

Blue Economy:  
innovative & sustainable  
[www.bluecluster.be](http://www.bluecluster.be)

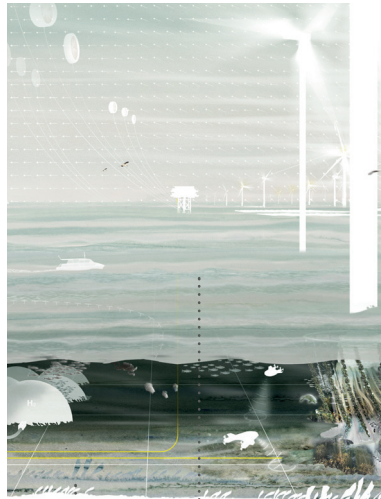
# Blue Cluster focuses on

The blue economy is as vast and diverse as the sea. We have strategically selected **eight areas** that will help shape the future of humankind, the environment and the economy:



Coastal protection  
& use of mineral  
resources

Ecosystem approach



Renewable  
energy &  
freshwater  
production

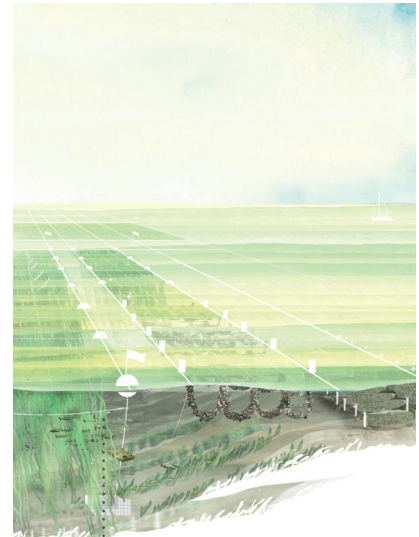
Smart  
sea



Maritime  
connection

Blue  
tourism

Ocean pollution and  
waste solutions



Sustainable  
seafood  
& marine  
biotechnology



PIET OPSTAELE  
CEO

We  
innovate  
because  
we care!

Dear reader,

Five years have passed, and the development of a sustainable blue economy is more topical than ever. The major challenges surrounding climate change, energy transition, food security and biodiversity loss require vigorous innovative solutions. To achieve this, Blue Cluster has clearly assumed its place and pioneering role in the Flemish and international innovation landscape. Every day, Blue Cluster screens new ideas and our team enters into a dialogue with stakeholders in Belgium and abroad: knowledge institutions, governments, businesses, citizens and policymakers.

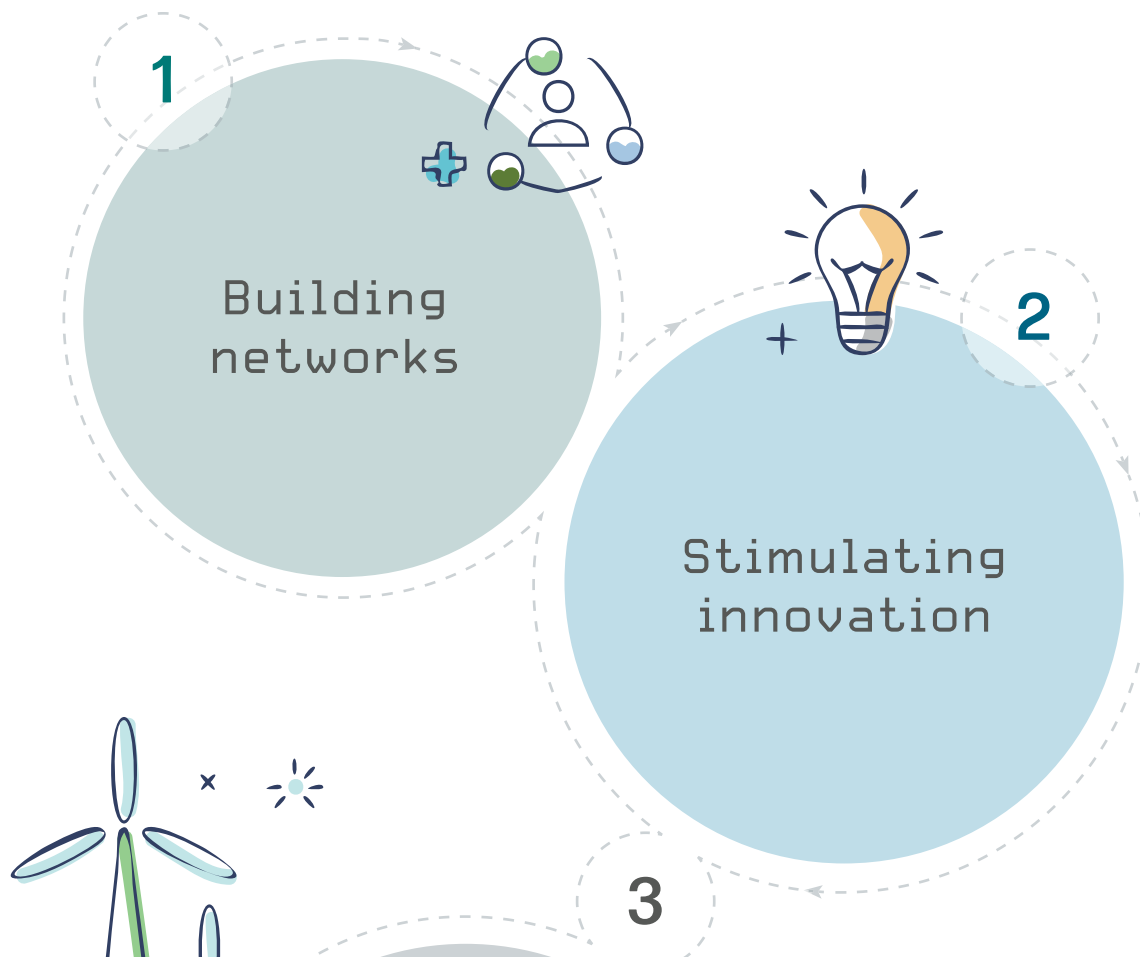
To build up knowledge, share it and create value, you need public support. We have that support: Blue Cluster has grown into a broad community of world-renowned knowledge institutions, dynamic and innovative SMEs, top companies with a global pioneering role and strong government bodies. This is the result of the efforts and ambassadorship of all our members and partners. One goal is paramount: the development and implementation of innovative solutions to help realise essential transitions and to develop a sustainable blue economy in which Flanders is recognised as one of the most innovative regions in Europe.

