ADT4Blue

ADT4Blue OC2

Innovation Challenges

Interreg Atlantic Area

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Acknowledgements

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Executive Summary

This document compiles all innovation challenges that integrate ADT4Blue OC2 running from May 28th to July 28th 2025, at 5 pm Brussels Time.

1. Aquaculture and Fisheries

1.1. Making fishing operations more efficient and optimal (#OC2-AF-C01)

Making fishing operations more efficient and optimal **Code: #OC2-AF-C01**
Challenge description
Global warming poses a critical challenge to fishing operations. As the climate changes, the marine environment undergoes significant transformations, affecting both fishing activities and the communities that rely on them. Temperature shifts, altered ecosystem dynamics, extreme weather events, and habitat alterations lead to changes in fish distribution and abundance, as well as unpredictable weather patterns. These factors directly and negatively impact the fishing industry, forcing it to alter routes and adapt to increasing uncertainty. We are looking for ideas, products and services that can be addressed by advanced digital technologies to: • mitigate climate change • increase sustainability • enhance circularity and competitiveness in the fisheries operations sector and, thus, making it more efficient.

2. Coastal and Tourism Solutions

2.1 Digital solutions for coastal sports and tourism management (#OC2-STM-C02)

Digital solutions for coastal sports and tourism management **Code: #OC2-STM-C02**
Challenge description
Coastal and marine sports and tourism offers opportunities for economic growth and local development, but it must be approached with a strong commitment to conservation. Sustainable sports and tourism practices include minimising carbon emissions from transportation, protecting sensitive coastal ecosystems, and promoting awareness among tourists about marine conservation. The goal is to effectively organise and promote services to visitors and users, creating a seamless and engaging experience. This requires leveraging synergies and aggregating services to maximise network effects. We are looking for ideas, products, services, and apps to empower sustainability for coastal sports and tourism that can be addressed by advanced digital technologies by facing specific needs or making citizens and tourists conscious about their impact in the ecosystem to improve their habits.

3. Communication

3.1. Enhancing knowledge transfer and networking within the Blue Economy (#OC2-COM-C03)

Enhancing knowledge transfer and networking within the Blue Economy **Code: #OC2-COM-C03**
Challenge description
There is a growing need to integrate advanced technologies into the Blue Economy to improve efficiency, sustainability and innovation across its various sectors. However, a significant obstacle is the misalignment between technological advancements and the actual needs of stakeholders, including industry leaders, policymakers, researchers, coastal communities, and environmental organisations. This misalignment often arises from miscommunication between the scientific community, tech experts, and end-users, as well as a misunderstanding of stakeholders' real needs, leading to the underutilisation of innovations. We are looking for ideas that can be powered by advanced digital technologies to enhance knowledge transfer and networking among different stakeholders from the Blue Economy domain.

4. Data Analytics

4.1 Unlocking data for climate and biodiversity solutions (#OC2-DA-C04)

Unlocking data for climate and biodiversity solutions **Code: #OC2-DA-C04**
Challenge description
Stakeholders struggle to have access to data, namely: economic data, marine and biodiversity index data, impacts of nature-based solutions and energy data. But more importantly, they lack insights from that data, understanding the data and how to benefit from it, extracting knowledge to improve products, services or processes, and what would be the benefits of using a certain process of the product. We are looking for ideas that leverage advanced digital technologies to create/improve analysis and predictions models to boost the climate change adaptation, protection of biodiversity and ecosystems.

5. Maritime Transports

5.1. Empowering maritime connectivity (#OC2-MT-C05)

Empowering maritime connectivity **Code: #OC2-MT-C05**
Challenge description
Ensuring that ships remain connected to their head offices and the global network is crucial for modern maritime operations. Reliable internet access on board enables the use of innovative digital solutions for navigation, safety, and communication, as well as the seamless transmission and reception of essential documents. However, the current satellite technology, which is the most prevalent method for providing maritime internet, is prohibitively expensive, limiting access for many vessels. We are looking for ideas that use advanced digital technologies to answer ship connectivity in a more sustainable and cost-effective way, in matters of maritime operations, of fuel consumption and pollution, routes simulation, among others.

6. Ocean Monitoring, Conservation and Marine Ecosystems Protection

6.1. Developing environmentally responsible cleaning solutions (#OC2-OMP-C06)

Developing environmentally responsible cleaning solutions **Code: #OC2-OMP-C06**
Challenge description
The cleaning products commonly used for the external parts of ships and boats often contain toxic substances, such as harmful particles or high concentrations of acids. These substances are directly discharged into the sea during the cleaning process. Consequently, these procedures are extremely damaging to the environment, particularly the oceans, and pose significant risks to the professionals involved in the cleaning activities. We are looking for products and ideas that leverage advanced digital technologies to optimise/improve maritime cleaning solutions to mitigate marine pollution, to make cleaning activities more sustainable and reduce environmental impact.

