MARINEWIND

Market Uptake Measures of Floating Offshore Wind Technology Systems

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EXECUTIVE SUMMARY

Floating offshore wind (FOW) is rapidly emerging as a transformative technology in Europe's transition to Net Zero. By enabling access to deeper waters and stronger wind resources, FOW expands the geographical potential of offshore wind and supports the decarbonisation of energy systems across the continent. The European Union has set ambitious targets to deploy over 100 GW of offshore wind by 2030, including at least 6 to 8 GW from floating wind. The UK, as a leading market, has a pipeline of over 25 GW of floating wind projects in development, and is actively shaping the policy and investment landscape to support this growth [1].

Considering the advanced status in floating offshore wind development, the UK has been used as a detailed case study for an in-depth analysis aiming at identifying the key policy enablers and barriers that influence deployment and offers evidence-based recommendations to accelerate progress. This approach aligned with the goal of quantifying the impact of policy and regulatory barriers and assessing comparative importance, using the UK as a benchmark for more granular analysis.

Despite growing momentum, the deployment of FOW remains constrained by several systemic challenges. These include complex and fragmented permitting processes, insufficient grid and port infrastructure, limited investment certainty, and a shortage of skilled labour. While initiatives such as the UK's Contracts for Difference (CfD) scheme, the Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS), and the Offshore Transmission Network Review (OTNR) are beginning to address these issues, gaps remain in strategic coordination, regulatory clarity, and long-term planning.

Through two stakeholder workshops with UK actors, the project identified and prioritised eight critical enablers for FOW deployment. These are strategic planning and coordination, grid infrastructure and connectivity, port development, supply chain optimisation, innovation, standardisation, workforce development, and community engagement. Each enabler was assessed against the current UK using a Red–Amber–Green (RAG) methodology to evaluate alignment and effectiveness.

The findings suggest that, while policy support for floating wind is progressing, it may not yet be sufficient to enable deployment at the pace required to meet long-term targets. Strategic planning remains fragmented, infrastructure investment is underfunded, and regulatory frameworks are often slow to adapt to the unique needs of floating wind. Stakeholders called for more integrated national strategies, stronger financial de-risking tools, and enhanced regulatory oversight to ensure the timely delivery of infrastructure and project approvals.

To address the aforementioned challenges, the report presents a comprehensive policy framework analysis for FOW, drawing on literature reviews, stakeholder engagement, and comparative case studies across Europe. Based on this analysis, the deliverable outlines a set of targeted recommendations for policymakers, industry stakeholders, and investors. These include reforming permitting systems and enhancing Contracts for Difference (CfD) scheme by incorporating non-price criteria such as a commitment to local supply chain development, innovation in floating platform technologies, and environmental performance, to better reflect the unique challenges and strategic values of floating offshore wind.

The report also recommends increasing targeted investment in port infrastructure and improving the responsiveness of grid infrastructure funding mechanisms to align with deployment timelines. In addition, strengthening technical standards and fostering international collaboration through platforms such as Horizon Europe and the North Seas Energy Cooperation are seen as critical to accelerating progress. Finally, the report highlights workforce development and transparent community engagement not as standalone actions, but as essential, cross-cutting enablers of inclusive and sustainable growth, ensuring that the benefits of floating offshore wind are widely shared and that deployment is supported by the necessary skills and public trust.

By acting on these recommendations, the European Union and the UK can position themselves as global leaders in floating offshore wind. Doing so will not only support climate and energy goals but also drive innovation, create high-value jobs, and support long-term economic resilience in a rapidly evolving global energy landscape.

1. INTRODUCTION

This Deliverable (D1.2) presents a final policy framework analysis for floating offshore wind (FOW) in the context of the MARINEWIND project. It builds on the findings of our previous Deliverable (D1.1) – *Analysis of policy and regulatory barriers and enablers*, which assessed key aspects related to wholesale market designs and international policy frameworks and focuses on identifying the policy and regulatory conditions that support or hinder the deployment of FOW.

This report aims to provide evidence-based insights that can inform policy development and support the wider adoption of FOW across Europe, with a particular emphasis on the UK. It seeks to:

- Enhance understanding among policymakers of the key enablers and barriers to FOW deployment.
- Foster collaboration between governments, industry, and other stakeholders.
- Improve communication between technology developers and public and private sector actors.

By raising awareness of the benefits and challenges associated with FOW, this report aims to support the creation of effective policies and regulatory processes that can accelerate deployment and investment in the sector.

As illustrated in Figure 1, floating offshore wind is gaining momentum globally as a key enabler of the transition to low-carbon energy systems. By unlocking access to deeper waters and more consistent wind resources, FOW expands the geographical potential of offshore wind and supports decarbonisation efforts across Europe and beyond.

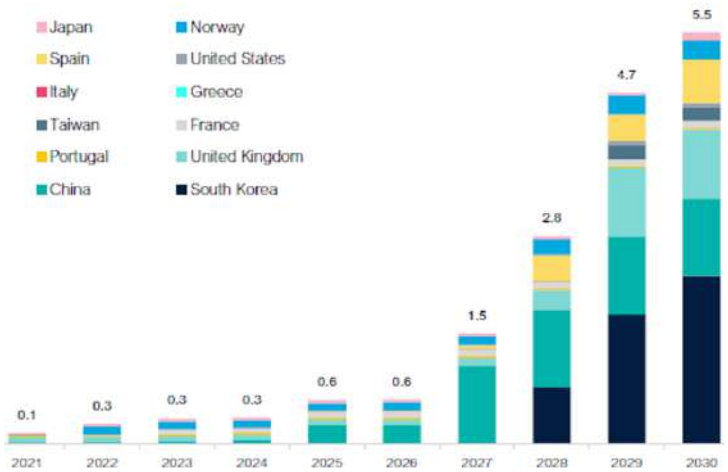

Figure 1 Cumulative capacity by country 2021-2030 (GW) [4COffshore]

Across Europe, several countries are developing national strategies and implementing pilot projects to accelerate the deployment of FOW. Italy is preparing to scale up its offshore wind capacity post-2030, with the Med Wind project expected to deliver up to 2.8 GW of power. Spain has launched its first floating wind project, DemoSATH, which is now generating electricity and feeding it into the grid. Portugal's WindFloat Atlantic, the first operational floating wind farm in continental Europe, has generated over 259 GWh since 2020. Greece has set ambitious targets of 1.9 GW by 2030 and 17.3 GW by 2050, while Belgium is developing deep-water projects such as BEL-Float. Figure 2 highlights the cumulative floating wind outlook to 2040. These developments are supported by EU-wide initiatives, such as Horizon Europe and the North Seas Energy Cooperation, which promote cross-border collaboration, innovation, and regulatory alignment [2][3].

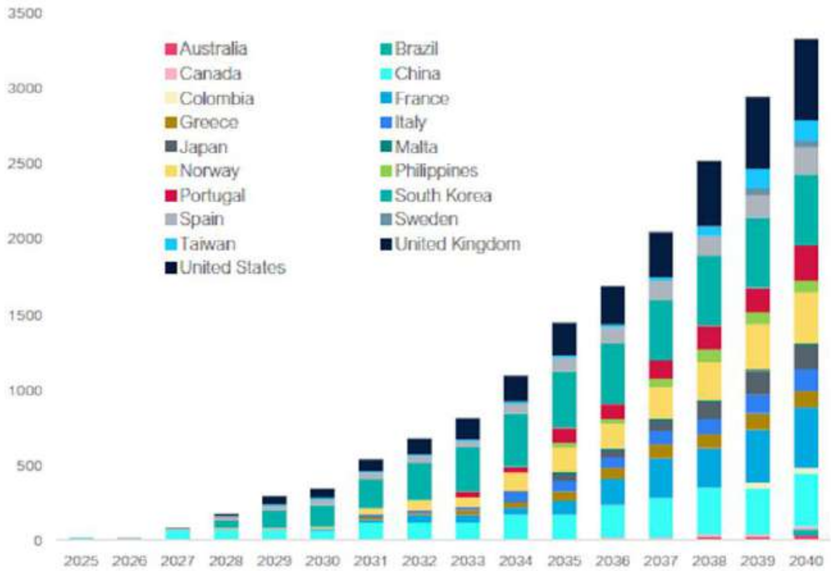

Figure 2 Cumulative floating wind outlook to 2040 [4C Offshore]

Within this broader European context, the UK stands out as a leading market for floating offshore wind, with a pipeline of approximately 25 GW, the largest in Europe. The UK's policy landscape includes targeted initiatives such as the Offshore Wind Environmental Improvement Package (OWEIP), which streamlines consenting processes under the Energy Act 2023, and the Contracts for Difference (CfD) scheme, which now includes dedicated funding pots for floating wind. Additional programmes, such as the Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS) and the Floating Offshore Wind Demonstration Programme, further support infrastructure development and technological innovation[4][5][6][7].

This report uses the UK as a detailed case study to explore how national policy frameworks can enable or constrain FOW deployment. By analysing the UK's experience, the report aims to identify best practices, highlight policy gaps, and generate actionable recommendations that can inform FOW policy development across Europe and internationally, in line with the objectives of the MARINEWIND project.

The scope of this analysis is limited to policy and regulatory enablers and barriers relevant to the deployment of FOW. It includes qualitative assessments of policy effectiveness, stakeholder perspectives (UK only), and comparative insights from MARINEWIND Labs countries. Technical design, engineering aspects, and non-European markets are outside the scope of this deliverable, except where international examples are used for contextual benchmarking.

2. METHODOLOGY

This section outlines the approach applied to assess the policy and regulatory landscape for floating offshore wind within the MARINEWIND project. The methodology combined desk-based research, stakeholder engagement, and comparative analysis to identify key enablers and evaluate the effectiveness of existing policies.

The analysis focused on five countries, Portugal, the UK, Greece, Spain, and Italy, selected as part of the MARINEWIND Labs. These Labs served as national case studies for the project and represented different stages of floating offshore wind development. The UK and Portugal were chosen as countries with active FOW deployments, while Greece, Spain and Italy were selected for their planned or emerging FOW initiatives. This structure supports the project's goal of transferring knowledge from more established markets to those still in the early stages of planning or implementation.

The UK served as the primary case study for in-depth policy analysis, working as a blueprint to illustrate how national policy frameworks can be evaluated and improved. This included two dedicated stakeholder workshops focused on identifying and prioritising strategic enablers, validating policy alignment, and identifying gaps. In contrast, the analysis of the other four countries was based on structured questionnaires and desk research conducted by national partners, combined with insights resulting from the co-creation workshops implemented in the local Labs. These inputs provided comparative insights into regulatory frameworks, permitting processes, and national policy readiness.

The methodology followed a structured process, illustrated in Figure 3 below, which guided the identification, assessment, and mapping of policy and regulatory enablers. This included:

- A literature review to identify initial barriers and enablers.
- Stakeholder validation (UK only) to refine and prioritise enablers.
- Policy mapping and effectiveness assessment using a Red- Red-Amber-Green framework.
- Comparative analysis of the MARINEWIND Labs to contextualise findings and inform broader recommendations.

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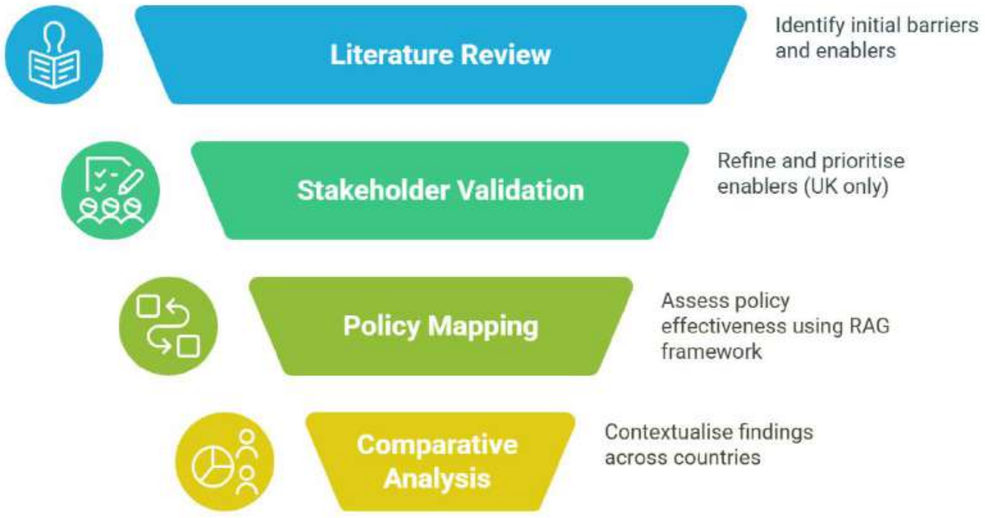

Figure 3 Approach to policy and enabler mapping

2.1. Literature review and data collection

An initial review of targeted literature was conducted to gain insight into the political landscape of floating offshore wind in the UK and Europe. This consisted of national strategies, devolved administration plans, industry reports, and international plans and contributed to the formulation of the eight critical enablers, informed the creation of indicators, and structured the assessment process.

Crucial sources included the Offshore Wind Sector Deal, the Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS) and multiple rounds of the Contracts for Difference (CfD) Scheme, all of which emphasised the way floating wind delivers on the country's wider renewable energy ambitions.

Insights from the industry were provided by organisations such as RenewableUK, the Offshore Renewable Energy Catapult and the Offshore Wind Industry Council. These sources provided valuable insights into the evolution of the supply chain, investment signals, and infrastructure requirements.

To understand the situation within the broader international context, literature, and reports from the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), and WindEurope are considered. These provided benchmarks for the UK's approach, alongside those of Norway, France, and Japan.

Workshop 1 provided UK-only input, validated, and corrected the findings identified in the literature review, ensuring consistency with the country's priorities and challenges.

2.2. Identification of key policy and regulatory characteristics

Building on Deliverable D1.1, which mapped regulatory obstacles and permitting practices in Europe, this task identified national consenting frameworks, UK policy papers, and European market design reforms. The findings covered long-term barriers (e.g., grid constraints, permit delays, and infrastructure gaps) and enablers (such as CfD, planning reform, and dedicated investment schemes).

A structured questionnaire was also conducted in four additional European regions (Greece, Italy, Portugal, and Spain). This gave comparative data and an idea of common regulatory issues and national variations. The UK's framework was analysed in more depth to learn about the way policy design and policy implementation influence the deployment of FOW.

