MARINEWIND

Market Uptake Measures of Floating Offshore Wind Technology Systems (FOWTs)

1/11/2022 – 31/10/2025

Call: HORIZON-CL5-2021-D3-02

Project 101075572 — MARINEWIND

D4.2: Recommendations for MARINEWIND stakeholders

Lead partner: Q-PLAN International

Authors: Parodos L., Q-PLAN International
Tsogas D., Q-PLAN International
Spyridopoulos G., Q-PLAN International

Submission date: 31/10/2025

Dissemination level		
PU	Public, fully open	X
SEN	Sensitive, limited under the conditions of the Grant Agreement	

Co-funded by the European Union

Document history

Issue date	Version	Changes made / Reason for this issue
3/12/2024	0.1	Input from partners
19/12/2024	0.2	Updates from the MML workshop
30/06/2025	0.3	Additional input from partners
21/07/2025	0.4	First Draft Version of deliverable shared with APRE
10/10/2025	0.5	Full draft version and share for Quality review by UoY
31/10/2025	1	Final version

Co-funded by
the European Union

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

EXECUTIVE SUMMARY

This deliverable presents a set of targeted recommendations developed within the framework of the MARINEWIND project, which aim to support interested stakeholders across Europe to accelerate the market uptake and sustainable development of Floating Offshore Wind Technologies (FOWT). Drawing on extensive research, stakeholder engagement, and practical insights, these recommendations address critical challenges and provide actionable guidance for industrial players, academics, public authorities, citizens and green innovation stakeholders.

The recommendations are organised in two batches: the first batch provides guidance at the European level, addressing challenges that influence the large-scale cross-border deployment of FOWT. The second batch sets out country-specific recommendations derived from MARINEWIND Labs, tailored to national and regional contexts and stakeholder needs. To ensure that the recommendations reflect real-world needs and priorities, a Mutual and Mobilisation Learning (MML) workshop was organised to present, discuss, and validate the proposed recommendations with diverse stakeholders.

Through this deliverable, MARINEWIND offers practical guidance and fosters collaborative action to advance floating offshore wind in Europe, contributing to the EU's clean energy transition and climate goals.

1 INTRODUCTION

MARINEWIND is a 3-year Coordination and Support Action which started in November 2022 and is supported by the European Union within the framework of the Horizon Europe programme **(GA No 101075572)**.

MARINEWIND aims to identify bottlenecks and potential opportunities to strengthen the Floating Offshore Wind Technologies and increase their market uptake across Europe. Particularly, it aims to:

- Increase awareness towards developing political and business agendas open to the floating offshore wind energy opportunities,
- Increase social acceptance of FOWT via science-based evidence and tools,
- Contribute to the development of efficient financial frameworks to support further investments in FOWT,
- Provide solutions characterized by a wide potential for reapplication and long-term viability.

In line with these objectives, this deliverable sets out actionable recommendations based on MARINEWIND's findings, offering practical guidance for all the MARINEWIND stakeholders from the Quintuple helix at European level and specific recommendations for the countries hosting the **Labs** (Italy, Spain, Portugal, United Kingdom and Greece). The recommendations were developed to address all key aspects with respect to policy, regulatory, social, environmental, financial, market and technological dimensions.

The remaining sections of this document will cover the following topics:

- **Section 2** describes the methodology followed by the MARINEWIND consortium, under the guidance of Q-PLAN, towards the definition of recommendations.
- **Section 3** presents the MARINEWIND recommendations at EU and country Lab level.
- **Section 4** provides some concluding remarks and the next steps.

The **Annexes** include the recommendations template (Annex I), and the Agenda (Annex II) and guidelines of the Mobilisation and Mutual Learning workshop which was organized within the frame of Task 4.2 (Annex III).

2 METHODOLOGY

To develop **actionable and specific Recommendations** for stakeholders to enhance the market uptake and development of Floating Offshore Wind Technologies (FOWTs) across Europe, we followed a structured and collaborative methodology. The analysis focused on existing challenges in the domain of FOWTs, particularly in fostering innovation in national and EU supply and value chains. Through the development and proper dissemination of the MARINEWIND Recommendations to relevant stakeholders, partners strive to provide insights into innovative opportunities in terms of technological, organisational, market, policy and regulatory dimensions. Beyond these areas, MARINEWIND Recommendations can advance the deployment readiness of FOWTs by providing knowledge and directions regarding their potential capacities and balancing aspects, as well as system services including markets and market signals.

The process for developing the MARINEWIND recommendations involved several key steps:

1. Defining the Approach and Structure

The initial step was to define a suitable approach for this task. This included determining the objectives and scope of the MARINEWIND recommendations, as well as their structure, such as whether they should be organized by stakeholder groups (e.g., policymakers, industry, academia) or by thematic dimensions (e.g., social, regulatory, financial). To inform this decision, Q-PLAN conducted desktop research on similar stakeholder recommendation studies, identifying gaps, best practices and relevant insights.

2. Developing a Template for shaping the recommendations

Based on the information required for the recommendations, Q-PLAN developed a standardized template to collect input from MARINEWIND partners. To ensure clarity and facilitate their contributions, an example recommendation was provided to partners complementary to the template. In order to have sufficient recommendations for all the MARINEWIND Labs, partners provided several recommendations at national level, but also a few at EU level. The template for collecting input is available in Annex I.

3. Conducting Desk Research and Consolidating an Initial set of Recommendations

Each partner conducted a desk research exercise using project deliverables, online reports, and relevant publications. The aim was to summarise key results and findings from WP1, WP2 and WP3 activities and online literature, and identify success stories, existing challenges and areas for improvement in terms of developing FOWTs. Based on this research, partners drafted an initial set of recommendations per Lab and EU level.

Q-PLAN gathered the input from all partners and aggregated it into a consolidated set of initial recommendations. This step involved analysing the feedback, identifying overlaps, and ensuring that the recommendations were coherent, comprehensive, and actionable with support from partners.

4. Engaging Stakeholders through a Mobilization and Mutual Learning Workshop

To validate and enrich the initial set of recommendations with additional insights, Q-PLAN, with the support from all partners, organized a Mobilization and Mutual Learning (MML) workshop. This workshop brought together stakeholders from across the quintuple helix, including representatives from academia, industry, public authorities, civil society and SMEs. The feedback and insights gathered during the workshop were of vital importance in refining and finalising the recommendations.

2.1 Floating Offshore Wind in the EU – Current state of play

Floating offshore wind technology is rapidly evolving in Europe, reflecting a significant shift towards renewable energy sources. Currently there are **five operational Floating Offshore Wind farms** in Europe with a total capacity of **218 MW**. These projects are primarily located in regions where traditional bottom-fixed installations are less viable due to water depth constraints. Specifically, the operational Floating Offshore Wind farms are:

- **Hywind Scotland** (North Sea, off Peterhead, UK), consisting of 5 (6 MW) turbines and totalling 30 MW.
- **WindFloat Atlantic** (Atlantic Ocean, ~20 km off Viana do Castelo, Portugal), consisting of 3 (8.4 MW) turbines and totalling around 25 MW.
- **Kincardine Offshore Wind Farm** (North Sea, ~15 km off Aberdeenshire, Scotland), consisting of 6 (5*9.5 MW and 1*2 MW) turbines and totalling around 50 MW.
- **Hywind Tampen** (North Sea, ~140 km off Bergen, Norway), consisting of 11 (8 MW) turbines and totalling 88 MW.
- **Provence Grand Large** (Mediterranean Sea, ~17 km off Port-Saint-Louis-du-Rhône, France), consisting of 3 turbines (8.4 MW) totalling around 25 MW.

In addition to the existing projects, several countries are actively pursuing new floating wind developments. France is in the process of tendering a **250 MW floating wind farm**[1] off the coast of the Occitanie region in the Gulf of Lion, Mediterranean Sea, and has plans for two additional projects in the Mediterranean. Countries like Spain, Portugal, and Norway are also expected to hold large-scale floating wind auctions soon, indicating a growing interest and investment in this technology across Europe[2].

Floating offshore wind energy is gaining significant traction, driven by the need to meet ambitious climate targets and enhance energy security. The EU aims for wind power to constitute approximately 34% of its electricity by 2030, necessitating the installation of 30 gigawatts (GW) of new wind energy

[1] Ocean Winds and Banque des Territoires awarded new 250 MW floating offshore wind project in the French Mediterranean Sea.

[2] Wind Europe, 2023. Floating wind is making great strides. Available at: Floating wind is making great strides | WindEurope

annually[3]. Floating offshore wind technology is pivotal in this expansion, especially in regions with deep waters where traditional fixed-bottom turbines are not feasible.

Despite the progress, the EU faces challenges in scaling up floating offshore wind to meet its climate goals. In 2024, the EU installed 15 GW of new wind capacity, significantly below the 30 GW annual target required to achieve the 2030 objectives. This shortfall of the European Offshore Wind supply chain is attributed to various bottlenecks and challenges that prevent EU Member States from achieving their individual offshore wind targets. Addressing them is crucial to accelerating the deployment of Floating Offshore Wind projects in Europe. A brief overview of these challenges is summarised below[4]:

- **Lengthy Permitting Processes:** The European wind industry faces slow permitting procedures, which reduce orders for wind turbines and delay project timelines.
- **Lack of Standardized Regulations:** Variations in regulatory frameworks across EU member states create inconsistencies, complicating cross-border projects.
- **Increased cost inflation of raw materials and logistics:** European manufacturers see their margins tightened, resulting in higher prices.
- **Competition with China's products:** China's product prices dropped (up to 48% in 2022) while in other regions continued to rise, threatening European manufacturers' share out of Europe.
- **Dependency on imports:** The European wind industry is challenged by strong dependence on import of critical raw materials from non-EU countries, resulting in high price volatility and logistics risks.
- **Demand of larger turbines:** A lot of investments have been made on optimising the wind turbine models to increase their profitability, while at the same time the market trends show huge interest in bigger and more powerful turbines, leading to the risk that investments will not pay off.
- **Social acceptance:** Project developers face concerns about visual impact, environmental effects, and disruption to marine activities. Limited community involvement and awareness further fuel opposition.

Based on the findings of the various project activities and the desk research, an initial set of Recommendations was developed. The initial Recommendations were validated and enriched in a dedicated Mobilization and Mutual Learning workshop (see section 2.2).

[3] Reuters, 2025. EU's 2024 new wind capacity less than half amount needed for climate goal, industry group says. Available at: https://www.reuters.com/business/energy/eus-2024-new-wind-capacity-less-than-half-amount-needed-climate-goal-industry-2025-01-10/?utm_source

[4] Rabobank, 2023. The Bottlenecks Challenging Growth in the EU Offshore Wind Supply Chain. Available at: https://www.rabobank.com/knowledge/d011354306-the-bottlenecks-challenging-growth-in-the-eu-offshore-wind-supply-chain?utm_source=

2.2 Mobilisation and Mutual Learning (MML) workshop

As part of the methodology, a **Mobilization and Mutual Learning (MML) Workshop** was organized to exchange best practices and lessons learned regarding barriers and enablers surrounding the development of FOWTs. The workshop mainly focused on gathering insights from stakeholders with diverse expertise and background, aiming to validate and enrich the initial set of recommendations developed for the MARINEWIND project.

For the successful organisation of the MML workshop, Q-PLAN developed detailed guidelines along with an invitation letter and shared them with partners. Based on the guidelines, partners provided the necessary input to Q-PLAN in terms of MARINEWIND recommendations and ensured the participation of relevant stakeholders from all MARINEWIND Labs, including Academia, Industry, Public Authorities, Civil Society, and SMEs. All Labs were instructed, well in advance, to share a list of 7 confirmed stakeholders to secure the fair representation of all Labs in the workshop.

The workshop was held online on December 11, 2024, via the MS Teams platform, with 40 participants in attendance as depicted below:

Table 1: MML workshop participants

Stakeholder Group	Number of participants
Industry	12
Academia	15
Public Authorities	01
Civil Society	02
Green Innovation / SMEs	10
Total	**40**

During the workshop, Q-PLAN provided an overview of the MARINEWIND project, focusing on the Recommendations, to the participants. Following that, the initial set of recommendations per Lab and EU level was presented by partners (see figure below).

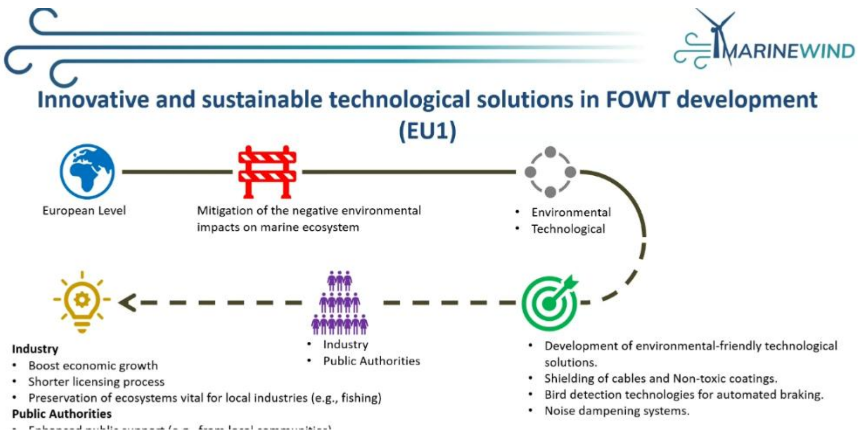

Figure 1: Illustration of a MARINEWIND recommendation

In order to engage the audience and gather valuable feedback and insights, 2 interactive sessions were included in the workshop agenda. The 1st interactive session took place in the [Miro workspace](), where participants were asked to provide additional details on the presented recommendations and suggest new ones based on their expertise and experiences. This session facilitated a dynamic exchange of ideas and helped identify potential gaps in the initial set of recommendations (see figure below).

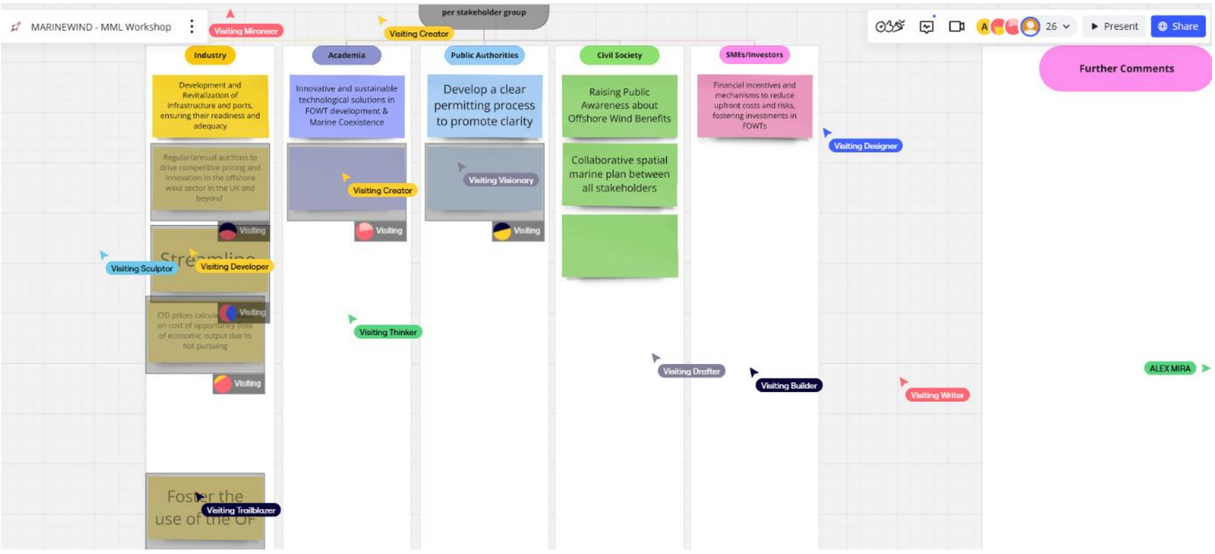

Figure 2: Engagement of participants in the Miro board

Finally, the 2nd interactive session utilized the [Mentimeter]() tool to prioritize the recommendations presented. Participants rated the recommendations based on their perceived importance and potential impact, helping to identify the most critical areas for action (see figure below).

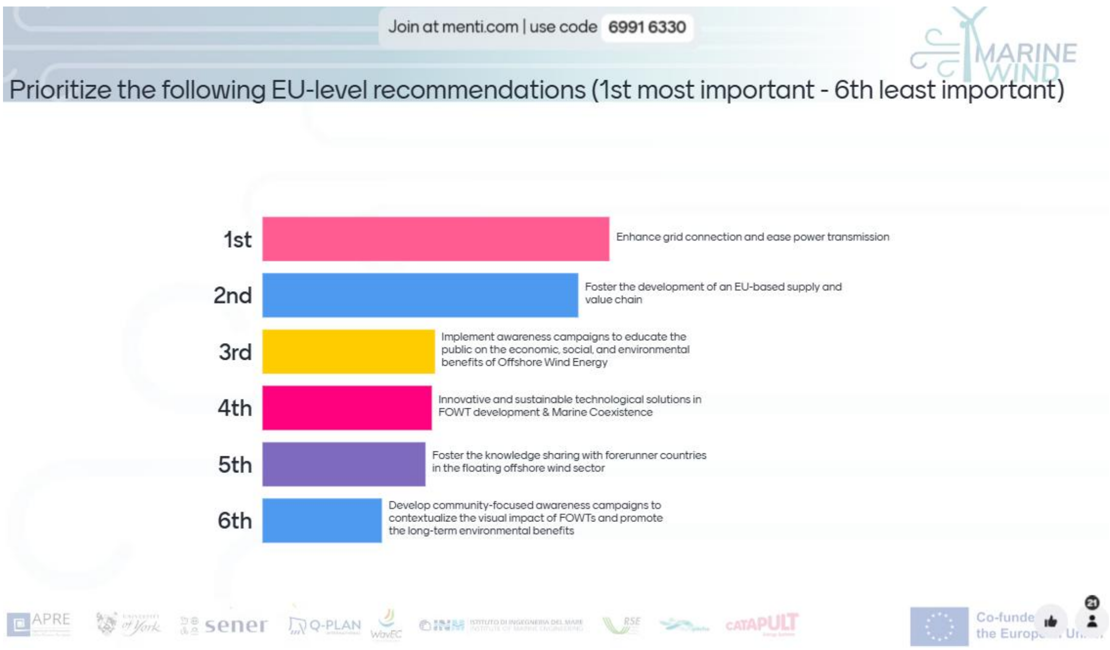

Figure 3: Prioritisation of MARINEWIND Recommendations through Mentimeter

The workshop was marked by high levels of engagement and representation of all Labs, with participants actively sharing their insights and suggestions. The feedback gathered during the interactive sessions provided valuable input for refining the initial set of recommendations and developing specific and actionable MARINEWIND Recommendations.

3 MARINEWIND STAKEHOLDER RECOMMENDATIONS

Based on the experiences and outcomes of the MARINEWIND project, this section provides practical recommendations designed to guide stakeholders in advancing floating offshore wind development. The recommendations are structured in two parts:

- those applicable and relevant across many countries at European level, and
- tailored guidance for country Lab specific contexts.

