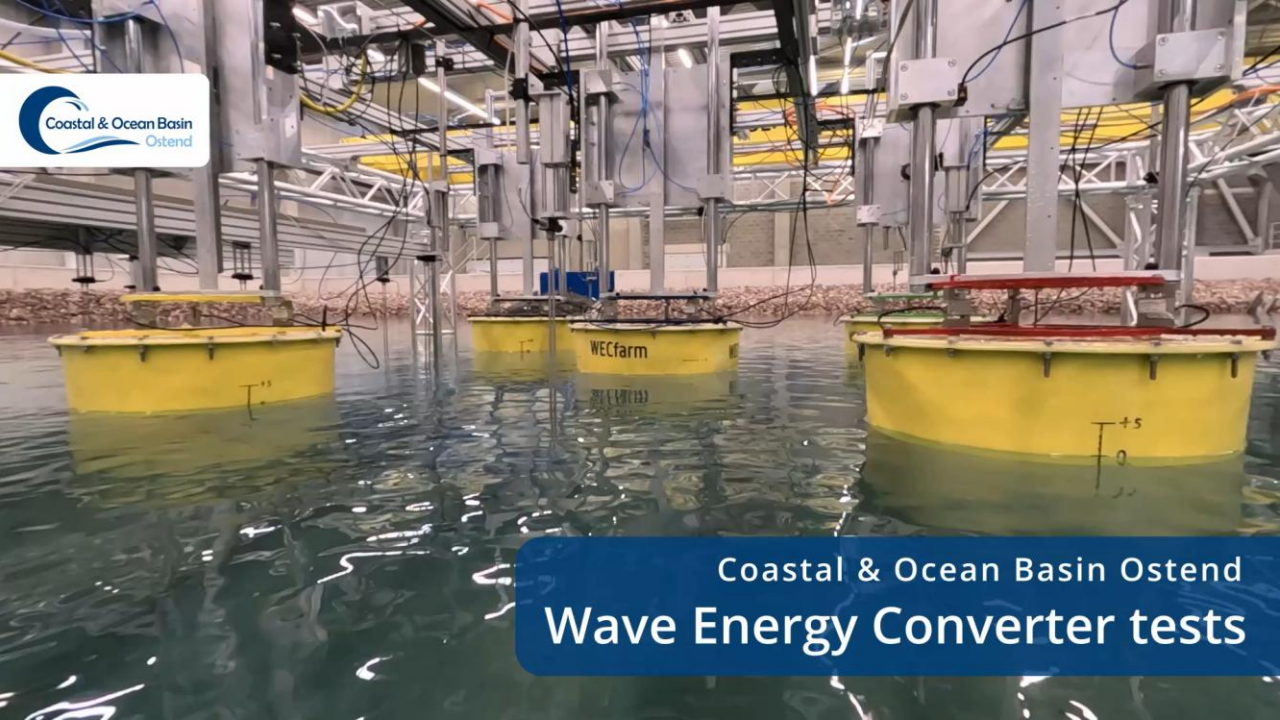












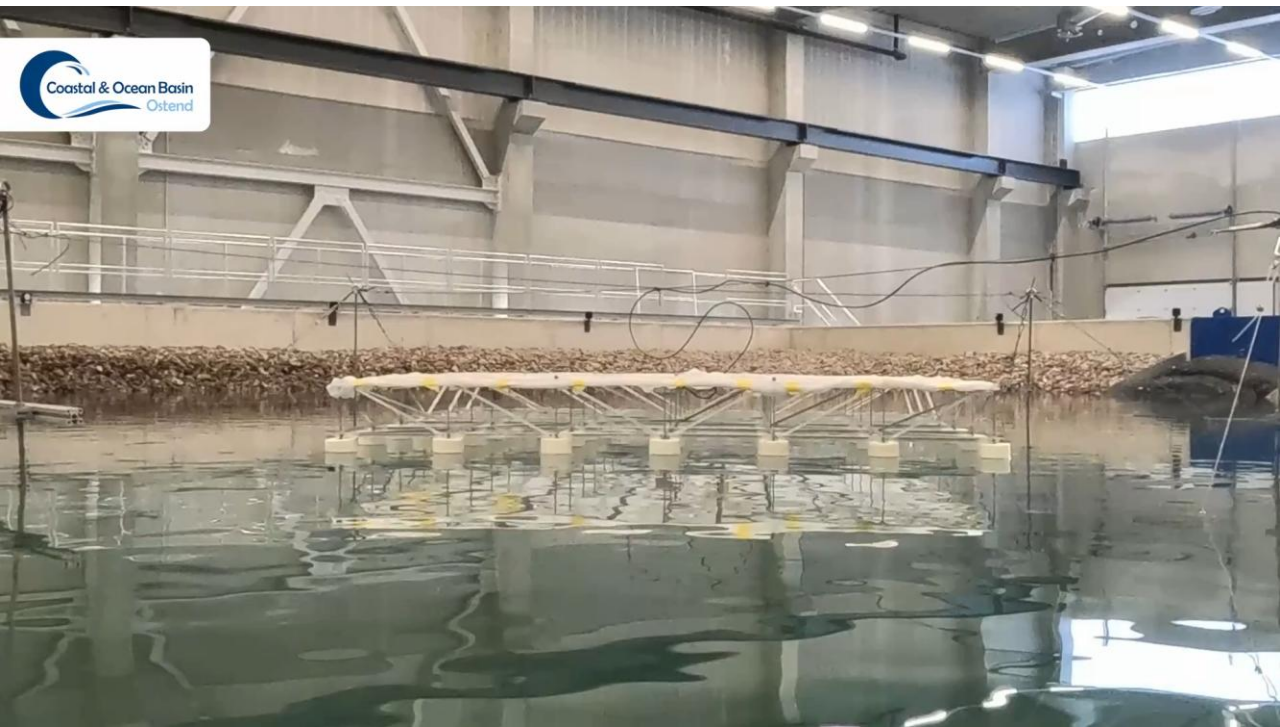
Coastal & Ocean Basin Ostend
Wave Energy Converter tests