6.2. Reducing maritime plastic pollution (#OC2-OMP-C07)

Reducing maritime plastic pollution **Code: #OC2-OMP-C07**
Challenge description
Maritime plastic pollution has become a significant environmental threat, adversely affecting oceans, marine ecosystems, biodiversity, and human health. Plastic waste enters the sea from various sources, including land-based activities, maritime industries, and illegal dumping. Moreover, several major obstacles hamper the development of efficient and sustainable solutions, including insufficient and inconsistent data on plastic waste distribution, difficulty in detecting microplastics, integrating various technologies like IoT, AI, and Blockchain into existing systems, and the high cost and resource requirements for deploying these technologies. We are looking for ideas that harness advanced digital technologies to reduce maritime plastic pollution, to significantly enhance ocean quality and improve its capacity to absorb CO2, support marine biodiversity, promote healthier and more sustainable blue food, and benefit coastal tourism.

6.3. Environment assessment tools (#OC2-OMP-C08)

Environment assessment tools **Code: #OC2-OMP-C08**
Challenge description
Oceans cover over 71% of our planet and are crucial for maintaining ecological balance, supporting a rich diversity of life, regulating climate, and driving economic activities in the blue economy. Despite their importance, oceans are facing critical threats from pollution, overfishing, habitat destruction, and the impacts of climate change. The ability to monitor, assess, and protect marine ecosystems is crucial to mitigate these threats and ensure the sustainable use of ocean resources. We are looking for ideas and/or services that can be addressed by advanced digital technologies to enhance ocean monitoring, improve data integration, provide tools for predicting the future impact of pollution and ecosystem changes, and support sustainable practices.

7. Ocean Renewable Energies

7.1. Tackling the high cost of energy in the Blue Economy (#OC2-ORE-C09)

Tackling the high cost of energy in the Blue Economy **Code: #OC2-ORE-C09**
Challenge description
Blue Economy activities are highly dependent on energy, making the high cost of energy a significant barrier to growth, sustainability, and competitiveness. The ocean renewable energy sector, including wind, wave, and tidal solutions, faces challenges in enhancing energy efficiency, renewable generation, and storage capabilities due to hight initial investment costs. Hence, ensuring that new energy systems do not harm marine ecosystems is critical to balancing energy development with environmental sustainability. We seek innovative ideas powered b y advanced digital solutions to improve energy efficiency in maritime and coastal activities, reducing overall consumption; accelerate the adoption of renewable energy sources, such as wind, wave, and tidal energy, to minimise reliance on fossil fuels; develop efficient energy storage and management systems for stable, optimised energy supply; enhance infrastructure and grid connectivity to support seamless integration and distribution of renewable energy.

8. Port Activities

8.1. Advanced Digital Solutions for Harbour Management (#OC2-PA-C10)

Advanced digital solutions for harbour management **Code: #OC2-PA-C10**
Challenge description
Port Authorities must manage their facilities and movements within a commercial harbour, which involves complex operations with numerous safety, security, and contractual obligations. Tracking the movements of people, equipment, and goods is essential to ensure operational efficiency, safety compliance, and security measures are upheld. Innovative digital technologies, like IoT, computer vision and AI, could allow them to track and manage the movements of people, equipment, and goods within harbour facilities, enhancing safety, security, and operational efficiency. Yet, a commercial harbour is a complex environment, with several moving objects in a very dynamic scenario which hinders conventional tracking solutions. Moreover, it is also a challenging environment for conventional communication systems. We are looking for ideas, tools and/or services that can be addressed by advanced digital technologies to improve harbour management activities, such as data integration, real-time data collection, security and safety situations, among others.

8.2. Optimising of port pilot routes and trips (#OC2-PA-C11)

Optimising of port pilot routes and trips **Code: #OC2-PA-C11**
Challenge description
Efficient scheduling and high-level coordination of port pilot trips are crucial for the smooth operation of ports and the activities of all involved parties. However, the trips from the base to the vessels and back are not optimised, leading to unnecessary travel, wasted time, and increased fuel consumption. This inefficiency is partly due to ad-hoc decision-making by individual pilots and the absence of a coordinated system to streamline their activities. We are looking for ideas, products, tools, and services that can be addressed by advanced digital technologies to increase efficiency, sustainability and circularity in port activities, such as routes and trips simulations, among others.