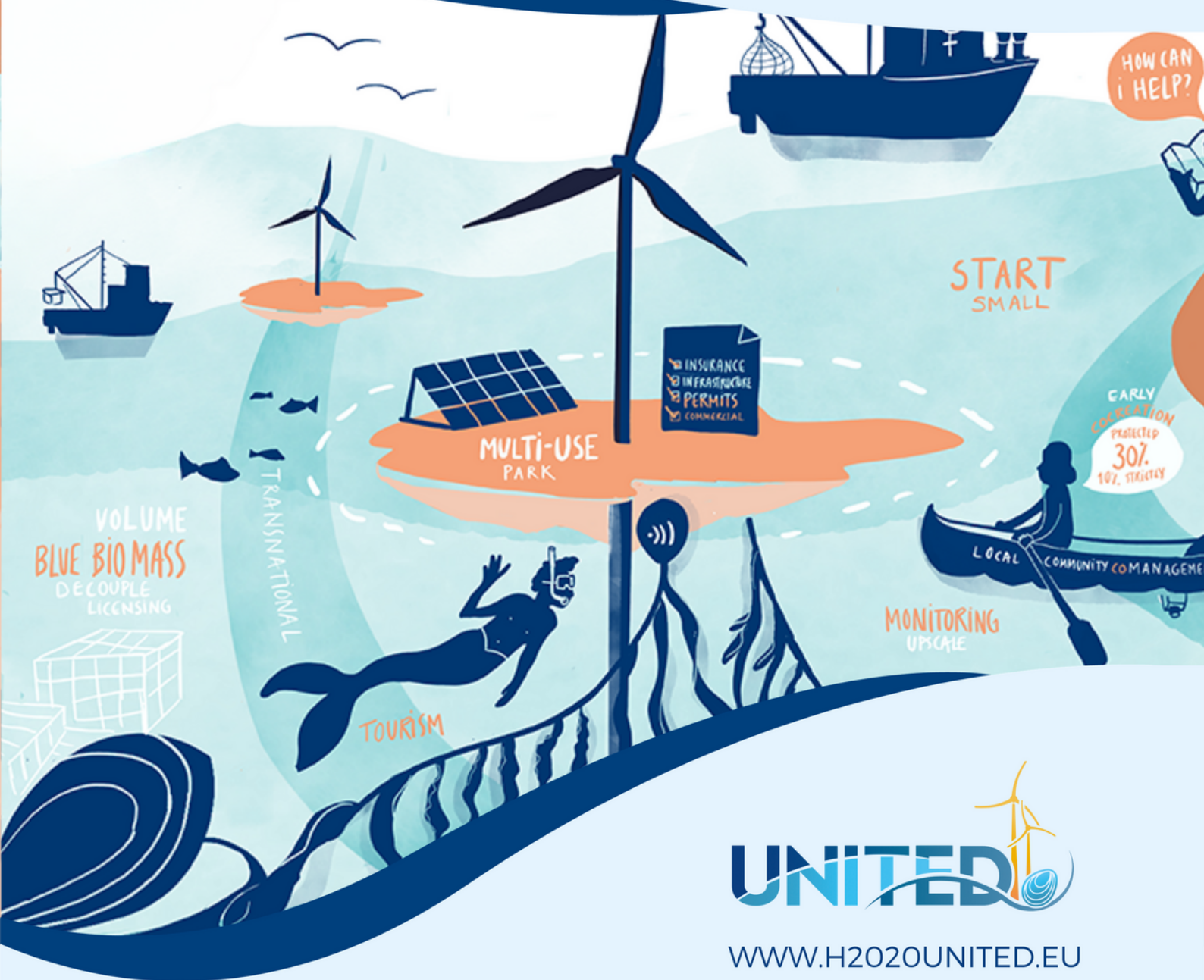


OCEAN MULTI-USE

COMMERCIALISATION ROADMAP EXECUTIVE SUMMARY



Funded by the European Union (H2020 Grant Agreement no 862915). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them

OCEAN MULTI-USE COMMERCIALISATION ROADMAP

The **Horizon 2020 UNITED project** has been running for a period of 4 years between January 2020 and December 2023. The project has piloted **5 multi-use solutions in the real environment** in 5 European Member States, increasing the **TRL from 4 to 7** for most of the solutions.