WECfarm

Experimental modelling of
an array of five point absorber wave
energy converters

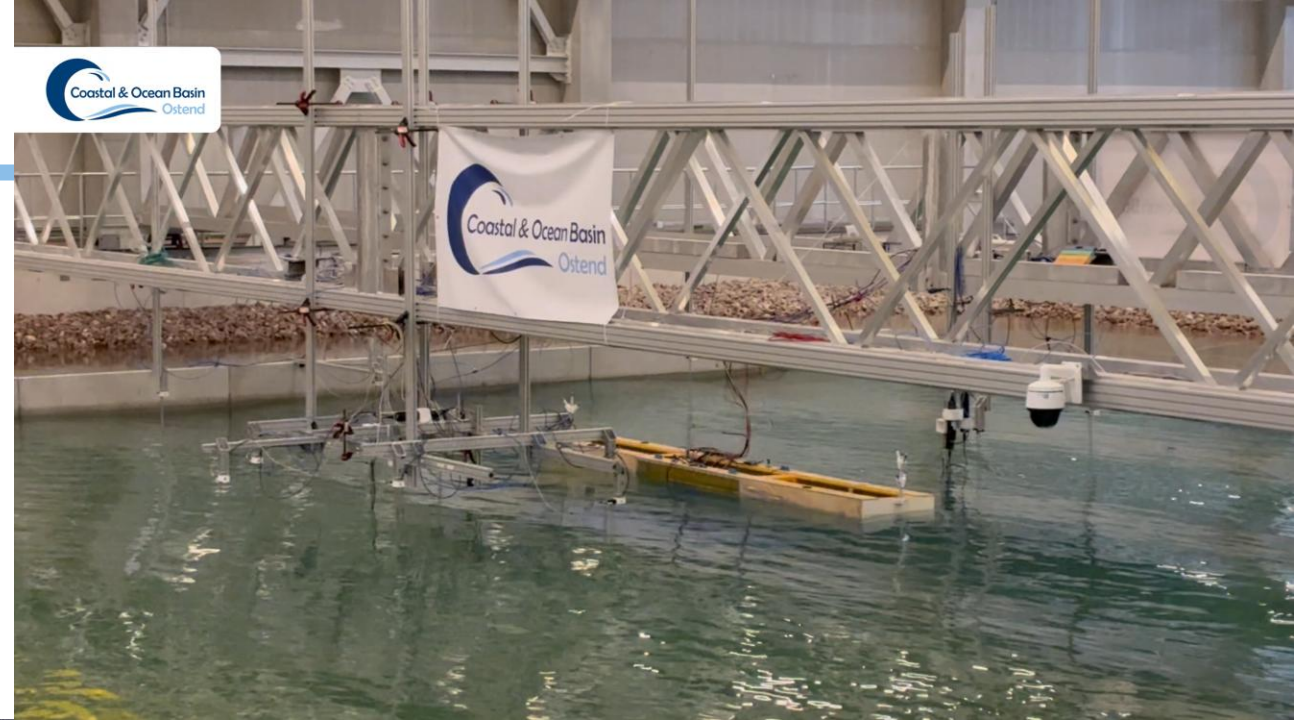
MarineSpots

Exploring the use of floating
photovoltaic installations in the
Belgian North Sea



Bluebox

Experimental tests to assess the performance of a hybrid floating breakwater (OWC) under realistic wave and current conditions

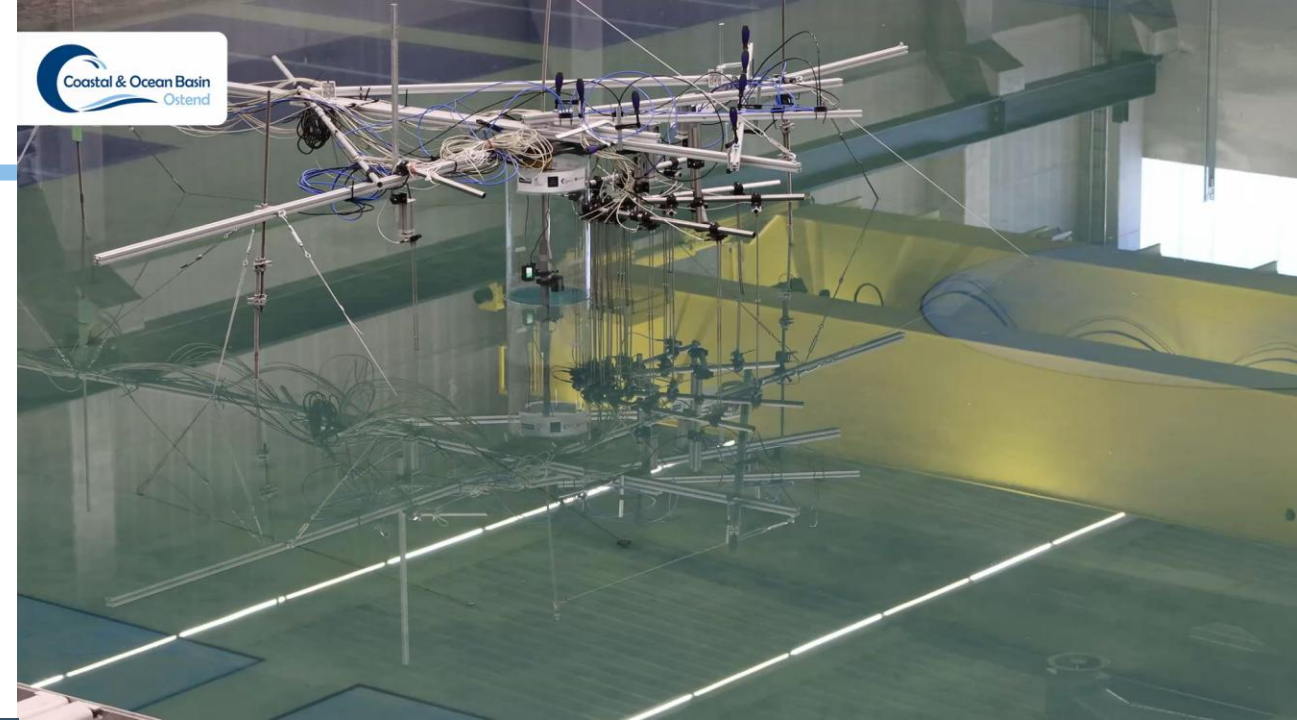


INF4INITY

Testing how an Artificial Reef Structure (ARS) alters the behavior of a floating wind turbine structure in wave and current conditions

PhairywinD

Physical modelling campaign
to investigate the wave field
around a large monopile



MORE-OS

Study of hydrodynamic
performance, interconnectors
and wave induced pressures
for a floating PV structure
exposed to directional waves.