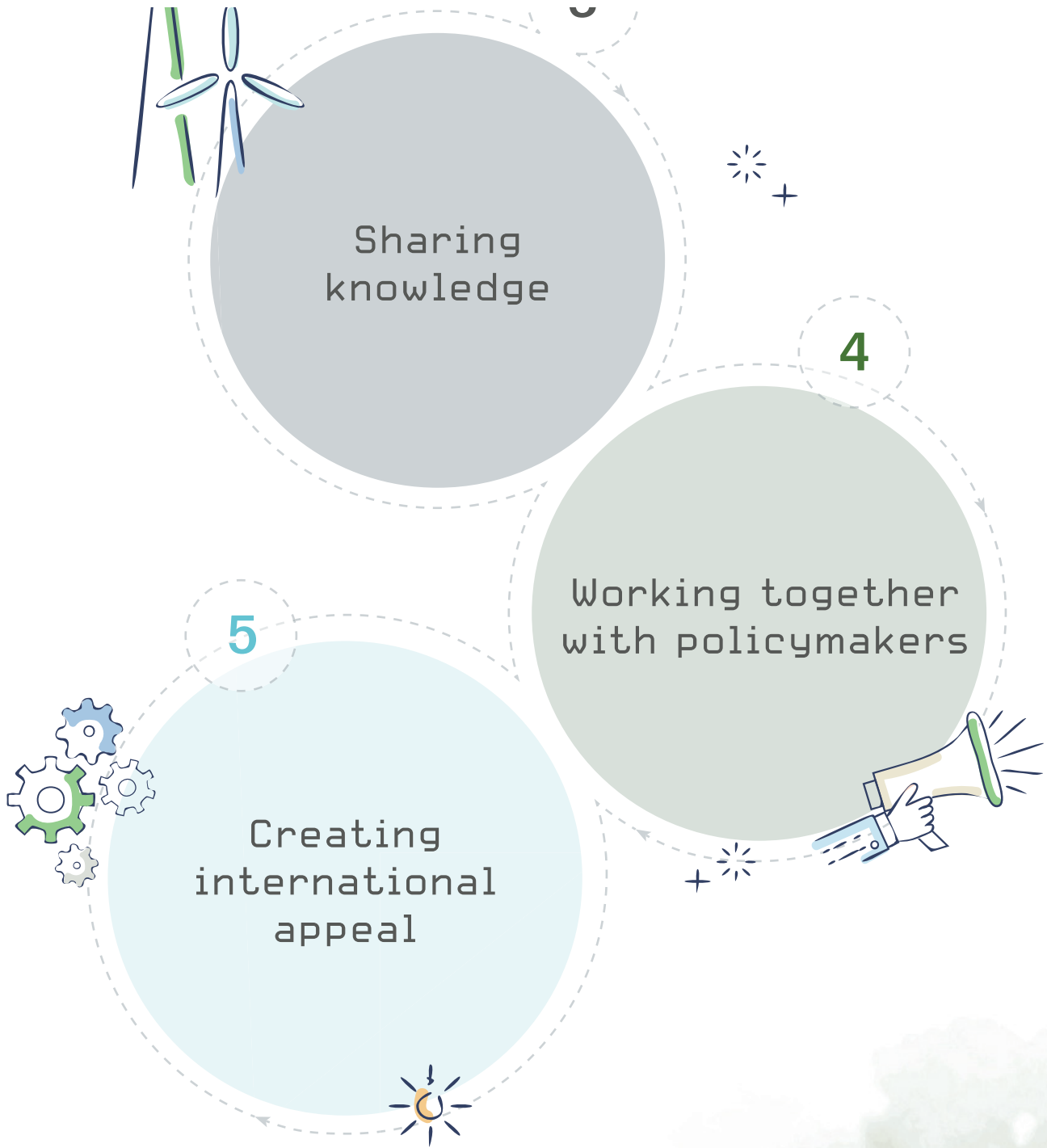
The past five years have been a real tour de force, with forty projects representing a budget of €58 million. However, we are not there yet. A lot remains to be done: we need to further develop our focus areas, tap into new sources of funding, and highlight and unlock the enormous potential of the blue economy even more. This brochure gives you an idea of where we are today. In the meantime, we are eagerly looking forward to the next five years, because we remain firmly convinced that the sea holds the key to our future.



Since 2018, Blue Cluster has been officially recognised by the Flemish government as the spearhead cluster for the blue economy in Flanders. This role implies that we are the first point of contact as well as the main discussion partner for policy makers, companies and organisations engaged in sustainable innovative economic activities linked to the sea. We also support our members in achieving actual sustainable blue growth.