Belgium: Offshore wind, flat oyster aquaculture and restoration, and seaweed cultivation.

Germany: Blue mussels, seaweed farming and offshore wind energy.

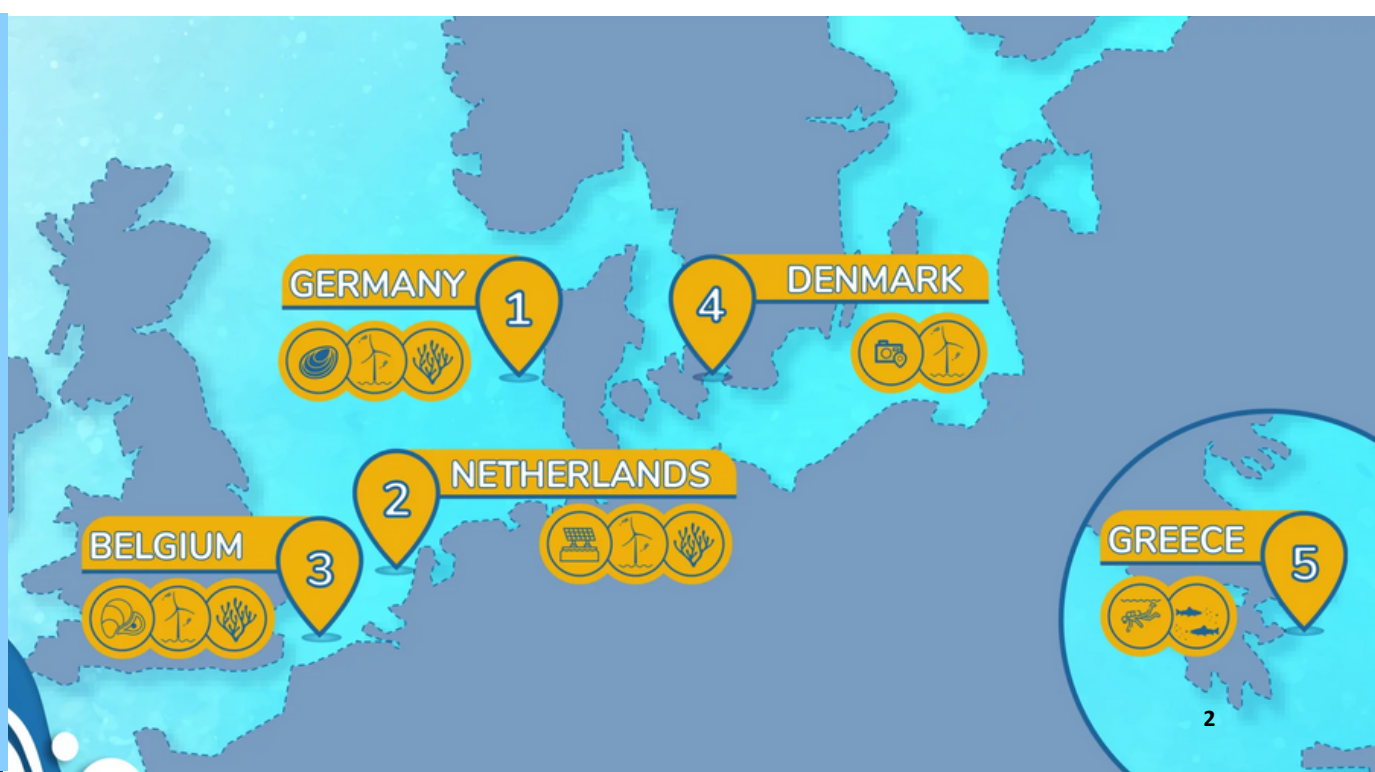
Netherlands: Offshore seaweed and floating solar energy.

