AQUAWIND

Innovative multi-use prototype combining offshore renewable energy and aquaculture in the Atlantic Basin

WP5 EXPLOITATION

D5.2 Sustainable business exploitation and job plan prospects

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[1] PU= Public, SEN=Sensitive

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EXECUTIVE SUMMARY

This deliverable presents the strategic business framework developed for the AQUAWIND project, an innovative multi-use offshore platform combining floating wind energy and sustainable aquaculture. As part of the project's exploitation and commercialization strategy, the document outlines the value proposition, market potential, and pathways for scaling AQUAWIND within the European blue economy.

The report begins by contextualizing the need for integrated marine solutions, addressing increasing spatial constraints, climate targets, and seafood demand. It then introduces AQUAWIND's multi-use approach, which maximizes offshore space efficiency while creating synergies between two high-growth sectors: renewable energy and aquaculture.

A comprehensive target market analysis identifies and evaluates key European regions based on technical, environmental, and economic criteria, with full scoring and country-specific breakdowns included in Annex 3. Complementing this, Section 6 explores competitive positioning by benchmarking AQUAWIND against a set of EU-funded multi-use projects (Annex 2), highlighting lessons learned and strategic differentiators.

At the core of this deliverable is the AQUAWIND Business Model Canvas (Section 8), which provides a structured overview of key partners, activities, resources, customer segments, revenue streams, and cost structure. The canvas is informed by stakeholder input and real market dynamics, with an extended version provided in Annex 4. Recommendations for commercialization include consortium building, blended financing, IP licensing, and alignment with EU taxonomy and policy frameworks.

Overall, this deliverable serves as a foundational tool to guide AQUAWIND's transition from demonstration to market, offering a clear roadmap to attract investors, secure regulatory support, and contribute meaningfully to Europe's sustainable blue economy.

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1. INTRODUCTION

The AquaWind project (Innovative multi-use prototype combining offshore renewable energy and aquaculture in the Atlantic Basin) is a co-financed project by the European Climate, Infrastructure and Environment Executive Agency (CINEA) under the European Maritime, Fisheries, and Aquaculture Fund (EMFAF). The project is being carried out by a multidisciplinary consortium that includes R&D centers, companies, a regional authority, and a maritime cluster from three EU member states (FR, ES, PT) in the Atlantic basin.

The consortium members are: the Government of the Canary Islands through the Canary Islands Agency for Research, Innovation, and Information Society (ACIIS, coordinator); the Oceanic Platform of the Canary Islands (PLOCAN, testbed); the University of Las Palmas de Gran Canaria (ULPGC); the Canary Islands Science Park Foundation (FCPCT); Consulta Europa; the Canary Islands Maritime Cluster (CMC); EnerOcean S.L; Innosea S.A; WavEC; and Canexmar S.L.

The objective of AquaWind is to carry out a demonstration test of a multi-use (MU) solution that combines an adapted offshore aquaculture cage integrated into a floating wind turbine prototype (W2Power). This involves the structural, economic, environmental, and biological validation through different tests and research campaigns, including three short fattening trials (3-4 months duration) with live specimens of gilthead seabream (*Sparus aurata*) and secondly greater amberjack (*Seriola Dumerili*) as an alternative species. The cultivation will take place in a remotely operated cultivation cage prototype integrated into the floating wind energy prototype, which has already been tested previously at the PLOCAN testbed, albeit without the structural coupling of the designed cage prototype and the inclusion of live fish specimens (Figure 1).

Fig 1 - Schematic view of the join unit W2Power prototype

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2. METHOLOGY

2.1. MARKET ANALYSIS MATRIX

The market analysis matrix allows to spotlight the main markets from the key market components from regulations to social impact. This method allows to compare markets and identify the drawbacks and strengths of the selected potential markets.

2.2. BUSINESS MODEL CANVAS

The development of the AQUAWIND Business Model Canvas followed a structured, participatory, and research-based methodology designed to capture the full potential of a multi-use offshore platform. The process began with a contextual analysis of market needs, regulatory frameworks, and technological capabilities within the blue economy.

Key stakeholders—including technical experts, industry partners, and policy advisors—were engaged to co-design the model through workshops, interviews, and feedback sessions. The of Business Model Canvas was completed integrating cross-sectoral insights from both offshore wind and aquaculture sectors. Emphasis was placed on aligning the business logic with sustainability goals, investment readiness, and scalability potential.

The resulting canvas reflects a comprehensive and validated structure for value creation, delivery, and capture in multi-use marine infrastructures. A summarized version is included in Section 8, while the detailed canvas is available in Annex 4.

2.3. COMMERCIALIZATION STRATEGY

The Commercialization Strategy was developed to provide a clear roadmap from demonstration to market deployment. It is structured around the following key components:

- **Product Positioning:** Market and regulatory analysis defined AQUAWIND’s value proposition as a dual-use offshore platform.
- **Go-to-Market Strategy:** A phased approach (prototype, pre-commercial, small-scale, large-scale) ensures scalability, cost reduction, and risk management.
    - Operational Implementation and Value Chain map technical steps, supply chains, and bottlenecks.

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    - Quadruple Helix engagement structured co-creation with industry, policymakers, research, and society, supported by tailored strategies, partnerships, and communication frameworks.
- **Stakeholder Analysis:** Stakeholders were mapped using a Mendelow matrix to align engagement with power and interest levels.
- **Budget & Financial Projections:** Financial models combined techno-economic results with assumptions on royalties, licensing, and services to project revenues and payback across scales.
- **Risk Assessment & Mitigation:** A structured risk matrix identified key threats with mitigation strategies linked to each commercialization phase.

2.4. TECHNO-ECONOMIC ASSESSMENT

The techno-economic assessment studies perform an AQUAWIND's financial viability, leveraging the financial data output by the project. Its purpose is to assess the fiscal performance and ascertain its feasibility. This serves as a mean to study the stability and profitability, substantiating whether it justifies a monetary investment.

It is essential to highlight that, for demonstrators that are still in the research phase and have not yet transitioned to commercialization, the financial analysis endeavours to delineate the circumstances under which the business model could achieve financial feasibility.

2.5. EXPLOITATION STRATEGY

The methodology applied in the Exploitation Strategy considers the approach to identify and assess the exploitable outcomes of the AQUAWIND project, gathering detailed information on potential exploitables. This was followed by a classification of results according to their exploitation potential (commercial, scientific, regulatory, or societal) and alignment with the project's innovation goals.

Consultations were held with project partners to validate and refine the identified outcomes, assess intellectual property rights (IPR) implications, and explore synergies across work packages.

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3. MARKET RESEARCH

Considering a complete market analysis, a global market analysis must be prepared to identify the potential of floating offshore wind and aquaculture. This will forward to spotlight the different niche markets to implement AQUAWIND product and the value propositions after the pilot stage.

3.1. GLOBAL OFFSHORE WIND MARKET ANALYSIS

The global offshore wind sector has experienced dynamic shifts in recent years, reflecting both policy transitions and technological advancements. In 2022, new installations totalled 8.8 GW, a 58% decline from the record 21.1 GW in 2021, largely due to China's policy-driven surge ending with the cessation of national feed-in tariffs (FiTs). This brought the cumulative global capacity to 64.3 GW by year-end 2022 (*Global Wind Report-2023*, n.d.). However, 2023 marked a robust recovery with an estimated 18 GW installed globally, driven by sustained growth in key markets and a rebound from China's normalization. By mid-2024, Europe alone added 1.1 GW ((WindEurope Market Intelligence, 2023)), with projections suggesting a global total of 25-28 GW for the full year, factoring in seasonal accelerations.

CHINA

China solidified its position as the global leader, commissioning over 5 GW in 2022 despite the Feed-in-Tariff (FiT) phase-out on January 1, 2022, transitioning to a grid parity model. Regional subsidies in provinces like Guangdong, Jiangsu, and Shandong supported this resilience, pushing cumulative capacity past 30 GW—surpassing Europe's three-decade milestone in just over a decade. In 2023, installations likely reached 6-7 GW, with 2024 expected to maintain this pace, driven by large-scale projects and turbine sizes exceeding 10 MW ((*Global Wind Report-2023*, n.d.). China's dominance reflects its aggressive decarbonization goals and mature supply chain.

EUROPE

In 2022, Europe added 2.5 GW in 2022 across six countries, reinforcing its leadership in technological innovation and floating wind development. By H1 2024, 1.1 GW of offshore wind was connected (Windeurope.Org Windeurope.Org WindEurope Market Intelligence, 2023), with a revised full-year forecast of 3-4 GW due to delays (e.g., UK's Dogger Bank A). Cumulative capacity reached 35 GW by mid-2024 (278 GW total wind, 243 GW onshore). Key markets include:

UNITED KINGDOM

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In 2022, the UK completed Hornsea 2 (924 MW of 1.4 GW), the world's largest operational offshore wind farm, and added 255 MW at Seagreen (1.1 GW). H1 2024 saw only 38 MW connected due to construction delays, but 1.5 GW is anticipated by year-end, supported by 4.9 GW awarded in AR6 (including 400 MW floating). Cumulative capacity nears 15 GW.

FRANCE

France entered the commercial offshore market with Saint-Nazaire (480 MW) in 2022. In H1 2024, it led Europe with 633 MW (Saint-Brieuc: 360 MW; Fécamp: 273 MW), targeting 688 MW for 2024, including floating demonstrators (e.g., Provence Grand Large, 25 MW). Floating wind gained traction with the 250 MW A05 Brittany award.

GERMANY

Added 342 MW in 2022 and 386 MW in H1 2024 (Baltic Eagle: 191 MW; Gode Wind 3: 195 MW), with a 2024 goal of 1.67 GW. Cumulative offshore capacity hit 8.85 GW by mid-2024.

ITALY

Launched its first commercial project, Beleolico (30 MW), in 2022 with Chinese Mingyang turbines—the Mediterranean's first offshore wind farm.

NORWAY

Partially commissioned Hywind Tampen (60.2 MW of 94.6 MW) in 2022, delayed by supply chain issues. Full operation is expected in 2025, bolstering floating wind leadership.

3.1.1. ASIA PACIFIC

TAIWAN

Installed 1,175 MW in 2022, falling short of a 2,016 MW target due to COVID-19 and typhoon disruptions. Growth continued in 2023-2024 with ~1 GW annually, supported by 3 GW awarded in 2022 auctions.

JAPAN

Commissioned 84 MW at Noshiro Port in 2022 (Akita Noshiro's full 140 MW delayed). Progress remains slow, with 2024 adding ~100 MW, constrained by permitting and deep-water challenges.

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VIETNAM

No commercial intertidal projects in 2022, though >300 MW missed 2021 deadlines due to PPA delays. Regulatory clarity in 2023 spurred ~200 MW in 2024, mostly intertidal.

3.1.2. UNITED STATES OF AMERICA

In the Americas, no new capacity in 2022, but 2023 saw Vineyard Wind (800 MW) begin partial operation, with 1-1.5 GW expected in 2024. Leasing auctions (e.g., California's 3 GW) signal a 15 GW pipeline by 2027.

3.1.3. OFFSHORE WIND CUMMULATIVE INSTALLATIONS

In terms of offshore wind cumulative installations, China's ascent to the leading position occurred in 2021 when it surpassed the United Kingdom. The trend of market dominance continued for China in 2022, as it solidified its market share. Following China in this rank are Germany, the Netherlands, and Denmark, which complete the roster of the top five offshore wind markets globally.

Aside from China, where an impressive 19.7 GW of offshore wind projects were approved under the 'grid-parity' mechanism, the year 2022 witnessed the allocation of 12.5 GW of offshore wind capacity through auction processes worldwide(*Global Wind Report-2023*, n.d.). Of this total, Europe accounted for 9.5 GW, and Taiwan secured 3 GW. Within Europe, the United Kingdom led the way by awarding the most offshore wind capacity (7 GW) through the Contracts for Difference (CfD) Allocation Round 4. Following suit were the Netherlands (1.5 GW) and Germany (980 MW). Notably, Europe's most recent offshore wind auctions, the 'subsidy-free' tenders in the Netherlands (each for 760 MW), employed non-price criteria to select winners.

In contrast, the United States did not allocate any offshore wind project capacity in the same year. However, a collective capacity of over 13 GW was allocated through lease sales in regions including the New York Bight, Carolina Long Bay, and California. Notably, the California auction marked the first offshore wind lease sale on the US Pacific Coast. This event was not only pioneering in supporting commercial-scale floating wind development but also symbolic of the burgeoning interest in offshore wind across the diverse American regions.

In the year 2022, the global wind market, encompassing both onshore and offshore installations, encountered a decline in all regions except Europe. This downturn resulted in a year-over-year decrease of 17.1% (*Global Wind Report-2023*, n.d.).

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In 2022 offshore wind saw a substantial decrease of 58% (12.3 GW) in new offshore wind installations compared to 2021. This decrease was predominantly attributed to the normalization of annual growth rates following the conclusion of China's policy-driven installation rush. The surge in installations driven by policy measures in China concluded, leading to a return to more typical growth rates for offshore wind installations globally.

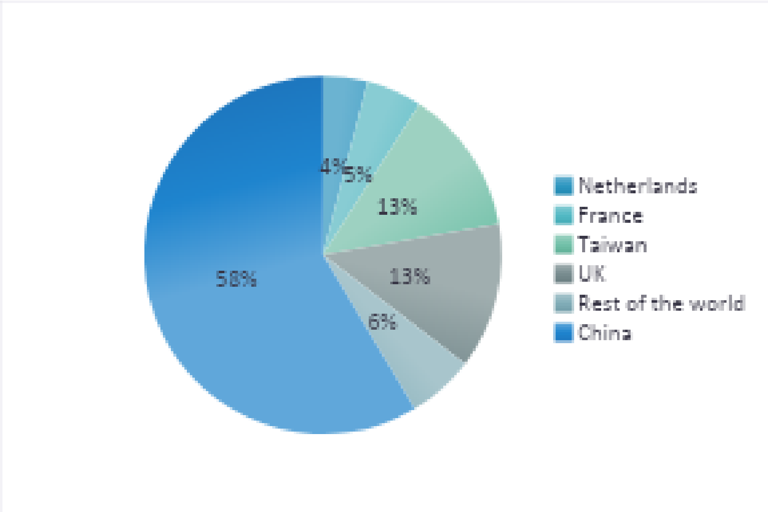

Fig 2 - NEW OFFSHORE INSTALLATIONS (2022)

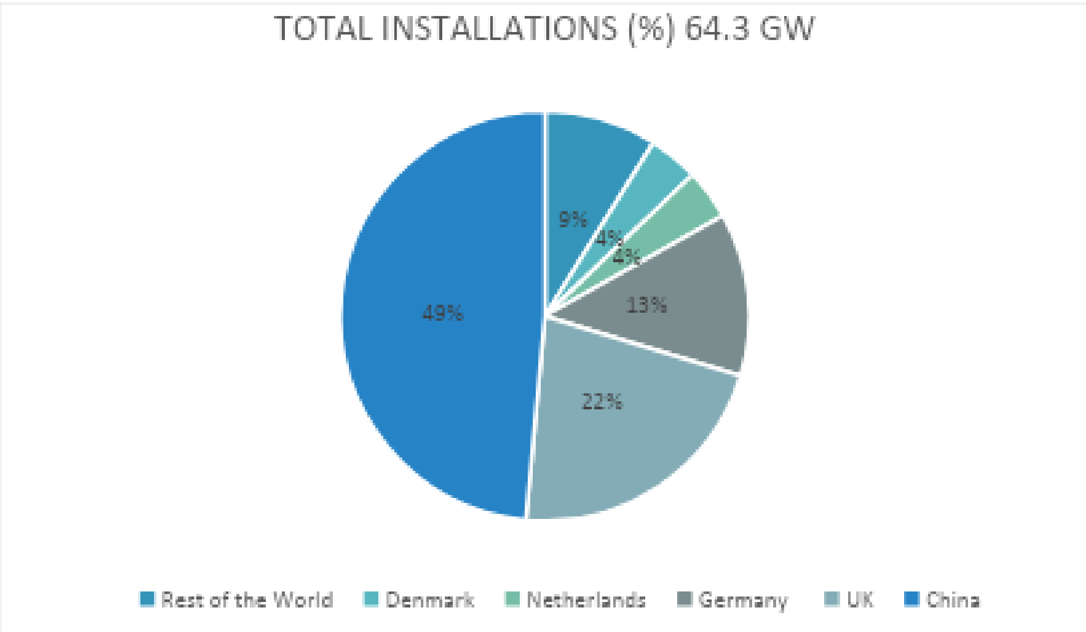

Fig 3 - TOTAL OFFSHORE INSTALLATIONS (2022)

3.2. GLOBAL AQUACULTURE MARKET

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The global aquaculture industry has solidified its role as a critical pillar of food security and economic development, experiencing remarkable growth driven by escalating seafood demand, diminishing wild fish stocks, and advancements in farming technologies. According to the Food and Agriculture Organization's (FAO) ("The State of World Fisheries and Aquaculture 2024," 2024)), global aquaculture production reached an unprecedented 130.9 million tonnes (MT) in 2022, including 94.4 MT of aquatic animals—surpassing capture fisheries (90.8 MT) for the first time as the primary source of aquatic animal production. Total fisheries and aquaculture production hit a record 223.2 MT in 2022, up 4.4% from 2020, reflecting a robust growth trajectory [FAO, 2024].

These valuations reflect growing consumer demand for seafood—rich in protein, omega-3 fatty acids, and micronutrients—coupled with innovations like recirculating aquaculture systems (RAS) and AI-driven monitoring tools (e.g., Innovasea's 'Realfish Pro', launched October 2022). Global per capita consumption of aquatic foods rose from 9.1 kg in 1961 to 20.7 kg in 2022, nearly doubling the population growth rate, with 89% of 2022's aquatic animal production (162.5 MT) used for human consumption [FAO, 2024].

Over 600 aquatic species are farmed globally, showcasing significant genetic diversity. In 2022, top producers included silver carp (*Hypophthalmichthys molitrix*, ~5.3 MT, +30% annual growth), wakame algae (*Undaria pinnatifida,* 5.2 MT, +5.2%), and Eucheuma (4.6 MT, +32.5%) [FAO, 2024 estimates from earlier trends]. Finfish like carp, tilapia, and salmon dominate, with molluscs (e.g., mussels, oysters) and crustaceans (e.g., shrimp) also significant. China leads with 52.88 MT of aquatic animals in 2022, followed by India (10.23 MT), Indonesia, Vietnam, and Bangladesh, collectively accounting for over 89.8% of global aquaculture output (FAO, 2024c). High-value species such as gilthead seabream (*Sparus aurata*) and greater amberjack (*Seriola dumerili*).

3.2.1. EUROPEAN AQUACULTURE MARKET

During 2011 the EU produced 1.26M T from aquaculture products being a 0.3% decrease where the production has a 12.7% accumulated fall since 1999.

On the other hand, aquaculture production had a primary sale value of 3,854M€, with a 13.3% increase from 2010. However, there is an unequal impact in every EU country, its economic and social relevance overtakes fishing, as it happens in some Spanish communities. The total combined production of aquaculture and fishing with it all time high in 10.6M T in 1988, since then it has a 40.2% fall. The EU forecast have not

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compensated extractive fishing market reduction. Spain is the country with biggest aquaculture production with 271,096T in 2011 (21.5% total EU), second France with 226,020T (17.8%) and third United Kingdom with 177,155T (14%). However, considering the production value UK leads this head with 789.9M € followed by France with 738.1M € and Greece with 576.2M €.

Mussels are the main specie produced in the EU 355,555T, followed by the rainbow trout 176,983T and the Atlantic salmon 171,983T. In 2011 EU produced 625.586T of mussels with a value of 1,300,000 € representing 8.6% globally, being Spain, followed by France, Italy, Germany and Greece, representing more than 85% of the total EU mussel production. Table 1 shows the main EU species produced by the EU. The gilthead seabream occupies the fifth position, with an annual production of 98,840 tonnes, while Commercial farming of the greater amberjack in the EU is currently limited, with Greece and Spain being the primary producers, though their combined production is still under 100 tonnes (Šegvić-Bubić et al., 2022)

Table 1 - Main species produced by aquaculture in Europe

Specie	Scientific name	Tonnes (T)
Mussel	*Mytilus edulis galloprovinciais*	355,555
Rainbow trout	*Onchorynchs mykiss*	176,983
Atlantic Salmon	*Salmo salar*	171,034
Japanese Oyster	*Crassostrea gigas*	104,403
Gilthead seabream	*Sparus aurata*	98,840
Sea bass	*Dicentrarchus labrax*	73,196
Carp	*Cyprinus carpio*	61,860
Japanese clam	*Ruditapes philippinarum*	37,519
Turbot	*Psetta maxima*	11,138
Eel	*Aguila Anguilla*	6,711

For further information, **Annex 1** shows Spanish, North and South America market analysis.

3.2.2. MARKETS TRENDS AND DRIVERS

Aquaculture's growth is propelled by declining wild stocks (e.g., overfishing), and health awareness, with seafood consumption rising 3.1% annually over the past decade

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(FAO, 2024c). Innovations, genetic improvements, and offshore systems enhance efficiency and sustainability. The FAO notes aquaculture now provides over 50% of global seafood, a share expected to grow.

3.3. GLOBAL OFFSHORE WIND AND AQUACULTURE MARKET

Currently, the concept for offshore combined technologies is recent, and no commercial projects have been deployed. However, Research and Development (R&D) projects have been developed such as UNITED, H2Ocean, MARIBE, ULTFARMS, TROPOS, FIBERGY and ORPHEO+.

Hereby, offshore wind farms and aquaculture are included as part of the action plans. Despite numerous research endeavours, the practical implementation of pilots within real-world environments remains notably limited. Most of these initiatives have predominantly focused on operational settings in Belgium, the Netherlands, Germany, and the UK, primarily centred around the North Sea region. In the Baltic region, projects have predominantly gravitated towards the cultivation of mussels or seaweed due to prevailing constraints on fish aquaculture. However, the concept of multi-use holds significant promise for potential applications in new offshore wind farm (OWF) developments within the Mediterranean region, particularly in countries like France.

Furthermore, it’s noteworthy that heightened enthusiasm and interest surround multi-use scenarios connected to offshore aquaculture, particularly emanating from substantial industrial players in Norway. These interests extend beyond just OWF scenarios and encompass synergies with the Oil & Gas sector as well.

OTHER MULTIUSE PROJECTS

A comprehensive analysis of relevant multi-use offshore platform projects has been conducted to provide context, lessons learned, and benchmarking for the AQUAWIND co-location concept. These reference projects span across several EU-funded and international initiatives focused on co-locating activities such as renewable energy generation, aquaculture, maritime transport, and biotechnology within marine environments.

These projects offer valuable insights into technical, regulatory, and economic barriers and opportunities for deploying multi-use solutions at sea. They also highlight diverse design approaches, from modular floating platforms to fixed co-use infrastructure, as well as innovative concepts such as hydrogen storage, integrated logistics, and aquaculture enhancements.

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Table 2 Sister multiuse projects

Project	Focus Area	Notable Contributions
ORPHEO+	Test control system strategies of the W2Power combined with aquaculture	Validation achieved for the integration of aquaculture cages with a floating offshore with platform.
H2OCEAN	Wind/wave energy with hydrogen storage and multi-trophic aquaculture	Addressing grid imbalance via offshore hydrogen production
MARIBE	Synergies across Blue Growth sectors	Sectoral combinations and investment matchmaking
UNITED	Demonstration of multi-use pilots in EU waters	Business models and upscaling roadmap for co-location
ULTFARMS	Integration of Low-Trophic Aquaculture in Offshore Wind Farms	Technological and biological innovation in offshore aquaculture
FIBERGY	Advanced composite materials (FRP) for offshore renewable energy platforms	Development and validation of innovative FRP materials, design guidelines, and production methods for next-generation floating wind and tidal platforms (W2Power and Tidetec).
TROPOS	Floating modular multi-use platforms for deep waters	Conceptual design of modular platforms integrating energy, aquaculture, transport, and leisure services, with environmental and economic feasibility assessment.

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Each of these projects is described in detail in **Annex 2**, where readers can find extensive background on objectives, results, implementation strategies, and how these findings inform AQUAWIND's design and strategy.

The collective learnings from these projects underpin the technical feasibility, commercial viability, and long-term sustainability of the AQUAWIND approach. They also validate the potential for cost synergies and environmental performance improvements when implementing ocean multi-use systems across Europe and beyond.

4. MARKET FORECAST

4.1.1. GLOBAL OFFSHORE WIND MARKET FORECAST

Looking ahead to the global offshore wind outlook, the year 2022's 58% decline in annual installations is anticipated to give way to a strong rebound, with projected installations reaching a notable 18 GW in 2023. This resurgence is underpinned by a compelling Compound Annual Growth Rate (CAGR) of 32% projected for offshore wind over the next five years. Such a promising growth trajectory suggests that the sector's new installations are poised to double by 2027 from the levels anticipated in 2023.

China and Europe are set to play pivotal roles as the main drivers of near-term growth in offshore wind installations. These two regions are expected to contribute to over 80% of new additions in 2023 and 2024, solidifying their positions as leaders in the sector. The United States and emerging markets within the Asia-Pacific (APAC) region are projected to gradually gain substantial market share starting from 2025. This growth trajectory envisions the addition of 7-8 GW of new offshore wind capacity annually over the remaining forecast period.

In totality, a remarkable 130 GW of offshore wind capacity is forecasted to be added globally from 2023 to 2027 (Global Wind Report-2023). This period anticipates an impressive average annual installation rate of nearly 26 GW. These predictions underscore the significant growth potential and momentum of the offshore wind sector in the coming years.

The global offshore wind sector is poised for substantial growth, projected to expand from 8.8 GW in 2022 to a substantial 35.5 GW by 2027. This trajectory translates to a notable increase in its share of total global installations, ascending from its present 11% to an anticipated 23% by 2027.

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Within Asia, China is expected to remain the foremost contributor to offshore wind growth, with a staggering 64 GW projected to be added over the upcoming five years. Following China's lead are other key players in the region: Taiwan, set to contribute 6.9 GW; South Korea, contributing 2.3 GW; Vietnam, with 2.2 GW (largely intertidal projects); and Japan, expected to contribute 0.9 GW.

In Europe, a significant surge is foreseen in offshore wind capacity, with more than 37 GW expected to be installed between 2023 and 2027(WindEurope, 2024). Within this span, the United Kingdom is projected to lead the charge with a contribution of 41% of the total, primarily driven by the commissioning of projects from the Contracts for Difference (CfD) Allocation Rounds 3 and 4. Germany is set to contribute 16%, followed by the Netherlands with 9%, Poland at 8%, France with 8%, and Denmark contributing 6%.

The United States, with its first utility-scale offshore wind project expected to achieve partial connection in 2023, is anticipated to commission a substantial 15 GW of offshore wind capacity in the next five years. This projection positions the US as the second-largest offshore wind market after China and the UK, considering new additions. This projection is grounded in the assumption that the necessary supply chain will be established in time to cater to the surging growth along the East Coast of the United States

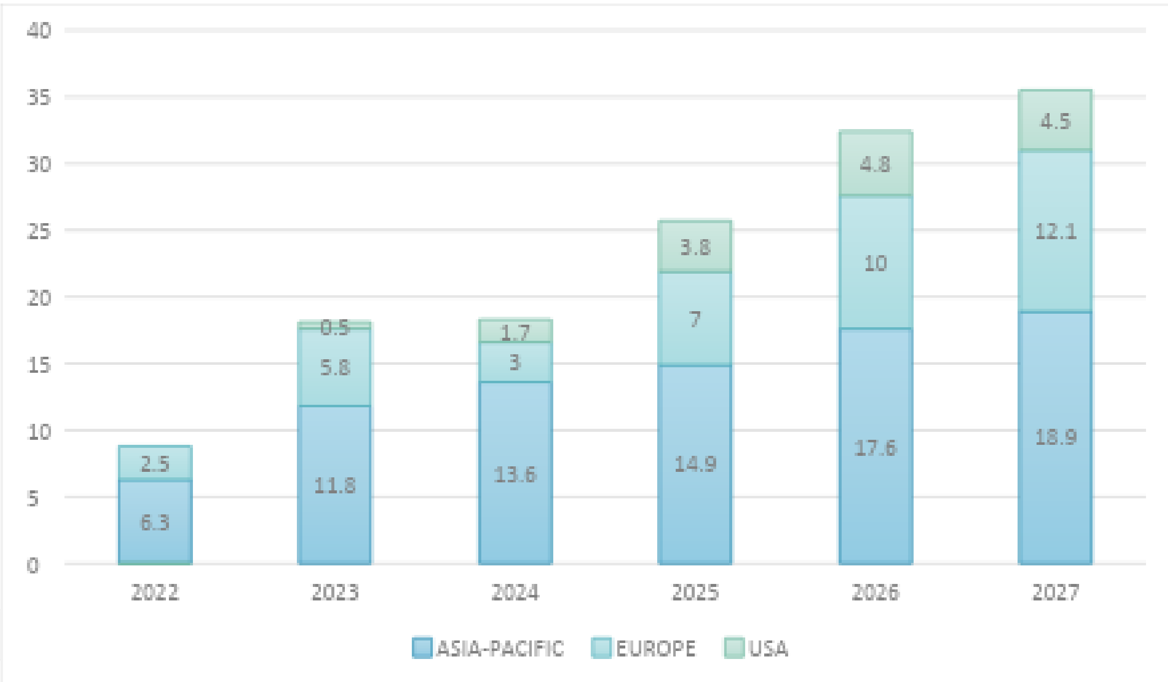

Fig 4 - OFFSHORE WIND MARKET PROJECTIONS GW

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Key Markets for Offshore Wind Deployment (2022-2032)

- China: Expected to add a remarkable 64 GW of offshore wind capacity in the next five years.
- Taiwan: Projected to contribute 6.9 GW of new offshore wind capacity from 2023 to 2032.
- South Korea: Anticipated to add 2.3 GW of offshore wind capacity during the same period.
- Vietnam: Expected to contribute 2.2 GW, primarily focusing on intertidal projects.
- Japan: Projected to commission 0.9 GW of offshore wind capacity between 2023 and 2032.
- United Kingdom: Set to install more than 37 GW of offshore wind capacity in the period 2023-2032, driven by various projects.
- Germany: Projected to contribute 16% of the total European offshore wind capacity additions in the same period.
- Netherlands: Expected to contribute 9% of the total European offshore wind capacity additions.
- Poland: Set to add 8% of the total European offshore wind capacity between 2023 and 2032.
- France: Projected to contribute 8% of the European offshore wind capacity additions during the same period.
- Denmark: Expected to contribute 6% of the total European offshore wind capacity additions.
- United States: Anticipated to commission 15 GW of offshore wind capacity from 2023 to 2032, making it a significant market after China and the UK.
- Emerging APAC Markets: Other emerging markets in the Asia-Pacific region are expected to gain sizeable market share, with 7-8 GW of new offshore wind capacity projected to be added annually over the forecast period.

4.1.2. AQUACULTURE MARKET FORECAST

The global aquaculture sector continues on a robust upward trajectory, having reached a **record production of 130.9 million tonnes** of aquatic animals in 2022, marking an increase of approximately 8.1 million tonnes compared to 2020

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(FAO, 2024a). This milestone represents the first time that aquaculture production (**130.9 Mt**) has surpassed capture fisheries as the dominant source of aquatic animal output (FAO, 2024a)

The **first-sale value** of global aquaculture in 2022 is estimated at **USD 296 billion**, matching its status as the leading contributor to total fisheries and aquaculture revenue (FAO, 2024a).

The FAO projects further increase in the sector through 2032, with **aquatic animal production expected to reach around 205 million tonnes**—a 10% growth over 2022 (FAO, 2024a). This increase is expected to elevate **per capita consumption** globally from **20.7 kg** in 2022 to an average of **21.3 kg** by 2032 (FAO, 2024a).

Table 3 Aquaculture Market Forecast 2022 - 2032

Metric	2022 Value	2032 Projection
Aquaculture Production (tonnes)	130.9 million tonnes	~205 million tonnes (↑10%)
Per Capita Consumption	20.7 kg/year	21.3 kg/year (↑)
First-Sale Value	~USD 296 billion	(Not explicitly projected)

Key Drivers and Implications

- **Surpassing capture fisheries**: Aquaculture's pre-eminence underscores its growing importance for global food security, especially in the context of sustainable seafood supply (FAO, 2024a).
- **Strong economic value**: The sector's substantial revenue (USD 296 billion) highlights its role as a major contributor to the Blue Economy.
- **Consumption trends**: The rise in individual consumption (20.7 → 21.3 kg) reflects shifting dietary preferences and could support AQUAWIND's positioning within sustainable seafood markets.
- **Regional dynamics & potential**: Although not detailed in this paragraph, SOFIA 2024 also emphasizes dominance by Asian aquaculture producers and

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highlights the need for increased capacity in regions like Africa and Latin America to meet nutritional and economic needs.

5. TARGET MARKET ANALYSIS

This section presents a comparative market analysis to evaluate the suitability of different geographies for the potential deployment and scale-up of the AquaWind multi-use concept, combining floating offshore wind (FOW) and aquaculture.

The analysis focuses on 11 countries/regions, including core EU and international markets. It assesses each based on six critical dimensions: (1) Regulations, (2) Financial Incentives, (3) Infrastructure & Logistics, (4) Conflicts of Use, (5) Environmental limitations, and (6) Public Perception. Each dimension is rated from 1 (low favourability) to 5 (high favourability), providing a quick visual summary of the readiness and attractiveness of each market for AquaWind's post-pilot deployment and commercialization.

Definitions of Evaluation Dimensions

1. Regulations

This dimension assesses the clarity, stability, and favorability of national and regional legal frameworks governing offshore renewable energy and aquaculture. It considers permitting complexity, alignment with EU directives, and the existence (or lack) of specific provisions enabling multi-use platforms.

2. Financial Incentives

This dimension evaluates the availability and strength of public and private financial mechanisms supporting offshore renewables and aquaculture. It includes grants, subsidies, green loans, tax incentives, feed-in tariffs, and access to EU or national funding instruments that can de-risk investment in multi-use infrastructure.

3. Infrastructure & Logistics

This dimension measures the readiness and adequacy of port facilities, shipyards, transport connections, grid infrastructure, and supply chains required for deploying and maintaining floating offshore wind and aquaculture systems. It also accounts for the existence of skilled labor and local industrial capacity.

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4. Conflicts of Use

This dimension assesses potential competition with other maritime and coastal activities, such as shipping lanes, fishing grounds, naval areas, tourism, and marine protected zones. Lower scores indicate higher risks of space-use conflicts, while higher scores suggest more compatibility with multi-use deployment.

5. Environmental Limitations

This dimension considers the physical and ecological conditions that may constrain project deployment, including water depth, seabed type, biodiversity sensitivity, extreme weather events, and compliance with marine spatial planning or Natura 2000 areas. Favorable scores reflect conditions that minimize risks and ease environmental permitting.

6. Public Perception

This dimension evaluates societal acceptance of offshore renewable energy and aquaculture. It includes local community attitudes, stakeholder engagement outcomes, media narratives, and the presence (or absence) of organized opposition. A higher score reflects stronger public support and a smoother pathway to social license to operate.

Table 4 Target Analysis Matrix

	Regulations	Financial incentives	Infrastructure & Logistics	Conflicts of Use	Environmental Limitations	Public perception
Spain (mainland)	4	3	4	3	3	3
Canary Islands	4	4	3	3	4	3
Portugal	3	3	3	3	3	3
Portugal (Madeira & Azores)	3	4	2	4	4	3
France	4	3	3	3	3	3
UK	5	4	4	3	2	2

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Ireland	3	2	2	3	3	2
Netherlands	4	2	4	2	2	2
Japan	4	3	3	3	3	3
Korea	3	3	3	3	3	3
China	5	3	5	3	3	2

Note from the author: The scores are based on the authors criteria by its own research.

