

CASE STUDIES ON ECOSYSTEM APPROACH IN BLUE BIO ECONOMY



Funded by the European Union under Grant Agreement ID 101060703. 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.

Blue Bio Clusters project is empowering Europe's coastal regions to grow a sustainable, innovative, and resilient blue bioeconomy.





INTRODUCTION

Europe's sea regions hold major potential for the Blue Bioeconomy, offering marine-based resources for food, feed, pharmaceuticals, and more. However, the growing demand for resources and increasing environmental pressure, exacerbated by climate change, pose serious sustainability challenges. Ecosystem degradation, species loss, and water quality decline threaten both biodiversity and economic stability.

Unsustainable Blue Bio production practices, such as overreliance on wild fish feed or poor waste management, may harm ecosystems. Meanwhile, fragmented regulations, limited market access, and a lack of coordination hinder progress, especially for small enterprises. Effective, inclusive governance and long-term strategies are essential to mitigate these risks and support sustainable growth.

The Ecosystem Approach (EA) offers a way forward. By integrating environmental, social, and economic considerations into planning and management, EA helps assess trade-offs, minimise negative impacts, and enhance ecosystem services. These services, e.g. water purification, habitat provision, and carbon storage—are vital to the health of marine environments and the industries that rely on them.

Tools and frameworks such as the ones listed in the booklet are being created to help companies and policymakers embed EA principles into business models and decision-making. These resources highlight practical steps for implementation, and promote collaboration across sectors.

However, widespread adoption of EA still faces some hurdles: lack of awareness, unclear incentives, and insufficient data remain major barriers. Many tools lack pilot testing, and stronger links are needed between tool developers and users. **Successful implementation depends not just on technology, but also on shifts**



in governance culture, policy support, and industry mindsets. Despite the challenges, momentum is building. With coordinated effort, emerging tools, and growing stakeholder engagement, the Ecosystem Approach can guide the Blue Bioeconomy toward a more resilient, inclusive, and regenerative future. Within the BlueBioClusters project, specific Online Awareness Tools were developed, one for companies to evaluate their current Ecosystem Approach activities and another for policymakers to outline actionable steps to implement the EA.

The booklet aims to visualise how different case studies applied an EA framework or Ecosystem Services valorisation tool to translate their EA efforts into an internal decision or to gain benefits from external parties. The case studies highlight the positive impact that the production of various aquatic organisms may have on ecosystem services, as well as how these benefits are recognised and valorised through the Ecosystem Approach.

This valorisation may come from food provisioning, contributions to nature enhancement, integration into broader production cycles, site sharing, and other synergistic effects. The outreach to companies on Ecosystem Approach has shown that the use of ecosystem services valorisation tools is not yet common practice in the blue bio-based production sector. However, their application is more evident in activities focused on nature enhancement or restoration, areas where blue bio production can play a crucial role. This is logical, as quantifying ecosystem services impacts is crucial for validating the benefits of restoration, which will also help to refine the tools, supports certification efforts, and may ultimately facilitate their broader and more routine adoption within the Blue Bioeconomy.



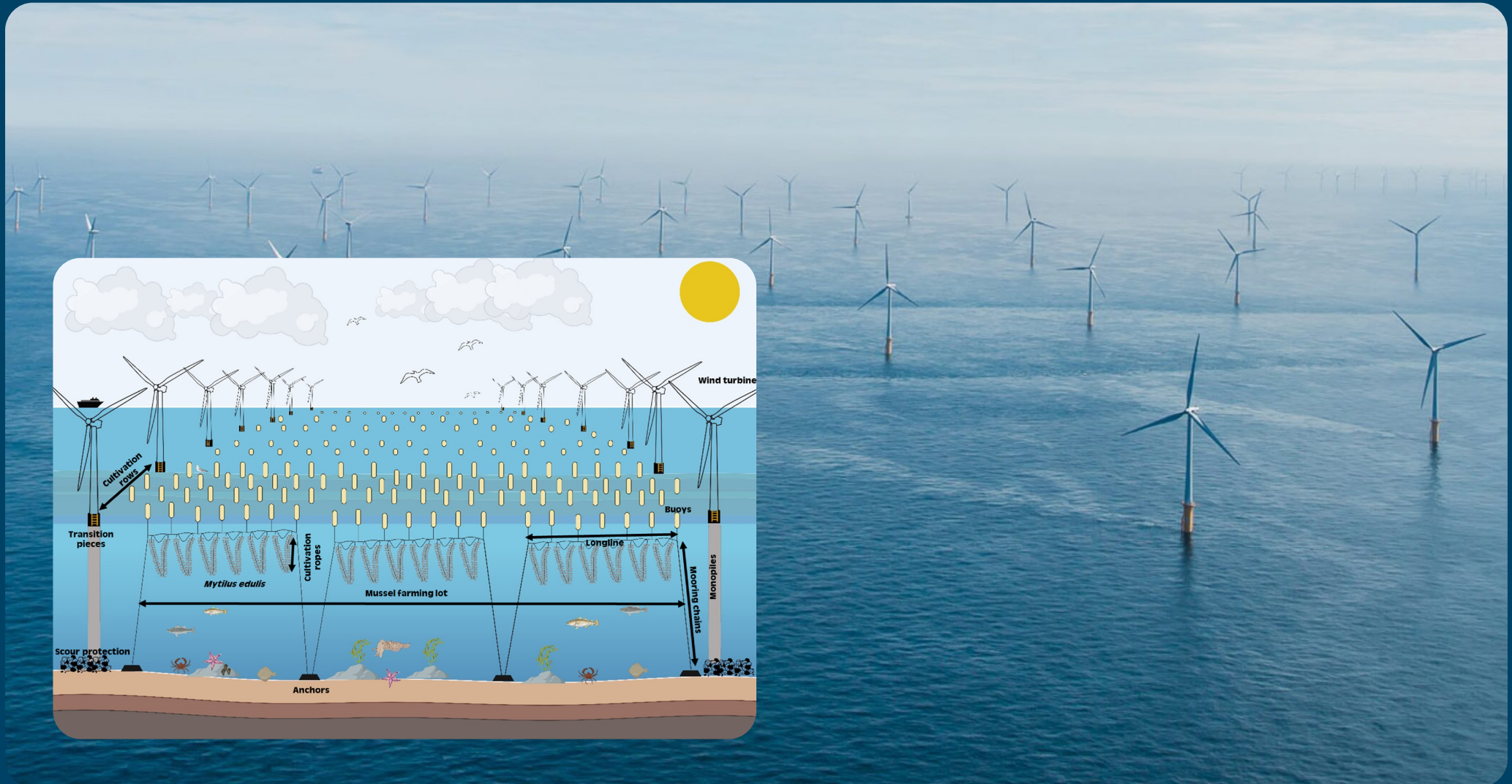
OVERVIEW OF SHOWCASE STUDIES

	Showcase study	Region	Framework/ Tool used	Partners Involved	Contact Persons
1	Offshore wind farm with mussel farm 	Belgium	SUMES	Parkwind Ugent	Laura Vittoria De Luca Peña laura.delucapena@ugent.be
2	IMTA in Estonia   	Estonia	BlueBioSites	Red Storm Aqua Verde	Jonne Kotta jonne.kotta@sea.ee
3	Bivalves culture 	Portugal	NESEV	Oceano Fresco Haedes	Lénia Rato lenia.rato@haedes.eu
4	Bio-stabilisation through musselculture 	Belgium	MESAT	Coastbusters Emelia Mantis Consulting	Tomas Sterckx sterckx.tomas@deme-group.com Sacha De Clercq sacha.declercq@emelia.be Emile Lemey emile@mantisconsulting.be
5	Nature-based wastewater treatment 	France	EA Ladder	ZENI Mantis Consulting	Jean-Michel Pommet jean-michel.pommet@ze-ni.com Bernd Herremans bernd@mantisconsulting.be