Denmark: Offshore wind and tourism.

Greece: Tourism and fish aquaculture.

The concept of multi-use presents a solution for harmonising diverse maritime priorities through a more integrated planning approach. Sea space utilisation in the EU is on the rise, driven mainly by the **growing demand for renewable energy generation and local sustainable food**. This trend is evident in the ambitious renewable energy targets and various initiatives aimed at promoting sustainable aquaculture development offshore. Moreover, nature conservation objectives require the allocation of **30% of marine areas for conservation by 2030**, which is potentially increasing the spatial **conflicts in the already congested seas**.

Ocean multi-use involves the deliberate shared use of marine resources in close geographic proximity by two or more maritime activities, such as offshore wind and low trophic aquaculture, potentially leading to additional socio-economic and environmental benefits.



The **Ocean Multi-Use Commercialisation Roadmap** presented here provides a range of key recommendations derived from the UNITED pilot projects and showcases practical examples that can guide future multi-use initiatives. It serves as a valuable resource to support the future adoption and expansion of multi-use, not only in the pilot locations but also beyond. This Roadmap is beneficial for innovators, industry stakeholders, and policymakers, as it offers insights into the facilitators for scaling up and broader adoption.

It is important to emphasise that **scale-up of offshore multi-use solutions is not always the optimal solution**. This Roadmap does not advocate solely for the economies of scale; instead, it promotes a more widespread adoption of the multi-use system approach. This approach can foster synergies not only among sectors, leading to increased socio-economic benefits, but also between nature and economic activities, **creating additional social and economic value compared to single-use scenarios**.

The full Ocean Multi-Use Commercialisation Roadmap is available for download here:

[DOWNLOAD ROADMAP](#)



[DOWNLOAD](#)



WHY THE OCEAN MULTI-USE COMMERCIALISATION ROADMAP?

The Ocean Multi-Use Commercialisation Roadmap filters UNITED's insights, providing a **compass for scaling multi-use** initiatives. This resource is not only valuable for innovators and industry actors but also essential for policymakers to grasp the enablers for widespread multi-use adoption.

The roadmap presents a selection of **recommendations** derived from the project's pilots and highlights **practical examples** that can guide future multi-use initiatives organised by relevant topics. The recommendations aim to support the future adoption and expansion of multi-use, not only in the pilot project locations but also in broader contexts.

It is vital to emphasise that advocating for scale-up is not the primary objective. Instead, the roadmap promotes the **wider adoption of a multi-use system thinking** that can foster synergies among sectors, leading to increased socio-economic benefits. Additionally, it encourages **synergies between nature and economic activities**, creating greater social and economic value compared to single-use approaches.

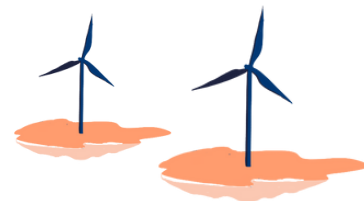


Learn more about the multi-use concept from the [Ocean Multi-Use Action Plan 2018](#).



MARKET ANALYSIS OVERVIEW - UNITED ECONOMIC SECTORS

Offshore renewable energy



European Union (EU) Member States have agreed on ambitious long-term goals for the deployment of offshore renewable energy, ranging from

109-112 GW by 2030, 215-248 GW by 2040, and 281-354 GW by 2050.

The **North Sea and Baltic Sea** basins show the most potential, which has been supported by the high-level policy agreements (Tables 2 and 3), followed by the Atlantic Sea. Due to the presence of wave energy, the Atlantic and North Sea are also good candidates for combined hybrid energy solutions such as the one demonstrated by the **EU-SCORES project**.²

Nevertheless, ensuring the social and environmental sustainability of offshore renewable energy development remains a challenge. To meet these targets, annual deployment rates will have to increase significantly, putting additional pressure on the European seas.

