, which is managed by the Reform and Investment Task Force (SG REFORM) from the European Commission. The project is implemented by the International Energy Agency (IEA), in cooperation with the European Commission.

The overarching objective of the action is to assist five focus countries – Finland, Ireland, Lithuania, the Netherlands and Slovakia – in developing and implementing policy and regulatory measures aimed at **reaching their renewable energy targets**, notably through **accelerating permitting**.

In support of this objective, the IEA has organised and facilitated three workshops and a dedicated offshore wind event. The objective of these workshops is **to understand the challenges and priorities of the focus countries**, share international best practices, and offer a platform for discussion.

On 25 April 2024, the IEA Secretariat brought together experts from governments, industry, academia and regulators to discuss the **challenges and best practices in accelerating offshore wind deployment.** Topics included identifying the most efficient solutions for streamlining project development, from site identification to contract, and for supporting the development of complementary infrastructure.

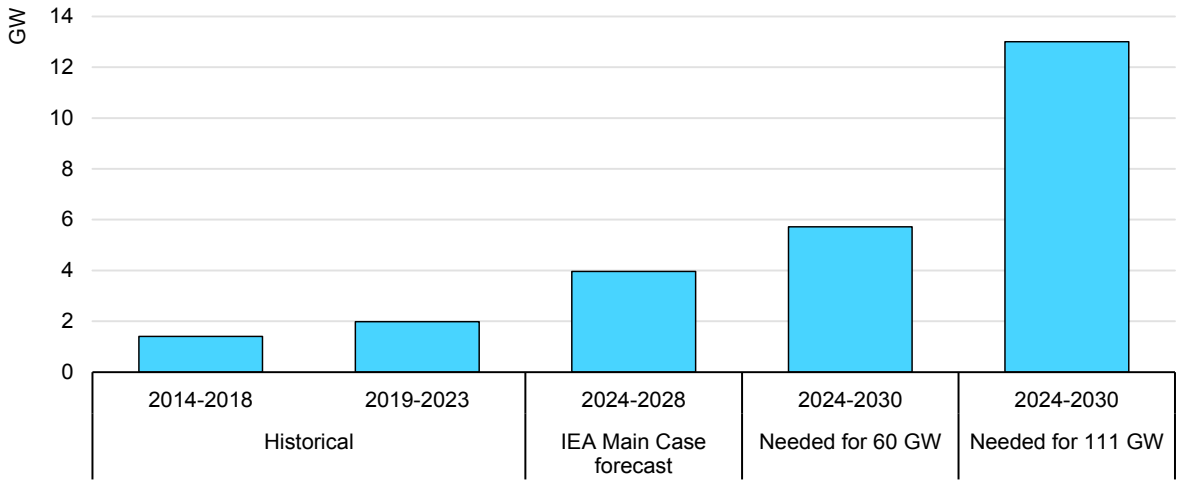
This document is a summary of the main outcomes of the offshore wind workshop. It provides examples of proven solutions with an aim of informing policy development.

EU offshore wind ambitions

Offshore wind energy is one of the main components of the European Union's (EU) ambitious clean energy transition strategy. To ensure the realisation of its full potential, the European Commission published a dedicated EU strategy on offshore renewable energy in November 2020, setting targets for installed capacity of **60 gigawatts (GW) by 2030 and 300 GW by 2050**. In addition, Member states have collectively committed to long-term goals for offshore renewable energy development across the European Union's five sea basins, with a target of approximately **111 GW of installed capacity by 2030 and 317 GW by 2050**.

Achieving this ambition requires **increasing the average annual capacity deployment by a factor of more than five, compared with the last five years**. Several challenges need to be addressed to realise this goal, including suboptimal processes of site identification, investigation and auctioning; lengthy permitting; and insufficient co-ordination in the deployment of power grids and ports. Recent increases in investment costs and supply chain disruptions have further exacerbated the challenges faced by offshore wind developers.