2.3. Assessment and quantification of characteristics

The identified characteristics were assessed through a structured review of consenting procedures and policy frameworks in five European countries: the UK, Spain, Portugal, Italy, and Greece, representing partner countries for the MARINEWIND Project. This included analysis of national permitting processes, spatial planning, regulatory structures, and barriers to deployment.

The findings informed the identification of key enablers for the deployment of FOW.

2.4. Identification of enablers

An initial list of ten enablers has been identified during the literature review, grouped into policy, regulatory, infrastructure, and strategic themes. During Workshop 1, stakeholders reviewed, refined and expanded this list based on their practical experience. Some enablers were reworded or merged, while others were newly introduced to reflect real-world deployment challenges and opportunities.

We then prioritised the final set of eight enablers using a high/low impact and effort matrix, which is described in more detail in later sections. These enablers formed the foundation for the subsequent policy mapping and effectiveness assessment.

2.5. Policy-enabler mapping and effectiveness assessment

To assess how existing policies are fit for supporting FOW deployment, each enabler was subdivided into quantifiable sub-indicators. These were then used in the assessment of policy alignment in a Red-Amber-Green (RAG) framework in Workshop 2, with the following meaning:

- **Green**: Strong alignment and effective support.
- **Amber**: Partial alignment or moderate gaps.
- **Red**: Significant gaps or misalignment.

The mapping was conducted using MURAL [8], an online collaboration tool, with colour-coded notes and evidence-based rationales. The analysis also considered delivery timeframes, clarity of policy and the expected impact in relation to the UK's 2050 Net Zero goal.

This has allowed us to take a step back and consider whether any policies exist to address the barrier or support the enabler, and also to consider whether the policy mix delivers the necessary level of support. Besides the RAG ratings, the study considered the general strength of coverage under each enabler, considering time to delivery, policy clarity, and the likely impact, as mentioned above. The assessment was specifically framed around the context of the UK’s Net Zero target as a use case to illustrate where additional policy intervention may be necessary to facilitate the development of floating offshore wind in a timely manner.

3. FOW STATE OF PLAY: BARRIERS AND ENABLERS

As of 2025, the floating offshore wind sector continues to demonstrate strong growth potential, with increasing global interest and investment. The global offshore wind capacity is expected to grow by 19GW in 2025 alone, with floating wind accounting for a growing share due to its ability to access deeper waters and more consistent wind resources [9]. However, despite this momentum, global floating wind capacity is expected to remain below 7 GW by 2030 unless further policy support is introduced [10] .

Across Europe, including both EU member states and non-EU countries such as the UK, FOW deployment is advancing rapidly. The UK currently leads with the largest floating wind pipeline in the region, totalling approximately 32 GW, including major projects in the ScotWind leasing round and the Celtic Sea. Other countries making notable progress include France, Spain, Portugal, Greece, and Italy, each supported by national strategies and EU-level initiatives such as Horizon Europe and North Sea Energy Cooperation.

Outside Europe, countries such as Japan, South Korea, the United States, and China are also accelerating floating wind initiatives, reflecting the global relevance of floating wind.

Figure 4 Floating wind projects in the pipeline, Westwood analysis [10]

However, despite the growing momentum, the deployment remains uneven across Europe. While some variation is expected due to differences in geography, seabed conditions, and maritime space availability, the disparity also reflects broader policy, regulatory, and investment challenges. Countries with strong enabling frameworks have made faster progress, while others face delays due to fragmented permitting systems, limited infrastructure readiness, or unclear market signals. Understanding these differences is important not only for identifying best practices but also for ensuring that emerging markets are supported in building the conditions necessary for future deployment.

The following sections provide a structured overview of these dynamics:

- Section 3.1 outlines the key barriers currently hindering the deployment of FOW.

- Section 3.2 highlights the enabling conditions and policy mechanisms that are helping to overcome those barriers and support the market growth.

3.1. Barriers to deployment

3.1.1 Permitting delays and regulatory complexities

Permitting remains one of the most significant structural barriers to the deployment of FOW across Europe. In the UK, despite recent reforms under the Energy Act 2023 and the Offshore Wind Environmental Improvement Package (OWEIP), developers still face complex and time-consuming Environmental Impact Assessments (EIAs) and Habitat Regulations Assessments (HRAs). While the UK has committed to reducing consenting timelines from four years to one, implementation remains uneven [11].

The narrow definition of “floating offshore wind” in the CfD Allocation Regulations 2014 has also constrained innovation. The CfD Allocation Round 7 consultation (2024) proposes revisions to broaden eligibility and mitigate gaming risks, but these changes are not expected to take effect until Allocation Round 8 [12].

Across Southern Europe, similar challenges persist. Greece and Italy face fragmented permitting regimes and underdeveloped Maritime Spatial Planning (MSP), while Spain’s regulatory uncertainty has delayed the implementation of auction frameworks. These issues collectively undermine investor confidence and delay project pipelines.

In Greece, the primary challenges include regulatory constraints related to permitting processes, similar to those seen across Southern Europe, as well as a lack of port readiness. This includes both inadequate infrastructure and limited technical expertise. While the Greek government has set ambitious targets for offshore wind development, these supply chain bottlenecks, particularly in port capacity and logistics, represent a separate structural hurdle that must be addressed in parallel with regulatory reforms to realise these goals.

Table 1 Barriers in the existing policies in Greece

	Existing Policies	Identified Gaps
Greece	**Offshore Wind Law (Law 4964/2022)** establishes a regulatory framework for offshore wind development, designating HEREMA to lead site investigation, allocation, and concession development.	**Complex permitting processes** are still lengthy approval procedures that lack a streamlined system.
	National offshore wind farm development programme: 25 areas for offshore wind development, aiming for 4.9 GW by 2030-2032.	**Stringent environmental assessments** are comprehensive and time-consuming.
	Renewable energy targets: 1.9 GW of offshore wind capacity by 2030, contributing to an 82% share of renewable energy in electricity generation.	**MSP deficiencies**: Lack of a fully developed MSP framework and **navigational and maritime concerns** linked to conflicts with existing maritime activities.
	Investment schemes include Greece's recovery and resilience plan, which comprises €17.77 billion in grants and	**Grid connection challenges** due to Infrastructure limitations.

	€12.73 billion in loans to support renewable energy projects.	

Italy faces similar regulatory challenges, including slow authorisation procedures and the absence of a cohesive policy framework to support floating offshore wind development. In addition to these permitting-related issues, Italy also grapples with a separate economic barrier: the high costs associated with the technological immaturity of FOW and the underdeveloped domestic supply chain. These financial constraints, while not regulatory in nature, significantly impact project viability and must be addressed in parallel to unlock the sector's potential.

Table 2 Barriers in existing policies in Italy

	Existing Policies	Identified Gaps	Impact on Project Timelines
Italy	**Renewable energy targets**: 40% of total energy production from renewables by 2030; 3.8 GW additional FOW capacity through the FER-2 mechanism.	**Complex authorisation processes that involve** multiple entities and lack optimisation.	**Extended project planning and approval Phases**: The complexity and slow pace of the authorisation process can significantly extend the time required to obtain necessary approvals.
	Incentives and funding schemes: CfD mechanisms managed by the Gestore dei Servizi Energetici (GSE,) as well as the National Recovery and Resilience Plan (PNRR).	**The rejection of projects by harbour masters** is causing technical barriers.	**Increased uncertainty and risk**: Technical barriers and a lack of a consolidated MSP create uncertainties for developers, increasing the risk of delays.
	Maritime Spatial Planning (MSP): Integrated approach to MSP under Legislative Decree 201/2016.	**Lack of Consolidated National MSP**: Affects the consenting process.	**Higher costs and resource allocation**: Delays in project timelines can result in increased costs and the need for additional resources to address regulatory and logistical challenges.
	Cross-border cooperation: Non-binding agreements with other Member States to connect up to 8.5 GW to the national grid by 2030.	**Need to reinforce the value Chain**: Supporting local companies and creating jobs.	**Reduced Investor Confidence**: Uncertainties and delays can reduce investor confidence, potentially affecting the availability of funding and investment in FOW projects.
		Lack of Simplification Procedures: To shorten the authorisation process.	**Missed renewable energy targets**: Delays in project timelines can result in missed renewable energy targets, which in turn impact national climate goals and the overall growth of the FLOW sector.

Spain's offshore wind industry has made significant progress, but political uncertainty and administrative delays have slowed the release of a regulatory framework necessary for the sector's growth. The lack of a clear and regulatory environment adds pressure to existing challenges, such as developing the supply chain and securing investor interest.

Table 3 Barriers in existing policies in Spain

	Existing Policies	Identified Gaps	Impact on Project Timelines
Spain	**Renewable energy targets of** 1 to 3 GW of offshore wind capacity by 2030.	**Complex permitting** process and high competition under the new auction-based	**Extended project planning and approval Phases**: Competitive bidding and layered authorisation steps may

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		system defined by Royal Decree 962/2024.	prolong timelines despite clearer procedures.
	Incentives and funding schemes: Royal Decree 962/2024, Strategic Project for Economic Recovery and Transformation (PERTE) on Renewable Energy, Renewable Hydrogen and Storage (ERHA).	**Regulatory implementation is still evolving, with uncertainty remaining** around auction timelines and technical requirements.	**Increased uncertainty and risk**: The lack of visibility into permits and tariff concessions creates uncertainty for developers, thereby increasing the risk of delays.
	Royal Decree 960/2020 regulates the economic regime for the production of renewable energy electricity.	**Environmental regulations** still lack guidance specific to offshore areas, despite the updated maritime spatial plans (Royal Decree 150/2023).	**Higher costs and resource allocation**: Developers may need to invest more in environmental assessments and stakeholder engagement.

The offshore wind sector in Portugal is anticipated to accelerate, but regulatory and spatial planning challenges persist. A recent government decision to reduce the designated area for offshore wind development by 15%, in response to concerns from the fishing industry, highlights the complexities of Maritime Spatial Planning (MSP) and stakeholder coordination. This decision highlights the importance of a more integrated regulatory approach that balances renewable energy goals with traditional maritime activities, ensuring that permitting processes are both inclusive and efficient.

3.1.2 Funding and investment challenges

In the UK, the FLOWMIS and floating wind demonstration programme are important steps, but stakeholders continue to call for more robust financial de-risking tools, such as sovereign guarantees, blended finance, and revenue stabilisation mechanisms. While Allocation Round 6 (AR6) introduced a 52% increase in the strike price for floating wind, stakeholders note that **long-term visibility, particularly beyond the current allocation rounds, remains limited** [1] This perceived lack of clarity on future support mechanisms and market signals affects investment planning, especially for projects with long development horizons. The key concern is not the existence of limits to visibility, but rather **how far ahead** developers can reasonably forecast policy and revenue conditions to make informed financial commitments.

Across Europe, the absence of harmonised investment frameworks and the variability of subsidy schemes continue to present challenges for cross-border project development and supply chain coordination. These differences can create uncertainty for developers operating in multiple markets, potentially slowing progress toward regional integration.

Additionally, existing accounting and financial reporting standards often fail to accurately reflect the specific cost structures and risk profiles associated with floating offshore wind. While mechanisms such as CfDs provide some level of revenue certainty, they may not fully address the capital intensity and long development timelines associated with these projects. There is growing interest in exploring complementary financial instruments, such as targeted guarantees or political risk insurance, to help improve investment conditions.

The offshore wind sector has also become more selective in response to rising costs driven by global supply chain pressures and the declining profitability of wind farms. For example, the failure of Allocation Round 5 (AR5) to attract offshore wind projects showed how rising costs have narrowed investor portfolios, where developers are now focusing only on key deliverable projects [13]. While floating offshore wind may be somewhat insulated from this immediate pressure, given the longer development pipeline and later Final Investment Decisions (FIDs) compared to bottom-fixed offshore wind, these trends underline the importance of financial and policy stability in ensuring long-term sector viability. A proactive approach to mitigating risk and incentivising private sector participation will be required.

3.1.3 Grid connection and infrastructure limitations

Grid integration remains one of the most significant structural holdups for the deployment of floating offshore wind in the UK and Europe. The scale and pace of FOW development are increasingly constrained by insufficient transmission capacity, long lead times for grid upgrades, and fragmented planning processes.

In the UK, the Offshore Transmission Network Review (OTNR) and its deliverable, the Holistic Network Design (HND) [14][15], have laid the foundation for a more coordinated and strategic approach to offshore grid development. The HND identifies the critical onshore and offshore infrastructure required to meet the UK's 50 GW offshore wind target by 2030, including early-stage coordination between The Crown Estate and National Grid ESO to align seabed leasing with grid capacity planning. However, implementation progress has been slower than anticipated, and the Scotland–England transmission interface continues to experience severe congestion, leading to curtailment and reduced investor confidence [16].

The Pathway to 2030 programme and Transmission Methodology Options (TMO) reforms aim to address these constraints by prioritising investment in new high-voltage transmission lines and subsea interconnectors, particularly across the Scotland–England boundary. These are essential to unlock capacity for ScotWind and Celtic Sea projects. However, delivery timelines remain tight, and the risk of delays persists due to permitting and supply chain constraints [17]. From a technical perspective, the deployment of high-voltage direct current (HVDC) systems is increasingly necessary to connect remote floating wind sites to the onshore grid. HVDC infrastructure, while efficient over long distances, requires complex engineering and significant capital investment, often exceeding £1 billion per link. These challenges are amplified in deeper waters, where floating platforms introduce additional design and installation complexities.

Across Europe, the revised Trans-European Networks for Energy (TEN-E) Regulation [18] and the North Seas Energy Cooperation (NSEC) framework promotes the development of meshed offshore grids and cross-border interconnectivity. These initiatives are critical to enabling large-scale FOW integration and balancing supply across the continent. However, national-level coordination, permitting, and cost-sharing mechanisms remain underdeveloped, slowing progress on pan-European grid solutions.

These challenges highlight ongoing concerns among stakeholders about the need for clearer processes around grid connection queue management (e.g., TMO4+ reforms), timely delivery of HND and pathway to 2030 projects and greater regulatory certainty to support anticipatory investment. Similarly, limited progress cross-border planning under NSEC and TEN-E continues to constrain the development of integrated offshore grid solutions [19].

3.1.4 Environmental and social considerations

Environmental and social licensing is increasingly recognised as a critical factor influencing the pace and success of FOW deployment. The primary barrier in this area is the lack of consistent, streamlined processes for assessing and managing environmental and social impact, which can lead to delays in project approvals and increased uncertainty for developers.