**To succeed in this role, we focus our activities around five pillars:**





# Building networks

Everything starts with a close-knit and diverse network. We regularly bring government, research, industry and citizens together in both formal and informal settings with plenty of room for spontaneous encounters. We do this consciously between and across sectors so as to create synergy and boost interaction and cooperation between very diverse stakeholders.

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## Blue Night



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## SME Café



## Corporate Day

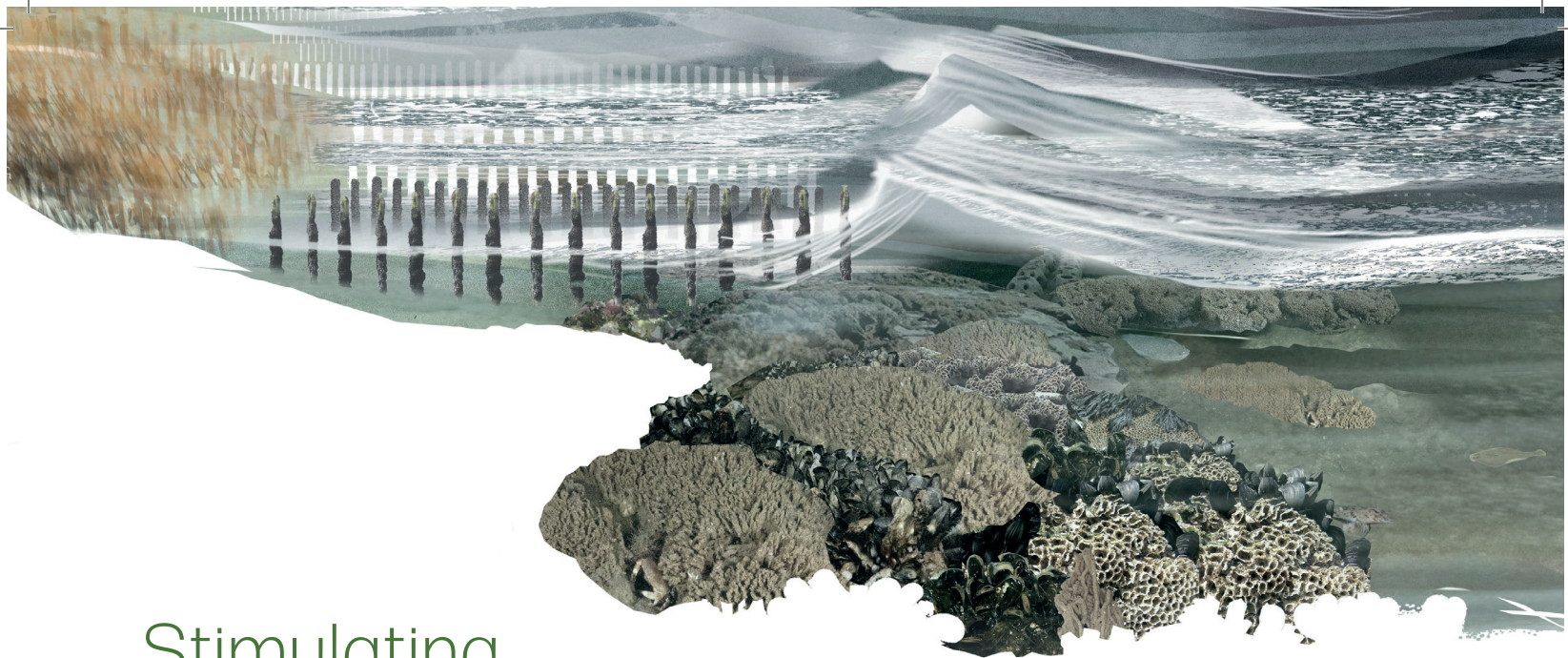


## Intercluster with Flanders Space



## InnovFest





## Stimulating innovation

Blue Cluster stimulates innovation in each of its eight focus areas. Projects enable us to deepen our own knowledge about sustainable blue growth and help companies roll out their innovative ideas: from feasibility studies and proofs of concept to new sustainable products, services, processes or business models.

We introduce these innovations to a wide audience through networking and knowledge sharing. This boosts public support and provides inspiration for new innovations.





# WHITE PAPER

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'Adopting the ecosystem approach in the blue economy'

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Major challenges such as biodiversity loss and climate change can to a significant extent be linked to ecosystems and the impact of human activities on these ecosystems. An ecosystem approach is an essential element to address these challenges effectively.

Companies want to assume responsibility, but are still reluctant to integrate such an approach in their operations because of its complex nature. We have developed a white paper to support businesses in this manner. The goal is to eventually convince all actors in the blue economy to adopt this approach. This is the only way to achieve growth in harmony with marine habitats and ecosystems.

The white paper focuses on the ecosystem approach performance wheel. This tool starts from scientifically based knowledge on the impact on the marine ecosystem and on socioeconomic and policy objectives. The performance wheel is intended to provide companies with a clear picture of their application of the ecosystem approach. This will help them take targeted actions.

Possible knowledge gaps are no valid reason to postpone the implementation. Close collaboration between knowledge institutions and the industry needs to result in improved models, data platforms and indicators to quantify the impact of economic activities on the environment and its ecosystem services. Companies can provide an assessment framework, for example through current innovation projects, and thus help roll out the performance wheel on a small scale. In this process, Blue Cluster acts as a bridge builder between industry, science and government.



# BANKBUSTERS

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Every year, billions of cubic metres of material are dredged to keep ports and rivers accessible. This material is often considered a worthless waste product. But what if it could play a role in restoring our eroded tidal areas and help improve our local ecosystem services?

BankBusters looks into this possibility by testing new techniques and procedures for the treatment, installation and dewatering of soft dredged material. The tests are first carried out on a laboratory scale at the Mesodrome (University of Antwerp).

