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Update on the development of the industry in participating countries

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Project Links

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IDEA-IRL Project Partners

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Reporting is based primarily on interviews and supplementary research undertaken between August 2025 and December 2025, to give a snapshot of the markets of interest at that time. While efforts have been made to capture significant updates in these markets in the time between the interviews taking place and publication of the final report, some more recent developments may not be accounted for. Furthermore, the information about individual markets covered in this report should not be considered the complete view of market updates or challenges. For a more detailed view, the authors suggest the reader consults individual market reports from relevant national authorities, some of which are referenced in this report.

[1] IDEA Project home page: https://iea-wind.org/task49/
[2] IDEA-IRL Project home page: https://www.marei.ie/project/idea-irl-integrated-design-floating-wind/

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Table of Acronyms

AHP	Analytical Hierarchy Process
BiMEP	Biscay Marine Energy Platform
BOEM	Bureau of Ocean Energy Management
BSH	Bundesamt fur Seeschifffahrt und Hydrographie
CfD	Contract for Difference
CIB	Clean Industry Bonus
DAERA	Department of Agriculture, Environment and Rural Affairs
DGRM	General Directorate for the Maritime Resources
DMAP	Designated Maritime Area Plan
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
FLOW	Floating Offshore Wind
HVDC	High Voltage, Direct Current
IDEA	Integrated Design of Floating Wind Arrays
IDEA-IRL	Integrated Design of Floating Wind Arrays - Ireland
IEA	International Energy Agency
MAC	Maritime Area Consent
MARA	Maritime Area Regulatory Authority
MOF	Ministry of Oceans and Fisheries
MSP	Marine Spatial Planning
NOAA	National Oceanic and Atmospheric Administration
ORE	Offshore Renewable Energy
ORESS	Offshore Renewable Energy Support Scheme
OSW	Offshore Wind Power (Promotion Act)
OW	Offshore Wind
POEM	Spanish Maritime Space Planning
SC-DMAP	South Coast DMAP
TCP	Technical Collaboration Programme
UCC	University College Cork
WEA	Wind Energy Area
WEI	Wind Energy Ireland
WP	Work Package

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1 Integrated Design of Floating Wind Arrays (IDEA)[4]

This report has been prepared as the fourth deliverable for work package (WP) 4 of the International Energy Agency Wind Technology Collaboration Programme (IEA Wind) Task 49 - Integrated DEsign of floating wind Arrays (IDEA). Task 49 is an international partnership composed of members of the offshore wind industry from 12 partner countries. WP4 is led by the IDEA-IRL project, an Ireland-based counterpart to Task 49 that is a partnership between the University College Cork (UCC), Wind Energy Ireland (WEI), and Gavin and Doherty Geosolutions. The IDEA-IRL project commenced in February 2023. Its goal is to accelerate the sustainable development of Floating Offshore Wind (FLOW) both domestically and internationally. This will be achieved by building upon key background knowledge and by coordinating and leveraging the international FLOW research effort under the framework of the IEA Wind Technology Collaboration Programme (TCP). Specific objectives across all the IDEA work packages include:

- Deliver a set of fully defined reference sites characteristic of the international global FLOW deployment pipeline including relevant technical, social, environmental, and economic parameters.

- Deliver a set of fully open source and customisable floating wind array reference designs including key engineering tool input files, cost and environmental impact models.

- Deliver a Failure Mode, Effects & Criticality Analysis framework for floating wind arrays including for coupled / cascading failures.

- Engage with the international groups developing innovations for the floating wind energy industry, categorise in terms of multidisciplinary impact and ensure that functionality for their development is included in the reference sites and/or reference farm definitions.

- Engage with the international agencies responsible for Marine Spatial Planning (MSP) to collect open research questions and concerns.

- In IDEA-IRL, apply the work of Task 49 in an Irish context and engage with the local supply chain to provide specific policy recommendations and development pathways and to raise the profile of floating wind energy technology, related research, and expertise in Ireland through the delivery of a multifaceted communications strategy.

This report will primarily serve to update on the consultation that has taken place during the third year of WP4 activities, aiming to provide qualitative assessments of the development of the offshore wind (OW) industry in partner countries based on data collected from industry experts using a questionnaire.

[4] More information on the task and previously published deliverables can be found at https://iea-wind.org/task49/ and https://www.marei.ie/project/idea-irl-integrated-design-floating-wind/

2 IDEA Work Package 4 Overview

WP4 of the project is focused on Stakeholder Integration and Research Requirement Classification. It will be used to ensure the project has the required information from stakeholders, providing key input to the other more technically focused WPs (1-3) within the IDEA project (Figure 2-1).

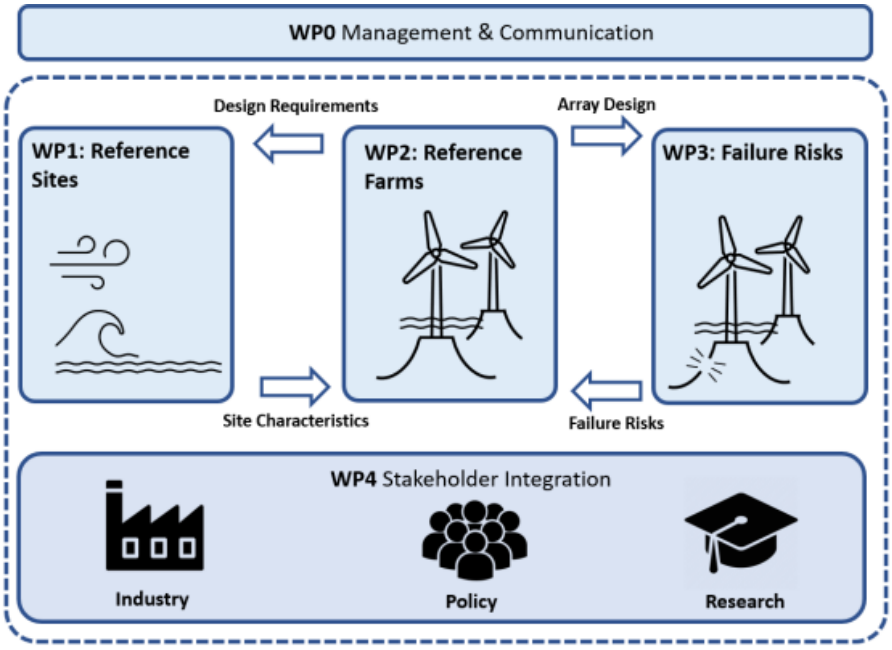

Figure 2-1: Overview of WP0-4.

WP4 has a few key objectives, including to:

- Assess & facilitate international MSP collaboration for FLOW zoning and identify future development zones for FLOW internationally.
- Align Task work to real world research questions and analysis methods.
- Curate a floating wind innovation register and score for social, economic and environmental benefit.

The six planned deliverables for this WP, to address these key objectives are:

- WP4-D1: Analytical hierarchy process (AHP) report detailing the AHP methodology to be used to rank and score a list of floating wind innovations (Month 6) – COMPLETED
- WP4-D2A[5]: MSP consultation report publishing the results of the first interview round and arising queries and recommendations for their resolution. (Month 12) – COMPLETED
- WP4-D2B: AHP Ranking Report. Report outlining the outcome of the of innovation ranking and assessing potential research topics. (Month 14) – COMPLETED
- WP4-D3: Supply chain capability consultation report (Month 24) – COMPLETED
- WP4-D4: Market development update from partner countries (this report) (Month 36)
- WP4-D5: Recommendations for future activities (Appendix B of this report) (Month 36)

[5] Supported by a publication in EERA DeepWind 2024 proceedings [40] - Floating offshore wind – an overview of marine spatial planning and the needs of the industry (Dvorak et. al., 2024)

2.1 Findings from the first two years of Work Package 4

The detailed findings of the first year of WP4 are available in the previous deliverables, however, to state the motivation for this report, a summary is provided below.

During the first year of interviews, the focus was on MSP and FLOW innovations. During the consultations we spoke to the interviewees about other potential non-technological challenges to the development of floating wind which we could analyse in future WP4 work. Two such areas were identified:

1. **Supply chain constraints –** Many interviewees noted a concern about there not being enough capacity and capability within the global and national supply chains to fulfil the ambitious deployment targets which have been set by governments. This also included expressions of uncertainty about the effects of local supply chain content requirements have on the price of offshore wind (OW) projects. In WP4 Deliverable 3 we explored what measures are being taken by IDEA partner markets to encourage the development of supply chain and skills.

2. **Coexistence** – With OW and FLOW taking up more space, questions are arising about how we can we better work with other industries to manage coexistence and using the same maritime space for more industrial purposes. This mainly relates to fishing and how it interacts with FLOW, but not exclusively. More research is required to determine what is possible and how these interactions differ between OW and FLOW.

The initial plan for WP4 was to continue the MSP interviews for another two years and thus create a view of how MSP develops throughout the duration of the task. However, since in the first year it was found that the importance of MSP is clear and realised by all member countries, the vast majority of which already have an MSP policy in place or are in the process of developing one, it was proposed to explore the supply chain constraints related to FLOW across key Task 49 partner countries.

The format of the second-year consultation mirrored the approach taken during the first year of WP4 – with interviews undertaken with national representatives with experience in either industrial policy or within the supply chain for FLOW in the given country, and a report prepared on the findings. The core of the findings are:

1. **Absolute majority of manufacturing and mining is done in China,** and many markets will not be able to capture value associated with large scale manufacturing and fabrication.

2. **Supporting port development and transmission grid** improvements could be one of the best ways to help create an environment for FLOW and OW development

3. **Workforce development** programs are being set up in most markets

4. **Total manufacturing capacity is not enough** to meet national and global deployment targets

5. **National industrial strategies and policies specifically for offshore wind are being rolled out** and often include considerations for ports, transmission, critical manufacturing focuses and workforce building

2.2 This report in context of IDEA WP4

This report plans to give a brief update on the development FLOW and OW markets, projects and key policies in select IDEA partner countries. Though 2024 was a record year for wind energy deployment with 109 GW deployed onshore and 8 GW deployed offshore[1], the growth rate is not quite what would have been hoped for when the IDEA task was founded, which followed the record year of 2021 when 21.1 GW of OW got deployed, mostly in China. This report aims to update the context of the other work of IDEA with more up-to-date performance from markets, which seems especially important in the context of the 2024 and 2025 dip in global OW market performance as a result of turbulent geopolitics and other challenges [1].