In the UK, regulatory bodies such as Natural England have highlighted the need for more robust baseline environmental data and clearer frameworks for adaptive management to address ecological risks associated with offshore infrastructure. Key concerns include the potential impacts of anchoring systems, subsea cabling, and vessel traffic on sensitive marine habitats, particularly those supporting seabirds and marine mammals [20].

On the social side, community acceptance remains a significant challenge, particularly in coastal regions with strong marine economies. While visual impacts are minimal for FOW located far offshore, concerns persist around underwater noise during construction and operation, disruption to fishing activities, and cumulative impacts on marine space. The issues can delay planning processes and reduce public support if not adequately addressed.

Factors such as trust in developers, perceived environmental benefits, and opportunities for meaningful community participation are fundamentally connected to the success of planning and deployment efforts. Thus, engaging with communities through surveys, mapping public attitudes, and fostering transparent communication can cultivate trust and gather support for floating offshore wind turbine projects [21]. Best practice examples include Scotland’s community benefit frameworks and Norway’s co-location models, which integrate FLOW with aquaculture and marine conservation zones. They could inform more inclusive policy design across Europe.

At the European level, while frameworks such as the EU Biodiversity Strategy for 2030 and the Maritime Spatial Planning Directive (2014/89/EU) [22] provide a policy foundation for integrating environmental safeguards, implementation remains uneven across Member States, contributing to regulatory fragmentation and uncertainty.

3.1.5 Port infrastructure limitations

The deployment of floating offshore wind relies heavily on the **availability of suitable port infrastructure**. Ports serve as the logistical backbone for the assembly, integration, and deployment of floating platforms, turbines, and subsea systems. However, across the UK and Europe, many existing port facilities face significant limitations, including insufficient land availability, inadequate quay length and strength, shallow channel depths, and limited heavy-lift capacity [23]. These constraints can delay project timelines (e.g. assembly, integration, and installation) and increase logistical complexity.

In the UK, the Floating Offshore Wind Taskforce has estimated that up to £4 billion is required to upgrade at least eleven ports across the country for large-scale floating offshore wind [24]. These upgrades include dredging, quay reinforcement, expansion of laydown areas, and the development of deep-water berths capable of accommodating semi-submersible platforms and heavy-lift vessels. Without these enhancements, the UK risks missing its 2030 target of 5 GW of floating wind capacity and falling behind international competitors.

A further challenge is the **lack of investment certainty**. Port operators are often hesitant to commit capital without clear visibility on project pipelines, leasing schedules, and long-term revenue prospects. This uncertainty can delay infrastructure development, even where technical needs are well understood.

Similar issues are observed across Europe. In countries such as Spain and Portugal, port readiness has emerged as a key constraint, particularly in regions with limited deep-water access or competing maritime uses. While EU-level initiatives such as the Net-Zero Industry Act (2024) and the Strategic Technologies for Europe Platform (STEP) aim to support critical infrastructure development, including ports, implementation remains at an early stage [25][26] [27].

A 2024 survey by Westwood Global Energy Group indicates that 50% of stakeholders consider port infrastructure a primary barrier in the development process of FOW. This suggestion reinforces the need for a governmental and industrial partnership model to address the challenges supported by targeted funding mechanisms such as the UK's FLOWMIS and the EU's Connecting Europe Facility (CEF) [27].

In addition to physical limitations, many ports serve multiple sectors such as shipping, fishing, and defence, which can complicate planning and investment decisions. The need to accommodate diverse users adds further complexity to infrastructure upgrades and long-term development strategies.

The project growth in floating wind, as shown in Figure 5, is expected to exceed 10GW globally and 3-5GW in Europe by 2040, underscoring the scale of infrastructure required. Without timely action to address these constraints, there is a risk that deployment will be delayed, and countries may struggle to meet their renewable energy targets or maintain competitiveness in the global market.

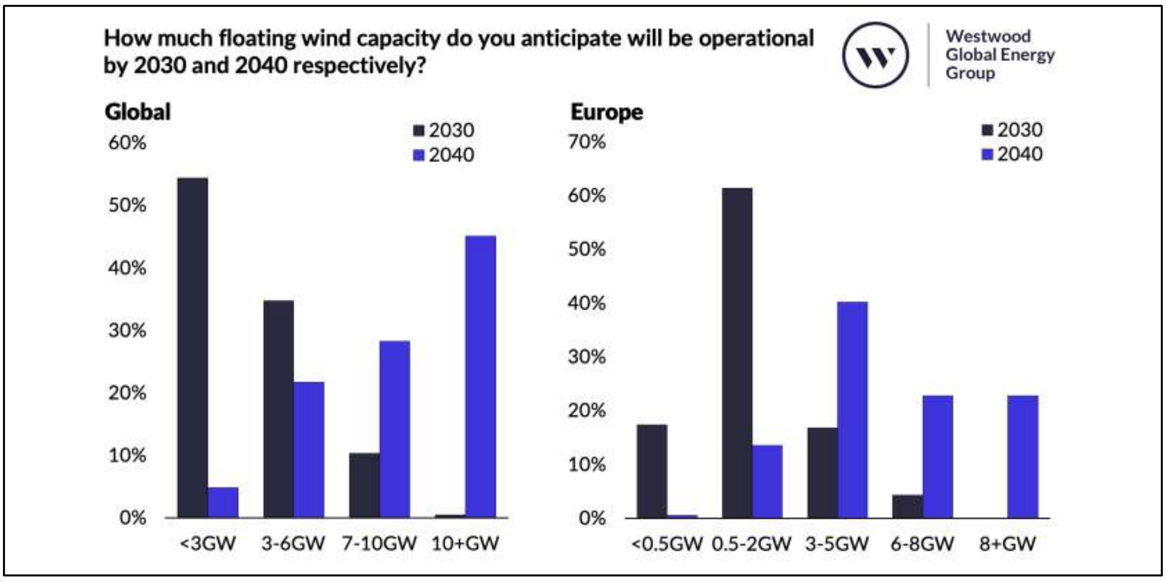

Figure 5 Anticipated global and European floating wind capacity by 2030 and 2040 [27]

3.2. Enabling conditions for FOW adoption

3.2.1 Government initiatives and funding programmes

Governments have introduced a series of targeted initiatives to support the development and deployment of FOW, combining financial incentives with environmental considerations and infrastructure investment. The Contracts for Difference (CfD) scheme remains the UK's primary market mechanism for de-risking renewable energy projects. In Allocation Round 6 (AR6), the maximum strike price for floating wind was increased by 52%, from £116/MWh to £176/MWh, reflecting the higher capital costs and technology maturity gap compared to fixed-bottom offshore wind [28].

This adjustment was designed to restore investor confidence following the undersubscription of AR5 and to accelerate early-stage deployment. The Energy Act 2023 introduced the Offshore Wind Environmental Improvement Package (OWEIP), which includes strategic compensatory measures and the Marine Recovery Fund. These mechanisms enable developers to contribute to environmental restoration in exchange for streamlined consenting, striking a balance between ecological protection and deployment speed [29].

In parallel, the Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS) provides up to £160 million in grant funding to upgrade port infrastructure and strengthen domestic supply chains [30]. FLOWMIS is a cornerstone of the UK's industrial strategy for floating wind, supporting the development of fabrication yards, heavy-lift quays, and logistics hubs. Collectively, these programmes demonstrate the UK's commitment to positioning itself as a global leader in floating wind, while also supporting regional economic development and supply chain resilience.

By integrating financial incentives with streamlined regulatory processes, Europe will position itself as a leader in the floating offshore wind sector, promoting sustainable energy solutions and economic growth.

3.2.2 Streamlined permitting processes

The UK government has implemented measures to streamline permitting processes for FOW projects, aiming to accelerate development and reduce administrative burdens. The Nationally Significant Infrastructure Projects (NSIP) reform, introduced through the Planning Act 2008, consolidates various consents into a single Development Consent Order (DCO). This unified framework streamlines the approval process for large-scale infrastructure projects, including offshore wind farms, and significantly reduces the time required to obtain necessary permissions [31].

In February 2022, the UK government announced its Offshore Wind Environmental Improvement Package to accelerate the delivery of new offshore wind infrastructure while ensuring that appropriate environmental considerations are considered [32]**.** These reforms aim to reduce duplication, shorten approval timelines, and provide greater certainty for developers.

The Offshore Wind Acceleration Taskforce, convened by the Department for Energy Security and Net Zero (DESNZ), has worked with regulators and industry to identify and address bottlenecks in the planning system. Its recommendations include digitalising the consenting process, improving inter-agency coordination, and embedding adaptive management into licensing frameworks. These efforts reflect a broader shift toward a more agile and risk-based regulatory model, which is essential for scaling floating wind within the UK's 2030 and 2050 Net Zero targets.

3.2.3 Technological advancements and innovation

Technological innovation is central to the successful deployment and long-term viability of floating offshore wind across Europe. As countries seek to harness wind resources in deeper waters, investment in enabling technologies, such as dynamic cables, mooring systems, and floating substructures, has become increasingly important.

Across Europe, national efforts, supported by EU programmes such as Horizon Europe and Innovation funds contribute to a growing body of knowledge and technical readiness across the continent, leading to significant advancements in technological innovation in floating offshore wind. **Italy** is progressing through the FER2 - Renewable Energy Sources 2 mechanism and has announced CfD-style support for floating wind in the central and southern Mediterranean. **Spain** has launched the PERTE ERHA - Strategic Project for Economic Recovery and Transformation on Renewable Energy, Renewable Hydrogen and Storage programme, which includes funding for floating wind prototypes and hybrid offshore platforms. **Portugal** continues to build on the success of WindFloat Atlantic and is preparing for commercial-scale auctions with a strong emphasis on innovation. **Greece** is developing a national offshore wind strategy with a focus on deep-water floating projects, supported by EU Recovery and Resilience Facility funds. **Belgium** is exploring hybrid offshore energy islands and multi-use platforms that integrate floating wind with hydrogen and storage technologies.

The UK provides a useful example of national-level support for innovation in this area. Through the Floating Offshore Wind Demonstration Programme, the UK has allocated £31.6 million to support projects focused on advancing key components for FOW deployment [33] This is complemented by the Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS), which offers up to £160 million in capital grants to improve port infrastructure and strengthen supply chain capacity [34]. These initiatives aim to reduce costs, accelerate technology readiness, and support the development of solutions that are exportable.

It is recognised that, while national approaches may differ, many of the challenges and opportunities in FOW innovation are shared across Europe. Greater collaboration, through joint research, shared demonstration sites, and coordinated funding, will be key to accelerating commercial deployment, reducing costs, and maintaining Europe's leadership in floating offshore wind.

3.2.4 International collaboration and knowledge sharing

International collaboration and the exchange of knowledge are essential for advancing floating offshore wind across Europe and globally. By collaborating with international partners, countries can share best practices, align regulatory frameworks, and accelerate the development of the industry.

Horizon Europe, the European Union's Framework Programme for Research and Innovation, plays a central role in supporting cross-border collaboration. The UK continues to participate in Horizon Europe as an associated country, enabling UK organisations to contribute to and benefit from FOW-related projects. Notably, calls such as "Demonstrations of Innovative Floating Wind Concepts" support the development of novel platform designs, construction methods, and integrated offshore energy systems, reinforcing the European value chain for floating wind [35].

The North Seas Energy Cooperation (NSEC) is another initiative that brings together the UK, EU Member States, and the European Commission to coordinate offshore energy planning in the North Sea region. NSEC supports joint efforts in Maritime Spatial Planning, offshore grid integration, and the development of hybrid energy hubs as critical components for scaling FOW deployment across national boundaries [36]

Beyond Europe, the UK-US Floating Offshore Wind Supply Chain Innovation Bilateral (FLOWB) programme exemplifies the benefits of transatlantic cooperation (LSP Renewables, 2023). Led by the Offshore Renewable Energy (ORE) Catapult and Innovate UK, in partnership with institutions such as the University of Maine and the National Renewable Energy Laboratory (NREL), FLOWB supports the co-development of exportable technologies and strengthens supply chain resilience [37].

Within the UK and across Europe, there is growing recognition of the need for stronger collaboration between developers, research institutions, and supply chain actors. Industry stakeholders have called for the creation of regional innovation clusters, shared testing facilities, and open-access data platforms to improve knowledge transfer and reduce duplication of effort. The establishment of regional training centres is also seen as vital to addressing the skills gap and supporting the long-term growth of the FOW workforce.

By fostering international and intra-European collaboration, the sector can accelerate innovation, reduce costs, and ensure that Europe remains at the forefront of global offshore renewable energy development.

3.2.5 The role of technical standards and certifications

The deployment of floating offshore wind across Europe relies on a robust framework of technical standards and certification schemes to ensure safety, reliability, and performance throughout the project's lifecycle. These standards are crucial for mitigating investment risk, securing regulatory approval, and facilitating cross-border interoperability.

At the international level, the **IEC TS 61400-3-2:2019** standard remains a foundation of FOW design, providing guidance on structural integrity, site-specific conditions, and dynamic loading. This is complemented by ISO standards such as ISO 19904-1 (floating structures) and ISO 12944 (corrosion protection), which are widely adopted across the offshore energy sector [38].

In the UK, these international standards are integrated with national legislation, including the Health and Safety at Work Act 1974 and the Construction (Design and Management) Regulations 2015. These frameworks ensure that safety, environmental protection, and accountability are embedded across all phases of FOW development.

Several classification societies have developed FOW-specific guidance that is widely used across Europe:

- Det Norske Veritas (DNV) standards, such as **DNV-ST-0119 and DNVGL-SE-0422**, provide comprehensive frameworks for certifying floating turbine structures and projects. DNV standards have supported multiple UK initiatives, including Hywind Scotland, the world's first floating wind farm, where their certification facilitated the development of innovative spar-buoy designs and mooring systems [39].

- The American Bureau of Shipping (ABS) has also made significant contributions through its **guidelines for building and classing floating offshore wind turbines (2020),** which have been instrumental in projects such as the Kincardine Offshore Wind Farm in Scotland, which supports its semi-submersible floating platforms. ABS's standards address key areas, including mooring systems, dynamic responses, and fatigue analysis, providing robust criteria for design and certification [40].

- **Lloyd's Register's (LR)** provides additional guidance through its Guidance Notes for Offshore Wind Farm Project Certification (2019), integrating IEC 61400-3-2 and the ISO 19000 series, with LR-specific rules. While not exclusive to floating turbines, these notes cover dynamic cables, station-keeping systems, and grid connections. LR frameworks have supported UK projects, ensuring compliance with national legislation such as the Electricity Act 1989 and the Health and Safety at Work Act 1974 [41].