3.1 European level recommendations

This paragraph presents recommendations concerning the European level, drawing on the MARINEWIND project's insights and engagement with stakeholders. They aim to inform European stakeholders by addressing cross-border challenges and opportunities to advance the sustainable development and market uptake of FOWT throughout Europe. The following table outlines the High-level Recommendations at European level, which are further analysed in this section.

Table 2: High-level Recommendations at European level

1	Mitigation of the negative environmental impacts on marine ecosystem
2	Facilitate technological maturity for developing FOWTs
3	Closing the knowledge gaps in terms of technological solutions, skills needed, investments schemes and indication on how to shape a supportive regulatory and policy framework by leveraging on the insights provided by operating wind farms
4	Need to reduce the EU dependencies in terms of supply of critical raw material and energy provision
5	Develop community-focused awareness campaigns to contextualize the visual impact of offshore wind farms and promote the long-term environmental benefits
6	Implement awareness campaigns to educate the public on the economic, social, and environmental benefits of offshore wind energy

Recommendation #1

Innovative and sustainable technological solutions in FOWT development	
Respective WP(s)	WP2 – Social acceptance and environmental impact analysis
Respective Deliverable(s)	D2.1 – Analysis of Social and Environmental Barriers and Enablers
Geography level of reference	European level
Dimension	Environmental, Technological
Targeted stakeholders	Industry, Public Authorities
References	• MARINEWIND (2023). Deliverable D2.1 - Analysis of Social and Environmental Barriers and Enablers

	• Alma Economics (2021). Offshore wind energy in Greece: Social and economic impacts • Αειχώρος (2022). Παράμετροι χωροταξικού σχεδιασμού και ανάπτυξης για την υπεράκτια αιολική ενέργεια στην Ελλάδα

High level Recommendation
Mitigation of the negative environmental impacts on marine ecosystem

Context

The specificities and size of FOWT projects introduce new environmental conditions from the construction stage to their operation and decommission. The main environmental concerns raising from these conditions are acoustic and electromagnetic disturbances, impacts on seabirds, changes in atmospheric and oceanic dynamics, alteration of seabed integrity and water quality due to the presence of moving artificial structures, effects on the marine species behaviour due to the presence of mooring lines and submarine cables or an increased risk of accidents, related to a higher density of marine space use.

There are feasible technological solutions that could be applied on FOWT projects and not only reduce the negative environmental impact on marine ecosystems but also increase the positive ones. To this end, the need for faster environmental impact assessment, and licensing, could be met through these innovative technologies, which would ensure certain sustainability standards.

Description

The interaction of FOWT with marine ecosystems can manifest through a complex range of environmental impacts. Innovative technological solutions should be developed to minimize the negative and maximize the positive environmental impacts on marine ecosystems and facilitate the development of FOWTs. Such technologies are: (i) Shielding of cables, (ii) Non-toxic coatings, (iii) Bird detection technologies for automated braking, and (iv) Noise dampening systems.

Who is involved and potential Benefits

The introduction of innovative solutions can facilitate the environmental impact assessment in the licensing process and make the investment in FOWTs more attractive.

Industrial Stakeholders

- **Economic growth**: Applying innovative technologies on the development of FOWTs will contribute to increased market share and economic development of industrial stakeholders specialized in these technologies.
- **Shorter licensing process**: By using innovative technologies that reduce negative environmental impacts by design, investors can obtain faster the license to develop and operate a FOWT, as the environmental impact assessment will be completed in a shorter period of time.

- **Preservation of Ecosystems**: By reducing disruption to marine and coastal ecosystems, these projects help maintain biodiversity, which is vital for local industries such as tourism and fishing.

Public Authorities (Local, Regional, and National Governments)

- **Enhanced public support**: Projects with minimized environmental impacts are likely to face less resistance from local communities and stakeholders, simplifying approval processes and ensuring smoother project implementation.
- **Alignment with Sustainability Goals**: Environmental-friendly designs support national climate targets and reinforce public authorities' commitment to sustainable development.
- **Improved Investor Confidence**: Environmentally sustainable designs can attract investors who prioritize ESG (Environmental, Social, and Governance) criteria.

Recommendation #2

Enhance grid connection and ease power transmission	
Respective WP(s)	WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	D3.2 – Analysis of technological barriers and enablers of floating offshore wind
Geography level of reference	European level
Dimension	Technological
Targeted stakeholders	Industry, Academia
References	• MARINEWIND (2023). D3.2 – Analysis of technological barriers and enablers of floating offshore wind • S. Rodrigues, "Trends of offshore wind projects. Renewable and Sustainable Energy Reviews," Energies, vol. 49, no. doi: 10.1016/j.rser.2015.04.092, pp. 1114-1135, 2015 • WFO (2024) – Floating Offshore Wind Dynamic Cables: Overview of Design and Risks

High level Recommendation

Facilitate technological maturity for developing FOWTs

Context

Grid connection and power transmission are critical components in the development and efficient operation of FOWTs. These systems ensure that generated energy is reliably delivered to onshore grids, overcoming unique challenges related to distance, environmental conditions, and technical constraints.

As FOWTs are located far from the coastline, the cost of grid connection rises significantly due to the need for longer undersea cables and advanced technologies to minimize energy loss. Along with the increasing deployment targets and rapid installation schedules the seamless integration of offshore wind farms into onshore grids is further complicated.

Additionally, FOWTs are subject to constant motion from waves and currents, demanding flexible yet durable cabling systems capable of withstanding harsh environmental conditions over their operational lifespans. Installing subsea cables presents additional challenges, requiring careful consideration of varying water depths, seabed conditions, and potential conflicts with marine ecosystems or existing infrastructure, such as shipping lanes and telecommunications networks.

These challenges underscore the need for innovative solutions to enhance grid connection and ease power transmission, ensuring the viability and scalability of FOWTs.

Description

The recommendation aims to promote the adoption of advanced technologies to boost technological maturity in terms of developing FOWTs. For instance, the innovative transmission technologies Modular Multilevel Converters (MMCs) and High Voltage Direct Current (HVDC) systems can be used in flexible DC transmission. Additionally, dynamic, robust and flexible cables, along with specialized connectors, protectors and ancillary equipment can increase efficiency, reliability, and durability of grid connections and power transmission for FOWT projects, even under challenging environmental conditions. Finally, efforts in the domain of floating platform designs should be enhanced to optimize stability and efficiency, while considering environmental conditions.

Who is involved and potential Benefits

The recommendation offers significant benefits by enhancing industry efficiency and reliability while driving academic innovation through research opportunities and advancements in grid connection and power transmission technologies.

Industrial Stakeholders

- **Lower Costs**: Improved grid connection and transmission technologies lower operational costs, enhance reliability, and make large-scale FOWT projects more viable. This boosts profitability and competitiveness, encouraging further investment and innovation.
- **Risk mitigation**: By ensuring robust and reliable infrastructure, technical challenges such as dynamic cable durability, drift-off effects, downtime and maintenance costs are reduced, minimizing the operational risks and improving the overall project feasibility and profitability.

Academia

- **Pushing of State-of-the-Art**: Researchers and Academic institutions could leverage the focus on advanced technologies to drive innovation and develop new methodologies or materials. This could lead to breakthroughs in dynamic cable systems, improved efficiency, and comprehensive study of environmental impacts.
- **Collaboration with Industry**: Academic institutions can utilize their expertise and research in advanced technologies and materials to foster collaboration with industry and unlock funding opportunities.

Recommendation #3

Foster the knowledge sharing with forerunner countries in the floating and offshore wind sector in general	
Respective WP(s)	• WP1 - Policy framework assessment and co-creation • WP2 - Social acceptance and environmental impact analysis • WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D2.1 – Analysis of social and environmental barriers and enablers • D3.1 – Analysis of financial and market barriers and enablers • D3.2 – Analysis of technological barriers and enablers
Geography level of reference	European level
Dimension	Policy, Regulatory, Social, Environmental, Financial, Market, Technological
Targeted stakeholders	Industry, Academia, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2023). Deliverable D1.1 – Analysis of policy and regulatory barriers and enablers. • MARINEWIND (2024). Deliverable D2.1 - Analysis of social and environmental barriers and enablers. • MARINEWIND (2024). Deliverable D3.1 – Analysis of financial and market barriers and enablers. • MARINEWIND (2024). Deliverable D3.2 – Analysis of technological barriers and enablers. • MARINEWIND (2024). Italian Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Italian Lab 3rd Co-creation Workshop Report.

High level Recommendation

Closing the knowledge gaps in terms of technological solutions, skills needed, investments schemes and indication on how to shape a supportive regulatory and policy framework by leveraging on the insights provided by operating wind farms

Context

Key barriers hindering the development of FOWTs in the Mediterranean countries are resulting from multiple factors, which could be summarised as follows:

- Multiple and competing instances resulting from economic, environmental and social considerations to be considered and adequately balanced in the definition of the objectives.
- Lack of clear policy framework and well-defined incentives to attract investors.
- Shortcomings linked to a predominant decentralised and "developer-led" approach.
- Lack of a well-trained local workforce along the whole value chain.
- Bureaucratic hurdles in approval processes leading to obstacles and delays.
- Lack of a shared vision amongst policymakers on the role of offshore wind in the energy mix, which does not match with the objectives of the energy transition.

To guide a sustainable and responsible development of FOWTs, overcoming the above-mentioned barriers, the EU Mediterranean countries could leverage on the expertise of forerunner countries – such as Denmark, Norway and the United Kingdom – through the establishment of synergies and a process to foster the knowledge exchange, closing the gaps at different levels, covering the technological, regulatory, financial and educational aspects.

For this purpose, the experience of the WINDMED project could be used as a best practice. In fact, in order to facilitate the exchange of best practices between Denmark and other Mediterranean countries, the project has established a close cooperation with the Danish Embassy in Italy, securing a strong involvement of wind sector stakeholders and public authorities.

Description

To accelerate the deployment of FOWTs in the Mediterranean Sea, following the path of the forerunner countries, the EU has to undertake a well-defined process to foster the exchange of knowledge and best practices that will help to close the existing gaps from the technological, regulatory, financial and educational perspectives.

Who is involved and potential Benefits

The establishment of synergies and cooperation actions oriented towards the exchange of knowledge and best practices between the Mediterranean area and forerunner countries in the FOWT sector has cascading effects on all the stakeholder groups. The expected benefits are listed below, according to the different categories:

Industrial stakeholders & Green innovators

Indications on the type of technologies and materials to be applied, how to address technological challenges (e.g., regarding floaters assembly and design, dynamic cables, floating sub-stations), type of expertise needed and well-established training programmes to be replicated, how to optimise the use of the maritime space amongst different projects, learning from on available data, be prepared for the authorisation process.

Public Authorities

Insights on the type of interventions needed at the policy level to foster the deployment of FOWTs in terms of integration of different perspectives and needs into a comprehensive framework; methodologies on how to ensure the engagement of the community; regulation of the provision of financial incentives for developers and energy management for the communities, indications on how to simplify and accelerate the authorisation process, with the ultimate goal to achieve the energy targets.

Academia

Leveraging on a huge amount of data, covering the assessment of the environmental impact, the latest technologies developed, and the type of materials applied, to further enrich and expand their studies.

Civil society

Experimenting the socio-economic benefits from first-hand experiences and benefitting from well-established training programmes, having a clearer overview of the impacts stemming from the implementation of an offshore wind farm.

Recommendation #4

Foster the development of an EU-based supply and value chain	
Respective WP(s)	• WP1 - Policy framework assessment and co-creation • WP2 - Social acceptance and environmental impact analysis • WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D2.1 – Analysis of social and environmental barriers and enablers • D3.1 – Analysis of financial and market barriers and enablers • D3.2 – Analysis of technological barriers and enablers
Geography level of reference	European level
Dimension	Policy, Regulatory, Social, Environmental, Financial, Market, Technological
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• Mario Draghi (2024). The future of European competitiveness – A competitiveness strategy for Europe. • European Wind Power Action Plan (2023). • MARINEWIND (2023). Deliverable D1.1 – Analysis of policy and regulatory barriers and enablers. • MARINEWIND (2024). Deliverable D2.1 - Analysis of social and environmental barriers and enablers. • MARINEWIND (2024). Deliverable D3.1 – Analysis of financial and market barriers and enablers. • MARINEWIND (2024). Deliverable D3.2 – Analysis of technological barriers and enablers. • MARINEWIND (2024). Italian Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Italian Lab 3rd Co-creation Workshop Report.

High level Recommendation

Need to reduce the EU dependencies in terms of supply of critical raw material and energy provision

Context

Despite the overall positive development in the past, the European wind industry currently faces major problems exacerbated by geopolitical instability, growing competition from abroad and rapid technological changes. The main factors hindering the full potential of the EU wind industry are:

- Uncertain demand for wind turbines in the EU due to the lack of a clear overview of the planned wind deployment at the national level, leading to an inadequate planning of investments and the under-utilisation of the production capacities.
- Complex permitting procedures characterised by administrative burdens and long awaiting times, leading to significant delays for the approval new projects.

- A challenging context marked by difficulties in accessing raw materials and financing, high inflation and price volatility.
- Inadequate and heterogeneous design of national tenders for the development of renewable energy, based mainly on price criteria rather than introducing penalties for non-execution of projects and non-price criteria, covering environmental and social aspects.
- Increasing international competition due to the role of China as supplier of raw materials to the EU and as an emerging competitor in third country markets, leveraging prices on average 20% lower compared to the EU and US counterparts, and causing a potential reduction of competitiveness and innovation on the EU market.
- Limited availability of skilled workers (e.g., operators of vessels, cranes or heavy lifts) in the wind manufacturing sector affecting the increase of the European production capacity.

Thus, in order to reach the ambitious climate targets set at the EU level, a coherent plan to accelerate the decarbonisation in a cost-efficient way is required, establishing a fair and competitive international environment for the EU wind manufacturers based on an EU-based supply chain. Key actions to secure a leading role of European industry in the clean energy sector should include:

- Foster the engagement and coordination amongst key industrial players, financial investors, and Member States to shape a favourable business environment to enable a strong EU wind industry.
- Support skills development for the renewable energy sector.
- Harmonise and improve Member States’ auction design principles by introducing non-price criteria.
- Action plan to facilitate grids build-out, including both transmission and distribution levels, to accelerating key cross border electricity infrastructure projects.
- Lower the cost of energy for end-users with the support of adequate policies to decouple the price of natural gas from clean energy.
- Increasing the supply of both private and public finance for clean energy deployment and accelerate the timing of the permitting for installation.
- Creating an Energy Union with an institutional framework to strengthen the monitoring, investigation and decision-making powers at the EU level so that decisions and market functions of cross-border relevance are taken centrally.
- Refocusing the support for clean tech manufacturing, focusing on technologies where the EU has a leading role.

The above-mentioned actions should be implemented in a short time to guarantee the achievement of the energy targets, being all the Member States aware of the development potential inherent in the key sectors (e.g., robotics, automation, etc.) and then take action to adapt the production system and the available technologies to the wind energy industry, leveraging on the high-quality skills, workforce and resources that are currently available within the European Union.

Description

Geopolitical instability, increasing competition from abroad and rapid technological changes are threatening Europe’s growth. To reduce the dependencies from external suppliers and have a leading role in the decarbonisation process, the EU has to build a common strategy for the creation of an EU-based supply and value chain.

Who is involved and potential Benefits

The creation of an EU-based supply and value chain has wider positive benefits shared amongst all the stakeholder groups, as follows:

- **Accelerate the achievement of the 2030 and 2050 Climate Targets** through a shared action plan joining efforts at the EU and national levels.
- **Create a favourable environment to trigger investments**.
- **Ensure the coordination amongst the EU Member States** in terms of financial investments, policies and strategies.
- **Reduce the dependencies from external suppliers** for critical raw materials and energy.
- **Guarantee a better coordination amongst different polices** (fiscal, trade and foreign economic policies) and policymakers both at the EU and national level, to streamline and standardise the authorisation process and establish a centralised decision-making for specific topics related to energy.
- **Create new opportunities and positive spill-over effects** on the local communities in terms of job creation, trainings, refurbishment of marginal areas, boosting the local economy.

Recommendation #5

Addressing Visual Impact Concerns in Offshore Wind Installations	
Respective WP(s)	WP2 – Social acceptance and environmental impact analysis
Respective Deliverable(s)	D2.1 – Analysis of Social and Environmental Barriers and Enablers
Geography level of reference	European level
Dimension	Policy, Social, Environmental
Targeted stakeholders	Industry, Academia, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2024). Spain Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 3rd Co-creation Workshop Report. • MARINEWIND (2024) D2.1: Analysis of Social and Environmental Barriers and Enablers • White, S., Michaels, S., & King, H. Stage 1-Ready reckoner of visual effects related to turbine size. • Maslov, N., Claramunt, C., Wang, T., & Tang, T. (2017). Method to estimate the visual impact of an offshore wind farm. Applied Energy, 204, 1422-1430.

High level Recommendation

Develop community-focused awareness campaigns to contextualize the visual impact of offshore wind farms and promote the long-term environmental benefits

Context

The visual impact of offshore wind farms has been a significant concern among coastal communities, often leading to resistance against new developments. Public perception studies indicate that visible structures disrupt the natural landscape, which may affect tourism and local acceptance. However, examples from other countries highlight the success of education campaigns in shifting perceptions towards seeing these installations as symbols of environmental progress. Addressing these issues requires collaborative efforts between developers, local governments, and the public to highlight the benefits of renewable energy while respecting cultural and aesthetic values.

Description

Promote dialogue and visual impact studies to address concerns regarding offshore wind installations and their effect on seascapes, emphasizing the role of renewable energy in combating climate change.

Who is involved and potential Benefits

Effectively addressing visual impacts in offshore wind farm projects unlocks numerous benefits for both local communities and project developers. By integrating advanced design techniques, such as camouflaged or visually appealing turbine structures, and strategically positioning wind farms at greater distances from the shore, the aesthetic concerns of coastal populations can be significantly alleviated. This approach not only mitigates opposition but fosters a deeper sense of community collaboration and ownership over renewable energy initiatives.

One immediate benefit is the enhancement of public trust and acceptance, which can accelerate project approval processes and reduce costly delays. Communities that perceive developers as respectful of local heritage and landscapes are more likely to support such projects, minimizing conflicts and fostering long-term cooperation.

Additionally, offshore wind farms located and designed with visual impact in mind may bolster local economies by maintaining or even enhancing tourism appeal. For example, integrating viewing platforms, visitor centers, or educational outreach programs tied to offshore installations can transform these sites into attractions that celebrate sustainability and innovation.

By harmonizing energy development with coastal aesthetics, these measures also advance broader climate and energy transition goals. Aligning with EU sustainability standards, projects that account for visual impacts demonstrate a commitment to both environmental and social considerations, paving the way for more equitable and ecologically sound energy solutions.

Recommendation #6

Raising Public Awareness about Offshore Wind Benefits	
Respective WP(s)	WP2 – Social acceptance and environmental impact analysis
Respective Deliverable(s)	D2.1 – Analysis of Social and Environmental Barriers and Enablers

Geography level of reference	European level
Dimension	Social, Environmental
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2024). Spain Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 3rd Co-creation Workshop Report. • MARINEWIND (2024) D2.1: Analysis of Social and Environmental Barriers and Enablers • White, S., Michaels, S., & King, H. Stage 1-Ready reckoner of visual effects related to turbine size. • Maslov, N., Claramunt, C., Wang, T., & Tang, T. (2017). Method to estimate the visual impact of an offshore wind farm. Applied Energy, 204, 1422-1430.