Key Findings and Strategic Conclusions

- **Canary Islands and Mainland Spain** emerge as top priority markets for AquaWind, particularly due to their strong regulatory readiness, moderate to high financial incentives, and the availability of marine spatial planning mechanisms. The Canary Islands offer added fiscal advantages (e.g., ZEC tax regime), and the PLOCAN test site significantly enhances deployment feasibility.
- **Portugal (both mainland and outermost regions)** ranks favorably, especially in terms of financial incentives and environmental suitability. However, fragmented permitting and underdeveloped infrastructure in Madeira and Azores slightly reduce its overall score, despite its ultraperipheral advantages.
- France and the United Kingdom are mature offshore wind markets with relatively well-structured regulatory environments. However, multi-use integration remains more complex in practice, and environmental and public perception constraints may require stronger stakeholder engagement.
- The Netherlands and Ireland show supportive policies, but gaps in financial incentives and limited infrastructure readiness present barriers. Nonetheless, the Netherlands demonstrates leadership in multi-use experimentation (e.g., nature-inclusive design), which may be leveraged strategically.
- Asian markets (Japan, South Korea, and China) present long-term opportunities due to their scaling ambitions in offshore wind and technological capacity. However, regulatory maturity for multi-use and public participation frameworks are still evolving. China shows high infrastructure readiness and regulatory clarity but low transparency in public consultation processes.
- Environmental and societal acceptability is an essential component for market entry. While technical and financial factors weigh heavily, regions with elevated biodiversity (e.g., Azores, Canary Islands) or strong public advocacy (e.g.,

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France, Spain) will require comprehensive Environmental Impact Assessments (EIAs) and inclusive outreach strategies.

Overall, this comparative analysis highlights the Canary Islands, mainland Spain, and Portugal as the most promising short-to-medium-term markets for AquaWind's first commercial deployments. These regions present a compelling balance of political support, infrastructure readiness, and acceptable risk levels.

A detailed breakdown of each country, including the full regulatory context, incentive schemes, environmental factors, and references to spatial planning tools, is provided in Annex 3.

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6. OFFSHORE WIND AND AQUACULTURE MARKET SHARE

To allocate a realistic market scenario for the installation of AQUAWIND solution, each platform consists in 2x5MW with an aquaculture production capacity of 300T.

It has been assumed a 5% of the Serviceable Available Market (SAM), whereas it has been estimated per period. It has also been assumed that during 2023 the Total Accessible Market (TAM) share is higher than the upcoming years due to the limited competitors in a commercial state. However, estimates suggest that many different technologies will reach the commercial market.

Table 5 Total Available Market (TAM) (2025-2040)

Period	% of Total Available Market (TAM)
2025	50% *Est
2035	25%
2038	27%
2040	30%

The first step for commercialization, would kick off in Gran Canaria where there is already a national framework for deployment of offshore energies, along with the Strategic energy plans and the energy transition targets. These plans include a first phase of 250MW for offshore wind by 2030 and 1000MW by 2040.

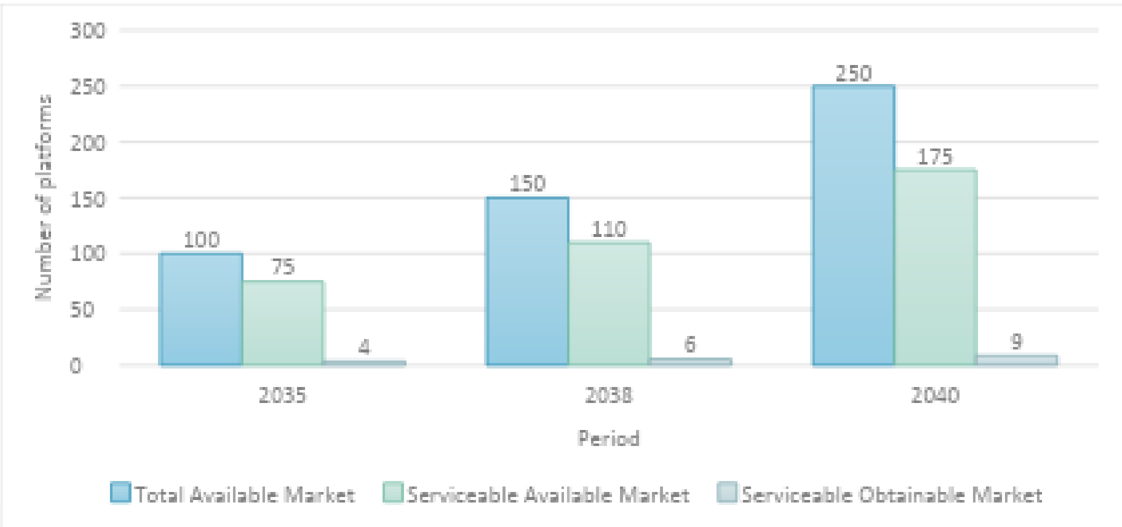

Fig 5 - Floating offshore wind market share (2035-2040)

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Figure 5 shows the evolution of the Total Available Market (TAM), the Serviceable Available Market (SAM), and the Serviceable Obtainable Market (SOM) for floating offshore wind within the AQUAWIND framework, based on an estimated 5% share of SAM. The projections indicate steady growth, with TAM increasing from 100 MW in 2035 to 250 MW in 2040. This reflects the expected expansion of offshore wind capacity in the Canary Islands, supported by national strategic energy plans and regulatory frameworks.

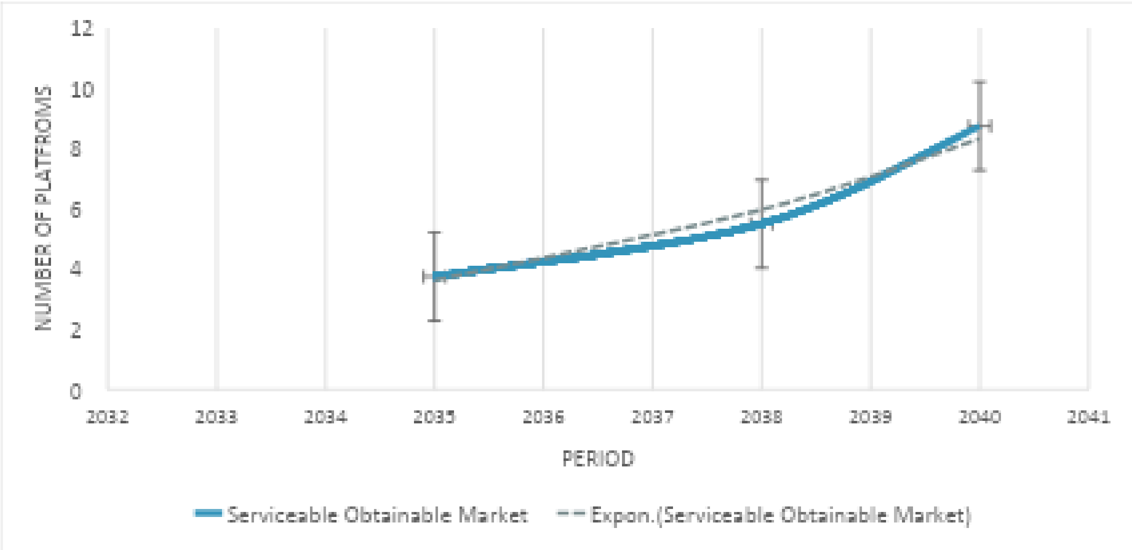

Fig 6 - Floating Offshore Wind SAM

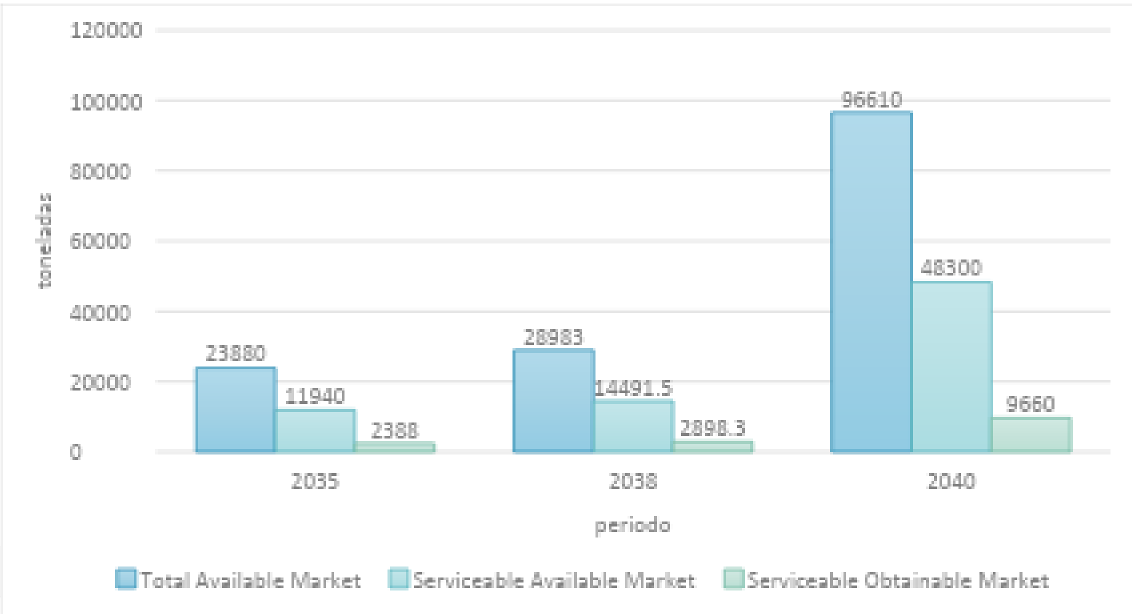

Fig 7 - Aquaculture market share

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Figure 7 shows the potential market values into aquaculture production equivalents expressed in tonnes. The baseline data (TAM = 23,880 T, SAM = 11,940 T, SOM = 2,388 T in 2035) served as the starting point for modeling subsequent years, with projections reaching 28,983 T in 2038 and 96,610 T in 2040. These values stem from mid-term European aquaculture production forecasts, based on FAO (FAO, 2024b) and (EUROMOFA, 2022) statistics, and have been adapted to the Canary Islands context for this scenario.

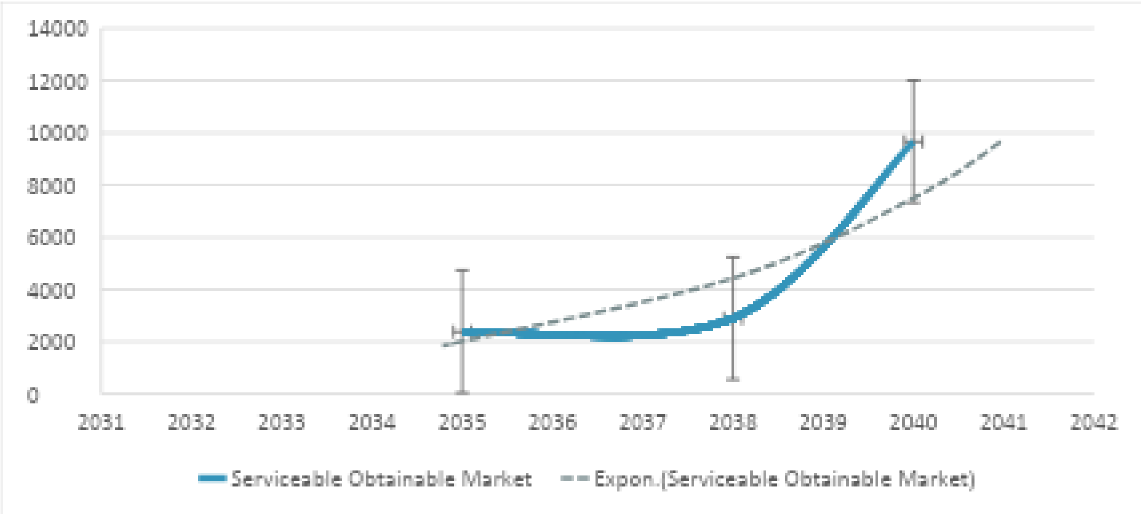

Fig 8 - Aquaculture SAM

6.1. MULTIUSE MARKET SHARE

The multiuse technology has certain limitations as mentioned above, mainly due to the environmental conditions for floating offshore wind and aquaculture, where each of them requires different conditions, limiting the potential areas for their installation.

On the other hand, currently there are limitations regarding permitting. This is a major drawback because in most markets, blue economy legal frameworks are just for single use technologies, establishing individual locations for each technology, whereas multiuse is not included as part of this framework. In this sense, the allocation of an area to one of these technologies often excludes the use of the same area for a different purpose.

However, in this report's market share marine spaces are considered based on the technology which has more condition-based limitations, floating offshore wind. Hereby, the inclusion of aquaculture as a hybrid solution is less limited by meteocean conditions and more by the market needs for fish food streams.

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The market share for multiuse in this report considers the market share for floating offshore wind per period, where 40% of the locations could fulfill the meteocean conditions for both technologies and a 5% of accessible market with no legal limitations. In addition, no competence is considered as there are no commercial projects deployments combining floating offshore and aquaculture, where AQUAWIND solution would be the unique and first out-to-market with this hybrid solution.

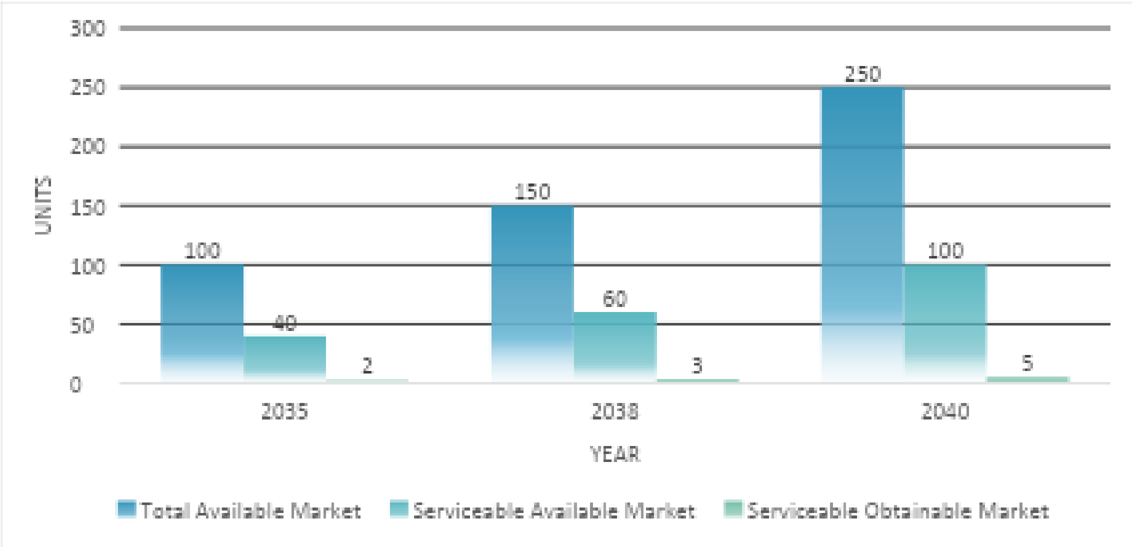

Fig 9 - Multiuse market share 2035-2040

As shown in Figure 9, the Total Available Market (TAM) grows steadily from 100 units in 2035 to 250 units by 2040, in line with floating offshore wind projections. The Serviceable Available Market (SAM) (Figure 10), restricted by environmental compatibility, is estimated at 40 units in 2035, 60 in 2038, and 100 in 2040. From this, the Serviceable Obtainable Market (SOM), which considers only areas without legal barriers, is projected at 2 units in 2035, 3 units in 2038, and 5 units in 2040.

These projections illustrate both the potential and the challenges for multi-use deployment: while technical feasibility is high within compatible sites, regulatory adaptation and streamlined permitting will be decisive in unlocking commercial opportunities.

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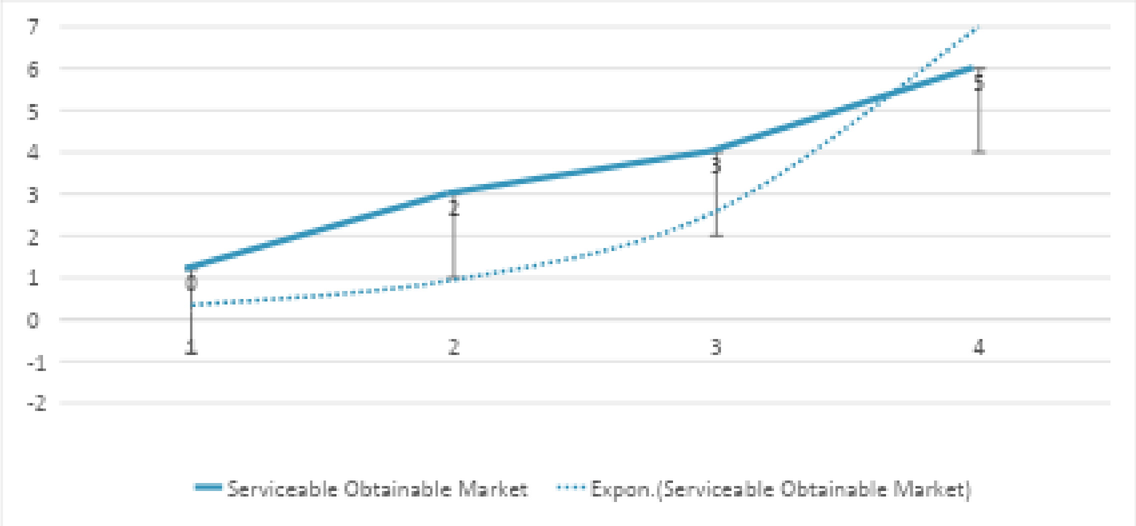

Fig 10 - Serviceable Obtainable Market

7. INVESTMENT COMMUNITY

7.1. MARKET BARRIERS AND OPPORTUNITIES

7.1.1. MARKETS AND TECHNOLOGY

Efficiency: Research and development efforts are focused on improving the efficiency of marine energy devices. This includes optimizing the design of turbines, wave energy converters, and tidal energy systems to extract more energy from the ocean.

On the other hand, reducing fish mortality and feeding devices research and development are key to optimize aquaculture production.

Durability and Reliability: Enhancing the durability and reliability of marine energy technologies is a priority. Devices must withstand the harsh marine environment, including saltwater corrosion and extreme weather conditions.

Regarding aquaculture, improving cages durability with less material waste and degradation are key for a more sustainable and reliable production, improving animal welfare.

Grid Integration: Advancements in grid integration technologies are crucial for effectively incorporating marine energy into existing electrical grids. This includes developing smart grid solutions, energy storage systems, and grid management strategies.

Materials Innovation: Innovations in materials, such as the use of advanced composites and coatings, can extend the lifespan of marine energy devices and reduce maintenance costs.

For cage fabrication the use of advanced materials such as copper, can extend the lifetime of the aquaculture plant and reducing maintenance and environmental impacts.

Environmental Monitoring: Research is ongoing to better understand and minimize the environmental impact of marine energy projects and aquaculture. This includes studying the effects on marine ecosystems and developing mitigation measures.

Scaling Up: As the industry matures, there is a shift toward scaling up multiuse projects. This involves building larger arrays of devices and optimizing project economics through economies of scale.

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Data and Analytics: Data collection and analytics play a crucial role in optimizing energy and fish production. Advanced monitoring systems and data-driven insights can improve performance and reduce operational costs.

GOVERNANCE AND INSTITUTIONS OF MARINE RENEWABLE ENERGY

Governance and institutions play a critical role in shaping the development and regulations of blue economy. Effective governance helps address regulatory challenges, environmental concerns, and ensures the responsible and sustainable growth of the industry.

- **Regulatory Frameworks:** National Regulations: Each country typically has its own regulatory framework for marine renewable energy and aquaculture. These regulations govern aspects such as permitting, environmental impact assessments, safety standards, grid connections, and fish harvest and treatment.
- **International Agreements:** In regions with shared marine resources, international agreements and treaties may be necessary to establish rules for cooperation, resource allocation, and environmental protection.
- **Environmental Impact Assessment:** Environmental Agencies: Environmental agencies are responsible for conducting assessments to evaluate the potential impact of multi- use, including marine ecosystems and wildlife.
- **Mitigation Measures:** Governance frameworks often require developers to implement mitigation measures to minimize the impact of projects, such habitat restoration efforts.
- **Permitting and Licensing:** Permitting Process: Governments typically require developers to obtain permits and licenses before deploying marine energy devices. These processes involve thorough reviews, public consultations, and compliance with environmental and safety standards.
- **Research and Development Support:** Government Funding: Governments and research institutions often provide funding for research and development for blue economy. This support helps advance technology and reduce costs.
- **Collaborative Initiatives:** Public-private partnerships and collaborative research efforts between government agencies, universities, and industry players can accelerate innovation.
- **Grid Integration and Energy Market Regulation:** Grid Codes: Regulatory bodies establish grid codes and standards to ensure the seamless integration of marine energy into existing electrical grids.
- **Device Certification:** Independent certification bodies may be responsible for verifying the safety and performance of marine technologies.

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- **Funding and Incentives:** Financial Support: Governments often provide financial incentives such as feed-in tariffs, tax credits, grants, and loan guarantees to encourage the deployment of blue economy projects.
- **Public Engagement:** Stakeholder Engagement: Governments and developers engage with local communities, environmental groups, and other stakeholders to address concerns, gather input, and build support for blue economy projects.
- **Adaptive Governance:** Governance frameworks should be flexible to adapt to evolving technologies and scientific knowledge. Adaptive management approaches allow for adjustments as new information emerge

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8. BUSINESS MODEL CANVAS

AQUAWIND PROJECT CANVAS

AQUAWIND project: Floating offshore wind and aquaculture production

Key Partners

- Wind Turbine Manufacturers
- Shipyards
- EPCIs
- Corporate investors
- Venture capital investors
- Heavy lifting companies
- Engineering companies
- Cable handling
- Marine operation companies
- Certification institutions
- Research Institutions (Renewable Energy, Aquaculture, Marine Biology)
- Government Investment Agencies (Energy, Agriculture, Environmental)
- Aquaculture Equipment suppliers
- Local fisheries
- Fish sale companies

Key Activities

- Platform manufacturing and procurement
- Platform Installation and Maintenance
- Wind Power Generation and Grid Integration
- Monitoring and Environmental Impact Assessment
- Research and Development for Improved Synergies
- Fish production & harvesting
- IP management
- Engineering consulting

Key Resources

- Intellectual property
- Platform Design and Engineering Expertise
- Offshore wind expertise
- Skilled Workforce (Maintenance, Operations)
- Logistics expertise
- Project development
- Offshore aquaculture know-how

Value Proposition

- Sustainable Energy Generation from Wind Power
- Sustainable aquaculture
- Power density
- Space optimization (FOW+Aquaculture)
- Multi-use
- Access to deep sea offshore wind resources
- Offshore aquaculture
- Reduced visual impact
- Reduced Environmental Impact (Less marine space use, Synergistic Benefits)
- Collaboration Opportunities for Renewable Energy
- Semi-autonomous fish production
- Advanced mooring systems
- Multiple income streams

Customer Relationships

- Consultative Approach to Tailor Solutions for Specific Locations
- Ongoing Support for Wind Platform Operation and Maintenance
- Regulatory Compliance and Reporting Assistance
- Energy sales in a regulated market requires a regulator and DSO
- Direct contact with end users to promotoe MUP and track record.

Channels

- Direct Sales and Partnerships with Offshore Wind and aquaculture developers.
- Government Bidding
- Processes for Renewable Energy Projects
- Fish sales: local and european markets
- RRSS for dissemination and first contact.
- Marketing content, events and online marketing for fish sales.

Customer Segments

- Offshore Wind Developers
- Aquaculture project developers
- Renewable Energy and aquaculture Investors
- Government Agencies (Energy and Agriculture)
- Environmental Organizations
- Venture capital
- Naval construction
- Electricity to final users through DSO where the Canarian government is the main customer for the electricity generated.
- Seriola Durmilli for the Canary islands and spanish market.

Cost Structure

- Platform Construction and Installation Costs
- Wind turbine and aquaculture equipment procurement and Maintenance
- Platform material procurement
- Fish feeding
- Fish harvest
- Logistics
- Transport & Installation
- Workforce Costs (Engineering, Operations, Aquaculture)
- Insurance
- Social acceptance
- Regulatory Compliance and Permitting Costs
- Contigency

Revenue Streams

- Offshore Wind Power Sales to Energy Grids
- Environmental Incentives and Grants
- Licensing Fees from Technology Partners
- Royalties
- Consultation services
- Fish sales

AQUAWIND's business model combines floating offshore wind and sustainable aquaculture on a single multi-use platform. This model aims to optimize marine space, generate renewable energy, produce high-quality seafood, and contribute to the EU's blue economy objectives. Below is a summary of each of the nine business model canvas elements. **A complete version is available in Annex 4**.

Key Partners

AQUAWIND collaborates with wind turbine manufacturers for tailored designs, shipyards for platform construction, and EPCIs for integrated deployment. Certification bodies ensure regulatory compliance, while research institutions support innovation. Investors and aquaculture suppliers enable funding and operational capacity, and marine operation firms handle logistics and offshore maintenance.

Value Propositions

AQUAWIND delivers renewable offshore energy alongside high-quality seafood production. It optimizes marine space use, lowers environmental impact, and enables circular synergies. Its innovative platform supports EU sustainability goals while offering cost efficiencies and diversified revenue models.

Channels

Solutions are promoted through direct industry partnerships with wind and aquaculture firms, government procurement processes, and seafood distribution networks. AQUAWIND also engages stakeholders via social media, research collaboration, and participation in major blue economy events.

Customer Relationships

Clients benefit from tailored offshore integration services, regulatory support, and performance monitoring. AQUAWIND offers ongoing O&M support, market integration assistance, and public engagement strategies to build long-term relationships and trust.

Key Resources

Core resources include patented floating platform designs, a multidisciplinary workforce, specialized fabrication facilities, and strong legal, regulatory, and financial management systems. R&D capacity and intellectual property assets support innovation and commercialization.

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Key Activities

Key operations span platform engineering and deployment, renewable energy and aquaculture management, environmental impact monitoring, stakeholder engagement, licensing, and continuous optimization through data-driven maintenance and R&D.

Customer Segments

The project targets offshore wind and aquaculture developers, institutional and impact investors, public sector agencies, seafood distributors, electricity utilities, and blue economy stakeholders including local fisheries and NGOs focused on sustainability.

Revenue Streams

Revenue derives from electricity sales via PPAs, high-value seafood production, innovation grants and sustainability subsidies, and licensing of proprietary technologies and services to industry partners.

Cost Structure

Costs stem from platform manufacturing, equipment procurement, offshore logistics, aquaculture inputs, workforce, permitting, insurance, and community engagement. R&D, IP management, and contingency funds are also key budget components.

The full Business Model Canvas with extended details is available in **Annex 4.**

8.1. RECOMMENDATIONS

1. Emphasize Synergy in Value Propositions

Highlight the unique benefits of integrating multiple uses (e.g., renewable energy and aquaculture) in your value proposition. Articulate how the combined operations create efficiencies, enhance sustainability, and provide additional revenue streams compared to standalone projects.

2. Identify and Engage Diverse Customer Segments

Clearly define and segment your customer base. Consider stakeholders across different sectors, including energy, agriculture, environmental organizations, and local communities. Tailor your approach to address the specific needs and concerns of each segment to foster engagement and support.

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3. **Develop Strong Partnerships**

Cultivate strategic partnerships with key players in both sectors (e.g., renewable energy and aquaculture). Collaborate with technology providers, research institutions, government agencies, and industry associations to leverage expertise, share resources, and enhance project credibility.

4. **Diversify Revenue Streams**

Explore various revenue streams beyond primary sales, such as licensing fees, consultation services, environmental grants, and royalties from intellectual property. A diverse revenue model can enhance financial stability and attract investors.

5. **Focus on Sustainability and Regulatory Compliance**

Prioritize environmental sustainability in project design and operations. Establish robust processes for regulatory compliance and engage with regulatory agencies early in the project lifecycle to facilitate approvals and support.

6. **Invest in Community Engagement and Social Acceptance**

Implement community outreach programs to build trust and gain social acceptance. Address local concerns, promote the benefits of the project, and engage stakeholders through transparent communication and participatory decision-making.

7. **Leverage Technology and Innovation**

Incorporate cutting-edge technologies to enhance the efficiency and effectiveness of operations. Invest in research and development to continuously improve system designs, operational processes, and product offerings, ensuring that the project remains competitive.

8. **Establish a Clear Cost Structure**

Develop a detailed cost structure that outlines all project expenses, including construction, maintenance, labour, and regulatory compliance. Include contingency plans to address unexpected costs and ensure financial resilience.

9. **Monitor Performance and Adapt Strategies**

Regularly assess project performance and market conditions. Utilize key performance indicators (KPIs) to evaluate success and identify areas for

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improvement. Be willing to adapt strategies based on feedback and changing circumstances to ensure long-term viability.

10. Create a Robust Marketing and Communication Strategy

Develop a comprehensive marketing strategy that highlights the benefits of multi-use projects. Utilize various channels, including digital marketing, social media, and industry events, to reach potential customers, partners, and investors. Clearly communicate the project’s impact and success stories to build credibility and attract interest.

11. Seek Funding and Investment Opportunities

Actively pursue funding opportunities, including government grants, venture capital, and partnerships with financial institutions. Clearly articulate the business case for investment, emphasizing the potential for sustainable growth and profitability.

12. Skilled Workforce

Invest in training and development programs for your workforce to ensure they possess the necessary skills to operate multi-use platforms effectively. A knowledgeable and skilled team is crucial for optimizing operations and ensuring project success.

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9. TECHNO-ECONOMIC ASSESSMENT

9.1. SCENARIO DEFINITION

AQUAWIND project starts from the base of a demonstrator solution combining FOW and aquaculture as a multiuse technology. However, it must be considered the project development ending in a commercial stage and an out to market product.

Defining scenarios to find feasible and competitive scenarios is crucial to define the commercialization strategy for different markets and have an attractive and bankable product. In this case it is assumed AquaWind as a product where the different scenarios al modelled.

GENERAL ASSUMPTIONS

Floating offshore wind

Location	
Distance from coast	5 km
Availability	96,5%
Electricity price sold	150 €/MWh
CAPEX labour costs fraction	0.35
OPEX labour costs fraction	0.35
DECEX labour costs fraction	0.35

Aquaculture

Fish Specie	*Seriola durmerili*
Range of water	19-24º
Fish price sold	8500€/T

	SCENARIO 1	SCENARIO 2	SCENARIO 3
2 x Turbine per platform	5MW	5 (10MW)	5 (10MW)
Total power output	10MW	40 MW	200 MW

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Number of platforms	1	4	20
Capacity factor	49.71%	49.71%	49.71%
Operating time	20 years	20 years	20 years
Yearly aquaculture production	300 T/year	1200 T/year	6000 T/year
Number of cages	1	4	20

9.2. COST BREAKDOWN

ANNEX 5 show a detailed cost breakdown for the different scenarios, this data has been used to model the different scenarios. The data considers both technologies independently floating offshore wind and aquaculture. The cost breakdown used in AQUAWIND, uses the **MARIBE** costs as reference.

9.3. RESULTS

SCENARIO 1

Table 6 Scenario 1 Techno-economic results

Item	Value - Combination with impact	Unit
Project rating, FLW	10	MW
Project rating, AQ	300	tonnes / year
CAPEX	70	€million
OPEX	138	€million
DECEX	2	€million
Cost of finance	95	€million
Energy generated	871	GWh
Product produced	6600	tonnes
Levelised cost, FLW	196.36	€/MWh
Levelised cost, AQ	20187.55	€/tonne
Levelised cost by revenue, FLW AQ	162.9%	-
Simple payback	-	years

9.3.1. Key observations

- Small scale demonstration: 10 MW wind + 300 t/year aquaculture is designed as proof of concept, not cost efficiency.
- High costs: CAPEX (€70M), OPEX (€138M) and finance (€95M) make the project capital heavy.

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- Uncompetitive unit costs: Wind (196.36€/MWh) and aquaculture (20187€/t) are far above current market benchmarks.
- Weak combined economics: Revenue coverage at 162.9%.

SCENARIO 2

Table 7 Scenario 2 Techno-economic results

Item	Value - combination with impact	Unit
Project rating, FLW	40	MW
Project rating, AQ	1200	tonnes / year
CAPEX	250	€million
OPEX	303	€million
DECEX	7	€million
Cost of finance	343	€million
Energy generated	3484	GWh
Product produced	26400	tonnes
Electricity price sold	236,6	€/MWh
Fish price sold	8500	€/tonne
Levelised cost, FLW	196.36	€/MWh
Levelised cost, AQ	8111.53	€/tonne
Levelised cost by revenue, FLW AQ	120.2%	-
Simple payback	11.3	years

9.3.2. Key Observations

- **Upscaled case**: 40 MW + 1,200 t/year aquaculture significantly increases output compared to Scenario 1.
- **High costs persist**: CAPEX (€371M), OPEX (€393M), and finance (€343M) keep the project very capital intensive.
- **Improved but still uncompetitive**: Levelised aquaculture cost drops to 8111.53€/T but remains far above market levels. Wind LCOE is stable at 196.36€/MWh.
- **Payback improves slightly**: 11.3 years, showing better economies of scale.

SCENARIO 3

Table 8 Scenario 3 Techno-economic results

Item	Value - combination with impact	Unit

Project rating, FLW	200	MW
Project rating, AQ	6000	tonnes / year
CAPEX	1208	€million
OPEX	1183	€million
DECEX	35	€million
Cost of finance	1663	€million
Energy generated	17418	GWh
Product produced	132000	tonnes
Levelised cost, FLW	196.36	€/MWh
Levelised cost, AQ	4891.26	€/tonne
Levelised cost by revenue, FLW AQ	108,9%	-
Simple payback	9.5	years

9.3.3. Key Observations

- **Large-scale deployment**: 200 MW wind + 6,000 t/year aquaculture marks utility-scale rollout.
- **Massive investment need**: CAPEX (1208M€), OPEX (1183M€), and financing (1663M€) reflect very high entry costs.
- **Further cost efficiency**: Aquaculture cost decreases to 4,891€/T, closer to competitiveness but still high. Wind LCOE remains constant at 196€/MWh.
- **Payback decreases**: 9.5 years, confirming scaling effects but not sufficient for standalone viability.

9.4. SENSITIVITY ANALYSIS

The purpose of the sensitivity analysis is to evaluate the economic resilience of AQUAWIND's multi-use platform under varying cost and revenue conditions. Specifically, this analysis explores how fluctuations in CAPEX, OPEX, output, and market price affect the Net Present Value (NPV) and Internal Rate of Return (IRR) for different scale scenarios of the project.