OVERVIEW OF SHOWCASE STUDIES

	Showcase study	Region	Framework/ Tool used	Partners Involved	Contact Persons
6	Oyster restoration in offshore wind park 	Netherlands	Impact Platform	Go Ocean Orsted Van Oord	Marte Greefs marte@goocean.be
7	Lobster ranching in Windmill parks 	UK	NSC	RWE Whitbey Lobster	Aurelia Pearson aurelia.pearson@rwe.com
8	Offshore musselculture 	Belgium	MESAT	Colruyt Group Emelia Mantis Consulting	Stijn Van Hoestenbergh stijn.vanhoestenbergh@colruyt.be Sacha De Clercq sacha.declercq@emelia.be Emile Lemey emile@mantisconsulting.be
9	Mangrove restoration for seafood value 	Ecuador	EA ladder	Jan de Nul Mantis Consulting	Noa Ligot noa.ligot@jandenul.com Bernd Herremans bernd@mantisconsulting.be
10	Oyster Reef 	Belgium	Oyster Reef Digital Twin	Oyster Heaven	Brecht Stechele brecht@oysterheaven.org

SHOWCASE 1 OFFSHORE WIND FARM WITH MUSSEL FARM



SHOWCASE 1

OFFSHORE WIND FARM WITH MUSSEL FARM

THE COMPANY – PARKWIND

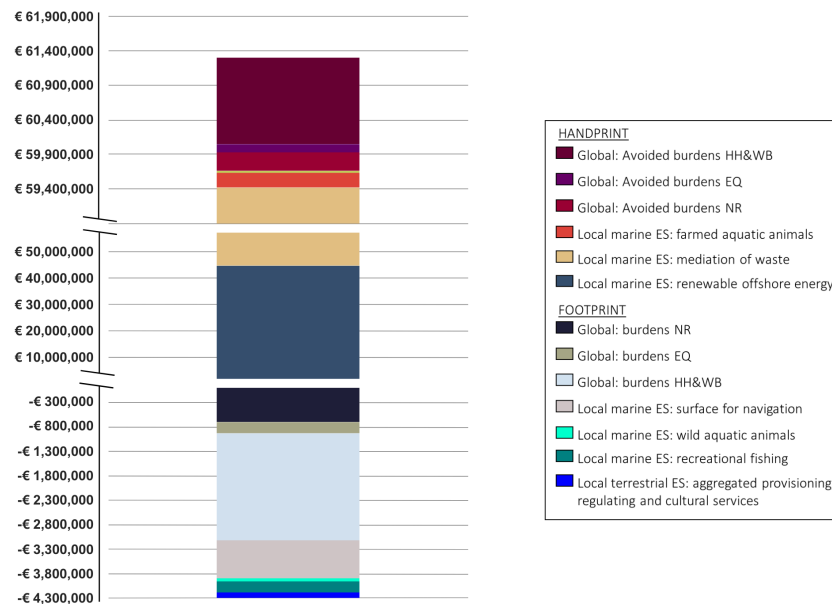
Parkwind N.V. is a Belgian company founded in 2012 and has a comprehensive approach that has led to the success of our current portfolio of four offshore wind farms off the Belgian and German coast with 225 turbines with a production capacity of 800 MW. That is enough to power the equivalent of almost 1,000,000 households with the conviction that wind energy is key to a sustainable future.

DECISION MAKING

Decision-making: “Recognizing the significant increase in benefits demonstrated by a substantially larger handprint—and thus a more positive impact on ecosystem services—PARKWIND is considering a more prominent role for blue bio-production in a multi-use scenario.”

CASE STUDY AND SUMES METHODOLOGY

The SUMES project developed a comprehensive environmental sustainability assessment methodology to quantify both the positive (handprint) and negative (footprint) impacts of Blue Economy activities across different geographical scales. This approach integrates Life Cycle Assessment (LCA) and Ecosystem Services assessment (ESA) to provide a holistic evaluation. The methodology was applied to a case study of a multi-use offshore farm in the Belgian part of the North Sea, combining an offshore wind farm (by Parkwind) with a hypothetical mussel farm. The results revealed a net positive handprint, primarily driven by local marine ecosystem services, particularly renewable offshore energy and waste mediation. Conversely, the footprint was mainly attributed to the supply chain impacts of manufacturing wind farm and mussel farm components. By expressing the results in euros per year, the findings become more tangible and accessible, facilitating clearer communication for decision-making.



Visualization of the handprint and footprint of a multi-use offshore farm combining an offshore wind farm and mussel farm. HH&WB: human health and well-being; NR: natural resources; EQ: ecosystem quality; ESs: ecosystem services; FU: functional unit (yearly electricity and mussel production)



SHOWCASE 2 IMTA IN ESTONIA



BLUE BIO SITES

FRAMEWORK/
TOOL USED





SHOWCASE 2 IMTA IN ESTONIA



FRAMEWORK/
TOOL USED

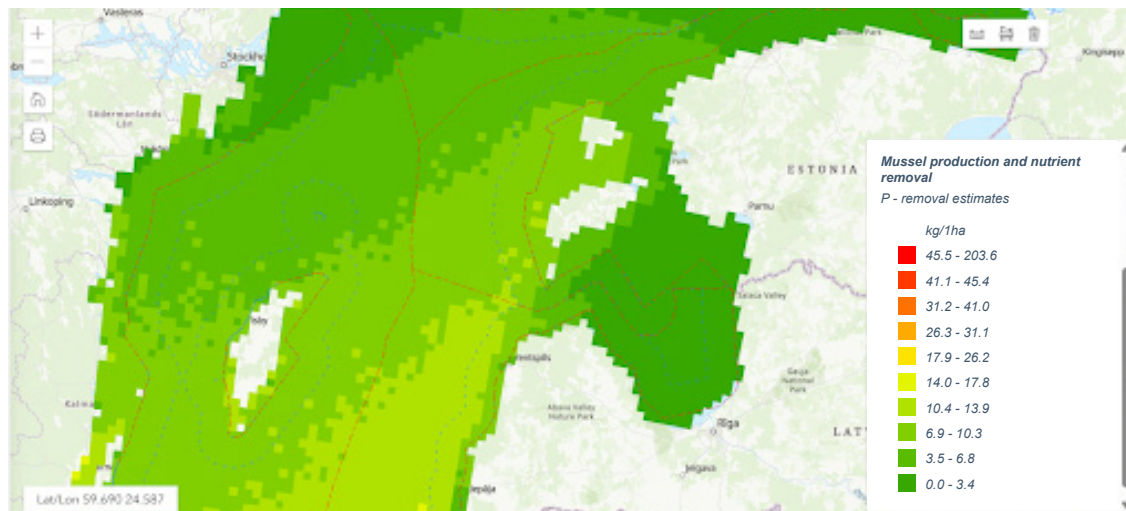
THE COMPANIES

Redstorm specializes in sustainable rainbow trout farming in the sea, with a focus on humane and responsible practices. To assure the aquatic ecosystem, Redstorm collaborates with Aqua Verde through integrating traditional fish farming with mussel and seaweed cultivation. In such way they achieve near-zero nutrient discharge into the sea while enhancing the diversity of cultivated species.