- Bureau Veritas has contributed with its **BV NI572,** focusing on floating substructures and mooring systems. These standards align with international frameworks, such as ISO 19901-4 and API RP 2SK, ensuring compatibility with oil and gas practices often adapted for FOW applications. BV's guidelines are particularly valuable for novel anchoring systems and load analysis, critical to the UK's floating wind sector [42].

As the FOW sector matures, there is growing recognition of the need for harmonised certification pathways across Europe. The EU's Offshore Renewable Energy Strategy and initiatives such as the Floating Wind Centre of Excellence are working to align standards, reduce certification costs, and support the development of interoperable, modular technologies.

The International Renewable Energy Agency (IRENA) emphasises the importance of such harmonised standards, noting that as of 2023, approximately 270 MW of floating wind capacity had been commissioned globally, with 244 GW in the pipeline. This highlights the sector's significant growth potential and the crucial role of standardised practices in promoting sustainable development [43].

By harmonising global standards from organisations such as IEC, ABS, DNV, BV, and LR with UK-specific regulations, the floating wind industry effectively addresses both technical and regulatory challenges. This integrated framework not only ensures the safety and integrity of FOWs, but also fosters innovation, supporting the UK's leadership in the global offshore wind sector. These standards provide a robust foundation for the development of novel technologies while maintaining compliance and operational excellence.

3.3. Global trends

Building on the analysis of barriers and enablers identified in Sections 3.1 and 3.2, this sub-paragraph examines how selected international markets have approached the deployment of floating offshore wind. The countries included Japan, France and the United States, chosen for their distinctive policy approaches, geographic and market diversity, and relevance to challenges identified in the UK and Europe. Rather than repeating previous analysis, this section highlights distinctive policy models, innovation strategies, and regulatory frameworks that offer transferable lessons for the UK and wider European efforts.

- **Japan** offers insights into Maritime Spatial Planning and auction design in geographies with limited shallow-water potential.
- **France**, as a leading EU member state, provides a useful intra-European comparator, particularly in areas such as public investment, reliability testing, and integration with other marine uses.
- **The United States** demonstrates how federal coordination and innovation funding can support early-stage deployment and supply chain development at scale.

These case studies are not intended to be exhaustive but rather illustrate how different countries have addressed specific challenges, such as auction design, infrastructure readiness, or stakeholder coordination, and provide comparative insights that can inform future policy development. Several regions have implemented distinctive policies to advance floating offshore wind, offering valuable insights for the UK and wider European policy development.

3.3.1 Japan

Japan's approach to FOW reflects strong central coordination and regional engagement, particularly in addressing spatial constraints and market concentration issues, also relevant to Europe's fragmented planning and permitting systems (see Section 3.1.1). Its auction design and industrial coordination offer useful parallels for improving seabed leasing and stakeholder alignment in the UK.

With a unique geography, particularly its steep continental shelf, which limits the deployment of fixed-bottom turbines, floating platforms are a more viable solution. The Japanese government has set a target of 10 GW of offshore wind capacity by 2030 and between 30–45 GW by 2040, with a significant portion expected to come from floating technologies [43].

To advance its offshore wind ambitions, Japan has implemented competitive auction frameworks that promote fair market access and project diversification. Notably, the government has introduced a 1 GW cap per bidder or consortium in recent auctions to prevent market concentration and encourage broader participation [44].

Operational projects such as the 84 MW Noshiro Port Offshore Wind Farm, which began operations in December 2022, mark a significant step in Japan's offshore wind expansion. Developed through a consortium of Japanese companies, it reflects efforts in industrial coordination and local supply engagement. Japan's approach, which combines central government leadership with regional planning and stakeholder collaboration, provides a framework that could inform other nations seeking to integrate floating wind into their energy and industrial strategies [45].

3.3.2 France

France's investment in reliability testing and multi-use platforms aligns with themes discussed in Section 3.1.4 on environmental and social considerations. The integration of floating wind with hydrogen and drone-based inspection technologies also complements the innovation enablers outlined in Section 3.2.3.

With a target of 20 GW of offshore wind capacity by 2050, half of France's capacity will be provided by floating offshore wind. The government has committed over €2 billion to support a 230–270 MW floating wind farm off the coast of Brittany, scheduled for commissioning in 2028 [43].

The Floatgen project, developed by BW Ideol, participated in successful testing that includes, but is not limited to, energy production and its transition to drone-based inspection, as well as future readiness for hydrogen integration. Furthermore, during the severe storm Ciaran that hit Europe in 2023, the other EDF installation, Provence Grand Large, with a 25 MW capacity, showcased the strain that the tension-leg floaters withstood during the storm's peak, providing a good reference for reliability [43]. France is also pursuing smaller 30 MW projects to boost its capability in floating wind projects.

3.3.3 USA

The US strategy demonstrates how targeted federal programmes, such as the Floating Offshore Wind Energy Shot and FLOWIN Prize, can de-risk early-stage investment and support supply chain scaling. These initiatives directly address the funding and investment challenges discussed in Section 3.1.2 and reinforce the importance of anticipatory infrastructure planning highlighted in Section 3.1.3.

The country has emerged as a global frontrunner in floating wind development, with over 6 GW in the pipeline, primarily in deep-water areas off the Pacific coast. Two-thirds of its 2,773 GW offshore wind potential is located in deep waters, which could generate 8,972 TWh annually [43].

In 2022, the Biden-Harris administration launched the Floating Offshore Wind Energy Shot to cut wind energy costs by 70%, targeting $45/MWh by 2035, alongside deploying 30 GW of offshore wind by 2030 and 15 GW of floating wind by 2035. The December 2022 Bureau of Ocean Energy Management auction raised $757.1 million from five leases off the California coast, expected to deliver 4.6 GW [46].

Key US initiatives to advance floating offshore wind include the Department of Energy's ATLANTIS program, which focuses on developing new turbine designs and simulation tools, and the FLOWIN Prize, which supports scalable domestic manufacturing and supply chain readiness. The National Offshore Wind Research and Development Consortium (NOWRDC) also plays a central role by funding R&D projects that strengthen the competitiveness of the US offshore wind sector [47].

4. FROM BARRIERS TO SOLUTIONS: PRIORITISING ENABLERS

This chapter builds directly on the barriers and enabling conditions identified in Chapter 3. While Chapter 3 provided a high-level overview of the structural challenges facing FOW deployment, this chapter focuses on the solutions, the enablers, that can address those challenges. It presents a more detailed, stakeholder-informed analysis of the most critical enablers, showing how each one maps to specific barriers. The enablers were identified through a literature review and validated through stakeholder engagement in the UK.

They were then prioritised based on their potential impact and feasibility. This chapter also introduces a set of indicators to track progress and effectiveness, laying the groundwork for the policy mapping in Chapter 5.

Note that, since the relationship between barriers and enablers is central to this analysis, the enablers are defined as the mechanisms, such as policy, regulatory, financial, or technical, that help overcome barriers to FOW deployment. For instance, grid infrastructure and connectivity are enabler that directly addresses the barrier of transmission bottlenecks.

4.1. Linking barriers to enablers: insights from literature and the UK case study

A complex mix of barriers and enablers shapes the deployment of floating offshore wind across Europe. While the UK serves as a detailed case study in this report, the insights reflect broader European trends and challenges.

4.1.1 What's holding back FOW? A recap of common barriers

Despite growing momentum, FOW deployment remains uneven across Europe due to several persistent challenges, including p**ermitting delays and regulatory fragmentation**, particularly in Southern Europe and the UK. Significant **high capital costs and limited investment certainty**, exacerbated by inflation and inconsistent subsidy frameworks. **Grid infrastructure constraints**, especially at key transmission interfaces, such as those between Scotland and England. **Port infrastructure limitations**, with many European ports lacking the capacity for large-scale FOW deployment. **Environmental and social concerns**, including the impacts on marine biodiversity and community acceptance, as well as **skills shortages**, are affecting the entire FOW value chain.

Figure 6 Key barriers to the deployment of floating offshore wind

Figure 6 shows the common barriers to the deployment of FOW, which could be summarised as follows:

- **Permitting delays and regulatory complexity** leading to fragmented Maritime Spatial Planning (MSP) and lengthy environmental assessments across Southern Europe (e.g., Greece, Italy, Spain). In the UK, despite reforms such as the Offshore Wind Environmental Improvement Package (OWEIP), permitting remains complex and inconsistently applied.
- **Funding and investment uncertainty,** resulting in high capital costs and long development timelines, making FOW highly sensitive to policy signals. While the UK's CfD AR6 introduced higher strike prices, the failure of AR5 highlighted investor caution. Across Europe, inconsistent subsidy schemes and a lack of harmonised investment frameworks further complicate financing.
- **Grid bottlenecks** are a shared concern. In the UK, the Scotland–England transmission interface remains a critical pinch point, despite initiatives like the Holistic Network Design (HND). Similar issues are reported in Spain and Portugal, where grid upgrades lag behind the development of projects.
- **Port infrastructure limitations,** a common issue in many European countries, that lack ports with the quay length, depth, and heavy-lift capacity required for FOW deployment. The UK's FLOWMIS scheme is a step forward, but stakeholders note it is insufficient to meet the scale of need. France's multi-port coordination model offers a useful comparator.
- Across Europe, **environmental concerns and community opposition** can delay projects. The UK's adaptive licensing proposals and community benefit frameworks (e.g., in Scotland) are emerging best practices.

- A shortage of skilled labour is a growing concern across the continent. The UK has identified this as a critical constraint, with calls for **national skills training strategies and regional skills hubs.**

4.1.2. How enablers address existing barriers

Despite these challenges, several enablers are driving progress, including **Government funding schemes** (e.g., CfD in the UK, FER2 in Italy, PERTE ERHA in Spain), **technological innovation**, supported by EU and national R&D programmes; i**nternational collaboration**, through programmes such as Horizon Europe, NSEC, and bilateral initiatives. **Standardisation and certification frameworks** ensure safety and interoperability; strategic planning and coordination are particularly important when aligning seabed leasing, grid planning, and permitting.

In the UK, initiatives like the Offshore Transmission Network Review (OTNR), FLOWMIS, and the Floating Offshore Wind Demonstration Programme exemplify how targeted policy can address structural barriers and accelerate deployment.

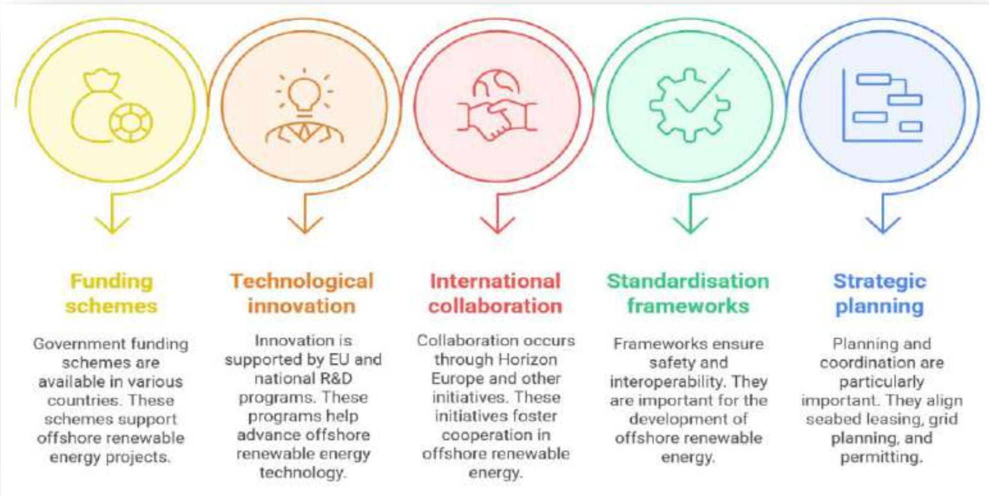

Figure 7 Key enablers to accelerate floating offshore wind deployment

Figure 7 describes the key enablers to accelerate FOW deployment, namely:

- **Public funding mechanisms and policy instruments** such as the UK's CfD scheme (a market-based revenue support mechanism), the FLOWMIS (a capital grant programme), and the Floating Offshore Wind Demonstration Programme (targeted R&D funding) provide financial support and help de-risk early-stage projects. Similar government-backed mechanisms are emerging in other countries, for example, France's €2 billion investment in floating wind infrastructure and Spain's PERTE ERHA programme, which supports renewable hydrogen and offshore innovation.

- **Streamlined permitting processes:** The UK's NSIP reform and digitalisation of consenting processes aim to reduce delays. Other countries, such as Greece and Portugal, are exploring "one-stop shop" models to simplify the approval process.

- **Technological innovation programmes such as** EU-wide R&D programmes (e.g., Horizon Europe) and national initiatives are advancing floating platform designs, mooring systems, and hybrid energy hubs. The UK's innovation funding supports exportable solutions and technology readiness.

- **International collaboration** programmes, such as the North Seas Energy Cooperation (NSEC) and the UK-US FLOWB initiative, promote knowledge sharing, joint planning, and cross-border grid integration.

- **Harmonised technical standardisation** (e.g., IEC, DNV, ABS) **and certification** are critical for investor confidence and cross-border interoperability. The UK integrates these with national safety and environmental regulations.

4.1.3 Implications of UK FOW: insights for other countries

While the barriers and enablers identified in this chapter are relevant across Europe, the UK provides a useful case study. As one of the most advanced floating offshore wind markets in Europe, the UK's experience highlights both the challenges of scaling deployment and the strategic policy responses that can accelerate progress.

Key developments in the UK include **the evolution of the CfD scheme,** which now includes dedicated funding pots for floating wind and higher strike prices to reflect the technology's cost profile and unique challenges associated with FOWs. These targeted mechanisms reduce investment risks, making projects more attractive to developers and encouraging new market entrants. By allocating these funds, resources are channelled towards early-stage and innovative projects, which is essential for scaling up deployment.

The UK has also introduced **measures to strengthen domestic supply chains,** such as incorporating local content considerations into CfD bidding**.** By focusing on **local supply chain development**, the UK can drive economic growth in coastal communities and create sustainable employment opportunities. This approach aligns with the government's broader regional development and may offer a model for other countries seeking to maximise economic co-benefits from FOW deployment.

On the transmission side, initiatives like the Offshore Transmission Network Review (OTNR) and the Holistic Network Design (HND) have aimed **to address grid bottlenecks through more coordinated planning**. **Early collaboration** between the Crown Estate and the National Energy Systems Operator (NESO) has also helped align seabed leasing with grid capacity planning.