On the other hand, offshore wind **permitting procedures and their length vary significantly** across the Member States, slowing the rollout of offshore renewable energy.

While the concept of spatial efficiency and co-using sea space is **often encouraged on the policy level**, the multi-use between offshore renewables and other uses is not yet common practice.

The established wind energy sector can lead the way in integrating multiple activities in wind farms. The offshore wind industry often operates in different countries holding extensive expertise in marine ecology and biodiversity, e.g., from EIA processes, that can be utilised to site, design, and conduct robust multi-use pilot projects.



Learn more about combining different types of renewables offshore from the EU SCORES project



MARKET ANALYSIS OVERVIEW – UNITED ECONOMIC SECTORS

Aquaculture market analysis



Aquaculture Policy Push in the EU

The sustainable development of aquaculture is one of the main objectives of the EU **Common Fisheries Policy**. It is also reflected in the **Strategic Guidelines for a more sustainable EU aquaculture** and the **EU Algae Initiative**. Aquaculture production is recognised by the **European Green Deal** as a source of “**low carbon**” **protein for food and feed**.

Aquaculture Trends

The EU seafood market is heavily dependent on imports to meet its consumption needs. In 2021, imports accounted for 72% of the total seafood supply [3], and 29% of EU consumption came from farmed products [4]. The development of sustainable EU aquaculture offshore plays a key role in meeting the increasing demand for sustainable protein and improving the EU’s seafood self-sufficiency. In 2020, the EU aquaculture sector employed around **57,000 people working for approx. 14,000 enterprises**. The enterprises are primarily small, close to the shore, and family-owned.

In terms of volume of aquaculture production per category of species, **more than half is shellfish [5]**, while **marine fish account for around 20%**. The vast majority of EU production is for mussels, trout, seabream, oysters, seabass, carp and clams. More recently, **Integrated Multi-Trophic Aquaculture (IMTA)** has emerged as a space-efficient and environmentally friendly approach. However, to date, the development has mainly relied on a couple of EU research and innovation funded initiatives. In 2020, the 27 EU Member States produced **430.748 tonnes of mussels**, mainly from aquaculture (94% of the total). **Spain** is by far the main producer (47% of the EU production in 2020), followed by **France, Italy, the Netherlands, Denmark, Greece and Ireland**. **Belgium**, on the other hand, has no mussel aquaculture production but is a major mussel consumer. There is, therefore, still much **potential for further growth** and diversification in terms of producing countries and species farmed.

More recently, there has been a substantial focus on **seaweed farming** in Europe. The EU considers seaweed farming to be a **key pillar of its Blue Bioeconomy Strategy**. There are currently **several seaweed startups** in Europe, but production volumes are just in the hundreds of tons and are growing only slowly.

³ INTRAFISH. 2023. Available at: <https://www.intrafish.com/markets/european-union-hits-record-low-levels-of-seafood-self-sufficiency-as-dependence-on-imports-grows/2-1-1330537>

⁴ EUMOFA. 2023. Available at: https://www.eumofa.eu/documents/20178/566349/EFM2023_EN.pdf/95612366-79d2-a4d1-218b-8089c8e7508c?t=1699352554122

⁵ CINEA 2023. EU aquaculture sector: Socioeconomic development (2008-2020)

MARKET ANALYSIS OVERVIEW – UNITED ECONOMIC SECTORS

Tourism market analysis



EU coastal areas are amongst the most preferred touristic destinations for European and international travellers, making coastal and maritime tourism the **biggest, growing sector of the EU Blue Economy** in terms of Gross Value Added and employment. Coastal tourism comprises recreational activities taking place in the proximity of the sea (such as swimming, sunbathing, coastal walks, and wildlife watching) as well as those taking place in the maritime area, including nautical sports (e.g. sailing, scuba diving, cruising, etc.).