High level Recommendation

Implement awareness campaigns to educate the public on the economic, social, and environmental benefits of offshore wind energy

Context

Public misperceptions about offshore wind farms often hinder project development. These include concerns about costs, environmental impacts, and disruption to local activities. Education campaigns can address these misconceptions, fostering greater understanding and acceptance. Drawing on examples from Northern Europe, such initiatives should highlight offshore wind's role in combating climate change, reducing energy costs, and creating jobs.

Description

Develop targeted communication strategies to increase public understanding and support for offshore wind projects.

Who is involved and potential Benefits

Awareness campaigns about the benefits of offshore wind energy provide significant advantages for various stakeholder groups, fostering a supportive environment for project implementation and long-term success. These benefits include:

- Enhanced understanding of renewable energy leads to increased acceptance and participation in local projects. Awareness initiatives help dispel common misconceptions about offshore wind farms, such as high costs or environmental harm, creating a more informed community that recognizes the benefits of clean energy, such as improved air quality, job creation, and energy cost reductions.
- Greater public support reduces opposition and associated delays, enabling smoother project development and deployment. A well-informed public can also attract investments by showcasing successful case studies and reinforcing confidence in the sector.

- Authorities: Increased public understanding and acceptance minimize conflicts, streamlining planning and permitting processes. Such campaigns also align with broader climate goals, such as reducing greenhouse gas emissions, and demonstrate governmental commitment to sustainable development.
- The integration of research-driven messaging in campaigns enhances their credibility and impact. Additionally, public engagement initiatives foster opportunities for new research into renewable energy technologies and social acceptance dynamics.
- Local workshops and interactive events strengthen community bonds by addressing specific concerns and involving citizens in decision-making processes. This inclusive approach builds trust and mitigates the “Not In My Back Yard” (NIMBY) attitude often seen with energy projects.
- Using technologies like virtual reality to visualize offshore wind projects can bridge the gap between abstract concepts and tangible benefits. These tools make it easier for stakeholders to comprehend the scale, aesthetics, and impact of projects, enhancing engagement and support.

Overall, such campaigns lay the groundwork for a collaborative approach to renewable energy development, ensuring that economic, social, and environmental benefits are maximized across stakeholder groups. By fostering greater public awareness, the offshore wind sector can achieve a more sustainable and inclusive transition to clean energy.

3.2 Country Lab’s stakeholder recommendations

This section outlines recommendations tailored to the specific contexts of the 5 MARINEWIND Labs. These targeted recommendations reflect local challenges, priorities, and stakeholder’s input, and are intended to support national and regional authorities, industry players, and other relevant actors in fostering the growth of floating offshore wind at the regional/local level.

3.2.1 Italy

The following table outlines the High-level Recommendations for Italy, which are further analysed in this section.

Table 3: High-level Recommendations for Italy

1	Foster the development of adequate infrastructures and ports for the production, assembly and delivery of FOWTs
2	Co-create adequate management practices and compensation measures for the fishing sector, instead of restrictive regulations, where possible
3	Promoting a greater focus on the development of positive externalities for local communities to foster social acceptance
4	Provide clear financial incentives to foster investments in the Italian FOWTs sector
5	Develop integrated planning strategies by including the environmental protection aspects and synchronising the national and regional objectives with the “developer-led” and decentralised approach taken so far to guide the deployment of FOWTs

Recommendation #1

Lack of adequate infrastructures to support the deployment of floating offshore wind plants in Italy	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation • WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D3.1 - Analysis of financial and market barriers and enablers • D3.2 - Analysis of technological barriers and enablers
Geography level of reference	Italian Lab
Dimension	Policy, Financial, Market, Technological
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2023). Deliverable D1.1 - Analysis of policy and regulatory barriers and enablers. • MARINEWIND (2024). Deliverable D3.1 - Analysis of financial and market barriers and enablers. • MARINEWIND (2024). Deliverable D3.2 - Analysis of technological barriers and enablers. • MARINEWIND (2024). Italian Lab 3rd Co-creation Workshop Report.

High level Recommendation

Foster the development of adequate infrastructures and ports for the production, assembly and delivery of FOWTs

Context

The availability of adequate infrastructure, including ports to be employed for the production, assembly and delivery of floating platforms, is a key factor to enable a faster deployment of FOWTs. However, a lack of proper spaces to support the offshore wind farms in all the stages has been identified. This entails many challenges at different levels:

- Logistical and administrative challenges to adapt port facilities to offshore wind operations.
- Need to ensure that port yards have sufficient available space to be dedicated to FOWTs and are well-connected to floaters' production facilities.
- Complex authorisation procedure requiring the coordination of several institutional actors including Port Authority for the update of harbour's plan and to approve the assignment of new functions to the port. As an example, the Italian Ministry of Environment is responsible for the approval of land and sea impact, while the Ministry of Transport for the validation of the new function of the port, and port yard concessionaires.
- Lack of adequate funds to co-financing the development of ports in central and southern Italy to support the offshore wind supply chain.

As starting point to tackle the above-mentioned challenges and foster the development of adequate infrastructures, the Italian Government set additional measures, which were included in the Legislative

Decree “Energy Security” (Art.8, Law n.181, 9 December 2023). One key action regards the Ministry for the Environment and the Energy Security, who launched a call for expressions of interest to identify two ports in Southern Italy and additional areas to be designated as offshore wind hubs. The ports of Augusta and Taranto were selected (Interministerial Decree No. 167 of the Ministry of Infrastructure and Transport, Ministry of Environment and Energy Security and Ministry of Economy and Finance, July 4, 2025).

Moreover, the investments in ports and infrastructures could have important spill-over effects on the local economy, boosting a market for high-tech boats and local ports which can activate an economic flywheel in terms of jobs creation and new opportunities.

Description

To accelerate the deployment of wind farms, Italy should adapt the infrastructure and ports to the specific requirements for the production, assembly, and delivery of FOWTs throughout the life cycle of the plant. Thus, Italy has to implement strategic actions at the administrative, financial and operational levels to trigger investments in key infrastructures, with positive spill-over effects on the local economy.

Who is involved and potential Benefits

Industrial and Green Innovation Stakeholders

- **Adequate infrastructures to rely on** for the deployment of offshore wind plants, reducing the risks and boosting investments.
- **Reduced waiting time for the adaptation of ports** following a clearer division of competences and smoother authorisation procedure.
- **Availability of local-based infrastructures, materials and workforce** resulting in cost reduction and minor dependence from external suppliers.

Public Authorities

- **Clearer division of responsibilities** to streamline the decision-making and authorisation procedure for the adaption of ports to the requirements of FOWTs.
- **More informed funding allocation** to support the implementation of RES policies, with clear indications on the measures to be undertaken.

Civil Society

- **New opportunities in terms of job creation**: Investments will boost a market for high-tech boats and local ports, leveraging on the existing expertise of the local workers adapted to the FOWTs needs through an upskilling process.
- **Renovation of the port and its surroundings**: Investments will promote the requalification of the harbour area, creating positive widespread benefits for the local community.

Recommendation #2

Reduce the potential conflicts between different socio-economic activities linked to the use of the sea	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation • WP2 - Social acceptance and environmental impact analysis
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D2.1 – Analysis of social and environmental barriers and enablers
Geography level of reference	Italian Lab
Dimension	Policy, Regulatory, Social, Environmental
Targeted stakeholders	Industry, Public Authorities, Civil Society
References	• MARINEWIND (2023). Deliverable D1.1 - Analysis of policy and regulatory barriers and enablers. • MARINEWIND (2024). Deliverable D2.1 – Analysis of social and environmental barriers and enablers. • MARINEWIND (2024). Italian Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Italian Lab 3rd Co-creation Workshop Report.

High level Recommendation

Co-create adequate management practices and compensation measures for the fishing sector, instead of restrictive regulations, where possible

Context

The Italian fishing sector is facing a major crisis, with a 35% decrease in the quantities of the fish caught and a 20% reduction of the employment rate, affecting the whole supply chain. According to fishermen, the realisation of floating offshore wind farms could further boost the negative effects of the crisis, due to the combination of the following factors:

- Restrictive regulations imposed by European authorities and local NGOs, as well as by the need to co-exist with other uses of the sea, which are limiting the available area to be reserved to fishing.
- Potential conflicts between FOW farms and traditional bottom trawling, in particular with negative impacts on the traditional trawling technique (with an estimated reduction of the fishing areas of 43% in the Mediterranean).
- Fishing is no longer considered as an attractive job by the young people.
- Spill-over effects generated by the crisis of the fishing activities on the entire supply chain.

To overcome the above-mentioned barriers, the following actions should be implemented:

- Identify good regulation and management practices instead of restrictive fishing measures, where possible, allowing a better use of the sea as renewable resource.
- Investigating whether small-scale fishing can co-exist with new anchoring technologies which are less invasive and how new technologies applied to trawling could be consistent with the realisation of floating offshore wind farms.

- Considering the specific needs highlighted by fishermen in the initial planning stages to gain their full support to the deployment of FOWTs.
- Fostering the establishment of an engagement pathway with fishermen associations, co-designing possible solutions and compensation measures to foster the co-existence between different uses of the sea, including the production of renewable energy and (e.g., adequate roundtables between ministries and fishermen's associations; studies to explore the co-existence with aquaculture, etc).
- Highlighting the positive environmental impacts of floating offshore wind plants, which could promote the repopulation of protected areas while respecting biological spawning times.

Description

To overcome the potential conflicts related to the multiple uses of the sea, Italy has to consider the specific needs and expectations expressed by the different socio-economic categories, especially fishermen. The shaping of ad-hoc regulations and the provision of adequate compensation measures will foster a better use of the sea as renewable resource, reducing oppositions to new technologies such as FOWTs.

Who is involved and potential Benefits

Industry

- **Reduced conflicts with other uses of the sea**: Ad-hoc regulations and compensation measures will facilitate a dialogue amongst stakeholders, decreasing the opposition of other socio-economic activities, especially the fishing sector, to the realisation of offshore wind farms.
- **New collaboration opportunities** with other socio-economic activities connected to the other uses of the sea.

Public authorities

- **Clear indications to shape the policy framework for the implementation of FOWTs** integrating the specific needs of fishermen associations and foreseeing compensation measures to foster the co-existence amongst different uses of the sea, reducing potential opposition actions.
- **Policy coordination at the local and EU level**, aligning the different objectives and providing the fishermen association with clear indications about the areas dedicated to fishing activities, fostering a better use of the sea as renewable resource.

Civil society

- **Well-defined rules for the fishing sector** with a clear definition of the areas reserved to fishing and an adequate assessment of the costs-benefits generated by FOWTs on the fishing sector.
- **Clear management practices** to deal with the needs of the different socio-economic activities related to the marine environment.
- **New opportunities for the fishing sector with offshore wind plants** that could promote the repopulation of protected areas while respecting biological spawning times.

Recommendation #3

Lack of social acceptance amongst the local communities due to widespread misconceptions related to FOWTs	
Respective WP(s)	WP2 - Social acceptance and environmental impact analysis
Respective Deliverable(s)	D2.1 – Analysis of social and environmental barriers and enablers
Geography level of reference	Italian Lab
Dimension	Policy, Social, Financial, Market
Targeted stakeholders	Industry, Public Authorities, Civil Society
References	• MARINEWIND (2024). Deliverable D2.1 – Analysis of social and environmental barriers and enablers. • MARINEWIND (2024). Italian Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Italian Lab 3rd Co-creation Workshop Report.

High level Recommendation

Promoting a greater focus on the development of positive externalities for local communities to foster social acceptance

Context

Fostering dialogue and open discussions with neighbouring territories and key actors, including the local community, the fishing industry and trade unions, is a pivotal action to increase the social acceptance and take the project forward by demonstrating that offshore is concrete, sustainable, and can co-exist with different instances and realities. However, this goal seems difficult to be achieved, due to the following reasons:

- Widespread misconceptions and false myths related to the implementation of FOWTs.
- Lack of a proper and timely provision of information related to the realisation of offshore wind plants.
- Lack of a clear co-creation pathway to ensure the engagement of the local communities and key actors from the initial planning phase.

To overcome the above-mentioned challenges, the following actions should be undertaken:

- Promoting the spill-over effects on the local economy and labour market in terms of job creation, reskilling opportunities and training.
- Fostering the production of green energy to address the local consumption and guarantee stable and reduced electricity price.
- Establishing an ongoing dialogue with the local community in all the phases of the project (awareness-raising campaigns, educational activities, roundtables, etc.) to collect in advance their concerns and expectations.
- Relying on the basis of a sound scientific knowledge and well-defined objectives to be achieved in the dialogue with the local communities.

- Involving not only large manufacturing companies, but also national and local SMEs, to produce positive externalities on the communities.
- Foreseeing compensation actions oriented towards the renewal of the area and with a potential boosting effect on tourism (e.g., refurbishment of the Tuna factory in Favignana funded by the 7SEASmed project in the Sicily Region).

Description

To tackle the widespread misconceptions related to FOWTs at the local level, Italy has to establish an ongoing dialogue with the local communities, based on the sharing of information from the very initial phases of the project and the clear perception of the socio-economic benefits, to be further developed with the ultimate goal to increase the level of social acceptance.

Who is involved and potential Benefits

Industrial Stakeholders

- **Fostering investments**: reduction of the perceived investment risks and uncertainties linked to possible oppositions of the local community.
- **Increased level of social acceptance**: addressing the concerns of the local community by considering their needs and foreseeing compensation measures from the very initial phases of the project.
- **Relying on a local workforce and supply chain** reducing the dependence from materials and expertise outside the EU, while showing the positive externalities for the local community.

Public authorities

- **Increasing the public trust**: clear socio-economic improvements for the local communities, perceived as promoted by public authorities.
- **Improvement of the consulting and decision-making process** through the active involvement of the local community affected by the policies, resulting in a higher level of acceptance.

Civil society

- **Growth of the local economy and renewal of the public space**: spill-over effects and new opportunities in terms of job creation, upskilling and reskilling, training for the creation of a local-based workforce throughout the supply chain linked to FOWTs, with the local community having a clear perception of the benefits generated.
- **Reduction of the electricity price**: warranties in terms of stable energy prices and production of green energy able to address the local consumption.
- **Strengthening the participatory process**: higher involvement of the citizens in the decision-making process and the co-creation of solutions linked to key aspects for the local community, having the chance to share their concerns and thoughts, resulting in a higher level of consent.

Recommendation #4

Lack of incentives for industrial players to address the high investment risks related to FOWTs	
Respective WP(s)	WP3 - Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D3.1 - Analysis of financial and market barriers and enablers • D3.2 - Analysis of technological barriers and enablers
Geography level of reference	Italian Lab
Dimension	Policy, Regulatory, Social, Financial, Market
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2024). Deliverable D3.1 – Analysis of financial and market barriers and enablers. • MARINEWIND (2024). Deliverable D3.2 – Analysis of technological barriers and enablers. • MARINEWIND (2024). Italian Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Italian Lab 3rd Co-creation Workshop Report.

High level Recommendation

Provide clear financial incentives to foster investments in the Italian FOWTs sector

Context

According to the stakeholders of the IT Lab, the Italian industry lacks the capacity to address the market demands related to wind energy in a short time, especially in terms of provision of all the necessary components (e.g. turbines, cables), which could be available only starting from 2029. Thus, the provision of financial incentives and state aid is crucial for the deployment of FOWTs in Italy, being pivotal financial instruments to tackle the following issues and foster investments in Italy:

- The Italian industry needs to be adapted to the offshore wind needs, leveraging on the available skills and capacities ok key sectors.
- The deployment of the wind plants is capital intensive compared to other type of technologies, due to the need to carry out preliminary analysis (e.g., geotechnical, environmental, design of floating foundation and dynamic cables for site-specific conditions, etc).
- Need to address high costs, investment risks and uncertainties in the Italian offshore wind market, enabling a major predictability of revenues and bankability of projects.
- FOWTs are characterised by a lower level of technology readiness and lack of track-record compared to onshore wind.
- Need to establish a clear pathway to reduce the traditional dependency from fossil fuels and set up clear, achievable and reliable long-term targets achievable targets in terms of energy production.
- Need to define a clear long-term industrial vision with an ambitious objective for floating offshore wind, stimulating the development of dedicated supply chains.

The dialogue with the Italian stakeholders brought out the potential role of Italy as a driver in the development of FOWTs. However, a huge financial support to realise a technological upgrade of key sectors for the deployment of FOWTs is urgently needed. For instance, the Italian metalwork sector has great capacity to be further exploited. However, to date, is located inland and is oriented towards other types of production, so it could not be converted to the production of components for the wind industry in the short term.

Description

To accelerate the market uptake of FOWTs, Italy has to attract and foster investments. To this purpose, the provision of clear financial incentives is crucial to adapt the Italian industry to the needs of the offshore wind sector, while reducing the high costs, investment risks and uncertainty.

Who is involved and potential Benefits

Industrial and Green Innovation Stakeholders

- **Foster the investments by reducing high costs, investment risks and uncertainties** in the Italian offshore wind market.
- **Enable a major predictability of revenues and bankability** of projects.
- **Build a local supply chain and rely on a skilled workforce**: Incentive schemes will foster the adaptation of the Italian industry to the offshore wind needs, in terms of materials, capacity and skills.

Public Authorities

- **Guidance on how to shape the policy framework**: the identification of the gaps to be closed and the type of support needed from the financial perspective provide a well-defined guidance on the sectors in which the policy interventions are needed.
- **Support in the definition of clear long-term targets** in terms of energy production and which are achievable and reliable, as well as their achievement.
- **Attract investors**: A clear regulation in terms of financial incentives will provide secure support to developers, enabling an attractive environment for investors and thus bringing more projects.

Civil Society

- **Leveraging on new opportunities in terms of jobs creation, training, upskilling and reskilling** to address the specific needs of FOWTs which could revitalise the Italian industry, due to an adaption following investments.
- **Revitalisation of marginal areas**, following investments which could tackle social problems and creating recreational spaces for the local community.

Recommendation #5

Significant delays in the approval of a national Maritime Spatial Planning leading to a bottom-up approach in the assignment of areas to market operators	
Respective WP(s)	WP1 – Policy framework assessment and co-creation

Respective Deliverable(s)	D1.1 – Analysis of policy and regulatory barriers and enablers
Geography level of reference	Italian Lab
Dimension	Policy, Social, Environmental, Market
Targeted stakeholders	Industry, Public Authorities, Green Innovation
References	• MARINEWIND (2023). Deliverable D1.1 - Analysis of policy and regulatory barriers and enablers. • Ministry of Infrastructure and Transport (2024, Ministerial Decree No. 237). Italian Maritime Spatial Planning. • Italian Ministry of the Environment and Energy Security (2024). Italian National Integrated Plan for Energy and Climate. • MARINEWIND (2024). Italian Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Italian Lab 3rd Co-creation Workshop Report.