A pilot project will subsequently be set up in the Scheldt river basin to determine the ecological, technical and economic feasibility.

All this should ultimately lead to reuse and stabilisation of soft sediment and sustainable erosion protection of river banks. A beautiful example of a Nature-Based Solution: an innovative, sustainable solution inspired by nature.

Partners



## RAINBOW

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Offshore wind turbines are continuously exposed to extreme weather conditions. This obviously has an impact on their operation and lifespan. The sector is therefore always looking for sustainable solutions to keep offshore wind turbines running better and longer.

With RAINBOW, the project partners specifically want to gain more insight into the erosion of rotor blades as a result of precipitation and lightning. To this end, the partners make use of weather forecast models, monitor the turbines and energy yield closely, and perform automated inspections of rotor blades with drones.

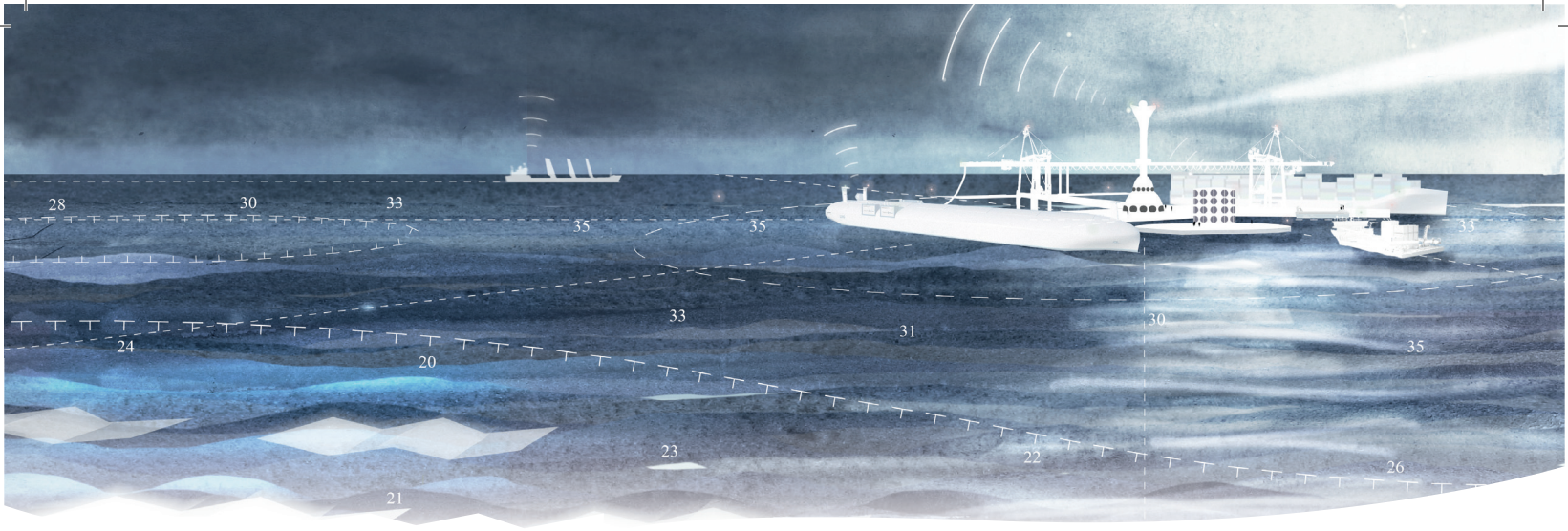
Based on the outcome, coatings and other protection materials are tested and validated under realistic North Sea conditions. The results also help to better prepare and schedule inspection flights with drones.

This should ultimately lead to a longer lifespan of the wind turbines and a drastic reduction in inspection, maintenance and repair costs. Better risk management of erosion and damage to the turbine blades also contributes to more energy production and more competitive energy prices.



Partners





# PLUXIN

## Plastic Flux for Innovation and Business Opportunities in Flanders

To fight plastic pollution, it is important to gain insight into how much plastic our rivers and oceans contain, and where and when plastic ends up in the water. We need innovative and automatic detection methods to collect sufficient amounts of data. The collected data will enable us to develop computer models to calculate the flow of plastic, identify accumulation zones, and gain insight into the distribution of plastic in the water column.

Within this context, the PLUXIN project partners are working on a concrete protocol for plastic sampling and analysis and developing automatic remote sensing. The aim is to quantify the flow of plastic from rivers and ports to the marine environment and determine pollution hotspots.

At the same time, PLUXIN is investigating possible economic and social valorisation of the accumulated knowledge and project results. PLUXIN also offers a platform where knowledge institutions, companies, scientists, policy makers and citizens can enter into a dialogue about blue innovation. This should lead to new interdisciplinary collaborations and innovation projects.

Partners





# WAVE LAKE

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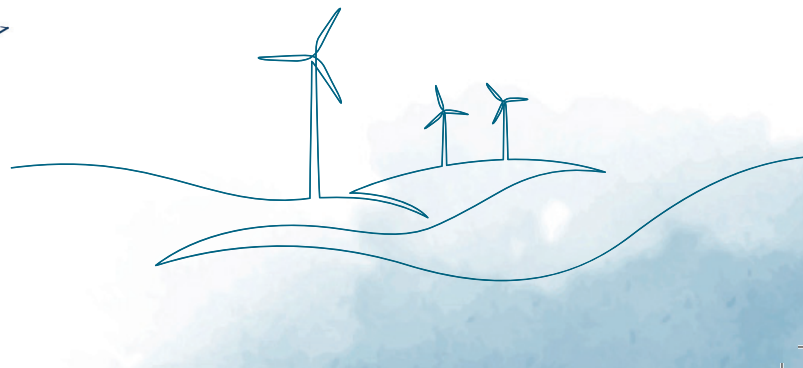
The WaveLake project partners want to develop and validate a new technological concept for a safe underwater wave generator for surfers. The aim is to make it possible to surf all year round both from a technical and from an economic perspective.