The Belgian Context



National Level



AGENDA

12:00	Welcome and Networking Lunch
12:45	Introduction and Context
13:00	MARINERG-i
13:20	Flemish and European Policy Framework
13:45	Expert and Stakeholder Perspectives
15:00	Closing Remarks
15:15	Tour of the COB Lab

Dr. Fiona Devoy McAuliffe



ROLE Senior Researcher Fellow – offshore renewable energy

ORGANISATION University College Cork (UCC)

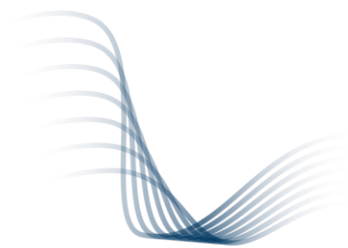
PRESENTATION “About MARINERG-i”

SHORT INTRODUCTION

- *Managing application for MARINERG-i to join 2021 ESFRI roadmap*
- *Coordinating European projects including MARINERG-i_PP & VERTI-GO*
- *Research in logistics simulation and tech-economic analysis*

CONTACT F.DevoyMcAuliffe@ucc.ie





marinerg-i

Stakeholder Workshop – Belgium 8th October 2026

Projects

ESFRI roadmap

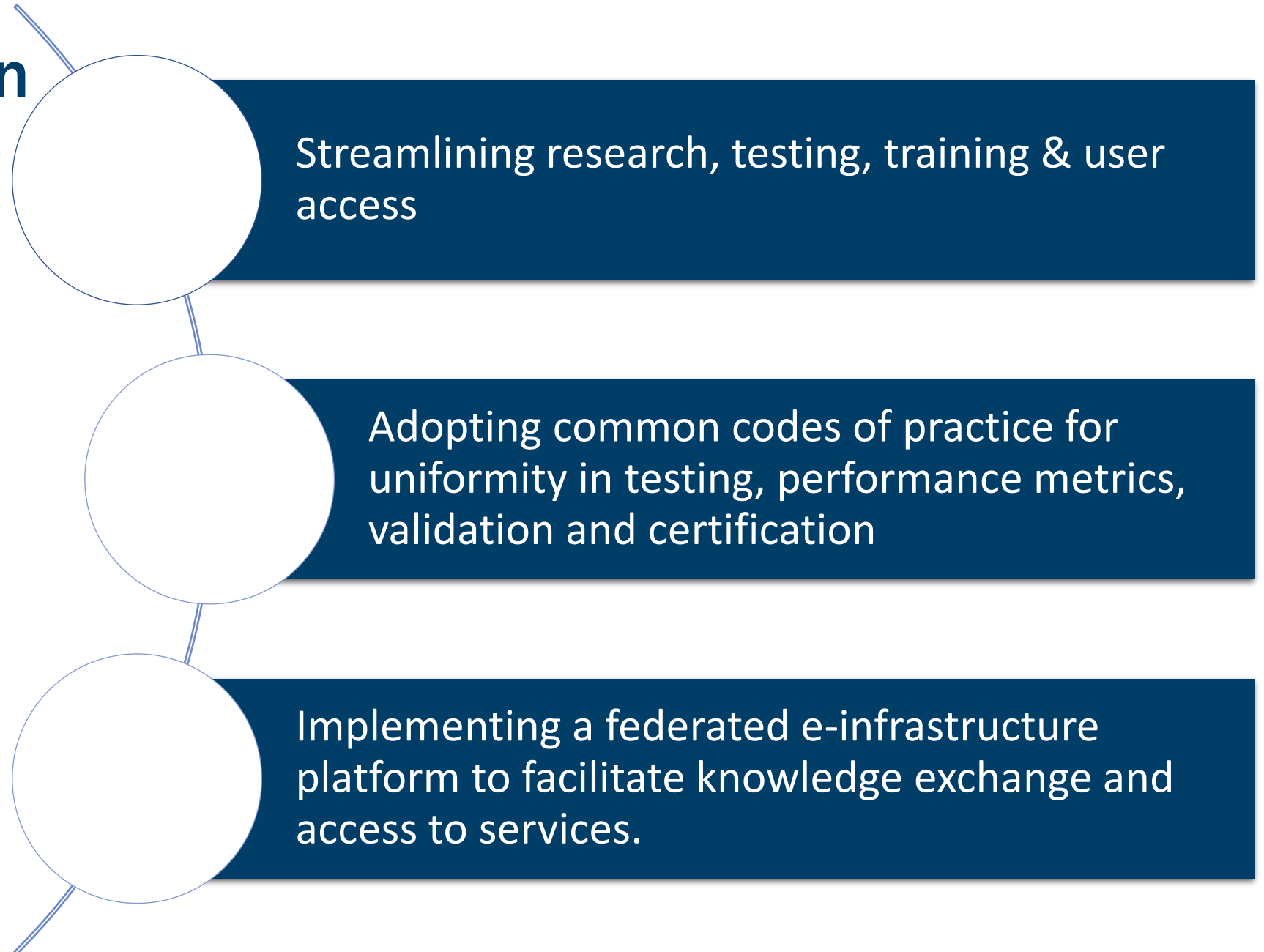
Permanent legal
entity



A Distributed Research Infrastructure (DRI) of testing infrastructures to accelerate the delivery of Offshore Renewable Energy (ORE).

Mission & Vision

**Drive the
development of
innovative,
investable ORE
technologies by...**



22 ESFRI PROJECTS and 41 ESFRI LANDMARKS

<https://ri-portfolio.esfri.eu/>

▶▶ ESFRI PROJECTS

	NAME	FULL NAME	TYPE	LEGAL STATUS (Y)
DIGIT	EBRAINS	European Brain ReseArch INfrastructureS	distributed	AISBL, 2019
	SLICES	Scientific Large-scale Infrastructure for Computing/ Communication Experimental Studies	distributed	
	SoBigData++	European Integrated Infrastructure for Social Mining and Big Data Analytics	distributed	
ENERGY	IFMIF-DONES	International Fusion Materials Irradiation Facility - DEMO Oriented NEutron Source	single-sited	
	MARINERG-i	Marine Renewable Energy Research Infrastructure	distributed	