High level Recommendation

Develop integrated planning strategies by including the environmental protection aspects and synchronising the national and regional objectives with the "developer-led" and decentralised approach taken so far to guide the deployment of FOWTs

Context

A timely political planning for the deployment of floating offshore wind is crucial to ensure a coordination amongst the different actors and thus reaching the common objective and energy targets. However, the significant delays in the approval of an Italian Maritime Spatial Planning, which was adopted only on the 25th of September 2024 and previously replaced by a bottom-up approach led by the industrial developers, slowed down the deployment of FOWTs, due to the following reasons:

- Lack of an optimised use of the maritime space with the overlapping and potential conflicts among different projects.
- Lack of a common vision amongst policymakers and national stakeholders on the role of offshore wind in the energy mix.
- Lack of clear targets to be reached in terms of energy production at the national and local level. In July 2024, the new version of the Italian NECP was sent to the EC, setting a target of 2.1 GW to be installed by 2030, misaligned with the timeframe of the auction clearing.
- Lack of coordination between the Italian government and the private technical developers, who have already carried out geophysical and geotechnical analyses.

Moreover, the drafting of a planning strategy for the offshore wind farms should integrate the environmental protection aspects, the assessment of visual impact, as well as the preservation of archaeological assets, regarded as a key concern in the Italian context. Thus, integrated planning strategies to balance biodiversity protection while fostering renewable energy development should be developed in collaboration with private technical developers, ensuring the effective management of the impacts generated by offshore projects.

To this purpose, two best practices could be identified. The first one is represented by the 7SEASmed project, located in the Sicily Region. Starting from the very preliminary phases of the project, developers consulted the local community to successfully address the concerns about the visual impact of the floating offshore wind farms. In fact, according to the opinion of the local stakeholders, the visual impact of FOWTs was indicated as main cause of the opposition to the implementation of such projects, decreasing the level of social acceptance. However, the project managed to show that the offshore wind technologies are characterised by a lower visual impact due to the distance of the plants from the coast.

On the other hand, the example of the Irish Government represents a second best practice of synergies with private technical developers. In fact, the Irish Government, while still working on their national MSP, is favouring a decentralised parallel approach, in order to shorten waiting times.

In conclusion, a close cooperation between policymakers and technical developers for the drafting of long-term integrated strategies and the national Maritime Spatial Planning are fundamental to reassure investors, align the objectives set for the energy transition and avoid the perception of conflicting competences.

Description

To accelerate the uptake of FOWTs and ensure the achievement of the energy targets, Italy has to guarantee a timely strategical planning, synchronising the national and regional objectives with the bottom-up approach promoted by the developers, while integrating insights from the environmental and geotechnical studies. A timely and integrated planning will reassure investors, align the objectives set for the energy transition and avoid the perception of conflicting competences.

Who is involved and potential Benefits

Industrial Stakeholders and Green Innovation

- **Improving the location of the projects according to the specific geographical features** of the Italian waters and the wind resource availability.
- **Optimising the use of the maritime space**, avoiding potential overlaps among different projects and conflicts with other uses of the sea, especially with the fishing sector.
- **Promoting a clear long-term industrial vision** in terms of targets to be achieved and shared by both policymakers and technical developers, to reassure investors, stimulate the development of the supply chain and avoid the perception of conflicting competences.

Public Authorities

- **Increasing collaboration opportunities with technical developers**, leveraging on mutual expertise and preliminary studies to shape more informed RES policies.
- **Creating a stable and supportive policy framework with a clear political and industrial strategy**, fostering investments and ensuring that the deployment of FOWTs matches with the objectives set for the energy transition.
- **Allowing a clear definition of roles and competences between the different actors** involved in the process, avoiding overlaps and shortening the duration of the whole permitting and legislative process.

3.2.2 Spain

The following table outlines the High-level Recommendations for Spain, which are further analysed in this section.

Table 4:High-level Recommendations for Spain

1	Enhance collaboration between offshore wind developers and local fisheries to mitigate socio-economic impacts.
2	Ensure offshore wind projects respect cultural heritage sites through comprehensive impact assessments and stakeholder consultations
3	Promote research initiatives and technological innovation to enhance coexistence between marine biodiversity and offshore wind farms
4	Speed up the approval process for regulatory frameworks for offshore wind deployment
5	Boost the Spanish supply chain by capitalising on the country's capabilities in naval construction and the steel industry to support the deployment of FOWT

Recommendation #1

Coexistence of Offshore Wind and Fisheries: Addressing Impact and Opportunities	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation • WP2 - Social acceptance and environmental impact analysis
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D2.1 – Analysis of social and environmental barriers and enablers
Geography level of reference	Spanish Lab
Dimension	Policy, Regulatory, Social, Environmental
Targeted stakeholders	Industry, Academia, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2024). Spain Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 3rd Co-creation Workshop Report. • MARINEWIND (2024) D2.1: Analysis of Social and Environmental Barriers and Enablers • Diez-Caballero, K., Troiteiro, S., García-Alba, J., Vidal, J. R., González, M., Ametller, S., & Juan, R. (2022). Environmental compatibility of the parc tramuntana offshore wind project in relation to marine ecosystems. Journal of Marine Science and Engineering, 10(7), 898.

High level Recommendation

Enhance collaboration between offshore wind developers and local fisheries to mitigate socio-economic impacts.

<u>Context</u>

The installation of offshore wind turbines can disrupt traditional fishing activities, leading to conflicts between developers and local communities. Fishermen have expressed concerns about restricted access to fishing zones and potential ecological disruptions that may affect fish stocks. Additionally, there is a perceived lack of transparency in decision-making processes, exacerbating mistrust. Best practices from other regions highlight the importance of establishing cooperative frameworks that balance renewable energy goals with the livelihoods of coastal communities.

Description

Promote policies and strategies that facilitate coexistence between offshore wind farms and fisheries by emphasizing compensation mechanisms, transparent communication, and collaborative management models.

Who is involved and potential Benefits

The integration of offshore wind farms with fisheries presents a unique opportunity to advance renewable energy while preserving the livelihoods of coastal fishing communities. Transparent communication and collaborative approaches can minimize conflicts and foster a mutually beneficial coexistence.

One key benefit is the potential for trust-building through the establishment of fisheries liaison officers. By ensuring direct and reliable communication between wind farm developers and fishing communities, these officers can pre-emptively address concerns about safety, gear management, and operational coordination. Such measures can reduce uncertainties and mitigate risks, paving the way for smoother project implementation.

Innovative marine spatial planning and technology can further support coexistence. For example, designing wind farm layouts that maintain navigable routes or integrating artificial reefs into turbine foundations can create new habitats, potentially enhancing local fish stocks and benefiting both industries. These strategies not only reduce ecological disruptions but also highlight the shared interest in sustainable marine resource management.

Moreover, offering fair compensation schemes and supporting the diversification of fishing activities can bolster the resilience of coastal economies. Combined with educational programs and stakeholder involvement, these initiatives can transform potential conflicts into opportunities for long-term collaboration.

By addressing both ecological and socio-economic dimensions, this approach aligns with EU renewable energy goals while ensuring the preservation of cultural and economic stability in coastal communities. Such synergies exemplify the broader potential for harmonizing environmental and societal priorities in the transition to clean energy.

Recommendation #2

Balancing Offshore Wind Development with Cultural Heritage Conservation	
Respective WP(s)	WP2 - Social acceptance and environmental impact analysis
Respective Deliverable(s)	D2.1 – Analysis of social and environmental barriers and enablers

Geography level of reference	Spanish Lab
Dimension	Policy, Regulatory, Social, Environmental
Targeted stakeholders	Industry, Academia, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2024). Spain Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 3rd Co-creation Workshop Report. • MARINEWIND (2024) D2.1: Analysis of Social and Environmental Barriers and Enablers • Pasqualetti, M. J. (2011). Opposing wind energy landscapes: a search for common cause. Annals of the Association of American Geographers, 101(4), 907-917.

High level Recommendation

Ensure offshore wind projects respect cultural heritage sites through comprehensive impact assessments and stakeholder consultations

Context

Cultural heritage sites along coastal regions often overlap with areas identified as optimal for offshore wind development. The installation of turbines near these sites may lead to tensions, as communities fear the loss of historical integrity and cultural identity. For instance, areas with historic ports or protected maritime zones require special consideration to balance renewable energy goals with cultural preservation. Best practices from other EU regions demonstrate that early consultations with heritage organizations and local communities, combined with detailed cultural impact assessments, can mitigate these challenges.

Description

Implement frameworks to protect cultural heritage while advancing offshore wind development, ensuring the alignment of renewable energy goals with the preservation of historical and cultural landmarks.

- **Industry:** Work closely with cultural heritage experts to avoid sensitive areas and minimize disruptions.
- **Academia:** Research the long-term impacts of offshore projects on cultural heritage sites.
- **Public Authorities:** Develop policies that integrate cultural preservation into renewable energy planning.
- **Civil Society:** Advocate for transparent discussions about potential cultural impacts and solutions.
- **Green Innovation:** Explore construction techniques and designs that preserve the visual and physical integrity of cultural sites.

Who is involved and potential Benefits

Balancing offshore wind development with cultural heritage conservation offers a unique opportunity to integrate modern renewable energy initiatives with the preservation of historical and cultural legacies. These measures aim to safeguard the cultural identity of coastal regions while advancing the adoption of sustainable energy sources, contributing to the decarbonization of local energy systems and global climate goals.

By incorporating cultural heritage considerations into the planning and implementation of offshore wind projects, developers can minimize visual and aesthetic impacts on coastal landscapes, preserving the historical ambiance and significance of affected regions. Conducting archaeological prospection before and during construction enables the identification, rescue, and valorisation of underwater cultural heritage, ensuring that the seabed's historical treasures are protected and appreciated.

Engaging local communities, indigenous groups, and relevant stakeholders fosters trust and collaboration, encouraging a shared commitment to both cultural preservation and renewable energy goals. This inclusive approach can enhance local identity, tourism, and economic development by ensuring that projects reflect the values and aspirations of the communities they impact.

Offshore wind farms' minimal visual footprint relative to other energy sources further supports the harmonious integration of renewable energy projects with heritage conservation. Additionally, these projects create opportunities for education and community involvement, strengthening connections between local populations and their cultural heritage. The synergy between sustainable energy and historic preservation exemplifies a holistic approach that enriches both ecological and cultural landscapes, paving the way for a future that respects and celebrates the past while embracing innovation.

Recommendation #3

Advancing Research and Innovation for Sustainable Marine Coexistence	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation • WP2 - Social acceptance and environmental impact analysis
Respective Deliverable(s)	D2.1 – Analysis of social and environmental barriers and enablers
Geography level of reference	Spanish Lab
Dimension	Policy, Social, Environmental, Technological
Targeted stakeholders	Industry, Academia, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2024). Spain Lab 2nd Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 3rd Co-creation Workshop Report. • MARINEWIND (2024) D2.1: Analysis of Social and Environmental Barriers and Enablers • Pardo, J. C. F., Aune, M., Harman, C., Walday, M., & Skjellum, S. F. (2023). A synthesis review of nature positive approaches and coexistence in the offshore wind industry. ICES Journal of Marine Science, fsad191.

	• Cosgrove, S. (2024, September). Data-Driven Planning for the Co-Existence of Offshore Wind and Nature-Inclusive Designs. In OCEANS 2024-Halifax (pp. 277-281). IEEE.

High level Recommendation
Promote research initiatives and technological innovation to enhance coexistence between marine biodiversity and offshore wind farms

Context

Offshore wind projects face challenges related to their ecological impact, particularly in regions of high biodiversity. Potential risks include disruptions to marine habitats, noise pollution, and interference with migratory species. Stakeholders often lack robust data to predict and mitigate these impacts effectively. Encouraging multidisciplinary research can bridge this gap, enabling evidence-based solutions that harmonize energy development with marine conservation. Technological advancements, such as wildlife monitoring systems and eco-friendly turbine designs, can significantly reduce ecological footprints. Lessons from similar projects in the Baltic and North Seas highlight the importance of stakeholder collaboration in fostering innovation.

Description

Develop research programs and support innovation aimed at minimizing ecological disruptions while optimizing offshore wind energy production.

- **Industry:** Invest in eco-friendly technology to minimize habitat disruption.
- **Academia:** Focus on research initiatives addressing biodiversity and renewable energy coexistence.
- **Public Authorities:** Fund research programs and provide incentives for eco-innovation.
- **Civil Society:** Advocate for transparent research processes and inclusion of local knowledge.
- **Green Innovation:** Develop solutions like biodegradable materials and advanced monitoring tools.

Who is involved and potential Benefits

Focus on sustainable marine coexistence ensures that offshore wind developments align with ecological, social, and economic priorities. By leveraging synergies across sectors, these initiatives aim to mitigate spatial conflicts and optimize marine resource use. Enhanced frameworks for coexistence can transform offshore wind farms into multifunctional spaces, fostering biodiversity while enabling sustainable fisheries, aquaculture, and other marine activities.

For fisheries, coexistence solutions like the adoption of passive fishing methods can minimize conflicts and capitalize on the "reef effect" of OWFs, supporting species such as brown crab and Atlantic cod. For aquaculture, integrating OWFs with seaweed and bivalve farming offers innovative avenues for sustainable food production and carbon mitigation while reducing operational pressures on coastal ecosystems. The potential of OWFs to serve as Marine Protected Areas (MPAs) further highlights their role in enhancing marine biodiversity, contributing to global conservation goals like the Kunming–Montreal Global Biodiversity Framework.

These advancements foster constructive engagement among stakeholders, reducing barriers to social acceptance. By ensuring robust communication and collaboration among industries, regulators, and researchers, they pave the way for informed decision-making and long-term sustainability. Moreover, the technological and ecological insights derived from coexistence strategies have the potential to unlock new economic opportunities, reinforcing offshore wind's role in a thriving blue economy.

Recommendation #4

Speed up the approval process for regulatory frameworks for offshore wind deployment	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation
Respective Deliverable(s)	D1.1 – Analysis of policy and regulatory barriers and enablers
Geography level of reference	Spanish Lab
Dimension	Policy, Regulatory, Social, Environmental, Technological, Financial, Market
Targeted stakeholders	Industry, Academia, Public Authorities
References	• MARINEWIND (2023). Deliverable D1.1 - Analysis of policy and regulatory barriers and enablers. • MARINEWIND (2023). Spain Lab 1st Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 3rd Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 2nd Co-creation Workshop Report. • National Energy and Climate Plan (NECP2030)

High level Recommendation

Speed up the definition and implementation of a clear, coordinated regulatory framework for floating offshore wind in Spain

Context

A clear regulatory framework is essential for the deployment of FOW, both to ensure the achievement of national energy targets and to establish a shared roadmap among key stakeholders. However, the lack of a coherent Spanish regulatory framework has hindered interest in and deployment of FOWTs. This situation stems from several interrelated factors:

- The absence of a clear and comprehensive roadmap for OW development can lead to potential conflicts between overlapping projects. A key proposal to address this is the establishment of a single window process, where EIA, water area permits, and grid connection requests are submitted together in a single application. This process would be managed centrally by the Ministry, which would coordinate and collect feedback from all relevant authorities, streamlining and accelerating administrative procedures.

- A lack of shared vision among policymakers and national stakeholders regarding the role of OW in the future energy mix.
- Uncertainty around national and regional energy production targets. Although the updated Spanish National Energy and Climate Plan set a target of 3 GW of OW capacity by 2030, no timeline for auctions has been defined.
- Insufficient coordination between the Spanish government and private developers, many of whom have already conducted geophysical and geotechnical surveys in anticipation of project development.

Description

The deployment of FOW technologies in Spain is hindered by the absence of a clear, timely regulatory framework. This recommendation therefore calls for an urgent roadmap to be developed that is coherent, has aligned targets and improves coordination between public authorities and private developers, including the implementation of a single-window permitting system to consolidate all necessary authorizations. The ultimate aim is to advance and speed up the approval process to unlock investment and accelerate project deployment.

Who is involved and potential Benefits

A well-defined regulatory framework would provide clarity and predictability to investors and developers, reducing uncertainty and attracting private capital. Implementing a streamlined permitting process, like the single-window system, would minimize bureaucratic delays and administrative burdens, accelerating the deployment timeline. Ultimately, these improvements will support the achievement of national energy and climate targets, promote industrial growth, and position Spain as a leader in FOW technology.

Recommendation #5

Strengthen Spain's Supply Chain for Employment and Social Impact	
Respective WP(s)	• WP3- Financing, techno-economic analysis and survey
Respective Deliverable(s)	D3.2 - Analysis of technological barriers and enablers
Geography level of reference	Spanish Lab
Dimension	Policy, Social, Technological, Financial, Market
Targeted stakeholders	Industry, Civil society, Green Innovation
References	• MARINEWIND (2024). Deliverable D3.2 - Analysis of technological barriers and enablers. • MARINEWIND (2023). Spain Lab 1st Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 3rd Co-creation Workshop Report. • MARINEWIND (2024). Spain Lab 2nd Co-creation Workshop Report.

High level Recommendation
Boost the Spanish supply chain by capitalising on the country's capabilities in naval construction and the steel industry to support the deployment of FOWT

Context

Spain possesses a solid industrial base in shipbuilding, naval engineering, and offshore infrastructure, supported by well-established shipyards along its coast. However, the national supply chain is not yet fully prepared to address the specific requirements of FOW turbines. Key challenges include:

- Limited specialization in critical FOWT components (floating platforms, dynamic cables, anchoring systems), frequently sourced internationally.
- Lack of coordination between shipyards, engineering firms, and developers, hindering alignment of production capacities with project timelines.
- Insufficient investment in facility upgrades and digitalization to meet FOWT precision, scale, and schedule demands.
- Supply chain fragmentation, with SMEs struggling to access large procurement processes.
- Uncertainty in regulatory and auction calendars, discouraging long-term industrial planning.

Addressing these gaps is essential to maximize job creation in coastal and industrial regions, boost societal support for FOW projects, reduce import dependence, and position Spain as a competitive hub in Europe's offshore wind sector.

Description

This recommendation proposes leveraging Spain's industrial strengths, especially in naval construction and steel manufacturing, to adapt and activate the supply chain for FOW technologies. Aligning these sectors with deployment goals will build a resilient, competitive, and innovative supply chain, generating local employment and enhancing social acceptance of the energy transition.

Who is involved and potential Benefits

A strengthened Spanish supply chain will generate high-quality employment opportunities, particularly in regions with shipbuilding and steel industries, supporting social acceptance through local economic growth. It will reduce reliance on imports, shorten project delivery times, and increase Spain's strategic autonomy in the clean energy transition. By fostering collaboration between traditional industries and emerging OW technologies, Spain can establish itself as a leading European player in FOW development.

3.2.3 Portugal

The following table outlines the High-level Recommendations for Portugal, which are further analysed in this section.