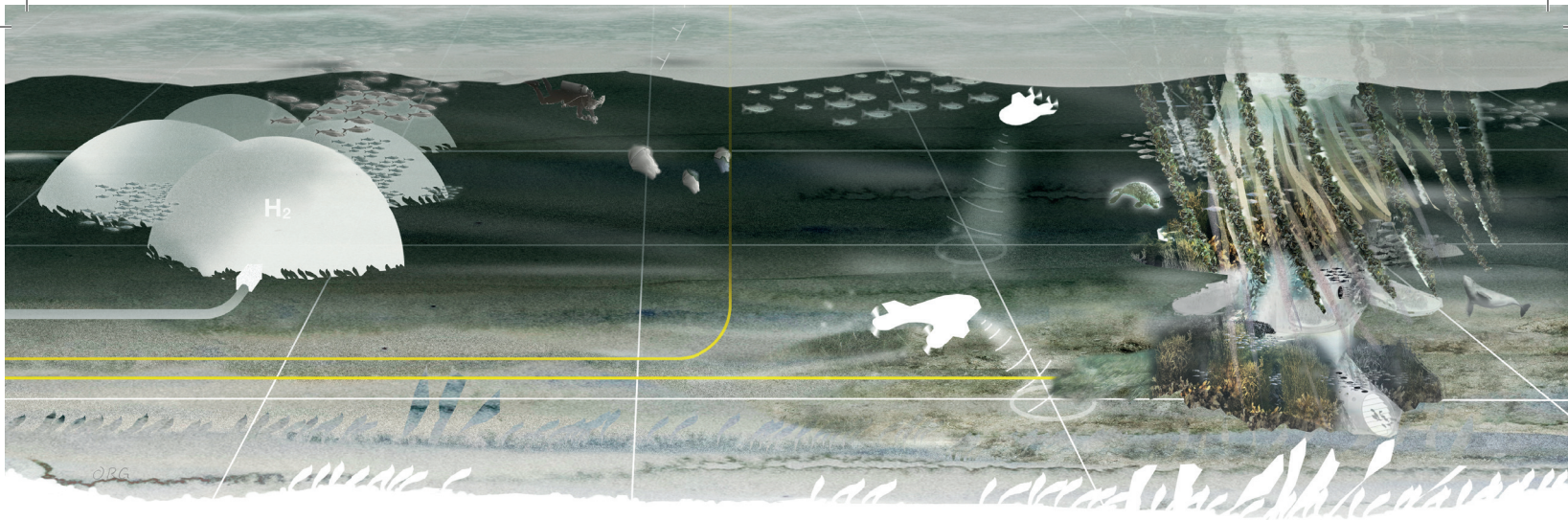
The WaveLake concept aims to surpass the international state-of-the-art in terms of average number of waves, wave preforms and acceptable spectrum in wave heights, shapes, styles and speed. At the same time, WaveLake wants to address disadvantages such as visual impact, safety risks, own frequency tuning and high costs.

The new technology should allow extremely precise manipulation of the wave profiles and generate multiple profiles to serve surfers of very different levels. In addition, the structure of the water basin and the bathymetry (the reef) and their interaction with the wave generator are essential.

The combination of all these factors should ensure a pleasant, safe, energy-efficient and maintenance-friendly installation you can operate profitably all year round without having to rely on income from secondary activities.

## Partners





## H2TUGBOATS

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Hydrogen is increasingly regarded as the fuel of the future. Many technological aspects have already been developed, but is this enough? The H2Tugboats feasibility study investigates whether hydrogen can effectively serve as a clean fuel in maritime shipping in Flanders. Two complex challenges are paramount: reducing shipping emissions and adapting the infrastructure in ports accordingly.

To this end, H2Tugboats zooms in on more efficient and cost-effective conversion of tugs. The project partners have set up a pilot in the port of Zeebrugge so as to map out the operational impact of hydrogen on a functional tugboat. This enables them to determine the most efficient working method for the various operational sub-processes (safety, bunkering, maintenance, inspections). All learnings can subsequently be included in future retrofits.

A second aspect H2Tugboats is looking at in more detail is the construction and operation of a bunkering station at a production facility with all the associated boundary conditions. Again, operational experience should clarify many of the outstanding questions.

### Partners



# SYMAPA

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## Synergy between Mariculture & Passive Fisheries

The aim of the SYMAPA project is to look for possible synergies between mariculture of mussels, oysters and seaweeds and passive fishing. The project partners have built a unique test setup in the North Sea to examine the possibility of combining several activities in the same marine space.

### Partners

 COLRUYT GROUP



**ILVO**

**museum**

SYMAPA provides answers to the following questions:

- What are efficient substrates for the capture of spatter from mussels and flat oyster? Which biodegradable substrates can be used for habitat enrichment?
- Which monitoring programme should be used to evaluate the effects of mariculture and passive fisheries?
- Which passive fishing gear works efficiently in the conditions of the Belgian part of the North Sea? Which stimuli can significantly increase the fishing capacity of passive gear?
- Which production and harvesting systems for bivalve shellfish and seaweed are North Sea resistant and safe? How can one predict maintenance and harvest times?
- How can we achieve sustainable multi-use and ensure value chain creation for marine resources?