3 Format and objective of the questionnaire

The aim of this deliverable is to find out about the most impactful policy news, market developments and strategy changes in partner countries as well as any new MSP policies or newly designated areas for offshore wind and how these align with national deployment targets. We were also interested in finding out how the geopolitical situation has been impacting the offshore wind industry and how the offshore wind market is performing in general and what the attitudes are.

To achieve this, we contacted IDEA country representatives to ask them to fill in a questionnaire with questions about the state of the market, development or MSP legislation, recent seabed leasing and Contract for Difference (CfD) auction round results, as well as more general questions about local market performance. We present a full list of questions sent to the IDEA country representatives in Appendix A: Survey questionnaire.

IDEA country representatives were asked to fill in the questionnaire and send it back to us in spreadsheet form. The people filling in the spreadsheet were not necessarily the official country representatives in IDEA, but people well-placed in industry, academia, or other organisations to comment on the state of the industry in their country. Their identities and affiliations will remain anonymous.

We received responses from representatives for Ireland, Italy, Spain, Korea, Portugal, Germany, USA, the Netherlands and provide our own review of the market in the United Kingdom. The information presented in this report comes primarily from the questionnaire analysis and, where marked as such, from additional sources.

4 Results by partner country

Below we present the data collected using the questionnaire from our contacts within the wider IDEA community. Where appropriate, the data is supported by independent research and cited accordingly.

4.1 Ireland

Total Installed OW capacity[6]	25 MW
Installed FLOW capacity	0 MW
2030 Deployment target	5 GW
Long-term target	37 GW (2050)
FLOW targets	No official FLOW targets, but due to bathymetry, FLOW is expected to play a role in fulfilling the long-term targets.
Other market notes	Expected 2 GW of non-grid-connected OW, which may include FLOW, to be in development by 2030.

4.1.1 General information

The Irish offshore wind market is making steps towards delivery of the first wave of projects in the late 2020s and early 2030s. Ireland faces a number of challenges: Some of the most demanding metocean conditions in the world, especially on the west coast, an often-mentioned slow permitting regime. The situation is made more challenging by an electricity grid, which is already heavily constrained in some areas and a lack of relevant domestic manufacturing capacity. However, the Irish policy landscape has improved a lot over the past half a decade with sectoral plans[7], the national offshore renewables designated maritime area plan (DMAP)[8], and offshore renewable energy support scheme (ORESS[9], the Irish CfD scheme), and other supporting policy[10].

4.1.2 Updates in MSP and site development

MSP in Ireland is guided by the National Marine Planning Framework (2021) - Ireland's first MSP - although this is not specifically for offshore renewable energy (ORE) though and does not dedicate ORE sites as such. This is done in a series of sectoral DMAPs for ORE. Ireland's first sub-national MSP for ORE - The South Coast Designated Maritime Area Plan (SC-DMAP) - was published in 2024 by the Department of Climate, Energy and the Environment, which designates sites, is the competent authority for MSP in Ireland, and publishes the DMAPs. The national ORE DMAP is expected to be published in Q4 2027 and identify sites for FLOW. The SC-DMAP specifies four sites off the south coast with a potential capacity of over 5 GW. These are fixed-foundation sites and there are no official designations for FLOW sites yet. The first of the four, Tonn Nua[11] (900MW), was auctioned under the ORESS scheme in November 2025, with a record low strike price.

During the site auction process, the developer must be awarded a Maritime Area Consent (MAC) by MARA (The Maritime Area Regulatory Authority) for the site area before they can apply for planning consent to develop the site. A MAC is the equivalent of a seabed lease and gives the right to use a part of the sea, conditional on securing other permits. MACs may be awarded on a competitive basis going forward, linked to the ORESS auction scheme. The ORESS scheme is in place to award subsidy support with de-risking (a CfD) and development rights for sites. The winner of the recent Tonn Nua auction may now apply for a MAC from MARA, and is also awarded a two-way CfD for the project. An auction schedule has not yet been set for the remaining sites in the SC-DMAP. Apart from the SC-DMAP projects, three of the initial four ORESS1 projects are under development with a combined maximum capacity of roughly 2.6 GW. Combined with Tonn Nua, this gives a current pipeline of 3.5 GW, with additional ORESS2 projects expected to bring this to roughly 7.6. There are two additional projects being developed outside the ORESS scheme (Oriel and Arklow). This is far off the long-term target, so more sites need to be dedicated in the national ORE DMAP in 2027. This is expected to include OW and FLOW.

4.1.3 Market response to recent events

The pace of market development is generally subdued, but this is mainly as a result of the move to a plan-led development regime, and delays with DMAP preparations and auction scheduling. This means that aside the three ORESS1 projects, there is only one site that developers were competing for this year (Tonn Nua). A further auction has not yet been scheduled, but this is expected to be for the Li Ban site and allow between 1.1-1.5GW. The slowed-down development prompted no change to deployment targets, but rather an acceptance that 2030 targets will not be reached. Sceirde Rocks, an ORESS1 project - was abandoned by its developer. It is thought this is due to a company level restructuring to focus on projects with lowest risk and greatest potential for profit. Geopolitical and global market pressures and the challenging weather conditions on the west coast of Ireland may have also played a role in the decision to abandon.

The Port of Cork was successful in its application €38.5m of funding for developments to facilitate the deployment of OW projects. Rosslare Europort have developed a similar €30m modernisation masterplan which includes a construction of an ORE hub.

With the general market slow-down, the expected FLOW timelines have slipped, although there are plans for a floating wind demo project(s) under the national DMAP. ORE and FLOW are still expected to play a major role in Ireland's energy transition, but the deployment will be slower than initially hoped due to a lack of infrastructure and wholistic policy support. The good news is the public and private sectors are working to improve both.

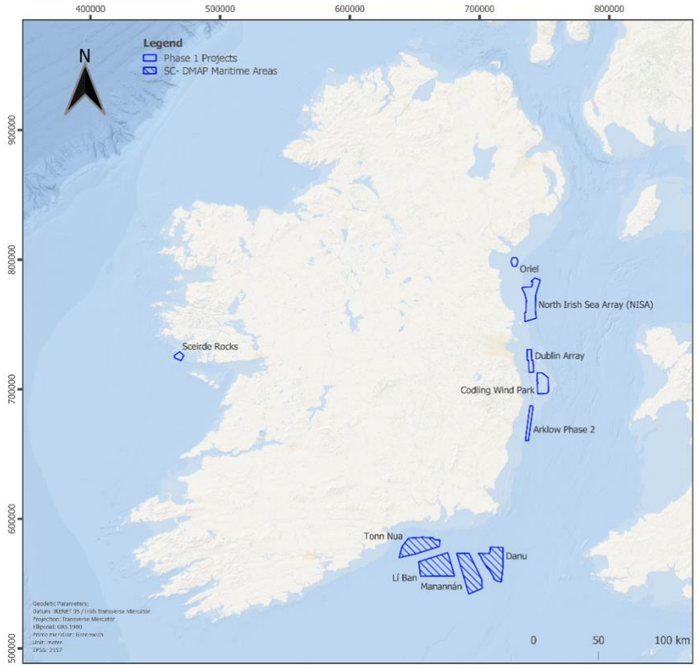

Figure 4-1: Irish ORESS1 and ORESS2 sites

[6] 'Total' installed OW capacity includes fixed and floating OW.
[7] https://enterprise.gov.ie/en/publications/publication-files/powering-prosperity.pdf
[8] https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/national-designated-maritime-area-plan-dmap-for-offshore-renewable-energy/
[9] https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/offshore-renewable-electricity-support-scheme-oress/
[10] https://windenergyireland.com/images/files/web-bvg-report-jan-2024.pdf
[11] https://www.gov.ie/en/department-of-climate-energy-and-the-environment/press-releases/minister-obrien-welcomes-successful-result-of-states-second-offshore-wind-auction/

4.2 Italy

Total Installed OW capacity	30 MW
Installed FLOW capacity	0 MW
2030 Deployment target	2.1 GW
Long-term target	16 GW (2050)
FLOW targets	No specific FLOW targets, but FLOW expected to be the majority of OW deployment due to bathymetry.

4.2.1 General information

The project pipeline in Italy is one of the largest of any market, with over 80 GW undergoing the environmental permitting or scoping process as of early 2025 [2]. This is a pipeline of 128 projects, the largest being the Sicilian Strait Renexia project, which is almost 2.8 GW [2]. However, the project development is made challenging by an unclear process of seabed leasing and OW projects have so far been excluded from any incentive energy auction schemes. Italy's only operational wind farm – a 30 MW project in Taranto, took 14 years to develop largely due to permitting issues. Since then, Italy has adopted an MSP strategy policy as one of the last countries in the EU, but the legislative and policy advances have not yet managed to untangle the leasing, permitting and subsidy processes to unlock the large project pipeline.

4.2.2 Updates in MSP and site development

Italy adopted its Maritime Space Management Plans[12] on the 25th of September 2024 by Ministerial Decree No. 237. The plan also comes with an interactive online mapping tool[13]. This decree is a strategy plan, not an implementation plan and it does not include designation for individual ORE sites but rather allows ORE activities in multiuse zones. The MSP authority in Italy is the Ministry of Infrastructure and Transport, and they are also the ones to have issues the recent plans.

A specific implementation plan for ORE development is expected to be released soon, following the release of the FER2 decree in 2024, which describes a two-way CfD mechanism expected to be used by OW developments in Italy in the future [3].

Though the specific ORE MSP is not released yet, the Ministry of Environment and Energy Security is working on a piece of legislation known as the "Offshore Wind Ministerial Decree"[14], which identifies ORE development areas and ports which will be expected to play a role in the strategic supply chain. These are Augusta, Taranto (home to the only OW farm in the country), Brindisi, and Civitavecchia [4]. This designation is a step in the right direction towards defining the national infrastructure to support OW development but is likely insufficient in creating a policy environment which would let the industry grow.