ENVIRONMENT	DANUBIUS-RI	International Centre for Advanced Studies on River-Sea Systems	distributed	ERIC Step1
	DiSSCo	Distributed System of Scientific Collections	distributed	
	eLTER RI	Integrated European Long-Term Ecosystem, critical zone and socio-ecological system Research Infrastructure	distributed	
HEALTH & FOOD	EIRENE RI	Research Infrastructure for EnvIRonmental Exposure assessment in Europe	distributed	
	EMPHASIS	European Infrastructure for Multi-scale Plant Phenomics and Simulation	distributed	
	EU-IBISBA	European Industrial Biotechnology Innovation and Synthetic Biology Accelerator	distributed	
	METROFOOD-RI	Infrastructure for promoting Metrology in Food and Nutrition	distributed	



Jan 2027 - Dec 2028



3. PREPARATION

Preparatory Phase, business & construction plan, political and financial support secured, data policy & data management, cost book plan, legal entity identification

4. IMPLEMENTATION

site construction and deployment of organisation and legal entity, recruitment, IPR & innovation policies, operation and upgrade plan, secure funding for operation

2. DESIGN

design study, business case, political and financial support obtained, common access policy, top-level breakdown of costs, governance and HR policy

5. OPERATION

frontier research results, services to scientific community, outreach, continuous upgrade of instrumentation and methods, political and financial support for long-term operation

1. CONCEPT DEVELOPMENT

concept screening, consortium formation, access policy and funding concept, scientific and project leadership

6. TERMINATION

e.g. dissolution, dismantling of facilities and resurrection of site, reuse, merger of operation and organisation, or major upgrade