Over half of the EU bed capacity is concentrated in coastal regions. For the economy of many coastal EU Member States, tourism generates a significant portion of the national revenue. It has a wide-ranging impact on economic growth, employment and social development. Tourism is particularly significant for **Southern European** countries, such as Spain, Portugal, Italy, Malta and Greece. At the same time, coastal tourism is characterised by **high seasonality**, with demand concentrated in a limited number of months, usually July and August. Dealing with seasonality is, in fact, one of the key policy issues in tourism [7].

Although there is still a large market for mass sun and beach tourism, travellers are increasingly seeking unique sustainable experiences, especially in Western Europe. Pure leisure tourism is in decline. The choice of holiday destination is increasingly influenced by **ethics, moral values, concerns about the coastal environment and its ecosystems, including biodiversity protection and a desire to positively impact local communities**. This is especially the case for Generation Y or millennial travellers. Travellers are eager to avoid crowds and look for more remote destinations, which means that these destinations are not expected to remain remote for long.

⁷ EUROSTAT. 2023. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tourism_statistics_-_seasonality_at_regional_level#The_regions_with_the_highest_seasonality_are_coastal_regions

OFFSHORE WIND MULTI-USE VISION 2030

112 GW OF OFFSHORE WIND CAPACITY integrated with sustainable food provision and nature conservation, while preserving spatial resources for future use.

MARKET ANALYSIS AND POTENTIAL

2030

FIRST LARGE-SCALE, LONG TO MEDIUM-TERM COMMERCIAL MULTI-USE PROJECT REACHES THE BREAK-EVEN POINT

MULTI-USE INTEGRATED INTO OFFSHORE ENERGY ISLANDS CONCEPTS

WELL DEVELOPED MARKET ECOSYSTEM AROUND WIND FARMS

UNITED BUSINESS MODELS REPLICATED IN OTHER AREAS

CLEAR REGULATORY FRAMEWORK AND INCENTIVES

FINANCIAL INCENTIVES: FOR MULTI-USE FOR DEMONSTRATION

MULTI-USE ZONES IDENTIFIED IN EXISTING AND FUTURE WIND FARMS



2024

MARINE AQUACULTURE MULTI-USE VISION 2030

Sustainable seafood production was successfully scaled up through collaboration with offshore renewables, and the integration of coastal tourism and local culture has decisively shifted consumer preferences towards greater emphasis on sustainable seafood choices.

MARKET ANALYSIS AND POTENTIAL

2030

FIRST LARGE-SCALE, LONG TO MEDIUM-TERM COMMERCIAL AQUACULTURE MULTI-USE PROJECT REACHES THE BREAK-EVEN POINT

EXPANDED MARKET AND CONSUMER PREFERENCES FOR LOW TROPHIC SPECIES (E.G. SMALL OR INVASIVE SPECIES)

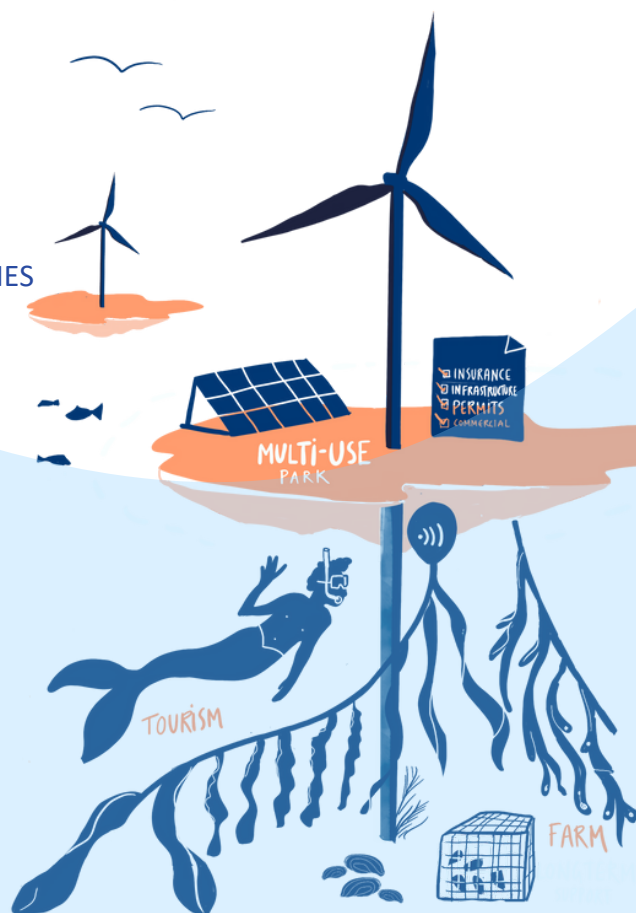
PREMIUM MULTI-USE PRODUCTS AND CERTIFICATIONS DEVELOPED