Taken together, these examples suggest that a combination of **targeted financial support, strategic infrastructure planning, and supply chain alignments** can help overcome key deployment barriers. While the UK's policy framework continues to evolve, its experience offers valuable insights for other countries seeking to accelerate FOW deployment, drive innovation, stimulate economic growth, and increase competitive global market.

4.1.4 Emerging opportunities: stakeholder-informed ideas for future policy development

In addition to addressing current barriers, stakeholders and literature sources identified a number of forward-looking opportunities that could enhance the long-term success of floating offshore wind. These ideas were raised during Workshop 1 and through comparative analysis of international case studies (see Section 3.3). While not all are direct responses to the barriers outlined in Chapter 3, they reflect areas where proactive policy development could unlock new value, improve resilience, or accelerate deployment.

Targeted policy improvements are essential to sustain and accelerate the growth of FOW. Beyond tackling existing challenges, proactive measures can open new opportunities and secure the sector's long-term success.

Stakeholders noted that current licensing frameworks are often rigid and time-consuming (see Section 3.1.1). **One proposed solution was the adoption of adaptive licensing practices**, where requirements evolve based on project milestones and environmental monitoring. This approach, used in other offshore sectors such as aquaculture, could help reduce delays while maintaining environmental safeguards.

In response to concerns about curtailment and grid congestion (Section 3.1.3), some stakeholders **suggested exploring the co-location of FOW with hydrogen production,** where excess wind energy generated during periods of grid curtailment can be used to produce green hydrogen, which can then be stored and utilised across industries, transport, and heating. This approach improves the project economics and supports the decarbonisation goals. Initiatives like HyDeploy and the Orkney Islands' hydrogen projects demonstrate the potential of incorporating hydrogen systems into renewable energy frameworks.

As extreme weather events become more frequent, **resilience standards for FOW infrastructure** are critical. Floating platforms, being more exposed than fixed-bottom turbines, require advanced materials, dynamic mooring systems, and real-time monitoring technologies to withstand harsh marine conditions. While international standards such as IEC TS 61400-3-2 provide a foundation, UK-specific guidelines tailored to the North Sea's unique challenges would further enhance resilience and reliability.

To address grid bottlenecks and fragmented planning (Section 3.1.3), participants highlighted the potential for **zonal grid planning,** similar to Germany's integrated offshore grid strategy. This could significantly decrease congestion, simplify connections, and reduce delays.

Combining wind, solar, and hydrogen production in a single offshore platform offers a promising route to optimise resource use and enhance system flexibility. The North Sea Wind Power Hub is a leading example of this approach, **demonstrating the potential of multi-energy platforms** to support cross-border energy distribution and the integration of green hydrogen.

Co-funded by the European Union

Co-locating FOW with aquaculture, marine conservation, and shipping can maximise the value of marine space. Countries like Norway and Denmark have already trialled such models. The UK and Europe could adopt similar policies by embedding multi-use requirements into seabed leasing and permitting frameworks.

Continued engagement in programmes such as Horizon Europe, the North Seas Energy Cooperation (NSEC), and bilateral agreements will be essential to drive innovation, reduce costs, and align regulatory frameworks. These **partnerships position** the UK and Europe to remain at the forefront of global FOW development.

Building public support through clear communication of the economic and environmental benefits of FOW is vital. At the same time, **investment in training programmes and regional skills hubs** will be necessary to develop a workforce capable of meeting the sector's growing demands.

These ideas represent emerging areas of interest rather than formal recommendations. They reflect stakeholder aspirations and international best practices that could inform future policy development. Where appropriate, selective proposals are carried forward into Chapter 6 for further consideration.

Table 1Table 4 highlights how each strategic idea aligns with identified barriers and enablers.

Table 4 FOW opportunity mapping

Characteristic	Barrier	Enabler
Adaptive licensing	Permitting delays, regulatory complexity	Streamlined permitting
Green hydrogen co-location	Grid congestion, curtailment	Infrastructure integration, innovation
Resilience standards	Environmental, technical risks	Technology innovation, reliability
Zonal grid planning	Grid connection delays, fragmented planning	Grid infrastructure, coordination
Multi-energy platforms	Limited system flexibility, integration	System-level innovation
Co-location with activities	Marine space competition, stakeholder conflict	Marine spatial planning, multi-use design
Collaboration and R&D	Fragmented R&D, policy alignment	International cooperation, innovation funding
Public engagement	Social acceptance, workforce gaps	Community engagement, skills investment

4.2. Validation of enablers as solutions to deployment barriers (Workshop 1)

This section builds on the barrier-enabler framework introduced in Chapters 3 and 4.1 by presenting the results of the first stakeholder workshop, which focused on validating and refining the enablers identified through the literature review. These enablers are not standalone ideas, but they are **direct**

responses to the barriers outlined earlier in the report. For example, grid infrastructure and connectivity address transmission bottlenecks, while community engagement responds to social acceptance challenges.

The workshop aimed to ensure that the final set of enablers reflects real-world deployment needs and is grounded in stakeholder experience. Participants were invited to review, revise, and prioritise the enablers based on their potential to overcome specific barriers and accelerate the deployment of floating offshore wind.

The workshop was UK-oriented. However, the presented insights will capture the general challenges and opportunities for the sector across Europe. This approach ensured that the final set of enablers was based on actual experience and aligned with real-world deployment needs.

Stakeholders were allowed to contribute additional enablers that they believed were not already included and then prioritised all proposed enablers according to their perceived impact and required effort. This bottom-up approach ensured the enablers would truly reflect the experiences of industry, government, and research. Importantly, the results from this workshop directly informed the policy scoping and effectiveness review conducted in Workshop 2.

4.2.1 Initial enablers from literature review

The following list represents an initial set of enablers identified through the literature review, including government policies, industry publications, and academic studies. These were not intended as a final framework but as a starting point for stakeholder validation. Each enabler, listed in Table 5 below , was linked to one or more barriers identified in Chapter 3 and served as a basis for discussion in Workshop 1.

Table 5 Initial Set of Enablers for Floating Offshore Wind Deployment

Enabler	Rationale
Planning, Permitting, and Consenting	Reducing delays and complexity in project approvals.
Compliance Costs	Lowering costs to improve project viability and investor confidence.
Connectivity Timelines	Ensuring timely grid connections to avoid deployment delays.
Planned Capacity	Providing market certainty and clearer investment signals.
Grid Capacity	Upgrading infrastructure to handle additional FOW generation.
Improvements to Port Infrastructure	Enabling efficient assembly, staging, and deployment of FOW assets.
Extra CfD Revenue Support (Supply Chain Investment)	Incentivising supply chain growth and early-stage investment.
Investment in Port Upgrades	Addressing physical and logistical barriers to deployment.
Cost Reductions	Making FOW more competitive through innovation and scale.
Technology Readiness Level (TRL)	Ensuring technologies are mature and commercially deployable.

4.2.2 Stakeholder Revision and Additions

During Workshop 1, stakeholders reviewed the initial list and proposed revisions based on their operational and policy experience. Several enablers were merged, reworded, or removed to better reflect deployment realities. New enablers were also introduced to capture overlooked but critical areas such as skills development and community engagement. Table 6 highlights the eight enablers, validated by stakeholders and forming the foundation for the policy mapping and recommendations in Chapters 5 and 6. Each enabler addresses one or more barriers identified in Chapter 3. More information on the key revision and rationale can be found in Table 12 in the Annex section.

Table 6 Final sets of enablers and descriptions

Revised Enabler
Planning, Permitting, and Consenting.
Electricity Network and Grid Infrastructure.
Port Infrastructure.
Supply Chain Development.
Standardisation and Readiness.
Innovation and R&D.
Skills.
Community, Environmental Impact & Social Value.

4.2.3 Prioritisation Exercise

To assess the importance of each enabler and the possibility of implementation that could bring the most benefit, stakeholders participated in prioritising the enablers using a High/Low Impact versus High/Low Effort matrix. This approach helped pinpoint areas that could offer significant benefits to floating offshore wind deployment (e.g., the quick wins) within the given context, considering political and resource constraints, as well as their achievability within current policy and resource constraints, and their long-term strategic value.

The definitions below were provided to guide the exercise:

- **High Impact**: Significantly accelerates FOW deployment.
- **Low Impact**: Has low influence on FOW deployment.
- **High Effort**: Requires significant time, resources, policy changes, infrastructure, etc.
- **Low Effort**: Can be implemented with minimal time, resources, or infrastructure.

The exercise was conducted using MURAL, a visual collaboration tool that allowed participants to map each enabler within a matrix based on its potential impact and effort required for implementation. This process provided a clear visual overview of where policy and industry efforts could be most effectively directed, whether toward low-effort, high-impact opportunities that could be quickly realised, or towards more complex, high-impact challenges that would require more sustained investment and coordinated action.

The results informed the final selection of enablers for further policy mapping and effectiveness assessment in Workshop 2.

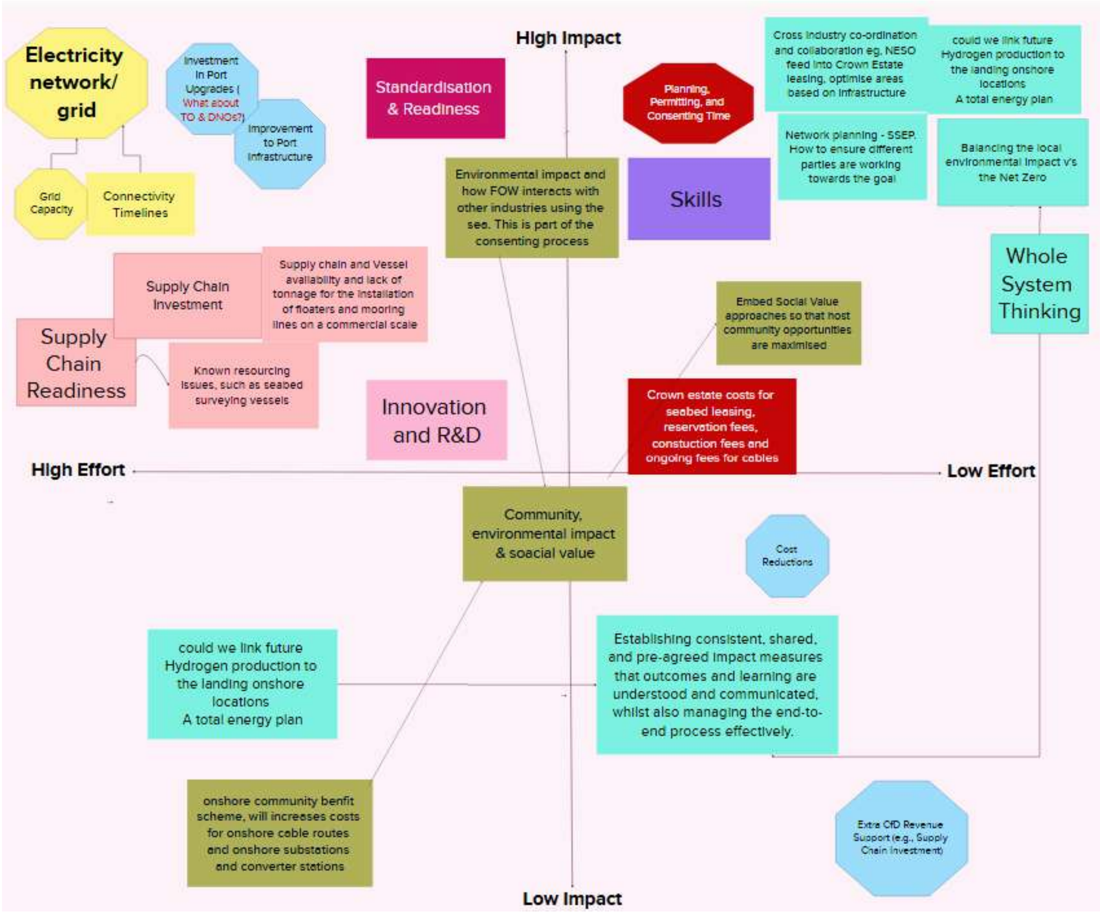

Figure 8 Figure 8 Stakeholder Prioritisation of Enablers - Impact vs Effort Matrix

4.2.4 Final set of enablers

Following the prioritisation, eight enablers were agreed upon as the most critical for accelerating FOW deployment. The group reflected a strong consensus across industry and research participants, who considered these areas the most critical to enabling progress. These enablers reflect a balance of strategic planning, infrastructure readiness, innovation, and social value. They form the foundation for the policy mapping and gap analysis in Workshop 2 and are presented in Chapter 5.

Table 7 below summarises each enabler and its focus.

Table 7 Final Set of Enablers and Descriptions

Enabler	Description
Strategic Planning & Coordination	Coordinated planning across leasing, infrastructure, and policy to reduce delays and improve delivery certainty.
Supply Chain Optimisation	Ensuring the availability and efficiency of vessels, components, and logistics to meet deployment needs.
Grid Infrastructure & Connectivity	Addressing grid capacity and connection timelines to support the timely integration of FOW projects.
Port Development & Investment	Upgrading ports to support the construction, assembly, and deployment of floating offshore wind assets.

Standardisation & Operational Readiness	Aligning design, performance, and operational standards to streamline delivery and reduce risks.
Innovation & Research Development	Supporting new technologies and scaling through targeted funding and ongoing R&D.
Skills Development & Workforce Planning	Building the workforce through skills deployment and long-term capacity planning.
Community Engagement & Social Value	Ensuring local benefits and mitigating environmental and social impacts associated with FOW deployment.

4.3 Prioritising strategic enablers and defining indicators for deployment readiness

This section presents the final prioritisation of the strategic enablers and introduces a set of indicators designed to measure deployment readiness. These indicators help track whether enabling conditions are met and whether policy interventions are having the intended impact. The prioritisation and indicator development were both conducted during Workshop 1, as part of a single integrated activity.

Note that indicators are measurable factors used to assess progress toward deployment goals. For example, planning approval time reflects the effectiveness of permitting reforms, while grid connection approval time tracks the readiness of infrastructure. These indicators were developed to align with the enablers and provide a practical framework for evaluating the effectiveness of policies.

4.3.1 Ranking of strategic enablers based on stakeholder input

Building on the refined list of enablers from Section 4.2, stakeholders were asked to assess each enabler based on its potential impact on the deployment of FOW. This prioritisation exercise helped to distinguish between foundational enablers, those that must be addressed early to unlock wider progress, and those that, while important, may have a more indirect or longer-term influence.