The Operational Decision Support System (ODSS) demonstrated the nutrient removal benefits of mussel and seaweed farming and supported the near-zero discharge strategy of their integrated aquaculture. This approach allowed securing the permit from the Environmental Board

THE TOOL

The Blue Bio Sites portal hosts multiple tools to support the sustainability of aquaculture and marine spatial planning. Among these, the Operational Decision Support System (ODSS) is a web-based platform designed to assist in the planning and implementation of low-trophic aquaculture activities, such as mussel and seaweed farming, particularly in the Baltic Sea region. By integrating environmental data, spatial analyses, and predictive models, the ODSS enables users—including spatial planners, policymakers, and aquaculture practitioners—to make informed decisions about site selection and management for sustainable aquaculture development.



This visualization from the ODSS portal highlights the ecosystem service of nutrient removal, specifically illustrating the phosphorus removal achieved by offshore mussel farming

SHOWCASE 3
BIVALVES' CULTURE



BUSINESS CASE – OCEANO FRESCO

After identifying a unique opportunity for bivalves grow-out in 2015, Oceano Fresco founders established the company in Portugal - with the mission of promoting regenerative aquaculture, an effective blue economy, and sustainable oceans.

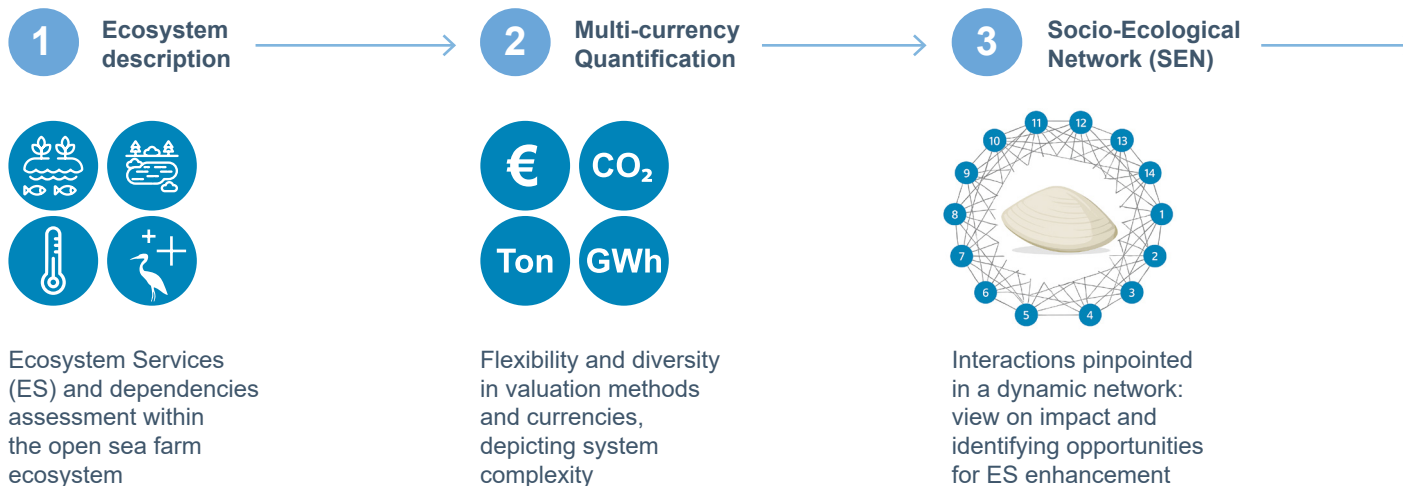
Financed by founders, 'business angels', public incentives and venture capital investors, which share the same vision, Oceano Fresco is the first clams' open sea farm in the world. Its goals: sustainable protein sources, restored biodiversity, positive carbon footprint, Sustainable Development Goals alignment, enhanced Ecosystem Services.



VERTICAL
BIVALVES



NESEV & HAEDES ADD-VALUE



OUTPUTS

Regenerative aquaculture backed by numbers

Ecosystem Enhancement

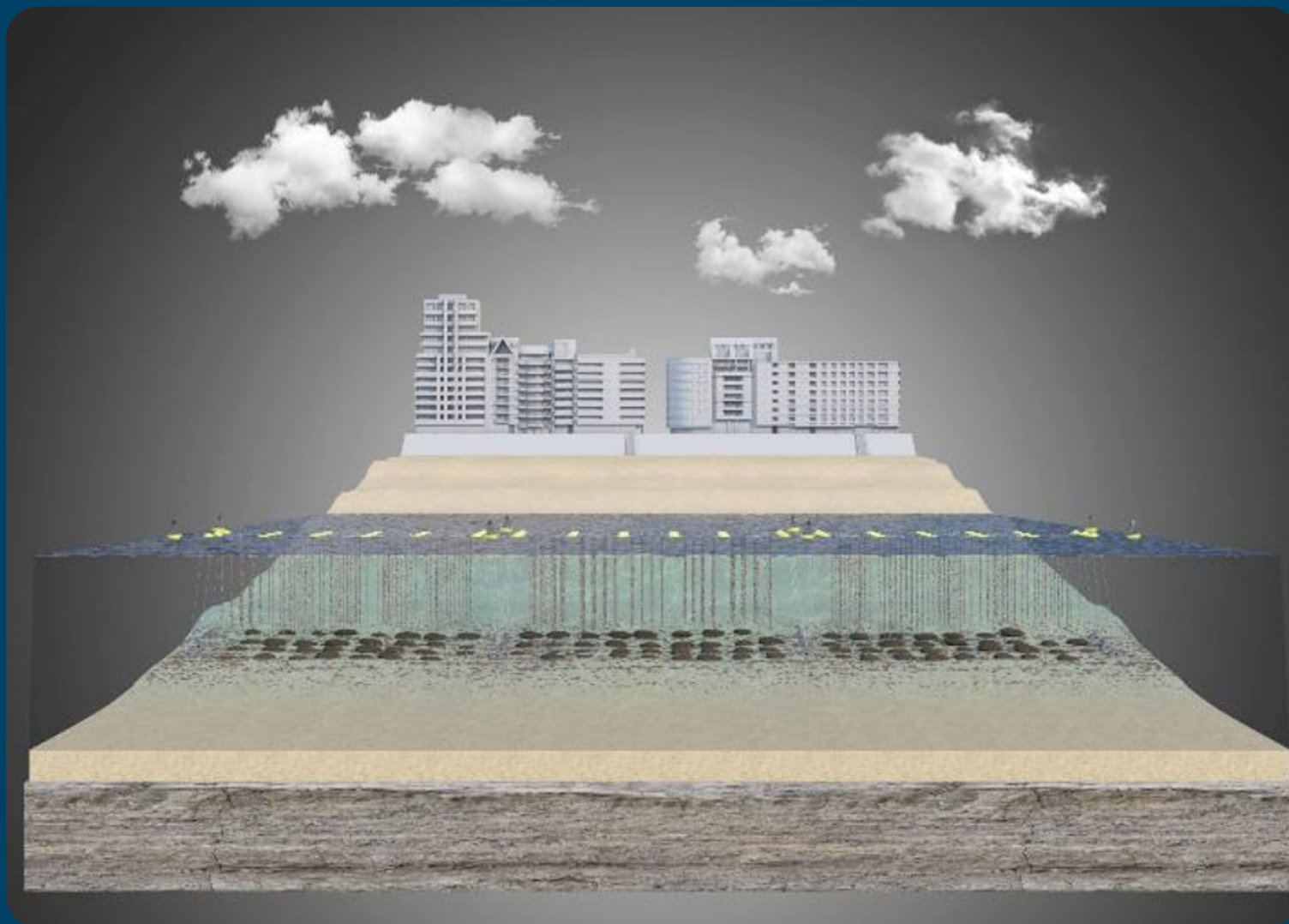
Sustainability Reporting

Financing Trust



SHOWCASE 4

BIO-STABILISATION THROUGH MUSSEL CULTURE





SHOWCASE 4

BIO-STABILISATION THROUGH MUSSEL CULTURE



MESAT

FRAMEWORK/
TOOL USED

THE PROJECT – COASTBUSTERS

The Coastbusters project investigates an innovative approach to coastal defense: ecosystem creation and/or restoration by building natural biogenic reefs, using “biobuilder” species and living organisms that reinforce natural processes, biodiversity, flood and coastal protection with one overall long-term goal: nature-based solutions for large-scale ecosystem generation.