Average annual offshore wind capacity growth in the European Union, historical and needed to reach 2030 targets



The European Commission has recently published several **strategic documents and policy measures** aimed at facilitating the ambitious expansion of offshore wind capacity. Among these initiatives are the European Wind Power Action Plan and Communication to deliver on the European Union's offshore renewable energy ambitions, published in October 2023. The Offshore Network Development Plan of the European Network of Transmission System Operators for Electricity (ENTSO-E), published in January 2024, provides a long-term vision of power grid investment needs. In addition, the Commission has established a **permitting expert group** to streamline the permitting process through tools such as an online question-and-answer platform. The Commission will also release **guidance on cost-sharing for grid investments and designing auction non-price criteria.**

Main findings

Centralise offshore site preparation

Offshore wind projects' long lead times and complexity of the development process are crucial challenges that can be addressed by **centralising site preparation under a single government agency** (or a group of closely co-operating agencies)**.** This solution has been successful in reducing risk for the developer and expediating project construction, e.g. in the Netherlands. Three key tasks would fall under such agency's responsibility.

First, to provide **support in securing grid connection** in co-operation with the transmission system operator (TSO), including arranging permits for power line construction and ensuring timely commissioning of the connection. Such co-ordinated approach also allows the TSO to standardise key connection components, leading to cost reductions and shorter connection development time.

Second, to co-ordinate identification and investigation of offshore wind sites. The co-ordination of site investigations by a central authority allows **contracting maritime works for pre-project development in advance**, ensuring the availability of suitable contractors and limiting the risk of delays. Insufficient supply of offshore wind maritime services has been mentioned by workshop attendees as a significant challenge, which is expected to further exacerbate as offshore wind installations in Europe accelerate towards 2030 targets. Site pre-investigation also significantly reduces the risks faced by a developer when entering a tender for a wind farm development, potentially resulting in higher competition and lower generation costs.

Third, to guide developers through environmental impact assessment and permitting processes and tender a site for project development. A centralised authority is also better suited at co-ordinating **cumulative environmental impact assessments, especially across national borders,** and where multiple projects interact. The results of such assessments could then be shared with all developers, creating a level of playing field for all prospective developers.

Having ownership of extensive and detailed data regarding offshore sites and environmental impacts can help governments in setting various **comparative assessment parameters for auctions** including non-price criteria e.g. regarding local resource use, habitat protection, biodiversity and innovation. This knowledge also allows offered incentives to be adequately adjusted to enable fair revenues for developers. Additional auction criteria can be an important factor in the process of awarding sites, allowing governments to achieve various goals related to environment protection or local communities' support. The auction winner is usually granted either the project development rights without any further support or a Contract for Difference

(CfD). **CfDs ensure stable remuneration, significantly reducing the risk,** and in most cases are preferred by developers, especially in nascent offshore wind markets.

The government's involvement in project preparation significantly reduces the risks for the developers, which translates to **lower costs of offered electricity**. Co-ordination of administrative procedures by one government agency also **reduces the risk of delays**, helping to meet government targets on time. On the other hand, in this case project preparation risks and potential costs are transferred from the developers to taxpayers, e.g. in the case of investigating a site which proves to be unsuitable for offshore wind investment.

Industry representatives also shared their preference to **maintain the parallel open-door pathway** for developers. In this approach developers are allowed to independently conduct site investigations and project development in areas pre-identified for offshore wind by a Maritime Spatial Plan. This pathway can be useful for developers interested in developing purely merchant power plants and introducing innovative solutions, including hydrogen production, which may not be a part of official government strategy or supported by any policy. An open-door pathway also allows a developer to develop a project at its own pace, which can be preferred, especially in a volatile market environment.

An example of centrally co-ordinated site preparation and permitting process is the **Netherlands,** where a public entity, the Netherlands Enterprise Agency, is responsible for organising all activities related to offshore wind site preparation, including site investigations up to reaching wind farm site decision, development of offshore grid connection and organisation of auction. The agency closely co-operates with Rijkswaterstaat (the Ministry of Infrastructure and Water Management), responsible for evaluating permit conditions; TenneT, a TSO responsible for grid connection; and the Ministry of Climate Policy and Green Growth co-ordinating all efforts. This approach proved to be very successful, limiting delays in project development compared with many other markets, and contributed to the achievement of competitive prices. Over 5 GW have been awarded so far, with 15 GW more planned to be auctioned by 2027.