Table 5: High-level Recommendations for Portugal

1	Address infrastructure bottlenecks, including ports and grid connections, to ensure readiness for the large-scale deployment of floating offshore wind technologies (FOWTs)
2	Adopt non-price criteria in offshore wind auctions to promote sustainability, local supply chain development, and social acceptance
3	Ensure coexistence by addressing conflicts with fishing and shipping industries through collaborative engagement and adaptive spatial planning
4	Enhance the capacity and readiness of local supply chains to meet the unique requirements of floating offshore wind technologies, ensuring resilience, reducing dependency on external suppliers, and fostering local economic benefits
5	Mandate rigorous and transparent Environmental Impact Assessments (EIAs) for floating offshore wind projects, ensuring that they address biodiversity, marine ecosystems, and cumulative impacts, while promoting stakeholder engagement

Recommendation #1

Enhance Infrastructure Readiness for Floating Offshore Wind Development	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation • WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D3.1 - Analysis of financial and market barriers and enablers • D3.2 - Analysis of technological barriers and enablers
Geography level of reference	Portugal Lab
Dimension	Policy, Market, Technological
Targeted stakeholders	Industry, Public Authorities, Green Innovation
References	• MARINEWIND Workshop Reports (2023-2024) • National Energy and Climate Plan (NECP2030)

High level Recommendation

Address infrastructure bottlenecks, including ports and grid connections, to ensure readiness for the large-scale deployment of floating offshore wind technologies (FOWTs)

Context

Key ports in Portugal, such as Viana do Castelo, Figueira da Foz, and Sines, require substantial upgrades to meet the needs of FOWTs, from assembly to maintenance. The national grid also lacks the capacity to integrate the projected offshore wind capacity. These barriers threaten the timely achievement of Portugal's targets, including 2 GW of installed capacity by 2030 and 10 GW auctioned by 2050. Addressing these challenges is vital for attracting investments and ensuring alignment with EU climate goals.

Description

To accelerate the large-scale deployment of floating offshore wind farms, Portugal must tackle critical infrastructure bottlenecks through coordinated, forward-looking measures. Strategic actions should focus on upgrading and expanding port infrastructure to handle the assembly, storage, and maintenance of large floating platforms and/or turbines. Reinforcing onshore and offshore grid connections and interconnectors is essential to ensure the stable and efficient transmission of electricity from offshore installations to consumption centers. Additionally, enhancing port logistics, (e.g., heavy-lift capacity and specialized vessels) will enable streamlined construction, installation, and servicing of FOWTs.

- **Industry**: Invest in port-specific equipment and facilities to accommodate large turbines.
- **Public Authorities**: Simplify permitting and allocate funding for port and grid upgrades.
- **Green Innovation**: Develop innovative logistics solutions to optimise supply chains.

Who is involved and potential Benefits

Infrastructure readiness will enable the efficient deployment of FOWTs, create jobs in coastal areas, and attract global investments, positioning Portugal as a leader in the floating offshore wind sector. It will also ensure grid reliability and energy security. Specific benefits for each stakeholder group include:

Industry

- **Improved port facilities and specialized equipment** will lower logistical costs and reduce delays in the construction and maintenance of floating offshore wind farms.
- Enhanced infrastructure **will attract international developers and investors**, boosting competitiveness and opening doors for technology export and collaboration.

Public Authorities

- **Addressing infrastructure bottlenecks** will help Portugal meet its national renewable energy targets and EU climate goals more reliably and cost-effectively.
- **Strengthened grid connections** will ensure stable electricity supply, contributing to national energy security and resilience against market volatility.

Green Innovation Sector

- **Developing innovative logistics and supply chain solutions** will foster new R&D and business opportunities for startups and research centres.

Recommendation #2

Integrate Non-Price Criteria into Offshore Wind Auctions	
Respective WP(s)	WP1 – Policy framework assessment and co-creation
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D1.2 - Final policy framework analysis
Geography level of reference	Portugal Lab

Dimension	Policy, Regulatory, Social
Targeted stakeholders	Industry, Public Authorities, Civil Society
References	• MARINEWIND Workshop Reports (2023-2024) • National Energy and Climate Plan (NECP2030)

High level Recommendation

Adopt non-price criteria in offshore wind auctions to promote sustainability, local supply chain development, and social acceptance

Context

The Portuguese government has initiated discussions and aims to auction up to 10 GW of offshore wind capacity by 2050, presenting a significant opportunity to accelerate the energy transition and strengthen the green economy. However, current auction models primarily favour the lowest bid, often overlooking broader sustainability and socio-economic goals. Aligning auction design with EU best practices by integrating non-price criteria can ensure that floating offshore wind projects deliver long-term environmental protection, local economic benefits, and stronger community trust, ultimately improving project success rates and reducing opposition. On top of that, Stakeholder feedback gained during the MARINEWIND co-creation workshops highlighted the importance of prioritising biodiversity protection and community benefits.

Description

Incorporating non-price criteria — such as environmental impact mitigation, local content requirements, and community engagement — will encourage developers to design projects that can foster a balanced and sustainable development of FOWTs. Auctions should reward projects that contribute to biodiversity recovery, local employment, and social benefits.

- **Industry**: Develop innovative, environmentally friendly technologies, strengthen partnerships with local suppliers, and engage proactively with communities to build trust and secure project licenses.
- **Public Authorities**: Define clear, transparent non-price criteria and ensure fair weightage alongside cost considerations; monitor compliance and adjust frameworks to reflect evolving sustainability goals.
- **Civil Society**: Advocate for inclusive processes and actively participate in shaping community benefit schemes to ensure that local voices are heard and respected.

Who is involved and potential Benefits

Integrating non-price criteria will create a sustainable framework for offshore wind, improve social acceptance, and position Portugal as a model for inclusive energy transitions.

Industry

- **Stimulate local supply chain development**, increasing resilience and reducing logistical costs.

Public Authorities

- Deliver **balanced auction outcomes** that contribute not only to lowest cost but also to biodiversity protection and regional development.
- **Meet EU environmental standards and climate targets** more effectively while supporting just transition goals.

Civil Society

- Benefit from local **job creation**, **community investment funds**, or **infrastructure improvements** tied to offshore wind projects.
- Have a **stronger voice** in shaping project impacts and ensuring fair distribution of benefits.

Recommendation #3

Promote Coexistence Between Offshore Wind Farms and Maritime Activities	
Respective WP(s)	WP2 - Social acceptance and environmental impact analysis
Respective Deliverable(s)	• D2.1 – Analysis of social and environmental barriers and enablers • D2.2 - Final social acceptance and environmental impact analysis
Geography level of reference	Portugal Lab
Dimension	Policy, Social, Environmental
Targeted stakeholders	Industry, Public Authorities, Civil Society
References	• MARINEWIND Workshop Reports (2023-2024) • National Energy and Climate Plan (NECP2030)

High level Recommendation

Ensure coexistence by addressing conflicts with fishing and shipping industries through collaborative engagement and adaptive spatial planning

Context

In regions like Viana do Castelo, local fishermen have raised concerns about restricted access to traditional fishing grounds, potential impacts on fish stocks, and the economic risks to coastal communities reliant on fishing. Offshore wind farms may also intersect with busy shipping lanes, raising navigational safety issues. Without proactive conflict management, floating offshore wind projects risk delays, legal challenges, and local opposition. Transparent stakeholder dialogues, clear spatial planning, and innovative multi-use concepts — such as combining offshore wind infrastructure with aquaculture or artificial reefs — can minimise conflicts, protect marine ecosystems, and generate added value for multiple maritime sectors.

Description

The goal is to ensure that the deployment of floating offshore wind farms minimises disruption to traditional maritime activities and enhances synergies where possible. Collaborative approaches should include early and continuous stakeholder engagement, joint resource planning, fair compensation measures, and opportunities for co-benefits.

- **Industry**: Actively explore practical synergies between wind farms and other maritime sectors, such as combining wind farms with aquaculture, fisheries enhancement zones, or tourism initiatives, to create added value.
- **Public Authorities**: Facilitate inclusive stakeholder roundtables and ensure clear, balanced allocation of sea space. Implement monitoring frameworks to adjust plans as needed.
- **Civil Society**: Advocate for fair compensation, sustainable alternative livelihoods, and meaningful participation in decision-making processes, ensuring that local knowledge and community needs shape project development.

Who is involved and potential Benefits

Building trust and fostering coexistence will reduce project opposition, promote marine biodiversity, and strengthen stakeholder relationships.

Industry

- **Reduced risk of delays and legal disputes** through early conflict resolution and transparent engagement.
- **Potential new business models** combining offshore wind with aquaculture or other blue economy activities.

Public Authorities

- **Smoother project permitting** and faster deployment by demonstrating balanced treatment of all maritime users.
- Enhanced reputation for **inclusive governance** and **responsible marine spatial planning**.

Civil Society

- **Continued access to traditional fishing grounds** where possible, or fair and transparent compensation where access is restricted.
- **Improved trust in decision-making** and increased involvement in shaping the sustainable use of coastal and marine resources.

Recommendation #4

Strengthening Local Supply Chains for Floating Offshore Wind	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation • WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D3.1 - Analysis of financial and market barriers and enablers • D3.2 - Analysis of technological barriers and enablers
Geography level of reference	Portugal Lab
Dimension	Policy, Regulatory, Financial, Market, Technological
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND Workshop Reports (2023-2024)

	• WindFloat Atlantic Case Studies • National Energy and Climate Plan (NECP2030)

High level Recommendation

Enhance the capacity and readiness of local supply chains to meet the unique requirements of floating offshore wind technologies, ensuring resilience, reducing dependency on external suppliers, and fostering local economic benefits

Context

Portugal's ambition to auction 10 GW of offshore wind capacity by 2030 (revised to 2 GW in operation and 10 GW of leased projects by 2030) presents an immense opportunity for local supply chains. However, the workshops revealed critical gaps that need to be addressed:

- Industrial Readiness: Many sectors, such as metal fabrication and cable manufacturing, lack the scale and technical expertise required for large-scale projects.
- Vessel Availability: Limited access to specialized installation and maintenance vessels poses a significant logistical bottleneck.
- Workforce Skills: Upskilling and reskilling the workforce is necessary to meet the demands of this emerging sector.
- Supply Chain Bottlenecks: Delays in material procurement (e.g., steel, rare earth elements) can hinder project timelines.

To overcome these challenges, Portugal must leverage its industrial heritage in sectors like shipbuilding and metalwork while encouraging public-private partnerships and foreign direct investment to bridge capacity gaps. Clear incentives and strategic planning will be essential to unlock the potential of local industries, create jobs, and ensure timely project execution.

Description

The successful deployment of floating offshore wind technologies in Portugal depends on robust, resilient, and efficient local supply chains. This includes capacity building in key industrial sectors such as manufacturing (e.g., turbines, dynamic cables), services (e.g., vessel construction), and infrastructure (e.g., port facilities). While Portugal has a strong base in onshore wind, the transition to floating offshore wind requires targeted investments to address gaps in production capacity, logistics, and workforce skills.

Industry:

- Collaborate with local suppliers to develop scalable solutions for manufacturing and logistics.
- Invest in workforce training programs in collaboration with academia.

Public Authorities:

- Provide targeted financial incentives to attract investments in local manufacturing.
- Streamline permitting processes to enable faster development of supply chain infrastructure.

Civil Society:

- Engage with local communities to highlight job opportunities and socio-economic benefits from supply chain development.

Green Innovation:

- Promote the use of sustainable materials and technologies in local supply chain processes.

Who is involved and potential Benefits

Strengthening local supply chains will generate significant economic and environmental benefits, including:

- **Economic Growth**: Enhanced supply chains will drive local job creation and attract foreign investment, boosting regional economies.
- **Reduced Dependency**: A self-reliant supply chain will minimize delays and risks associated with international procurement.
- **Resilience**: Localized production ensures greater resilience against global market fluctuations.
- **Sustainability**: Encouraging green innovation in supply chain practices will align with Portugal's decarbonization goals.

Recommendation #5

Ensure Comprehensive Environmental Impact Assessments (EIAs)	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation • WP2 – Social acceptance and environmental impact analysis
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D2.1 – Analysis of social and environmental barriers and enablers
Geography level of reference	Portugal Lab
Dimension	Policy, Social, Environmental
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND Workshop Reports (2023-2024) • WindFloat Atlantic Case Studies • National Energy and Climate Plan (NECP2030)

High level Recommendation
Mandate rigorous and transparent Environmental Impact Assessments (EIAs) for floating offshore wind projects, ensuring that they address biodiversity, marine ecosystems, and cumulative impacts, while promoting stakeholder engagement

Context

The deployment of floating offshore wind farms in Portugal will affect marine environments, including sensitive habitats, biodiversity, and ecosystem dynamics. The workshop discussions emphasized the importance of assessing these impacts early in the project lifecycle. Key issues identified include:

- Limited baseline data on marine biodiversity and ecosystem health.

- Concerns from fishing communities and environmental organizations about potential habitat degradation.
- The need to consider cumulative impacts from multiple offshore projects in the same area.
- Limited public awareness of mitigation measures, leading to resistance from local communities.

To address these challenges, Portugal must strengthen its EIA framework, mandating robust studies, fostering transparency, and promoting co-creation with stakeholders. Additionally, lessons learned from early projects like WindFloat Atlantic can inform best practices for future developments.

Description

Comprehensive Environmental Impact Assessments (EIAs) are crucial for identifying and mitigating potential impacts of floating offshore wind projects on marine ecosystems. This includes assessing biodiversity loss, habitat alteration, and cumulative impacts from multiple projects. Transparent processes, involving stakeholders such as local communities and environmental NGOs, will help build trust and ensure sustainable development.

Industry:

- Ensure early and robust environmental assessments during project planning.
- Incorporate innovative mitigation technologies to reduce ecosystem impacts.

Public Authorities:

- Standardize and enforce EIA requirements across all floating offshore wind projects.
- Facilitate data-sharing platforms to support cumulative impact assessments.

Civil Society:

- Engage local communities and environmental organizations during EIAs.
- Communicate findings transparently to build trust and understanding.

Green Innovation:

- Develop advanced tools for monitoring and mitigating environmental impacts.

Who is involved and potential Benefits

Industry

- **Risk Reduction**: High-quality EIAs help developers identify and address potential risks early, reducing the likelihood of costly delays, legal disputes, or opposition.

Public Authorities

- **Policy Alignment**: Supports national commitments to EU environmental directives, marine spatial planning, and climate goals.
- **Evidence-Based Decisions**: Reliable EIA data equips regulators to make sound, transparent permitting decisions that balance renewable energy targets with biodiversity protection.

- **Public Confidence**: Rigorous processes strengthen the credibility of permitting authorities and build citizen trust in the governance of offshore resources.

Civil Society

- **Transparency and Voice**: Stakeholders gain a clear view of potential environmental impacts and can participate meaningfully in project design and mitigation measures.
- **Ecosystem Protection**: Strong EIAs help protect marine biodiversity, fishing grounds, and coastal livelihoods that depend on healthy ecosystems.

Green Innovation

- **New Solutions**: Comprehensive environmental monitoring drives innovation in low-impact installation techniques, species-friendly turbine designs, and nature-inclusive infrastructure.
- **Shared Learning**: EIAs generate valuable open data that can be used by researchers, innovators, and other projects to improve best practices and cumulative impact assessments.

3.2.4 United Kingdom

The following table outlines the High-level Recommendations for the UK, which are further analysed in this section.

Table 6: High-level Recommendations for UK

1	Address the critical need for upgrading grid connections to reduce bottlenecks and facilitate the rapid integration of new floating offshore wind generation
2	Implement comprehensive policy and market reforms to create a conducive environment for the rapid deployment of floating offshore wind projects in the UK
3	Address the critical need for robust port and grid infrastructure to support the large-scale deployment of floating offshore wind farms in the UK
4	Introduce diversified funding mechanisms such as Contract for Difference (CfD) schemes, Public-Private Partnerships (PPPs) and green bonds to bridge financial gaps, reduce investor risks, and catalyse private sector engagement
5	Develop a targeted investment program to modernize port infrastructure across the UK, focusing on facilities supporting floating offshore wind turbines (FOWTs). Utilize blended financing mechanisms to enhance the supply chain, reduce costs, and establish the UK as a leader in offshore wind logistics
6	Develop and implement a coordinated strategy to modernize ports and streamline the supply chain for floating offshore wind turbines (FOWTs), exploiting existing investments, fostering public-private collaborations, and utilizing advanced logistics and manufacturing innovations to reduce costs and accelerate deployment

Recommendation #1

Grid Connections Upgrade for Floating Offshore Wind in the UK	
Respective WP(s)	• WP1 – Policy framework assessment and co-creation • WP3- Financial and technological assessment
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D3.2 —Analysis of technological barriers and enablers
Geography level of reference	UK Lab
Dimension	Policy, Regulatory, Financial, Market, Technological
Targeted stakeholders	Industry, Public Authorities, Green Innovation
References	• MARINEWIND (2023). Deliverable D1.1 - Analysis of policy and regulatory barriers and enablers. • MARINEWIND (2024) Deliverable D3.2 —Analysis of technological barriers and enablers. • Nick Winser ENC Report on Electricity Networks • National Electricity System Operator (NESO) Connections Reform Report • National Policy Statement for Electricity Networks Infrastructure (EN-5)

High level Recommendation
Address the critical need for upgrading grid connections to reduce bottlenecks and facilitate the rapid integration of new floating offshore wind generation

<u>**Context**</u>

Several key issues contribute to these bottlenecks, and addressing these gaps is essential to meet the UK's renewable energy targets and to support the growth of the floating offshore wind sector. These include, but are not limited to:

- **Curtailment**: Without adequate grid capacity, excess power generated by wind farms may need to be curtailed, leading to wasted renewable energy and reduced efficiency.
- **Connection delays**: Prolonged timelines for grid connection approvals and construction can delay the commissioning of new wind projects, impacting overall energy targets.
- **Loss of investor confidence**: Uncertainty and delays in grid connections can deter investors, who seek predictable and timely returns on their investments.

Delays in Planning Authorization: Lengthy and complex planning processes for grid infrastructure upgrades can further delay project timelines, exacerbate bottlenecks and increase costs.

Addressing these gaps is essential to meeting the UK's renewable energy targets and supporting the growth of the floating offshore wind sector.

Description

Grid connection bottlenecks currently limit the integration of floating offshore wind farms in the UK. The existing grid infrastructure is not equipped to handle the rapid increase in power generation expected from new floating wind projects.

According to the latest Electricity Networks Commissioner (ENC) report and the National Electricity System Operator (NESO), significant upgrades are needed to ensure that new generation capacity can be connected efficiently and at pace.

Who is involved and potential Benefits

- Industry: Collaborate with grid operators to identify critical bottlenecks and develop solutions for efficient grid connections.
- Academia: Research advanced grid management technologies and provide technical expertise to support grid upgrades.
- Public Authorities: Implement policies and provide funding for grid infrastructure upgrades, ensuring regulatory frameworks facilitate rapid development.
- Civil Society: Advocate for sustainable grid development that minimises environmental impact and supports local communities.
- Green Innovation: Promote innovative technologies in grid upgrades to enhance efficiency and sustainability.

Recommendation #2

Policy and Market reform for accelerating floating offshore wind deployment	
Respective WP(s)	WP1 – Policy framework assessment and co-creation
Respective Deliverable(s)	• D1.1 – Analysis of policy and regulatory barriers and enablers • D1.4— Final policy framework analysis (WIP)
Geography level of reference	UK Lab
Dimension	Policy, Regulatory, Financial, Market
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2023). Deliverable D1.1 - Analysis of policy and regulatory barriers and enablers. • RenewableUK(2022), UK Floating Wind Taskforce • Research and Innovation hubs: Test centres- EMEC, UKFOWTT Plymouth, FLOWIC; IEA Wind(2021) Stakeholder engagement • Energy Systems Catapult- Rethinking Electricity Market; Locational Energy Pricing in the GB power market • National Grid (2023)- Net Zero Market reform

High level Recommendation

Implement comprehensive policy and market reforms to create a conducive environment for the rapid deployment of floating offshore wind projects in the UK

Context

The deployment of floating offshore wind in the UK faces several policies and market-related challenges. These include complex and lengthy planning and permitting processes, insufficient financial incentives, and market uncertainties that deter investment. According to industry reports and government analyses, such as the Nick Winser ENC report and recommendations from the National Grid ESO (Electricity System Operator), addressing these issues is crucial for accelerating the deployment of floating offshore wind.