An example is the use of an aquaculture hanging musselculture system, adapted to initiate a mussel flux from the droppers towards the seabed to kick-start biogenic reef development.

Using MESAT to assess ecosystem services impacts, Coastbusters demonstrated that a biogenic reef can offer a sustainable alternative with added ecological value.

“BIO-STABILISATION”, HOW DOES IT WORK?

Reef facilitation infrastructure is installed in the foreshore zone, where mussels settle, break off and gradually form seabed reefs. These natural barriers reduce wave energy and stabilize sediments.

Mussels also improve water quality through filtration and contribute to carbon uptake during shell formation and growth. Their dense beds act as biodiversity “hotspots” – providing habitat, shelter and food for diverse marine life.



Coastal
Protection



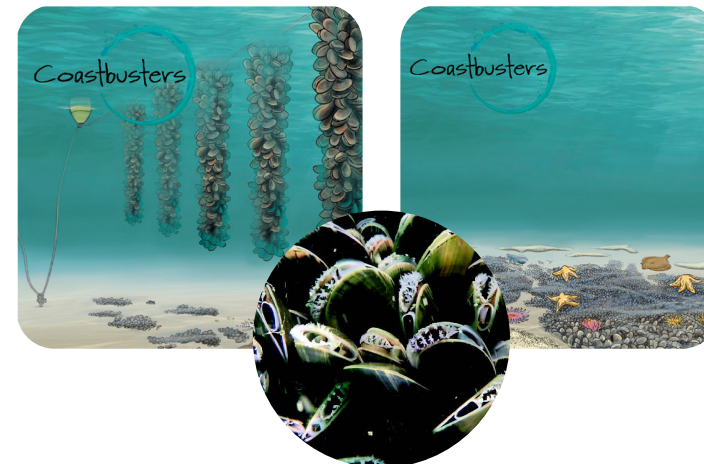
Water Quality
Regulation



Carbon Uptake
& Storage

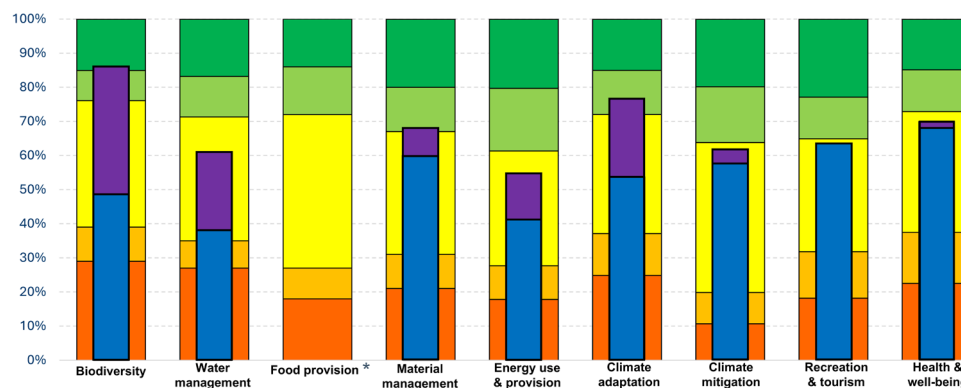


Biodiversity
& Productivity

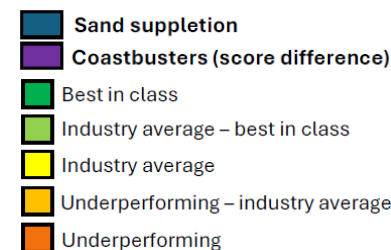


ASSESSMENT OF ECOSYSTEM SERVICES?

The Marine Ecosystem & Sustainability Assessment Tool (MESAT, ©Emelia) was used to evaluate and compare ES impacts between a conventional coastal defense method -sand suppletion- and the Coastbusters project. MESAT assesses nine key ES using verifier criteria, aligned with international sustainability frameworks (SDGs, EU Taxonomy, etc.) and scientific expertise. Results are presented through clear, cumulative visualizations based on a qualitative scoring system intended for internal and external stakeholder communication.



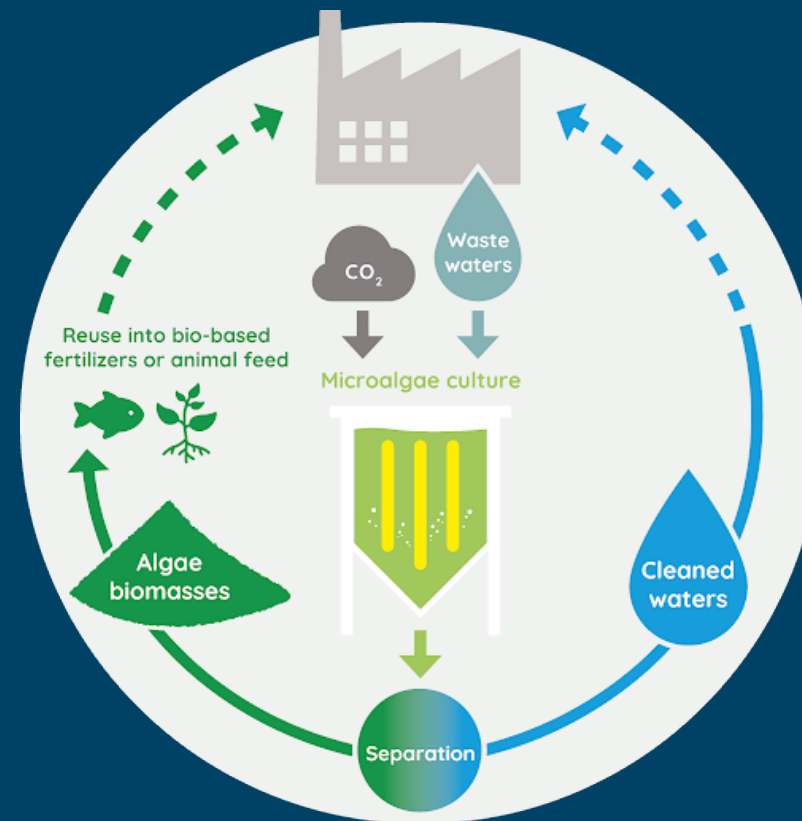
* not applicable for both projects.



Sand suppletion scores “industry average” across all relevant ES.

Coastbusters creates significant added value for biodiversity, water management and climate adaptation with scores that range from “transition industry to best in class” and “best in class”.