Without a clear framework for issuing marine area use licenses, developers need to apply for maritime state concessions for ORE projects. The maritime state concession (following the Articles 36 of the Navigation Code) is issued by Ministry of Infrastructure and Transport/Maritime Directorate/Port Authority (depending on its duration) for the installation and operation of the ORE project.

While there is no formal application for seabed leases, OW farms with a positive Environmental Impact Assessment (EIA) are now able to apply for a single authorisation following the instructions set out in the Handbook for Submitting Applications for Single Authorisation of Offshore Wind Farms[15] issued by the Ministry of Environment and Energy Security in November 2024.

This is another step in the right direction towards creating an easy-to-navigate permitting regime, but the situation is still far from a plan-led offshore wind deployment regime with regularly scheduled seabed lease auctions, clear permitting rules, and CfD auctions which is proving to be efficient in other jurisdictions. It is still unclear how sites will be awarded to developers, especially in cases where planning permission applications use overlapping geographic regions.

4.2.3 Market response to recent events

Developers and trade associations are paying close attention to the OW through the organisation of various conferences, but the government excluded OW from the first incentive auction in 2025. The official reason is that there are too few OW projects with a positive EIA (a requirement for participating in the auction).

The project pipeline in Italy reflects the regulatory regime in the country. While there are EIA applications for 89 projects of a combined roughly 70 GW, due to there not being a clear seabed leasing system, it is quite likely that many of these projects will be overlapping and a potential award of a lease to one will disqualify others. This may create a skewed idea of the pipeline of actually deliverable projects in the country. Regardless, there is still optimism for the 2.1 GW short-term target, even if it may be delivered later than 2030. There has been no recent change to national deployment targets.

Recent policy development includes the Legislative Decree No. 190 of 25 November 2024 (which transposed Renewable Energy Directive III) for the reorganisation of authorisation procedures for renewable energy sources (including FLOW and ORE) and the Interministerial Decree No. 167 of 4 July 2025 for the creation of two industrial hubs (Port of Taranto in Apulia Region and Port of Augusta in Sicily Region) for the offshore wind power industry, intended to strengthen the Italian industrial supply chain in the marine renewable energy sector.

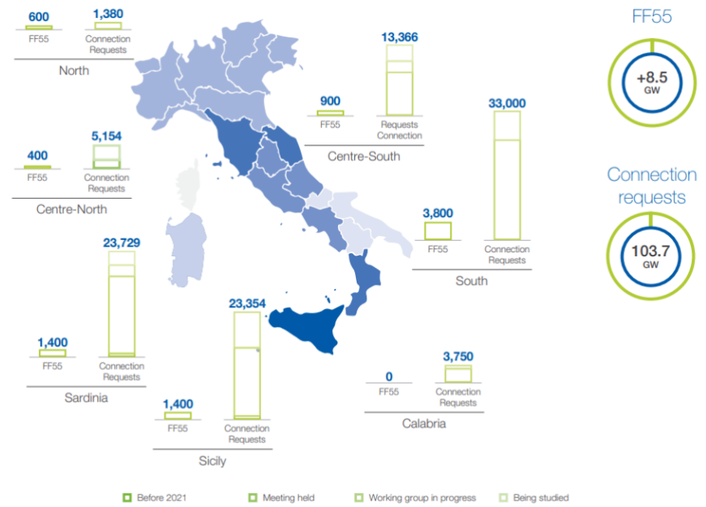

Figure 4-2: Grid connection requests received by TERNA from offshore wind farms by region [5] (note: FF55 relates to the "Fit-for-55, Italy's plan to achieve carbon neutrality)

[12] https://www.mit.gov.it/documentazione/pianificazione-dello-spazio-marittimo

[13] https://sid.mit.gov.it/mappa

[14] https://ageei.eu/wp-content/uploads/2025/04/DM-EOLICO-OFFSHORE.pdf

[15] https://www.mase.gov.it/portale/documents/d/guest/vademecum_eolico_off-shore_dgfta-pdf

4.3 Spain

Total Installed OW capacity	2 MW
Installed FLOW capacity	2 MW (pilot project)
2030 Deployment target	1-3 GW
Long-term target	17 GW (2050)
FLOW targets	No official FLOW targets, but due to bathymetry, FLOW is expected to play a role in fulfilling the long-term targets.

4.3.1 General information

Due to Spain's bathymetry, all the OW installed power is expected to be floating OW deployment. However, the site selection from the Spanish Government is being significantly delayed, with no auctions published yet. Spain currently has no operational commercial size OW projects, but there is activity in the development of FLOW solutions in Spain. The Biscay Marine Energy Platform (BiMEP) is currently testing a 2 MW floating solution. Other demonstration projects are also undergoing development off the coast of mainland Spain as well as the Canary islands.

4.3.2 Updates in MSP and site development

There is an MSP with offshore wind zones pre-assigned in the Spanish Maritime Space Planning (POEM)[16] published and accepted in 2024. The Spanish MSP policy considers five geographic areas (below) and creates a POEM for each. The POEMs are published by the Ministry for Ecological Transition and the Demographic Challenge. The ministry also publishes the roadmap for offshore wind and marine energies[17].

- North Atlantic area (Galicia)
- South Atlantic area
- The Alborán and the strait
- Levantin-Balearis area
- Canary Islands area

All specified sites are for floating OW. The Spanish bathymetry along all coasts does not present opportunity for a scaled development of fixed-bottom OW due to high water depths.

It is still in debate and to be determined how the different sites will be awarded to the developers, so no auction or lease has yet been organised. However, the initial idea is to use pre-assigned prices using mechanisms such as pay-as-bid (all accepted projects get awarded the price of their bid) or pay-as-clear (all accepted projects get awarded the highest accepted price in the application round).

No seabed leasing auctions have yet been held and there is still ongoing debate on how sites will be awarded to developers. Completing the design of this mechanism is the next step in policy creation for the support of the OW market in Spain.

At the present rate, not enough sites are being developed quickly enough, and the POEMs do not specify enough sites. POEM plans expect wind farms of around 300-500 MW scale with a total capacity of roughly 2.5 GW, which is much lower than the long-term targets. With not enough sites designated and an unclear seabed leasing process, it will be very difficult to hit short-term targets as well.

4.3.3 Market response to recent events

Overall, the interest of the different stakeholders is high in Spain, but due to the delays and the uncertainty in the next steps of the POEM, the market has significantly slowed down in the last couple of years. Presently there are no open auctions, and it is unlikely this will change very quickly. However, the sector is active and should be able to react as soon as the auctions start to open. The development of demo projects is helping the industry keep in touch with authorities as well. The first auction is expected to happen in the Canary Islands, where the government is expected to kick-off the plan with the first auction for a project of 150-250 MW.

Geopolitical and global market pressures may have played a role in the delay of the whole strategy, although the this is likely a smaller contribution to the delay than from local political opposition and a high degree of bureaucracy in the regulatory process. Despite the delays, national targets have not been changed recently and remain at the 1-3 GW level by 2030, however there is an acceptance of the reality that these goals will likely not be met. There has also been no recent announcement in the last couple of years related to the deployment of OW and FLOW in Spain.
Currently, all stakeholders are waiting for the government to finalise the regulatory framework and start organising seabed lease and CfD auction. At this stage, there is no information about when the auctions will kick-off and the sector is sceptical about the short-term. The good news is that the sites are identified and well known by the different stakeholders, so the activity should be recovered very quickly once the auctions are open. The industry is pushing hard for advances in regulation [6].

Spain has a shipbuilding industry, a strong port network (although needing an improvement to make them fit-for-purpose in terms of ORE projects), understands the national significance of the industrial opportunity which comes with development of OW [7].

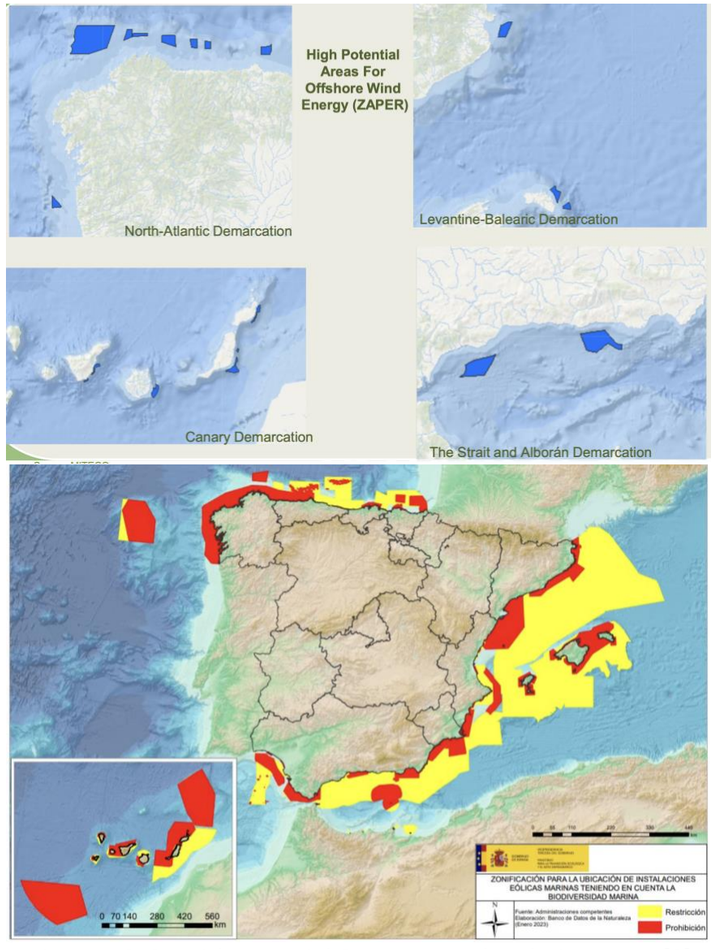

Figure 4-3: Spanish potential OW zones and exclusion zones [8]

[16] https://www.miteco.gob.es/es/costas/temas/proteccion-medio-marino/ordenacion-del-espacio-maritimo.html

[17] https://www.miteco.gob.es/content/dam/miteco/es/ministerio/planes-estrategias/desarrollo-eolica-marina-energias/enhreolicamarina-pdf_accesible_tcm30-538999.pdf

4.4 Korea

Total Installed OW capacity	355 MW
Installed FLOW capacity	0 MW
2030 Deployment target	18.3 GW
Long-term target	40.7 GW (2038)
FLOW targets	No national FLOW targets, but 6 GW plan by the city of Ulsan and Korean government and 10 GW plan in the Shinan County.
Other market notes	Due to spatial limitations, most of wind development in Korea will be offshore.