Key issues include:

- Complex planning and permitting Processes leading to lengthy and complicated approval processes delay project timelines and increase costs.
- Insufficient financial incentives, such as inadequate subsidies or tax incentives, make it difficult for developers to secure funding and achieve financial viability.
- Unpredictable market conditions and regulatory changes create risks for investors, reducing confidence and investment in the sector.
- Existing regulations may not be fully adapted to the specific needs of floating offshore wind technology, creating additional hurdles.

Description

Introducing and enforcing policy and market reforms aimed at reducing barriers to entry, providing financial incentives, and creating a stable regulatory environment to support the growth of floating offshore wind in the UK. This includes streamlining planning and permitting processes, offering subsidies or tax incentives, and ensuring long-term market stability.

Who is involved and potential Benefits

Implementing policy and market reforms will create a more favourable environment for deploying floating offshore wind projects, increasing renewable energy capacity and reducing reliance on fossil fuels.

These reforms will also attract investment, create jobs, and drive economic growth in the renewable energy sector. Streamlined processes and financial incentives will reduce project timelines and costs, making floating offshore wind more competitive and viable.

- **Industry**: Engage with policymakers to advocate for streamlined planning and permitting processes and provide input on necessary regulatory adjustments.
    - **Environmental and certification support**: providing the necessary site management, technical support, and supply chain link-up to help developers focus on developing and demonstrating their technologies. This support is essential for achieving project certification and insurability, which are critical for the commercial viability of floating wind projects.

  - **Research and innovation hubs:** Organisations like the Offshore Renewable Energy (ORE) Catapult and other innovation and test centres (EMEC, UK FOWTT, FLOWIC, etc) that focus on advancing offshore wind technologies and supporting industry growth.

- **Local governments and planning authorities** to implement policy reforms to simplify planning and permitting, offer financial incentives and ensure regulatory stability. These bodies are responsible for granting planning permissions and meeting local regulations.
- **Marine and coastal stakeholders:** This includes the fishing industry, shipping companies, and coastal communities that may be affected by the development of offshore wind farms. Their engagement is essential to address potential conflicts and ensure mutual benefit.
- **Military and aviation interests:** The Ministry of Defence and aviation authorities must be involved in addressing any potential impacts on radar systems and airspace management.
- **Consumer advocacy groups** representing the interests of electricity consumers and can provide valuable input on how market reforms might affect energy prices and reliability.
- **Financial institutions and investors** (such as banks, investment funds, and other financial entities) provide capital for large-scale offshore wind projects. Their involvement is critical for the financial viability and scaling of the industry.

Recommendation #3

Infrastructure Development for Floating Offshore Wind	
Respective WP(s)	WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D3.1 —Analysis of financial and market barriers and enablers • D3.2 —Analysis of technological barriers and enablers
Geography level of reference	UK Lab
Dimension	Policy, Regulatory, Financial, Market, Technological
Targeted stakeholders	Industry, Academia, Public Authorities, Civil Society, Green Innovation
References	• Industry reports on port infrastructure requirements for offshore wind in the UK- RenewableUK, Industrial leadership, ORE Catapult • Research papers on grid integration of renewable energy sources in Scotland and Wales- Floating offshore Wind Centre of Excellence • Government policy documents on renewable energy infrastructure development in the UK- Gov UK- Offshore Wind champion, Floating Offshore Wind 2050 vision

High level Recommendation

Address the critical need for robust port and grid infrastructure to support the large-scale deployment of floating offshore wind farms in the UK

Context

Inadequate infrastructure hinders the deployment of floating offshore wind farms in the UK, particularly in Scotland and Wales. Ports in these regions need to be equipped with specialised facilities to handle the large-scale components of floating wind turbines, such as floating platforms and mooring systems.

The existing grid infrastructure must also be upgraded to manage the increased power output and ensure efficient transmission to onshore grids. Addressing these gaps is essential for successfully commercialising and scaling floating offshore wind technology, especially with the ambitious targets set by ScotWind in Scotland.

Description

Invest in and upgrade port facilities and grid infrastructure in England, Scotland, and Wales to accommodate the unique requirements of floating offshore wind installations. This includes enhancing port capabilities for assembly, storage, and transportation of large components and upgrading grid connections to handle increased power generation from projects like ScotWind.

Industry: Collaborate with port authorities in England, Scotland and Wales to develop specialised facilities and logistics solutions for floating wind components.

Academia and research organisation: Research innovative infrastructure solutions and provide technical expertise to support infrastructure development in these regions. Such as:

- Offshore Renewable Energy Catapult - innovation and research centres supporting developing and commercialising offshore renewable energy technologies, including floating wind.

Public authorities: Implement policies and provide funding to support infrastructure upgrades in Scotland and Wales, ensuring regulatory frameworks facilitate rapid development.

- The Crown Estate and Crown Estate Scotland's role is crucial in facilitating access to suitable sites for floating offshore wind farms as owners and responsible for the seabed leasing process for offshore wind projects in England, Wales, and Scotland, respectively. Their role is crucial

Civil society: Advocating for sustainable infrastructure development that minimises environmental impact and supports local communities in Scotland and Wales. This includes, but not limited to:

- Engaging with local communities and coastal authorities to gain social license to operate and ensuring that the benefits of offshore wind projects are shared locally
- Organisations such as the RSPB (Royal Society for the Protection of Birds) and WWF (World Wildlife Fund) for ensuring that offshore wind development is environmentally sustainable and minimises impacts on marine ecosystems

Financial institutions and investors: Banks, investment funds, and other financial institutions providing the necessary capital for large-scale offshore wind projects. Their involvement is critical for the financial viability and scaling of the industry

Trade associations such as RenewableUK, representing the wind and marine energy industries in the UK and playing a significant role in advocacy, policy development, and industry collaboration

Green innovation: Promoting green technologies in infrastructure development to enhance sustainability and reduce carbon footprints.

Who is involved and potential Benefits

Upgrading port and grid infrastructure in Scotland and Wales will facilitate the efficient deployment and operation of floating offshore wind farms, leading to increased renewable energy generation and reduced reliance on fossil fuels. Enhanced infrastructure will also create economic opportunities, including job creation in the construction, maintenance, and operation of wind farms. Furthermore, improved grid connections will ensure a stable and reliable power supply, contributing to energy security and resilience in these regions.

Recommendation #4

Innovative Financing Mechanisms for Floating Offshore Wind Deployment in the UK	
Respective WP(s)	WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D3.1 —Analysis of financial and market barriers and enablers • D3.2 —Analysis of technological barriers and enablers
Geography level of reference	UK Lab
Dimension	Financial, Market
Targeted stakeholders	Industry, Public Authorities, Civil Society
References	• MARINEWIND (2023). D3.1 – Analysis of Financial and Market Barriers and Enablers • MARINEWIND (2023). D3.2 – Analysis of Technological Barriers and Enablers

High level Recommendation

Introduce diversified funding mechanisms such as Contract for Difference (CfD) schemes, Public-Private Partnerships (PPPs) and green bonds to bridge financial gaps, reduce investor risks, and catalyse private sector engagement

Context

The financial viability of floating offshore wind turbines (FOWTs) remains a key barrier in the UK, as high capital expenditures (CAPEX) and operational costs (OPEX) deter private investment. The 2023 CfD auction round failed to secure bids for offshore wind due to insufficient funding levels and the 2024 CfD auction round was able to offer funding for a low capacity of 400 MW which is not enough to meet the ambitious 2030 goals, highlighting the need for innovative financing structures.

Public-Private Partnerships (PPPs) have demonstrated success in co-financing large-scale infrastructure projects globally, providing a shared-risk model that aligns public interest with private efficiency. For example, Hywind Scotland leveraged innovative financing to lower its LCOE and build investor confidence. Green bonds and blended finance mechanisms have been proven effective in infrastructure projects but are underutilised in the renewable energy sector.

Best practices suggest tailoring CfD schemes to account for high-risk technologies, creating incentives for green bonds, and expanding PPP adoption to ensure resource pooling. These measures will mitigate financial risks, attract diversified investments, and foster long-term economic sustainability for FOWT deployment in the UK.

Description

To accelerate FOWT deployment, the UK should adopt more flexible CfD schemes tailored for high-risk projects, establish PPP frameworks to pool public and private capital, and leverage green bonds for renewable infrastructure. PPP models, used successfully in infrastructure development, can align stakeholder interests and share financial risks, reducing the Levelized Cost of Energy (LCOE). This approach builds on lessons from projects such as Hywind and Kincardine FOWT plants.

Industry

- Partner with public entities in PPP models to co-finance large-scale FOWT projects.
- Utilize green bonds and hybrid PPP financing structures to secure long-term capital.

Public Authorities

- Redesign CfD auctions to attract PPP participation by incorporating risk-sharing mechanisms.
- Provide financial guarantees to PPP projects to mitigate investor risks and improve credit ratings.

Civil society

- Promote transparency in PPP agreements to ensure community benefits from funded projects.

Who is involved and potential Benefits

Expanding financing mechanisms and exploiting Public-Private Partnerships (PPPs) for FOWT projects in the UK can deliver transformative benefits across industrial, governmental, and green innovation sectors by fostering financial stability, boosting stakeholder confidence, and promoting sustainable development.

Industrial Stakeholders

- **Predictable Revenue Streams through Enhanced CfD Schemes**: Tailored CfD auctions designed for FOWTs can provide developers with long-term price guarantees, reducing financial risks and improving revenue predictability for high-risk projects.
- **Improved Investment Confidence**: The combination of CfDs and PPP models lowers perceived risks for private investors, fostering greater confidence and enabling the commitment of funds to long-term FOWT projects.
- **Faster Deployment and Scaling**: Reliable funding streams from CfDs and co-financed PPP structures facilitate the scaling of production and deployment activities, ensuring timely delivery of turbines and infrastructure to meet rising energy demands.

- **Streamlined Project Execution**: Improved access to funding facilitates efficient project timelines, enabling developers to focus on scaling production and meeting increasing renewable energy demands.
- **Enhanced Market Competitiveness**: Innovative funding models lower the Levelized Cost of Energy (LCOE), allowing FOWTs to compete more effectively with other renewable and conventional energy sources.

Public Authorities (Local, Regional, and National Governments)

- **Economic Growth and Regional Benefits**: Enhanced CfD schemes coupled with PPP-driven investments attract large-scale projects, stimulating local economies, creating jobs in coastal regions, and supporting supply chain development.
- **Stronger Energy Transition Objectives**: CfD schemes aligned with government net-zero strategies ensure more renewable energy is brought online, reducing reliance on fossil fuels and improving national energy security.
- **Improved Transparency and Coordination**: The integration of PPP models ensures that governments, industry, and local communities collaborate effectively, enhancing project transparency and public trust.
- **Greater Energy Security and Independence**: Expanding the renewable energy sector through robust funding mechanisms helps governments reduce reliance on fossil fuels and improve national energy security.

Green Innovation Stakeholders

- **Accelerated R&D and Innovation**: Targeted funding from CfDs and PPPs supports the development of advanced technologies, such as modular floating platforms, dynamic cabling, and hybrid wind-hydrogen systems, enabling faster innovation cycles.
- **Expedited Market Entry for Emerging Solutions**: The security provided by CfDs encourages the testing and deployment of new technologies, reducing barriers for green innovations in the offshore wind sector.
- **Sustainability and Collaboration**: By aligning PPP frameworks with enhanced CfDs, stakeholders can prioritize environmental sustainability, fostering a collaborative ecosystem where technological progress and ecological protection coexist.

Recommendation #5

Establish a port infrastructure investment program for floating offshore wind development	
Respective WP(s)	• WP1 – Policy Framework Assessment • WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D1.1 —Analysis of Policy and Regulatory Barriers and Enablers • D3.1 —Analysis of financial and market barriers and enablers
Geography level of reference	UK Lab
Dimension	Policy, Financial, Market, Technological

Targeted stakeholders	Industry, Academia, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND Deliverable D1.1: Policy and Regulatory Barriers and Enablers • Global Energy Group. “The Port of Nigg Selected as Marshalling, Storage, and Logistics Base for Foundation Structures for Seagreen Offshore Windfarm.” Accessed November 27, 2024. https://gegroup.com/latest/the-port-of-nigg-selected-as-marshalling-storage-and-logistics-base-for-foundation-structures-for-seagreen-offshore-windfarm. • Port of Cromarty Firth. “Port of Cromarty Firth: Supporting the Offshore Wind Sector.” Accessed November 27, 2024. https://pocf.co.uk. • Able Seaton Port. "Supporting Offshore Wind Operations at Able Seaton Port." Accessed November 27, 2024. • The Crown Estate. “Marine Supply Chain Accelerator Fund.” Accessed November 26, 2024. https://www.thecrownestate.co.uk/our-business/marine/supply-chain-accelerator-fund.

High level Recommendation

Develop a targeted investment program to modernize port infrastructure across the UK, focusing on facilities supporting floating offshore wind turbines (FOWTs). Utilize blended financing mechanisms to enhance the supply chain, reduce costs, and establish the UK as a leader in offshore wind logistics

Context

Insufficient port infrastructure is a critical bottleneck to achieving the UK’s offshore wind targets, particularly for floating wind technologies. Many UK ports lack the required capabilities, such as deep-water access, heavy lift capacity, and storage for large components. Without adequate facilities, projects face delays, increased costs, and reliance on foreign infrastructure.

Recent success stories, such as the upgrades to Scotland’s Port of Nigg and Port of Cromarty Firth, demonstrate the potential for UK ports to transform into offshore wind hubs. These ports have invested in facilities tailored to renewable energy, including deep-water quays and laydown areas. Similarly, Able Seaton Port in England has emerged as a key player in the offshore wind sector, hosting assembly and deployment operations for major projects such as Dogger Bank.

A national PIIP would build on these examples, focusing on underdeveloped regions to enhance the UK’s capacity for floating offshore wind deployment. Public-private partnerships (PPPs) and green bonds could provide essential financing, while targeted government grants could prioritize infrastructure in areas with significant renewable energy potential.

This approach would reduce logistical costs, strengthen the domestic supply chain, and accelerate the deployment of FOWTs, positioning the UK as a global leader in offshore wind.

Description

The UK requires a coordinated approach to upgrade and expand port infrastructure to meet the demands of floating offshore wind projects. The Port Infrastructure Investment Program (PIIP) would focus on strategic port locations, leveraging public and private funding to modernize facilities for FOWT manufacturing, assembly, and deployment. The program would address supply chain inefficiencies and high logistical costs while promoting regional economic development.

Financial and Investment Institutions (Banks, Mutual Funds, Wealth Management Companies)

Banks:

- Provide low-interest loans or revolving credit lines for port infrastructure upgrades.
- Offer structured finance options, such as project finance or syndicated loans, tailored to the renewable energy sector.

Mutual Funds:

- Create renewable energy-focused funds that include infrastructure investments in FOWTs as part of a diversified portfolio.
- Partner with public entities to support blended financing initiatives, such as combining grants and private investments.

Wealth Management organisations:

- Design sustainable investment products targeting high-net-worth individuals (HNWIs) interested in environmental, social, and governance (ESG) criteria.
- Channel private wealth into green projects, such as port upgrades for offshore wind, through dedicated investment vehicles.

Industry

- Invest in co-located manufacturing and assembly facilities at upgraded ports to reduce logistical inefficiencies.
- Partner with public authorities to fund and manage port upgrades.

Academia

- Conduct studies on optimizing port layouts and operations for FOWT deployment.

Public Authorities

- Provide grants to strategically important ports for upgrading infrastructure.
- Develop a long-term national port strategy aligned with offshore wind targets.

Civil Society

- Ensure communities near upgraded ports benefit through job creation and local economic development.

Green Innovation

- Pilot new technologies for port operations to improve efficiency and reduce costs.

Who is involved and potential Benefits

Co-funded by the European Union

The Port Infrastructure Investment Program would address a major barrier to scaling up floating offshore wind in the UK. Upgraded ports, modeled on successful projects such as the Port of Nigg and Able Seaton Port, would provide the capacity needed for large-scale FOWT deployment. These improvements would reduce dependency on international facilities, lowering costs and enhancing the UK's competitiveness.

Industrial stakeholders would benefit from streamlined supply chains and reduced logistical costs, while public authorities would achieve energy transition goals more effectively. Regional economies would experience significant growth, driven by job creation and supply chain development in coastal areas.

The program would also attract foreign investment and enhance the UK's reputation as a global leader in renewable energy infrastructure. By leveraging innovative financing mechanisms and fostering collaboration among stakeholders, the PIIP would ensure financial sustainability while accelerating the decarbonization of the energy sector.

Recommendation #6

Integrated port and supply chain optimisation for Floating Offshore Wind Deployment	
Respective WP(s)	• WP1 – Policy Framework Assessment • WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	• D1.1 — Analysis of Financial and Market Barriers and Enablers • D3.1 —Analysis of financial and market barriers and enablers
Geography level of reference	UK Lab
Dimension	Financial, Market, Technological
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND. Deliverable D1.1: Policy and Regulatory Barriers and Enablers. Accessed November 26, 2024. • The Crown Estate. "Marine Supply Chain Accelerator Fund Documentation." Accessed November 28, 2024. https://www.thecrownestate.co.uk/our-business/marine/supply-chain-accelerator-fund. • Global Energy Group. "The Port of Nigg Selected as Marshalling, Storage, and Logistics Base for Foundation Structures for Seagreen Offshore Windfarm." Accessed November 28, 2024. https://gegroup.com/latest/the-port-of-nigg-selected-as-marshalling-storage-and-logistics-base-for-foundation-structures-for-seagreen-offshore-windfarm. • Port of Cromarty Firth. "Port of Cromarty Firth: Supporting the Offshore Wind Sector." Accessed November 28, 2024. https://pocf.co.uk. • Able Seaton Port. "Supporting Offshore Wind Operations at Able Seaton Port." Accessed November 28, 2024.

High level Recommendation
Develop and implement a coordinated strategy to modernize ports and streamline the supply chain for floating offshore wind turbines (FOWTs), exploiting existing investments, fostering public-private collaborations, and utilizing advanced logistics and manufacturing innovations to reduce costs and accelerate deployment

Context

The deployment of floating offshore wind turbines (FOWTs) in the UK faces significant hurdles, including insufficient port infrastructure, fragmented supply chains, and high costs associated with logistics and manufacturing. Ports are currently ill-equipped to handle the scale and complexity of FOWTs, with gaps in key areas such as deep-water berths, heavy-lift cranes, and storage for large components.

Supply chain inefficiencies exacerbate these challenges, leading to delays and increased costs for developers. With the UK targeting 50 GW of offshore wind by 2030, including 5 GW of floating wind, these barriers must be addressed to achieve deployment goals.