Streamline offshore permitting procedures

Setting a clear legal framework and streamlining administrative procedures is crucial for the success of a permitting process. The risks associated with permitting or possible delays are important factors in offshore wind investment decision-making. Permitting procedures should be clearly defined, with all necessary steps and responsibilities known from the beginning of the process to avoid unnecessary delays that can significantly increase the overall investment cost and put national targets at risk. The procedure should also include consultations with the local community and other stakeholders and define a clear pathway in case of any legal conflicts and appeals. It has been highlighted by multiple speakers that **firm deadlines for administrative procedures should be set**, possibly with a positive silence clause.

Setting the envelope technology requirements in permitting decisions should be considered in the context of quickly changing offshore wind technology. In a majority of EU Member states, once the permit is granted, there is very limited flexibility regarding technology design envelope, installation techniques and sometimes locations of individual turbines. This can present challenges in the utilisation of the latest technologies and introduce additional risk and cost for developers and suppliers. The permitting process should allow for timely project updates, without a need for restarting lengthy procedures. The permitting framework should also streamline deployment of quickly maturing new technologies, such as offshore hydrogen production plants, complex grid connections, and bigger fixed-bottom and floating turbines. Current environmental impact assessment procedures might also require updating to evaluate these new technologies.

Finally, setting a **one-stop shop for interaction between developers and governments has proven to be very effective in streamlining permitting** in multiple countries, such as Denmark, Germany and the Netherlands. It greatly increases the clarity about the requirements and can avoid duplication of work for developers and administrators. A one-stop shop is an effective solution for both centralised and developer-led permitting processes. **Digitalisation of the administrative procedures** is another important step, improving the overall efficiency of the process. Successful implementation of a one-stop shop requires close co-operation between government bodies engaged in the offshore wind project development.

Current guidelines from the European Commission about the permitting defined in the Renewable Energy Directive provide a good base for the process design. However, implementation in many countries is slow, which negatively impacts offshore wind development.

In Denmark, the Danish Energy Agency (DEA) serves as a one-stop shop, responsible for preparing and granting all licences and permits necessary for the development of an offshore wind farm. The DEA co-ordinates with all relevant authorities and other stakeholders, allowing for a streamlined permitting process, and facilitating communication between the developer and administration.

Set firm, long-term targets

Ensuring investors' and developers' engagement requires setting long-term national targets for offshore wind development. Well-defined strategies help to align all related legislation processes and executive documents with an overarching goal, e.g. by guiding the maritime spatial planning process, power grid development plans, offshore site investigation plans and auctions schedule. Such strategies should also include ensuring an adequate demand for targeted offshore wind power generation and policies supporting deployment.

Deployment targets also help manufacturers to **adjust supply chain capacity to avoid potential bottlenecks**. Such plans should be co-ordinated with a wide spectrum of stakeholders and include an analysis of full economic impacts to maximise the benefits for the whole economy. It is favourable if a plan is defined in a high-level legislation, making it relatively resistant to sudden reversal.

A good example of a document supporting comprehensive planning is the Celtic Sea Blueprint, an analysis of economic opportunities of developing floating offshore wind farms in the Celtic Sea, conducted by the Crown Estate of the **United Kingdom**. It is an evidence-based assessment of infrastructure requirements, minimum needed capacity to be installed, supply chain capabilities, investment needs, potential of job creation and economic development. The analysis also included an assessment of risks and challenges to be addressed as well as identified optimisation opportunities. The report significantly improved the awareness of both policy makers and industry regarding market potential and could lead to much more streamlined deployment of offshore wind capacity in the United Kingdom.

Enhance regional co-operation

Enhanced regional co-operation is key for planning and managing the development of hybrid projects connecting multiple countries. Despite harmonisation of many rules and regulations at the EU level, even minor differences in administrative procedures and requirements between countries can lead to significant delays.

Closer co-ordination is necessary for planning and managing energy flows in complex offshore power grids and assessing cumulative ecological impacts of multiple neighbouring wind farms. This also includes increasingly crowded sea basins, such as the North Sea, where plans already exist for hybrid and meshed grids connecting offshore wind farms and shores of multiple countries. Similar projects are also expected in the Baltic Sea in the near future.