Four scenarios have been defined based on the combined capacity of floating offshore wind and aquaculture systems:

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9.4.1. SCENARIO 1

Table 9 Scenario 1 Sensitivity analysis results

CAPEX (combined sectors)	OPEX (combined sectors)	Output (combined sectors)	Price (combined sectors)	Levelised cost by revenue	NPV (yr0) (€ million)	IRR
10%	0%	0%	0%	172%	-61,62	-4%
5%	0%	0%	0%	167%	-57,82	-4%
0%	0%	0%	0%	163%	-54,02	-4%
-5%	0%	0%	0%	159%	-50,22	-3%
-10%	0%	0%	0%	154%	-46,42	-3%
0%	10%	0%	0%	170%	-60,32	-6%
0%	5%	0%	0%	167%	-57,17	-5%
0%	0%	0%	0%	163%	-54,02	-4%
0%	-5%	0%	0%	159%	-50,87	-2%
0%	-10%	0%	0%	156%	-47,72	-1%
0%	0%	10%	0%	148%	-45,44	-1%
0%	0%	5%	0%	155%	-49,73	-2%
0%	0%	0%	0%	163%	-54,02	-4%
0%	0%	-5%	0%	172%	-58,31	-5%
0%	0%	-10%	0%	181%	-62,60	-8%
0%	0%	0%	10%	158%	-51,44	-3%
0%	0%	0%	5%	161%	-52,73	-3%
0%	0%	0%	0%	163%	-54,02	-4%
0%	0%	0%	-5%	165%	-55,31	-4%
0%	0%	0%	-10%	168%	-56,60	-5%

9.4.1.1. Key observations

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- **Overall viability is very weak:** Scenario 1 remains unprofitable under all tested variations. The project shows consistently negative NPV (from –€46M to –€63M) and **negative IRR values (–1% to –8%)**, confirming that at this scale the AQUAWIND solution is not financially attractive without subsidies or major cost/price improvements.
- **CAPEX reductions improve but do not solve viability:** A 10% CAPEX reduction lowers the levelised cost from **163% to 154%** and improves IRR from –4% to –3% (best case), with NPV losses reduced to –€46M. Conversely, a 10% CAPEX increase worsens NPV to –€62M and IRR to –4% to –5%. CAPEX efficiency is therefore critical, though insufficient alone to achieve profitability.
- **OPEX variations have limited impact:** Adjusting OPEX by ±10% shifts NPV by ~€6–7M but leaves IRR between –6% and –1%. While cost control helps reduce losses, OPEX is not a decisive factor for viability at this stage.
- **Output performance strongly influences results:** A +10% increase in output reduces the levelised cost to **148% of revenues** and lifts IRR to –1%, with NPV improving to –€45M (best outcome). In contrast, a –10% drop in output increases levelised cost to **181%** and worsens IRR to –8%, with NPV at –€63M. This confirms production reliability as the most sensitive driver.
- **Price fluctuations mirror output effects:** A +10% increase in prices reduces levelised cost to 158% and improves IRR to –3% (NPV –€51M). A –10% decrease raises levelised cost to 168% and worsens IRR to –5% (NPV –€57M). Price support mechanisms (e.g., subsidies, feed-in tariffs, or blue economy credits) would be essential for viability.
- **Levelised cost consistently exceeds revenues:** Even under the best-case conditions (reduced CAPEX and higher output/price), the levelised cost remains **148–154% of revenues**, far above break-even levels. This indicates that at small demonstration scale, Scenario 1 cannot reach cost-competitiveness.

9.4.2. SCENARIO 2

Table 10 Scenario 2 Sensitivity analysis results

CAPEX (combined sectors)	OPEX (combined sectors)	Output (combined sectors)	Price (combined sectors)	Levelised cost by revenue	NPV (yr0) (€ million)	IRR
10%	0%	0%	0%	128%	-96,76	4%
5%	0%	0%	0%	124%	-83,14	5%
0%	0%	0%	0%	120%	-69,52	5%

-5%	0%	0%	0%	116%	-55,91	6%
-10%	0%	0%	0%	112%	-42,29	7%
0%	10%	0%	0%	124%	-83,24	5%
0%	5%	0%	0%	122%	-76,38	5%
0%	0%	0%	0%	120%	-69,52	5%
0%	-5%	0%	0%	118%	-62,67	6%
0%	-10%	0%	0%	116%	-55,81	6%
0%	0%	10%	0%	109%	-35,19	7%
0%	0%	5%	0%	115%	-52,36	6%
0%	0%	0%	0%	120%	-69,52	5%
0%	0%	-5%	0%	127%	-86,69	5%
0%	0%	-10%	0%	134%	-103,86	4%
0%	0%	0%	10%	117%	-59,21	6%
0%	0%	0%	5%	118%	-64,37	6%
0%	0%	0%	0%	120%	-69,52	5%
0%	0%	0%	-5%	122%	-74,68	5%
0%	0%	0%	-10%	124%	-79,84	5%

9.4.2.1. Key Observations

- **Better resilience than Scenario 1, but still unprofitable**
  The baseline case shows an NPV of –€69.5M and an IRR of 5%, confirming that even at this scale the project remains financially unattractive without external support or major cost reductions.
- **CAPEX is a decisive factor**
  A 10% CAPEX reduction improves IRR from 5% to 7% and cuts NPV losses by ~€27M (from –€69M to –€42M). Conversely, a 10% CAPEX increase worsens NPV to –€97M and drops IRR to 4%. This highlights CAPEX efficiency as the single strongest cost lever.
- **OPEX has moderate influence**
  A ±10% change in OPEX shifts NPV by ~€14M but leaves IRR between 5–6%. While cost control is important, OPEX variations alone cannot restore viability.

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- **Output and price remain the strongest revenue drivers**
  A 10% increase in output or price improves IRR to 7% and reduces NPV losses substantially (to –€35M to –€59M, best-case outcomes). In contrast, a 10% decrease in output or price lowers IRR to 4–5% and worsens NPV to –€80M to –€104M.
- **Levelised cost still exceeds revenues**
  Even under favorable conditions, the levelised cost remains between 109–117% of revenues, showing persistent uncompetitiveness. In downside cases (e.g., –10% output or price), this rises to 134%, confirming the fragile economics.

9.4.3. SCENARIO 3

Table 11 Scenario 3 Sensitivity analysis results

CAPEX (combined sectors)	OPEX (combined sectors)	Output (combined sectors)	Price (combined sectors)	Levelised cost by revenue	NPV (yr0) (€ million)	IRR
10%	0%	0%	0%	117%	-284,18	6%
5%	0%	0%	0%	113%	-218,20	7%
0%	0%	0%	0%	109%	-152,22	7%
-5%	0%	0%	0%	105%	-86,23	8%
-10%	0%	0%	0%	101%	-20,25	9%
0%	10%	0%	0%	112%	-205,47	7%
0%	5%	0%	0%	110%	-178,84	7%
0%	0%	0%	0%	109%	-152,22	7%
0%	-5%	0%	0%	107%	-125,59	8%
0%	-10%	0%	0%	106%	-98,96	8%
0%	0%	10%	0%	99%	19,47	9%
0%	0%	5%	0%	104%	-66,37	8%
0%	0%	0%	0%	109%	-152,22	7%
0%	0%	-5%	0%	115%	-238,06	7%
0%	0%	-10%	0%	121%	-323,90	6%
0%	0%	0%	10%	106%	-100,64	8%

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0%	0%	0%	5%	107%	-126,43	8%
0%	0%	0%	0%	109%	-152,22	7%
0%	0%	0%	-5%	111%	-178,00	7%
0%	0%	0%	-10%	112%	-203,79	7%

9.4.3.1. Key Observations

- **Baseline improves significantly compared to Scenarios 1 and 2**
  The baseline case shows an NPV of –€152M and an IRR of 7%. While still negative, this reflects a stronger economic position and clear benefits from economies of scale.
- **CAPEX remains the most influential cost driver**
  A 10% CAPEX reduction raises IRR to 9% and cuts NPV losses drastically (to –€20M), nearly reaching breakeven. Conversely, a 10% CAPEX increase worsens NPV to –€284M and lowers IRR to 6%. CAPEX efficiency is therefore critical for competitiveness.
- **OPEX has a modest but supportive impact**
  A ±10% OPEX variation shifts NPV by ~€25–30M, with IRR staying at 7–8%. While not a game-changer, OPEX optimization contributes positively to financial performance.
- **Output and price increases can flip results**
  A 10% increase in output or price improves IRR to 9% and, in the case of output gains, even generates a positive NPV (+€19M). This underlines the decisive role of market conditions and production reliability. A 10% decrease, however, deepens NPV to –€204M to –€324M and reduces IRR to 6–7%.
- **Levelised cost approaches parity with revenues**
  At baseline, levelised cost is 109% of revenues — much closer to breakeven than in smaller-scale scenarios. In the best case (+10% output), it falls below 100% (99%), showing that cost-competitiveness could be achievable under favorable conditions.

10. TECHNO-ECONOMIC ANALYSIS CONCLUSION

The techno-economic analysis of AQUAWIND across three deployment scenarios (10 MW/300 t, 40 MW/1,200 t, and 200 MW/6,000 t) confirms the scalability and technical potential of the concept but also highlights persistent financial challenges under current cost and market assumptions.

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At the demonstration scale (Scenario 1), the platform fulfils a proof-of-concept role rather than economic viability. Unit costs are uncompetitive (LCOE ~€196/MWh; aquaculture >€20,000/t), and sensitivity results show negative NPVs (–€46M to –€63M) and negative IRR values (–1% to –8%). Even under favorable assumptions, levelised costs remain 148–154% of revenues, confirming that small-scale pilots cannot achieve profitability without strong subsidies.

At the intermediate scale (Scenario 2), economies of scale reduce aquaculture costs (~€8,100/t) and improve payback (11.3 years). The baseline IRR remains modest at 5%, with NPVs negative (–€42M to –€104M across sensitivities). CAPEX reductions (–10%) show the strongest positive effect, raising IRR to 7% and narrowing losses. Output and price also prove decisive: a +10% change cuts NPV losses nearly in half. Nevertheless, levelised costs still exceed revenues (109–117%), leaving the project financially unattractive without external support.

At the large-scale utility deployment (Scenario 3), results improve markedly. Aquaculture costs fall below €4,900/t, payback shortens to 9.5 years, and baseline IRR reaches 7%. Sensitivity analysis shows that under favorable conditions (e.g., +10% output), IRR can rise to 9% and NPV turn slightly positive (+€19M), demonstrating the potential for breakeven at scale. Conversely, negative output or price swings push NPVs down to –€200M to –€324M, underscoring high market exposure. Importantly, levelised costs approach parity with revenues (99–109%), a first sign of potential competitiveness under optimized conditions.

The sensitivity analysis across scenarios yields three key insights:

1. CAPEX reductions are critical – A 10% reduction consistently improves IRR by ~1–2 points and reduces NPV losses substantially.
2. Output and market prices are decisive – ±10% swings can shift IRR between –8% and 9%, making production reliability and market mechanisms (e.g., premium pricing, contracts for difference) central to viability.
3. OPEX efficiencies help but are not decisive – While beneficial, variations in OPEX alone cannot restore profitability.

In conclusion, AQUAWIND demonstrates technical scalability and growing resilience at larger scales, with Scenario 3 showing the first signals of possible breakeven. However, profitability will not be achievable under current market conditions without:

- Policy and financial support mechanisms (subsidies, CfDs, or credits).
- Cost reductions through innovation, industrialization, and supply chain maturity.

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- Stable regulatory frameworks recognizing and incentivizing multi-use platforms.

These enablers will be essential to transform AQUAWIND from a demonstrator into a bankable, competitive solution for the offshore renewable and aquaculture markets.

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11. SOCIO-ECONOMIC ASSESSMENT – JOB PLAN CREATIONS PROSPECTS

The socio-economic assessment considers the scenarios described previously. The study considers the job creation during the project spam time, which includes DECEX, CAPEX and OPEX including labour costs for the project.

This chapter includes a summary of the plan developed according to the previous scenarios. The **complete version of the job plan prospects study** is included in **Annex 8**.

11.1. RESULTS (BASED ON INPUT-OUTPUT MODEL)

Input–Output (IO) modelling was used to estimate the economic impacts of the Aquawind project on the economies of the Canary Islands and Mainland Spain. This approach captures the interconnections between economic sectors, allowing the quantification of how project investments generate direct, indirect, and induced effects.

The analysis is based on structured spending across the project's lifecycle phases: Development & Consenting, Manufacturing, Assembly & Installation, Operation & Maintenance (O&M), and Decommissioning. Each phase is assigned a defined duration (4, 3, 1, 25, and 1 years respectively). Expenditures are assumed to be evenly distributed over time within each phase and allocated to the most relevant industrial sectors. However, it does not account for front-loaded investments or variations such as cost escalations during implementation.

Three local content scenarios (low, intermediate, and high) are considered to simulate varying levels of regional and national supply chain participation (Table 12).

Table 12 - Local content scenarios (High, Intermediate, and Low)

Phases	Canary Island	Mainland Spain	EU and abroad
High Local Content			
Development & Consenting	100%	0%	0%
Manufacturing	60%	25%	15%
Assembly & Installation	85%	10%	5%
Operation & Maintenance	90%	5%	5%
Decommissioning & Disposal	95%	5%	0%
Intermediate Local Content			

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Development & Consenting	90%	10%	0%
Manufacturing	45%	40%	15%
Assembly & Installation	65%	30%	5%
Operation & Maintenance	80%	15%	5%
Decommissioning & Disposal	80%	20%	0%
Low Local Content			
Development & Consenting	80%	20%	0%
Manufacturing	30%	65%	15%
Assembly & Installation	50%	45%	5%
Operation & Maintenance	70%	25%	5%
Decommissioning & Disposal	75%	25%	0%

The IO tables used for this analysis were sourced from the most recent available data (Instituto Canario de Estadistica, 2005)(Instituto Nacional de Estadistica, 2019).

It is important to highlight that this methodology assumes a static macroeconomic structure, meaning sectoral relationships remain fixed over time and do not capture potential changes in technology, productivity, or market dynamics. It also assumes no capacity constraints, no input substitution, and no price adjustments, limiting the complete reflection of real-world economic behaviour. Additionally, the analysis does not consider external shocks such as policy changes, global market fluctuations, or climate-related events, all of which could influence the outcomes.

To account for economies of scale and non-linear learning effects, the analysis is conducted per unit of M€ of project expenditure. This unit-based approach allows results to be scaled up by applying the appropriate multiplier according to the total project investment being assessed. This enables the estimation of the number of Full-Time Equivalent (FTE) jobs (direct, indirect and induced) and provides insight into the contribution of local and national industries (Figure 11 and

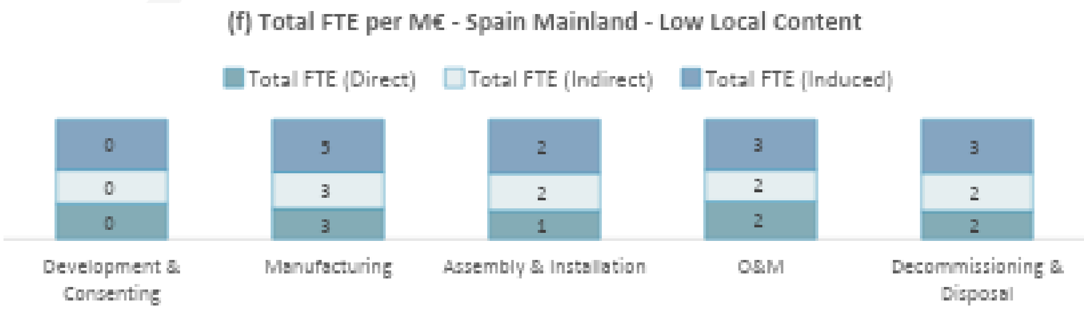

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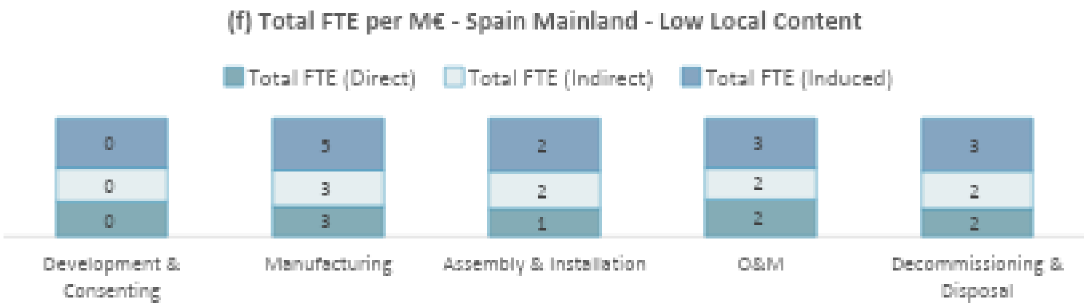
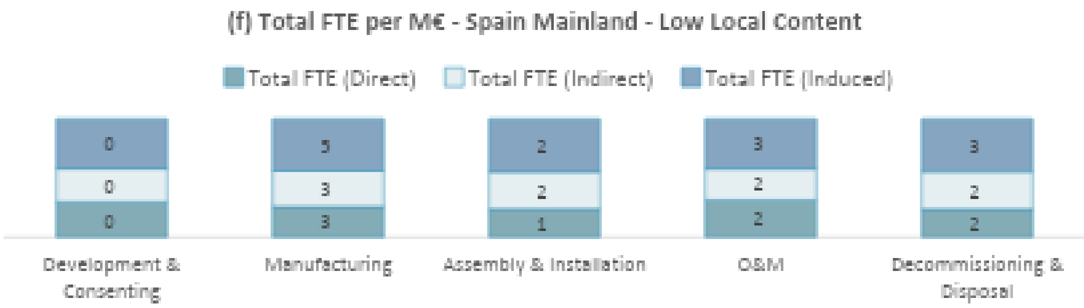
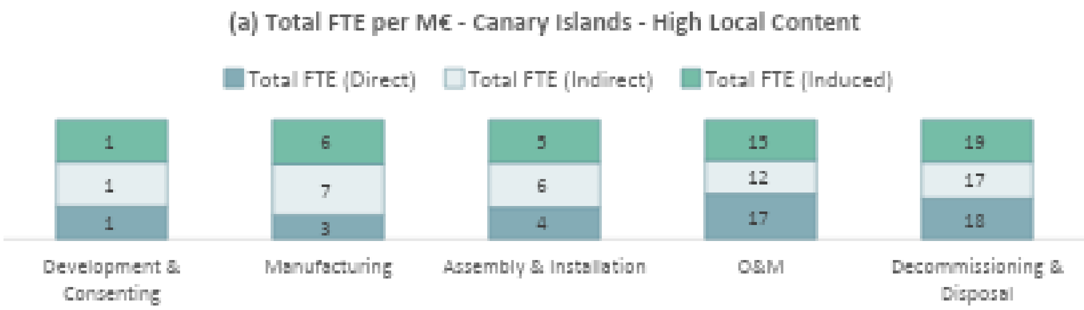
Figure 12).


(f) Total FTE per M€ - Spain Mainland - Low Local Content
Total FTE (Direct)
Total FTE (Indirect)
Total FTE (Induced)
0
0
0
5
3
3
2
2
1
3
2
2
3
2
2
Development & Consenting
Manufacturing
Assembly & Installation
O&M
Decommissioning & Disposal


(f) Total FTE per M€ - Spain Mainland - Low Local Content
Total FTE (Direct)
Total FTE (Indirect)
Total FTE (Induced)
0
0
0
5
3
3
2
2
1
3
2
2
3
2
2
Development & Consenting
Manufacturing
Assembly & Installation
O&M
Decommissioning & Disposal


(a) Total FTE per M€ - Canary Islands - High Local Content
Total FTE (Direct)
Total FTE (Indirect)
Total FTE (Induced)
1
1
1
6
7
3
5
6
4
15
12
17
19
17
18
Development & Consenting
Manufacturing
Assembly & Installation
O&M
Decommissioning & Disposal

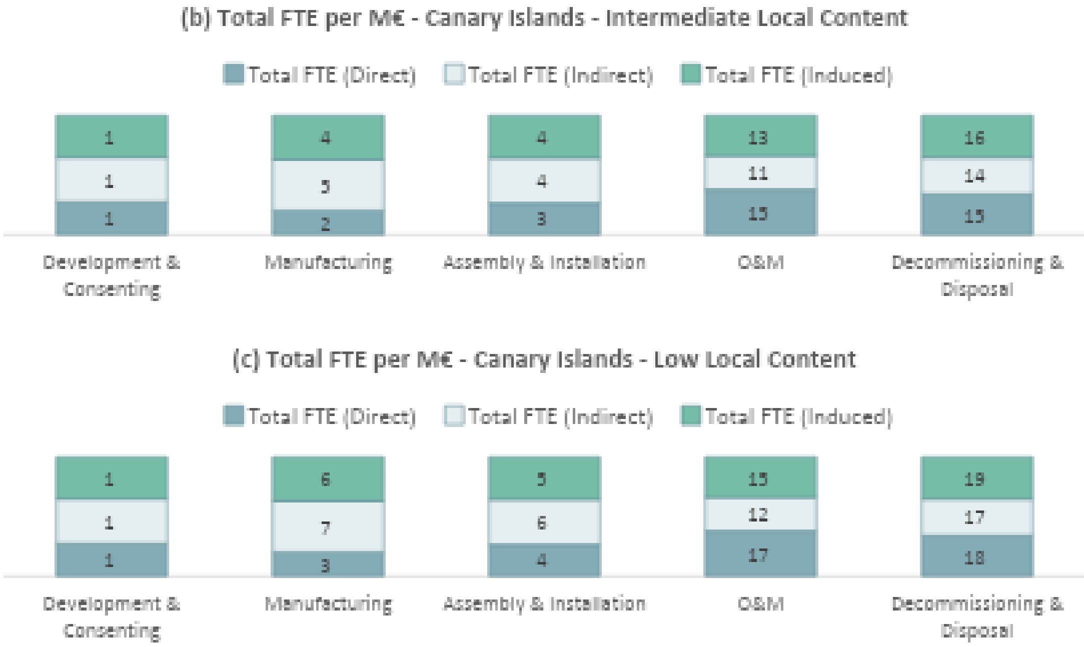


Figure 11 – Canary Island Total FTE per M€ divided by direct, indirect and induced effects (a) High Local Content, (b) Intermediate Local Content, and (c) Low Local Content

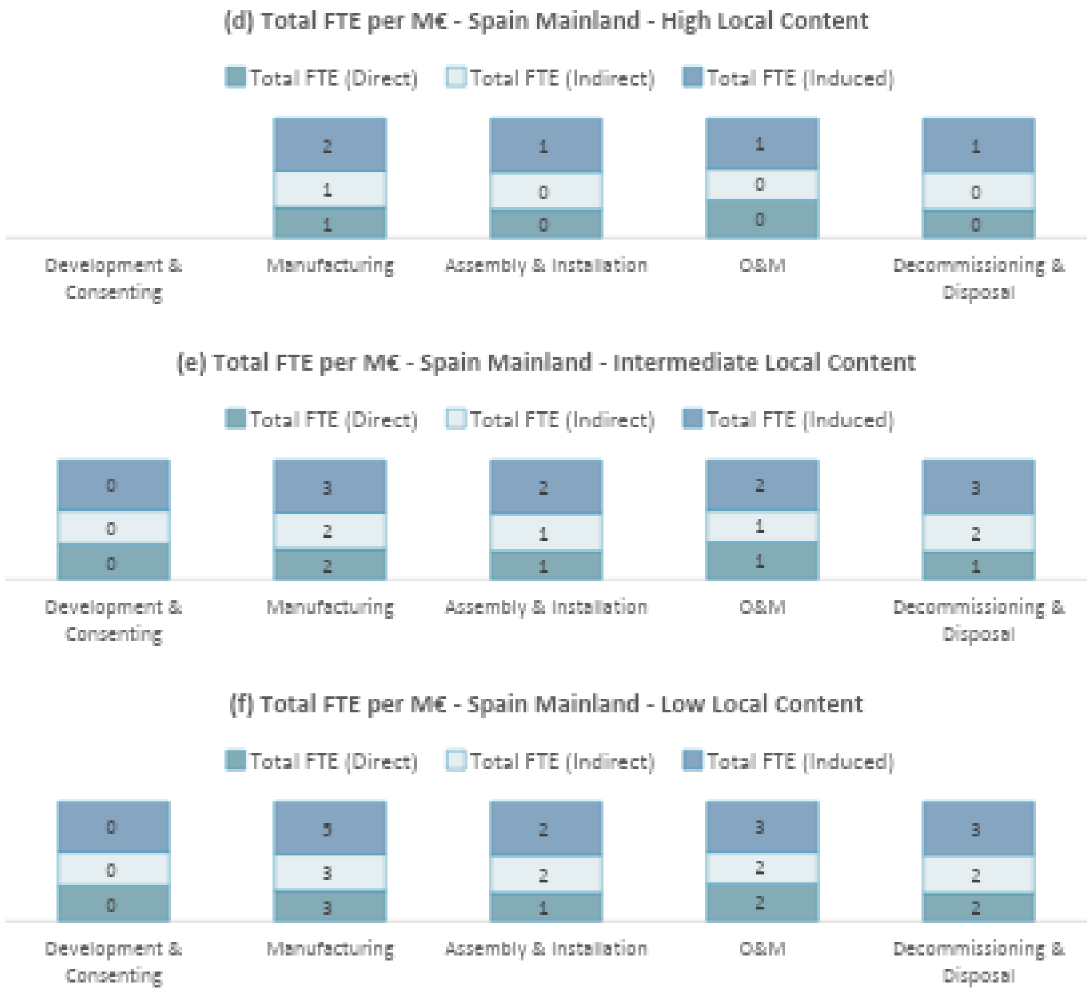


Figure 12 – Spain Mainland Total FTE per M€ divided by direct, indirect and induced effects (d) High Local Content, (e) Intermediate Local Content, and (f) Low Local Content

The analyses indicate that the Canary Islands generate more jobs per €1 million invested, driven by higher labour intensity and service-oriented economic structure. In contrast, Mainland Spain shows more efficient and capital-intensive job creation, reflecting its stronger and more diversified industrial base. These differences highlight the distinct economic profiles of the two regions: a service-driven economy in the Canaries versus a more industrialised and technologically advanced structure on the mainland.

In the Canary Islands, construction sector consistently drives job creation across all local content scenarios, due to its strong presence in the manufacturing and installation phases. Other key contributors include metal and non-metal goods, transport equipment, and repair and maintenance, the latter benefiting from the long-term nature of O&M activities. While fishing and aquaculture are also central to the project concept, their direct employment impact is relatively modest during the CAPEX phase, becoming more relevant in O&M over the project's lifecycle. Engineering and technical services also play a moderate role in early stages, with legal and business services contributing mainly through indirect effects.

In contrast, Mainland Spain sees higher overall employment when local content is shifted away from the Canary Islands. In this case, construction sector again leads job creation, but aquaculture-related employment rises significantly under intermediate and low Canarian content scenarios, as O&M activities, especially those linked to primary sector operations, are carried out on the mainland. This reflects Mainland Spain's stronger industrial base with large-scale infrastructure projects.

These findings underscore that while the Canary Islands may currently show lower industrial efficiency compared to the mainland, the region's higher labour intensity presents clear socio-economic advantages. Government strategies aimed at regional development are important not only to meet national targets for renewable energy and sustainable aquaculture, but also to generate local employment and strengthen economic resilience. Moreover, efforts to improve productivity through automation and modernization of project processes could support the growth of other local industries, including machinery, equipment maintenance, and technical training providers by creating demand for more specialized skills and services.

Given the data limitations, simplified assumptions, and methodological constraints, the results are best interpreted as approximate estimates, and the analysis should be viewed as exploratory and indicative.

11.2. EMPLOYMENT IMPACT SURVEY

In parallel with the input–output (IO) modelling, Task 5.7 introduced a dedicated **Employment Impact Survey** aimed at collecting empirical data from project partners to complement the techno-economic and socio-economic assessments. The survey, designed and coordinated by the Clúster Marítimo de Canarias (CMC), was deployed through the EU Survey platform and circulated among AquaWind partners including ULPGC, PLOCAN, WAVEC, Consulta Europa, EnerOcean, INNOSEA and CMC itself.

The objective of the survey was to **capture real-world insights on current and expected employment impacts** across the project's development stages and scaling scenarios. In particular, it aimed to quantify the distribution of direct, indirect and induced jobs; the balance between permanent and temporary positions; and the allocation of roles across professional categories (management, STEM, technical,

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administrative, etc.) and value chain phases (manufacturing, installation, O&M, decommissioning, aquaculture farming and processing).

The survey was structured around four reference scenarios:

- **Current scenario (0.6 MW / 1.5 t, 1 platform/cage)** – prototype phase.
- **Scenario 1 (10 MW / 300 t, 1 platform/cage)** – early commercialisation.
- **Scenario 3 (200 MW / 6,000 t, 20 platforms/cages)** – full commercialisation.

Across these scenarios, the survey collected **quantitative ranges** (<5, 5–10, 11–20, 21–50, 51–100, >100) rather than absolute numbers, reflecting the uncertainties typical of pre-commercial projects but still allowing trends to be identified. Results confirm the **progressive increase in employment prospects with project scale**, ranging from modest but highly skilled positions in the prototype phase (52 people mobilised, 8 of them new hires) to projections of more than 100 jobs in several categories under the large-scale commercialisation scenario.

The survey results add value to the techno-economic assessment by:

- **Validating IO modelling assumptions** with primary data from industry and research partners.
- **Providing a sector-specific breakdown** of expected employment by role, permanence, and value chain phase.
- **Highlighting partner perspectives** on the differentiated impact of scaling on technical versus coordination/support activities.
- **Offering a forward-looking view** of job creation aligned with the multi-use concept of AquaWind.

The full Employment Impact Survey, including methodology, results and analysis, is presented as a standalone annex to this deliverable. It complements the IO-based estimates by adding a **qualitative and empirical dimension** to the socio-economic assessment, thus ensuring that the job creation prospects of AquaWind are both model-driven and grounded in stakeholder experience.

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12. EXPLOITATION STRATEGY

12.1. EXPLOITATION STRATEGY

This exploitation strategy was developed at the start of the AQUAWIND project to provide a structured framework for how results would be exploited during its implementation and beyond its lifetime. The actions and commitments described here reflect both the original strategy and its ongoing application to ensure continuity after project completion.

The Exploitation Strategy outlines the strategies and activities required to ensure that the project's outcomes are effectively adopted and utilized by relevant stakeholders. The scope defines clear pathways for the practical use of the project's Key Exploitable Results (KERs).

Scope

The Exploitation Plan aims to:

- **Maximize Uptake**: Facilitate the adoption of AQUAWIND's integrated renewable energy and aquaculture systems by key stakeholders, including industry players, policymakers, and local communities.
- **Support Knowledge Transfer**: Provide tools and resources to share knowledge and best practices with a wider audience, including technical guidelines, training materials, and open-access publications.
- **Enhance Policy Influence**: Develop policy recommendations to promote regulatory support for multi-use renewable energy platforms and facilitate their implementation in various regions.
- **Ensure Economic Viability**: Demonstrate the economic benefits of the AQUAWIND model, supporting stakeholders in understanding the financial opportunities associated with integrating renewable energy and aquaculture.
- **Promote Environmental Sustainability**: Ensure that the project supports the ecological health of marine environments, contributing to carbon reduction and marine biodiversity enhancement.

The governance structure, mandate, and operational guidelines of the Exploitation Committee are detailed in **Annex 7 – Terms of Reference for the Exploitation Committee**. This annex outlines its composition, responsibilities, and mechanisms for ensuring that AQUAWIND's results are exploited effectively and in alignment with the project's overarching goals.

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12.2. EXPLOITATION ACTIVITIES

Activities Overview

- **Testing Multi-Use Platforms**: Conduct pilot projects combining wind turbines and aquaculture facilities to validate the technical feasibility and benefits of integration. This includes monitoring operational performance, analysing synergies, and assessing the challenges and solutions involved in co-location.
- **Workshops and Collaboration**: Organize workshops that bring together energy and aquaculture stakeholders, focusing on knowledge exchange, training, and technology transfer. These workshops include live demonstrations, case studies from the pilot projects, and collaborative sessions to develop best practices for multi-use platforms.
- **Community Engagement**: Engage with coastal communities to promote understanding of the benefits, generate support, and encourage local participation. Activities include policy meetings, educational events, and the creation of informational materials highlighting the environmental and economic benefits of the project.
- **Policy Advocacy**: Advocate for policies that support the integrated use of marine spaces, leveraging project results to influence marine spatial planning and environmental regulation. The advocacy process includes developing policy briefs, engaging with regulatory bodies, and presenting findings at conferences and industry events.
- **Replication and Scalability Activities**: Identify potential regions for replication of the integrated platform model. Develop a scalability roadmap to assist other regions in adopting the AQUAWIND concept, including economic feasibility studies, environmental assessments, and stakeholder engagement strategies.

Exploitation Tools and Methods

- **Stakeholder Collaboration Workshops**: Facilitate collaborative workshops/events for the renewable energy and aquaculture sectors to share findings, demonstrate technologies, and train practitioners. These workshops may be conducted both online and in-person to maximize participation and impact.

- **Open-Access Publications**: Publish scientific papers, articles, and policy briefs to disseminate findings broadly within the academic community, industry, and

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regulatory bodies. Publications shall be made available on open-access repositories, ensuring that all stakeholders can access the information freely.

- **Knowledge Platforms**: Utilize the project website and platforms such as Zenodo to share data, outcomes, and technical reports to facilitate knowledge transfer.
- **Networking Events**: Host and participate in industry-specific networking events to present the AQUAWIND concept and create partnerships that can help expand the implementation of the project. These events can be used to identify potential stakeholders and investors interested in furthering the project's objectives.
- **Replication and Scalability Tools**: Develop tools for replication like final reports, recommendations, guidelines, economic analysis, etc to help other regions or stakeholders adopt the integrated platform model.

12.3. KEY PERFORMANCE INDICATORS (KPIS)

- **Aquaculture Yield and Quality**: Measure the productivity of aquaculture operations.
- **Environmental Impact Assessment**: Evaluate the environmental impact in terms of carbon offset, underwater noise, biofouling, water and sediment quality.
- **Community Engagement Metrics**: Track community engagement activities, such as the number of community events held, number of participants, and community feedback. The metrics are stated in the Grant Agreement**.**
- **Replication and Scalability Metrics**: Study potential markets for replicating the integrated model.

12.4. MONITORING AND EVALUATION

Monitoring and evaluation are to be conducted continuously throughout the project to ensure the successful achievement of KPIs and effective implementation of exploitation activities.

- **Ongoing monitoring and reviews**: Conduct periodic reviews of project activities to assess progress against collected data. These reviews shall involve work package leaders and can be addressed in the Steering Committee meetings to ensure alignment with exploitation goals.

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- **Stakeholder Feedback Mechanism**: Implement a feedback mechanism to gather insights from stakeholders, including renewable energy developers, aquaculture practitioners, and community members.
- **Final Impact Assessment**: At the end of the project, conduct a comprehensive impact assessment to evaluate the overall success of the exploitation plan, focusing on stakeholder adoption, environmental benefits, and economic impacts. This assessment will also include recommendations for future projects and scalability.

12.5. DEFINITION AND SCOPE OF EXPLOITABLE RESULTS

In the context of the AQUAWIND project, an **exploitable result** is defined as:

Any tangible or intangible output generated within the project that holds the potential to create value—economic, scientific, environmental, social, or strategic—and that can be used, transferred, or further developed by internal or external stakeholders after the project ends.

This definition aligns with the European Commission's broader interpretation of exploitation, which recognizes a diversity of use cases and beneficiaries. Importantly, an exploitable result does **not need to be fully open** or universally accessible to be considered as such.

Exploitables can fall under various categories, including but not limited to:

- **Public**: openly accessible results, such as scientific publications, environmental methodologies, or open-source tools.
- **Restricted**: results with controlled access, typically shared under agreements (e.g., consortium-only protocols, internal datasets).
- **Protected**: results owned or licensed by individual partners for exclusive or commercial use (e.g., technical designs, components, or services).

Moreover, **some exploitables may only be relevant or usable by specific stakeholders**, such as industrial developers, aquaculture operators, policymakers, or researchers. The key consideration is whether the result has potential to generate impact and whether a clear route of exploitation can be defined.

12.6. ROLES AND RESPONSIBILITIES

- **Work Package Leaders**: Each leader ensures that activities within their package align with exploitation goals, providing regular updates to the exploitation coordinator. They are also responsible for the progress reviews and ensuring the data collection for KPIs is accurate and complete.
- **Exploitation Coordinator**: Oversees the overall exploitation activities, monitors progress towards KPIs and ensures alignment with project objectives. The coordinator reports to the Steering Committee and Management Board.