4.4.1 General information

The Korean OW industry and government are setting ambitious deployment plans in both the short-term and long-term. Because of spatial constraints in land use, the majority of wind power developed in Korea is expected to be offshore. This puts a unique pressure on the industry to deliver the 20% renewable electricity target set out in the 2017 8th Plan for Long-term Electricity Supply and Demand[18]. Korea's offshore wind industry is at a pivotal moment, shaped by a combination of deliberate policy development specifically designed to overcome market barriers and accelerate development.

4.4.2 Updates in MSP and site development

South Korea does not yet have specifically designated OW sites but has designated marine energy development zones within its territorial sea at water depths of less than 60 m under MSP policy, which includes for OW. Meanwhile, the Offshore Wind Power Site Information Map[19] was developed in 2022. However, a major policy shift is currently underway. The new Special Act on the Promotion of Offshore Wind Power (OSW Promotion Act), introduces a government-led system for designating ORE sites based on an expanded version of the Offshore Wind Power Site Information Map, which is under development and includes floating sites in areas with water depths of up to 1,000 m. The organization responsible for MSP in South Korea is the Ministry of Oceans and Fisheries (MOF). The MOF sets the national Marine Spatial Master Plan and the Exclusive Economic Zone (EEZ) management plans; province-level plans are drafted by governors but require MOF approval. Korea Marine Environment Management Corporation and Korea Maritime Institute are also stakeholders in MSP.

Korea does not lease the seabed. The license to use the site is granted by permit. So far, site selection in Korea has followed a developer-led model, with the developer proposing and conducting surveys. However, the OSW Promotion Act transitions the system towards a plan-led approach. The OSW Promotion Act has been passed, but many of its operative details (zoning procedures, permit streamlining, consultation rules) will depend on the enforcement decree and regulations which are still in development. The seabed use permits for sites are awarded based on competitive electricity price auctions in auction rounds. The auction schedule and allocation process are outlined in the Offshore Wind Power Competitive Bidding Roadmap announced in August 2024. The government uses fixed-price competitive bidding and in the 2024 round awarded 1.886 GW of permits, including the first floating award at Bandibuli. Floating projects receive an incentivising price top-up (some sources quote this as a doubling in strike price compared to fixed OW [9]). The bidding roadmap set 7-8 GW of offshore tenders through Q1-2 2026.

4.4.3 Market response to recent events

The national deployment targets were recently formalized and increased with the official adoption of the 11th Basic Plan for Long-term Electricity Supply and Demand earlier this year. This plan solidifies the government's higher ambitions for wind energy, and makes the targets official policy. Several foundational policies and strategies have been announced or implemented in the and the health of South Korea's offshore wind market has improved in the last year. It has transitioned from a state of high potential but deep uncertainty to one of structured optimism and clear, government-led direction.

The OSW Promotion Act aims to simplify development of OW projects and enable quicker permitting by introducing plan-led zoning, one-stop permitting and tendered developer selection from 2026. Electricity infrastructure development is being headed by the National Backbone Power Grid Expansion Special Act, in force since the 26th September 2025. This creates accelerated governance to deliver transmission projects that underpin the west-coast high-voltage direct current (HVDC) “energy highway” and a subsea grid.

The newly elected government prefers renewable energy over nuclear energy. The recently announced 5-Year State Affairs Operation Plan outlines a national strategy focused on a major energy transition to renewables, with specific policies for offshore wind, alongside several regional wind energy pledges. The government plans to establish a new roadmap to raise the renewable energy target for 2030 (currently 78 GW of total renewables) supporting:

- OW Development: Construction of large-scale offshore wind farms in the Southwest Sea and Jeju. This will be achieved by using a plan-led approach for rapid scoping.
- Industrial Competitiveness: development of domestic technology for OW turbines, parts, and equipment, as well as constructing installation vessels and dedicated ports to strengthen the local industry.
- Community Profit-Sharing: Expansion of the solar/wind pension program to share profits from renewable energy projects with local residents.
- Coexistence with Fisheries: Introduction of a profit-sharing model for fishermen. The plan explicitly supports achieving the 18.3 GW wind energy installation goal.

The health of South Korea's offshore wind market has been improving. 2025 delivered new legislation, more permit awards, first floating site awards, and operating capacity of 355 MW.

Figure 4-4: A screenshot from the Korean MSP map [10]

[18] https://new.kpx.or.kr/menu.es?mid=a20407000000

[19] https://energyandspace.kr/en/offshoremapen/

4.5 Portugal

Total Installed OW capacity	25 MW
Installed FLOW capacity	25 MW
2030 Deployment target	2 GW
Long-term target	No official long-term target reported
FLOW targets	2 GW (2030)
Other market notes	Portugal does not plan to develop fixed-bottom offshore wind.

4.5.1 General information

In 2020, Portugal commissioned the first floating wind farm using semi-submersible platforms and large turbines (8.33MW) at the WindFloat Atlantic 25 MW project off Viana do Castelo, in around 100 m of water. The project has been surpassing expectations in terms of generation figures and has survived 20 m waves [11]. For now, this is the only operational project in the country, although development is expected in the near future, linked to anticipated seabed lease auction rounds, which should be announced along with the tendering process either by the end of 2025 or early 2026 [12]. After a re-framing of national targets from first 8 GW, then 10 GW to the most recent target of 2 GW by 2030 [13], [14], the Portuguese market is expected to take off as soon as the auctions are underway.

4.5.2 Updates in MSP and site development

The MSP policy in Portugal makes specific considerations for offshore renewables[20], allocating an area with a total combined potential of around 10 GW. This way, the area allocated to offshore renewables is in line with long-term national targets, and availability of space should not present a bottleneck keeping Portugal from deploying enough ORE to meet these targets.

The MSP is published by the General Directorate for the Maritime Resources (DGRM) and they also provide a map view of the national plan [21]. The DGRM should periodically revise the MSP, keeping in mind any technological development of the ORE sector and changing national deployment targets.

Site allocations are expected to follow a competitive tendering process with expected auction rounds. The model has been selected and published in 2025 by the Portuguese government[22], however the exact process for the first auction round is still unclear. The auction rules, process and timeline for the first round of seabed lease auctions should be published either in late 2025 or early 2026.

The "Portuguese Offshore Working Group" has published a final report[23] on the planning and operation of ORE installations in the country in 2023. The report makes suggestions for locations of future ORE deployments, starting with Viana do Castelo in the first instance (location of the currently only operational Portuguese OW farm). It also suggests setting up a competitive model and collaborating closely with the network provider to create an efficient and secure grid. The working group also identified capacities of existing ports and any upgrades required to make them more fit-for-purpose in deploying ORE technology.

4.5.3 Market response to recent events

The expansion of the Portuguese OW sector in recent years has been shaped by market, policy, and geopolitical factors, as in most countries. The success of the WindFloat Atlantic project keeps the attention of the industry. The energy crisis initially increased interest in the sector, likely as an effort to diversify electricity production, but this momentum slowed when energy prices returned to normal, while some costs of OW and FLOW components increased amidst global supply chain pressures felt by all OW and FLOW markets.

The current Portuguese government aims to position the country as an international hub for investors in the offshore industry by taking advantage of its geographic location and favourable, if at times severe, metocean conditions. To achieve this, the government is forming a policy and regulatory regime that should allow OW projects to be implemented quickly and efficiently, while maintaining cost competitiveness and regulatory stability. Significant growth in the sector is expected soon.

The deployment targets have stabilised at 2 GW by 2030, most likely to be delivered as a series of medium size projects of about 400-600 MW each [12]. This is to balance investment volume with realistic expectations of logistical and industrial capabilities. There is a common acceptance that, most probably, the 2030 targets will not be reached before 2034/5.

Though it may appear that the Portuguese market is lagging behind countries in Europe with similarly advantageous metocean conditions, this view may be skewed. The bathymetry dictates that OW projects in Portugal use floating technology, which has so far been slower than expected to deploy in other markets as well. Once the first round of ORE auctions is published, which should be soon, the market will hopefully be ready to deploy. This will depend on the capabilities, and costs of FLOW technology at the time.