MAKING WASTEWATER TREATMENT AN ECONOMIC & ENVIRONMENTAL OPPORTUNITY



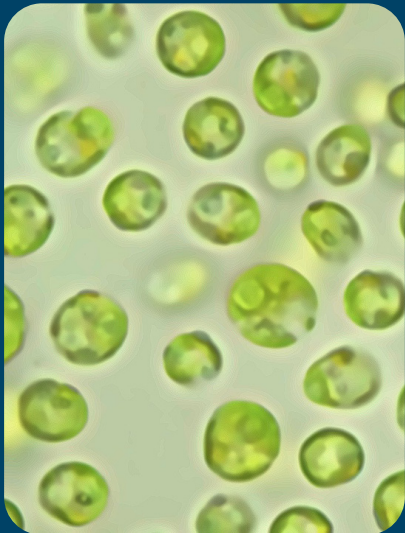
6 CLEAN WATER
AND SANITATION



14 LIFE
BELOW WATER



15 LIFE
ON LAND



SHOWCASE 5 NATURE-BASED WASTEWATER TREATMENT



THE COMPANY – ZENI

ZENI is a French startup, founded in 2023, that specializes in cleaning industrial wastewater by using microalgae as a nature-based solution.

Their innovation leads to a circular approach for water reuse, while the remaining biomass can be revalued as protein input in feed & aquafeed or as biobased fertilizer & soil regeneration in agriculture.

THE COMMITMENT

ZENI will use the EA Ladder to strengthen their sustainability claims and further improve their ecosystem impacts.

Additionally, ZENI will use the Ladder results to find additional support, for example, by convincing impact investors to get involved with ZENI, and showcasing to the investors that they are able to enter in EU funding programs

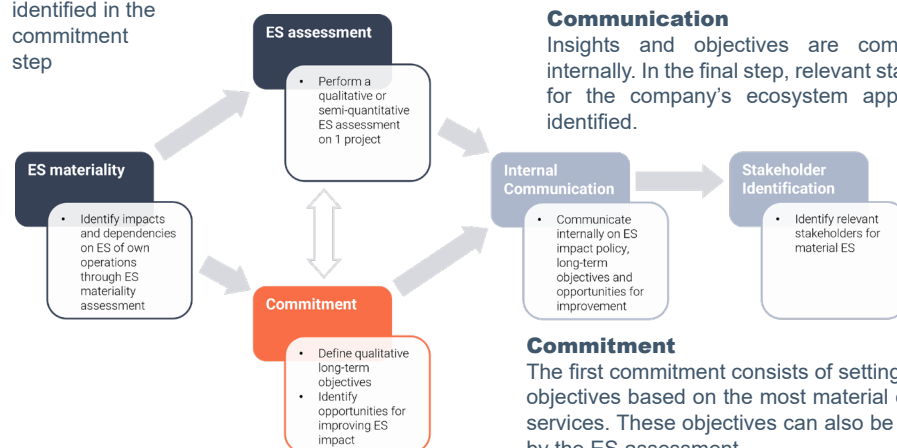
Legend

Low
Medium
High

GENERAL PROCESS FOR ACHIEVING LEVEL 1 ON THE LADDER

Insight

Insights are obtained through an ES materiality analysis and a project-based ES assessment. The ES assessment can already showcase opportunities for improvement identified in the commitment step



Communication

Insights and objectives are communicated internally. In the final step, relevant stakeholders for the company's ecosystem approach are identified.

Commitment

The first commitment consists of setting long-term objectives based on the most material ecosystem services. These objectives can also be influenced by the ES assessment.

Ecosystem service	Dependency	Impact	Materiality
Provisioning			
Food provisioning			+
(Clean) water provisioning			+
Energy provisioning			+
Raw abiotic materials			-
Biotic materials			+
Regulating			
Water quality regulation			+
Climate regulation			-/+
Cultural			
(Eco)tourism			+
Educational values			+
Supporting			
Nutrient cycling			+

Results of the ecosystem services materiality assessments of ZENI
(major component of the Ladder – Level 1):

For this assessment, materiality is a combination of ZENI's dependency on the ecosystem service and their impact on the service. Dependencies, impacts and materiality are scored as low, medium or high (see legend). Impacts can be positive or negative, indicated by a + or – sign.

THE TOOL – EA LADDER

The Ecosystem Approach (EA) Ladder is a framework that encourages Blue Economy companies to engage in an EA by assessing their level of commitment to improve their impacts on ecosystems and the services these ecosystems deliver, based on continuous improvement.

The ladder consists of four levels, with increasing requirements on insights in ecosystem impacts, setting targets and installing measures to improve impacts, and transparency. For each level, three dimensions are evaluated: insight, commitment and communication. As we move up the ladder, assessments and commitments move from qualitative to quantitative, and the targets to be achieved, communication and collaboration need to be intensified, and the focus shifts from one's own operations to the value chain.

ZENI is testing the first explorative Level of the Ladder to setup and strengthen their EA, and to showcase their positive contributions to nature.

The EA Ladder is a tool conceptualized by Mantis Consulting



OYSTER RESTORATION IN OFFSHORE WIND PARK



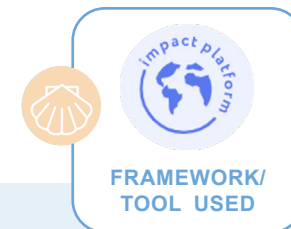
FRAMEWORK/
TOOL USED





SHOWCASE 6

OYSTER RESTORATION IN OFFSHORE WIND PARK



THE COMPANIES

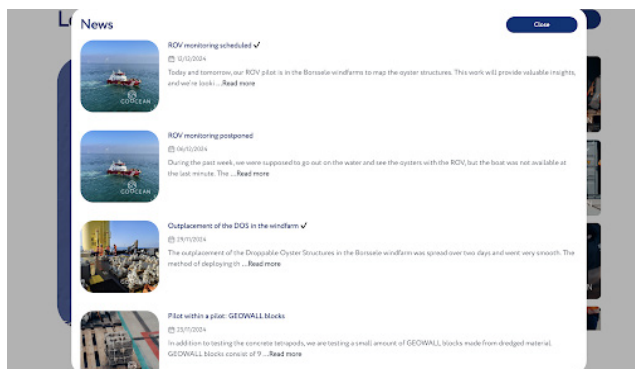
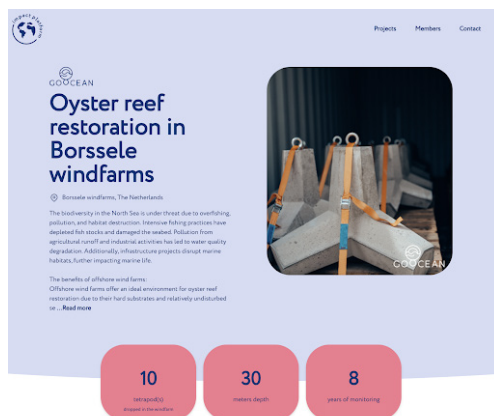
Offshore companies like Ørsted and Ocean Health (an initiative by Van Oord) are looking for tools that monitor and communicate their impact. Go Ocean is a Belgian company, founded in 2024, and has the mission to accelerate the restoration of marine ecosystems and biodiversity worldwide. Because Go Ocean makes every project and its positive impact transparent and tangible via the Impact Platform, offshore marine companies/investors are willing to invest in the execution of the solutions. These investments lead to cooperation with Bluebio producers. One example is the installation of Droppable Oyster Structures in the Borssele offshore wind parks, in the Netherlands, in collaboration with Ørsted and Ocean Health and financed by the Go Ocean client Victrix Foundation. This project aims to strengthen the health of oyster reefs in the North Sea by introducing oyster structures in the wind farms.