12.7. VISUAL IDENTITY AND BRANDING

The visual branding for the AQUAWIND project incorporates symbols of both **renewable energy** and **aquaculture**. Branding elements include wind turbines combined with aquatic imagery, highlighting the integrated nature of the project. This visual identity will be used across all documents, promotional materials, and digital platforms to maintain consistency and enhance project visibility.

13. CONCLUSION

The Exploitation Plan for AQUAWIND aims to ensure the long-term impact of integrating **floating offshore wind** and **sustainable aquaculture** by encouraging the uptake of the project outcomes across different sectors. Through targeted exploitation activities, stakeholder engagement, and the use of appropriate tools and methods, the project will contribute significantly to the growth of the Blue Economy while supporting environmental sustainability.

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14. COMMERCIALIZATION STRATEGY

14.1. PRODUCT POSITIONING

AQUAWIND represents a breakthrough in offshore infrastructure by combining floating offshore wind energy generation with sustainable aquaculture on a single, multi-use platform. This dual-function approach maximizes the use of marine space while responding to the urgent global needs for clean energy, sustainable food production, and environmental preservation.

The project's value proposition is built around the following key pillars:

- **Sustainable Energy Generation from Wind Power**

AQUAWIND harnesses offshore wind to produce clean, renewable electricity. By tapping into deep-sea wind resources, the platform ensures a stable and consistent energy supply, especially in locations where fixed-bottom wind turbines are not feasible.

- **Sustainable Aquaculture Integration**

The platform supports responsible aquaculture practices that enhance food security without compromising environmental integrity. By relocating fish farming operations offshore, AQUAWIND reduces pressure on coastal ecosystems and minimizes the ecological footprint typically associated with land-based or near-shore aquaculture.

- **Multi-Use Platform Efficiency**

Through its integrated design, AQUAWIND enables energy generation and aquaculture on the same infrastructure, improving overall efficiency and reducing costs associated with separate developments. This synergy reduces the spatial footprint and optimizes logistics, operations, and maintenance.

- **Access to Deep-Sea Offshore Wind Resources**

The floating platform technology allows AQUAWIND to operate in deep-water areas where wind resources are stronger and more reliable, opening new geographies that are inaccessible to traditional offshore wind solutions.

- **Offshore Aquaculture Potential**

Operating aquaculture systems offshore allows for cleaner, deeper waters, which support healthier fish populations and greater production efficiency. This also alleviates many of the challenges associated with coastal or onshore aquaculture, such as pollution and land-use conflicts.

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- **Reduced Visual and Environmental Impact**

The offshore location of the platform minimizes visual intrusion on coastal landscapes and preserves natural seascapes, making the technology more acceptable to coastal communities. Additionally, the combined use of marine space reduces habitat disturbance and infrastructure duplication.

- **Scalable Construction and Deployment Capacity**

AQUAWIND's design emphasizes modular construction, using advanced marine technologies that allow for rapid fabrication, assembly, and deployment. This supports scalability and cost-effective industrialization of the concept.

- **Energy Access for Remote Coastal and Island Regions**

The solution is particularly suited for remote areas with limited access to clean energy infrastructure, offering a viable path to electrification and economic development in islands and deep-sea regions.

- **Reduced Environmental Impact through Synergies**

By co-locating two ocean-based activities, the platform minimizes total marine space use, reduces carbon emissions, and promotes synergistic benefits, such as nutrient recycling between aquaculture and surrounding marine ecosystems.

- **Enabling Collaboration in the Renewable Energy Sector**

AQUAWIND creates a framework for cooperation among stakeholders in the offshore wind, aquaculture, environmental, and research sectors. This fosters cross-sector innovation, data sharing, and the co-development of sustainable marine technologies.

- **Advanced Mooring and Anchoring Systems**

The platform utilizes state-of-the-art mooring solutions to ensure operational stability and safety in challenging offshore environments. These systems are engineered for durability, resilience, and minimal seabed impact.

In summary, AQUAWIND's floating offshore wind and aquaculture platform stands at the intersection of environmental responsibility and economic opportunity. It offers a tangible, scalable solution to the challenges of marine spatial planning, decarbonization, and food production, contributing to the EU's vision for a sustainable, resilient blue economy.

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14.2. GO-TO-MARKET STRATEGY

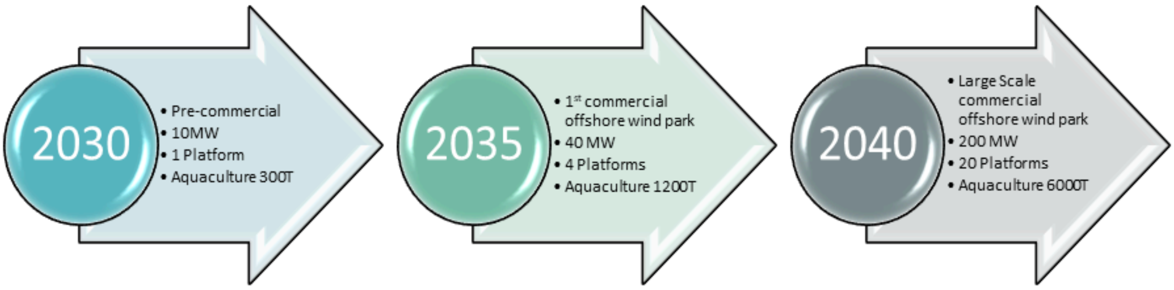
The commercialization of AQUAWIND is structured across four strategic phases, each aligned with specific technical milestones, investment needs, and stakeholder engagement goals. The strategy bridges the transition from technology development to full market deployment, ensuring a scalable, cost-effective, and sustainable rollout.

14.2.1. OPERATIONAL IMPLEMENTATION:

The operational implementation phase transforms AQUAWIND's commercialization strategy into concrete actions. This includes project planning, technical validation, stakeholder coordination, and communications to facilitate a smooth market entry and establish competitive positioning in both the offshore wind and aquaculture sectors.

Key implementation principles include:

- Cross-functional collaboration across engineering, environmental science, and policy.
- Optimization of logistics, procurement, and deployment processes.
- Risk mitigation through real-time monitoring, iterative design, and regulatory alignment.



2030 Full Scale Prototype Development

Building on lessons from the prototype phase, AQUAWIND partners and stakeholders aim to develop a pre-commercial project focusing on:

- Optimizing structural, electrical, and aquaculture system integration.
- Improving platform efficiency and cost-effectiveness.
- Conducting detailed engineering assessments and securing permits. This stage aims to refine the design for commercial readiness while continuing stakeholder engagement and public consultation.

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2035 - Small scale commercial AQUAWIND

Deployment of a small-scale commercial pilot, integrating the outcomes of the pre-commercial phase into a market-facing product. This stage will:

- Demonstrate commercial viability of multi-use platforms (MUPs).
- Establish operational standards and maintenance protocols.
- Facilitate cost reduction and system standardization. The pilot will serve as a proof of concept for large-scale replication, attracting early customers and public-private partnerships.

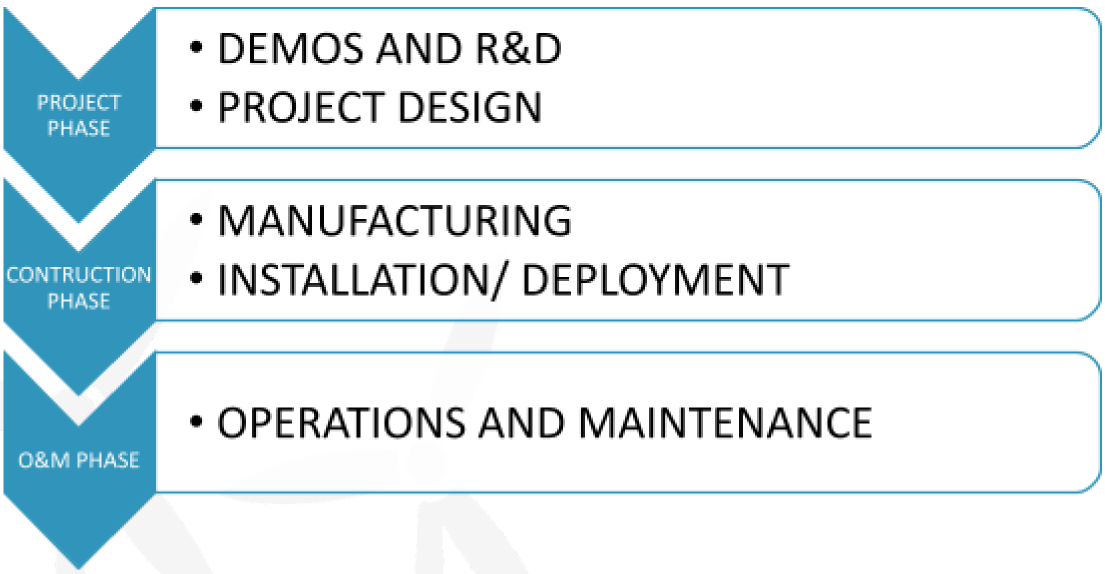
2040 - Large scale commercial AQUAWIND

Full-scale commercialization with multiple multi-use offshore platforms deployed across selected European waters. This phase will:

- Deliver a competitive, replicable MUP solution.
- Scale production of both wind energy and aquaculture output.
- Position AQUAWIND as a market leader in dual-use offshore infrastructure. The long-term vision includes expanding into new regions and promoting European technological leadership in sustainable ocean innovation.

14.2.2. VALUE CHAIN

A clear overview of the value chain is a key component to identify risks and how can be minimised to attract investors.



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14.2.3. QUADRUPLE HELIX

In alignment with responsible innovation principles and stakeholder-driven approaches, the AQUAWIND business model integrates a **Quadruple Helix** framework, involving four key stakeholder groups: public authorities, industry partners, research institutions, and civil society. This model is essential to ensure social acceptance, policy alignment, scientific support, and market relevance.

The Quadruple Helix approach fosters strategic synergies, co-creation of value, and long-term partnerships for the replication and upscaling of the solution beyond the pilot phase. By engaging these actors early and consistently, AQUAWIND aims to consolidate a robust ecosystem that contributes to the commercial deployment and sustainability of the concept.

The complete list of identified stakeholders under each helix category is provided in **Annex 6** as seen in D1.3 Stakeholder engagement plan.

14.2.3.1. Tailor Engagement Strategies

EPCI Firms

Strategic Partnerships: Form strategic alliances with EPCI firms for construction and installation phases. Highlight their role in enhancing project execution and efficiency.

Joint Ventures: Explore joint venture opportunities where these firms can contribute technical expertise and share in project risks and rewards.

Technology and Expertise Exchange: Leverage their knowledge and technology in wind energy to optimize project design and execution.

Venture Capital

Focus on Innovation: Emphasize the innovative aspects of the AQUAWIND project and its potential for high returns. Highlight any unique technology or business model.

Flexible Funding Terms: Offer attractive investment terms to accommodate their need for higher risk and potential returns. This may include equity stakes or convertible notes.

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Exit Strategy: Provide clear exit strategies and growth projections to demonstrate potential future value and liquidity.

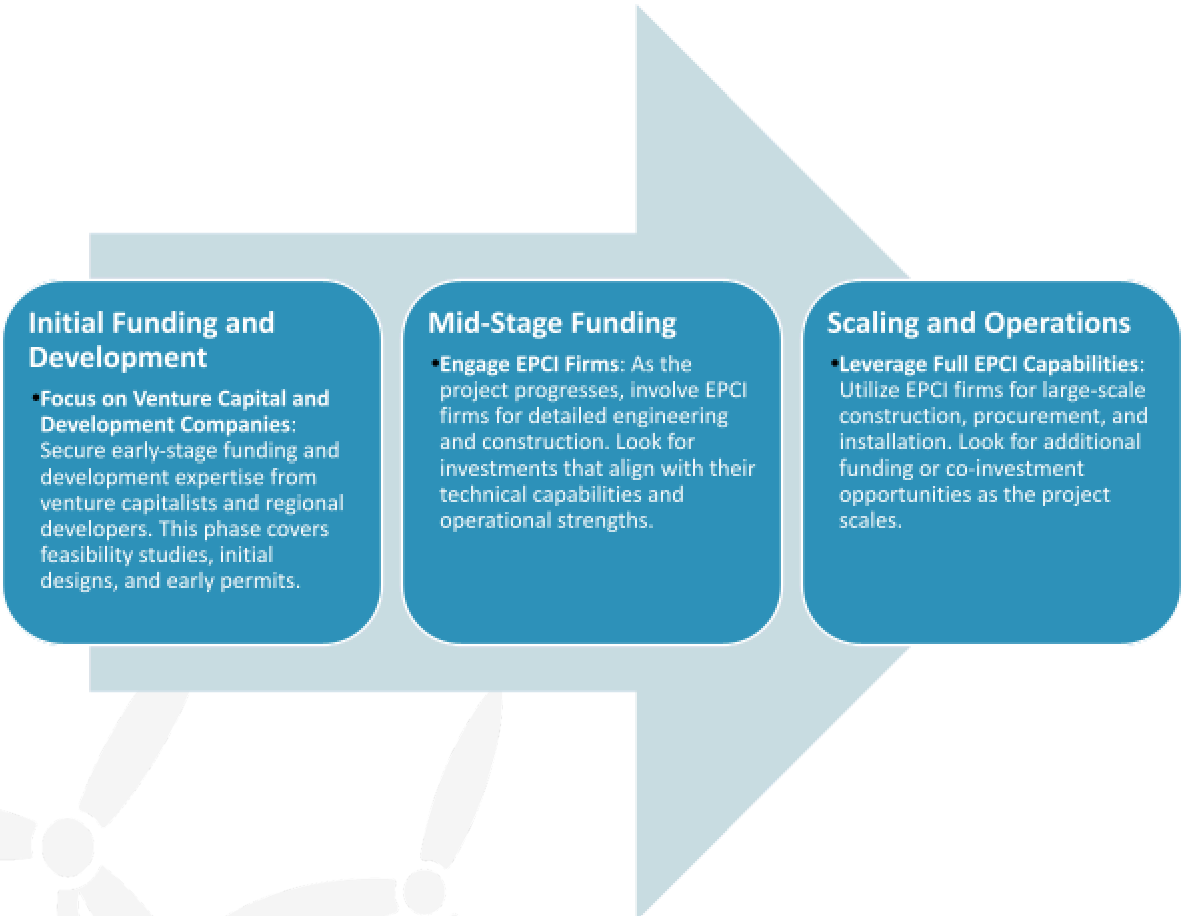
14.2.3.2. Development Companies

Regional Expertise: Utilize their local market knowledge and operational capabilities to streamline development, particularly in regions where they have a strong presence.

Local Partnerships: Forge partnerships with these companies to handle specific regional or sectoral challenges, potentially reducing costs and increasing efficiency.

Local Engagement: Ensure these developers are involved in local stakeholder engagement and project execution.

14.2.3.3. Investment Phases



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14.2.3.4. Risk Management and Mitigation

Address Technical and Operational Risks

Collaborate with EPCI Firms: Use their expertise to mitigate technical and operational risks through rigorous planning and risk management practices.

Diversify Risk: Spread investment across multiple EPCI firms to reduce dependency on any single entity and manage risks associated with project execution.

Financial Risk

Secure Multiple Funding Sources: Combine venture capital, EPCI investments, and development funding to ensure a diversified financial base.

Transparent Reporting: Maintain transparent financial reporting to build trust with all investors and manage expectations.

14.2.3.5. Communication and Reporting

Regular Updates

Provide Timely Reports: Keep investors informed with regular progress reports, financial updates, and milestone achievements.

Engagement Meetings: Schedule periodic meetings with major stakeholders to discuss progress, address concerns, and align on project goals.

Transparency

Open Channels: Ensure open communication channels for addressing investor queries and concerns. Transparency in operations and decision-making will build investor confidence.

14.2.3.6. Strategic Alliances and Partnerships

Regional Collaboration

Leverage Local Knowledge partnering with development companies for regional insights and logistical support. This companies such as ASTICAN, ZAMAKONA SHIPYARDS, CANEXMAR among other companies interested in the development of floating offshore wind and aquaculture industry with the goal of also developing the local supply chain and economic development of the Canary Islands.

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Engage with Gobierno de Canarias and Cabildo de Gran Canaria as well as the central Spanish government to secure support, incentives, public tenders and favourable policies.

Industry Collaborations

Joint Projects: Explore opportunities for joint projects or collaborations with other EPCI firms to leverage combined strengths and resources.

Company	Type	Country
ACCIONA	EPCI	SPA
IBERDROLA	EPCI	SPA
ORSTED	EPCI	DK
RAMBOL	EPCI	DK
SHELL GLOBAL	EPCI	UK
REPSOL	EPCI	SPA
ENEL GREENPOWER	EPCI	IT
EDP	EPCI	PT
EDF	EPCI	FRA
CAPITAL ENERGY	VENTURE CAPITAL	ESP
EQUINOR	EPCI	NOR
NATURGY	EPCI	ESP
MASDAR	EPCI	UAE
TOTAL ENERGIES	EPCI	FR
CEPSA	EPCI	SPA
RWE RENEWABLES IBERIA	EPCI	SPA
DISA	EPCI	SPA
OCEANWINDS	EPCI	FRA
CANEXMAR	DEV	SPA
ACUIPALMA	AQUA DEV	SPA

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AQUANARIA	AQUA DEV	SPA
PESCANOVA	AQUA DEV	SPA

14.3. STAKEHOLDER ANALYSIS

Stakeholder analysis in key to analyse the importance of each and the impact and interests in the project. It also allows to mitigate risks associated with stakeholders and to develop a specific strategy. This section uses a Mendelow matrix to spotlight each of the main stakeholders involved in the commercialization of AQUAWIND. This matrix divides stakeholders in 4 different groups along with their interests and power in the project.

Hereby, it has been considered the deployment in Gran Canaria, however this matrix is not fix and positions could change along the project life cycle and depending on future project scopes, figure 13 shows the Mendelow matrix for this case.

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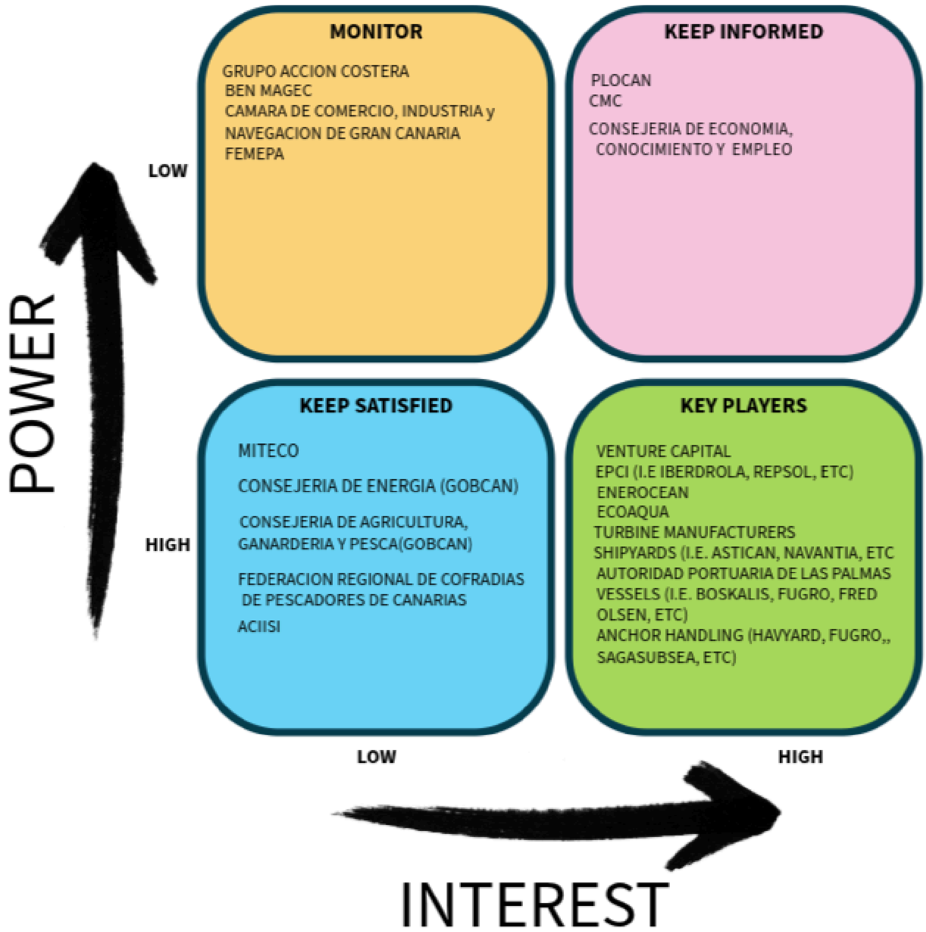

Fig 13 - AQUAWIND commercial stakeholder matrix

14.4. BUDGET AND FINANCIAL PROJECTIONS:

AQUAWIND detailed budget consider three different stages as an estimate for deployments. The price range goes for a single platform, small scale park and a big scale park. These prices can vary due to different variables and are just an estimation. Price will primarily be affected by the location, wind park size, the fabrication costs, among other factors. For the price estimates, economy of scale price reduction has been applied for the different project dimension.

Single platform, 1 Cage	40M€
Small Scale- 4 Platforms, 4 cages	40M€
Large Scale- 20 Platforms, 20 cages	767M€

Table 13 Project dimensions budget estimations

14.4.1. FINANCIAL PROJECTIONS

For the commercialization plan of AQUAWIND, it is necessary to assess the need of defining the business model and the cost breakdown and the value propositions. AQUAWIND can be considered as a product, where the company shareholders own the IP and the technology where revenues will come depending on the installations and the energy produced.

ROYALTIES

Project developers would pay a fee for using AQUAWIND intellectual property. This fee would be annual based on the electricity production per year during the project lifespan.

SERVICES

Services would consist of IP and know-how related to floating offshore wind, aquaculture, MUPS and project licensing.

LICENCES

IP owners will develop projects and sell the license for the project deployment. The fee would be dependent on the project DEVEX as part of the investment. For the financial projections the following assumptions have been considered:

Services	100€/hour
Royalties	5%
Licensing	100,000€/MW
DEVEX costs	4,500,000 €
CAPEX	25,000,000 €
Operating costs	10% from revenues
Taxes (Canary Islands)	7%
Other costs	10%

Table 14 Financial projections assumptions

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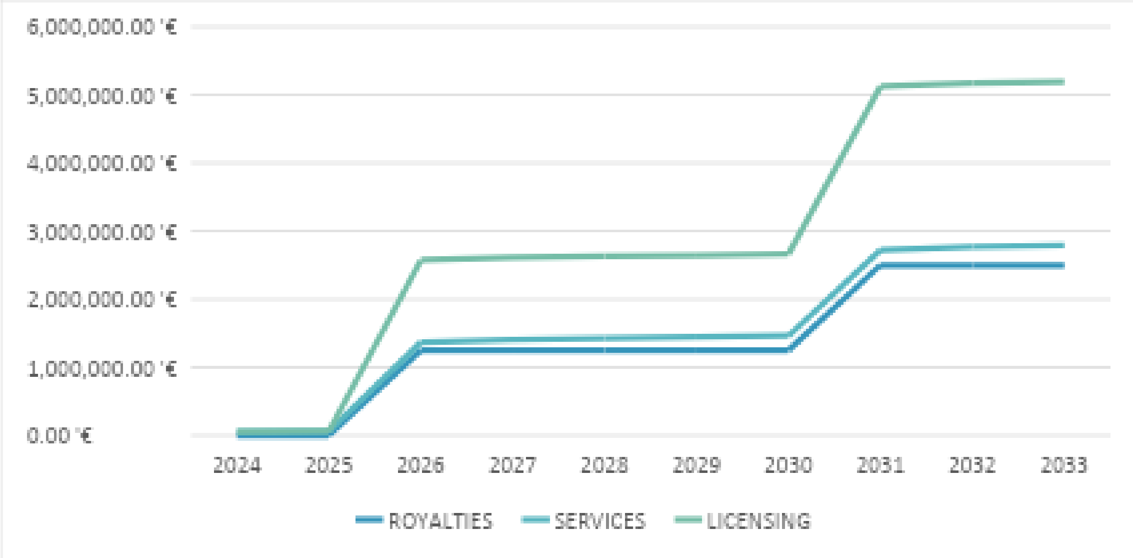

Fig 14 - Revenue streams projections 2024-2033

The first 2 years revenues will come from consulting hours as services, expenses will come from DEVEX (considered as a fix cost due to new project developments) and minor operational expenses. When the first installation is completed by 2026, streams from royalties and licensing would increase revenues, operational expenses would increase as well due to the company scale up and workforce needs.

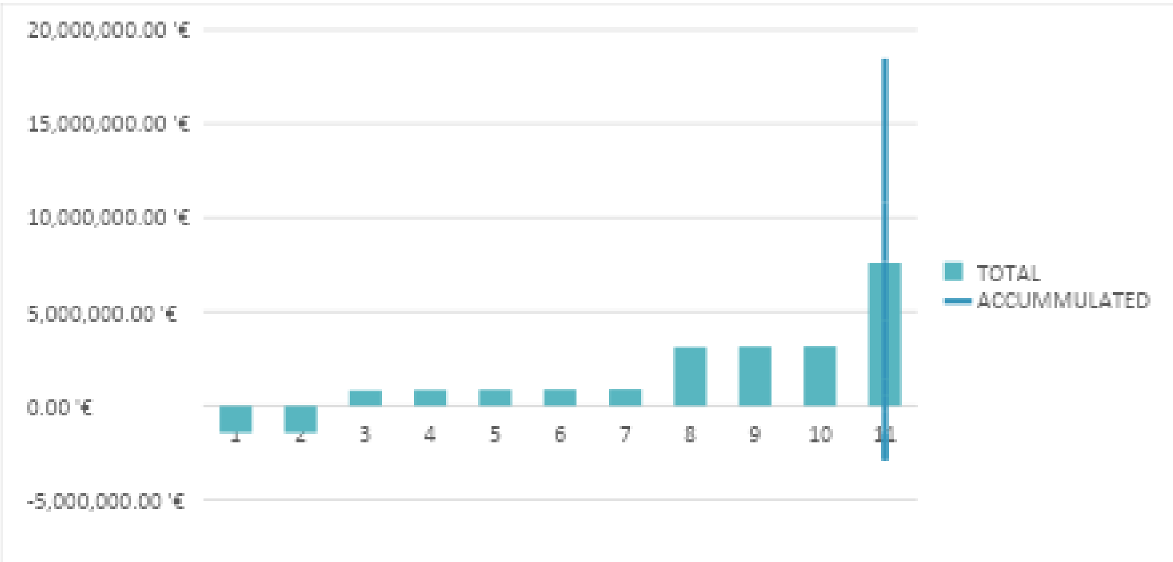

Fig 15 - Cash flow and accumulated 2024-2033

Annual balance between revenues and expenses, and on the other hand, the accumulated cash flows during the 10 years lifespan. The first two years the balance would remain negative as well as the accumulated due to the reduced revenues and the DEVEX costs for the development. It is to be mentioned that AQUAWIND would be a project developer, where the combined solution of FOW and aquaculture are commercialized as a developed project, CAPEX costs would be part of the client/ investor and IP owners have revenues from royalties, licensing, and services.

After the first installation (2026), the balance will remain positive, whereas the accumulated curve (payback years) will be end of 2028, 5 years and an NPV of 14.366.084 €.

14.5. RISK ASSESSMENT AND MITIGATION:

14.5.1. RISK IDENTIFICATION AND MATRIX

1. Non access to capital investment
2. Materials price increase for fabrication
3. Change in legal frameworks.
4. Competitors copy concept.
5. Increased fish mortality
6. Extended project deadlines
7. Design problems.
8. High skilled team members leave the team.
9. Electricity production decrease.
10. Poor fish quality
11. Value chain constraints

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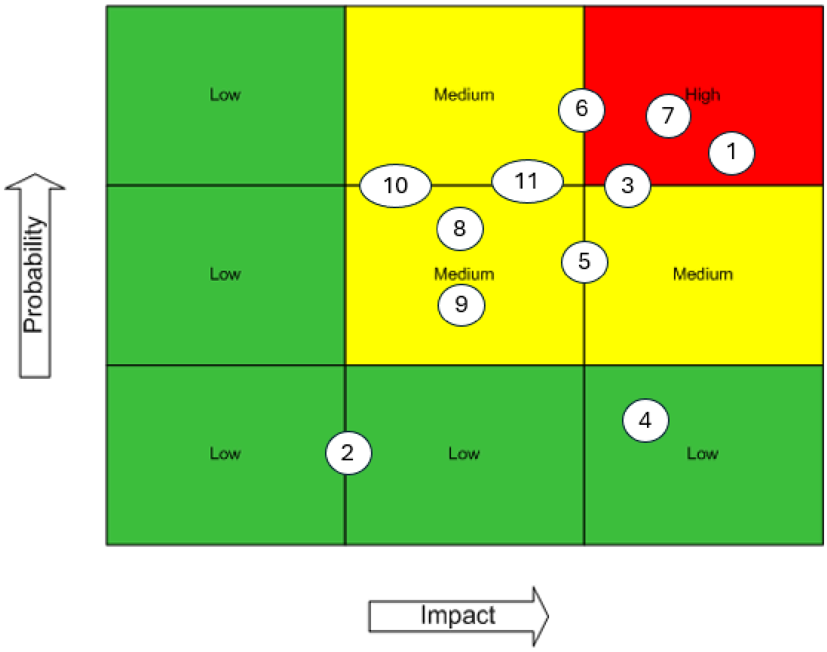

The grid matrix inquires it if the most risks are observed to be in the 3-5 range in terms of possibilities and the 8-11 range in terms of effects. Notably, four risks stand out with high ratings: Risks No 1, 3, 6 and 7.

Risk 1 is tied to the possibility of not being able to get the financing and investment that is needed for the project, which threatens it with failure and as such must be investigated immediately due to its negative effects. This risk is considered as the one, having a high probability ranking because AquaWind can be complicated to fund given the high costs of the product, its novelty, and high level of complexity.

Risk 3, change in legal framework can have negative influence on the project. This process is prone to prolonged time due to complexities in government procedures and as regulations get tighter or more provisions are included. There is a substantial risk of disruption to the schedule as it can result in unplanned delays.

Risk 6 foresees the chance of falling behind the scheduled project deadline which is highly possible given the associated level of uncertainty around the number of iterations that the project can afford to go through. But the possibility that the project will have no time to be completed as it was planned due to missed deadlines could relate to internal (Aquawind development stages Pre-FEED, FEED, Detailed design), and external (during the fabrication and later operation and maintenance), deadlines.

Risk 7 refers to design issues which are the most crucial especially being possible at the as prototype stage (scale 1:6). Project causing design errors are a big source of

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challenge as they may cause delaying and if they discovered after selling a product then it will be financial burden to the Aquawind company and harm its reputation and customer trust too.

14.5.2. HIGH LEVEL RISKS MITIGATION

No capital for launching business (Denied funding, etc.)

Mitigating the risk of not having access to investment capital involves several strategies aimed at diversifying funding sources, improving financial stability, and exploring alternative financing options. Here are some approaches:

- Cost Optimization: This should start with the classifying of the most urgent expenses, the negotiations of the most beneficial terms with debtors, and then the optimizing of the resources for cash generation.
- Alternative Financing Options: Attempt other financial instruments, e.g. crowdfunding, peer-to-peer lending, revenue-based financing, or equipment leasing. These types of funds could enable more flexibility and cost-effective entry conditions with respect to more conventional forms of investment.
- Grants and Subsidies: Apply for grants, subsidies and other non-equity financing possibilities that come from various government bodies, or business associations. Funds provisions can offer a competitive capital without including ownership of shares or repayment.
- Strategic Partnerships and Joint Ventures: Create efficient partnerships with the existing companies or investors through joint ventures to acquire capital, expertise, and resources. Working with partners can be regarded as the safety shield for financial risks and as a way of building the development of projects.
- Revenue Generation Strategies: It will be critical to develop a process that will generate revenue and help to reduce dependence on external capital. This will include sales of goods and services, interest and royalties on copyright, as well as release of tangible assets for the monetary benefit.
- Debt Financing: Study debt financing options like bank loans, credit lines, or asset-based loans may be applicable. On the contrary, although equity financing means that debt must be repaid, the finance is obtained without having to give up ownership or control of the business.
- Self-Funding: Continuing the business by utilizing profits or even personal savings as a starting capital would be a viable way. Self-funding has the advantage of sole owner and controller concurrently with building a history of performance that can in future attract investors.

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- Financial Planning and Risk Management: Design and modelling a financial plan which encompasses future cash flow predictions, budgeting and risk management.
- Investor Relations and Networking: Extended investor network and an attractive pitch for business angels, venture capitalists, and institutional investors. Be present at industry events, pitch competitions, and networking meetings, all of which would allow to demonstrate the project and influence the investment growth.
- Resilience and Adaptability: Preserve a resilient and flexible mindset to successfully face any challenges that may occur when seeking for funding. Adaptation to new strategies, taking up new opportunities as well as the existence, is the key to long-term success.

Change in legal frameworks.

Mitigating risks associated with legal framework changes in MUPs in the deployment of floating offshore wind and aquaculture involves several key steps:

- Comprehensive Legal Analysis: Perform a study of the present legal landscape as existing at the local, national, and international levels relevant to MUPs. Recognize the zone of the possible areas of uncertainty and risks that can be triggered by any legal change.
- Engagement with Regulatory Authorities: Ensure continuous communication channels with supervisory authority which is the responsible authority to monitor offshore wind farms. Continuous monitoring for developing regulations and providing input as part of consultation process for a positive outcome or mitigating possible challenges.
- Diversification of Legal and Regulatory Risks: Diversify legal and regulatory risks by investing in various jurisdictions or different projects that may have different jurisdictions with the goal of increasing the level of return. This might reduce the effect of negative changes in any single territory on the results of the vote.
- Scenario Planning: Formulate the business continuity plan and conduct the what-if analysis to evaluate the possible impacts of the legal framework change on the project outcomes. This, in turn, will be then transforming into chance-taking risk management and strategy identification to conform with dynamic regulatory circumstances.
- Legal Due Diligence: To avoid possible legal issues during project implementation it is advisable to conduct a legal due diligence that will uncover the existence of any legal risks or legal ambiguities that might be worsened by future legal changes. By being able to deal with these critical conditions at an early stage, we can be sure that any future disruptions will be avoided.

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- Contractual Protections: Insert clauses into contracts that are signed with suppliers, contractors and other entities which address the legal risks of such changes. This power may embrace provisions like force majeure clauses, change in law agreements and means of dispute resolution.
- Political and Stakeholder Engagement: Partner with key political officeholders, such as the government officials, and policymakers, to ensure stable and supportive legislative environment for offshore wind energy investment. These ties with the major stakeholders can be used to try and influence policy to find conducive environment to operate in and to avoid regulatory risks.
- Monitoring and Compliance: Introduce effective reporting and supervisory processes to quantify changes in regulatory framework and make sure the business maintains compliance. It is intended at the formation of internal legal and regulatory compliance groups or outsource some of the legal advisors.
- Insurance and Risk Transfer: Think of getting suitable insurance policies or explore alternative transfer mechanisms of risk especially with regards to legal and regulatory risks. Using tools such as political risk or regulatory change insurance may help reduce the potential loss caused by unfriendly legislations.
- Adaptability and Flexibility: Take note of respective authorities' legal and regulatory updates and adjust your plan and implementation strategies accordingly. Therefore, the capability for implementing flexibility may be required during the design, timeframes, and costing phases to account for the possibility of regulatory changes.

Project exceeds deadlines.