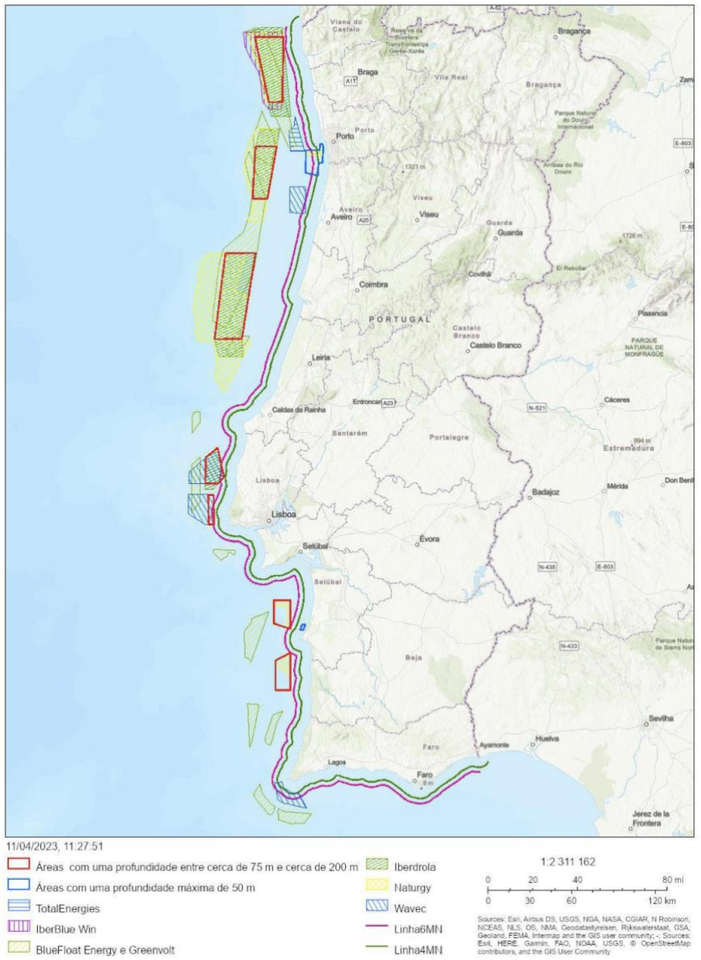

Figure 4-5: Future Portuguese OW developments [15]

[20] https://www.psoem.pt/plano-de-afetacao-para-energias-renovaveis-offshore/

[21] https://webgis.dgrm.mm.gov.pt/portal/apps/webappviewer/index.html?id=9ea76f6fe4ca463a8ced196e30fcc2e1

[22] https://diariodarepublica.pt/dr/detalhe/despacho/4752-2025-915282933

[23] https://www.lneg.pt/relatorio-final-do-grupo-de-trabalho-para-o-planeamento-e-operacionalizacao-de-centros-eletroprodutores-baseados-em-fontes-de-energias-renovaveis-de-origem-ou-localizacao-oceanica/

4.6 Germany

Total Installed OW capacity	10 GW
Installed FLOW capacity	0 MW
2030 Deployment target	30 GW
Long-term target	40-50 GW (2035), 70 GW (2045)
FLOW targets	No specific FLOW targets.
Other market notes	German bathymetry is suitable for fixed-bottom solutions and there is no expectation of FLOW development.

4.6.1 General information

One of the original pioneering countries of wind energy, Germany is home to the world's 3rd largest OW market after China and the UK with around 10 GW deployed. Access to the North Sea with favourable wind conditions has attracted the development of 32 currently operational wind farms [16]. Due to the bathymetry of the German part of the North Sea (the German Bight), with a large part of the German Bight having a depth of less than 20 m, FLOW technology is not deployed or expected to be deployed in Germany, due to the lower cost of fixed-foundation solutions. This is similar in the German Baltic Sea. The market in Germany is showing fast growth, with just below a GW of OW installed in 2024 [17].

4.6.2 Updates in MSP and site development

Germany has access to two seas – the Baltic and the North Sea. The majority of OW development happens in the North Sea (8 GW in operation) due to proximity to demand centres, metocean conditions and shallow depth, but there are wind farms in operation and various stages of planning in the German Baltic (1.8 GW in operation) as well. The Federal Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrographie – BSH) is the organisation in charge of MSP in Germany and publishes the Area Development Plans[24] which covers both the German North Sea and the German Baltic waters. The MSP policy includes designation of sites for wind farms. There are no considerations specifically for FLOW due to bathymetry specifics.

Across the two sea basins, 42 projects are either in operation (9.87 GW), construction (17.8 GW), or planning (16 GW). All of these are expected to be operational by 2034. A complete list of projects including maps and other data is available in the status report for the development of offshore wind in Germany in 2025[25].

This degree of market expansion is almost enough to match the increased deployment targets of 50 GW by 2035; however further sites would have to be designated and built up. There is still space, and additional capacity can be designated. Some wind farms will also be reaching the end of their lifespan before 2035; some have been operational since 2009. Therefore, there may be some scope for re-powering with modern machines to increase capacity of existing sites.

Seabed areas are allocated to developers in competitive auction schemes. These are based on price of electricity from the given wind farm – negative bidding (lowest price wins). The auction design has recently been criticised when in the second 2025 round where two sites of a total 2.5 GW were on offer, but no one bid.

Figure 4-6: Offshore wind projects in German waters [20]

The critique mentions a lack of a two-way CfD for revenue stabilisation and high development right fees as reasons for the lack of interest in bidding in the latest auction [18], [19].

4.6.3 Market response to recent events

National deployment targets for 2035 have been increased from 40 to 50 GW, which is a testament to the stability of the market, optimism regarding growth predictions and the health of the OW industry in Germany. The research focus (especially regarding financing) has shifted back to any research related to achieving the goals in time. Thus, research of disruptive and future concepts is not funded as a priority. This includes FLOW, as this is not an essential technology for German OW deployment targets.

In the first half of 2025, offshore wind supplied 5.2% of German electricity. The rate of market expansion is expected to accelerate past 2027 in a push towards achieving the 2035 target [20]. Along with modernisation of existing installation through re-powering and lifetime extension of existing assets, turbine size is expected to follow the growth it has experienced up to now. Germany also has an extensive network of ports which have experience serving the OW industry at all levels and all stages of the project development.

[24] https://www.bsh.de/DE/THEMEN/Offshore/Meeresfachplanung/Flaechenentwicklungsplan_2025/Anlagen/Downloads_FEP2025/FEP_2025.pdf?__blob=publicationFile&v=1

[25] https://www.wind-energie.de/fileadmin/redaktion/dokumente/publikationen-oeffentlich/themen/06-zahlen-und-fakten/2025_Status_des_Offshore-Windenergieausbaus_Erstes_Halbjahr.pdf

4.7 USA

Total Installed OW capacity	174 MW
Installed FLOW capacity	0 MW
2030 Deployment target	30 GW
Long-term target	115 GW (2050)
FLOW targets	15 GW (2035)
Other market notes	There are state-level as well as federal-level deployment targets in the USA. The main states for expected deepwater deployment are Maine, California and Oregon.

4.7.1 General information

The year 2025 has been a challenge for OW in USA. The Trump administration, known for opposing wind energy, have through executive orders and tariffs effectively halted any future development of the industry and made it as difficult as possible for projects currently in development to continue construction. Developers have pulled out of the market due to the policy opposition and the associated high degree of business uncertainty [21]. The situation in the USA is evolving at a rapid pace, but this report attempts to summarise the state of play at the time of writing (December 2025).

4.7.2 Updates in MSP and site development

While there is no formal authority in charge of an overarching MSP process, many organisations contribute to the formation of plans for ocean space management. The Bureau of Ocean Energy Management (BOEM) of the Department of the Interior is the organisation responsible for the leasing of federal waters on the outer continental shelf for energy and minerals purposes – this includes designation of sites for ORE, which in the USA are called Wind Energy Areas (WEAs). BOEM collaborates with the National Oceanic and Atmospheric Administration (NOAA), the Department of Defense and the Coast guard.

Some of the WEAs are in deep water, especially off the coasts of California and Maine. Up to 2025, 3.5m acres (over 14,000 km^2) have been designated as WEAs. The WEAs are then leased using a competitive leasing process organised by BOEM[26].

In July 2025, BOEM cancelled the designation of all WEAs following Secretary's Order[27] "Ending preferential treatment for unreliable, foreign controlled energy sources in department decision-making". The five-year BEOM leasing schedule was also cancelled, effectively completely halting development of offshore wind in the country.

In addition to this, stop-orders have been issued to wind farms Empire Wind 1 (Equinor, 800 MW, scheduled first power 2027) and Revolution Wind (Orsted, 704 MW, scheduled first power 2026). The stop-orders halted construction of both wind farms, but have since been overturned by judges and construction continues [22], [23].

The Trump administration further imposed a 50% tariff on wind turbine parts and components and shortened the Biden-era federal tax credits for wind and solar developers to end in 2026 instead of the originally planned 2032 [24].

The policy environment is hostile towards OW development and as a result, there are only seven offshore wind projects active on the USA east coast currently – two in operation, five in various stages of construction [24]. This is down from about 30 projects in 2023.

To meet the national and state targets, leasing, planning, and construction must resume. More sites are needed to meet total 2050 state targets. The total estimated capacity of existing designated lease areas is about 38 GW.

4.7.3 Market response to recent events

Recently, the policy in the US has been changing dynamically in ways which go directly against building the sort of policy landscape which allows OW to thrive. On the first day of the second Trump presidency, the president signed the memorandum[28] "Temporary Withdrawal of All Areas on the Outer Continental Shelf from Offshore Wind Leasing and Review of the Federal Government's Leasing and Permitting Practices for Wind Projects". This was followed by other anti-renewables policy like the Secretary of the Interior's order[29] to "Rein in environmentally damaging wind and solar projects".

This was followed by the July executive order to prematurely end the clean energy production and investment tax credits and implement enhanced Foreign Entity of Concern restrictions each as identified in the One Big Beautiful Bill Act. The Order directs the Secretary of the Interior to revise regulations and policies to eliminate preferential treatment for wind and solar facilities compared to reliable, dispatchable energy sources[30].

Further on in August, the Transportation Secretary Sean Duffy terminated and withdrew $679m of funding for wind projects and announced that the money should be directed towards "America's maritime dominance" [25] .

The USA remains a market of huge potential and scale for OW and FLOW development. While momentum had been building in the market over the last number of years, recent developments have stopped the market in its tracks. It remains to be seen when and if confidence in the market will return. This will be driven by the policy framework, it is unlikely developers will be interested in (re)entering the market without some assurances about long-term prospects.