THE IMPACT PLATFORM

The Go Ocean Impact Platform gives constant updates on the ecosystem parameters allowing real-time follow-up of the impact of the activities. Additionally, the platform provides a variety of information and content that can be used in sustainability reports or shared on websites, social media, newsletters, and so on. Public accessibility facilitates the process from A to Z. If necessary, a personalized client impact dashboard can be developed, so multiple projects and project impacts can be followed up in the same place.

The main benefit of the Go Ocean impact platform is that, although there are many parties involved in this project, everyone – and especially the investor (the government of business client) – is kept up to date on the project developments.

The installation of the Droppable Oyster Structures was reported through this platform and the future monitoring results collected, analysed, and reported on by Waardenburg Ecology and Wageningen University will also be shared through the platform.



THE MONITORING PLATFORM

The Go Ocean Impact Platform helps the project developers, Ørsted and Ocean Health, to monitor the impact of their marine activities and the oyster restoration, providing one central location to collect all the project results, and helps to communicate this to their investors. In this way, they can transparently pass information to the government or the investors to back their efforts for a positive impact on the ecosystem for which they were granted the tender or the investment.

RWE



WHITBY
LOBSTER
HATCHERY

SHOWCASE 7

LOBSTER RELEASE AT TRITON KNOLL OFFSHORE WINDFARM



FRAMEWORK/
TOOL USED





WHITBY
LOBSTER
HATCHERY

SHOWCASE 7

LOBSTER RELEASE AT TRITON KNOLL OFFSHORE WINDFARM



FRAMEWORK/
TOOL USED

THE COMPANY – RWE

RWE is leading the way to a clean energy world. With its investment and growth strategy Growing Green, RWE is contributing significantly to the success of the energy transition and the decarbonisation of the energy system. Around 20,000 employees work for the company in almost 30 countries worldwide. RWE is already one of the leading companies in the field of renewable energy. RWE is investing billions of euros in expanding its generation portfolio, in particular in offshore and onshore wind, solar energy and batteries. It is perfectly complemented by its global energy trading. RWE is decarbonising its business in line with the 1.5-degree reduction pathway and will phase out coal by 2030. RWE will be net-zero by 2040. Fully in line with the company's purpose - Our energy for a sustainable life.

THE PROJECT

Experts found that the Scour protection at the base of specific turbines and the offshore substations is deemed an ideal habitat for Lobster to thrive. Lobsters are a crucial link in the food chain and help regulate the populations of smaller organisms, such as crabs and sea urchins, which prevents imbalances in reef ecosystems. In this collaboration project between RWE and Whitby Lobster Hatchery, 5,000 juvenile lobsters are released at the Triton Knoll offshore wind farm to help increase biodiversity in the North Sea. RWE are committed to protecting and enhancing biodiversity. The Lobster Hatchery project demonstrates how this is done and aligns with RWE's internal values. A monitoring programme is currently being developed alongside experts to monitor the success of the project and provide valuable data to both RWE and Whitby Lobster Hatchery. The monitoring will also to provide information for potential future biodiversity projects.



OUTCOMES

The Lobster Hatchery Project assists the objective of complying with RWE's internal Biodiversity Policy and supports RWE's key ambitions for Community engagement by having active engagement and collaboration, fostering meaningful partnerships that create shared value. This supports bluebioproduction because the release of the juvenile lobsters will help increase the population which not only promotes marine wildlife but will also help to prevent imbalances in the ecosystem. This aims to improve biodiversity within Triton Knoll Offshore Windfarm and in the North sea as the lobsters migrate across the seabed.



NORTH SEA CONSERVATION (NSC)

The North Sea Conservation (NSC) was established to operate the Whitby Lobster Hatchery. Whitby Lobster Hatchery conserve lobster populations by a member of the local fishing community bringing in egg bearing female lobsters, lobster eggs are released and captured in the hatchery system, juvenile lobsters are developed in the hatchery increasing survival rates compared to the wild then the lobster juveniles are released back into the wild in locations such as Triton Knoll Offshore Windfarm. NSC utilises its three key pillars of conservation, education & research to bring balance back to our oceans, boosting the sustainability of our fishing communities and aiming to bring an ecosystem approach to marine conservation.

In accordance with both NSC's and RWE's values, biodiversity projects are being developed to protect the important local marine ecosystem and conserve lobster populations in the area, demonstrating RWE's commitment to biodiversity and sustainability at its operational offshore sites.



SHOWCASE 8

MUSSEL CULTURE



THE COMPANY – COLRUYT GROUP

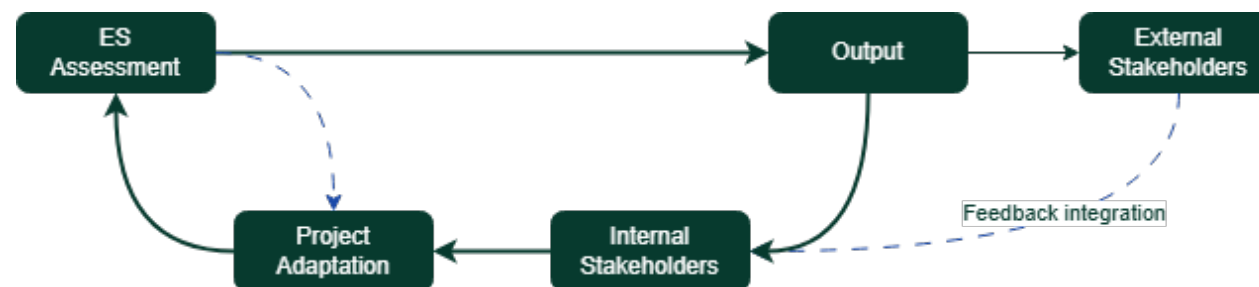
Colruyt Group is a prominent Belgian retail group that works in several sectors, including food distribution, food services & green energy production. Since 2020, Colruyt Group has been developing the first commercial sea farm in the Belgian part of the North Sea (BPNS): Zeeboerderij Westdiep. The farm is an example of extractive aquaculture, as the mussels effectively remove excess nutrients from the water and contribute to the health of marine ecosystems. These enabling conditions along with the BPNS's regulatory framework creates a conducive environment for pioneering aquaculture projects like Colruyt's Westdiep Zeeboerderij.