The ranking of the enablers presented in Figure 9 is based on a thorough analysis of stakeholders. insights gathered in Workshop 1. Participants provided valuable input regarding the perceived impact of each enabler on accelerating the deployment of FOW. Building on this feedback, the enablers were systematically evaluated and prioritised.

Figure 9 Prioritisation of Strategic Enablers

The results reflect a strong consensus around the 3 top enablers:

- Strategic planning and coordination.
- Grid infrastructure and connectivity.
- Port development and investment.

These were seen as essential to enabling timely deployment, reducing uncertainty, and ensuring infrastructure readiness. Other enablers, such as **community engagement and social value**, were recognised as important for long-term sustainability and public acceptance but were perceived to have a more limited immediate impact on deployment speed.

This prioritisation provides a clear framework for focusing policy and investment efforts where they are likely to have the greatest effect.

4.3.2 Key indicators for measuring deployment readiness

Alongside the enabler prioritisation, key indicators were also ranked to highlight the most critical factors influencing the successful deployment of floating offshore wind, as shown in Figure 10 below. Each indicator was assessed using a five-point scale from 1 to 5 with 5 indicating indicators essential for deployment, 4 as a significant accelerator, and 3 to 1 reflecting supportive or marginal roles.

Strategic Planning and Coordination	Grid Infrastructure and Connectivity	Port Development and Investment	Supply Chain Optimisation	Standardisation and Operational Readiness	Innovation & Research Development	Skills Development and Workforce Planning	Community Engagement and Social Value
Planning Approval Time (Rating: 5) Directly measures planning efficiency and is critical for ensuring FOW projects stay on schedule.	Grid Connection Approval Time (Rating: 5) Directly measures the efficiency and is vital for quickly connecting offshore wind projects.	Investment in Port Infrastructure (Rating: 5) Essential capital investment to ensure that ports are equipped for large-scale FOW installations and handling.	Domestic Sourcing & Material Availability (Rating: 5) Critical for ensuring key components are locally available and reducing dependency delays in the supply chain.	Regulatory Consistency and Predictability - (Rating: 5) This indicator provides a stable framework, reducing uncertainty and aligning developers on consistent, streamlined process.	R&D Investment Amount - (Rating: 5) Reflects the financial commitment driving breakthroughinnovations and long-term FOW competitiveness.	Workforce Growth Rate - (Rating: 5) A strong increase in workforce numbers is essential to meet the scaling demands of FOW projects.	Social Value Integration - (Rating: 5) Ensures mandatory inclusion of social value measures directly embeds community benefits into each project.
Existence of a Long-Term Dedployment Roadmap (Rating: 5) Provides strategic direction and alignment across stakeholders, essential for hitting the 2030 FOW target (5 GW)	Grid Capacity Expansion (Rating: 5) Critical to ensure that sufficient capacity is available to support new offshore wind installations.	Port Upgrades and New Facilities (Rating: 5) Directly reflects proactive developmement measures tailored to offshore wind deployment.	Vessel Availability and Readiness (Rating: 5) Essential for timely installations, any delays in specialised vessels can stall the overall project progress.	Industry-Wide Technical Standards - (Rating: 5) Establishes uniform, consensus-based criteria that ensures inter-operability and accelerate industry scaling.	Technology Readiness Level - (Rating: 5) Directly measures how close FOW technologies are to commercial deployment, ensuring practical readiness.	Existence of Dedicated Training Programs - (Rating: 5) Quality, targeted training initiatives ensures the workforce is equipped with industry-specific skills from the outset.	Local Acceptance / Objection Rate - (Rating: 4) Measures the share of resident who either support or object to project consent. A high acceptance is critical as it shortens timelienes and lowers litigation risk.
Long-Term Financial & Policy Stability for Investors (Rating: 4) Builds confidence in the sector, reducing perceived risk and attracting necessary investment.	Integration Success Rate (Rating: 4) This reflects the overall effectiveness of grid integration, highly important but dependent on capacity and timing.	Port Capacity Utilisation (Rating: 4) Indicates improvements in cargo and vessel throughput along with operational efficiency, though it depends on existing capacity levels.	Supply Chain Partnership Count (Rating: 4) Reflects strong domestic supplier relationships, this is key for reliability, though its less direct than sourcing or vessel readiness.	Certification and Testing Framework - (Rating: 4) Ensures robust, standardised verification of technologies, enhancing reliability, though this builds on established standards.	Commercialisation Rate - (Rating: 4) Indicates successful transition from pilots to market-ready solutions, which is key for scaling up.	Apprenticeship and Traineeship Uptake - (Rating: 4) A high uptake signals successful integration of new talent, crucial for long-term sector sustrinability.	Local Job Creation - (Rating: 4) Tangible local employment supports community prosperity and fosters long-term regional benefits.
Reduction in Permitting Delays (Rating: 4) Addresses a key bottleneck, fewer delays mean faster progress on crucial project milestones.	Investment in Grid Upgrades (Rating: 4) This indicates financial commitment toward necessary infrastructure improvements, supporting long-term project viability.	Heavy-Lift Quay Capacity (Rating: 4) Essential for assembling and loading large floating foundations, currently only a few ports currently meet required lift limits so impact is high but not critical.	Lead Time Reduction (Rating: 4) Demonstrates improvements in delivery efficiency, shorter lead times can significantly enhance project timelines.	Compliance Rate - (Rating: 4) Directly measures adherence to essential technical, safety, and operational standards across projects.	Collaborative Research Partnerships - (Rating: 4) Strong collaborations can accelerate progress by combining industry, academia, and government expertise.	Skill Transition Rate - (Rating: 4) Facilitates rapid industry expansion by leveraging expertise from related sectors like oil and gas.	Community Benefit Funding - (Rating: 4) Direct investment in community projects provides measurable economic and social returns for local areas.
Milestone Achievement Rate (Rating: 3) Good measure of real-time progress but it potentially overlaps with approval time and permitting indicators.	Deployment of Smart Grid and Energy Storage Solutions (Rating: 3) Enhances grid stability and flexibility, though its direct impact on connection speed is secondary.	Shoreside Grid & Charging Capacity (Rating: 3) Enables electric/hybrid vessels and yard power, thereby improving long-term efficiency, but has less immediate influence on concstruction schedule.	Local Manufacturing Capacity & Export Growth (Rating: 3) Indicates growth in domestic production and competitiveness, supporting the long-term industry availability and export potential.	Commissioning Time - (Rating: 3) Indicates operational readiness, though it can be influenced by external factors beyond standardisation.	Number of Innovation Projects - (Rating: 3) Provides insight into R&D activity levels, although high volume does not always equal high impact.	Training Program Effectiveness - (Rating: 3) While important for long-term quality, its impact depends on existing training quality and scale.	Workforce Diversity & Inclusion - (Rating: 3) Tracks the proportion of jobs filled by under-represented groups in project host communities. This is important for fair social value, but less influence on project timelines.
Regulatory Harmonisation Actions (Rating: 3) Streamlines processes across agencies, but this tend to be an ongoing effort rather than a core metric.	Floating Offshore Wind Curtailment Rate (Rating: 3) Tracking curtailment can help to cut wasted generation and flag grid constraints but its influence on connection speed and capacity is moderate.	Local Supply Chain Integration (Rating: 3) Important for enabling domestic links, but its impacts is less direct on physical port readiness.	Investment in Supply Chain Infrastructure (Rating: 3) Shows financial commitment to infrastructure upgrades, while this is important, its impact is indirect compared to operational metrics.	Grid Connection On-Time Rate - (Rating: 3) Reflects efficiency in connecting to the grid but this is partly dependent on broader grid infrastructure improvements.	Patent and IP Generation - (Rating: 3) Measures innovative outputs an proprietary advancements, supporting long-term competitive advantage.	Geographic Distribution of Training Hubs - (Rating: 3) Ensures accessibility across regions, though its immediate effect is more supportive than transformational.	Community Engagement Frequency - (Rating: 3) Total funding or percentage of project revenue allocated towards local community investment.

Figure 10 Prioritisation of Key Indicators

The prioritisation focused on identifying which indicators directly support deployment timelines and project delivery. Those rated highest, such as Planning Approval Time, Grid Connection Approval Time, and Investment in Port Infrastructure, were considered essential for progress. Lower-rated indicators still added value but were seen as less critical to near-term deployment.

4.3.3. Summary and link to policy mapping

The prioritisation of enablers and indicators presented in this chapter provides a clear, stakeholder-informed foundation for evaluating the current effectiveness of policy. By identifying which enablers are most critical to accelerating the deployment of floating offshore wind and which indicators best reflect progress, this framework ensures that subsequent analysis is both targeted and actionable.

The top-ranked enablers, such as strategic planning and coordination, grid infrastructure and connectivity, and port development and investment, highlight the structural and systemic changes needed to unlock large-scale deployment. Meanwhile, indicators such as planning approval time and grid connection approval time provide measurable benchmarks for assessing whether policy interventions are achieving their intended results.

These insights directly inform the policy mapping and gap analysis in Chapter 5, where existing European and UK policies are assessed against the prioritised enablers. This approach ensures that recommendations are grounded in both evidence and stakeholder consensus, supporting a more coordinated and effective policy environment for FOW.

5. ASSESSING STRATEGIC ENABLERS AGAINST EXISTING POLICIES

5.1. Initial policy mapping and assessment

This section outlines the initial policy mapping exercise undertaken to evaluate how well existing UK policies align with the eight strategic enablers identified and prioritised in Workshop 1. The purpose of this exercise was to establish a baseline understanding of current policy coverage and identify potential gaps that could hinder the deployment of floating offshore wind.

The mapping focused on policies that directly support or influence the enablers, drawing from both national and devolved frameworks. These included key instruments such as the Contracts for Difference (CfD) scheme, the Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS), the Offshore Wind Sector Deal, and Maritime Spatial Planning strategies in Scotland and Wales.

Each policy was evaluated using three key criteria:

- **Importance**: Does the policy directly address a key barrier or enabler for FOW deployment?
- **Impact**: What is the expected influence of the policy on accelerating deployment?
- **RAG Rating**: A red-amber-green system used to assess alignment:
    - **Green**: strong alignment and evidence of effective delivery.
    - **Amber**: partial alignment or uncertainty in implementation.
    - **Red**: limited or no meaningful support; significant policy gaps.

Only policies with a clear and direct link to the objectives or indicators of each enabler were included in the mapping. High-level strategies without defined delivery mechanisms were noted but not assessed in detail.

It is important to note that this mapping reflects the best available information at the time of review. Given the dynamic nature of policy development, some documents were under consultation or pending updates. This made the stakeholder validation process in Workshop 2 particularly valuable, ensuring that the analysis remained current and grounded in practical experience.

The results of this initial mapping provided the foundation for the more detailed validation and gap analysis presented in the following sections.

5.2. Stakeholder validation of policy alignment (Workshop 2)

Following the initial policy mapping exercise, a second stakeholder workshop was conducted to validate the findings and assess the effectiveness of current UK policies in supporting the deployment of floating offshore wind. This workshop focused on the four highest-priority enablers identified in Chapter 4 and aimed to identify critical policy gaps and opportunities for improvement.

5.2.1 Workshop Objectives and Evaluation Criteria

The primary objective of Workshop 2 was to evaluate the alignment between existing UK policies and strategic enablers for FOW deployment. Stakeholders were asked to review the initial policy mapping outputs, identify any missing or overlooked policies and assess the effectiveness of current policies using the structured Red Amber Green (RAG) framework within MURAL. This exercise helped surface both areas of clear policy support and those where further action is needed. This structured approach ensured consistency across assessments and enabled a focused discussion on the most pressing policy needs.

5.2.2 Stakeholder Identification of Missing Policies

As part of the validation process, stakeholders were asked to review the initial mapping of policies and identify any core policies they believed were missing. The purpose of this exercise was to ensure that all relevant policy considerations were captured and to provide participants with an opportunity to suggest possible actions that they believed might help reinforce the enablers.

Using MURAL, participants added these suggestions as digital sticky notes under each category of enablers. These contributions reflected real-world deployment challenges and emerging policy needs.

The resulting tables (Tables 8-11) below present both the initial mapped policies and those additional policies proposed by stakeholders, offering a more complete picture of the UK's policy landscape for FOW.

Table 8 shows the key UK policies that support strategic planning and coordination for FOW. It brings together core national frameworks, such as the Offshore Wind Sector Deal and the British Energy Security Strategy, along with additional policies suggested by stakeholders. These include long-term climate targets, marine planning laws, grid investment schemes, and proposals like CfD non-price criteria. Together, they help build a more joined-up and clearer approach to tolling out FOW across the UK.

Table 8 Strategic Planning & Coordination

Initially Mapped Policies	Additional Policies Suggested by Stakeholders
Offshore Wind Sector Deal (2019)	Climate Change Act 2008
Clean Power 2030 Action Plan	Marine Spatial Planning Act (2016)
British Energy Security Strategy (BESS)	Carbon Budget
Contracts for Difference Scheme (CfD)	CfD non-price criteria (for planning/coordination)
Offshore Wind Environmental Improvement Package (OWEIP)	ASTI (Accelerated Strategic Transmission Investment)
Planning and Infrastructure Bill	LOTI (Large Onshore Transmission Investments)
Scottish Government's Sectoral Marine Plan for Offshore Wind Energy	RESP (Regional Energy Strategic Plan)
	SSEP (Strategic Spatial Energy Plan)

Table 9highlights the key UK policies and processes that shape grid infrastructure and connectivity for floating offshore wind. It includes core frameworks such as the Offshore Transmission Network Review, the National Policy Statement EN-5, the Great Grid Upgrade, and major laws like the Electricity Act and the Planning Act.

Additionally, stakeholder input provided important details, including the role of Development Consent orders, key technical standards, price control mechanisms such as RIIO, grid connection reforms, and environmental checks, such as the Habitats Regulations. Together, these guide how grid projects for FOW are planned, approved, and delivered.

Table 9 Grid Infrastructure & Connectivity

Initially Mapped Policies	Stakeholder Suggested Policies
Offshore Transmission Network Review (ONTR)	DCO (Development Consent Order) process for nationally significant infrastructure (Under Planning Act 2008).
National Policy Statement for Electricity Networks Infrastructure (EN-5)	SQSS (National Electricity Transmission System Security and Quality of Supply Standard).
The Great Grid Upgrade	ESQCR (Electricity Safety, Quality and Continuity Regulations).
Planning and Infrastructure Bill	RIIO (Revenue = Incentives + Innovation + Outputs) network price control framework.
Electricity Act 1989	Grid Connection Queue reform initiatives (e.g., TMO4+).
Planning Act 2008	Habitats Regulations Assessment (HRA) process.
	Long-term (e.g., 10-year) strategic grid infrastructure plans.