## Want to learn more?

Discover all our projects on our website



# The Blue Innovation Awards

The projects mentioned above show only a small part of the wave of innovation in the blue economy. Many companies and government bodies in Belgium are strategically betting on innovation to enable sustainable blue growth. Blue Cluster likes to highlight these initiatives every year with the Blue Innovation Awards.

We focus on SMEs, large companies, collaborative initiatives and public bodies. A jury of experts in blue economy and innovation designates the nominees, who then compete against each other during the Blue Innovation Party. The Inspirational Blue Wave award also gives the public a chance to vote for their favourite innovative solution.

In 2022, the following companies and organisations received a Blue Innovation Award for their outstanding contribution to sustainable blue growth:

## Blue Innovation Wave Award:

 **MARLINKS** CPS Monitoring

By measuring acoustic vibrations along the cables, Marlinks is able to monitor the condition of submarine cables very precisely. This makes maintenance and repair work more efficient.

## Corporate Blue Innovation Wave Award:

 **DEME** Drilled XL monopile foundations for offshore wind farms

Thanks to this triple innovation from DEME, offshore wind farms can also be built on rocky soils.

## Blue Innovation Swell Award:

In the context of the UNITED collaboration initiative, these partners examined how to sustainably combine offshore wind, aquaculture, flat oyster restoration and seaweed cultivation.

## Blue Innovation Captain Award:

 **aquaduin** Wastewater treatment with willows

Aquaduin is investigating the potential of willow fields to further purify salt-rich wastewater. This can help tackle the structural water shortage in Belgium.

## Inspirational Blue Wave Award:

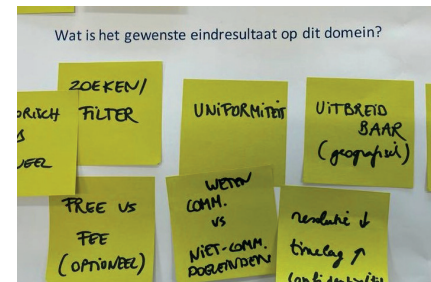
 **MULTI** Moray Base

The Moray Base enables sustainable and cost-efficient wind farms in waters more than 100 m deep. This ingenious design clearly impressed the public jury.



# Sharing knowledge

Innovation enables us to keep on expanding our knowledge of sustainable blue growth. We like to share this knowledge with professionals, for example through thematic workshops such as the Blue Sessions. Corporate Days give large companies and SMEs the opportunity to present their challenges and innovative solutions to each other. Together with VLIZ, we also organise the Blue Economy Science Summit, where companies and scientists meet. Time and again, these initiatives result in cross-pollination and ultimately new knowledge.



# Working together with policymakers

To stimulate sustainable blue growth, Blue Cluster works intensively with the government. We do so at the international level through various European projects and partnerships. We participate in these initiatives to look for strategic answers to questions such as:

- How can the blue economy contribute to a climate-neutral world?
- How can we make the best use of the available space at sea?
- How can we support coastal regions, businesses and citizens in the transition to a sustainable blue bio-economy?
- How can we motivate (young) people and provide them with the necessary skills to work in the blue economy?

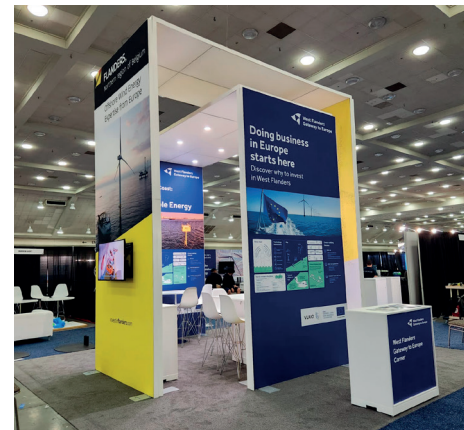
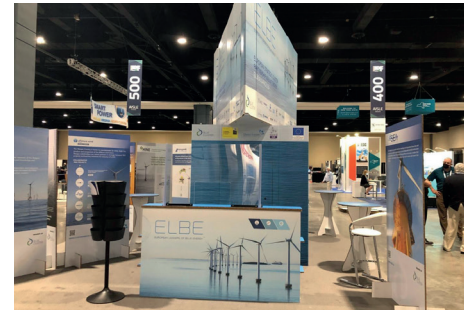
In addition, Blue Cluster provides advice to local, regional and national policy makers. For example, we have presented recommendations for mariculture to the Flemish government, and we have shared insights into fisheries-inclusive spatial planning at sea.