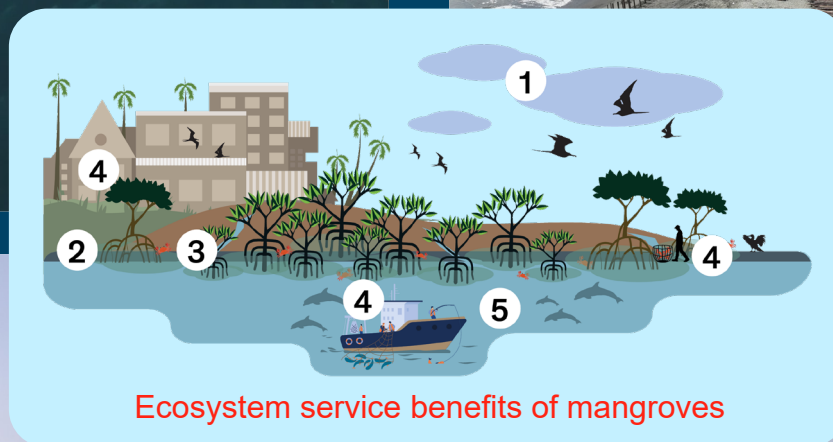
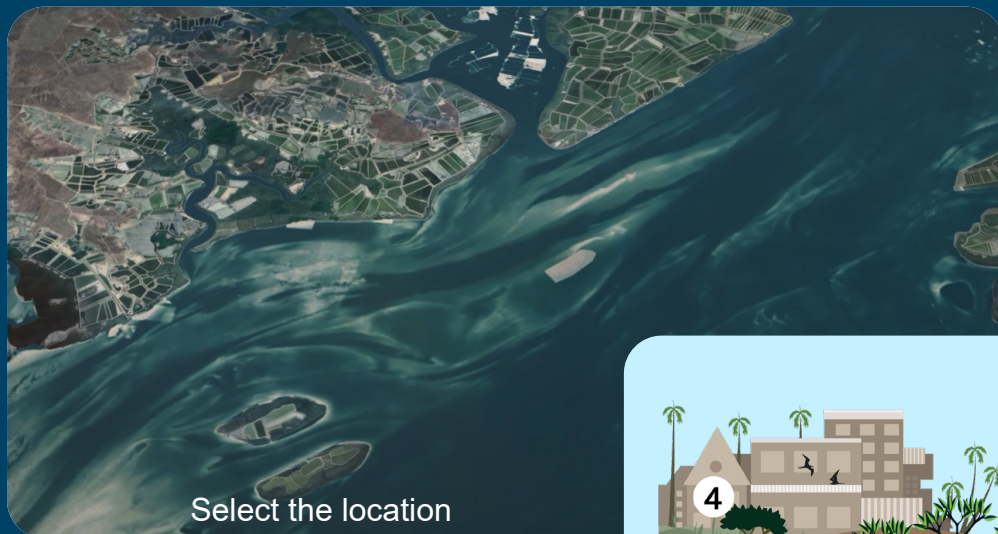
THE TOOL - MESAT

Before launching the project, a comprehensive EIA was conducted to obtain the permit and ensure ecological responsibility. In 2023, MESAT (© Emelia) was used to evaluate the project's performance against its initial projections. This evaluation helped to identify both areas of success, which enhance ecosystem services, and aspects requiring further attention and improvement,

MESAT'S THEORETICAL FLOW PROCESS

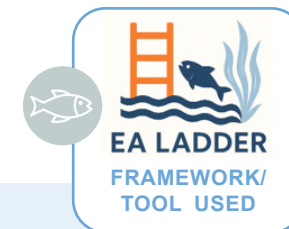


The MESAT questionnaires serve as a catalyst for internal discussions and insights concerning the project's design. Furthermore, it's insights provide the ability to inform and optimize the next stages of the project's design & planning



SHOWCASE 9

MANGROVE RESTORATION FOR SEAFOOD VALUE



THE COMPANY – AQUAForest

AquaForest is a unique collaboration between governmental organisations, industry, scientists and local communities, developing a 50-hectare mangrove habitat from scratch in Ecuador through the circular reuse of dredged sediments.

Mangrove forests provide a wide range of ecosystem services including carbon sequestration, water filtration, and coastal protection. Additionally, they support socio-economic activities such as ecotourism and sustainable fishing. In AquaForest these ecosystem services have been quantified to assess their positive impact on local communities and the environment.

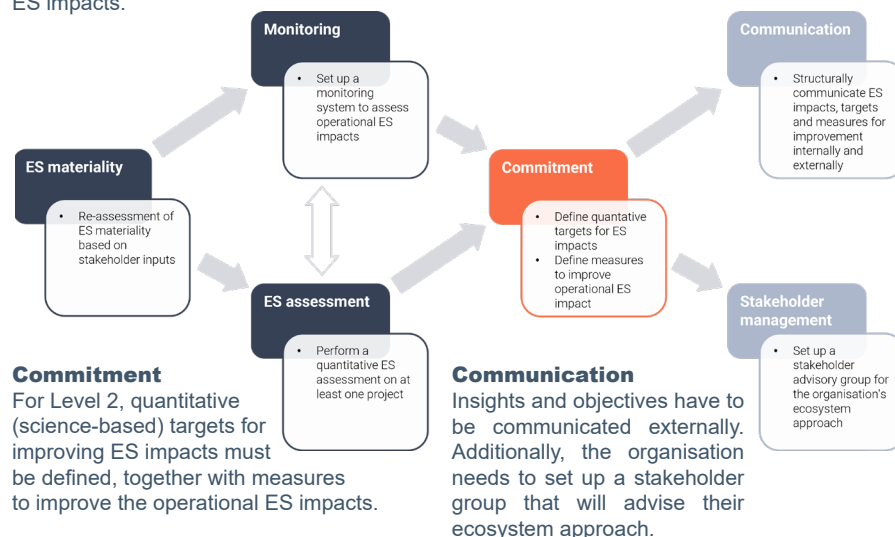
BlueBio benefit: Within the EA Ladder framework an ES assessment has been performed to quantify the ecosystem services of mangroves. This assessment shows a clear added value for local and traditional fisheries. With these results JDN creates awareness and engagement within local fishery communities, strengthening the support for the further development of the AquaForest project.



GENERAL PROCESS FOR ACHIEVING LEVEL 2 ON THE LADDER

Insight

Level 2 insights entail a reassessment of the ES materiality with stakeholder inputs, a quantitative ES assessment for at least one project, and setting up a monitoring system for ES impacts.



Commitment

For Level 2, quantitative (science-based) targets for improving ES impacts must be defined, together with measures to improve the operational ES impacts.

Communication

Insights and objectives have to be communicated externally. Additionally, the organisation needs to set up a stakeholder group that will advise their ecosystem approach.

Ecosystem service (ES)	Baseline (sandflat)	AquaForest (mangrove)	Average added value
Provisioning			
Fish & shellfish production	0 k€/yr	28 – 415 k€/yr	221 k€/yr
Regulating			
Erosion/sedimentation, climate regulation, flood protection, water quality, habitat maintenance	342 – 400 k€/yr	510 – 940 k€/yr	359 k€/yr
Nursery function	0/+	++	/
Cultural			
Recreation and tourism	0 – 13 k€/yr	0 – 151 k€/yr	69 k€/yr
Aesthetic value	+	+/++	/
Cognitive development	0	++	/
Supporting			
Biodiversity maintenance	0/+	+/++	/
TOTAL MONETARY BENEFIT	342 – 413 k€/yr	548 – 1505 k€/yr	649 k€/yr

Summary of the AquaForest ecosystem services assessment

(major component of the Ladder – Level 2):

The table shows the estimated added (monetary) value provided by AquaForest compared to the baseline sandflat scenario. Services that could not be quantified have been assessed semi-quantitatively (indicated by –/0/+ / ++).