CLEAR REGULATORY FRAMEWORK AND INCENTIVES

UNITED BUSINESS MODELS FOR OFFSHORE AQUACULTURE REPLICATED IN OTHER AREAS

ONGOING FUNDING SUPPORT PROVIDED TO FARMERS FOR OFFSHORE MULTI-USE DEMONSTRATION

AQUACULTURE AND NATURE RESTORATION MULTI-USE ZONES IDENTIFIED IN MSP (E.G. IN EXISTING AND FUTURE WIND FARMS)



2024

TOURISM MULTI-USE VISION 2030

European coastal tourism, interwoven with diverse sectors, offers local communities and travellers a diverse range of sustainable experiences, effectively mitigating seasonality and driving rural economic growth.

2030

MARKET ANALYSIS AND POTENTIAL

MORE LOCAL SOCIO-ECONOMIC BENEFITS DERIVED FROM THE BLUE ECONOMY VIA TOURISM MULTI-USE

TOURISM MULTI-USE LINKS BLUE ECONOMY SECTORS TO LOCAL CULTURE AND VALUES

TOURISM MULTI-USE WELL INTEGRATED INTO THE MARKET FOR SUSTAINABLE ADVENTURE AND RETREAT

UNITED BUSINESS MODELS FROM DENMARK AND GREECE REPLICATED IN OTHER AREAS

CLEAR REGULATORY FRAMEWORK AND INCENTIVES FOR INTEGRATION OF TOURISM IN OTHER SECTORS

FINANCIAL INCENTIVES: FOR MULTI-USE THAT CAN BOOST THE ECONOMY IN RURAL REGIONS

MSP AND COASTAL DEVELOPMENT PLANS IDENTIFIED AREAS FOR TOURISM MULTI-USE WITH MOST SOCIO-ECONOMIC POTENTIAL



2024

KEY MILESTONES TOWARDS REALISING BUSINESS OPPORTUNITIES

TOWARDS VIABLE BUSINESS MODELS

2025

Growth in the market for low trophic species driven by increased demand for aquaculture products, like small fish and invasive species, influenced by tourism and leisure activities e.g. Round Goby project in the Baltic Sea.

2026

Diversified tourism offerings, leading to enhanced local socio-economic benefits in rural regions.



LEARN MORE

ULTFARMS: UNITED's follow-up project



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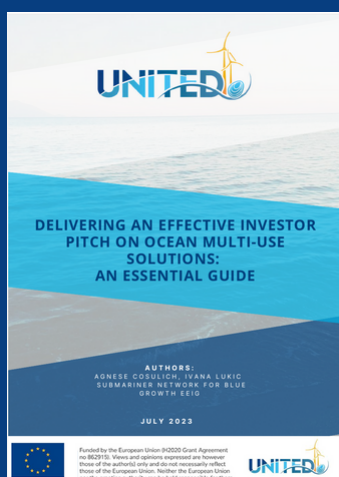
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ULTFARMS newsletter



Delivering an effective
investor pitch on ocean
multi-use solutions: An
essential guide



Guidance for Managing
the Intellectual
Property Rights in
Multi-Use Projects