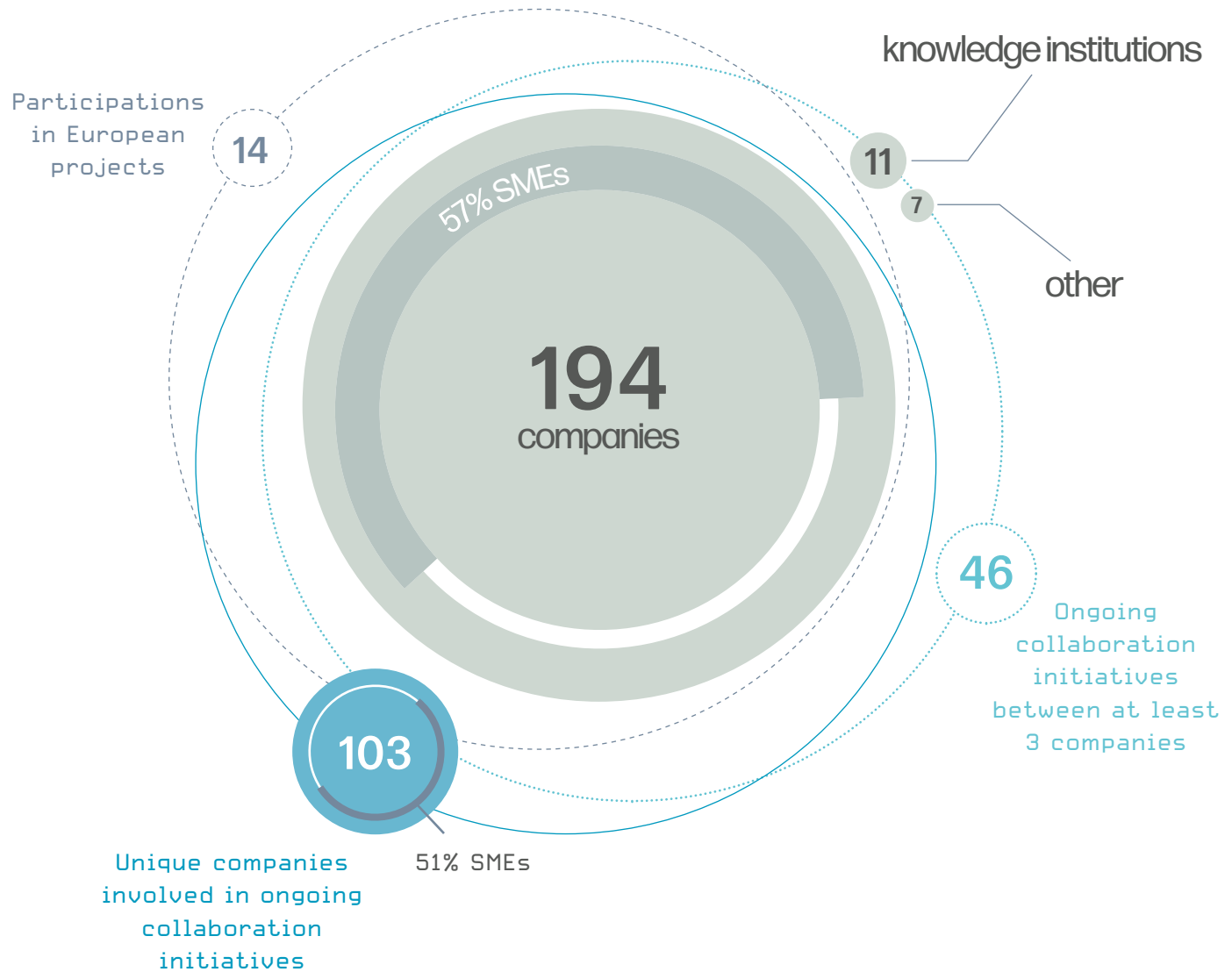
# Creating international appeal

Blue Cluster also puts the Belgian blue economy on the global map through international projects. For example, together with a number of European colleagues, we are looking at how to support companies in offshore wind to do business in Europe and beyond. We also engage in opening doors for SMEs that want to develop international contacts in the naval defence sector.

In addition, together with our stakeholders, we gain inspiration worldwide. We set up study tours to countries such as the US, Ireland, Norway, Japan and South Korea. We invite foreign delegations to visit us in Belgium. We promote the activities of our members at trade fairs and other events both within and outside Europe. We support international missions and group business trips to markets with great potential for our companies. We can rely on our structural partner Flanders Investment & Trade for all this.