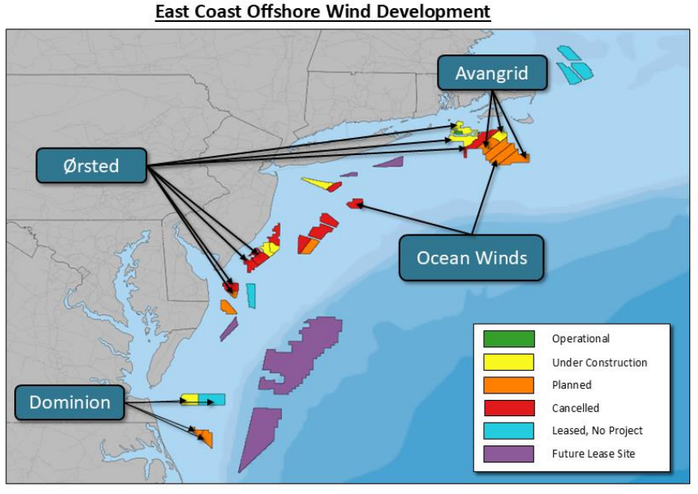

Figure 4-7: Offshore wind projects on the US East coast (note that light blue and purple projects are, for now, also on hold) [26]

[26] https://www.boem.gov/renewable-energy/lease-and-grant-information
[27] https://www.doi.gov/document-library/secretary-order/so-3437-ending-preferential-treatment-unreliable-foreign

[28] https://www.whitehouse.gov/presidential-actions/2025/01/temporary-withdrawal-of-all-areas-on-the-outer-continental-shelf-from-offshore-wind-leasing-and-review-of-the-federal-governments-leasing-and-permitting-practices-for-wind-projects/

[29] https://www.doi.gov/pressreleases/secretary-burgum-announces-order-rein-environmentally-damaging-wind-and-solar
[30] https://www.whitehouse.gov/fact-sheets/2025/07/fact-sheet-president-donald-j-trump-ends-market-distorting-subsidies-for-unreliable-foreign-controlled-energy-sources/

4.8 Netherlands

Total Installed OW capacity	4.7 GW
Installed FLOW capacity	0 MW
2030 Deployment target	21 GW (2032)
Long-term target	30-40 GW (2040)
FLOW targets	No official targets, bathymetry favours fixed-bottom projects.
Other market notes	Expected development of floating solar farms.

4.8.1 General information

The Dutch are one of the pioneering nations of OW, with the nation's first OW farm becoming operational in 2006. At the time of writing, the country has 13 OW projects with a total capacity of about 4.7 GW. In 2025, the Dutch government lowered the long-term OW deployment targets in a move which is being called a "reality check" and comes after two OW auctions which failed amidst financial concerns and a lack of interest. It needs to be said, however, that the original target of 50 GW by 2040, would have meant that at full capacity, Dutch OW would have been able to supply almost twice the nation's peak electricity demand (about 30 GW) [27]. The current target of 21 GW by 2030 remains one of the most ambitious, especially considering the size of the market.

4.8.2 Updates in MSP and site development

MSP in the Netherlands makes specific considerations for ORE since its inception in 2009, when MSP for the Dutch part of the North Sea was included in the National Water Plan 2009-2015 published by the Ministry of Infrastructure and Water Management. The most recent version of the plan is the North Sea Programme 2022-2027[31] and interestingly makes provisions for policy frameworks for co-use of space between OW and other industries including policy frameworks for passage through wind farms.

Due to the bathymetry of the Dutch part of the North Sea (average depth of about 30 m [28]) there are no considerations for FLOW in Dutch MSP and no expectations of FLOW ever being deployed.

A partial revision of the 2022-2027 North Sea Programme is currently underway, partly in an effort to designate more ORE areas to be developed after 2031. The revision is in the stage of international consultation – due to the southern North Sea being used by many nations, the Dutch government is following the principles of the Espoo convention[32] on the transboundary environmental impacts assessments. Designation of more ORE areas is required to match national deployment targets. This is expected to be finalised by the end of 2025, but as of early December there has been no announcement.

In the Netherlands, there is no separate seabed lease auction run by a seabed landlord (like Crown Estate in the UK or BOEM in the US). The Dutch government pre-develops sites and provides grid connections. Developers compete for permits through tenders organised by The Netherlands Enterprise Agency (RVO), an executive body of the Ministry of Economic Affairs. The format of the tenders has shifted over time; originally these were offered with subsidies, then became subsidy-free, then driven by non-price factors like systems and ecology and recently will possibly require financial payments.

4.8.3 Market response to recent events

As mentioned, deployment targets have shifted recently. The target for 2040 is expected to be moved to 30-40 GW down from the previous 50 GW and the 2030 target is expected to be achieved in 2032 instead. This is likely due to low interest from developers in participating in tenders with the current design which offers no subsidy incentive. Another reason for the reframing the targets is a slower-than-expected industrial electrification and development in the hydrogen market.

As a result, two upcoming project tenders (2GW total) have been postponed [29]. The geopolitical situation also has impacted current considerations regarding the roll-out of energy assets, stimulating more transboundary collaboration. The government has downsized the upcoming Nederwiek I-A site from 2 GW to 1 GW to reduce financial risks. It has also eased application requirements, simplified innovation criteria, limited developer liability in the first two years, and allowed financial contributions to be paid during operation rather than upfront. Only one 1 GW site will proceed as planned. The government is considering reintroducing subsidies and was expected to announce a detailed strategy on this by Q3 2025.

This shift reflects a more realistic alignment with infrastructure feasibility and demand forecasts, though it has raised concerns about long-term climate goals and investment certainty.

Dutch companies are actively developing floating wind turbine and foundation technologies, showcased in the 2025 Dutch Offshore Wind Innovation Guide but these are aimed at export rather than deployment in the Dutch EEZ. Focus remains on floating solar and integration with bottom-fixed wind.

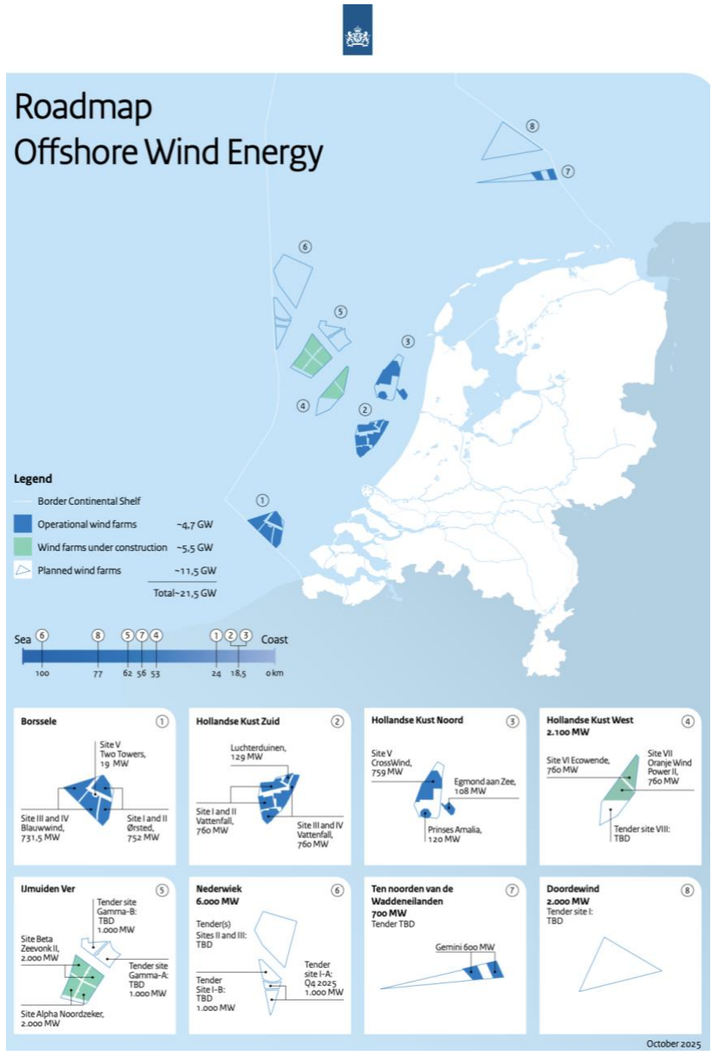

Figure 4-8: Dutch Offshore Wind Energy Roadmap [30]

[31] https://www.noordzeeloket.nl/publish/pages/201299/north-sea-programme-2022-2027.pdf

[32] https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&clang=_en

4.9 United Kingdom

Total Installed OW capacity	16 GW
Installed FLOW capacity	78 MW
2030 Deployment target	43-50 GW (2032)
Long-term target	Nothing specific for OW but Net zero by 2050
FLOW targets	No official targets – mentions of 5 GW by 2030 with proportion of FLOW/OW increasing in the future
Other market notes	The current UK OW market is larger than the onshore wind market. Non-grid-connected OW and FLOW is being developed to electrify offshore oil & gas.

4.9.1 General information

One of the original OW markets, the UK has had operational OW farms since 2000 when the Blyth offshore wind farm came online. Today, it is the second largest OW market in the world after China accounting for almost 20% of all OW deployed globally [31]. The market in the UK is mature with extensive supply chain embedment and local companies getting involved. Offshore wind is already the second largest source of electricity for the UK, after gas [32]. 2025 was a dynamic year in the UK market with new policies enacted, the first full year with Great British Energy[33], and the criticised CfD auction round 7, which operated under new rules focused on promoting domestic industrial growth rather than purely considering price. There is a high level of confidence in the market, despite this year's slight faltering after the unchecked optimism of the past couple of years. The market is now focusing on providing value for money, integrating domestic suppliers as much as possible and upgrading infrastructure to make sure it is up for the future challenge.

4.9.2 Updates in MSP and site development

The UK is home to two OW markets by the nature of who the "landlord" of the sea is – Scotland (where Crown Estate Scotland oversees seabed leases) and England, Wales, and Northern Ireland (where Crown Estate provides leases). This creates two markets with very similar policy frameworks, methods of operation, regulatory landscapes and procedures, but different organisations involved in lease allocation, permit awards and CfD applications. Some regulatory power is also devolved onto Wales and Northern Ireland. The below table summarises the responsibilities:

Table 4-1: Organisations responsible for regulating OW

	Scotland	England	Wales	Northern Ireland
Seabed lease	The Crown Estate Scotland	The Crown Estate		
Marine spatial planning	Marine Directorate	Marine management organisation	Welsh Ministers	Department of Agriculture, Environment and Rural Affairs (DAERA)
Marine license	Marine Directorate	Marine management organisation	Natural Resources Wales	Marine and Fisheries Division (DAERA)
Contracts for Difference	Low Carbon Contracts Company, National Grid ESO Framework set by Dept. of Energy Security and Net Zero			

CfD auction round 7[34] (AR7) opened in August 2025 with results expected in late 2025 or early 2026. AR7 sets out some new rules – a maximum capacity of 1.5 GW for OW, an option to commission the project in stages not smaller than 25% of the total capacity, and importantly, the Clean Industry Bonus[35] (CIB). CIB acts as a top-up to the CfD for eligible CfD holders who demonstrate a level of contribution towards growing the local UK supply chain. The total AR7 budget was set at £1.08bn (£0.9b for OW, £180m for FLOW) with an additional CIB budget of £544m. This is less than what the industry hoped for and AR7 is said to only be able to support around 5GW of OW and FLOW which would not move the UK towards the 2030 targets quickly enough [33].