THE TOOL – EA LADDER

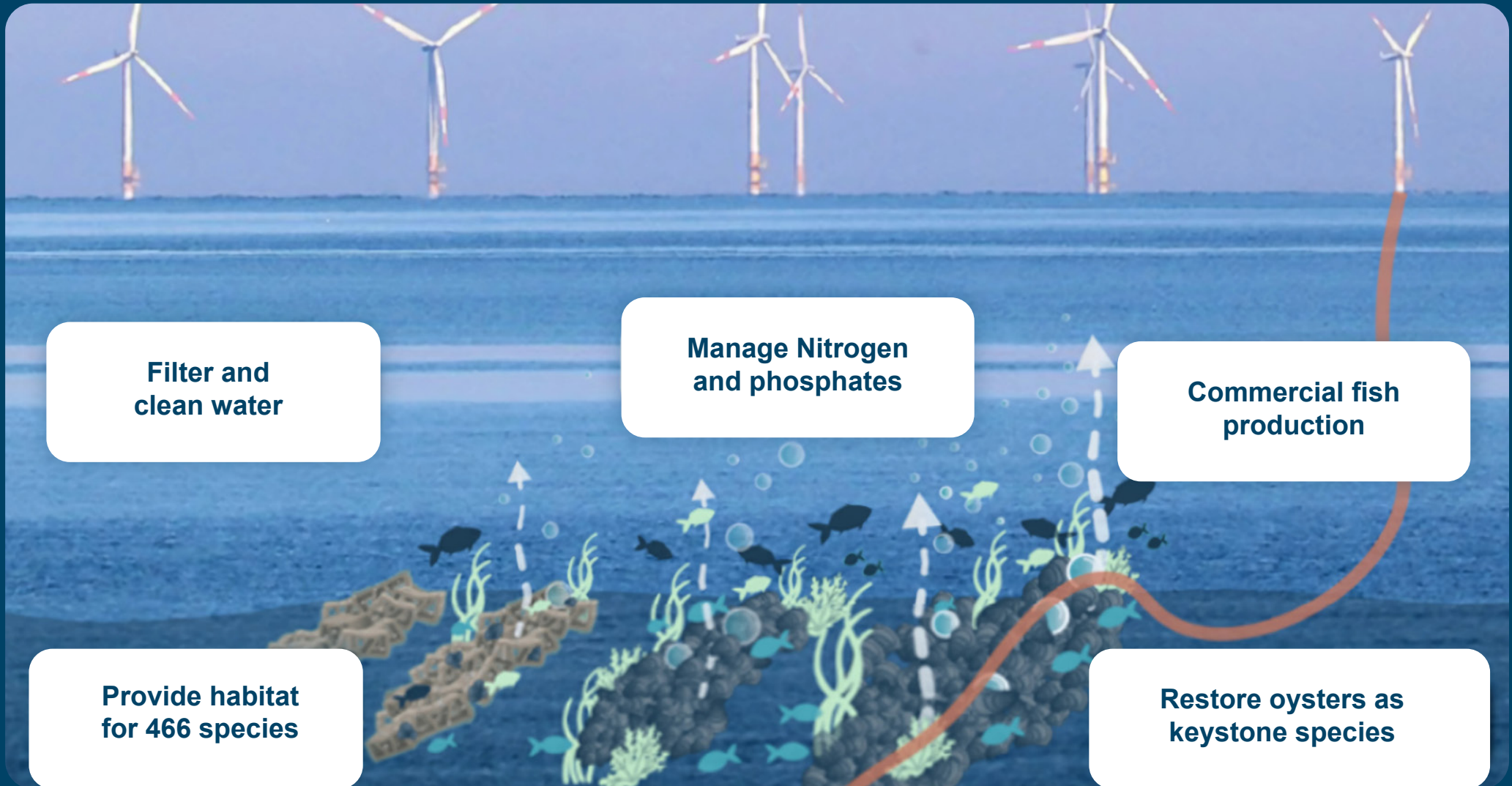
The Ecosystem Approach (EA) Ladder is a framework that encourages Blue Economy companies to engage in an EA by assessing their level of commitment to improve their impacts on ecosystems and the services these ecosystems deliver, based on continuous improvement.

The ladder consists of four levels, with increasing requirements on insights in ecosystem impacts, setting targets and installing measures to improve impacts, and transparency. For each level, three dimensions are evaluated: insight, commitment and communication.

The second Level of the Ladder focusses on quantification of insights and targets. JDN has used the AquaForest project for the ES assessment step, an essential step of this second Level.

The EA Ladder is a tool conceptualized by Mantis Consulting







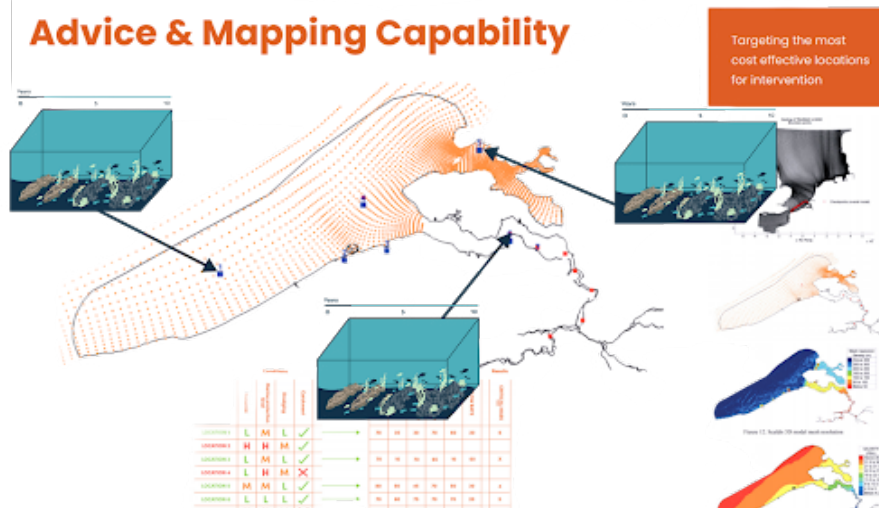
THE COMPANY – OYSTER HEAVEN

Oyster Heaven is a marine conservation organisation dedicated to regenerating oyster reefs at scale. Using our unique, science-backed technology - the Mother Reef - we enable large-scale, cost-effective restoration projects that can be deployed anywhere in the world. The Mother Reef has been rigorously tested in laboratory and field settings, ensuring both ecological effectiveness and financial viability. By rebuilding oyster reefs, Oyster Heaven restores vital marine ecosystems, enhances coastal resilience, and delivers measurable environmental impact.

THE TOOL

Oyster Heaven is developing sophisticated modelling tools to allow developments of Oyster Reef Digital Twins for all the reefs that we have build or will build. The Digital Twin allows us to predict restoration success and quantify restoration benefits at different locations of interest. It is used for site selection, to optimize reef setup, support monitoring programs and quantify potential ES revenues. This technology is being iterated and refined to allow those that wish to develop reefs to do so in a style and setting that is likely to generate the most optimal outcomes, saving time, money and reducing risk.

Advice & Mapping Capability



THE BELREEFS PROJECT

BELREEFS is Belgium's first large-scale offshore oyster reef restoration project, commissioned by the Belgian Federal Public Health Service. It brings together government, industry, and science to restore the functionally extinct European flat oyster (*Ostrea edulis*) in historically rich areas, particularly the gravel beds of the Hinderbanken. Our technology, the Mother Reef, plays a central role in BELREEFS' restoration strategy by providing a cost-effective, degradable, and scalable solution for oyster larvae settlement. The restoration of the oyster reef habitat is not only critical for marine biodiversity but also provides measurable ecosystem services like water filtration, carbon and nitrogen cycling, and habitat creation that generate quantifiable economic value. Through the Oyster Reef Digital Twins metric predictions are made for investors, policy makers or ecologists and in the future ecosystem service quantification will be quantified.





- Are you a company looking to evaluate your activities through the EA?
- Are you a policymaker looking for actionable steps to implement the EA in your region?
- What is the next step for my Ecosystem Approach implementation?



**Check Out the Online
Awareness Tools**



This booklet was made in the framework of
the BlueBioClusters-project (2025).

If you need more information on the booklet,
please contact info@blauwecluster.be

For more information on the project visit
our website: <https://bluebioclusters.eu/>



Funded by
the European Union

FOLLOW US



#bluebiocluster
bluebiocluster.eu



Funded by the European Union under Grant Agreement ID 101060703. 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.