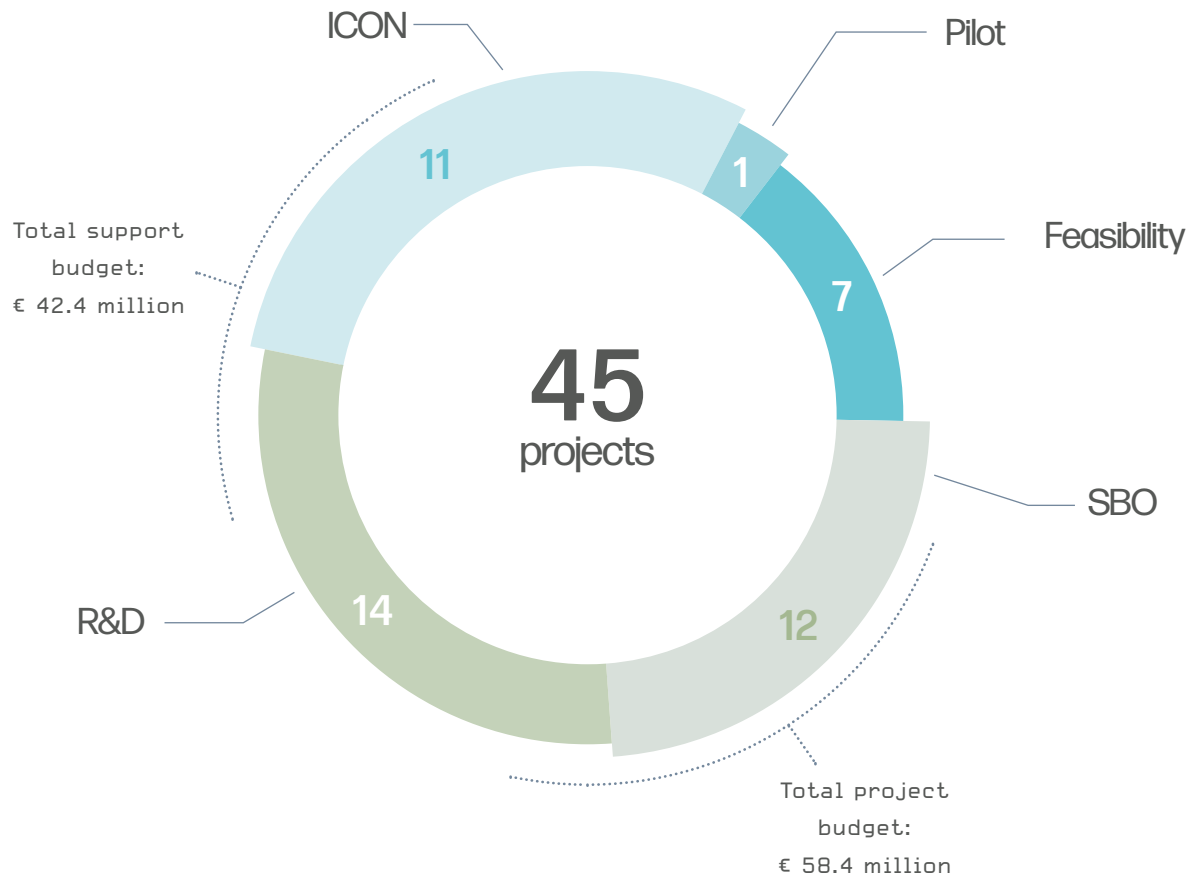


# Members and partners in figures



# Projects and budget

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# We are Blue Cluster



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**ANN OVERMEIRE**  
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**EVELINE BUYCK**  
Innovation Manager



**KINNIE DE BEULE**  
Innovation Manager



**DRIES DEBRUYNE**  
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**STEEFAAN MENSAERT**  
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**KRISTIEN VEYS**  
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**SOFIE VAN DEN HENDE**  
Aquaculture & Marine  
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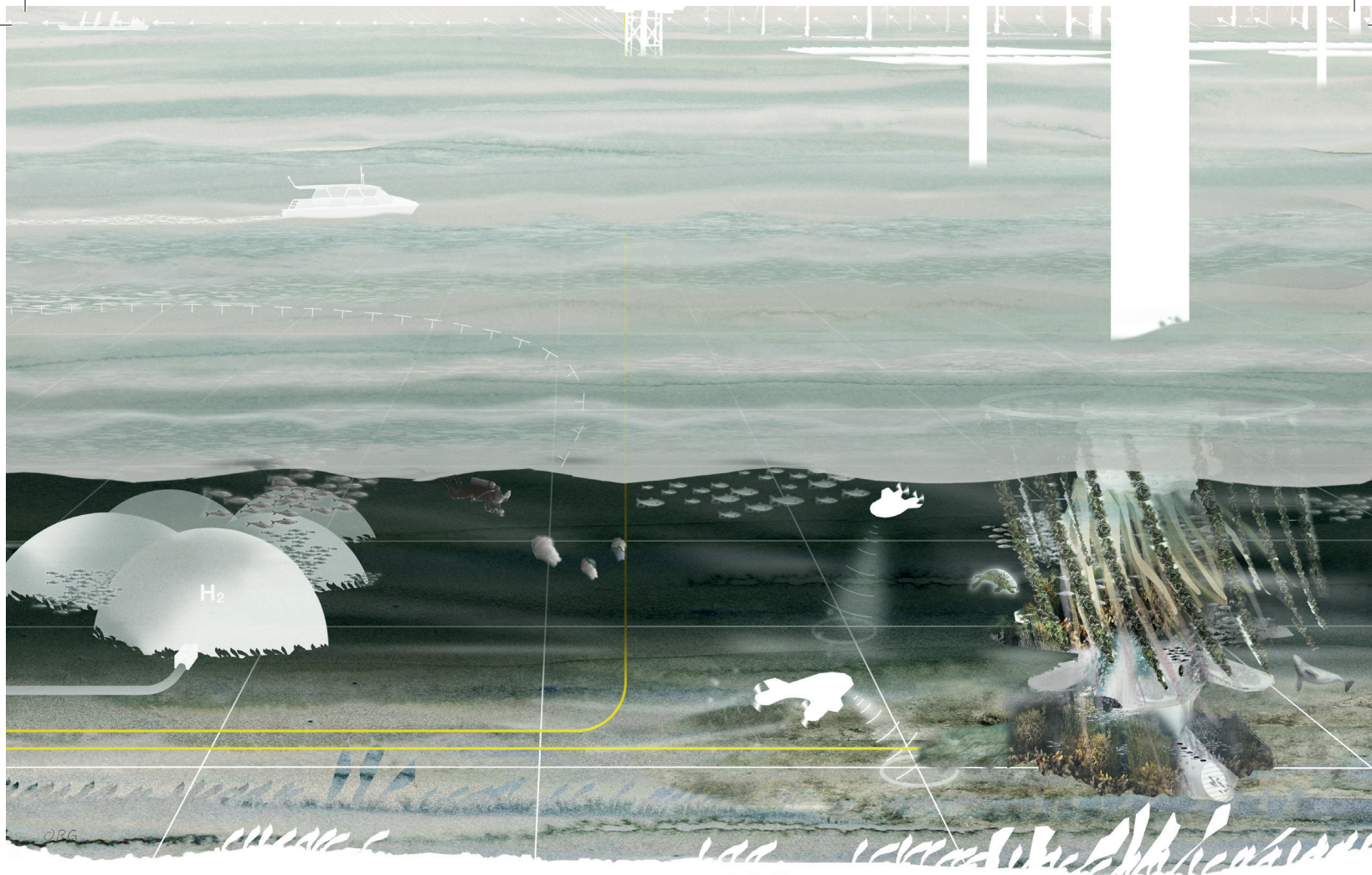


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Structural Partner