MARINERG-i_PP partners



UCC

Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland



WavEC
Offshore Renewables



FUNDACION
INSTITUTO DE HIDRÁULICA
AMBIENTAL DE CANTABRIA



THE EUROPEAN MARINE ENERGY CENTRE LTD



CENTRALE
NANTES



Bird & Bird



DUTCH MARINE ENERGY CENTRE



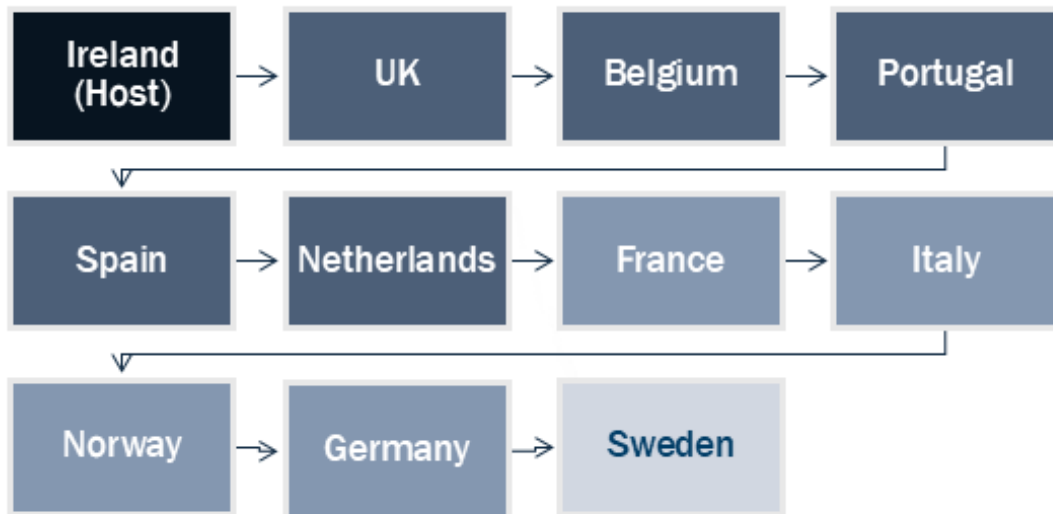
Consiglio Nazionale
delle **Ricerche**



Leibniz
Universität
Hannover

marinerg-i

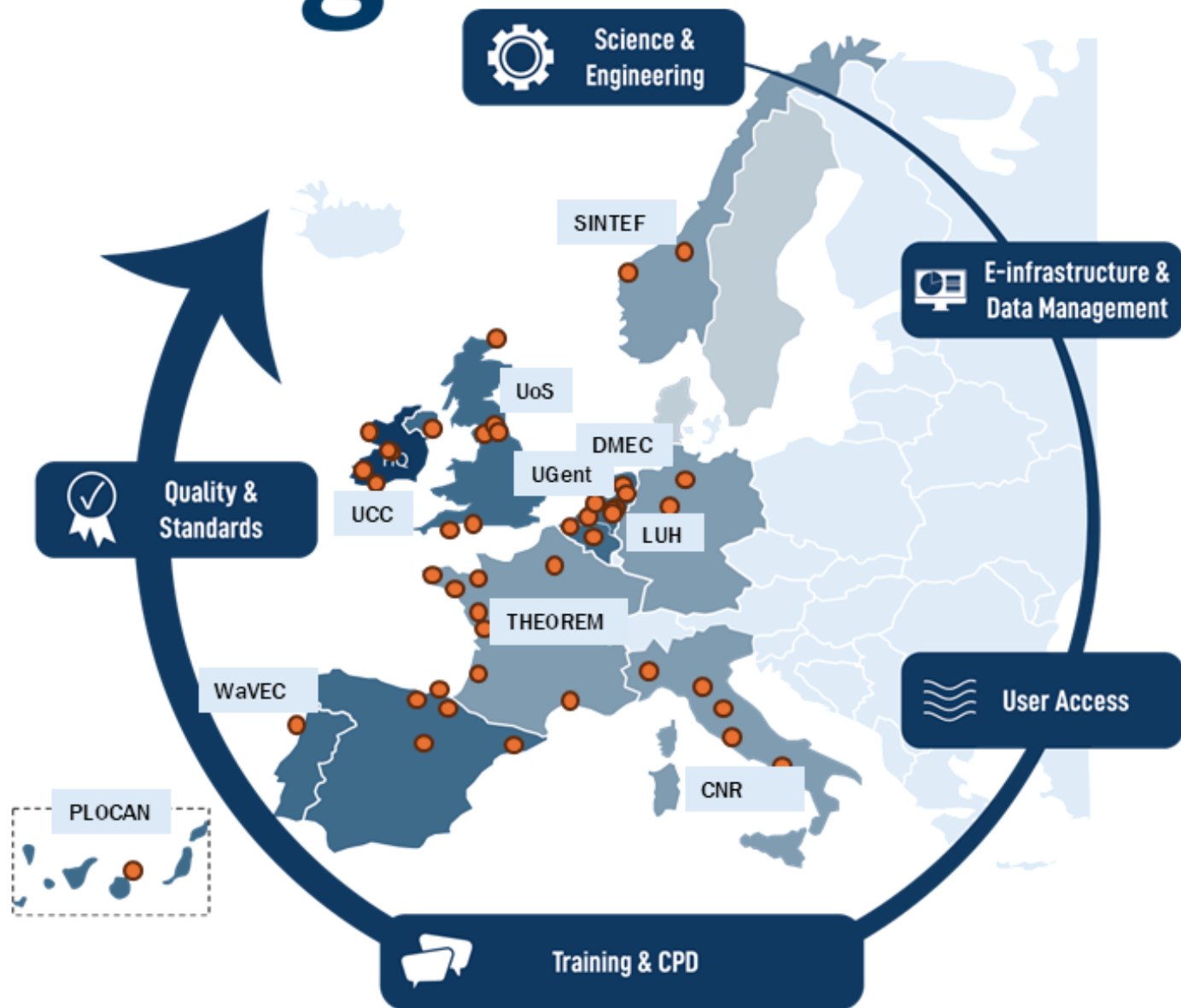
Membership



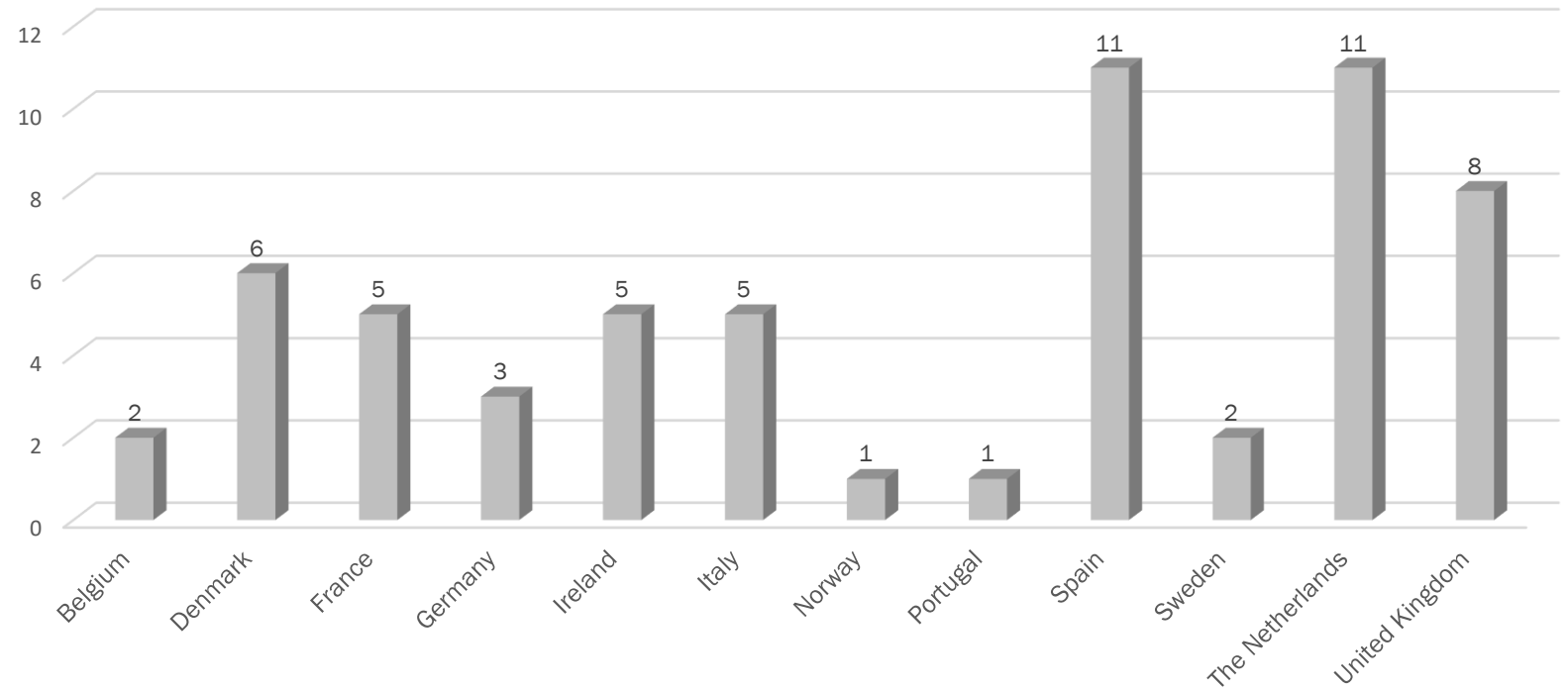
National Node

- Facilities

Service Group



Research Infrastructures



→ In total 60 facilities, 161 RIs ~30 still to engage

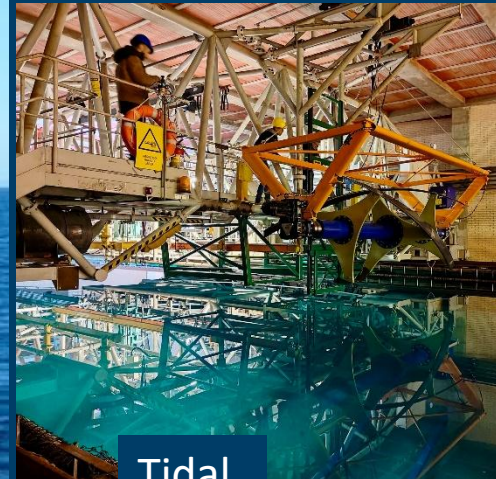
What will we cover?



Floating wind



Wave



Tidal



Floating solar



Mooring systems,
anchors &
components



Electrical: power
quality, performance
& grid integration



Drivetrains, Generators
& Electrical components



Device
Components



Logistics & robotics



Structures, Materials, Geotech & Manufacturing



Facility Scale	Focus Group					