Mitigating the risk of an offshore wind project exceeding deadlines involves proactive planning, effective project management, and contingency measures to address potential delays. Here are some strategies for mitigating this risk:

- Comprehensive Project Planning: Create a thorough project plan which is based on specific timelines, tasks, and task dependencies. Thoroughly perform risk assessment to identify any hindrances that can be tackled by designing mitigation strategies for each.
- Realistic Scheduling: Define the achievable and tight-scheduled deadlines based upon the deep analysis of project scale, resources availability, and external components like weather conditions and regulatory barriers. Bear in mind that instead of trying to create overly optimistic timelines that can lead to unrealistic expectations and delays, it would be better to be realistic with the timelines no matter how long.
- Contingency Planning: Develop risk mitigation strategies to navigate with unevenness caused by unforeseen obstacles or disturbances. Create your own

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journey to success with a free 7-day trial! No credit card required. Find suppliers, subcontractors, or machines vendors who can stop the possibility of failure. On top of the budget you have, allow yourself some additional resources or revenues for directed at when future challenges unexpectedly manifest themselves.

- Stakeholder Engagement: Interact with the prime stakeholders using the regulators, the contractors, the suppliers plus the local communities so as to keep the expectations clear and at the same time align them throughout the project lifecycle. Create open communication channels, and clear procedures for solving problems and dealing with conflicts on time.
- Contract Management: Enter contracts with clear and specific deadlines, performance measurements, and penalty clauses if breach of the contract occurs. Include in the contracts provisions that provide guidance and methods for changing circumstance such as force majeure events or regulatory changes.
- Resource Allocation: Allocating the resources properly to minimize the bottlenecks and achieve maximum throughput is a must. Adjust staffing levels or task assignments as inappropriate capacity constraints are detected or inefficiencies are noticed.
- Technology and Innovation: Capitalize on the latest technological innovations and use them in ways that maximize project processes and achieve efficiency. Use the developing technologies like process management automated programmes, remote monitoring systems and drone-based inspections to improve your oversight of projects and reduce delays.
- Weather Monitoring and Mitigation: Bring in place weather observation systems, as well as plans for the mitigation of weather caused risks. Take weather forecasts in account when planning and scheduling projects to preclude delays and enable seamless performance of work.
- Quality Assurance and Risk Management: Develop quality assurance processes with the purpose of identifying and correcting potential problems in the project progress at an early stage of the project. Implement regular risk assessments and invigilate precaution steps to avoid risks that manifest as delays or cost overruns.
- Continuous Monitoring and Reporting: Frost such procedures like having control mechanisms for monitoring and reporting project progress in terms of the set milestones and deadlines. Adopt scheduled progress reviews and status updates to map out the early warning signs and take corrective action measures to ensure that the project doesn't derail.

Mistakes in the design

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Mitigating the risk of design problems in an offshore wind project involves a combination of careful planning, rigorous design processes, and proactive risk management strategies. Here are some key approaches to mitigate this risk:

- Comprehensive Design Phase: Give particular attention to design phase, in which you conduct the comprehensive engineering analysis, feasibility study and preliminary testing (if applicable). As the design of the project comprises of both the collection of relevant data and the application of industry recognized engineering practices.
- Multidisciplinary Expertise: Form a team with the diverse shortcomings in the realm of civil engineering, mechanical engineering, electrical engineering, environmental science, and offshore construction. Promote teaming up and knowledge need for identification of problems from different angles.
- Peer Review and Independent Verification: Develop a peer review program to ensure validity of design and to pinpoint the gaps and the pitfalls. Hire an independent third party to carry out the verification survey assessing the design from outside, evaluate its suitability and compliance with the regulatory requirements.
- Prototyping and Testing: Experiment with the powertrain prototype test or simulation tests to validate the performance and reliability of important components or systems. Incorporate real world data and environmental conditions to determine how far the design would perform under different situations and come up with ways of improving it if necessary.
- Risk Identification and Assessment: Conduct a meaningful risk assessment to enumerate the risks from design and the possible effect on the project. Give priority to the risks which affect the organization greatly and have the high possibility of occurring and also devise strategies to deal with the most common risks immediately.
- Design Reviews and Iterative Improvement: Include regular design reviews during all stages of the project cycle. These design reviews might include evaluating progress, finding emerging issues and building upon former experiences or design iterations. Empower an evolving system of design refinements based on feedback and perpetual progression.
- Regulatory Compliance and Standards Adherence: Make sure that design has a compliance with the regulation rules, industry standards, and best practices. Make sure to stay on top of the latest regulatory and standard changes only so that you can make the appropriate modifications to the design to stay within the compliance range.

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- Supplier and Vendor Management: Work closely with suppliers and vendors to ensure that components and materials meet the specified design requirements and quality standards. Establish clear communication channels and quality control processes to address any deviations or non-conformities promptly.
- Contingency Planning and Resilience: Develop contingency plans to address design-related issues that may arise during project execution. Identify alternative design solutions, backup suppliers, or mitigation measures to minimize the impact of unexpected design problems on project schedule and budget.
- Documentation and Knowledge Management: Maintain accurate documentation of the design process, including design decisions, assumptions, calculations, and revisions. Establish knowledge management systems to capture lessons learned and facilitate knowledge transfer between project phases and team members.

15. AQUAWIND SHOWCASE EVENT

As part of AQUAWIND project a Showcase Event was hold on 6 June 2025 in Las Palmas de Gran Canaria, coinciding with the FIMAR 2025 fair. The event, coordinated by the Canary Islands Maritime Cluster (CMC) in collaboration with ACIISI, SPEGC and PLOCAN, served as a strategic platform to disseminate project progress, strengthen stakeholder engagement, and foster dialogue with the investment community.

The event consisted of two sessions: a public institutional session highlighting AQUAWIND's contribution to the blue economy and regional innovation, and a private technical session targeted at investors, where the technological, economic, and market potential of the project was presented. The Showcase also included dissemination activities at the FIMAR 2025 fair, with interactive tools and outreach materials to engage the wider public.

Key outcomes included:

- Consolidation of relationships with local and national investors.
- Increased visibility of AQUAWIND as the first European prototype combining floating offshore wind and aquaculture.
- Strengthened collaboration across government, industry, research, and training sectors.
- Enhanced attractiveness of the project for future scalability and investment opportunities.

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The full Showcase Event Report, including the programme, photographic dossier, dissemination materials, and detailed results, is provided in **Annex 9**.

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ANNEXES

ANNEX 1: MARKET ANALYSIS

SPANISH MARKET AQUACULTURE

During 2012 primary aquatic production decreased 14.52% reaching 1,081,881T, whereas fishing decreased 5.46% and aquaculture 2.75%. Mainly this production corresponds to marine aquaculture, just 6.31% produced was for continental aquaculture. Marine aquaculture, mainly producing molluscs which represent 77.53% meanwhile 16.08% correspond to fish. Being mussels the main national production with a 76%.

Regarding fish production the main species in Spain are the sea bass, gild head bream and rainbow trout in continental water. However, other species such as the turbot, croaker, tuna, eel, sea bream, etc.

The production of gild head bream, sea bass, turbot and tuna represent approximately 16% from the total, with an exponential growth in the last years. Table below show the 10 main species produced in Spain 2012. By 2023, seabream and sea bass likely reached ~20,000 T each, driven by export demand and offshore trials (Plan Estrategico Plurianual de La Acuicultura Española, n.d.)

Table 15 Main species produced in Spain 2012

Specie	Tonnes (T)
Mussel	203,663
Gilthead seabream	16,607
Rainbow trout	16,304
Sea bass	14,454
Turbot	7,767
Japanese clam	1,083
Plain European oyster	672
Croaker	645
Japanese Oyster	561

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ANNEX 2: MULTIUSE SISTER PROJECTS

ORPHEO +

The ORPHEO+ project represents the continuation of earlier initiatives (WIP10+ and ORPHEO) focused on advancing the W2Power floating platform towards multi-use applications. In this new phase, activities in the Canary Islands are dedicated to testing the integration of aquaculture operations with offshore renewable energy production.

At its core, ORPHEO+ aims to validate advanced control strategies on a wind–aquaculture prototype deployed at the PLOCAN test site. Supported by Blue-GIFT funding under the Interreg Atlantic Area programme, the project builds on previous experience to optimize the performance, stability, and reliability of the W2Power multi-use solution.

The Canary Islands activities specifically address:

- Deployment of a fish cage on the W2Power prototype for its second offshore test campaign, using designs previously developed in W2P-HERA.
- Validation of wave prediction algorithms with enhanced instrumentation.
- Application of innovative turbine control strategies tailored to a multi-use configuration supporting aquaculture.
- Assessment of the environmental impacts and potential ecosystem benefits of combined wind–aquaculture platforms.

Through these efforts, ORPHEO+ provides critical insights into the operational feasibility and environmental performance of hybrid offshore systems, directly informing the advancement of multi-use concepts within AQUAWIND.

FIBERGY

FIBREGY project explored the challenge in offshore renewable energy by enabling the adoption of Fibre-Reinforced Polymer (FRP) materials in the design and construction of next-generation floating platforms. By leveraging the advantages of FRPs, including reduced weight, higher durability, and corrosion resistance, FIBREGY aimed to improve performance and reduce lifecycle costs for offshore wind and tidal energy infrastructures.

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To achieve this, the project used advanced innovative FRP materials specifically qualified for the marine environment, while developing new design guidelines, production methods, and monitoring procedures. Advanced computational models and analysis tools are also being validated to ensure robust engineering and reliability standards for these large-scale structures.

The work was structured across six technical areas:

- Market attractiveness, cost-benefit analysis, and business planning.
- Development of fibre-based materials and joining solutions.
- Computational modelling and validation.
- Design methodologies, engineering, and design guidelines.
- Optimized production and manufacturing processes.
- Large-scale validation and demonstration activities.

The industrial relevance of FIBREGY is strengthened through its focus on two highly promising offshore renewable energy concepts: EnerOcean's **W2Power twin-turbine floating wind platform** and Tidetec's **rotating tidal turbine**.

TROPOS

TROPOS project the developed a floating **modular multi-use platform** concept, designed to study the potential of deep-water sites where fixed structures are not viable. With an initial focus on the **Mediterranean, tropical, and subtropical regions**, TROPOS introduced a flexible system architecture that could integrate multiple maritime activities into a single offshore platform.

The project's central innovation laid in its **modular design approach**, enabling the combination of interchangeable modules to host functions such as renewable energy generation, aquaculture, transport, logistics, and even leisure services. This flexibility maximized the adaptability of the platform to regional needs and market demands, while enhancing economic viability and sustainability.

Key achievements of TROPOS included:

- Identifying optimal locations for multi-use platforms through advanced numerical and physical modelling.

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- Investigating synergies between offshore activities such as wind energy, aquaculture, and transport.
- Designing **novel cost-efficient modular structures** that ensure interoperability and adaptability.
- Assessing environmental impacts and developing tailored evaluation methodologies.
- Configuring tailored multi-use platform solutions for different oceanic regions.

By combining **engineering innovation, environmental assessment, and economic feasibility analysis**, TROPOS laid the foundation for future multi-use offshore infrastructures in Europe. Its outcomes remain a key reference point for projects exploring the integration of renewable energy and aquaculture within shared maritime spaces.

H2OCEAN

This multi-use platform is designed to harness wind and wave power, utilizing a portion of the generated energy for a multitude of on-site applications. Notably, it includes the conversion of this energy into hydrogen, which can serve as a green energy carrier, capable of storage and transportation to the mainland. Additionally, H2OCEAN featured a multi-trophic aquaculture farm.

H2OCEAN, approaches the transmission of renewable electrical energy generated offshore through hydrogen. This concept offers an efficient means of transporting and storing energy, effectively decoupling energy production and consumption. By doing so, it mitigates the grid imbalance issue that plagues existing offshore renewable energy systems. Furthermore, this innovative approach eliminates the need for costly cable transmission systems, which typically constitute a significant portion of the investment in offshore energy generation infrastructure, ultimately contributing to lower energy prices.

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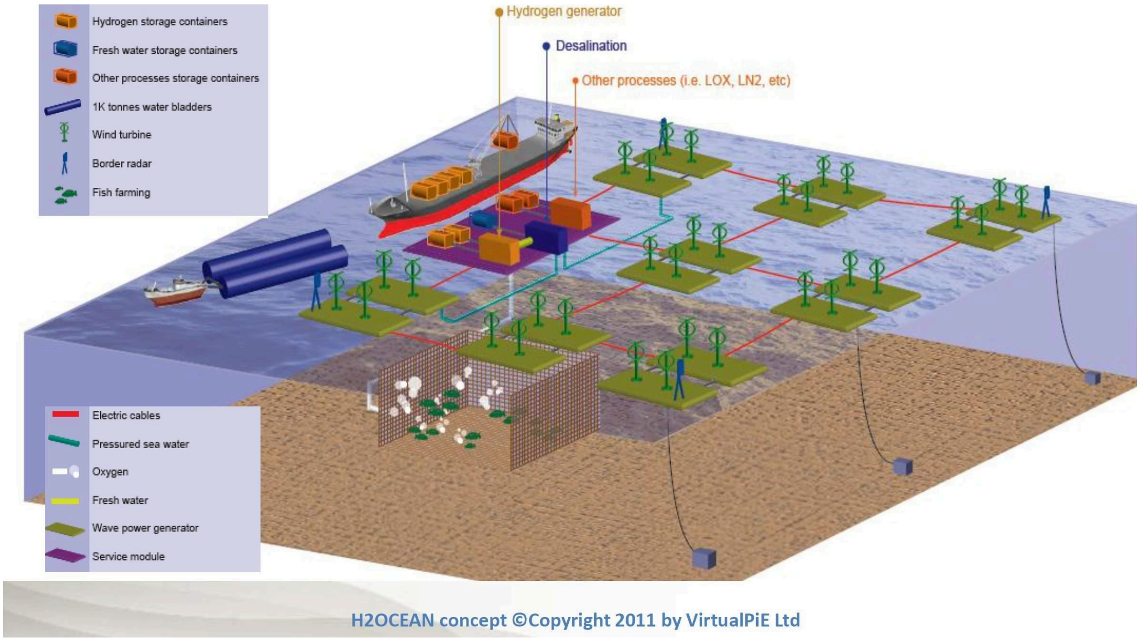

Fig 16 - H2Ocean project outline

MARIBE

MARIBE, a Horizon 2020 project, is dedicated to unlocking the vast potential of multi-use offshore space within the Blue Economy. MARIBE´s mission is to investigate and promote Blue Economy cooperative opportunities, including partnerships and joint ventures, among companies operating within the four core BG sectors. This endeavour seeks to advance these companies and their respective sectors while simultaneously encouraging the multi-use of offshore space in the Blue Economy. The four key BG sectors under examination are Marine Renewable Energy, Aquaculture, Marine Biotechnology, and Seabed Mining.

MARIBE extends its reach to encompass the Transatlantic Ocean Research Alliance and the Galway Statement, conducting comprehensive reviews across the three European basins: Atlantic, Mediterranean, Baltic, and the Caribbean Basin.

The project kicks off with an evaluation of the existing Blue Growth economy, conducting a socio-economic study across various Blue Growth sectors. This study includes mapping existing business models using best practice methodologies, taking into consideration their intricate value chains. Moreover, MARIBE identifies technical and non-technical challenges within these businesses and provides proposals for their resolution. Additionally, the project assesses key FP7 projects focusing on multi-use of space and multi-use platforms.

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Drawing insights from this comprehensive study, the consortium identifies opportunities for synergistic collaboration. A total of 24 sectoral combinations are examined, with 12 of them showing high potential for further development. To realize this potential, MARIBE collaborates with select EU-funded consortia, particularly those involved in the Oceans of Tomorrow projects, to nurture cross-sectoral projects. Furthermore, the project collaborates with various academic and industry partners to develop projects within five additional sectoral combinations that hold promise for synergistic collaboration. MARIBE's partners actively facilitate collaboration, forging partnerships when necessary, and assisting in the formulation of business and implementation plans needed to secure investment for these 12 projects.

UNITED

The UNITED project, acronym for multi-use offshore platforms demonstrators for boosting cost-effective and Eco-friendly production in sustainable marine activities, operates within the timeframe of 2020 to 2023. This project aimed to validate the feasibility of ocean multi-use through the development of five demonstration pilots in the European marine environment. Key objectives of UNITED included:

- Addressing current bottlenecks in large-scale ocean multi-use installations.
- Demonstrating the business synergies and benefits derived from ocean multi-use.
- Providing a roadmap for future deployment in multi-use sites, while addressing potential scaling barriers through best practices and lessons learned.

UNITED tempted to enhance the technology readiness levels of multi-use solutions by engaging industrial actors and integrating knowledge, technologies, and facilities. Additionally, it developed business models with the goal of reducing operation costs and generating benefits across all the involved sectors.

Demonstrations of the UNITED pilots to test the capacity of the Blue Economy within European waters, increased efficiency, and multi-functionality among traditionally competing interests in these sectors.

ULTFARMS

The ULTFARMS initiative stands to enhance ocean multi-use projects, with the aim to strength Europe's capacity for low-trophic aquaculture through efficient marine space utilization. With a focus on offshore aquaculture enhancement, ULTFARMS endeavours to develop innovative engineering, technical, ecological, and biological processes to optimize production in challenging offshore conditions and low-salinity environments.

Integral to ULTFARMS is the integration of Low-Trophic Aquaculture (LTA) systems within Offshore Wind Farms (OWFs), ensuring the delivery of environmentally responsible, low-carbon, and safe LTA products from conception to market. Through the implementation of novel cultivation structures, advanced grow-out systems, and eco-friendly design measures, ULTFARMS represents a significant stride forward in sustainable offshore aquaculture development.

ULTFARMS focuses on six Low-Trophic Aquaculture Pilots (LTAPs) distributed across various regions in the North and Baltic Seas. These LTAPs include Belgium-Belwind (Seaweed-Mussels-Oysters), the Netherlands-Borssele (Mussels), Germany-FINO2 (Seaweed) & FINO3 (Seaweed-Mussels-Oysters), and Denmark-Anholt Offshore Wind Farm (Seaweed-Mussels) & Samsø (Seaweed-Mussels). Collaboration between research and industry in the co-development and co-management of these LTAPs will result in bespoke designs and operations tailored to offshore conditions. Explore the map pins for detailed information on individual pilots.

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ANNEX 3: TARGET MARKET MATRIX ANALYSIS

SPAIN

Regulations (4): Spain's *Plan de Ordenación del Espacio Marítimo* ((I. DISPOSICIONES GENERALES MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO, n.d.)), updated in 2023, delineates marine zones for offshore wind (targeting 3 GW by 2030) and aquaculture, providing a clear framework. The *Strategic Plan for Spanish Aquaculture 2021-2030 (Plan Estrategico Plurianual de La Acuicultura Española, n.d.)* supports offshore expansion, though multi-use permissions require specific applications, adding complexity but not prohibitive barriers. Grid connection procedures via Red Eléctrica Española (REE) are well-regulated, facilitating integration.

Financial incentives (3): Horizon Europe and Centro para el Desarrollo Tecnológico Industrial (CDTI) grants support R&D and deployment, though not specific to multi-use. National recovery funds allocate ~€1.5B for renewables, with aquaculture eligible under sustainability criteria, but direct subsidies are limited.

Infrastructure & Logistics (4): Spain boasts robust shipyards and skilled labor, with REE upgrading grid capacity, REE's 2021–2026 transmission plan foresees significant reinforcements in Galicia and Andalusia to integrate new renewable capacity, with 2024 reports highlighting continued grid investments and expansion of transmission assets(EC, 2025).. However, heavy lifting capacity for large FOW platforms remains regionally constrained, requiring imports or upgrades.

Conflicts of Use (3): POEM (I. DISPOSICIONES GENERALES MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO, n.d.) zones avoid fishing areas, but overlaps with professional fisheries (e.g., Galicia's mussel farms) and yachting/leisure activities necessitate negotiations. Multi-use is not explicitly prioritized, requiring case-by-case approvals, posing moderate conflict risks.

Environmental issues (3): Designated FOW and aquaculture zones sidestep Natura 2000 areas (e.g., Mediterranean coast), but Spain's rich underwater ecosystems (e.g., Posidonia meadows) demand advanced environmental impact assessments (EIAs) [(I. DISPOSICIONES GENERALES MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO, n.d.). Risks are manageable with mitigation.

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Fig 17 - Red Natura and offshore wind areas

Public perception (3): Concerns over electricity costs and visual impacts persist, though acceptance grows with renewable energy awareness (e.g., 74% support in 2023 surveys) (Ellis et al., 2016) Fears of foreign dominance in projects linger, requiring local engagement.

CANARY ISLANDS

Regulations (4): POEM applies, with the Canary Islands' ultraperipheral status enhancing aquaculture frameworks (e.g., Plan Estratégico de Acuicultura Canaria) The Zona Especial Canaria (ZEC) tax regime simplifies permitting, though multi-use still requires bespoke approvals.

Financial Incentives (4): Beyond Horizon Europe, FEDER funds (~€500M for 2021-2027) and ZEC tax breaks (e.g., 4% corporate tax vs. 25% mainland) offer significant support. Regional plans allocate €50M+ for marine renewables, boosting AQUAWIND's appeal.

Infrastructure & Logistics (3): Shipyards (e.g., ASTICAN) and labour are capable, but limited heavy lifting (e.g., cranes >500T scarce) and construction space constrain scalability [PLOCAN, 2024]. REE's grid upgrades (e.g., 200 MW added by 2025) support deployment.

Conflicts of Use (3): Fisheries (e.g., tuna fleets) and tourism (e.g., yachting) compete with designated zones, though multi-use potential is recognized in regional strategies [GAC Canarias, 2023]. Special permissions mitigate moderate conflicts.

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Environmental Issues (4): Avoidance of Natura 2000 zones is prioritized, but the islands' biodiversity (e.g., cetaceans, seabirds) requires rigorous EIAs and monitoring (e.g., PLOCAN studies) [SEO/BirdLife, 2024]. Higher scrutiny elevates this rating.

Public Perception (3): Like the mainland, cost and visual concerns exist, but local job creation (e.g., AQUAWIND's pilot) fosters support (68% favour renewables) [Gobierno de Canarias, 2023]. Regional identity drives demand for local involvement. The selected areas for floating offshore wind and aquaculture have been identified out of protected areas seen in red NATURA 2000.

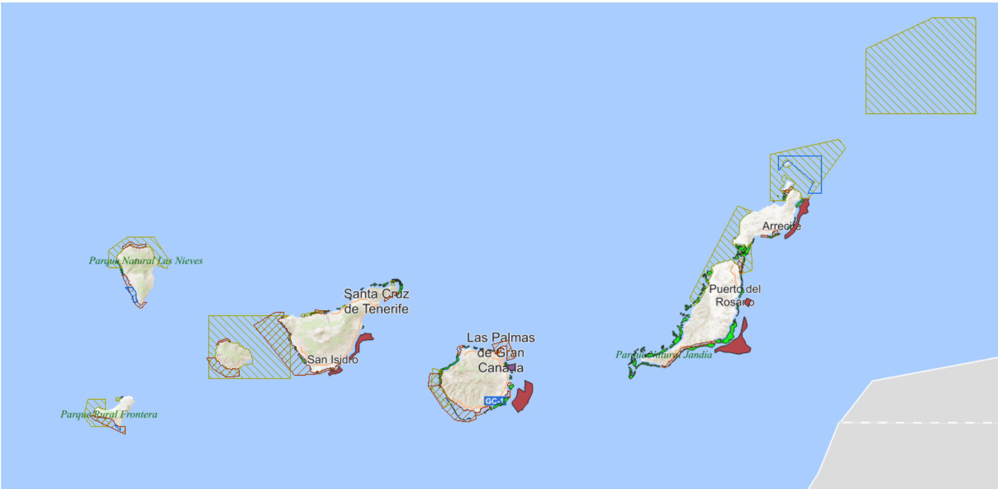

Fig 118 - Red Natura 2000 and offshore wind and aquaculture areas in the Canary Islands

PORTUGAL

Regulations (3): The *Plano de Situação do Ordenamento do Espaço Marítimo* (PSOEM) designates areas for FOW (e.g., 2 GW by 2030), but the TUPEM application process for multi-use is stalled pending a new tender framework [DGRM, 2024]. Aquaculture is regulated separately, creating uncertainty.

Financial Incentives (3): Horizon Europe and Instituto de Desenvolvimento Empresarial (IDE) offer grants (~€100M for renewables), with tax reductions for developers, though not multi-use-specific [EC, 2024]. Funding is moderate but accessible.

Infrastructure & Logistics (3): Shipyards (e.g., Lisnave) and skilled labour are adequate, but limited heavy lifting and fabrication capacity bottleneck large-scale FOW [WavEC, 2024]. Grid upgrades by Redes Energéticas Nacionais (REN) progress slowly (~1 GW by 2025).

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Conflicts of Use (3): Fisheries, yachting, and tourism (e.g., Algarve coast) overlap with PSOEM zones, with multi-use not yet streamlined, posing moderate risks [DGRM, 2024]. Stakeholder negotiations are key.

Environmental Issues (3): Natura 2000 zones are avoided, but coastal ecosystems (e.g., Ria Formosa) require EIAs [ICNF, 2024]. Impacts are manageable with standard mitigation. The TUPEM and Red Natura areas are shown in Figure 10.

Public Perception (3): Cost, visual impacts, and tech scepticism persist (65% renewable support), with calls for local jobs amplifying public discourse [Eurobarometer, 2023].

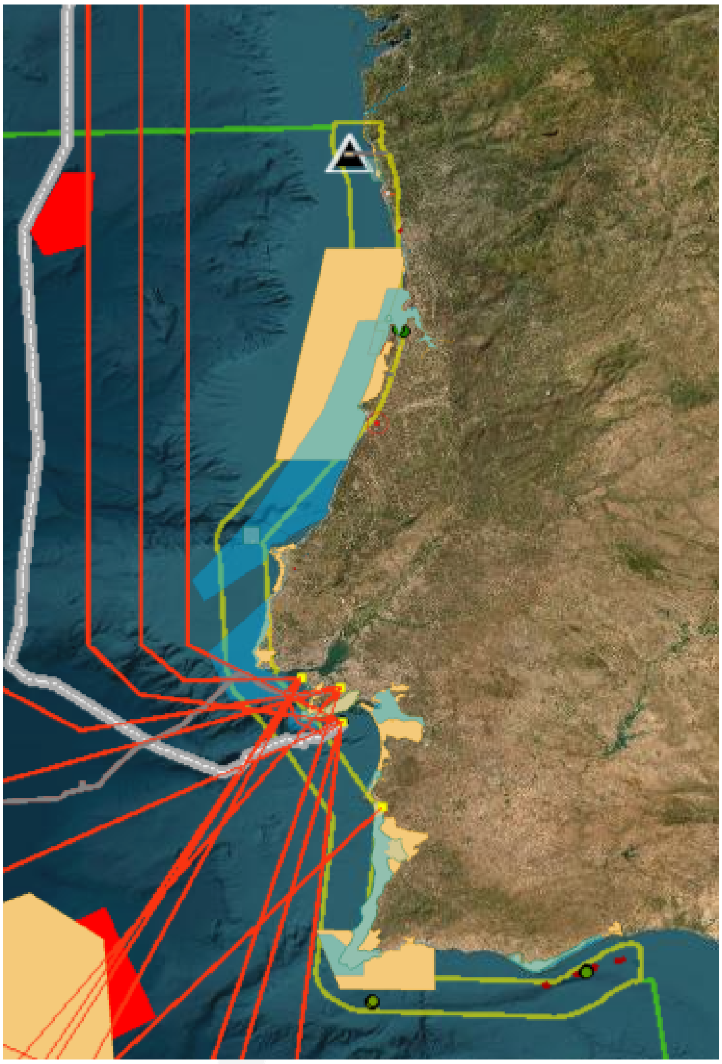

Fig 19 - Rede Natura and TUPEM areas for offshore wind and aquaculture areas in Portugal (Fuente Visor DGRM – PSOEM https://n9.cl/31d8s)

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MADEIRA AND AZORES

Regulations (3): PSOEM governs, with TUPEM delays affecting multi-use clarity (PSOEM, 2019). Ultraperipheral status adds flexibility, but aquaculture frameworks lack behind mainland standards.

Financial Incentives (4): Horizon Europe, IDE, and ultraperipheral tax benefits (e.g., reduced VAT) provide strong support. Regional autonomy enhances funding potential.

Infrastructure & Logistics (2): Limited shipyards, heavy lifting, and skilled labour hinder scalability]. Island isolation increases logistics costs, lowering this rating.

Conflicts of Use (4): Significant fisheries (e.g., Azores' tuna), tourism, and intercontinental cable zones (e.g., Azores' UN strategic areas) create high conflict potential (PSOEM, 2019). Multi-use requires careful zoning.

Environmental Issues (4): Natura 2000, and cetacean-rich waters demand extensive EIAs (EUROBAROMETER, 2023). High biodiversity elevates environmental scrutiny.

Public Perception (3): Cost and visual concerns mirror mainland trends, with local job emphasis strong (70% renewable support) (EUROBAROMETER, 2023).

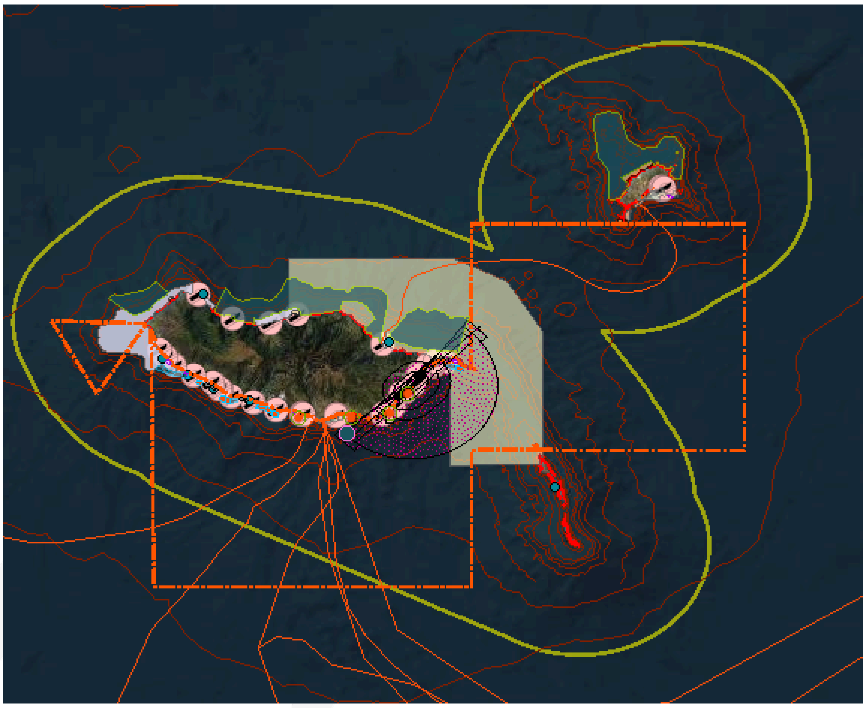

Fig 2012 - Madeira and Porto Santo PSOEM and Rede Natura 2000

Fig 21 - Azores PSOEM and Rede Natura 2000

FRANCE

Regulations (4): The Offshore Wind Pact (2022), signed by government and industry, sets clear targets of 18 GW by 2035 and 40 GW by 2050, along with designated floating offshore wind zones (Ministère de la Transition Énergétique, 2022). Aquaculture in France is governed under Law No. 97-1051 on maritime fisheries and mariculture; multi-use integration within offshore areas remains to be explicitly defined under this legal framework [Loi No. 97-1051, 1997].

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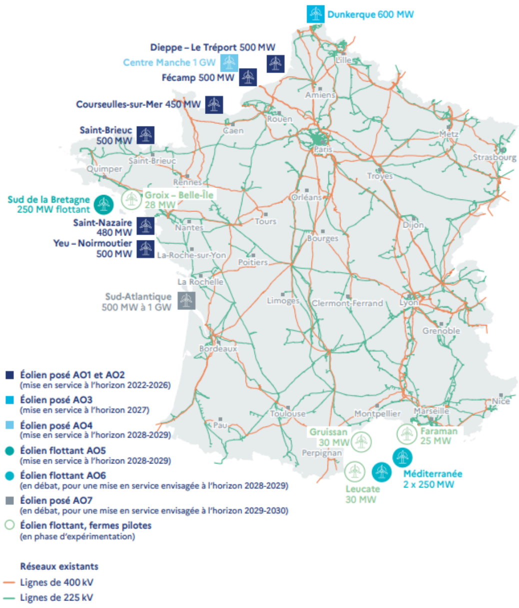

Fig 22 - Offshore wind projects plans in France

Financial Incentives (3): Contracts for Difference (CfDs) replace FiTs, offering market-based premiums (e.g., €86.5/MWh for A05), but direct subsidies are absent [EDF, 2024]. Horizon Europe adds ~€50M for multi-use R&D.

Infrastructure & Logistics (3): Skilled labor and ports (e.g., Brest) exist, but shipyard capacity for FOW is limited, and heavy lifting relies on imports. Grid upgrades lag slightly.

Conflicts of Use (3): Fisheries agreements (e.g., Brittany) and tourism overlap with wind zones, though multi-use is encouraged. Moderate conflicts are negotiable.

Environmental Issues (3): Some zones overlap Natura 2000 (e.g., South France bird habitats), requiring EIAs. Impacts are moderate with mitigation.

Public Perception (3): Cost and visual fears persist (68% renewable support), with local job concerns notable (EUROBAROMETER, 2023).

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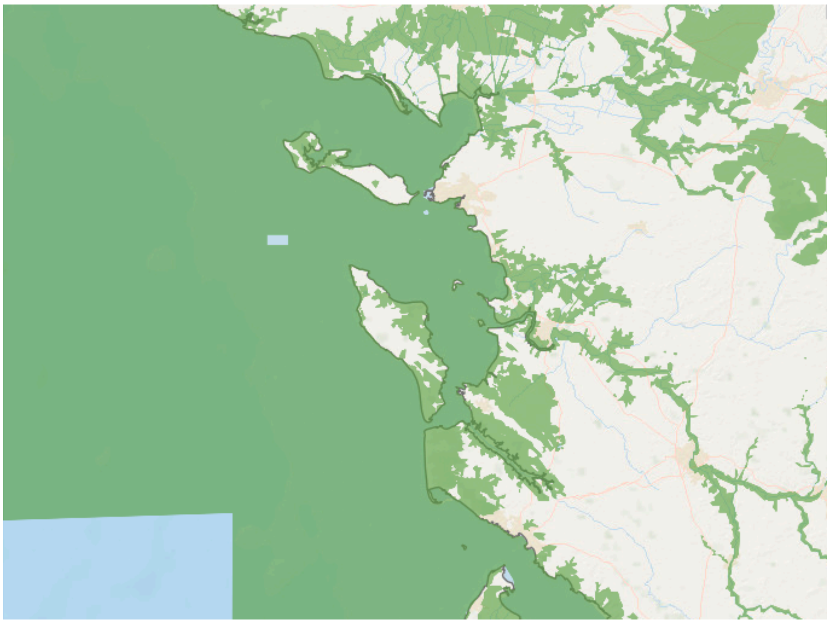

Fig 23 - Selected area for floating offshore wind in South France (Via Red Natura 2000 viewer)

UNITED KINGDOM

Regulations (5): Robust frameworks (e.g., CfDs, Renewable Obligation) support 50 GW offshore by 2030, with H1 2024 awarding 5.3 GW(Windeurope.Org Windeurope.Org WindEurope Market Intelligence, 2023) Multi-use requires specific permissions, but clarity is high.

Financial Incentives (4): The UK government's Contracts for Difference (CfD) round 7 (AR7) raised maximum guaranteed prices: floating offshore wind up to £194/MWh and fixed offshore wind around £81/MWh (in 2012 prices) to reflect rising project costs. These updated administrative strike prices support your line on up-to-date financial incentives (Desnz, 2024). £31.6 million Floating Wind Demonstration Funding
BEIS provided £31.6 million in grants for innovative floating offshore wind technologies via the Floating Offshore Wind Demonstration Programme (UKGOV, 2022).