4.9.3 Market response to recent events

It will be interesting to see how the industry reacts to the CIB and whether it maybe would have been better to instead use the money to increase the AR7 budget outright. The CIB is however a signal that non-price criteria are making their way into UK auctions. Paying developers more for supporting local industry is not directly a local supply chain content requirement, but as a positive incentive it may achieve a similar thing. It remains to be seen what other countries involved in the supply chain think of that and whether this decision will truly bring value for money to the UK taxpayer. Regardless, OW in the UK is there to stay and the nation is counting on the technology to deliver clean power and work towards the new Clean Power 2030[36] objectives

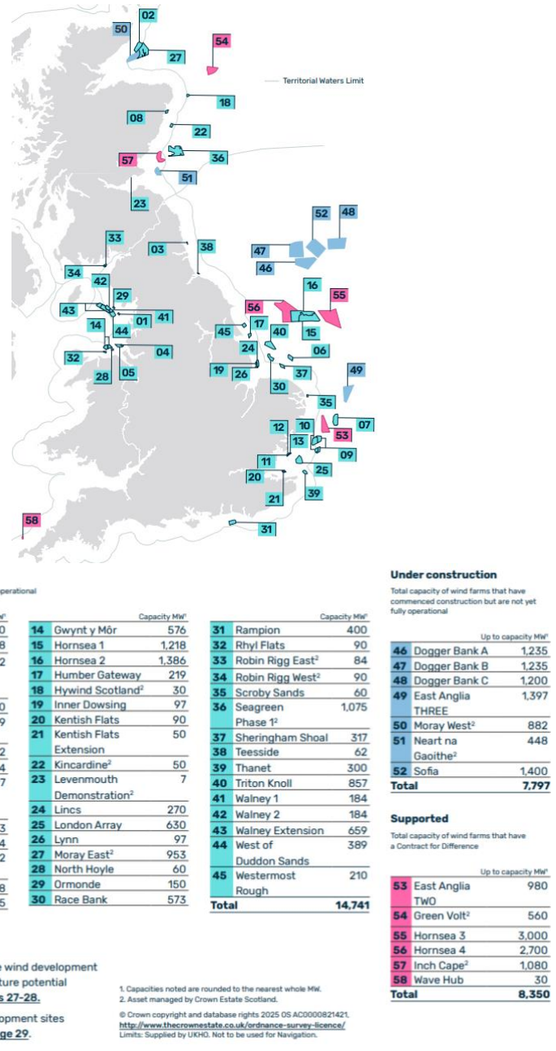

Figure 4-9: Offshore wind projects in UK waters [34] (values from December 2024, adapted)

[33] https://www.gov.uk/government/publications/introducing-great-british-energy/great-british-energy-founding-statement

[34] https://www.gov.uk/government/publications/contracts-for-difference-cfd-allocation-round-7-allocation-framework

[35] https://assets.publishing.service.gov.uk/media/67910467cf977e4bf9a2f17e/cfd-clean-industry-bonus-allocation-framework-corrected-22012025.pdf

[36] https://www.gov.uk/government/publications/clean-power-2030-action-plan

5 Summary of findings

Here we have presented market snapshots for those IDEA partner countries where we have managed to collect data via questionnaires. Some of the country also contain data collected outside of the questionnaires – where this is the case, this data is referenced accordingly. Below, Figure 5-1 and Figure 5-2 show summaries of current installed capacity for OW and FLOW in surveyed countries and also market development targets.

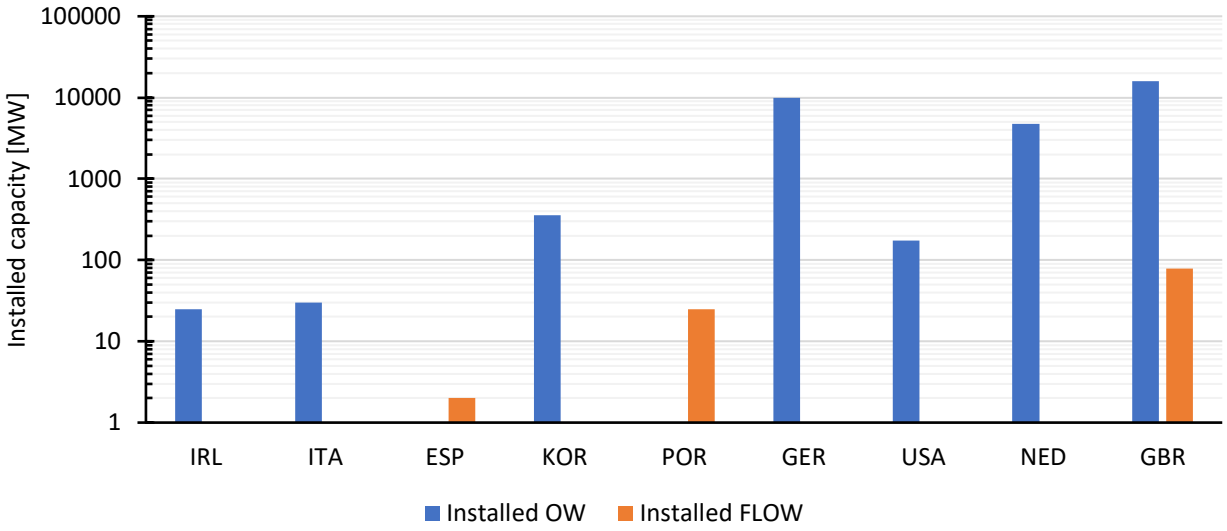

Figure 5-1: Reported values[37] of installed OW and FLOW capacity in partner countries (note a logarithmic scale has been used to display results)

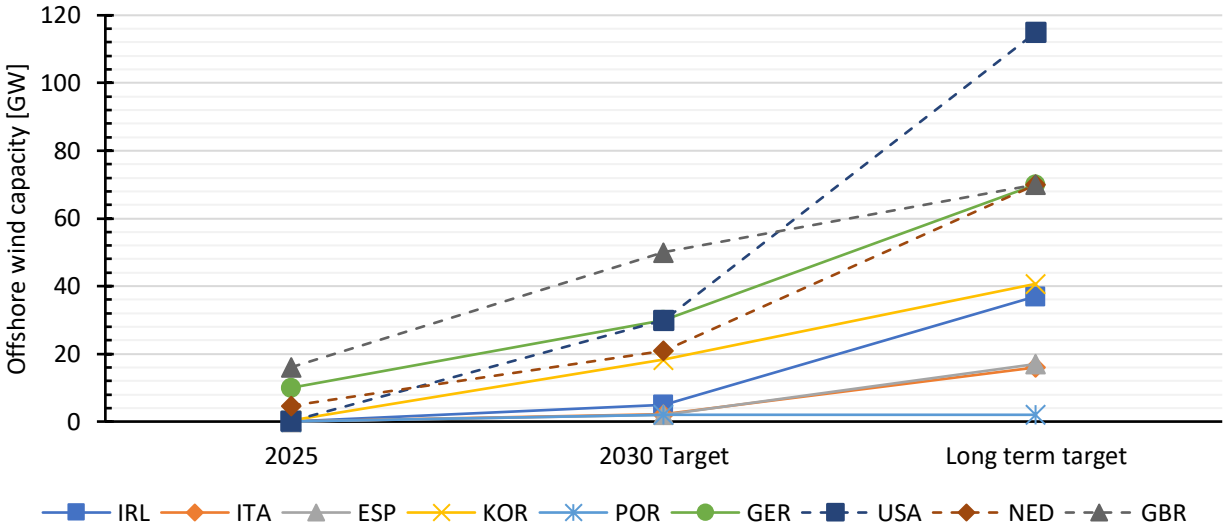

Figure 5-2: Reported installed capacity, 2030 development targets and long-term targets (combined OW and FLOW)

[37] Values reported in the figures are not necessarily the most up to date or accurate but represent the questionnaire answers.

5.1 Turbulent but optimistic progress

We have seen that some countries have reframed their national OW deployment targets in recent years – some have increased (Germany, UK) but for the most part, 2030 and long term targets have been either decreased or delayed (whether this is through a formal update to targets or a more general public acceptance that it is good to work towards targets, but they probably will not be reached in time). This has likely been caused by a combination of two factors;

1. **Progress with technology development and the implementation of supporting frameworks** has not been as quick as many would have hoped for.
2. **Targets have been re-baselined to reflect the current political mood** which has seen a focus away from reaching climatic targets from a fundamentalist point of view towards maximising the benefits of the business case offered by ORE as well as towards non-price criteria and topics completely unrelated to ORE:

    a. Political priorities have been re-aligned in recent years resulting in a split of focus from climatic targets towards topics of national security, industrial support and human rights.
    b. Tariff wars have brought a higher degree of uncertainty to a fully globalised OW market, which relies heavily on international business collaboration in all markets except for China.
    c. Projects getting cancelled due to lower-than-hoped-for strike prices, disadvantageous risk allocation where developers perceived they are taking on too much risk, or a lack of political support (or in the case of the USA, strong political opposition).
    d. Issues with infrastructure availability – ports, electricity grid.