Table 10 outlines key UK policies and initiatives that support the development of ports for floating offshore wind. Core schemes, such as FLOWMIS and the British Energy Security Strategy, provide funding and strategic direction. Stakeholder suggestions contribute to this with initiatives such as the Clean Industry Bonus, which supports port and manufacturing investment through CfD incentives, and the Celtic Freeport, part of the Freeports Programme, offering tax benefits to attract Foreign Direct Investment (FDI). The 2024 Industrial Growth Plan also highlights the need for strong port infrastructure and calls for a dedicated delivery body. Together, these efforts aim to attract investment and ensure UK ports are ready for FOW deployment.

Table 10 Port Development & Investment

Initially Mapped Policies	Stakeholder Suggested Policies
Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS)	Clean Industry Bonus (CIB) (Mechanism within CfD AR7, formerly Sustainable Industry Rewards).
British Energy Security Strategy (BESS)	Freeports Programme (e.g., Celtic Freeport, including Port Talbot, aligning with CIB criteria for deprived areas).
	2024 Offshore Wind Industrial Growth Plan (IGP).

Table 11 outlines key UK policies that support the development of the supply chain for floating offshore wind. Frameworks like the Offshore Wind Sector Deal, FLOWMIS, and CfD supply chain plans provide the foundation for investment and local content. Stakeholders suggested that additions could expand on this with targeted funding, such as The Crown Estate's Supply Chain Accelerator and GIGA, as well as broader strategies like the 2024 Industrial Growth Plan to boost UK manufacturing. Other inputs include regional planning. Local content in leasing, upcoming carbon pricing (CBAM), and SME support via programmes like Launch Academy and F4OR. Even grid-focused policies, such as RIIO, can help by improving market certainty. Together, these efforts aim to grow and strengthen the FOW supply chain.

Table 11 Supply Chain Optimisation

Initially Mapped Policies	Stakeholder Suggested Policies
Offshore Wind Sector Deal (2019)	The Crown Estate (TCE) Supply Chain Accelerator.
Offshore Wind Net Zero Investment Roadmap	2024 Offshore Wind Industrial Growth Plan (IGP).
Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS)	UK Carbon Border Adjustment Mechanism (CBAM) (from 2027).
Contracts for Difference (CfD) Scheme	Regional Development Planning & Initiatives.
Offshore Wind Policy Statement	Local content/supply chain development commitments (linked to Seabed Leasing).
Supply Chain Plan Requirements under the CfD Scheme	RIIO network price controls (indirect influence on market certainty).
	Strategic government support for the maritime sector.
	ORE Catapult Launch Academy.
	ORE Catapult Fit 4 Offshore Renewables (F4OR) programme.
	Green Industries Growth Accelerator (GIGA) funding.

5.2.3 RAG Assessment and Critical Policy Gaps

Stakeholders then evaluated the effectiveness of the current UK policy for each of the four top priority enablers. The evaluation during Workshop 2 was structured around two guiding questions posed to stakeholders for each key enabler:

- Question 1: *"Do the combined policies provide sufficient support to facilitate the enabler?".*
- Question 2: *"What gaps or limitations in current policy might slow progress or delivery?".*

The following paragraphs summarise the RAG assessment outcomes, critical policy gaps and several key insights from stakeholders:

Strategic planning and coordination rated largely Red and Amber due to fragmented strategies and a lack of holistic coordination. While initiatives like ASTI were seen as promising, stakeholders called for a more integrated, long-term national strategy tailored to FOW, with one stakeholder noting the absence of "holistic coordination" as a major issue.

Furthermore, persistent delays in development timelines were flagged, with some pointing to the 2019 Security Strategy's goal of reducing consent times, which many felt is still far from being reached.

Several emerging strategies, such as Centralised Strategic Network Plan (CSNP), SSEP, and RESP, were viewed as promising but incomplete. This suggests that while new plans are emerging, their impact and effectiveness have yet to be fully realised. One participant also warned that focusing on 2030 targets, such as Clean Power, may risk sidelining longer-term goals, including Net Zero by 2050, which are more relevant to FOW.

Some positive examples were acknowledged with programmes like ASTI highlighted as offering greater clarity and support for enabling infrastructure, earning a green rating. Overall, the feedback highlights a need for a more integrated and long-term strategy that is clearly aligned with the specific needs of FOW and supported by stronger coordination across the government.

Grid infrastructure and connectivity: Stakeholder feedback highlighted major concerns around grid readiness for FOW, with most responses falling in the Red rating. A key issue was the weak regulatory oversight, insufficient investment incentives, and lack of alignment between planning and physical grid constraints. , with one stakeholder calling for Ofgem to take a firmer role with licenses. Others stressed that current planning overlooks physical grid constraints, such as substation limits, warning that "the network is not infinite."

Another major gap was the limited investment appetite from transmission companies, which stakeholders felt was misaligned with the scale of infrastructure needed. The lack of progress on workforce skills and readiness was also flagged as a critical barrier to delivery.

Moreover, Amber-rated feedback acknowledged recent planning reforms as a positive step but warned of potential local pushback. As with Strategic Planning and Coordination, uncertainty was also noted regarding emerging strategies such as CSNP, SSEP, and RESP. ASTI was also mentioned as a green area, offering greater certainty for key transmission projects.

In conclusion, stakeholders have called for stronger regulation, clearer planning around grid limits, better investment incentives, and urgent action on workforce development, while ensuring that planning reforms are balanced with local engagement.

Port development and investment are also rated Red. Stakeholders expressed strong concern about the current scale and delivery of support for port infrastructure. A major issue was the limited scope of public funding, as seen in FLOWMIS, for instance, which was deemed insufficient, with one comment noting that "it only pays for about 100m of dock", far short of what is needed. Participants also highlighted a lack of incentives to unlock private investment, noting the reliance on industry without adequate de-risking measures.

In addition, operational readiness was another red flag. As ports scale up and electrify to support FOW, stakeholders stressed the need for grid planning to account for the significant new energy loads, which is an area that's currently overlooked.

Some policies were viewed more naturally, receiving Amber ratings. Strategies like the Offshore Wind Net Zero Investment Strategy set out broad assumptions, but stakeholders felt the delivery side remains unclear. Tools like the Clean Industry Bonus were seen as helpful but indirect investments in port-adjacent supply chains rather than core infrastructure.

However, there were Green signals. FLOWMIS itself was welcomed as a step in the right direction, and Freeports such as the Celtic Freeport were seen as promising investment platforms. The 2024 Offshore Wind Industrial Growth Plan was noted positively for recognising port development as critical and proposing a delivery body.

Overall, stakeholders called for significantly larger, more coordinated investments in port upgrades, alongside better integration of port energy needs into national infrastructure planning, to fully prepare UK ports for floating offshore wind.

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Supply chain optimisation received a mixed rating. While the 2024 Offshore Wind Industrial Growth Plan (IGP), like the Crown Estate's Supply Chain Accelerator GIGA and ORE Catapult's F4OR and Launch Academy, were welcomed, concerns remained about demand uncertainty, weak reinforcement of local content rules, and slow progress on infrastructure and vessel availability.

However, several Red concerns emerged. Stakeholders cited a lack of demand certainty, exacerbated by recent market events, including the cancellation of Ørsted's 2.4 GW Hornsea 4 project in 2025. The decision, driven by rising supply chain costs, interest rates, and delivery risks, highlighted the fragile economics underpinning large offshore wind projects. This has further shaken investors' confidence and added to the uncertainty around the long-term project pipeline.

Amber-rated policies showed promise but face delivery and scale challenges. While funding schemes like FLOWMIS and GIGA exist, their combined reach may not be enough to drive the large-scale investment needed. CfD supply chain plans and local content requirements were viewed as partially effective so far, with concerns about weak enforcement, infrastructure gaps, especially in areas like installation vessels and port readiness, were also flagged, with progress seen as slow.

Overall, while the strategic direction is clear, stakeholders emphasised the need for stronger demand signals, greater investment certainty, faster scaling of UK manufacturing, and more local content enforcement to build a resilient and competitive FOW supply chain.

5.2.4 Stakeholder suggested solutions and recommendations

Following the identification of policy gaps in Workshop 2, stakeholders proposed a range of practical and strategic recommendations to strengthen the UK's policy framework for FOW. These suggestions were specific and many pointed towards broader thematic areas for improvement. This section reflects both immediate needs and longer-term priorities and is grouped into these key thematic recommendations, highlighting the actionable and practical measures put forward:

Enhanced strategic planning, coordination, and policy cohesion: Stakeholders emphasised the need for a more integrated and forward-looking approach to FOW deployment. Key recommendations included:

- Reform the CfD scheme to better align with strategic FOW objectives, including clearer links to infrastructure and supply chain development.
- Enhancing coordination with National Energy Systems Operator (NESO) to ensure grid planning anticipates future FOW capacity and connection needs.
- Embedding FOW port electrification and grid connection requirements into national and regional grid development strategies.
- Develop a National Strategic Port Plan specifically for FOW, aligned with industrial strategy and deployment targets.

Scale-up investment and de-risking mechanism: To unlock private capital and accelerate infrastructure readiness, stakeholders called for:

- Increased public funding for strategic port upgrades, building on but going beyond FLOWMIS.
- Introduction of new public-private partnership models and financial de-risking tools (e.g. sovereign guarantees, blended finance).
- Adjustments to regulatory frameworks such as RIIO to enable earlier procurement of grid infrastructure and improve supply chain certainty.

Address skills and workforce gaps: A recurring concern was the shortage of skilled labour across the FOW value chain. Stakeholders recommended:

- A UK-wide action plan to address skills shortages across all phases of FOW deployment.
- Greater collaboration between government, industry, and education providers to deliver targeted training, apprenticeships, and reskilling programmes.
- Establishment of regional skills hubs to support local employment and supply chain resilience

Enhancing local content and supply chain development: To maximise domestic economic benefits and build a competitive FOW sector, stakeholders proposed:

- Strengthening policies that support UK-based manufacturing and services.
- Enforcing local content requirements more effectively within CfD and seabed leasing processes.
- Providing clearer demand signals to stimulate investment in UK supply chain capacity.

5.2.5 Summary of Key Insights and Policy Implications

The UK remains a global leader in floating offshore wind, with the largest project pipeline in Europe and a strong foundation of policy instruments, including the Contract for Difference (CfD) scheme, the Offshore Transmission Network Review (OTNR), the 2024 Offshore Wind Industrial Growth Plan (IGP), ASTI, Freeports, and the Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS). These initiatives have positioned the UK at the forefront of early-stage deployment and innovation.

However, stakeholder feedback gathered through Workshop 2 highlighted that **continued leadership will depend on addressing several persistent and systemic challenges**. While the UK has made significant progress, the following insights reflect areas where further action is needed to maintain momentum and ensure long-term competitiveness. a comprehensive view of the strengths and weaknesses in the UK's current policy framework for FOW. While several positive developments were acknowledged, such as participants also identified a number of persistent and systemic challenges that must be addressed to enable large-scale deployment.

The key insights are summarised below:

- **Coordination gaps in national strategy:** Stakeholders noted that, while the UK has many strong initiatives, these are not always aligned under a unified, FOW-specific national strategy. Better integration across seabed leasing, grid planning, port developments, and supply chain support would enhance delivery with efficiency.

- **Investment scale and certainty:** Public funding mechanisms, such as FLOWMIS, are seen as important steps, but stakeholders expressed concern that current public funding levels may not be sufficient to unlock the scale of private investment required. The failure of CfD Allocation Round 5 was cited as a signal of market sensitivity to risk and inflation.

- **Manufacturing and infrastructure capacity:** The UK has made progress in identifying port upgrade needs and supporting the development of its supply chain. However, stakeholders highlighted ongoing bottlenecks in grid and port infrastructure, as well as limited domestic manufacturing capacity for key components.

- **Workforce readiness: T**he UK has recognised the importance of skills development, but stakeholders called for faster and more coordinated action to address shortages across the FOW value chain, particularly in engineering, fabrication, and project delivery.

- **Regulatory delivery and oversight:** While reforms and regulatory initiatives are underway, stakeholders noted that implementation remains uneven. Strengthening regulatory enforcement (e.g. Ofgem's role in grid delivery) and ensuring community engagement were seen as essential to maintaining public trust and accelerating deployment.

These insights do not diminish the UK's leadership in FOW but rather highlight the **importance of consolidating and scaling up existing efforts**. Addressing these gaps will be crucial to unlocking the full potential of floating offshore wind in the UK, Europe, and globally, ensuring the sector makes a meaningful contribution to national energy, climate, and economic goals.

The findings form the basis for the actionable recommendations presented in Chapter 6, which aim to support the accelerated and sustainable growth of the UK's FOW sector.

6. RECOMMENDATIONS

The successful deployment of floating offshore wind across Europe depends on the strength and coordination of policy and regulatory frameworks. Drawing on stakeholder insights, comparative analysis, and the UK case study, this chapter presents targeted recommendations for three key stakeholder groups: policymakers (national and European), industrial stakeholders (developers, manufacturers, supply chain actors), and technology developers and investors.

These recommendations are designed to address the most pressing barriers identified across the five MARINEWIND Labs and described in earlier chapters 3 and 5, including immature grid and port infrastructure, fragmented planning, complex permitting delays, investment uncertainty, limited de-risking, skills shortages, and underdeveloped supply chains, and to accelerate deployment at the scale required to meet Net Zero targets.

Each recommendation, presented below, is designed to address one or more systemic issues, as validated through stakeholder engagement and policy mapping. It is worth noting that these recommendations are high-level and should be seen as a starting point. Further work is needed to assess regional capabilities, investment needs, and delivery models in more detail.