Infrastructure & Logistics (4): The historic Harland & Wolff yard in Belfast, critical for shipbuilding infrastructure, has been acquired by Navantia UK and is undergoing upgrades to enhance UK marine engineering capacity a boost for offshore wind logistics (MarineLog, 2025). Regarding grid upgrades & capacity enhancements, the national grid has launched an £8 billion Electricity Transmission Partnership to upgrade and expand transmission capacity across Great Britain, in line with offshore wind growth (National Grid, 2025).

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Conflicts of Use (3): Fisheries and leisure overlap with wind farms (e.g., North Sea), with multi-use not prioritized, posing moderate conflict (Szostek et al., 2025).

Environmental Issues (2): No Natura 2000 constraints; impacts (e.g., seabirds) are minimal with mitigation (JNCC, 2015). Low environmental hurdles boost this rating**.**

Public Perception (2): High renewable acceptance (80%) focuses on cost over visual impact (UKGOV, 2024) easing deployment.

IRELAND

Regulations (3): Targets include 5 GW operational by 2030 and an additional 2 GW of non-grid/off-grid capability by 2030, with **up to ~900 MW** to be procured on the South Coast under *Tonn Nua*, while detailed multi-use frameworks are still emerging (SEAI, 2024).

Financial Incentives (2): No direct subsidies; reliance on EU funds (e.g., Horizon) limits support (BVG Associates, 2024)("Ireland Will Miss Its 5 GW Offshore Wind Target by 2030, Industry Calls for Urgent Political Action," 2025)

Infrastructure & Logistics (2): Limited shipyards and heavy lifting capacity, with grid upgrades slow.

Conflicts of Use (3): Fisheries and multi-use potential coexist, but zoning clarity is pending (BVG Associates, 2024). Moderate conflict anticipated.

Environmental Issues (3): Habitat directives (e.g., Natura 2000) require EIAs, with manageable impacts(BVG Associates, 2024).

Public Perception (2): Strong renewable support (75%) focuses on cost and visual concerns

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Fig 24 - Natura 2000 areas

NETHERLANDS

Regulations (4): e Netherlands awarded 4 GW of floating offshore wind permits in mid-2024, assessed via non-price criteria prioritizing ecological protection and system integration—showing a supportive regulatory framework for multi-use deployment

Financial Incentives (2): While there's no direct subsidy for multi-use, RVO continues to administer broad EU-linked funding, including significant SME support under the REPowerEU umbrella.

Infrastructure & Logistics (4): Top-tier shipyards like **Damen** and efficient ports provide solid support for offshore wind assembly and deployment, though strain on heavy-lift and fabrication capabilities remains a consideration.

Conflicts of Use (2): With ecological design embedded into tender scoring (e.g., reef installations), multi-use planning is enabled, reducing potential conflict with fisheries.

Environmental Issues (2): Environmental impacts are mitigated via bird-safe setbacks and reef integration in tender design, maintaining a low-barrier environment for development.

Public Perception (2): With **nearly half of electricity** generated from renewables in 2023, Dutch support for green energy is strong—where cost remains more significant

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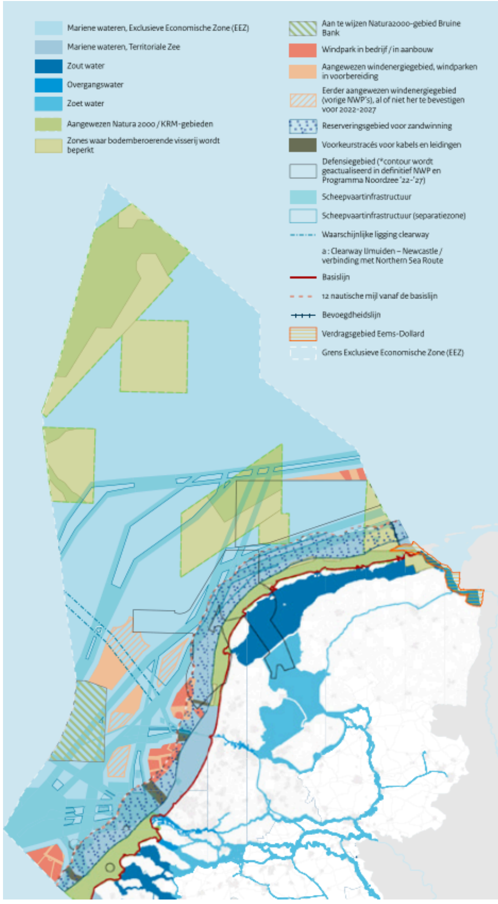

Fig 2513 - Offshore wind area development coloured in red (Dutch Gov., 2022)

JAPAN

Regulations (4): Japan targets 10 GW of offshore wind by 2030 and up to 45 GW by 2040, including floating offshore wind, per METI's Vision and government goals. Multi-use planning is emerging but not yet fully defined.

Financial Incentives (3): While no direct subsidies are specific to multi-use, the ¥2 trillion Green Innovation Fund established by METI supports R&D, demonstrations, and deployment of FOW technologies.

Infrastructure & Logistics (3): Japan benefits from capable shipyards such as Japan Marine United, and is preparing specialized floating wind vessels for deployment, although deep-water requirements impose scaling limits.

Conflicts of Use (3): Fisheries interests overlap with wind zones, requiring coordinated planning and compensation frameworks that indicate moderate conflict potential (Ángeles Gallar & Miguel Hernandez, 2025).

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Environmental Issues (3): FOW's deep-water location reduces coastal impact, but offshore projects above 10 MW still require comprehensive EIAs, which are complex and lengthy under current legislation (Hogan Lovells, 2017).

Public Perception (3): Public support for renewable and zero-emission energy is strong in Japan, with over 70% of the population in favour though concerns about visual and environmental impacts remain.

KOREA

Regulations (3): South Korea's emerging FOW framework includes planned tenders for floating and fixed bottom wind total of 1.25 GW during the next auction cycle, reflecting a phased build-up toward 2.3 GW by 2027.

Financial Incentives (3): METI's broader R&D initiative allocates 1 trillion won (USD 750 million) to pioneering energy technologies—including multi-use or offshore wind—though direct subsidies for multi-use remain limited.

Infrastructure & Logistics (3): South Korea has strong offshore fabrication capability, with HD Hyundai Heavy Industries manufacturing platforms, substations, and substructures, positioning Korea as a high-capacity producer, though scaling deep-water operations remains a challenge.

Conflicts of Use (3): Fisheries have opposed some offshore zones, especially around Ulsan, but new legal structures—like the OSW Promotion Act—allow the designation of integrated power generation zones, suggesting multi-use planning may be enabled over time.

Environmental Issues (3): Offshore wind projects are subject to rigorous EIAs under Korean law, including full-year ecosystem surveys and stakeholder consultations, adding predictability but also processing time.

Public Perception (3): Public support for renewable energy is growing under the Renewable Energy 3020 Plan, though concerns persist over costs—indicating moderate but rising acceptance of offshore technologies.

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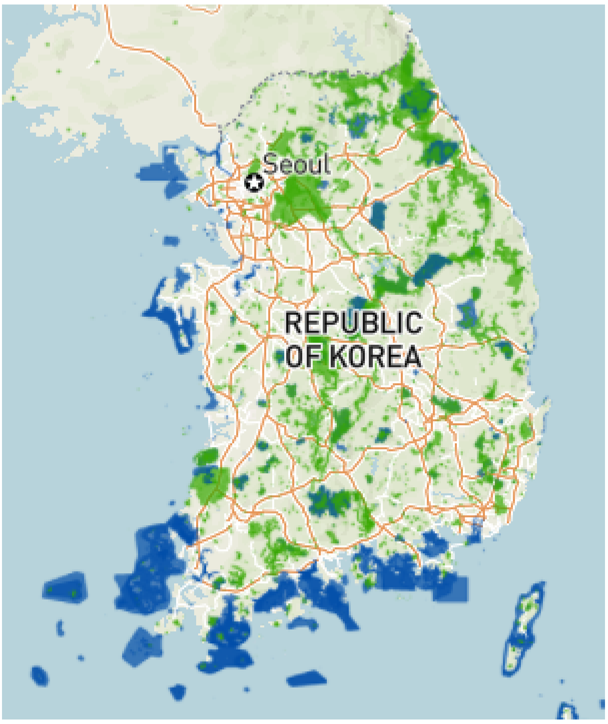

Fig 26 - Protected areas in Korea

CHINA

Regulations (5): China aims to add approximately 64 GW of offshore wind by 2027, per GWEC forecasts, while provincial frameworks like Guangdong's pricing-parity subsidies and renewable portfolio systems support integrative planning. Multi-use (e.g. combining aquaculture) is feasible under these policies.

Financial Incentives (3): National FITs have been phased out, replaced by local/regional subsidy schemes for example, in Guangdongoffering, indirect financial support for deployment.

Infrastructure & Logistics (5): With world-class shipyards such as COSCO Nantong and CSIC, China possesses strong offshore wind supply chain capabilities that facilitate rapid project scaling.

Conflicts of Use (3): Offshore wind zoning policy excludes fishing-intensive areas, showing recognition of fisheries competition and protecting zones while enabling multi-use planning.

Environmental Issues (3): Coastal pollution and biodiversity require EIAs, but impacts are manageable.

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Public Perception (2): lean energy (wind, solar, transmission) now contributes over 10% of GDP, underscoring strong societal and governmental support for energy transition (Lauri Myllyvirta, 2024) .

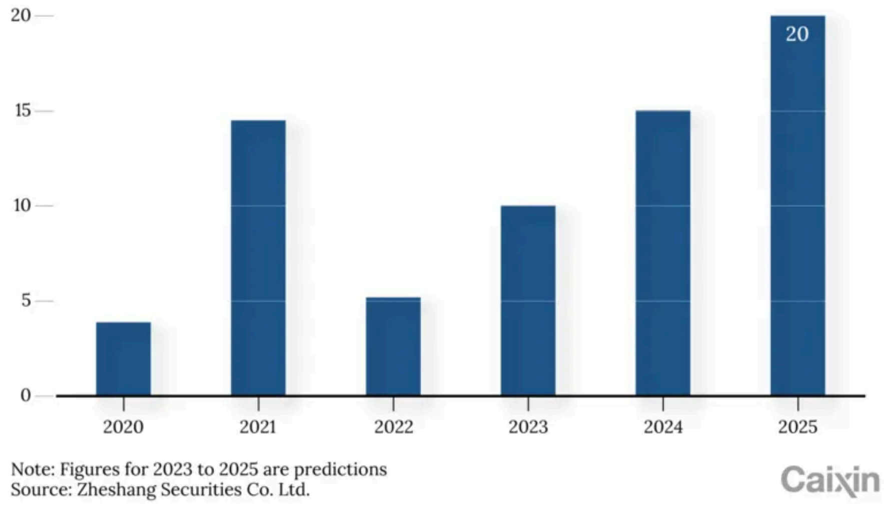

Fig 27 - Productions for offshore wind Installations in China

Fig 28 - Protected areas in China

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ANNEX 4: BUSINESS MODEL CANVAS (FULL DESCRIPTION)

KEY PARTNERS

Wind Turbine Manufacturers play an essential for providing state-of-the-art floating wind turbines optimized for multi-use platforms. These manufacturers collaborate closely with AQUAWIND to design and develop turbines that maximize energy efficiency while minimizing disturbances to aquaculture activities.

Shipyards will be crucial partners in the construction, assembly and maintenance of the floating platforms. Their expertise in large-scale marine structures will be vital for building the integrated wind and aquaculture facilities.

EPCIs (Engineering, Procurement, Construction, and Installation companies) will be responsible for overseeing the full lifecycle of AQUAWIND, from initial design to final deployment. Their multidisciplinary expertise ensures seamless integration of wind energy and aquaculture operations while meeting environmental and regulatory requirements.

Corporate Investors will be key funding sources for project scalability. Investors may include energy companies diversifying into renewables or agribusinesses seeking sustainable seafood production.

Venture Capital Investors will support early-stage development and innovative technologies, drawn by the potential of integrating two high-growth sectors—renewable energy and aquaculture.

Heavy Lifting Companies handle the transportation and installation of large components, such as wind turbine blades and aquaculture cages, ensuring a smooth offshore deployment process.

Engineering Companies contribute to the design and structural optimization of the platform to ensure stability, durability, and optimal operational efficiency in harsh marine environments.

Cable Handling Companies which manage the installation and maintenance of undersea cables to connect turbines to the grid while ensuring minimal interference with aquaculture systems.

Marine Operation Companies offer logistical support for deployment, maintenance, and operational management of the floating platforms, ensuring smooth day-to-day functionality.

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Certification Institutions validate safety, quality, and compliance with industry standards, essential for regulatory approval and investor confidence.

Research Institutions (Renewable Energy, Aquaculture, Marine Biology) whom support ongoing innovation, optimizing the synergy between wind energy and aquaculture while ensuring environmental sustainability.

Government Investment Agencies (Energy, Agriculture, Environmental) provide funding, regulatory support, and incentives to align AQUAWIND with national renewable energy and sustainable aquaculture goals.

Aquaculture Equipment Suppliers will supply specialized gear, including fish cages, feeding systems, and monitoring tools, ensuring efficiency and scalability of aquaculture production.

Local Fisheries & Fish Sale Companies Will Integrate AQUAWIND's aquaculture yields into existing seafood markets, ensuring sustainable and commercially viable fish production.

Value Propositions:

Sustainable Offshore Energy Generation where AQUAWIND harnesses advanced floating wind turbine technology to generate clean, renewable energy in deep-sea locations where wind resources are more stable and powerful. This approach enhances energy efficiency, reduces reliance on fossil fuels, and contributes to the EU's renewable energy targets and decarbonization goals.

Integrated Offshore Aquaculture by combining offshore wind energy with sustainable fish farming, AQUAWIND minimizes the need for coastal land use and reduces environmental pressures on near-shore ecosystems. The platform creates a controlled and eco-friendly aquaculture environment, ensuring high-quality seafood production while maintaining marine biodiversity.

Optimized Energy Efficiency for Aquaculture from using offshore wind turbines installed on AQUAWIND platforms, directly supply energy to the integrated aquaculture systems, reducing the need for additional undersea cabling and onshore power infrastructure. This self-sufficient energy model lowers operational costs and enhances the sustainability of offshore fish production.

Maximized Marine Space Utilization by co-locating energy production and aquaculture operations, AQUAWIND optimizes the use of limited marine space while addressing the growing challenge of spatial competition in offshore environments. This integrated

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approach reduces infrastructure redundancy, promotes multi-use synergies, and aligns with EU policies on sustainable blue economy development.

Economic & Environmental Synergies where AQUAWIND merges two high-value industries—renewable energy and aquaculture—into a single, efficient platform, reducing capital and operational costs while diversifying revenue streams. The system also enhances marine biodiversity by allowing organic nutrient recycling, creating a healthier and more balanced ecosystem around the platform.

Reduced Visual & Environmental Impact located offshore, AQUAWIND minimizes visual disruption compared to near-shore wind farms, addressing public concerns about coastal aesthetics. Additionally, by consolidating multiple operations into a single offshore location, the project reduces marine habitat disturbance, aligning with EU environmental protection objectives.

Advanced Engineering & Infrastructure Design AQUAWIND features a innovative floating platform specifically designed to withstand extreme offshore conditions while ensuring the stability and efficiency of both energy production and aquaculture operations. The platform incorporates innovative mooring systems, reinforced foundations, and optimized electrical installations, ensuring long-term resilience and operational reliability.

Market-Ready, High-Quality Seafood Production as the offshore aquaculture component of AQUAWIND supports responsible fish farming practices, producing premium-quality, traceable seafood that meets the growing demand for sustainably farmed fish in European and global markets. By integrating fish farming into a renewable energy infrastructure, the project enhances food security while reducing the environmental footprint of traditional aquaculture.

Collaboration & Innovation Opportunities AQUAWIND empowers strong partnerships between renewable energy developers, aquaculture operators, government agencies, and research institutions, driving technological advancements in offshore multi-use platforms. The project serves as a model for future sustainable ocean development, facilitating knowledge exchange and accelerating the transition to a circular blue economy.

Financial Resilience & Multiple Revenue Streams by combining wind energy generation, aquaculture production, licensing opportunities, and environmental incentives, AQUAWIND creates a diversified and stable financial model that reduces investment risks. This approach attracts renewable energy investors, venture capital firms, and corporate partners, ensuring long-term economic viability.

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Channels:

Direct Sales and Partnerships with Offshore Wind and Aquaculture Developers AQUAWIND establishes direct collaborations with offshore wind energy and aquaculture operators seeking integrated multi-use platforms. Through customized solutions and joint venture agreements, the project ensures a tailored approach to meet industry-specific requirements, fostering long-term business relationships and seamless technology adoption.

Government Bidding Processes for Renewable Energy Projects AQUAWIND participates in public tenders and funding programs at both the national and European levels, securing contracts that align with governmental offshore energy expansion plans, aquaculture policies, and sustainable blue economy initiatives. This channel is essential for ensuring regulatory alignment, funding support, and large-scale project deployment.

Seafood Distribution to Local and European Markets the aquaculture component of AQUAWIND supplies high-quality, sustainably farmed fish to domestic and international seafood markets. This involves wholesale partnerships, direct supply agreements with major retailers, and collaborations with seafood distributors to ensure efficient market penetration and meet the growing demand for sustainably sourced seafood.

Social Media and Digital Outreach for Dissemination and Stakeholder Engagement AQUAWIND leverages social media platforms, industry forums, and digital content marketing to raise awareness, engage stakeholders, and attract potential investors. Platforms such as LinkedIn, Twitter, and industry-specific online communities serve as key tools for knowledge sharing, first-contact networking, and brand positioning within the renewable energy and aquaculture sectors.

Participation in Industry Conferences and Blue Economy Events will actively engage in offshore energy and aquaculture industry events, trade fairs, and EU-funded project showcases to present its multi-use platform to investors, policymakers, and key industry players. Participation in these forums enhances market visibility, fosters strategic partnerships, and positions the project as a leading innovation in the sustainable marine economy.

Targeted Marketing and Online Campaigns for Sustainable Seafood Promotion were deploying digital marketing strategies, online advertising, and content-driven campaigns to promote sustainably farmed seafood from its integrated offshore aquaculture system. Through educational content, traceability initiatives, and

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consumer engagement, the project ensures that responsible aquaculture practices reach environmentally conscious consumers and premium seafood markets.

Strategic Partnerships with Research Institutions and Certification Bodies AQUAWIND collaborates with universities, research centres, and regulatory agencies to validate its technological advancements, sustainability impact, and compliance with EU standards. This channel ensures scientific credibility, supports policy recommendations, and enhances investor confidence in the project's long-term viability.

Customer Relationships

Consultative Solutions for Tailored Offshore Integration AQUAWIND works closely with developers in both the offshore wind and aquaculture sectors to design solutions adapted to specific site conditions, regulatory requirements, and operational needs. This consultative approach ensures that each deployment is optimized for energy efficiency, aquaculture productivity, and environmental sustainability.

Ongoing Support for Wind Platform Operation and Maintenance AQUAWIND provides continuous operational assistance, performance monitoring, and technical support to ensure the reliability of its floating wind energy and aquaculture systems. By offering proactive maintenance services and remote diagnostics, the project helps partners maximize uptime, optimize energy output, and reduce long-term operational costs.

Regulatory Compliance and Reporting Assistance: Navigating regulatory requirements is complex, especially for multi-use offshore projects. AQUAWIND builds strong relationships with customers by offering comprehensive regulatory compliance and reporting assistance. This includes helping clients understand and meet legal obligations related to both energy production and aquaculture operations, as well as preparing and submitting necessary documentation to authorities. This support reduces the administrative burden on customers and ensures that projects remain compliant and smoothly operational.

Integration into Energy Markets through Coordination with Regulators and DSOs in regulated electricity markets, AQUAWIND establishes strong working relationships with energy regulators and Distribution System Operators (DSOs) to ensure the smooth integration of wind-generated electricity into national and regional grids. These partnerships facilitate power purchase agreements, grid balancing, and compliance with energy market regulations.

Direct Engagement with End Users to Promote Multi-Use Platforms (MUPs) AQUAWIND actively engages with energy consumers, seafood buyers, environmental

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organizations, and investors to promote the benefits of multi-use offshore platforms. Through targeted outreach initiatives, industry collaboration, and transparent reporting on project performance, the project strengthens public awareness, investor trust, and sector-wide adoption of integrated offshore solutions.

Key Resources

Intellectual Property (IP) AQUAWIND leverages proprietary platform designs, engineering patents, and innovative offshore technologies to optimize the structural integrity, efficiency, and multi-functionality of its floating wind and aquaculture systems. These intellectual assets provide a competitive advantage, ensuring scalability and future licensing opportunities.

Advanced Offshore Engineering & Structural Design Expertise the success of AQUAWIND is built on cutting-edge offshore engineering capabilities, enabling the development of durable, storm-resistant floating platforms that can support both large-scale wind turbines and aquaculture operations. This expertise ensures that the platform can withstand extreme marine conditions while maintaining operational stability and efficiency.

Renewable Energy & Offshore Wind Expertise the project brings together specialists in wind turbine technology, energy production, and offshore grid integration, ensuring that AQUAWIND's floating turbines are optimized for deep-sea wind conditions. These experts work on maximizing power output, improving energy efficiency, and enhancing reliability in offshore environments.

Offshore Aquaculture Know-How, the integration of aquaculture into an offshore wind platform requires specialized expertise in fish farming, aquatic ecosystem management, and sustainable seafood production. AQUAWIND consortium employs marine biologists, aquaculture engineers, and fisheries experts to ensure that the system supports fish health, maximizes yield, and minimizes ecological impact.

Fabrication & Assembly Infrastructure for Floating Platforms AQUAWIND partners with specialized shipyards and marine fabrication facilities to manufacture and assemble its floating platforms. These facilities provide the necessary scale, precision, and expertise to ensure that the platforms meet high safety and performance standards.

Logistics & Offshore Deployment Capabilities, the project requires specialized logistical expertise for transporting, installing, and maintaining offshore infrastructure. This includes heavy-lifting operations, subsea cable installation, and remote

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maintenance solutions, ensuring efficient deployment and long-term operational stability.

Highly Skilled Workforce in Engineering, Operations, and Maintenance AQUAWIND relies on a multidisciplinary team of engineers, offshore technicians, aquaculture specialists, and energy system operators. This skilled workforce ensures the successful integration of wind energy and aquaculture, while also maintaining high safety and operational performance standards.

Regulatory & Environmental Compliance Frameworks, given the complex regulatory landscape for offshore projects, AQUAWIND integrates environmental impact assessment teams, legal consultants, and compliance specialists to ensure that all operations align with EU sustainability goals, marine conservation policies, and offshore energy regulations.

Project Development & Investment Expertise, the financial viability of AQUAWIND depends on strategic project planning, investment structuring, and risk management. The project benefits from experts in renewable energy financing, venture capital, and government funding programs, ensuring long-term financial sustainability.

Key Activities

Design and Manufacturing of Multi-Use Floating Platforms, AQUAWIND develops innovative, site-adapted floating platforms that support both wind turbines and aquaculture infrastructure. This process involves advanced structural engineering, material selection, and marine durability testing to ensure that the platforms are efficient, safe, and long-lasting in offshore conditions.

Installation, Deployment, and Mooring of Offshore Infrastructure, the successful implementation of AQUAWIND requires careful planning and execution of offshore platform deployment. This includes transporting wind turbines and aquaculture modules, securing mooring systems, and ensuring precise anchoring in deep-sea locations, all while minimizing environmental disruption.

Offshore Wind Power Generation and Grid Integration, AQUAWIND ensures that the energy produced by its floating wind turbines is efficiently transmitted and integrated into regional and national power grids. This involves power conversion, storage optimization, and grid compliance management, guaranteeing stable and scalable renewable energy delivery.

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Sustainable Offshore Aquaculture Operations, AQUAWIND manages fish stocking, feeding, monitoring, and harvesting within its offshore aquaculture system. The project optimizes fish health and production efficiency, ensuring that seafood is traceable, high-quality, and sustainably farmed while minimizing environmental impact.

Environmental Monitoring and Impact Assessment, continuous data collection and environmental assessment are crucial to ensure that AQUAWIND meets EU sustainability targets and marine conservation standards. Monitoring includes water quality analysis, fish welfare assessment, ecosystem impact studies, and biodiversity tracking to mitigate potential environmental risks.

Research and Development for Multi-Use Synergies, AQUAWIND invests in R&D to refine the integration of offshore wind and aquaculture, developing innovative mooring solutions, automated aquaculture monitoring, and energy-efficient seafood production techniques. Research partnerships with universities and marine institutes help drive technological advancements and long-term sustainability improvements.

Optimization of Operations and Maintenance, the project continuously refines operations and maintenance strategies to ensure the long-term efficiency and reliability of the floating platforms. This includes preventive maintenance programs, real-time performance monitoring, and the use of AI-driven diagnostics to reduce downtime and operational costs.

Fish Production, Harvesting, and Supply Chain Integration, AQUAWIND oversees fish harvesting, processing, and distribution, ensuring compliance with European food safety standards. The project collaborates with seafood distributors, retailers, and export markets to commercialize sustainably farmed seafood while promoting traceability and eco-certification.

Regulatory Compliance and Policy Engagement, given the complexity of offshore energy and aquaculture regulations, AQUAWIND works closely with government agencies, certification bodies, and marine authorities to ensure that all activities align with EU directives and local legal frameworks. This includes permit acquisition, policy advocacy, and compliance audits.

Technology Transfer and Licensing of Intellectual Property (IP) AQUAWIND commercializes its proprietary platform designs, energy optimization models, and aquaculture management technologies through licensing agreements and joint ventures. This approach accelerates industry adoption of multi-use offshore solutions while generating additional revenue streams.

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Stakeholder Engagement and Community Outreach AQUAWIND fosters social acceptance and stakeholder collaboration through community engagement initiatives, public consultations, and knowledge-sharing events. By involving local fisheries, environmental organizations, and coastal communities, the project ensures broad support and long-term sustainability.

Customer Segments

Offshore Wind Developers, companies specializing in offshore wind energy seek innovative solutions to harness wind power in deep-sea locations. AQUAWIND offers them a scalable, multi-use platform that maximizes energy production while reducing infrastructure costs through shared marine space. These developers benefit from an advanced, ready-to-integrate floating wind solution that aligns with EU renewable energy targets.

Aquaculture Project Developers, with global demand for sustainably farmed seafood increasing, aquaculture companies are looking for new production models that expand beyond coastal and land-based facilities. AQUAWIND provides offshore fish farming capabilities that offer cleaner water conditions, higher fish health standards, and reduced environmental impact, enabling aquaculture firms to scale operations responsibly.

Renewable Energy and Aquaculture Investors, institutional investors, venture capital firms, and corporate partners recognize the financial potential of multi-use offshore platforms. AQUAWIND's ability to generate stable, diversified revenue streams through wind energy sales and aquaculture production makes it an attractive opportunity for those seeking long-term, impact-driven investments in the blue economy.

Government Agencies (Energy, Agriculture, and Environmental Authorities), National and regional governments are actively promoting sustainable energy and food production as part of their climate action and food security policies. AQUAWIND aligns with these goals by offering a dual-purpose offshore infrastructure that contributes to energy transition, sustainable aquaculture, and marine conservation, making it a strong candidate for public funding and policy support.

Environmental Organizations and Marine Conservation Groups, NGOs and research institutions focused on marine sustainability see AQUAWIND as an innovative approach to minimizing the ecological footprint of offshore infrastructure. By reducing marine space competition, optimizing energy efficiency, and integrating ecosystem-friendly

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aquaculture practices, the project provides a viable solution for balancing economic development with environmental protection.

Venture Capital Firms and Blue Economy Accelerators specializing in marine innovation, renewable energy, and sustainable aquaculture seek disruptive business models that offer scalable and commercially viable solutions. AQUAWIND presents an investment-ready concept that combines offshore energy, food security, and climate resilience, attracting firms looking for high-impact, high-growth opportunities.

Naval Construction and Engineering Firms engaged in offshore infrastructure development benefit from AQUAWIND's demand for advanced floating platform construction, marine engineering expertise, and subsea cable management. This customer segment plays a critical role in expanding the manufacturing and deployment capacity for multi-use offshore solutions.

Electricity Buyers & Distribution System Operators (DSOs) as a renewable energy producer, AQUAWIND supplies offshore wind power to regional and national grids. Distribution System Operators (DSOs), energy utilities, and government-backed power purchasing programs are key customers seeking reliable, cost-effective clean energy sources to meet growing demand and EU decarbonization targets.

Seafood Distributors, Retailers, and Processors, AQUAWIND's offshore aquaculture provides high-quality, traceable, and sustainably farmed seafood for both local and international markets. This customer segment includes supermarkets, fish wholesalers, restaurant supply chains, and premium seafood brands that prioritize environmentally responsible sourcing.

Local Fisheries and Coastal Communities facing challenges from overfishing and climate change can benefit from AQUAWIND's aquaculture initiatives, which provide alternative employment opportunities, knowledge-sharing programs, and sustainable seafood production methods. These partnerships help promote economic resilience and marine resource conservation.

Revenue Streams

Offshore Wind Energy Sales to Power Grids, as AQUAWIND supplies renewable electricity from its floating wind turbines to national and regional energy grids through Power Purchase Agreements (PPAs) with utilities, Distribution System Operators (DSOs), and government-backed clean energy programs. Revenue is generated based on contracted energy output, wholesale electricity market pricing, and renewable energy incentives.

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Sustainably Farmed Seafood Sales, the integrated aquaculture system produces high-quality, eco-certified seafood, sold through wholesalers, seafood distributors, supermarkets, and direct-to-consumer markets. Revenue is driven by premium pricing for sustainable fish products, growing consumer demand for traceable and responsible seafood, and export opportunities to European and global markets.

Environmental Incentives, Grants, and EU Funding Programs where AQUAWIND aligns with EU sustainability objectives and benefits from public funding, environmental subsidies, and innovation grants for projects that promote clean energy, sustainable food production, and efficient marine resource use. These funds support initial development costs, technology scaling, and infrastructure deployment.

Cost Structure

Platform Construction and Offshore Installation Costs the development of multi-use floating platforms involves significant engineering, fabrication, and assembly expenses, including the procurement of marine-grade materials, advanced mooring systems, and aquaculture cage structures. Offshore installation costs include specialized transport vessels, cranes, and deep-water anchoring systems.

Wind Turbine and Aquaculture Equipment Procurement and Maintenance AQUAWIND requires high-performance wind turbines, subsea cables, aquaculture monitoring systems, and automated feeding technologies. Ongoing maintenance, repairs, and system upgrades are necessary to ensure efficiency, maximize uptime, and extend the lifespan of assets.

Logistics, Transport, and Deployment the transportation of wind turbine components, aquaculture infrastructure, and operational teams to offshore sites requires specialized marine logistics, offshore cranes, and lifting equipment. Efficient supply chain management and vessel coordination are essential to reduce downtime and optimize deployment efficiency.

Fish Feeding, Health Management, and Aquaculture Operations the aquaculture component requires sustainable fish feed, automated distribution systems, and disease monitoring technologies. Costs include nutritional research, breeding programs, and quality control measures to ensure high seafood yields and adherence to EU health standards.

Regulatory Compliance, Permitting, and Environmental Assessments AQUAWIND must comply with EU marine spatial planning policies, offshore energy regulations, and aquaculture sustainability guidelines. Costs cover permit applications, environmental

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impact assessments, legal consultations, and compliance reporting to ensure adherence to national and European laws.

Workforce Costs (Engineering, Operations, and Maintenance) the project requires a skilled workforce, including marine engineers, offshore wind technicians, aquaculture specialists, and logistics coordinators. Salaries, training programs, and personnel costs are critical investments in operational excellence.

Insurance and Risk Management given the risks associated with offshore infrastructure, extreme weather conditions, and operational hazards, AQUAWIND invests in comprehensive insurance policies covering platform damage, liability, and business continuity.

Community Engagement and Social Acceptance Initiatives to gain public trust and regulatory support, AQUAWIND conducts stakeholder consultations, outreach programs, and public awareness campaigns. These initiatives strengthen relationships with local communities, fisheries, and environmental organizations, enhancing long-term project viability.

Research and Development for System Optimization continuous R&D investment in advanced mooring solutions, automated aquaculture monitoring, and offshore wind efficiency improvements is essential for enhancing technology performance and reducing operational costs over time.

Technology Licensing and Intellectual Property Management to maintain a competitive edge in multi-use offshore platform development, AQUAWIND invests in patent protection, licensing agreements, and intellectual property enforcement, ensuring long-term value extraction from its innovations.

Contingency Funds for Unexpected Costs offshore operations are highly complex and exposed to external risks, including market fluctuations, regulatory changes, and extreme weather events. AQUAWIND sets aside contingency funds to mitigate financial risks and respond to unforeseen challenges.

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ANNEX 5: TECHNO-ECONOMIC ASSESSMENT SCENARIOS COST BREAKDOWN

The cost breakdown for the 3 proposed scenarios is based on the MARIBE model.