Nevertheless, 2023 and 2024 were both record years in terms of wind energy deployment when we look at the figures presented in GWEC annual reports for total annual (onshore and offshore) wind energy deployment [35], [36]. A slowing down in the market is not necessarily a surprise, the rapid growth of the years prior and the unhinged optimism in terms of market predictions in the past five years is now getting re-aligned into more realistic terms, which is easy to see as a downturn. The renewable energy sector will likely continue to grow, as ever, in an environment of constant dissonance between industrial progress and the mood of news articles [37].

5.2 A new narrative for renewables

The conversations around OW are changing away from the "green narrative" of decreasing CO_2 emissions and "saving the planet" and towards highlighting that renewable resources (including OW) have now become some of the cheapest sources of electricity in many markets. Focusing on the economic benefits of renewables including job creation, direct, indirect and induced economic activity effects, the potential to re-industrialise certain areas, while highlighting that renewable energy is already integrated within many power systems and that it provides a welcome increase in national energy security is the new norm in renewables communication.

This finally has the potential to change the way people view renewables from the "ugly unreliable hoax dreamed up by climate activists" into "a cheap, clean way to make electricity while providing employment and local economic value" [38], [39].

5.3 What are the countries with a growing offshore wind industry doing well?

Countries which have managed to build their OW industry have some things in common. Here we summarise some of the things countries have done to create an environment in which OW can thrive:

1. **Provide a clear policy and regulatory framework** which very clearly states what sort of permits developers need to get, what they need to consider in their impact assessments, which organisations are responsible for providing these permits. Ideally, this involves one organisation which provides most, if not all of the required permits to really simplify communication.

2. **Present a clear pipeline and method of awarding sites to developers** including identifying development sites in an MSP, publishing a clear seabed lease auction schedule (or allocation schedule if not auctioning leases) along with seabed lease application requirements, thus building a clear project pipeline with known milestone dates.

3. **Provide assurances about grid development** which is aligned with the MSP and which shows how the national grid operator plans to deliver power from the planned OW farms to demand centres to avoid unnecessary dispatch down and a clear route to market.

4. **Design a way of financially de-risking** OW projects by either offering CfD-like contracts or taking on more risk as a government or systems operator (for example by conducting site surveys or taking on grid development).

5. **Keep policy consistent and up to date** and avoid any unnecessary changes which decrease confidence of investors and developers and lead them to prioritise other markets or withdraw projects. Consult policy review with a range of stakeholders to make sure industrial development happens in a fair way and that the legislative and regulatory landscape is as efficient as possible without compromising its protective function.

6. **Work with OW stakeholders and the media** to improve public acceptance and local and community beneficial effects of industrial growth.

This is by no means an exhaustive list, more like an analysis of trends seen throughout the past years working on WP4 of IDEA and this report. Specific suggestions will be different for each market and the local goals and demands.

6 Conclusions

The IDEA project aims to help accelerate the commercial deployment of floating offshore wind arrays by providing reference metocean conditions, reference array-level designs, a better understanding of risk, and by studying challenges to the development of floating offshore wind. This report was led by IDEA-IRL, the Ireland-based project aligned with Task 49, as the fourth deliverable for WP4 – Stakeholder Integration. It builds on previous reports on MSP, innovation management, and supply chain capability which included interviews and consultation with offshore wind stakeholders from IDEA partner countries.

To write this report, we used data collected from international stakeholders via a questionnaire. We have provided market development updates on select partner countries along with a brief analysis of recent policy development in each market with a focus on MSP, site allocation, and seabed leasing.

In most markets, OW deployment targets are being either lowered or delayed. This is a reflection of the deployment targets as much as of the recent performance of the OW industry. This comes at the same time as a change in narrative towards a more “pragmatic” view on renewables, which highlights the mature nature of the technologies available and a shift towards advocating for the economic and security benefits of renewables rather than for growth of renewables from the fundamentalist climate action point of view. This viewpoint change is important for making renewables the “new default” source of electricity, which they need to become.

The analysed markets for the most part present a case of careful, realistic optimism. We identify several cases of progressive policy development which have enabled or will soon enable the growth of the OW industry in new and existing markets. What is clear from our exploration is that OW will continue growing, countries will continue relying on OW as one of the ways in which to achieve their (sometimes re-phrased) energy goals, and that a carefully set up the regulatory environment, with clear communications from the side of the government remains absolutely critical for fostering growth in the energy sector.

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Appendix A: Survey questionnaire

The below is the questionnaire which has been sent out to representatives of IDEA partner countries. Responses were collected with the response for Ireland provided as a guiding example. The form was sent out to participants as a spreadsheet they could fill in.

Part 0: General questions

1. Which country do you represent?
2. What is the installed offshore wind capacity in your country? What is the installed floating offshore wind capacity?
3. What are the current offshore wind deployment targets?
4. What are the current floating offshore wind deployment targets?

Part 1: Maritime spatial planning and site development

5. Are there designated offshore renewable energy (ORE) sites in your country's marine spatial planning (MSP) policy?
6. Which organisation is responsible for MSP in your country?
7. Are there specific designated sites for floating offshore wind in your country's MSP?
8. How are lease sites awarded to developers?
9. Is there a seabed lease auction schedule linked to the sites designated in the MSP policy? If not, how will sites be allocated to developers?
10. Have enough sites ben designated to reach national deployment targets?
11. What are the next steps in MSP in your country?
12. Please provide any useful links to national MSP resources (maps, policy documents, etc.)

Part 2: Market updates

13. How have market and policy pressures and the geopolitical situation been influencing the development of offshore wind projects and industry in your country?
14. Have there been any recent changes to national deployment targets to offshore wind or floating offshore wind?
15. What notable new policies, legislation, or industrial strategy documents and partnerships related to the offshore wind industry have been announced in your country recently?
16. Please provide general commentary on the health of the offshore wind and floating offshore wind markets in your country. How has this changed in the last year?

Appendix B: Summary of the IDEA-IRL work package 4 and future work recommendations

This appendix is the final deliverable of WP4 of the IDEA task and outlines the work completed and suggests a future direction of progress for any future tasks linked to stakeholder integration and policy development in OW and FLOW. We would like to thank all who have contributed to WP4 work by providing information in interviews and questionnaires and who have helped review and edit reports.

Progress made by IDEA-IRL WP4

WP4 was designed to include the views of various FLOW stakeholders into the work of the IDEA project. Throughout the project duration we have collected data using interviews, online questionnaires, and own desktop research. We have delivered the following reports:

1. WP4D1 outlining the analytical hierarchy process (AHP) method for innovation management and how this can be used in prioritising research in the FLOW industry.
2. WP4D2A represented views of international stakeholders on the status of market development and MSP in their domestic OW markets and presented information about the project pipelines and MSP practices in IDEA partner countries.
3. WP4D2B presenting the results of the innovation prioritisation based on a survey of FLOW stakeholders, which highlighted research topics perceived as the most potentially impactful for the development of the FLOW industry and the benefits which come with it.
4. WP4D3 shed some light on the capability and capacity of the global FLOW supply chain and presented information on localisation of supply chain capability across IDEA partner countries along with information on what countries are doing to promote domestic supply chain growth to capture economic value and provide employment opportunities.
5. WP4D4 presents a market update on project development in IDEA partner countries with a focus on development area allocation mechanisms, recent policy and project developments and presents a summary of what a policy environment fostering FLOW growth may look like.

The team has also presented the work at national and international conferences, published a proceedings paper on MSP and research needs[38] and is working on a paper on supply chain modelling for FLOW. Combined, the publications offer a broad view of what various stakeholders in different markets consider important within the FLOW industry and how the industry interacts with policy.

[38] Floating offshore wind – an overview of marine spatial planning and the needs of the industry (Dvorak et. al., 2024)

Suggestions for future research

Stakeholder interactions throughout WP4 work showed us people are interested in links between policy and technology, and in forming regulatory frameworks to develop new and existing markets.

Include non-technological factors in technological research work

Any future work needs to clearly define the contribution to the industry before the work starts and any objectives. Deliverables should be designed to complement technological and technical outputs and to align these with the research needs of the community. In future tasks "WP4-style" work should precede the technical work, which gives a chance to integrate stakeholder views before any technical work begins and align the scope of the technical work as well as possible with what people need at the time, while conducting policy and market research at the same time. The second part of this suggestion is tied to the design of recent seabed lease and Contract for Difference (CfD) auctions, which have increasingly included non-price criteria like local supply chain requirements, social impacts, and of course environmental impacts. A future "WP4" could explore the use of non-price criteria across various markets and investigate how equipment manufacturers and developers can consider these criteria in their design process. This could lead to suggestions for designs which optimise not just for price or performance, but also for non-price criteria.

Focus on research dissemination and engagement

Getting engagement from stakeholders has been one of the challenges with WP4. A future task should make a clear plan for engagement and dissemination to make sure the aims are clear, communicated, and appear worthwhile to a wide range of audiences. This includes a flexibility cause about re-framing the outcomes if the situation demands it. This should be an effort to maximise the impact of the work done, through getting more people involved and aligning their needs to the work.

Potential topics to focus on

1. Develop understanding of non-price criteria in seabed area auctions in various jurisdictions and make suggestions for inclusion of non-price criteria as a design-driver in the FLOW industry.
2. Explore the potential for standardisation of parts design in terms of identifying where this would have the most impact and proposing a way to increase the level of standardisation across the industry. This could include exploring a business case for interchangeable parts.
3. Provide an overview of ways of de-risking investment in FLOW at policy level, including attributing risk to various entities, CfDs, power purchase agreements, private wires and other tools and how these are used across markets.
4. Conduct a stakeholder consultation on the potential for co-existence of marine industries within the confines of an OW and FLOW farm. Inform on how these differ and what ways can be explored to minimise the displacing effect of OW on other industries.
5. Explore ways in which OW and FLOW can better integrate into national electricity grids without compromising non-synchronous generation limits. This could include looking for synergies with industries capable of flexible demand, innovative power trading, or energy storage mechanisms.
6. Create a better understanding of the interconnectedness of the OW industry to other industries to better evaluate potential economic impacts of supporting a local OW industry including direct, indirect economic effects, employment generated, and effect on cost of domestic OW.