National and European policymakers play a central role in shaping the enabling environment for FOW. The following actions are recommended:

- Introducing adaptive licensing frameworks that evolve with project milestones and environmental monitoring. Establishing centralised “one-stop shop” systems to reduce administrative delays, building on models trialled in Portugal and Greece.
- Developing integrated national strategies that align seabed leasing, grid development, port upgrades, and supply chain growth. In the UK, this could include a dedicated FOW roadmap coordinated with the National Energy System Operator (NESO) and devolved marine spatial plans.
- Continuing to refine the UK’s Contracts for Difference (CfD) scheme, which already includes dedicated funding pots for floating wind by enhancing its design to better reflect the unique characteristics of FOW. This could also include incorporating non-price criteria that reward local content, innovation, and environmental performance; to ensure that the CfD mechanism supports strategic deployment goals and delivers broader economic and social value. For EU Member States, it is important to consider implementing similar auction design reforms at the national level. Meanwhile, the European Commission could explore coordinated funding mechanisms through instruments such as the Innovation Fund or Horizon Europe, as well as introduce sovereign guarantees (government-backed assurances to reduce investment risk) and blended finance ((the strategic use of public funds to mobilise private capital) to better support early-stage infrastructure and technology investments.
- Prioritising funding for grid and port infrastructure through mechanisms such as the UK’s FLOWMIS and the EU’s Connecting Europe Facility (CEF). Encourage anticipatory investment by reforming regulatory frameworks, such as RIIO, supporting the early procurement of assets

where there is credible evidence of future need, while ensuring value for money and avoiding the risk of stranded or underutilised assets.

- Strengthening the mandate of regulators, such as Ofgem (UK) and national transmission operators, to ensure the timely delivery of grid infrastructure and enforce compliance with planning and delivery milestones.

- Fostering international collaboration by deepening engagement in initiatives such as Horizon Europe and the North Seas Energy Cooperation to share best practice, harmonise standards, and co-develop innovative pathways.

- Modifying network price controls (e.g., RIIO, the UK's regulatory framework that sets revenue allowances for electricity network operators based on performance and innovation) to facilitate the earlier procurement of essential grid equipment, ensuring the network is ready for FOW projects.

For Industry actors, including developers, manufacturers, and supply chain partners, improving collaboration is key to scale deployment and build resilience, particularly through the following actions:

- Collaborating with regulators and certification bodies to **co-develop and adopt technical standards** (e.g., IEC, DNV, ABS) that reduce costs and enhance interoperability across Europe.

- Investing in the development of the supply chain, **supporting the development of regional and local manufacturing hubs**, vessel capacity, and logistic infrastructure to build a resilient and inclusive supply chain. Leveraging programmes such as the UK's Industrial Growth Plan and the Crown Estate's supply chain accelerator.

- Partnering with regional and local governments and academic institutions to **establish training programmes, apprenticeships, and regional skills hubs**. This is key to meeting the growing demand for the workforce, including engineers, technicians, and project managers, across Europe.

- **Engaging in policy dialogue** by actively participating in consultations and workshops to ensure that practical industry insights on barriers, such as port limitations and grid connection queues, shape future policy and regulation.

- **Engaging transparently with coastal communities to establish trust, convey local benefits,** and tackle challenges at an early stage of project development. Introduction of community benefit schemes to drive the local share of the economics of FOW projects.

Technology developers and financial institutions are essential to driving innovation and unlocking capital by:

- Engaging early and openly with policymakers, regulators, and communities to **build trust, clarify project benefits, and address concerns**, particularly around environmental and social impacts.

- **Leveraging co-location opportunities**, exploring hybrid projects that can integrate FOW with hydrogen production, aquaculture, or marine conservation to enhance project viability and social value.
- Advocating for risk mitigation tools by **supporting the development of innovative financial instruments**, such as guarantees and insurance schemes, to de-risk investments in early-stage FOW projects.

7. CONCLUSIONS

Floating Offshore Wind is emerging as a pillar of Europe's clean energy transition, offering access to abundant, high-quality wind resources in deeper waters that fixed-bottom technologies cannot reach and enabling long-term energy security, stimulating regional economic growth, and environmental sustainability. As Europe and the UK pursue ambitious Net Zero targets, FOW present a strategic opportunity to decarbonise energy systems.

This report provides a comprehensive analysis of the policy and regulatory landscape shaping FOW deployment, using the UK as a detailed case study within a wider European context. Drawing on literature reviews, stakeholder workshops, and comparative policy mapping, the analysis has identified both barriers and critical enablers.

The analysis reinforces the view that despite the growing momentum, the sector continues to face persistent and interconnected barriers. The primary causes are the **inadequate grid and port infrastructure**, which remain immature to accommodate the scale and speed at which FOW will be installed. These physical limitations are exacerbated by **fragmented planning, complex permitting processes**, and a **lack of investment certainty**, as well as **limited financial de-risking mechanisms**, collectively delaying project pipelines and deterring investors. Stakeholder feedback suggests that **current levels of public funding are inadequate**. While policy support is strengthening, it does not yet reach the level required to mitigate the significant risks associated with the scale of capital investments needed. **Skills shortages** are limiting near and long-term strategic plans alongside **underdeveloped domestic supply chains**, requiring coordination across governance levels.

These issues are not unique to the UK. Similar constraints are evident across Southern and Western Europe, particularly in countries such as Spain, Greece, Italy, and Portugal. However, the UK's experience also demonstrates how targeted policy interventions, such as the Offshore Transmission Network Review (OTNR), FLOWMIS, and CfD reform, can begin to address these challenges.

Despite these obstacles, our analysis highlighted a clear set of strategic enablers that must be prioritised to accelerate and unlock the full potential of FOW. Policymakers must take the lead in creating a more enabling environment.

This includes **reforming permitting and licensing systems** to be more adaptive and responsive to project milestones and environmental monitoring. Centralised "one-stop shop" models, already being explored in countries like Portugal and Greece, offer a promising route to reduce delays and improve transparency. **Strategic planning must also be strengthened**. National governments should develop integrated frameworks that align seabed leasing, grid development, port upgrades, and supply chain growth. In the UK, this could take the form of a dedicated FOW roadmap, coordinated with the National Energy System Operator (NESO), and devolved marine spatial plans.

Financial mechanisms have played a pivotal role in enabling the growth of floating offshore wind, with the Contracts for Difference (CfD) scheme serving as the cornerstone of market support in the UK. Without CfD, early-stage FOW projects would likely not have progressed at scale. As the sector matures, however, the scheme should continue to **evolve, building on its success by refining**

dedicated funding pots for floating wind and incorporating non-price criteria that reward innovation, local content, and environmental performance. To further attract private capital and support infrastructure development, governments should also consider introducing complementary de-risking instruments, such as sovereign guarantees and blended finance tools, to address the unique risks associated with early-stage investments in infrastructure and technology.

Infrastructure investment must be accelerated. **Grid and port readiness remain critical bottlenecks** across Europe. Programmes such as the UK's Floating Offshore Wind Manufacturing Investment Scheme (FLOWMIS) and the EU's Connecting Europe Facility (CEF) should be scaled up and better aligned with long-term deployment pipelines. **Regulatory frameworks**, such as RIIO in the UK, should **be adapted to support anticipatory investment** in grid infrastructure, ensuring that capacity is available when and where it is needed.

Regulatory bodies also play a key role. Agencies such as Ofgem in the UK must be empowered to enforce delivery timelines and ensure that transmission operators are held accountable for infrastructure build-out. At the same time, **international collaboration should be strengthened**. Programmes like Horizon Europe, the North Seas Energy Cooperation (NSEC), and bilateral partnerships such as the UK–US FLOWB initiative provide valuable platforms for knowledge exchange, joint innovation, and regulatory harmonisation.

Industry stakeholders must also act decisively. Developers, manufacturers, and supply chain actors should **work together to scale domestic capacity**, invest in innovation, and support the development of regional manufacturing hubs and logistics infrastructure. **Collaboration with regulators and certification bodies** will be essential to refine and adopt harmonised technical standards that reduce costs and improve interoperability across markets.

Workforce development is another critical priority. Governments, industry, and academic institutions must collaborate to deliver **targeted training programmes, apprenticeships, and regional skills hubs**. This will ensure that the sector has access to the skilled labour it needs to grow sustainably.

Finally, **technology developers and investors must engage proactively with policymakers and communities**. Transparent communication, early engagement, and **a focus on co-benefits**, such as co-location with hydrogen production or marine conservation, will be essential to building public trust and securing long-term support. **Financial institutions should also advocate for the development of risk mitigation tools,** including insurance schemes and revenue stabilisation mechanisms, to support early-stage projects.

The future of floating offshore wind depends on a shared commitment to strategic planning, infrastructure readiness, financial innovation, and inclusive growth. By acting on these recommendations, stakeholders can accelerate deployment, strengthen Europe's leadership in offshore wind, and make meaningful contributions to climate, energy, and economic goals.

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LIST OF ACRONYMS AND ABBREVIATIONS

ABS: American Bureau of Shipping

AR: Allocation Round (AR5, AR6, AR7, AR8)

ASTI: Accelerated Strategic Transmission Investment

BESS: British Energy Security Strategy

BV: Bureau Veritas

CBAM: Carbon Border Adjustment Mechanism

CfD: Contracts for Difference

CIB: Clean Industry Bonus

CINEA: European Climate, Infrastructure Executive Agency

CSNP: Centralised Strategic Network Plan

DCO: Development Consent Order

DESNZ: Department for Energy Security and Net Zero

DNV: Det Norske Veritas

EIA: Environmental Impact Assessments

ERHA: Economic Recovery and Transformation (PERTE) on Renewable Energy, Renewable Hydrogen and Storage

ESQCR: Electricity Safety, Quality, and Continuity Regulations

F4OR: Fit 4 Offshore Renewables

FLOWB: Floating Offshore Wind Supply Chain Innovation Bilateral

FLOWMIS: Floating Offshore Wind Manufacturing Investment Scheme

FOW: Floating Offshore Wind

FOWT: Floating Offshore Wind Technology Systems

GIGA: Green Industries Growth Accelerator

HND: Holistic Network Design

HRA: Habitat Regulations Assessment

HVDC: High-Voltage Direct Current

IEA: International Energy Agency

IGP: Industrial Growth Plan

IRENA: International Renewable Energy Agency

ISO: International Organisation for Standardisation

LCoE: Levelised Cost of Energy

LOTI: Large Onshore Transmission Investments

LR: Lloyd's Register

MSP: Marine Spatial Planning

MWh: Megawatt Hour

NESO: National Energy Systems Operator

NPS: National Policy Statement

NREL: National Renewable Energy Laboratory

NSEC: North Seas Energy Cooperation

NSIP: Nationally Significant Infrastructure Projects

NOWRDC: National Offshore Wind Research and Development Consortium

OREC: Offshore Renewable Energy Catapult

ONTR: Offshore Transmission Network Review

OWEIP: Offshore Wind Environmental Improvement Package

PERTE: Strategic Project for Economic Recovery and Transformation

PNNR: National Recovery and Resilience Plan

RAG: Red-Amber-Green

RESP: Regional Energy Strategic Plan

RIIO: Revenue = Incentives + Innovation + Outputs

SQSS: National Electricity Transmission System Security and Quality of Supply Standard

SSEP: Strategic Spatial Energy Plan

STEP: Strategic Technologies for Europe Platform

TCE: The Crown Estate

TEN-E: Trans-European Networks for Energy

TMO: Transmission Methodology Options

TRL: Technology Readiness Level

9. APPENDIX

This Table 12 summarises how the preliminary enablers were refined, merged, or expanded based on stakeholder feedback during Workshop 1. The resulting framework informed the final set of eight strategic enablers.

Table 12 Final set of enablers, revisions and rationale

Original Enabler	Revised Enabler	Change Type	Stakeholder Insight
Planning, Permitting, and Consenting	Planning, Permitting, and Consenting	Refined	Retained due to its direct impact on deployment timelines.
Grid Capacity, Connectivity Timelines	Electricity Network and Grid Infrastructure	Merged and Renamed	Combined to reflect the interdependence of capacity and connection timelines.
Investment in Port Upgrades	Port Infrastructure	Refined	Narrowed to focus on readiness and physical upgrades.
Supply Chain Readiness, Supply Chain Investment	Supply Chain Development	Merged and Renamed	Broadened to include skills, vessels, and fabrication.
Standardisation and Readiness	Standardisation and Readiness	New Addition	Highlighted the need for consistent technical specifications.
Innovation and R&D	Innovation and R&D	New Addition	Recognised as essential for scaling emerging technologies.
Skills Development	Skills	New Addition	Identified as a key constraint for project delivery.
Environment & Community Considerations	Community, Environmental Impact & Social Value	New Addition	Emphasised the importance of social licence and local benefits.
Cost Reductions, Extra CfD Revenue Support	-	Removed	Considered outcomes rather than direct enablers.
Technology Readiness Level (TRL)	-	Removed	Absorbed into Innovation and R&D.

10.WORKSHOP FINDINGS

This country-specific questionnaire aimed to identify existing policies and regulatory frameworks supporting the development of floating offshore wind (FLOW) in these countries ' labs, with the ultimate goal to highlight the gaps in these frameworks and provide recommendations to address them. The key objective is to understand how policies and legislative frameworks can be designed and optimised to support the successful innovation, commercialisation, and large-scale deployment of FLOW.

Several measures can be implemented to address the identified gaps and support the successful deployment of floating offshore wind (FLOW) in Greece, Italy, Portugal and Spain.

- Streamlining permitting processes by establishing a centralised "one-stop shop" system can reduce bureaucratic delays and simplify approval processes.
- Developing clear and comprehensive Marine Spatial Planning (MSP) frameworks is crucial for balancing environmental protection and maritime activities, thereby reducing conflicts and uncertainties.
- Enhancing grid infrastructure is crucial for accommodating the variable nature of wind energy, ensuring the reliable integration of offshore wind projects.
- Increasing public awareness and engagement by providing citizens and stakeholders with adequate information on the benefits and impacts of FLOW can enhance public acceptance and support. Supporting local value chains by investing in local companies and creating jobs will reinforce the FLOW value chain, promoting sustainable development. Simplifying authorisation procedures to shorten the time required for project approvals will make the process more efficient and predictable. These measures collectively will contribute to achieving renewable energy targets, promoting sustainable development, and enhancing investor confidence in the FLOW sector.

11.KEY INSIGHTS FROM QUESTIONNAIRES

- **Policy and Regulatory Landscape**:
    - **National policies**: to summarise key national policies supporting FOW development, such as renewable energy targets, incentives, and funding schemes.
    - **Regulatory barriers**: identifying and describing the main regulatory barriers, including complex authorisation processes, technical rejections, and lack of consolidated Maritime Spatial Planning (MSP).
    - **Regulatory enablers**: to highlight enablers such as multidisciplinary task forces, "one-stop shop" procedures, and increased investments in storage systems and grid infrastructure.
- **Impact Analysis**
    - **Quantitative metrics**: Use metrics such as installed capacity, capacity factor, annual energy production, levelized cost of energy (LCoE), and investment levels to quantify the impact of policies and regulations.
    - **Qualitative insights**: Incorporate qualitative data on stakeholder engagement, public acceptance, and the effectiveness of regulatory processes.