Regional co-operation also requires adjusting national regulatory regimes to facilitate cross-border interactions or creating special regimes for offshore wind projects. An important first step in this effort would be to increase the public visibility of grid development plans to support co-operation with non-EU countries. Also, setting clear rules for international electricity trade with non-EU partners should be considered.

Secure supply chain and workforce availability

Significant administrative capacity enhancement is needed to efficiently process a growing number of increasingly complex projects. The expansion of the European offshore wind sector faces challenges across the whole supply chain, including turbine manufacturing, offshore site investigation and construction vessels. Early contracting of wind turbines and marine services

is already necessary to prevent delays and additional costs. These challenges are likely to increase due to planned step acceleration in EU demand towards 2030.

Addressing these challenges requires **long-term planning conducted in co-operation with the industry**, to ensure timely capacity expansion of manufacturing plants and marine services. **Co-operation with universities, schools and training centres** could also be helpful in ensuring availability of trained workers. Government plans need to be clearly communicated and advertised to increase awareness and encourage more workers to choose careers in the offshore wind sector.

Accelerate investment in power grids

Integrating the EU-targeted offshore wind capacity requires significant investments in grid infrastructure. According to the Offshore Network Development Plan (ONDP) published by ENTSO-E in January 2024, an estimated investment of **EUR 403 billion by 2050** would be required for building the needed grid infrastructure. Achieving this corresponds to **building grids nine times faster annually than in the past decade**, requiring a significant revamping of the approach to grid investments. According to transmission grid operator Elia Transmission Belgium, accelerating deployment of renewables, including offshore wind, contributes to almost doubling the company's investment plans in Belgium and Germany between periods of 2023-2027 and 2024-2028.

Establishing new sources of both public and private funding should be the priority. Permitting for grid investments needs to be streamlined to significantly shorten lead times and delays. Projects identified as crucial for the EU power grid should be given even more **priority in access to funding and faster permitting**. According to the ONDP, almost 15% of offshore wind capacity expected in Europe by 2050 will be connected via cross-border offshore hybrid corridors, once more stressing the need for seamless international co-operation.

Maritime Spatial Plans are crucial for offshore grid investments and should be co-ordinated with long-term plans of power system operators, as well as overall national offshore wind strategies. Cross-border projects in particular require comprehensive planning and effective co-operation between governments and system operators. A notable example of successful planning and permitting of complex infrastructure is the artificial offshore energy island project in Belgian territorial waters, currently under development by Elia Transmission Belgium. The island is designed to serve as a connection hub for multiple Belgian offshore wind farms and to be a part of European offshore grid in the future.

Ensure sufficient incentives for port expansion

Achieving the expansion of offshore wind ports needed to reach EU targets requires long-term planning. To serve as a base for construction and maintenance of a large offshore

wind farm, a port needs to designate a significant area to store and manipulate large components, such as blades, nacelles and tower segments. A port's area is usually very constrained, with multiple purposes competing for its use. Dedicating large existing plots or expanding ports for offshore wind operations is a significant cost, requiring very **long-term revenue visibility** to make a business case.

Concessional financing should be provided to identified ports, which can be long-term bases for construction of multiple wind farms. Governments should also encourage continuation of existing co-operation between ports and sharing of best practices in offshore wind operations.

Preliminary recommendations

Based on workshop findings, policy makers should consider focusing on the following actions to address challenges in offshore wind deployment:

- Establish a central agency responsible for offshore wind site identification and support developers in securing all necessary permits.
- Set a clear legal framework and streamline administrative procedures, including establishing one-stop shops and introducing firm deadlines for administrative procedures.
- Set long-term targets for offshore wind development to encourage stakeholder engagement and help align national plans and strategies.
- Enhance regional co-operation to efficiently manage development of hybrid projects connecting multiple countries.
- Ensure workforce and supply chain availability by co-ordinating deployment plans with the industry and education sector.
- Accelerate investments in power grids by establishing new sources of funding and streamlining permitting.
- Ensure sufficient incentives for expanding ports by co-ordinating long-term plans and providing concessional financing.

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