FLOATING OFFSHORE WIND

Spend item	Spend	Unit
Project Consenting and Development to FID	-302.080	€/MW
Project management from FID to WCD	-71.744	€/MW
Construction phase insurance	-74.340	€/MW
Turbine (exc. Tower)	-1.318.060	€/MW
Support structure (inc. tower)	-2.676.830	€/MW
Array cables	-127.204	€/MW
Installation	-265.972	€/MW
Transmission build	-562.034	€/MW
Construction contingency	-509.618	€/MW
CAPEX	**-5.907.882**	**€/MW**
Operation, maintenance and service (planned & unplanned, figures relate to post-warranty cost)	-107.380	€/MW/year
Operating phase insurance	-26.078	€/MW/year
Transmission charges	-15.340	€/MW/year
OPEX	**-148.798**	**€/MW/year**
Decommissioning wind	-173.460	€/MW
DECEX	**-173.460**	**€/MW**

AQUACULTURE

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Spend item	Spend	Unit
Planning, permits, consulting	-180.000	€
Nursery site (incl transfer)	-240.000	€
Offshore cages	-1.080.000	€
Boats	-1.140.000	€
Logistics & Packing	-720.000	€
Spares	-720.000	€
Biological stock	-5.915.000	€
Cameras	-30.000	€
Construction contingency	-1.002.500	€
CAPEX	**-11.027.500**	**€**
Fry purchase	-1.800.000	€/year
Fuel	-87.500	€/year
Feed cost	-1.200.000	€/year
Consumables	-80.000	€/year
Services	-60.000	€/year
Insurance	-180.000	€/year
Consultancy	-60.000	€/year
Maintenance	-400.000	€/year
Salaries	-1.200.000	€/year
Rent	-180.000	€/year
General expenses	-90.000	€/year
Concessions	-30.000	€/year
OPEX	**-5.367.500**	**€/year**
Decommissioning fish farm	-162.000	€
DECEX	**-162.000**	**€**

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ANNEX 6: QUADRUPLE HELIX

QUADRUPLE HELIX GROUP	COMPANY
RESEARCH COMMUNITY	(CA) Universidad de La Laguna ULL o Instituto Universitario de Desarrollo Regional o Instituto Universitario de Estudios Avanzados en Física Atómica, Molecular y Fotónica - (IUDEA) o Instituto de Materiales y Nanotecnología (IMN) o Instituto Universitario de Bio-Orgánica Antonio González o Fundación General de la Universidad de La Laguna – Emprende ULL (CA) Universidad de Las Palmas de Gran Canaria – ULPGC o Instituto Universitario de Acuicultura Sostenible y Ecosistemas Marinos (IU-ECOAQUA) o Instituto Universitario de Oceanografía y Cambio Global (IOCAG) o Instituto Universitario de Turismo y Desarrollo Económico Sostenible (TIDES) o Instituto Universitario de Sanidad Animal y Seguridad Alimentaria (IUSA) o Instituto Universitario de Sistemas Inteligentes y Aplicaciones Numéricas en Ingeniería (SIANI) o Instituto Universitario de Ciencias y Tecnologías Cibernéticas (IUCTC) o Instituto Universitario para el Desarrollo Tecnológico y la Innovación en Comunicaciones (IDeTIC) o Instituto Universitario de Microelectrónica Aplicada (IUMA) o Group for the Research on Renewable Energy Systems (GRRES) o Fundación Canaria Parque Científico Tecnológico de la Universidad de Las Palmas de Gran Canaria (FPCT-UPGC) o Banco Español de Algas (BEA) (CA) Centro Oceanográfico de Canarias - COC-IEO (CA) Instituto Tecnológico de Canarias- ITC (CA) Plataforma Oceánica de Canarias – PLOCAN (CA) Instituto de Tecnología y Energías Renovables – ITER (CA) Centro Tecnológico de Ciencias Marinas – CETECIMA

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	(CA) Parque Tecnológico de Fuerteventura (CA) Parque Científico y Tecnológico de Tenerife - PCTT (CA) Fundación Universitaria de Las Palmas – FULP
INDUSTRY	(CA) Fundación Puertos de Las Palmas - FPLP (CA) Clúster Marítimo de Canarias - CMC (CA) Federación de la PYME del Sector del Metal de Las Palmas – FEMEPA (CA) Federación Provincial de Empresarios del Metal y Nuevas Tecnologías de Santa Cruz de Tenerife – FEMETE (CA) Asociación Industrial de Canarias – ASINCA (CA) Asociación Canaria de Startups, Empresas de Base Tecnológica e Inversores Ángeles – EMERGE (CA) Asociación Canaria de Espacios Colaborativos – ACEC (CA) Cámara de Comercio, Industria y Navegación de Santa Cruz de Tenerife (CA) Cámara de Comercio, Industria y Navegación de Gran Canaria (CA) Cámara de Comercio, Industria y Navegación de Fuerteventura (CA) Cámara de Comercio, Industria y Navegación de Lanzarote (ES) Apromar: Asociación empresarial de acuicultura Española (APROMAR) (ES) Asociación Empresarial Eólica (AEE) (CA) Asociación eólica canaria (AEOLICAN) (ES) Asociación de Empresas de Energías Renovables (APPA) (ES) Asociación Española de Bioempresas (ASEBIO) (EU) Federation of European Aquaculture Producers (FEAP) (EU) European Algae Biomass Association (EABA) (EU) WindEurope (EU) Inversores – all the tilities (e.g Equinor, Iberdrola, Plenitude, ENEL, OceanWinds etc..)
SOCIAL	(CA) ASOCIACIÓN ADEPSI (CA) ASOCIACIÓN AVANFUER (ASOCIACIÓN DE VOLUNTARIOS DE AYUDA A LA NATURALEZA DE FUERTEVENTURA) (CA) ASOCIACIÓN BIENESTAR AMBIENTAL (ABIA) (CA) ASOCIACIÓN MOJO DE CAÑA (CA) CONFEDERACIÓN DE FEDERACIONES Y ASOCIACIONES DE MAYORES DE CANARIAS (COFAMCA) (CA) OCEANA

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	(CA) Asociación TURCON (CA) ECOLOGISTAS EN ACCIÓN – BEN MAGEC (CA) Grupo de Acción Costera de Gran Canaria - GAC GC (CA) Grupo de Acción Costera Fuerteventura (CA) Grupo de Acción Costera Tenerife (GAC Tenerife) (CA) Federación Regional de Cofradías de Pescadores de Canarias (CA) Federación Provincial de Cofradías de Pescadores de Las Palmas (CA) Federación Provincial de Cofradías de Pescadores de Sta. Cruz de Tenerife (CA) Asociación de armadores y pescadores de Canarias (MIRACANARIAS) (CA) Asociación para el Desarrollo Rural de la isla de La Palma (GAC La Palma) (CA) Asociación Insular de Desarrollo Rural de La Gomera (AIDER La Gomera) (CA) Asociación para el Desarrollo Rural y Pesquero de Lanzarote (ADERLAN Lanzarote) (CA) Asociación Grupo de Acción Social y Pesquera El Hierro (GALP El Hierro) (EU) Consejo Consultivo de las Regiones Ultraperiféricas (CC RUP)
POLICY MAKERS	(CA) Consejería de Economía, Conocimiento y Empleo del Gobierno de Canarias (CA) Consejería de Agricultura, Ganadería y Pesca del Gobierno de Canarias (CA) Consejería de Turismo, Industria y Comercio (CA) Agencia Canaria de Investigación, Innovación y Sociedad de la Información – ACIISI (CA) Autoridad Portuaria de Las Palmas – APLP (CA) Autoridad Portuaria de Santa Cruz de Tenerife – APTFE (CA) Ente Público Puertos Canarios – EPPE (CA) Compañía de Desarrollo de Canarias – SODECAN (CA) Sociedad de Promoción Económica de Gran Canaria – SPEGC (CA) Sociedad Canaria de Fomento Económico, S.A. – PROEXCA (ES) Ministerio para la transición ecológica y el resto demográfico (ES) Ministerio de Agricultura,Pesca y Alimentación (PT) Ministerio da Economia e do Mar (PT) Ministerio do Ambiente e Transição Energética

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	(FR) Ministère de l'Agriculture et de la Souveraineté Alimentaire (FR) Ministère de la Transition énergétique (EU) DG ENER (EU) DG REGIO (EU) JRC – DG RTD (EU) DG MARE (ORs) Comité de Suivi of the EU Outermost Regions

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ANNEX 7: EXPLOITATION STRATEGY, TERMS OF REFERENCES FOR THE EXPLOITATION COMMITTEE

Purpose

The Exploitation Committee (EC) of the AQUAWIND project is responsible for overseeing the exploitation of the project’s results, ensuring that the outputs are utilized effectively and sustainably for the benefit of project partners, stakeholders, and the broader industry. The EC will develop strategies for the commercialization, dissemination, and application of the project's technological, environmental, and social innovations.

Objectives

The key objectives of the Exploitation Committee are:

- To oversee the implementation of the exploitation and dissemination strategies of AQUAWIND’s results.
- To identify potential commercial opportunities and stakeholders, including the pathways to market for the technological innovations developed.
- To ensure alignment with the intellectual property rights (IPR) management framework established for the project.
- To assess risks and propose mitigation strategies for the effective exploitation of project outcomes.
- To facilitate partnerships with industry players, research institutions, and public authorities for the continuation and expansion of the project's technologies post-completion.
- To ensure the results align with EU environmental and sustainable energy policies, thus supporting broader societal impacts.

Composition

The EC will consist of:

- **Project Coordinator**: The project lead who will chair the committee and provide strategic guidance.

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- **Work Package (WP) Leaders and other technical partners**: Representatives from key technical and dissemination activities who will contribute to discussions on technological exploitation.

Responsibilities

The Exploitation Committee is responsible for:

- **Exploitation Strategy**: Designing and implementing a strategy for the use and commercialization of the AQUAWIND outputs, including technology prototypes, methodologies, and data.
- **IPR Management**: Ensuring that intellectual property is properly managed, protected, and, where applicable, commercialized according to the IPR framework defined in the project.
- **Dissemination**: Guiding the dissemination of results to ensure maximum impact on relevant stakeholders and the wider public.
- **Commercialization Pathways**: Identifying viable commercial pathways for the technologies and methodologies developed and ensuring sustainable exploitation.
- **Monitoring Progress**: Tracking the progress of exploitation activities and ensuring they are aligned with the project's milestones and objectives.
- **Partnerships**: Facilitating the creation of new partnerships with industry and research organizations to support the continuation and scaling up of the project's innovations after the project ends.
- **Reporting**: Providing regular reports to the project’s steering committee on the status of exploitation activities.

Meetings

- **Frequency**: The EC will meet at least yearly during the project lifecycle. Additional meetings may be convened as required by the project’s progress or strategic needs. Also, dedicated exploitation issues may be discussed during the project’s online Steering Committee meetings.
- **Venue**: Meetings can be held either in person or virtually, depending on the availability and geographic location of members.

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- **Agenda and Documentation**: The agenda for each meeting will be prepared by the members at least one week before the meeting. Follow-up on the meetings will be ensured by the Exploitation Coordinator within one week.

Decision-Making

- **Quorum**: A quorum for decision-making will consist of at least 50% of the EC members, including the Chair.
- **Consensus-Based**: Decisions within the EC will be made by consensus where possible. If consensus cannot be reached, a simple majority vote will be used.
- **Conflicts of Interest**: Members must declare any conflicts of interest and recuse themselves from decisions where a conflict exists.

Exploitation Plan

The EC will be responsible for developing the **Exploitation Plan**, which will:

- Identify the exploitable results of the project.
- Detail the market potential for the AQUAWIND technologies.
- Define roles and responsibilities for each partner in the exploitation process.
- Outline the intellectual property (IP) management framework.
- Include a timeline for post-project exploitation activities.

Reporting and Accountability

The EC is accountable to the AQUAWIND Project Steering Committee and Management Board. The Chair of the EC will:

- Submit periodic exploitation updates to the Steering Committee, outlining progress, risks, and recommendations.
- Ensure that the exploitation strategy is effectively aligned with the broader goals of the AQUAWIND project and compliant with EU funding regulations.

Duration

The EC will remain active for the entire duration of the AQUAWIND project and may continue to operate for a pre-defined period after the project ends, in order to monitor post-project exploitation activities.

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ANNEX 8: JOB PLAN CREATION PROSPECTS (EXTENDED VERSION)

Introduction

Employment in the offshore wind energy sector

Fig 29. Offshore Wind Turbines. Source: Image generated with AI (ChatGPT, 2025)

Global overview and current trends

Over the last decade, the global offshore wind market has evolved from a demonstration phase into a driving force behind the renewable energy sector. According to the Global Offshore Wind Report 2025 by the Global Wind Energy Council (GWEC)[2], 8 GW of new offshore capacity was connected in 2024, bringing the total

[2] Global Offshore Wind Report 2025: https://www.gwec.net/

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global installed capacity to 83 GW — enough to power 73 million homes. Government tenders awarded 56 GW of new capacity, with a further 48 GW under construction. However, the organisation warns that macroeconomic problems, failed tenders, and supply bottlenecks have lowered the short-term growth forecast. Nevertheless, the report maintains a robust medium-term forecast, expecting annual installations to grow from 8 GW in 2024 to 34 GW in 2030, with growth rates of 28% per year until 2029 and 15% until 2034. China continues to lead the way in terms of connections, followed by the United Kingdom, Taiwan, Germany and France. These five nations accounted for 94% of additions in 2024.

The report also highlights that the sector already provides hundreds of thousands of jobs and will play a crucial role in the upcoming 'industrial revolution' linked to electrification. The GWEC projects that global capacity will exceed 300 GW by the mid-2030s, requiring around one million additional workers over the next ten years to meet the needs of manufacturing, installation and associated services.

The state of offshore wind energy in the European Union

The European Union has experienced a similar take-off, albeit on a smaller scale. According to the European Commission's Blue Economy Report 2025[3], the EU had 18.9 GW of installed offshore wind power at the end of 2023, with preliminary estimates putting the total at 21.2 GW in 2024. This activity generated more than €5.3 billion in gross value added (GVA) in 2022 (42% more than in 2021) and generated a turnover of around €25 billion. In terms of employment, offshore wind directly employed 17,300 people in 2022, a figure which provisionally increased to 18,400 in 2023. The average annual salary was £60,000 in 2022. Another estimate, produced by 4C Offshore, suggests that the sector supported around 47,000 full-time equivalent jobs in the EU in 2024, of which 28,000 were direct jobs.

Geographical distribution is uneven: in 2022, Germany accounted for 69% of total employment (11,900 people), followed by Denmark (12%), the Netherlands (10%), and Belgium (9%). This reflects the industrial base and large business parks in these countries. At the sectoral level, 59% of workers are employed in production (component manufacturing, installation, and operational services), 28% in distribution, and 13% in transmission. In terms of gross value added (GVA), production accounts for 68%, distribution for 20%, and transmission for 12%.

[3] The EU Blue Economy report 2025: https://op.europa.eu/webpub/mare/eu-blue-economy-report-2025/blue-economic-sectors/marine-renewable-energy.html

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The EU has set ambitious targets: the Renewable Energy Action Plan and the Net Zero Industry Act aim to achieve 111 GW of offshore wind power by 2030 and 317 GW by 2050. This would contribute towards the goal of 42.5% of European energy consumption coming from renewables by 2030. To reach these milestones, it will be necessary to triple annual installation capacity, develop port and logistics infrastructure, and strengthen training programmes to ensure the availability of skilled labour.

Value chain and professional profiles

The offshore wind energy value chain encompasses all stages from project design and development to the decommissioning of wind turbines[4]. Broadly speaking, it is organised into five links, each with specific job characteristics and profiles:

- **Planning and development.** This includes resource analysis, environmental studies, obtaining permits and preliminary design. The most sought-after professionals are project engineers, land use specialists, marine biologists, energy economists and legal experts in maritime regulations. Risk analysts and coastal community relations managers are also involved.

- **Component engineering and manufacturing**. During this phase, the towers, nacelles, blades, floating substructures and electrical systems are designed and manufactured. The team comprises mechanical, electrical and naval engineers, as well as welders, boilermakers, CNC machine operators, blade composite technicians and power system specialists. There is also an emerging need for experts in hydrodynamics for floating structures and materials engineers to develop high-strength, recyclable components.

- **Installation and assembly**. This is one of the most labour-intensive stages of the construction process. It requires the involvement of logistics technicians, port loading and stevedoring personnel, captains and crews of installation vessels, specialist sailors, professional divers, and rope access workers. Installing submarine cables requires electrical engineers, divers and cable-laying vessel operators. Floating systems require more labour due to the complexity of mooring and anchoring.

- **Operation and maintenance (O&M).** Once the park is operational, it will provide stable employment for its 20–25-year lifespan. There will be a demand for high-voltage marine substation operators, power network and electronics

[4] (Wavec Offshore Renewables, 2022)

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engineers, remote monitoring technicians, energy storage specialists, and underwater inspection teams comprising divers and remote-controlled vehicle (ROV) pilots. Preventative maintenance and the occasional need for repairs generate a constant demand for electromechanical technicians and rapid response teams.

- **Decommissioning and recycling**. As the first offshore turbines installed in the early 2000s approach the end of their useful life, this link is becoming increasingly important. Tasks include decommissioning planning, cutting and removing components, and managing and recycling waste materials such as steel, composites, magnets and oils. This creates opportunities for environmental engineers, recycling technicians, heavy crane operators and circular economy consultants.

A variety of cross-cutting profiles emerge across the entire value chain, including data analysts, digitalisation and cybersecurity specialists, procurement and supply chain professionals, health and safety managers (HSE), and project management experts. The sector's rapid expansion has created a skills gap, with organisations such as WindEurope[5] and EU training programmes warning of a shortage of skilled technicians, particularly in trades such as welding, wind turbine assembly, crane operation, and electronic equipment maintenance. Additionally, many of the new floating projects rely on personnel from the oil and gas industry, necessitating reskilling and upskilling programmes to facilitate retraining.

Socio-economic impact of a floating offshore wind farm in Gran Canaria

The socioeconomic analysis of the potential for floating offshore wind power in the Canary Islands is based on two benchmark studies. The first, by Schallenberg-Rodríguez and Inchausti-Sintes (2021)[6], assesses the impact of a 200 MW pilot farm off the coast of Gran Canaria. It uses an input-output model to break down the economic effects into the phases of investment (CAPEX), operation and maintenance (O&M), and decommissioning. The study presents two contrasting scenarios based on local content: one with high local content, where much of the supply chain is based on the islands; and one with low local content, where many activities are carried out on the mainland or elsewhere in Europe.

[5] WindEurope. Workforce Report 2024 https://windeurope.org/intelligence-platform/product/wind-energy-in-europe-2024-statistics-and-the-outlook-for-2025-2030/

[6] Schallenberg-Rodríguez, J. y Inchausti-Sintes, F. (2021). Socio-economic impact of a 200 MW floating wind farm in Gran Canaria. Renewable and Sustainable Energy Reviews 148

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The second study, included in deliverable D7.3 of the European PivotBuoy project (2022), broadens the analysis to a pre-commercial scale of 420 MW. It also provides a more detailed characterisation of the value chain and professional profiles associated with floating technology. This serves to project the scaling effects and validate the trends observed in the 200 MW study.

Both studies agree that deploying a floating farm of this size would have a significant economic impact on the Canary Islands and the Spanish economy as a whole. In the 200 MW study's high regional content scenario, the investment phase would generate around €210 million in gross value added (GVA) for the islands, while the mainland would capture an additional €213 million. In the low regional content scenario, the GVA in the islands would be reduced to around €104 million, with a greater proportion captured on the mainland (€301 million). Taking into account all phases of the life cycle (including operation, maintenance, and decommissioning), the total national GVA would amount to around €600–680 million, with the Canary Islands capturing approximately 40% in the most favourable case.

In terms of employment, the CAPEX phase (estimated at seven years) would be the most labour-intensive, with around 4,788 man-years in the Canary Islands and 3,934 on the mainland in the high content scenario, compared to 2,415 and 4,466 man-years respectively in the low content scenario. This equates to an average of 6.2 man-years per MW in the most favourable case and 4.9 man-years per MW in the least favourable case. The operation and maintenance phase, lasting 25 years, would provide stable employment for around 100 full-time equivalents in the islands and 80–90 on the mainland, generating over 100 million euros in additional GVA for the Canary Islands economy.

Studies show that the Canary Islands' industrial structure has a decisive influence on results. As it is a service-dominated economy, each euro invested creates more direct jobs but less indirect GVA than on the mainland, where manufacturing is more developed. This explains why, despite having a higher employment intensity per euro of investment, the mainland has a higher indirect GVA.

Similarly, local content policy emerges as the most important factor in maximising the islands' economic benefit. Relocating key processes, such as manufacturing floating substructures, laying export cables and pre-assembling turbines, to the Canary Islands could practically double the islands' GVA during the CAPEX phase and generate over 2,000 additional man-years compared to outsourcing these activities.

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Floating wind power has a significantly higher impact compared to other energy technologies: a 200 MW combined cycle gas plant would generate less than one job per MW during construction and only a few dozen in operation and maintenance (O&M), while large-scale photovoltaics average around two man-years per MW in construction and less than 0.1 in O&M. Furthermore, from an environmental perspective, the floating wind power analysed in these studies has a life cycle carbon intensity of around 11 g CO_2-eq/kWh, with a carbon payback period of approximately eight months — well below that of any fossil fuel source, and around half the footprint of fixed wind power on foundations.

The results confirm that not only is a 200 MW floating offshore wind farm in Gran Canaria technically feasible, it could also drive economic diversification in the archipelago. Even in a conservative scenario, the project would generate employment comparable to that of one of the islands' major tourist resorts, helping to reduce the region's dependence on the service sector and retain skilled talent.

To maximise local benefits, it is recommended that the industrial and logistical capacity of the Port of Las Palmas and other strategic facilities (e.g. shipyards, heavy-lift cranes, welding and blade repair workshops) is strengthened, that permits and licences for new developments are streamlined, and that technical training programmes aimed at retraining workers and attracting specialised STEM (Science, Technology, Engineering and Mathematics) profiles are rolled out. These measures would facilitate the scaling up to meet the objectives of Spain's maritime spatial plans, which anticipate several gigawatts of floating wind capacity around the archipelago by 2030 and beyond. This would multiply the economic and social impact described in the pilot studies almost linearly.

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Employment in the aquaculture sector

Figure 30. Worker feeding fish at a marine fish farm. Source: (Ruta Pesquera & Naval, 2022)

European context: evolution and strategic relevance

Aquaculture has become a cornerstone of the European blue economy. It is aligned with the priorities of the European Green Deal[7] and the 2021–2030 Strategic Guidelines for developing sustainable, competitive and decarbonised aquaculture. The guidelines acknowledge the sector's pivotal role in ensuring food security within the European Union (EU), reducing reliance on imported fish (currently accounting for over 70% of EU consumption) and fostering stable employment opportunities in coastal and rural areas.

On 5 June 2025, the European Commission presented the European Ocean Pact[8] as a comprehensive strategy to address the main challenges facing the ocean. This strategy establishes a common European-level framework that unifies policies, coordinates initiatives, and drives a transformation towards more sustainable, secure, and

[7] Pacto Verde Europeo: https://www.consilium.europa.eu/es/policies/european-green-deal/
[8] Pacto Europeo por el Océano: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=comnat:COM_2025_0281_FIN

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competitive maritime governance. It provides a holistic approach to all policy areas related to the ocean, optimises coordination between stakeholders, and facilitates the implementation of existing legislation. The main objective is to transition to an 'Ocean Union', with a future Ocean Act as its regulatory pillar. As part of this new European legislative initiative, the Commission will launch an **EU Initiative on Sustainable Aquaculture**. This will include algae in the Bioeconomy Strategy, which is expected to be finalised by the end of 2025. The strategy will address issues related to algae production, launch a campaign in 2027 promoting the consumption of seafood, implement measures to ensure the sustainability of fisheries management and establish specific policies for managing non-native species that pose a threat to fisheries and aquaculture.

According to STECF 24-14 (2024)[9], the EU-27 aquaculture sector recorded production of 1.12 million tonnes in 2022, generating an economic value of €4.8 billion and maintaining a moderate growth trend over the last decade. In terms of employment, the sector provided jobs for 73,000 people, equivalent to 41,000 full-time equivalents, across more than 14,000 aquaculture companies. The sector's business structure continues to be characterised by micro and small family businesses, giving it a key socio-economic role in maintaining the cohesion of coastal communities and keeping people in rural coastal areas.

While European production remains significantly lower than that of Asian powerhouses such as China, which accounts for over 60% of global production, the EU has chosen a model centred on high added value, sustainability standards, and traceability. This approach aims to distinguish European aquaculture products from imported ones, in response to the growing demand for certified fish with low emissions that are produced in accordance with animal welfare criteria.

Spain: leading aquaculture producer in the European Union

Spain remains the undisputed leader in aquaculture within the EU, both in terms of production volume and diversity of species farmed. The report ‘Aquaculture in Spain 2024’ by APROMAR[10] indicates that in 2023, national production reached 266,066 tonnes of live product, with a first-sale value of 750.5 million euros. Although this volume represented a 12% decrease compared to the previous year, Spain still accounts for nearly 25% of European aquaculture production.

Production structure and dominant species

[9] The 2024 aquaculture economic report (STECF 24-14): https://op.europa.eu/en/publication-detail/-/publication/0c13327d-fd6a-11ef-b7db-01aa75ed71a1/language-en
[10] APROMAR. (2024) La acuicultura en España 2024: https://apromar.es/informes/

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Spanish aquaculture is characterised by two distinct production methods: the farming of bivalve molluscs (primarily mussels on Galician rafts) and the intensive farming of marine fish (such as sea bream and sea bass) in floating cages. In 2023:

- Mussels led the way in terms of volume, reaching 182,790 tonnes with a value of £127.6 million.
- Sea bass led the way in terms of value, reaching 24,580 tonnes worth €202.7 million.
- Sea bream recorded the highest year-on-year growth (+46.7%), reaching 13,106 tonnes.
- Sea bass and turbot are establishing themselves as emerging species in certain regions, offering potential for production diversification.

This diversification enables different market niches to be served (e.g. catering, exports and gourmet products) and helps to spread risk in the event of price fluctuations or specific diseases.

Employment and labour structure in the Spanish aquaculture sector

In 2022, Spanish aquaculture employed 10,253 people, equivalent to 5,878 Annual Work Units (AWUs)[11]. This figure shows a slight increase in AWU (+2.7%) compared to the previous year, alongside a reduction in employment (-9.8%). This is a sign of the sector's growing professionalisation and mechanisation.

In terms of gender equality, women account for 30% of the workforce, primarily in processing and laboratory roles, whereas men predominate in marine operations and cage management. The VII State Aquaculture Agreement, which came into force in April 2024, is a milestone in unifying working conditions between marine and continental aquaculture, thereby reinforcing employment stability and uniformity in the sector.

The Canary Islands: an emerging hub for marine aquaculture

The Canary Islands stand out within the national landscape as a strategic region for the expansion of marine aquaculture. In 2023, the archipelago's production reached 6,886 tonnes, marking a 20% increase compared to 2022 and placing the Canary Islands fifth in the regional ranking. The region's production already accounts for 11% of sea bream

[11] APROMAR. (2024) La acuicultura en España 2024: https://apromar.es/informes/

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and 22% of sea bass at a national level — species that hold significant commercial value in both the local and export markets.

The sector generates 261 full-time equivalent jobs (FTEs) on the islands[12], concentrated in a few companies operating advanced technology floating cages. The privileged oceanographic conditions, stable warm waters (17-24°C), high environmental quality and availability of suitable maritime spaces give the Canary Islands a competitive advantage for the farming of high added-value marine species.

The Regional Aquaculture Management Plan (PROAC, 2018) identified 30 areas suitable for the development of marine aquaculture (on all islands except La Gomera and El Hierro), with an authorised annual production capacity of 37,118 tonnes. According to estimates in the IAEA-Canarias 2024 report[13], this potential could allow current production to increase fivefold and create between 3,000 and 4,000 direct jobs over the next decade.

Professional profiles and training challenges

Modern aquaculture in Spain and the Canary Islands requires highly specialised and versatile professionals.

- Farm operators are responsible for feeding (manually or automatically), cleaning cages, controlling water parameters, and monitoring growth.
- Aquaculture health technicians are biologists and veterinarians who are dedicated to disease prevention and control, animal welfare, and biosecurity.
- Aquaculture engineers and oceanographers optimise offshore facilities and manage production in dynamic environments.
- Professional divers and anchoring technicians are essential for underwater inspections and maintenance of cages and anchoring systems.
- Specialists in digitalisation and automation integrate remote sensors, underwater cameras and software for real-time monitoring of fish behaviour.
- Hatchery technicians are experts in controlled reproduction, egg incubation and larval culture — a critical stage in ensuring fry quality.

[12] (Ministerio de Agricultura, Pesca y Alimentación): https://www.mapa.gob.es/dam/mapa/contenido/estadisticas/temas/estadisticas-de-la-pesca-y-la-acuicultura/3-acuicultura/establecimientos/empleo/tablas-pdf/2023_07_empleo_grupo_ca.pdf

[13] IAEA-Canarias 2024: https://www.cetecima.com/wp-content/uploads/2025/02/IAEA-Canarias2024-vdef-digital.pdf

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Despite the availability of maritime-fishing vocational training qualifications and specialised university degrees (such as those offered by the ULPGC), the sector faces challenges in attracting and retaining talent. Employers in the sector highlight the generation gap and the shortage of qualified personnel willing to work in demanding conditions (open sea, rotating shifts) as challenges. Overcoming these limitations requires dual training programmes, upskilling workers from other sectors, and campaigns to promote the dignity of blue jobs, such as those supported by the European Commission's Directorate-General for Maritime Affairs and Fisheries (DG MARE).

Opportunities for the Canary Islands and future prospects

The Canary Islands' position as an innovative aquaculture hub in the Atlantic is due to the combination of natural resources, sectoral spatial planning (PROAC) and European financial support for the period 2021-2027 (FEMPA). Within this framework, the European Commission has set aside a specific allocation of €315 million for the Outermost Regions (ORs) for structural investments and to compensate for additional costs. Of this amount, €82 million will go to the Canary Islands, as stated in the EC document Outermost Regions at a Glance (2022)[14].

In line with this distribution, the 2021–2027 FEMPA Action Plan for the Canary Islands allocates a total of €83,018,867.92 (excluding technical assistance), amounting to approximately €88 million with the addition of 6% for technical assistance. The main items are broken down as follows: €7,034,651.67 is allocated to aquaculture, processing and marketing, while €61,465,892.60 is earmarked for compensating for additional costs (Article 21 FEMPA)[15]. The latter is intended to offset additional production, processing and marketing costs in the ORs, as well as promoting modernisation, sustainability and the circular economy.

In the medium term, the planned expansion could diversify the Canary Islands' economy, which traditionally relies heavily on tourism, and boost the islands' food self-sufficiency. Furthermore, it paves the way for synergies with floating offshore wind energy projects, such as AquaWind, enabling the co-location of maritime activities and optimising the use of available marine space in line with the Spanish Maritime Spatial Planning Plans (POEM).[16].

14 (European Commission, 2022): https://ec.europa.eu/regional_policy/sources/policy/themes/outermost-regions/rup-2022/comm-rup-2022-glance_en.pdf

15 Plan de acción del FEMPA para la región ultraperiférica de Canarias (Gobierno de Canarias): https://www.mapa.gob.es/dam/mapa/contenido/pesca/participacion-publica/pp_procedimientos-2022/canarias.-plan-de-accion-fempa-mayo-inf.-publica-18052022/canarias-plan-de-accion-fempa-mayo-inf-publica-18052022.pdf

16 Plan de Ordenación del Espacio Marítimo (POEM): https://www.miteco.gob.es/es/costas/temas/proteccion-medio-marino/ordenacion-del-espacio-maritimo.html

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AquaWind Project

AquaWind is a pioneering project that aims to demonstrate the technical and socio-economic viability of an integrated, multi-use solution for the maritime environment. It combines W2Power prototype floating offshore wind energy generation technology (TRL 6) with an innovative finfish aquaculture system in specially designed cages incorporating novel materials, a high degree of digitalisation, and species diversification (TRL 4).

The project is being developed in Atlantic waters off the coast of Gran Canaria and is the first initiative in the region to test the simultaneous co-location of renewable energy production and live marine aquaculture. The multidisciplinary consortium comprises research centres, technology companies, a regional authority and a maritime cluster from three European countries: Spain, France and Portugal.

The project's key objectives include:

- Validating the joint and synergistic operation of the floating wind platform and the aquaculture system.
- Generating real data on performance and joint operation.
- Assessing the economic, environmental and social sustainability of the concept using specific indicators such as carbon footprint and impact on the surrounding maritime space.
- Developing a regulatory and legal framework to facilitate the future commercial implementation of similar multi-purpose projects in the Atlantic basin.

The consortium will also establish a robust exploitation plan and business model to scale up the technology from the current prototype to larger commercial solutions that combine electricity generation and sustainable aquaculture production.

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Methodolgy

The methodology applied for task T5.7 combines a rigorous review of specialised literature with a specific survey design aimed at project partners, thus ensuring an approach based on empirical data and tailored to the reality of the sector.

Objective and scope

The purpose of task **T5.7 – Job Plan Creation Prospects** is to analyse the job creation potential of the hybrid technology developed in the AquaWind project. This analysis focuses on evaluating how the introduction and progressive scaling of the integrated floating wind energy and marine aquaculture system can generate direct, indirect and induced job opportunities at different levels of technological and commercial maturity.

To this end, the study is structured in three key stages that reflect the evolution of the project:

- **Phase 1: Prototype (0.6 MW / 1.5 t, 1 platform/cage)**, representing the initial operation and proof of concept.
- **Phase 2: Early Commercialisation (10 MW / 300 t, 1 platform/cage)**, corresponding to an expanded pilot scale with initial commercial introduction.
- **Phase 3: Full Commercialisation (200 MW / 6,000 t, 20 platforms/cages)**, full commercial deployment stage, reflecting a large-scale industrial park.

This phased approach makes it possible to capture employment dynamics based on technological and economic developments, as well as to model different growth and adoption scenarios.

Methodology application

The methodology applied for task T5.7 is divided into the three stages explained below:

- **Literature review**: Relevant studies in the offshore wind energy and aquaculture sectors were analysed, with particular emphasis on research that breaks down the value chain, characterises types of employment (direct, indirect, induced), and estimates employment coefficients based on technological and production parameters. This review served to substantiate the assumptions and structures of the analysis.
- **Survey design and deployment**: The Canary Islands Maritime Cluster developed a detailed questionnaire that was distributed to project partners through the EU Survey platform, ensuring accessibility, security, and standardisation in data

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collection. The survey requested information on current employment and expectations in scaling scenarios, collecting quantitative and qualitative data in multiple dimensions: nature of employment (temporary, permanent), professional category (management, STEM, operators, others), specific sector (offshore wind, aquaculture), and distribution of employment across the different phases of the value chain (planning, manufacturing, installation, operation and maintenance, decommissioning).

- **Scaling scenarios**: The defined scenarios (prototype, early commercial, full commercial) were constructed jointly by the CMC with key technology partners such as EnerOcean (W2Power) and the project coordinator, Dr. Javier Roo, in collaboration with PLOCAN.

This process included technical and validation sessions to ensure that wind capacity and aquaculture production projections are realistic and consistent with expected technological developments and market conditions.

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Survey

Figure 31. AquaWind Employment Impact Survey Banner. Source: own elaboration.

Link to the survey: https://ec.europa.eu/eusurvey/runner/JobCreation_AquaWind

Employment Impact Survey – AquaWind Project

Dear AquaWind partners

As part of the AquaWind project's ongoing efforts under Work Package 5 – Exploitation: Business Plans, Sustainability Plans, and Knowledge Transfer & IP, the Clúster Marítimo de Canarias (CMC) has developed this brief survey

The purpose of this survey is to collect information on the employment generated by the AquaWind project. As a partner, your insights are important to assess the workforce dynamics in each segment of the value chain and to understand the broader economic and social benefits. In addition to capturing current employment impacts, the survey is structured around several scenarios. Please respond to each question based on the characteristics of the relevant scenario, approximating the number and types of jobs you believe could be generated:

- ***Current Scenario: 0.6 MW / 1.5 T, 1 platform/cage***

Future Estimates:

- ***Scenario 1: 10 MW / 300 T, 1 platform/cage***
- ***Scenario 2: 40 MW / 1200 T, 4 platforms/cages***
- ***Scenario 3: 200 MW / 6000 T, 20 platforms/cages***

The results of this survey will not only help us assess the current employment landscape but will also guide strategic planning for the potential commercial scale-up of the AquaWind prototype.

Table 2. Employment Impact Survey - AquaWind Project General Data

• **Name and surname:** ________________	• **Email:** ________________
• **Organisation** ________________	• **Estimated number of employees that have been involved (It is not the PMs you have assigned to the project, but all the people involved in the implementation of the prototype.)** ________________
• **How many of these jobs have been new jobs?** ________________	

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Table 3. Employment Impact Survey - AquaWind Project Current Scenario

- *Current scenario*
  0.6 MW / 1.5 t – 1 platform/cage

- **Number of**

	<5	5-10	11-20	21-50	51-100	>100
Direct jobs						
Indirect jobs						
Induced jobs						

- The direct sectors are those directly benefited by the project (CAPEX, OPEX and decommissioning).
- The indirect sectors are those that benefited by the linkage effect triggered by the direct sectors, but that are not labelled as direct ones, such as services activities, construction activities, among others.
- The induced effects are the remaining sectors, e.g. those related with consumption and leisure

- **Number of**

	<5	5-10	11-20	21-50	51-100	>100
Permanent jobs						
Temporary jobs						

- **Number of jobs in relation to the role**

	<5	5-10	11-20	21-50	51-100	>100
Senior Management						

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Management **STEM (Science, Technolgy, Engineering & Mathematics)** **Other non-technical** **Other technical** **Administration**	

- **Which sector do you belong to?**
  - ☐ **Aquaculture**
  - ☐ **Wind Energy**

- **Could you classify the employment generated in the different stages of the value chain?**

Depending on your response:
YES: If you can differentiate by stage, please indicate the number of jobs in each stage.
NO: If not, simply provide the total number of jobs generated overall.