Existing programs, such as the Crown Estate's £50 million Supply Chain Accelerator Fund and regional development grants have made progress in this direction. Learning from successful examples such as the Port of Nigg and Able Seaton Port, the UK should focus on coordinated upgrades and supply chain integration at key locations.

An integrated modernization strategy would target ports with high offshore wind potential, ensuring infrastructure upgrades are coupled with supply chain efficiency improvements. Public-private partnerships (PPPs) and green financing mechanisms can further enhance the impact of existing investments, driving down costs and enabling timely project execution.

Description

The UK should establish an integrated plan to enhance critical port infrastructure, align supply chain operations, and reduce the levelized cost of energy (LCOE) for FOWTs. By maximizing existing programs such as the Crown Estate's Supply Chain Accelerator Fund and regional growth grants, and aligning with long-term offshore wind deployment goals, the strategy can focus on high-impact upgrades. These include expanded heavy-lift capacity, deep-water access, and co-located manufacturing facilities at strategic ports, while fostering collaboration between stakeholders to create cost-efficient, scalable solutions.

Financial and Investment Institutions (Banks, Mutual Funds, Wealth Management Companies)

Banks:

- Infrastructure loans: Provide tailored low-interest loans to UK port authorities and offshore wind developers for upgrades to critical facilities, such as deep-water berths and heavy-lift cranes.
- Syndicated finance: Collaborate with other banks to pool resources for large-scale port modernization projects, ensuring risk-sharing and efficient capital allocation.

- Green lending frameworks: Expand green project financing under programs like the Bank of England's Green Financing Framework, explicitly targeting FOWT infrastructure.

Mutual Funds:

- Green energy investment funds: Develop renewable energy funds with a focus on port and supply chain infrastructure projects related to FOWTs, enabling retail and institutional investors to back the UK's offshore wind targets.

Wealth Management organisations:

- ESG-focused portfolios: Design portfolios that highlight UK-based renewable energy infrastructure projects, particularly targeting port upgrades for FOWTs, to attract high-net-worth individuals (HNWIs) and family offices.
- Private wealth channels: Offer clients opportunities to invest in UK offshore wind logistics projects with demonstrable social and environmental impacts, aligning with the country's net-zero goals.

Capital Investors and Venture Funds

- Equity partnerships: Invest directly in UK port authorities or offshore wind developers, focusing on early-stage modernization projects to address infrastructure gaps.
- Scaling logistics innovations: Fund innovative UK companies working on modular assembly techniques, digital supply chain tools, and advanced logistics technologies to enhance FOWT deployment efficiency.

Institutional Investors

- Long-term green bonds: Allocate capital to UK government or port authority-issued infrastructure bonds for port and supply chain upgrades, offering stable and sustainable returns.
- Public-private co-investments: Collaborate with UK government-led initiatives, such as the British Investment Bank, to support large-scale projects with public guarantees mitigating investment risks.

Industry

- Develop and deploy modular assembly techniques to streamline turbine manufacturing and reduce transport costs.

Public Authorities

- Align funding priorities with port infrastructure needs to maximize existing grants and subsidies.
- Encourage cross-regional collaboration to optimize the distribution of supply chain resources.

Civil Society

- Promote local engagement to highlight the economic and employment benefits of modernized ports.

Green Innovation

- Deploy advanced digital tools for real-time supply chain monitoring and optimization.

Who is involved and potential Benefits

Addressing port and supply chain barriers through an integrated modernization strategy will unlock the full potential of the UK's floating offshore wind sector. Upgraded ports will enhance logistical efficiency, reducing delays and costs, while supply chain improvements will create a robust, scalable framework for future deployments.

Industrial stakeholders will benefit from streamlined operations, lower transportation costs, and increased project timelines, while public authorities can exploit existing investments to achieve decarbonization targets more effectively. Regional communities will experience economic growth, driven by new job opportunities in manufacturing, construction, and logistics.

Additionally, supply chain integration will improve cost predictability, making FOWTs more competitive in the renewable energy market. Enhanced infrastructure will attract foreign investment, solidifying the UK's leadership in offshore wind innovation. By focusing on sustainability and economic efficiency, this strategy will contribute to a just energy transition, ensuring long-term economic and environmental benefits.

3.2.5 Greece

The following table outlines the High-level Recommendations for Greece, which are further analysed in this section.

Table 7: High-level Recommendations for Greece

1	Reduce excessive duration of the licensing process
2	Reduction of negative impact on tourism industry
3	Provision of financial support to accelerate the deployment of FOWT projects
4	Facilitate technological maturity for developing FOWTs
5	Develop a national strategic investment plan to modernize and repurpose key Greek ports and shipyards to support the entire lifecycle of FOWTs

Recommendation #1

Develop a clear permitting process to promote clarity	
Respective WP(s)	WP1 – Policy framework assessment and co-creation
Respective Deliverable(s)	D1.1 – Analysis of policy and regulatory barriers and enablers
Geography level of reference	Greek Lab
Dimension	Policy, Regulatory

Targeted stakeholders	Industry, Public Authorities, Green Innovation
References	• MARINEWIND (2023). Deliverable D1.1 - Analysis of policy and regulatory barriers and enablers • HEREMA (2023). National Development Plan – Offshore Wind Farms (NDP-ODF) • ELETAEN (2024). Business Project Plan. Offshore Wind Farms in Greece – Regulatory Challenges and Prospects

High level Recommendation
Reduce excessive duration of the licensing process

Context

It is well known that one of the main bottlenecks in Greece is the excessive duration (estimated and real) of the licensing processes. This is prevalent from the authorization process of the onshore wind farms over the last decades. The main reasons for the excess duration are:

- The complexity of the regulatory framework
- The opposition of some categories of stakeholders
- The lack of a consolidated experience in the sector
- The lack of human resources with adequate skill dedicated to the process

Based on the National Plan for the Energy and the Climate, the large energy savings required (-1.6% in 2030 and -26.5% in 2050 compared to 2021, despite economic growth) are accompanied by an impressive electrification of the vast majority of sectors of the economy, resulting in an increase of 21.7% in 2030 and a more than tripling in 2050 compared to 2021. This challenge should lead to a completely different and impressive development of the electricity system, both in terms of power generation and the transmission and distribution of electricity. Therefore, there is no time to waste (much more than required) in endless procedures which cause delays and/or postpone the development of Renewable Energy projects.

Description

To overcome the complexity of the licensing process, Greece has to take a pathway of simplification. Process clarity through a clear permitting process to be administered by a competent and trusted entity will attract increased domestic and foreign investments. This can be achieved by i) transparent and predictable guidelines (permitting roadmap, standardized criteria, digitalization of the permitting process), ii) comprehensive stakeholder consultations (early and often engagement, public participation), iii) alignment with best practices in EU and beyond, iv) facilitation of grid connection approvals and v) simplification of financial and legal requirements.

Who is involved and potential Benefits

A clear permitting process for offshore wind projects in Greece can deliver significant benefits across industrial, governmental, and green innovation sectors by creating a more predictable, efficient, and investment-friendly environment.

Industrial Stakeholders

- **Predictable Timelines and Reduced Costs**: Clear permitting helps industrial stakeholders anticipate timelines and avoid costly delays associated with regulatory barriers or unexpected compliance requirements.
- **Investment Confidence**: A transparent and streamlined process can encourage more private investment by reducing perceived risks and uncertainties, making it easier for developers and investors to commit to long-term projects.
- **Scalability and Operational Efficiency**: Faster permitting facilitates the scaling of production and construction activities, enabling industrial players to deploy turbines and infrastructure in a timely manner to meet increasing energy demands.

Public Authorities (Local, Regional, and National Governments)

- **Economic Development and Job Creation**: By smoothing out the permitting process, governments can attract more projects, boosting local economies through job creation in construction, maintenance, and supply chain & logistics.
- **Improved Regulatory Compliance and Environmental Safeguards**: A clear process enables public authorities to better coordinate with developers on environmental standards and ensure that biodiversity and marine ecosystems are protected.
- **Public Trust and Transparency**: Streamlined processes can foster greater public trust and increased social acceptance as communities are better informed about project stages, safety measures, and the environmental impact of offshore installations.

Green Innovation Stakeholders

- **Faster Pathways to Market for New Technologies**: A predictable permitting process can expedite testing and deployment of innovative technologies in offshore wind (such as floating turbines or new blade materials) by reducing bureaucratic bottlenecks.
- **Increased Collaboration Opportunities**: A transparent regulatory framework encourages collaboration between tech developers, environmental advocates, and industry players, enabling innovation and environmentally responsible practices to coexist.
- **Strengthened Sustainability Objectives**: Clarity in regulatory processes allows green innovation stakeholders to align project development with sustainability goals, supporting the larger shift to renewable energy while minimizing ecological impacts.

Recommendation #2

Sustainable approaches for harmonizing FOWTs with Tourism Industry	
Respective WP(s)	WP2 – Social acceptance and environmental impact analysis
Respective Deliverable(s)	D2.1 – Analysis of Social and Environmental Barriers and Enablers
Geography level of reference	Greek Lab
Dimension	Social
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation

References	• MARINEWIND (2023). Deliverable D2.1 - Analysis of Social and Environmental Barriers and Enablers • Loukogeorgaki, E.; Vagiona, D.G.; Lioliou, A. Incorporating Public Participation in Offshore Wind Farm Siting in Greece. Wind 2022, 2, 1–16. https://www.mdpi.com/2674-032X/2/1/1

High level Recommendation
Reduction of negative impact on tourism industry

Context

The challenge of attracting potential investors for FOWTs projects in Greece is complex due to the nation's heavy reliance on tourism, which constitutes a significant portion of its Gross Domestic Product (GDP). Greece's coastlines and marine tourism attract millions of visitors annually in terms of scenery, informal activities and/or sports (e.g., recreational boating), hence any FOWT developments, especially floating infrastructures that are visible from the coast, can provoke resistance both from local communities and tourism stakeholders.

Stakeholders' concerns primarily revolve around the potential visual pollution, noise, and perceived disruptions to natural landscapes and marine ecosystems. These attributes are critical to Greece's appeal as a tourist destination and can lead to the weaking of local tourism. As a result, any kind of resistance arising from the above concerns may lead to extensive bureaucracy and long delays non only in the licensing process of FOWT projects, but also in their development and operation, thus driving away potential investors.

Description

The mitigation of negative impact related to the development of FOWTs on tourist zones requires a strategic approach. Particularly, siting far from frequented tourist zones, enhancing community engagement, and demonstrating economic benefits for tourism entrepreneurs could reduce public opposition, while clear communication and inclusive planning processes can contribute to acceptance, showing that FOWTs could coexist with the tourism sector and support Greece's transition to clean energy. In addition, integration with blue tourism and promotion of a green image could lead to a great reduction of negative impact of the tourism industry.

Who is involved and potential Benefits

A strategic approach including specific actions to harmonize the development of FOWT with the industry tourism can deliver significant benefits across industrial, governmental, and civil society sectors by creating a more sustainable and investment-friendly environment.

Industrial Stakeholders

- **Reduced bureaucracy and delays**: Harmonizing FOWTs with the tourism industry will lead to less bureaucracy and delays, helping industrial players to develop accurate timelines and avoid costly delays associated with social acceptance.

- **Lower investment risk**: A transparent process along with clear communication can reduce unexpected barriers and risks related to local society's opposition to FOWT projects, thus attracting more investors.

<u>Public Authorities (Local, Regional, and National Governments)</u>

- **Project scalability**: By siting the FOWT projects far from the coastline, government can fill the gap between FOWT development and Tourism Industry, creating in this way a friendly environment for more projects.
- **National goals**: Reducing the negative impact on tourism industry, government can develop more FOWT projects and achieve its national goals towards the transition to green energy.

<u>Civil Society and SMEs</u>

- **Increased Collaboration Opportunities**: Clear communication and inclusive planning processes encourage collaboration between FOWT developers and civil society/SMEs, creating space for local economic growth.
- **Economic Development and Job creation**: Demonstrating the economic benefits of FOWT projects can increase social acceptance and bring more projects, resulting in job creation in local societies and economic development of local entrepreneurs.

Recommendation #3

Offer financial incentives to reduce upfront costs and risks	
Respective WP(s)	WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	D3.1 – Analysis of financial and market barriers and enablers
Geography level of reference	Greek Lab
Dimension	Financial
Targeted stakeholders	Industry, Public Authorities, Green Innovation
References	• MARINEWIND (2023). D3.1 – Analysis of financial and market barriers and enablers • World Bank Group (2021). [Key Factors for Successful Development of Offshore Wind in Emerging Markets]()

High level Recommendation
Provision of financial support to accelerate the deployment of FOWT projects

<u>Context</u>

The financial dimension poses significant barriers to developing and deploying FOWT projects in Greece. Securing financing for large-scale offshore wind initiatives is particularly challenging due to their high upfront costs, extended payback periods, and the perception of increased investment risks. These factors often prevent potential investors, particularly in an environment where competition for capital is intense. Additionally, FOWT projects must compete with other renewable energy sources, such as solar and onshore wind farms, as well as conventional fossil fuels. National economy and market dynamics heavily influence this competition, potentially limiting the attractiveness of FOWTs to investors.

Moreover, fluctuating energy prices, combined with changes in subsidy schemes and evolving market conditions, increase uncertainty about the economic viability of these projects. Such volatility complicates long-term financial planning, creating challenges in terms of consistent returns to investors. Addressing these financial barriers will require a combination of tailored policy frameworks, innovative financing mechanisms, and efforts to mitigate perceived risks, ensuring FOWTs become a viable and attractive investment option.

Description

Greek government can offer financial incentives and subsidies to reduce the upfront costs and risks associated with the development and deployment of FOWTs projects. These incentives may include among others i) Capital Grants and Subsidies, ii) Tax incentives (tax credits, accelerated depreciation, VAT reductions), iii) Feed-in Tariffs (FiTs) and Power Purchase Agreements (PPAs), iv) Risk Mitigation Mechanisms, v) Public-Private Partnerships (PPPs).

Who is involved and potential Benefits

The provision of financial support is crucial for the deployment of FOWT projects in Greece, offering critical benefits both not only for the government but also for SMEs and industrial stakeholders.

Industrial Stakeholders

- **Risk mitigation**: Reducing uncertainties and risks linked to energy prices creates a more stable investment climate, encouraging long-term strategic planning.
- **Improved Market Competitiveness**: Financing mechanisms that enhance financial feasibility allow the industry to compete more effectively against other renewable energy sources and conventional fuels.

Public Authorities (Government)

- **Accelerated Renewable Energy Goals**: Enabling FOWT financing supports Greece's transition to clean energy, aligning with national and EU climate targets.
- **Economic Growth and Job Creation**: Effective financial frameworks demonstrate the government's ability to facilitate innovation, attracting further investments. These investments in FOWTs stimulate job creation, infrastructure development, and regional economic activity.

SMEs (Investors)

- **New Investment Opportunities**: Reduced financial risks make FOWTs a viable investment for private investors.
- **Potential for Higher Returns**: Enhanced financial mechanisms and stability improve project profitability, making investments more attractive.

Recommendation #4

Strengthening the national supply chain through local content	
Respective WP(s)	WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	D3.1 – Analysis of financial and market barriers and enablers
Geography level of reference	Greek Lab
Dimension	Policy, Social, Market, Technological
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2023). D3.1 - Analysis of financial and market barriers and enablers • Hellenic Wind Energy Association (2024). Status and Challenges for the supply chain for Offshore Wind in Greece • World Bank Group (2021). Key Factors for Successful Development of Offshore Wind in Emerging Markets

High level Recommendation

Facilitate technological maturity for developing FOWTs

Context

Greece possesses significant potential to develop a robust supply chain for FOWT, leveraging its existing infrastructure and industrial capacity. Decommissioned shipyards and ports across the country present an opportunity for revitalization, offering ideal sites for manufacturing and assembling FOWT components at a lower cost. This could stimulate economic growth, create jobs, and support local industries.

Hellenic Cables, one of Europe's leading cable manufacturers, brings world-class expertise and capacity to produce the high-quality, durable cables essential for FOWT projects. Its involvement could enhance domestic capabilities and reduce dependence on foreign suppliers.

Moreover, Greece has a strong domestic production of steel and cement, two critical materials for FOWT construction. Utilizing these locally produced resources can significantly lower costs, streamline logistics, and improve supply chain reliability. This alignment of local infrastructure and expertise provides a strong foundation for Greece to lead in FOWT development, fostering national growth and global competitiveness.

Description

The recommendation aims to strengthen Greece's national supply chain in the domain of wind energy by revitalizing decommissioned shipyards and ports, leveraging domestic steel and cement production, and harnessing the expertise of Hellenic Cables in subsea cable Systems. This approach seeks to reduce costs, create jobs, and facilitate Greece's technological maturity for the development of FOWTs.

Who is involved and potential Benefits

The recommendation offers benefits by fostering economic growth, job creation, and enhanced local capabilities for industry, public authorities, civil society, and Green Innovation, strengthening Greece's renewable energy sector and supply chain.

Industrial Stakeholders

- **Growth opportunities**: The recommendation provides significant opportunities for local manufacturers, shipyards, and cable producers by increasing demand for their products and services. It boosts revenues and strengthens domestic industrial capabilities. Local suppliers can also become more competitive in the global market for FOWT components, enhancing Greece's industrial presence in the renewable energy sector.

Public Authorities

- **Increase national independence**: Public authorities benefit from economic revitalization in regions with decommissioned shipyards and ports. The development of a local FOWT supply chain aligns with national renewable energy and sustainability goals, reduces reliance on imports, and supports Greece's energy transition.
- **Enhance local public acceptance**: Local engagement in renewable energy projects promotes social acceptance of the energy transition and delivers long-term sustainability benefits.

Civil Society

- **Local job creation**: Communities benefit through new employment opportunities and economic growth, particularly in areas around revitalized shipyards and industrial zones.

Green Innovation (SMEs & Investors)

- **Business opportunities**: SMEs interested in the FOWT sector can seize new business opportunities as the local supply chain for FOWT develops.
- **Increased investment returns**: Investors benefit from the support of a growing market with a clear national strategy, which could yield returns as Greece moves towards green energy development.

Recommendation #5

Prioritization and revitalization of Greek infrastructure (ports & shipyards)	
Respective WP(s)	WP3 – Financing, techno-economic analysis and survey
Respective Deliverable(s)	D3.1 – Analysis of financial and market barriers and enablers
Geography level of reference	Greek Lab
Dimension	Policy, Regulatory, Social, Technological
Targeted stakeholders	Industry, Public Authorities, Civil Society, Green Innovation
References	• MARINEWIND (2023). D3.1 - Analysis of financial and market barriers and enablers • WindEUROPE (2021). A 2030 Vision for European Offshore Wind Ports: Trends and Opportunities

	• Hellenic Wind Energy Association (2024). Status and Challenges for the supply chain for Offshore Wind in Greece

High level Recommendation
Develop a national strategic investment plan to modernize and repurpose key Greek ports and shipyards to support the entire lifecycle of FOWTs

Context

Ports are central to the development of offshore wind. They play a key role for the local supply chain, logistics and supporting infrastructure (e.g. storage of components). Ports are where operation and maintenance of offshore wind farms are run, where all offshore wind turbines and other equipment get transported, and where floating turbines are assembled.