- ☐ **Yes**
- ☐ **No**

If you answered "No"

- **Number of jobs generated**
  - ☐ **<5**
  - ☐ **5-10**
  - ☐ **11-20**
  - ☐ **21-50**
  - ☐ **51-100**
  - ☐ **<100**

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If you answered "Yes" & "Aquaculture"

- **Number of jobs in relation to the value chain**

	<5	5-10	11-20	21-50	51-100	>100
Transport, storage and supply						
Farming						
Processing & distribution						

If you answered "Yes" & "Wind Energy"

- **Number of jobs in relation to the value chain**

	<5	5-10	11-20	21-50	51-100	>100
Manufacturing						
Assembly & installation						
O&M						
Decommissioning						

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Table 4. Employment Impact Survey - AquaWind Project Scenario 1

- *Scenario 1*
  10 MW / 300 t – 1 platform/cage

- **Number of**

	<5	5-10	11-20	21-50	51-100	>100
Direct jobs						
Indirect jobs						
Induced jobs						

- The direct sectors are those directly benefited by the project (CAPEX, OPEX and decommissioning).
- The indirect sectors are those that benefited by the linkage effect triggered by the direct sectors, but that are not labelled as direct ones, such as services activities, construction activities, among others.
- The induced effects are the remaining sectors, e.g. those related with consumption and leisure

- **Number of**

	<5	5-10	11-20	21-50	51-100	>100
Permanent jobs						
Temporary jobs						

- **Number of jobs in relation to the role**

	<5	5-10	11-20	21-50	51-100	>100
Senior Management						

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Management **STEM (Science, Technolgy, Engineering & Mathematics)** **Other non-technical** **Other technical** **Administration**	

- **Which sector do you belong to?**
  - □ **Aquaculture**
  - □ **Wind Energy**

- **Could you classify the employment generated in the different stages of the value chain?**

Depending on your response:
YES: If you can differentiate by stage, please indicate the number of jobs in each stage.
NO: If not, simply provide the total number of jobs generated overall.

□ **Yes**
□ **No**

If you answered "No"

- **Number of jobs generated**

□ **<5**
□ **5-10**
□ **11-20**
□ **21-50**
□ **51-100**
□ **<100**

If you answered "Yes" & "Aquaculture"

- **Number of jobs in relation to the value chain**

	<5	5-10	11-20	21-50	51-100	>100
Transport, storage and supply						
Farming						
Processing & distribution						

If you answered "Yes" & "Wind Energy"

- **Number of jobs in relation to the value chain**

	<5	5-10	11-20	21-50	51-100	>100
Manufacturing						
Assembly & installation						
O&M						
Decommissioning						

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Table 5. Employment Impact Survey - AquaWind Project Scenario 2

- ***Scenario 2***
  40 MW / 1200 t – 4 platform/cage

- **Number of**

	<5	5-10	11-20	21-50	51-100	>100
Direct jobs						
Indirect jobs						
Induced jobs						

- The direct sectors are those directly benefited by the project (CAPEX, OPEX and decommissioning).
- The indirect sectors are those that benefited by the linkage effect triggered by the direct sectors, but that are not labelled as direct ones, such as services activities, construction activities, among others.
- The induced effects are the remaining sectors, e.g. those related with consumption and leisure

- **Number of**

	<5	5-10	11-20	21-50	51-100	>100
Permanent jobs						
Temporary jobs						

- **Number of jobs in relation to the role**

	<5	5-10	11-20	21-50	51-100	>100
Senior Management						

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Management

STEM (Science, Technolgy, Engineering & Mathematics)
Other non-technical

Other technical

Administration

- **Which sector do you belong to?**
  - □ **Aquaculture**
  - □ **Wind Energy**

- **Could you classify the employment generated in the different stages of the value chain?**

Depending on your response:
YES: If you can differentiate by stage, please indicate the number of jobs in each stage.
NO: If not, simply provide the total number of jobs generated overall.

□ **Yes**
□ **No**

If you answered "No"

- **Number of jobs generated**

□ **<5**
□ **5-10**
□ **11-20**
□ **21-50**
□ **51-100**
□ **<100**

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If you answered “Yes” & “Aquaculture”

- **Number of jobs in relation to the value chain**

	<5	5-10	11-20	21-50	51-100	>100
Transport, storage and supply						
Farming						
Processing & distribution						

If you answered “Yes” & “Wind Energy”

- **Number of jobs in relation to the value chain**

	<5	5-10	11-20	21-50	51-100	>100
Manufacturing						
Assembly & installation						
O&M						
Decommissioning						

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Table 6. Employment Impact Survey - AquaWind Project Scenario 3

- *Scenario 3*
  200 MW / 6000 t – 20 platform/cage

- **Number of**

	<5	5-10	11-20	21-50	51-100	>100
Direct jobs						
Indirect jobs						
Induced jobs						

- The direct sectors are those directly benefited by the project (CAPEX, OPEX and decommissioning).
- The indirect sectors are those that benefited by the linkage effect triggered by the direct sectors, but that are not labelled as direct ones, such as services activities, construction activities, among others.
- The induced effects are the remaining sectors, e.g. those related with consumption and leisure

- **Number of**

	<5	5-10	11-20	21-50	51-100	>100
Permanent jobs						
Temporary jobs						

- **Number of jobs in relation to the role**

	<5	5-10	11-20	21-50	51-100	>100
Senior Management						

Management **STEM (Science, Technolgy, Engineering & Mathematics)** **Other non-technical** **Other technical** **Administration**	

- **Which sector do you belong to?**
  - □ **Aquaculture**
  - □ **Wind Energy**

- **Could you classify the employment generated in the different stages of the value chain?**

Depending on your response:
YES: If you can differentiate by stage, please indicate the number of jobs in each stage.
NO: If not, simply provide the total number of jobs generated overall.

□ **Yes**
□ **No**

If you answered "No"

- **Number of jobs generated**

□ **<5**
□ **5-10**
□ **11-20**
□ **21-50**
□ **51-100**
□ **<100**

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If you answered “Yes” & “Aquaculture”

- **Number of jobs in relation to the value chain**

	<5	5-10	11-20	21-50	51-100	>100
Transport, storage and supply						
Farming						
Processing & distribution						

If you answered “Yes” & “Wind Energy”

- **Number of jobs in relation to the value chain**

	<5	5-10	11-20	21-50	51-100	>100
Manufacturing						
Assembly & installation						
O&M						
Decommissioning						

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Results and analysis

A detailed analysis of the results of the AquaWind project's employment impact survey is provided below, based on responses from the consortium partners: ULPGC, PLOCAN, WAVEC, Consulta Europa, EnerOcean, INNOSEA and the Clúster Marítimo de Canarias. This study's main objective is to evaluate and forecast the potential for job creation in the project's various development phases, from the prototype stage to full commercialisation.

Analysis of Results: Employment in the Current Scenario

In the current scenario, the survey asked partners to estimate the number of employees who actively participated in implementing the AquaWind project prototype, and the number of new jobs created. The aggregate results from the seven partners are as follows:

- **The total number of employees involved is 52**, as revealed by the sum of the estimates.
- **Total new jobs**: partners indicate that **8** of these correspond to new hires generated specifically in this initial phase.

The current phase of the AquaWind project corresponds to the development and validation of the 0.6 MW/1.5-tonne prototype, representing the starting point for an innovative hybrid technology combining floating offshore wind energy and aquaculture. Despite being at an early stage, the project has already had a real and quantifiable impact on employability within the organisations that make up the consortium. A total of 52 people has been mobilised in this phase, eight of whom were hired specifically because of the project.

As for the details of the responses, when it came to direct employment, responses were received in all the lower ranges: two in each of <5, 5-10, and 11-20 range. A similar pattern emerged for indirect employment, with one response in each of <5, and 5–10 range, and three in the 11–20 range. Only three responses were received for induced employment, distributed between the lower and upper ranges.
In terms of employment type, low values predominate permanent employment received three responses in the <5 range, one in 5-10, and two in the 11–20 range, while temporary employment received four responses in the <5 range and 1 in the 11–20 range.

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Looking at professional profiles, the concentration is also clear in the lower ranges. There are four responses in the <5 range in senior management and five in management.

In STEM, the distribution is somewhat more diverse: Four in <5, one in 5–10, and one in 11–20. Responses in other technical jobs are divided between three in the lowest range and one in the 5–10 range, while in other non-technical jobs, there are only three contributions (two in the lowest range and one in the 5–10 range). In administration, the responses are almost entirely concentrated in the lowest range, with six in the 'less than 5' category.

In the group of jobs not classified by value chain, there are three responses in the lowest range and one in the 11–20 range. In terms of the offshore wind value chain, contributions are scarce and are all in the lower ranges: One response is in the range <5 in manufacturing and O&M; one is in the range 5–10 in assembly; and one is in the range 5–10 in decommissioning. In relation to the aquaculture value chain, the data indicated a range of 11-20 for transport, storage and supply, between 5-10 employees for farming, and <5 for processing and distribution.

Table 7. Current Scenario - Direct, indirect, induced jobs applied by the entities surveyed.

Employment category	<5	5-10	11-20	21-50	51-100	>100
Direct	2	2	2	0	0	0
Indirect	1	1	3	0	0	0
Induced	1	0	2	0	0	0

Table 8. Current Scenario - Permanent and temporary Jobs applied by the entities surveyed.

Type of employment	<5	5-10	11-20	21-50	51-100	>100
Permanent	3	1	2	0	0	0
Temporary	4	0	1	0	0	0

Table 9. Current Scenario - Jobs related to the role applied by the entities surveyed.

Professional role	<5	5-10	11-20	21-50	51-100	>100
Senior Management	4	0	0	0	0	0
Management	5	0	0	0	0	0
STEM	4	1	1	0	0	0
Other non-technical	2	1	0	0	0	0
Other technical	3	1	0	0	0	0

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Professional role	<5	5-10	11-20	21-50	51-100	>100
Administration	6	0	0	0	0	0

Table 10. Number of jobs generated (those that have not been able to classify themselves by value chain).

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Nº of jobs	3	0	1	0	0	0

Table 11. Number of jobs in relation to offshore wind the value chain

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Manufacturing	1					
Assembly & Installation		1				
O&M	1					
Decommissioning		1				

Table 12. Number of jobs in relation to the aquaculture value chain

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Transport, storage and supply			1			
Farming		1				
Proccessing & distribution	1					

The current scenario reflects a limited impact on employment overall, with most responses falling within the range of 1–5 jobs, and some within the ranges of 5–10 and 11–20. Overall, this is consistent with the project's pilot nature: an initial phase that mobilises staff within partner organisations and generates some new jobs, but which has not yet achieved a high volume of employment or broad induced effects.

Therefore, this initial scenario exhibits a pattern of employability that is typical of R&D projects in the prototype phase: it is small in scale, but the jobs are skilled and stable and are directly linked to the technological core of the project. Additionally, it demonstrates robust internal organisation with technical, administrative, and management structures prepared to progress to later phases involving greater operational complexity. There is an indirect impact and induced effects on the environment, which lay the foundations for a progressive increase as the project moves towards commercialisation and large-scale deployment.

Analysis of Future Scenarios

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It is important to emphasise that the following data represents estimates provided by the consortium partners, which should not be interpreted as exact or definitive figures. These projections are intended to model and supplement a more detailed study of the project's potential impact as it progresses towards commercialisation.

It should also be noted that although seven partners participated in the survey, this does not imply that they all responded to every question. This may be due to differences in the scope and nature of their activities, their level of knowledge about future scenarios or how relevant they consider certain aspects to be.

Scenario 1: Early Commercialisation (10 MW / 300 t)

In this scenario, which corresponds to 10 MW of wind power and 300 tonnes of aquaculture on a single platform, responses were collected from partners, although not all of them completed all sections.

In the case of direct employment, the estimates ranged from low to high values: three responses were recorded for fewer than five, one for 11–20, one for 51–100, and one for more than 100. A similar pattern emerges for indirect employment: one response in <5, two in 11–20, one in 51–100, and one in >100. Only three responses were received for induced employment, in the medium and high ranges (11-20, 51–100 and >100).

Regarding the nature of employment, responses were somewhat dispersed: for permanent employment, there were two in the range of <5, one in 5–10, two in the range of 11–20, and one in the range of >100; for temporary employment, there were three in the range of <5, one in the range of 21–50, and one in the range of >100.

Most categories of professional profile are concentrated in the lower value ranges, with some responses in the higher ranges:

- Senior management: three in <5, one in 5–10 and one in 11–20.
- Management: three in <5, one in 11–20 and one in 21–50.
- STEM: three in <5, two in 11–20 and one in 51–100.
- Other non-technical roles: one in <5 and two in 11–20.
- Other technical roles: two in <5, one in 51–100, and one in >100.
- Administration: Four in <5, one in 5–10 and one in 21–50.

Of the jobs not classified by value chain, two responses were received in the <5 category and one in the 11–20 category.

In terms of jobs distributed by value chain phase, with the focus in this case on the offshore wind value chain due to the absence of data for aquaculture, the following contributions were recorded: manufacturing (21–50 and >100); assembly/installation (21–50 and 51–100); operation and maintenance (O&M) (11–20 and >100); and decommissioning (21–50, with two responses). In relation to the aquaculture value chain, the data indicated the same as the current scenario, a range of 11-20 for transport, storage and supply, between 5-10 employees for farming, and <5 for processing and distribution.

Table 13. Scenario 1 - Direct, indirect, induced jobs

Employment category	<5	5-10	11-20	21-50	51-100	>100
Direct	3	0	1	0	1	1
Indirect	1	0	2	0	1	1
Induced	0	0	1	0	1	1

Table 14. Scenario 1 - Permanent and temporary jobs

Type of employment	<5	5-10	11-20	21-50	51-100	>100
Permanent	2	1	2	0	0	1
Temporary	3	0	0	1	0	1

Table 15. Scenario 1 - Jobs related to the role

Professional role	<5	5-10	11-20	21-50	51-100	>100
Senior Management	3	1	1	0	0	0
Management	3	0	1	1	0	0
STEM	3	0	2	0	1	0
Other non-technical	1	0	2	0	0	0
Other technical	2	0	0	0	1	1
Administration	4	1	0	1	0	0

Table 16. Scenario 1 - Number of jobs generated (those that have not been able to classify themselves by value chain)

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Nº of jobs	2	0	1	0	0	0

Table 17. Scenario 1 - Number of jobs in relation to the offshore wind value chain

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Manufacturing				1		1
Assembly & Installation				1	1	
O&M			1			1
Decommissioning				2		

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Table 18. Scenario 1 - Number of jobs in relation to the aquaculture value chain

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Transport, storage and supply			1			
Farming		1				
Processing & distribution	1					

The results of this scenario demonstrate a diverse range of responses. In several categories, contributions are in low ranges (<5), while others are in medium and high ranges, reaching more than 100 jobs in some cases. It is noteworthy that in induced employment, the three responses received are directly in the medium-upper ranges.

In professional profiles, low values are common, although there are also estimates in STEM, other technical fields and administration that reach medium or high levels. Within the value chain, estimates are in place for the manufacturing, assembly, O&M and decommissioning phases, with results ranging from intermediate to upper intervals.
In summary, this first scenario reflects a wide dispersion of estimates: responses in the low ranges coexist with others in the medium and high ranges, indicating different perceptions of the employment that could be generated by a single 10 MW and 300 t platform.

Scenario 2: Expanded Deployment (40 MW / 1.200 t)
In this scenario, which corresponds to 40 MW of wind power and 1,200 tonnes of aquaculture on four platforms, the responses received once more demonstrate a considerable dispersion between intervals.
In direct employment, estimates are distributed between two in <5, one in 5-10, one in 11–20, one in 51–100 and one in >100. The same logic underpinning the phenomenon applies to indirect employment. The distribution of the data is as follows: one in <5, one in 11–20, one in 21-50, one in 51–100 and one in >100. About induced employment, a mere three responses were documented, which registered medium-high values (21-50, 51–100 and >100).
About the nature of employment, the data demonstrate that for permanent positions, there are two responses in the range of <5, two in the range of 11–20, one in the range of 51–100, and one in the range of >100. Regarding temporary employment, the figures are as follows: two out of <5, one in 5-10, one in 11–20, and one in >100.
In professional profiles, heterogeneity remains a prevalent feature:

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- The senior management team is comprised of three members in <5, one in the 5-10 group, and one in 11-20.
- The distribution of management is as follows: three instances in the <5 category, one instance in the 11–20 category, and one instance in the 21–50 category.
- The STEM data indicates two in the <5 group, one in 5-10, two in the 11–20 group, and one in the >100 group.
- The remaining non-technical cases were distributed as follows: one in 5-10, one in 11–20 and one in 21–50.
- Regarding the technical aspects, the frequency was found to be one in <5, one in 5-10 range, one in 51–100 and one in >100.
- The administration of the treatment is as follows: two cases in instances where the number is less than five, one in 5-10, one case in instances where the number is between 11 and 20, and one case in instances where the number is between 51 and 100.

In the category of jobs not classified by value chain, two responses were recorded in the <5 range, and one in the 11–20 range. In the breakdown of jobs by offshore wind value chain, again, only with data from the offshore wind sector, the data is concentrated in the upper ranges: manufacturing with 1 in 21–50 and 1 in >100, assembly/installation with 1 in 21–50 and 1 in >100, O&M with 1 in 11–20 and 1 in >100, and decommissioning with 1 in 11–20 and 1 in 51–100. In this case, for the aquaculture value chain, there is a surge in personnel with ranges of 11-20 employees for each part of the value chain.

Table 19. Scenario 2 - Direct, indirect, induced jobs

Employment category	<5	5-10	11-20	21-50	51-100	>100
Direct	2	1	1	0	1	1
Indirect	1	0	1	1	1	1
Induced	0	0	0	1	1	1

Table 20. Scenario 2 - Permanent and temporary jobs

Type of employment	<5	5-10	11-20	21-50	51-100	>100
Permanent	2	0	2	0	1	1
Temporary	2	1	1	0	0	1

Table 21. Scenario 2 - Jobs related to the role

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Professional role	<5	5-10	11-20	21-50	51-100	>100
Senior Management	3	1	1	0	0	0
Management	3	0	1	1	0	0
STEM	2	1	2	0	0	1
Other non-technical	0	1	1	1	0	0
Other technical	1	1	0	0	1	1
Administration	2	1	1	0	1	0

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Table 22. Scenario 2 - Number of jobs generated (those that have not been able to classify themselves by value chain)

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Nº of jobs	2	0	0	1	0	0

Table 23. Scenario 2 - Number of jobs in relation to the offshore wind value chain

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Manufacturing				1		1
Assembly & Installation				1		1
O&M			1			1
Decommissioning			1		1	

Table 24. Scenario 2 - Number of jobs in relation to the aquaculture value chain

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Transport, storage and supply			1			
Farming			1			
Proccessing & distribution			1			

The results of this scenario show a wide dispersion in the responses. In all categories, there are contributions in the low (<5), medium (11–50) and high (≥51) ranges, including several cases in >100. In induced employment, although there were only three responses, they were in the upper ranges. In professional profiles, low values are common, but estimates in higher ranges also emerge, especially in STEM, technical and administrative roles.

In the offshore wind value chain phases, estimates range from medium to high, reflecting the perception that, in a larger-scale scenario such as this, multiple links (manufacturing, installation, O&M and decommissioning) would be activated. The aquaculture sector remains at an average level, with between 11 and 20 employees in each part of the proccess.

This second scenario confirms the coexistence of different views, which respond to the very nature of the activities of the partners who responded. Those more closely linked to manufacturing, technological integration, aquaculture or maintenance will project greater increases in employment, even in the higher ranges. On the opposite hand, those who perform tasks more focused on coordination, communication, management

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or organisational support place their estimates at low values, as their staffing levels do not grow in direct proportion to the increase in the scale of the project.

Escenario 3: Full Commercialisation (200 MW / 6.000 t)

This scenario, corresponding to 200 MW of wind power and 6,000 tonnes of aquaculture on 20 platforms, reflects a much larger scale, and the responses show a wide dispersion.

In terms of direct employment, there were two responses in <5, two in 21–50 and one in >100. For indirect employment, the estimates are distributed between one in <5, one in 21–50, one in 51-100 and one in >100. In terms of induced employment, only two responses were received, located in 51-100 and >100.

Regarding the nature of employment, in permanent positions there are two responses in <5, one in 11–20, one in 21-50 and one in >100. For temporary positions, the responses are concentrated in two in <5, one in 11-20 and one in 51–100.

For professional profiles, the responses also cover different levels:

- Senior management: estimates in one <5, two in 5–10, one in 11–20 and one in 21–50
- Management: responses in <5, two in 5–10, 21–50 and 51–100.
- STEM: wide dispersion, with two in <5, two in 11–20, one in 21–50 and one in >100.
- Other non-technical: one in 11-20, one in 21–50 and one in 51–100.
- Other technical: one in 5–10, one in 11-20 and two in >100.
- Administration: one in <5, one in 5–10, two in 11–20 and one in >100.

In jobs not classified by value chain, two responses were collected in <5 and one in 21–50.

In terms of the offshore wind value chain, the contributions are in the high ranges: in manufacturing and assembly/installation, there are two responses in >100, in O&M there are one in 51–100 and one in >100, and in decommissioning there are also one in 51–100 and one in >100. In the case of aquaculture, there has been an increase in all three parts of the process, with a range of 21-50 in Transport, storage and supply and Processing & distribution, and a range of 51-100 in Farming.

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Table 25. Scenario 3 - Direct, indirect, induced jobs

Employment category	<5	5-10	11-20	21-50	51-100	>100
Direct	2	0	0	2	0	1
Indirect	1	0	0	1	1	1
Induced	0	0	0	0	1	1

Table 26. Scenario 3 - Permanent and temporary jobs

Type of employment	<5	5-10	11-20	21-50	51-100	>100
Permanent	2	0	1	1	0	1
Temporary	2	0	1	0	1	0

Table 27. Scenario 3 - Jobs related to the role

Professional role	<5	5-10	11-20	21-50	51-100	>100
Senior Management	1	2	1	1		
Management	1	2		1	1	
STEM	2		2	1		1
Other non-technical			1	1	1	
Other technical		1	1			2
Administration	1	1	2			1

Table 28. Scenario 3 - Number of jobs generated (those that have not been able to classify themselves by value chain)

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Nº of jobs	2	0	0	1	0	0

Table 29. Scenario 3 - Number of jobs in relation to the offshore wind value chain

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Manufacturing						2
Assembly & Installation						2
O&M					1	1
Decommissioning					1	1

Table 30. Scenario 3 - Number of jobs in relation to the aquaculture value chain

Jobs generated	<5	5-10	11-20	21-50	51-100	>100
Transport, storage and supply				1		
Farming					1	
Proccessing & distribution				1		

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It is worth noting the clear increase in employment levels, which is in line with the project's large-scale expansion. As mentioned in Scenario 2, activities focused on technology or maintenance are growing significantly, while those focused on management, organisation and coordination are seeing smaller increases, as these activities do not require additional staff.

Thus, what appeared in Scenario 1 as a combination of low values with some responses in the middle and high ranges, and in Scenario 2 was consolidated with the appearance of higher figures, in Scenario 3 becomes a clearly polarised projection between very low contributions and estimates at the maximum levels.

Conclusions

The results of the analysis confirm that the AquaWind project is in line with the main growth trends of the blue economy, combining two strategic sectors: floating offshore wind energy and sustainable aquaculture.

Internationally, offshore wind reached 83 GW of installed capacity in 2024, with forecasts exceeding 300 GW in 2035, which will mean the addition of more than one million new workers in the next decade (GWEC, 2025). In Europe, capacity already stands at 21.2 GW, generating more than 47,000 full-time equivalent jobs with a growing number of technical and industrial profiles. For its part, aquaculture produced nearly 41,000 full-time equivalent jobs and more than €4.8 billion in turnover in 2022 (STECF 24-14), consolidating its position as a key sector in food security and ecological transition.

This international framework is particularly relevant for the Canary Islands, where the deployment of innovative technologies such as AquaWind can contribute to economic diversification and the creation of specialised jobs, in line with maritime spatial planning. Reference studies indicate that a 200 MW floating wind farm in Gran Canaria could generate between 6,800 and 8,700 man-years of work in the investment phase, as well as more than 100 stable jobs over 25 years of operation and maintenance, with regional added value capture of up to 40% in scenarios with high local content.

AquaWind's analysis shows a clear progression in employability as the scale of the project increases:

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- **In the current scenario (0.6 MW / 1.5 t)**, 52 workers were involved, with 8 new jobs created. Although the volume is low, these are mainly skilled profiles directly linked to the technological core.
- **In Scenario 1 (10 MW / 300 t)**, estimates range from low contributions (<5) to high contributions (>100), especially in technical and STEM profiles, as well as in the assembly and installation phases.
- **In Scenario 2 (40 MW / 1,200 t)**, the dispersion widens with responses ranging from low values to more than 100 jobs in key categories. The manufacturing, assembly and continuous operation phases account for a large part of the estimates.
- **In Scenario 3 (200 MW / 6,000 t)**, responses in the high ranges increase, exceeding 100 jobs in several categories and phases of the value chain, although contributions in the lower ranges continue to coexist, responding to activities that do not require more employees to carry out their job.

The variability in estimates lies in the nature of each entity's activities. Organisations more closely linked to component manufacturing, technological integration, aquaculture, or operations and maintenance project greater increases in employment. Conversely, organisations performing coordination, communication, management or support functions do not see their staffing needs grow proportionally as the scale of the project increases.

In conclusion, the results obtained suggest that future larger-scale scenarios could diversify job creation across the different links in the value chain, starting from a pilot phase with a small but skilled workforce. Within this hypothetical framework, the co-location of floating wind energy and aquaculture emerges as a solution capable of activating sectoral synergies, optimising the use of maritime space, and strengthening industrial, logistical, and training capacities in the Canary Islands. This could potentially drive employment in the region if these scenarios were to materialise.

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ANEX 9: AQUAWIND SHOW CASE EVENT REPORT

Introduction

On **6 June 2025**, the **Canary Islands Maritime Cluster (CMC)**, in collaboration with the **Canary Islands Agency for Research, Innovation and the Information Society (ACIISI)**, the **Gran Canaria Economic Promotion Society (SPEGC)** and the **Canary Islands Ocean Platform (PLOCAN)**, organised the **AquaWind Showcase Event**, a key meeting for disseminating the progress of the European **AquaWind** project. The event was held at the **Maritime Innovation Centre (CIMM)**, located in the Puerto Las Palmas Foundation Building, as part of the **European Maritime Day in my Country 2025**, promoted by the European Commission.

The main objective of the event was to showcase the technical and strategic advances of the AquaWind project, an initiative co-funded by the European Union that seeks to validate, for the first time in the European Atlantic, a multipurpose model for the co-location of activities in the marine environment. The project combines a floating offshore wind energy platform (W2Power, TRL6) with a fish farming solution (TRL4), equipped with a custom-designed cage, new net materials, a high degree of digitalisation and a multi-species approach.

The integration of both activities aims to demonstrate the technical, environmental, social and economic viability of this type of approach, which optimises the use of maritime space and moves towards a more sustainable, resilient and efficient blue economy model. The AquaWind consortium is made up of partners from Spain, France and Portugal, including public and private entities, research centres and a business cluster.

This conference, designed as a strategic action within Work Package 5 – Exploitation, in particular to advance **Task 5.4 - Investment Community Review**, also aimed to **bring the project closer to the investment community**, promoting possible collaborations that contribute to its future scalability, highlighting the milestones achieved to date, strengthening synergies between actors in the maritime-technological ecosystem and promoting dialogue with financial agents interested in innovative solutions linked to the blue economy.

During the closing of the event, the **FIMAR 2025 International Sea Fair** was officially inaugurated at the Sanapú Pier, next to the Poema del Mar aquarium and the Onda Atlántica walkway. Organised by **Infecar Feria de Gran Canaria and Ciudad de Mar**, and promoted by the **Cabildo de Gran Canaria**, the City Council of Las Palmas de Gran

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Canaria, and the Port Authority of Las Palmas, the event established itself as a regional benchmark for the nautical and maritime sectors.

The AquaWind project was given its own space within the Canary Islands Maritime Cluster stand. Throughout the weekend, a variety of audiences were treated to informative and interactive activities, including educational games, raffles and immersive digital experiences. This space allowed visitors to learn about the integration of floating wind energy and sustainable aquaculture and to discover how AquaWind is helping to transform the future of the sea from the islands.

This approach can help fulfill the "**Ocean Breakthroughs**" set out by the **Ocean Investment Protocol for 2030**, thereby strengthening the project's appeal to investors:

Ocean Renewable Energy: installing at least 380 GW of offshore wind capacity and mobilizing USD 10 billion in concessional financing to accelerate deployment in emerging economies (United Nations Global Compact, 2025).

Aquatic Foods: directing USD 4 billion per year toward resilient aquatic food systems that ensure sustainable nutrition for 3 billion people (United Nations Global Compact, 2025).

Moreover, blue-economy, specific financial instruments, such as Blue Bonds, developed under the guidance of ICMA, UNEP FI, and the IFC, and the Sustainable Blue Economy Finance Principles, provide clear pathways to attract private capital tied to measurable biodiversity and coastal resilience outcomes. This framework gives the AquaWind Showcase a quantitative and regulatory underpinning that drives investor interest and confidence. This facilitated attendee management and the collection of key data.

Event organisation

The event was planned to fulfil several complementary AquaWind project objectives: showcasing the prototype's progress, strengthening links with local and regional stakeholders, and presenting the technological proposal to investors in a structured environment conducive to dialogue.

The planning and organisation of the event began in early 2025. This included the following:

Identifying and segmenting key players, with a particular focus on agents in the investment ecosystem, public bodies, training centres, and companies in the maritime technology sector; and creating a database of potential investors, classified by type.

- **Venture capital and specialised funds**
- **banks and financial institutions.**
- **Large companies in the energy sector.**
- **Aquaculture and sustainable nutrition companies.**
- **Public innovation programmes and competitive funds.**
- **Local companies with investment capacity**
- **Business Angels**

To identify companies with investment potential, both locally and internationally, the **SABI** database was used, which allowed us to locate companies with financial capacity and strategic alignment with AquaWind's technological model. Specialised sources such as **The EIC Trusted Investor Network** and **BlueInvest reports** were also consulted. These compile and analyse key players in the Blue Economy financing ecosystem, offering detailed profiles of institutional investors, venture capital funds and co-investment platforms with experience in maritime and renewable energy projects.

This list can be found at the following link:

https://ec.europa.eu/eusurvey/runner/AquaWind_Survey_Showcase_Event

Personalised invitations were then sent by email to those identified, followed by follow-up actions. At the same time, a public communication campaign was designed and implemented through the CMC's channels. This included specific social media posts (on LinkedIn, Instagram and X) and the creation of an online registration form.

Consortium partners were also asked to promote the event on their social media and corporate websites to broaden the communication reach and strengthen the project's visibility in a coordinated manner at a European level.

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Programme

The AquaWind Showcase Event was structured into two distinct blocks, with the aim of involving both to a general audience interested in the institutional, educational and technological context of the project, and to more specialised profiles with an interest in the technical feasibility, commercial scaling and investment opportunities associated with the multipurpose model proposed by AquaWind.

The event was held in person at the Marine Maritime Innovation Centre (CIMM), located in the Puerto Las Palmas Foundation Building (SPEGC), and brought together a total of **32 attendees at the institutional session** and **17 attendees at the private technical session**.

Part I – Public Institutional Session (09:00 – 10:00)

Training Room 2 – CIMM

This first part of the conference, which was open to the public, was aimed at contextualising the project within the regional and European blue economy ecosystem, as well as presenting the progress made to date. It was particularly aimed at institutional representatives, training centres, local companies and entities linked to marine innovation.

The event featured the participation of **Javier Roo**, **AquaWind Project Coordinator from ACIISI**, **Pedro Mayorga, CEO of EnerOcean**, **and Carlos Navarro, Project Manager at PLOCAN**, among other experts. In addition, technical presentations and information materials on the project were shared, and images of the event were disseminated through the communication channels of the CMC and the collaborating entities.

Programme and speakers:

- **Institutional welcome**

Elba Bueno, Manager – Canary Islands Maritime Cluster

Javier Franco Hormiga, Director – ACIISI

- **Advantages of investing in the Canary Islands**

Delia Domínguez, Senior Technician – Canarias ZEC

- **Presentation of the AquaWind project**

Javier Roo, Project Coordinator – ACIISI

- **The importance of dual vocational training in the maritime sector**

Juan Socorro, Director – Las Palmas Maritime and Fishing Vocational Training Institute

This session addressed key issues such as the strategic positioning of the Canary Islands in the blue economy, the opportunity represented by AquaWind as a comprehensive technological solution, and the need to train specialised talent through dual vocational training models adapted to the new demands of the offshore sector.

Part II – Private Technical Session for Investment Entities (10:30 – 11:45)

Training Room 1 – CIMM

This second part, with a more private tone, focused on agents with a direct interest in the development and financing of technological solutions applied to the marine environment. The content focused on the technical aspects of the project, its scalability and market potential, and provided an opportunity for interaction with the developers.

Programme and speakers:

- **Multipurpose offshore model: opportunities and challenges**

Carlos Navarro, Project Manager – PLOCAN

- **Technical presentation of the AquaWind prototype**

Pedro Mayorga, CEO – EnerOcean

Javier Roo, Project Coordinator – ACIISI

- **Open question and answer session**

Moderated by the Canary Islands Maritime Cluster team

During this session, the technical challenges and economic viability of the model were explored in depth, and scenarios for future deployment at both national and international level were analysed. Direct exchange between investors, technology promoters and public institutions was also facilitated.

The conference was a significant milestone for the project's dissemination, sustainability and knowledge transfer strategy, contributing directly to Work Package 5 – Exploitation of AquaWind, and particularly to Task 5.4 – Investment Community Review, by consolidating relationships with key players in the local, national and international investment environment.

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As part of FIMAR 2025, the Canary Islands Maritime Cluster's stand dedicated to the AquaWind project was open for the three days of the fair. An interactive roulette wheel was set up at this meeting point with questions about floating wind energy and sustainable aquaculture, accompanied by information panels and explanatory videos detailing the scope and advantages of the project. Each participation in the game was rewarded with merchandise from the initiative, such as caps, reusable bottles and notebooks, which generated a constant flow of visitors interested in learning how AquaWind is promoting the Blue Economy from the Canary Islands.

Photographic dossier

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Results and conclusions

The AquaWind Showcase Event confirmed the strength and potential of AquaWind as the first European model for offshore wind and fish aquaculture co-location, with plans to scale up and replicate it on other coastlines. The recent launch of the prototype, completed after an intense manufacturing and testing process — a milestone publicly announced on 3 June 2025 — marked the decisive step from the design phase to open sea validation, reinforcing the technical confidence of those in attendance.

The **interest shown** by the thirty-two attendees at the institutional session and the representatives of funds, banks and large companies who participated in the private session, resulted in an **initial portfolio of qualified investors** willing to study the business plan and capital requirements of the demonstrator.

At the same time, the event **highlighted the importance of specialised talent**. Without initiatives such as the Azul Dual Vocational Training programme, promoted by the Las Palmas Maritime-Fishing Institute, the industrial deployment of new-generation offshore and aquaculture technologies would be unfeasible. The involvement of training centres and companies in the cluster ensures that the workforce operating the R&D&I projects today will be the same one that will scale up the commercial parks tomorrow.

Overall, the conference achieved the following:

- Strengthen the collaboration network between government, industry, R&D and training.

- Consolidate a core of potential financiers who will accompany the transition from the pilot to the pre-commercial stage.

With these achievements, AquaWind reaffirms itself as a pioneering, sustainable and scalable project that places the Canary Islands —and, by extension, the European Atlantic— at the forefront of multipurpose solutions for the efficient and responsible use of marine space.

In the near future, the AquaWind project has the potential to promote the creation of new industries and high value-added jobs, particularly linked to energy production, aquaculture, ship repair and port services. It also aims to benefit the research community and attract investors, involving professionals from various sectors and contributing to the retraining of the local workforce.

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AQUAWIND

Innovative multi-use prototype combining offshore renewable energy and aquaculture in the Atlantic Basin

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