Based on a recent study conducted by the Norwegian Offshore Wind on behalf of the Hellenic Wind Energy Association, a significant challenge for supporting participation in the offshore wind industry is the inadequacy of port infrastructure to meet the requirements of typical offshore wind farms and the assembly needs of standard floating wind turbines. A common issue across all ports, regardless of size or potential for future expansion, is the limited availability of space. While some ports include minor or major expansions in their master plans, the realization of these expansions often remains uncertain due to management uncertainties, government barriers or funding constraints.

Finally, the need to achieve the national goals towards green energy, along with the precipitation in the development of the pilot projects, make it necessary to have adequate and ready to operate infrastructure to implement the projects within the specified timeframes, hence avoiding further delays.

Description

The recommendation aims to facilitate the development of FOWTs in Greece by prioritizing and speeding-up the revitalization and/or expansion of ports and shipyards critical to the development of the offshore wind projects in Greece. This approach aims to avoid delays during the construction phase of the projects related to component imports, insufficient infrastructure and supply chain logistics. This could be achieved by i) infrastructure assessments, ii) upgrade of port facilities (Deep-Water Berths, Heavy-Lift Cranes and Equipment, Storage and Assembly Areas), iii) Integration of Digitalization and Automation (smart ports, Automation in Shipyards), and iv) attract investments and partnerships.

Who is involved and potential Benefits

Revitalizing and upgrading Greek ports and shipyards will streamline FOWT development, reduce delays, enhance local job opportunities, and attract investments by addressing infrastructure challenges and boosting supply chain readiness and efficiency.

Industrial Stakeholders

- **Enhanced operational efficiency**: Improved infrastructure will streamline supply chain logistics, reduce delays, and facilitate the efficient assembly and deployment of FOWTs.

Public Authorities

- **Increase national independence**: Public authorities benefit from economic revitalization in regions with decommissioned shipyards and ports. The development of a local FOWT supply chain aligns with national renewable energy and sustainability goals, reduces reliance on imports, and supports Greece's energy transition.
- **Increased competitiveness**: Localized infrastructure will reduce dependency on imports, lower costs, and position Greek companies as key players in the FOWT value chain.
- **Economic development**: Infrastructure revitalization and upgrade will stimulate regional economic growth and support the transition to a green economy.
- **Strengthened policy implementation**: Accelerated infrastructure revitalization and upgrade will align with national and EU renewable energy targets, showcasing Greece's commitment to clean energy initiatives.

Civil Society

- **Local job creation**: The revitalization of ports and shipyards will generate employment opportunities in both construction and operational phases.

Green Innovation (Investors)

- **Reduced project risks**: Improved infrastructure mitigates logistical challenges and uncertainties, making FOWT projects more viable and attractive for investment.
- **Higher return potential**: Accelerated infrastructure readiness can shorten project timelines, leading to earlier returns on investments in FOWT projects.

4 CONCLUSIONS – NEXT STEPS

This document consolidates key recommendations from the MARINEWIND project, reflecting the project's findings and practical lessons learned at both European and country-specific levels. Together, these recommendations aim to support policymakers, industry actors, and other relevant stakeholders in addressing barriers and unlocking the potential of FOWT across Europe.

Many of the recommendations developed across the five national MARINEWIND Labs reflect a shared understanding of critical needs, particularly regarding the promotion of social acceptance, the reinforcement of environmental assessment, and the streamlining of permitting procedures. This alignment demonstrates that, despite national differences, there is a strong case for coordinated actions and policy harmonisation across Europe. Even in more advanced contexts, such as the UK Lab, where Floating Offshore Wind Farms are already operational, these recommendations remain highly relevant — supporting further scale-up, enhancing community engagement, and ensuring long-term environmental and social sustainability. At the EU level, central recommendations emerging from the project are the need to strengthen the European Floating Offshore Wind supply chain and close knowledge gaps across Member States, ensuring the availability of infrastructure, components, and skilled labour to meet the ambitious deployment targets ahead. The table below outlines the recommendations that are relevant to at least 2 MARINEWIND Labs:

Recommendation	Italy	Spain	Portugal	UK	Greece	EU
Promote technological innovation and infrastructure readiness	X	X	X	X	X	X
Develop a resilient EU-based supply and value chain	X		X	X	X	
Implement inclusive and transparent planning frameworks	X				X	X
Increase social acceptance through community-focused initiatives		X	X		X	
Adopt supportive policy and financial instruments	X		X			
Develop a clear permitting process		X			X	

In summary, some key takeaways that could greatly enhance the FOWTs uptake are:

- **Promote technological innovation and infrastructure readiness**, including advanced grid connection solutions and upgraded port facilities, to support the efficient deployment of FOWTs across Europe.
- **Develop a resilient EU-based supply and value chain** to reduce dependencies on non-EU suppliers, enhance industrial competitiveness, and ensure long-term strategic autonomy in the wind energy sector.

- **Implement inclusive and transparent planning frameworks**, integrating environmental protections, stakeholder engagement, and streamlined permitting processes at both EU and national levels.
- **Increase social acceptance through community-focused initiatives**, such as raising awareness campaigns, compensation mechanisms for affected sectors (e.g. fisheries), and the co-creation of local benefits (e.g. reduced energy bills).
- **Adopt supportive policy and financial instruments**, including non-price auction criteria, long-term investment incentives, and targeted training programs to accelerate market uptake and ensure fair economic growth.
- **Develop a clear permitting process** to promote clarity and reduce excessive duration.

The table highlights that promoting technological innovation and infrastructure readiness has broad relevance across all MARINEWIND Labs and at the EU level as well. This demonstrates that strengthening technological capacity and ensuring the necessary infrastructure are universally recognized priorities for advancing floating offshore wind deployment in Europe. Similarly, developing a resilient EU-based supply and value chain emerges as a widely important measure, relevant to most of the Labs. In contrast, recommendations such as improving permitting processes or fostering social acceptance are more context-specific, reflecting the needs and challenges in national environments. Overall, the table outlines that while some actions require tailored approaches at the national level, others present clear opportunities for coordinated EU-wide strategies to accelerate market uptake.

Moving forward, the MARINEWIND consortium will actively disseminate these recommendations as well as a dedicated Booklet on Recommendations that will be created, translated in the 5 languages of the MARINEWIND Labs, ensuring greater visibility and wider impact. Furthermore, the recommendations presented in this document will directly feed the development of the deliverable D4.3 - **MARINEWIND Action Plan for Public Acceptance** of FOWTs, which aims to raise citizens' awareness and address non-technological barriers to facilitate greater market uptake.

To this end, by putting these recommendations into practice and aligning them with further actions, key stakeholders will be able to advance the sustainable and socially accepted deployment of floating offshore wind in Europe.

5 REFERENCES

1. MARINEWIND (2023). Deliverable D1.1 - Analysis of policy and regulatory barriers and enablers.
2. MARINEWIND (2024). Deliverable D2.1 – Analysis of social and environmental barriers and enablers.
3. MARINEWIND (2024). Deliverable D3.1 - Analysis of financial and market barriers and enablers.
4. MARINEWIND (2024). Deliverable D3.2 - Analysis of technological barriers and enablers.
5. MARINEWIND (2024). Italian Lab 2nd Co-creation Workshop Report.
6. MARINEWIND (2024). Italian Lab 3rd Co-creation Workshop Report.
7. Ministry of Infrastructure and Transport (2024, Ministerial Decree No. 237). Italian Maritime Spatial Planning.
8. Italian Ministry of the Environment and Energy Security (2024). Italian National Integrated Plan for Energy and Climate.
9. Nick Winser ENC Report on Electricity Networks
10. National Electricity System Operator (NESO) Connections Reform Report
11. National Policy Statement for Electricity Networks Infrastructure (EN-5)
12. RenewableUK(2022), UK Floating Wind Taskforce
13. Research and Innovation hubs: Test centres- EMEC, UKFOWTT Plymouth, FLOWIC; IEA Wind(2021) Stakeholder engagement
14. Energy Systems Catapult- Rethinking Electricity Market; Locational Energy Pricing in the GB power market
15. National Grid (2023)- Net Zero Market reform
16. Industry reports on port infrastructure requirements for offshore wind in the UK- RenewableUK, Industrial leadership, ORE Catapult
17. Research papers on grid integration of renewable energy sources in Scotland and Wales- Floating offshore Wind Centre of Excellence
18. Government policy documents on renewable energy infrastructure development in the UK- Gov UK- Offshore Wind champion, Floating Offshore Wind 2050 vision
19. Global Energy Group. “The Port of Nigg Selected as Marshalling, Storage, and Logistics Base for Foundation Structures for Seagreen Offshore Windfarm.” Accessed November 27, 2024. https://gegroup.com/latest/the-port-of-nigg-selected-as-marshalling-storage-and-logistics-base-for-foundation-structures-for-seagreen-offshore-windfarm.
20. Port of Cromarty Firth. “Port of Cromarty Firth: Supporting the Offshore Wind Sector.” Accessed November 27, 2024. https://pocf.co.uk.
21. Able Seaton Port. "Supporting Offshore Wind Operations at Able Seaton Port." Accessed November 27, 2024.
22. The Crown Estate. “Marine Supply Chain Accelerator Fund.” Accessed November 26, 2024. https://www.thecrownestate.co.uk/our-business/marine/supply-chain-accelerator-fund.
23. MARINEWIND (2024). Spain Lab 2nd Co-creation Workshop Report.
24. MARINEWIND (2024). Spain Lab 3rd Co-creation Workshop Report.

25. Diez-Caballero, K., Troiteiro, S., García-Alba, J., Vidal, J. R., González, M., Ametller, S., & Juan, R. (2022). Environmental compatibility of the parc tramuntana offshore wind project in relation to marine ecosystems. Journal of Marine Science and Engineering, 10(7), 898.
26. Pasqualetti, M. J. (2011). Opposing wind energy landscapes: a search for common cause. Annals of the Association of American Geographers, 101(4), 907-917.
27. Pardo, J. C. F., Aune, M., Harman, C., Walday, M., & Skjellum, S. F. (2023). A synthesis review of nature positive approaches and coexistence in the offshore wind industry. ICES Journal of Marine Science, fsad191.
28. Cosgrove, S. (2024, September). Data-Driven Planning for the Co-Existence of Offshore Wind and Nature-Inclusive Designs. In OCEANS 2024-Halifax (pp. 277-281). IEEE.
29. MARINEWIND (2023). Spain Lab 1st Co-creation Workshop Report.
30. National Energy and Climate Plan (NECP2030)
31. MARINEWIND Portuguese Workshop Reports (2023-2024)
32. WindFloat Atlantic Case Studies
33. HEREMA (2023). National Development Plan – Offshore Wind Farms (NDP-ODF)
34. ELETAEN (2024). Business Project Plan. Offshore Wind Farms in Greece – Regulatory Challenges and Prospects
35. Loukogeorgaki, E.; Vagiona, D.G.; Lioliou, A. Incorporating Public Participation in Offshore Wind Farm Siting in Greece. Wind 2022, 2, 1–16. https://www.mdpi.com/2674-032X/2/1/1
36. World Bank Group (2021). Key Factors for Successful Development of Offshore Wind in Emerging Markets
37. Hellenic Wind Energy Association (2024). Status and Challenges for the supply chain for Offshore Wind in Greece
38. WindEUROPE (2021). A 2030 Vision for European Offshore Wind Ports: Trends and Opportunities
39. Alma Economics (2021). Offshore wind energy in Greece: Social and economic impacts
40. Αειχώρος (2022). Παράμετροι χωροταξικού σχεδιασμού και ανάπτυξης για την υπεράκτια αιολική ενέργεια στην Ελλάδα
41. S. Rodrigues, "Trends of offshore wind projects. Renewable and Sustainable Energy Reviews," Energies, vol. 49, no. doi: 10.1016/j.rser.2015.04.092, pp. 1114-1135, 2015
42. WFO (2024) – Floating Offshore Wind Dynamic Cables: Overview of Design and Risks
43. Mario Draghi (2024). The future of European competitiveness – A competitiveness strategy for Europe.
44. European Wind Power Action Plan (2023).
45. White, S., Michaels, S., & King, H. Stage 1-Ready reckoner of visual effects related to turbine size.
46. Maslov, N., Claramunt, C., Wang, T., & Tang, T. (2017). Method to estimate the visual impact of an offshore wind farm. Applied Energy, 204, 1422-1430.

6 ANNEXES

6.1 Annex I

Title	*<XXX>*
Respective WP(s)	*<XXX>*
Respective Deliverable(s)	*<XXX>*
Geography Level of reference	*European level / MARINEWIND Lab* *<Specify the jurisdiction or geographical area to which the recommendation applies, guiding readers to understand its scope. You can illustrate the area using a map from:* https://www.mapchart.net/europe-nuts3.html *>* 
High level Recommendation	*<Identify a broader challenge to be addressed by the specific recommended action(s).>*
Dimension(s)	• *Policy* • *Regulatory* • *Social* • *Environmental* • *Financial* • *Market* • *Technological*
Brief Description	*<Offer a concise summary of the recommendation's core objectives and purpose for quick understanding. >*
Context or Scope of Issue (Identified gap or barrier or best practice coming from specific Lab) (150-300 words)	*<Outline the background or context surrounding the issue addressed by the recommendation, providing essential context for readers. It's a clear and comprehensive description of the issue or problem that regional authorities, policymakers and wind energy actors need to address.>*
Targeted recommendations per stakeholder group	*< Identify the specific groups or stakeholders affected by or involved in the policy, aiding readers in understanding its relevance to different parties>* • *Industry* • *Academia* • *Public Authorities* • *Civil Society*

	• *Green Innovation*
Expected benefits (150-300 words)	*<Outline the anticipated outcomes or effects of implementing the recommendation, helping readers gauge its potential effectiveness.>*
References	*<List the resources or data needed to support the policy's implementation, assisting readers in understanding the information needed for effective execution>*

6.2 Annex II

Mobilisation and Mutual Learning workshop Invitation & Agenda

Stakeholder recommendations for raising citizen's awareness & removing of non-technological barriers on FOWTs

Date 11/12/2024

Time 10:00 – 12:00 CET

TEAMS Link

Workshop Agenda	
Time (CET)	Activities
10:00 – 10:05	Welcome & introduction to MarineWIND project
10:05 – 10:20	Introduction to the Stakeholder Recommendations and presentation of best practices & lessons learned on key barriers & enablers of FOWTs across Europe
10:20 – 11:05	Presentation of country specific stakeholder recommendations on key barriers & enablers of FOWTs (Italy, Spain, Portugal, UK, Greece) ○ Italy – Riccardo Coletta (APRE) ○ Spain – Aldara Martínez Guardado (SENER) ○ Portugal – José Cândido (WAVEC) ○ UK – Paola Zerilli (University of York) & Ines Tunga (ESC) ○ Greece – Leonidas Parodos (Q-PLAN)
11:05 – 11:35	Discussion on the stakeholder recommendations ○ Interactive session through Miro Board
11:35 – 11:50	Prioritisation and sequencing of stakeholder recommendations ○ Voting session through Mentimeter
11:50 – 12:00	Next steps & Closing of the workshop

Brief description of the MarineWIND project

The MARINEWIND project supports investment in and commercialization of Floating Offshore Wind Turbines (FOWT) by both the private sector and public authorities, aligning with the European Commission's goal of climate neutrality by 2050. The project focuses its activities on the market uptake of FOWTs through the identification of key barriers and enablers on policy, regulatory, social, environmental, financial, market and technological dimensions, helping streamline processes and reduce deployment times.

Additional information for the MarineWIND project can be found here.

The MarineWIND Stakeholder Recommendations

The purpose of stakeholder recommendations is to exchange best practices and lessons learned regarding barriers and enablers with respect to policy, regulatory, social, environmental, financial, market and technological dimensions based on insights and findings of the MarineWIND project. These recommendations outline the opportunities to raise citizen's awareness and remove the non-technological barriers for the FOWT access to the market.

Participants/Target Group

Stakeholders from the Labs

- Industry, Academia, Public authorities, Civil society, Green Innovation

MarineWIND partners

During the MML workshop, each participant will:

- Review mainly the targeted recommendations for its stakeholder category and provide input if necessary;
- Add new recommendations through the interactive session (Miro Board);

Prioritize the already identified recommendations through the online voting session (Mentimeter).

6.3 Annex III

Guidelines for the MML workshop

Objective of the MML workshop and expected outcomes

The main goal of this document is to facilitate the MML workshop where national and EU stakeholders from the countries hosting the Labs collaboratively assess and prioritise the initial set of stakeholder recommendations.

The MML workshops' objectives are to:

- Encourage participants to engage in in-depth discussions and valorise the results coming from the Labs through the provided recommendations;
- Facilitate conversations aimed at providing additional best practices and lessons learned gained through their experiences;
- Foster a collaborative environment in which participants cooperate to prioritize the stakeholder recommendations.

The final Recommendations for MarineWIND stakeholders will contribute to the increase in societal acceptance of FOWTs facilities and installations through science-based evidence addressing misperception phenomena from citizens.

Time planning and responsibilities of the MML workshop

The MML workshop is planned to take place between late November and early December 2024. Doodle will follow to identify the best date among the MarineWIND partners.

The duration of the MML workshop will be approximately **2 hours**.

Each Lab is responsible for inviting targeted stakeholders and securing their participation on the day of the MML workshop.

For the presentation of the country specific recommendations **each Lab will be responsible for presenting the recommendations to the participants**. Below you can find who will present the recommendations from each Lab.

Country Lab	Partner	Presenter Name
Italy	APRE	Riccardo Coletta
Spain	SENER	Aldara Martínez Guardado
Portugal	Wavec	José Cândido
UK	UoY & ESC	Paola Zerilli and Ines Tunga
Greece	Q-PLAN	Leonidas Parodos

Workshops' participants

Open issues and key questions to be considered:

- ✓ How many participants should be targeted?
- ✓ Types of participants? Who are going to invite?
- ✓ Invitation process (i.e. when, how, preparatory actions)

Number of participants

According to the Grant Agreement, stakeholders from the Quintuple Helix together with the MarineWIND partners will be participants of the MML online workshop. Please note that since there are 5 stakeholder categories and 5 Labs, there should be limited participants from each category in order to ensure meaningful total participation. Therefore, we foresee 1-2 stakeholders per category per Lab, but **no more than 7 external stakeholders** in total per Lab. This will lead to a total number of approximately **45 participants** (35 stakeholders + 10 partners).

Types of participants

The MML online workshop aims to bring together stakeholders from the Quintuple Helix across the MarineWIND countries hosting a Lab as well as EU representatives. Each Lab will be responsible for securing their stakeholders in order to cover all aspects of the quintuple helix.

Country Lab	Name/Surname	Organisation	Stakeholder category
1			
2			
3			
4			
5			
6			
7			

Each stakeholder will be required to review mainly the targeted recommendations for their stakeholder category and provide input if necessary. All stakeholders will be able to add new recommendations through the interactive session (Miro Board) and finally, will be requested to prioritize the already identified recommendations through the online voting session (Mentimeter).

Invitation process

Setting a deadline for confirmation is important to ensure adequate time for additional invitations to be sent in case of limited participation. The **ideal deadline should be 2 weeks** before the MML workshop. The initial contact and invitations with potential participants should occur before the end of October.

The dedicated MML Workshop Invitation and Agenda file should be sent to the potential participants along with an introductory e-mail.