	Wave	Tidal	Offshore wind	Solar (PV)	Electrical and Grid connection	Cross-Cutting
Small Lab	Wave flume	Current flume	Wind tunnel	Wave flume	Turbine emulator	Material testing bench
					Wave flume	
					PTO testing bench	
Large Lab	Wave basin	Current flume	Wind tunnel	Wave basin	Turbine emulator	Material testing bench, corrosion tanks
			Wave basin		Wave basin	
Medium Scale open sea test site	Sheltered bay Low-energetic test site	Sheltered strait or channel	Sheltered bay	Sheltered bay Low-energetic test site	PTO testing rig	Coastal corrosion testing facility
					Sheltered bay	Sheltered bay
Large Scale Open Sea test site	Offshore open area	Offshore open area Strait or channel	Offshore open area	Offshore open area	Offshore open area	Offshore open area

Services



ACCESS



FACILITY
SELECTION



TECHNOLOGY
DEVELOPMENT
GUIDANCE



TRAINING
(INTERNAL
AND
EXTERNAL)



DATA
PROCESSING,
CURATION &
ACCESS



KNOWLEDGE
BASED
DISSEMINATION

E-infrastructure

MARINERG-i DIGITAL PLATFORM



1. FACILITY ACCESS PORTAL

- Discover facilities, equipment and services
- Guidance and advisory for facility selection
- Access requests and scheduling
- User registration and management



2. COMMUNITY & COLLABORATION

- Best practices, guidelines and common vocabularies
- News, events, training and webinars
- Collaborative workspaces, forums and messaging
- Stakeholder engagement and networking



3. DATA MANAGEMENT & FAIR CATALOGUE

- Distributed data stewardship by Research Infrastructures
- FAIR metadata and central catalogue
- Data governance and access policies
- Persistent identifiers (DOI) and provenance



4. DATA ACCESS & VIRTUAL RESEARCH ENVIRONMENT (VRE)

- Data discovery, access, visualisation and download
- Analytical tools, workflows and scripts
- Virtual Labs: JupyterHub, RStudio, Galaxy, etc.
- Shared workspaces and reproducible research



5. SUPPORTING DIGITAL SERVICES

- Authentication, authorisation and access control
- Secure data exchange and collaboration
- Scalable architecture for services and users
- Monitoring, helpdesk and user support

MARINERG-i ERIC Governance Structure

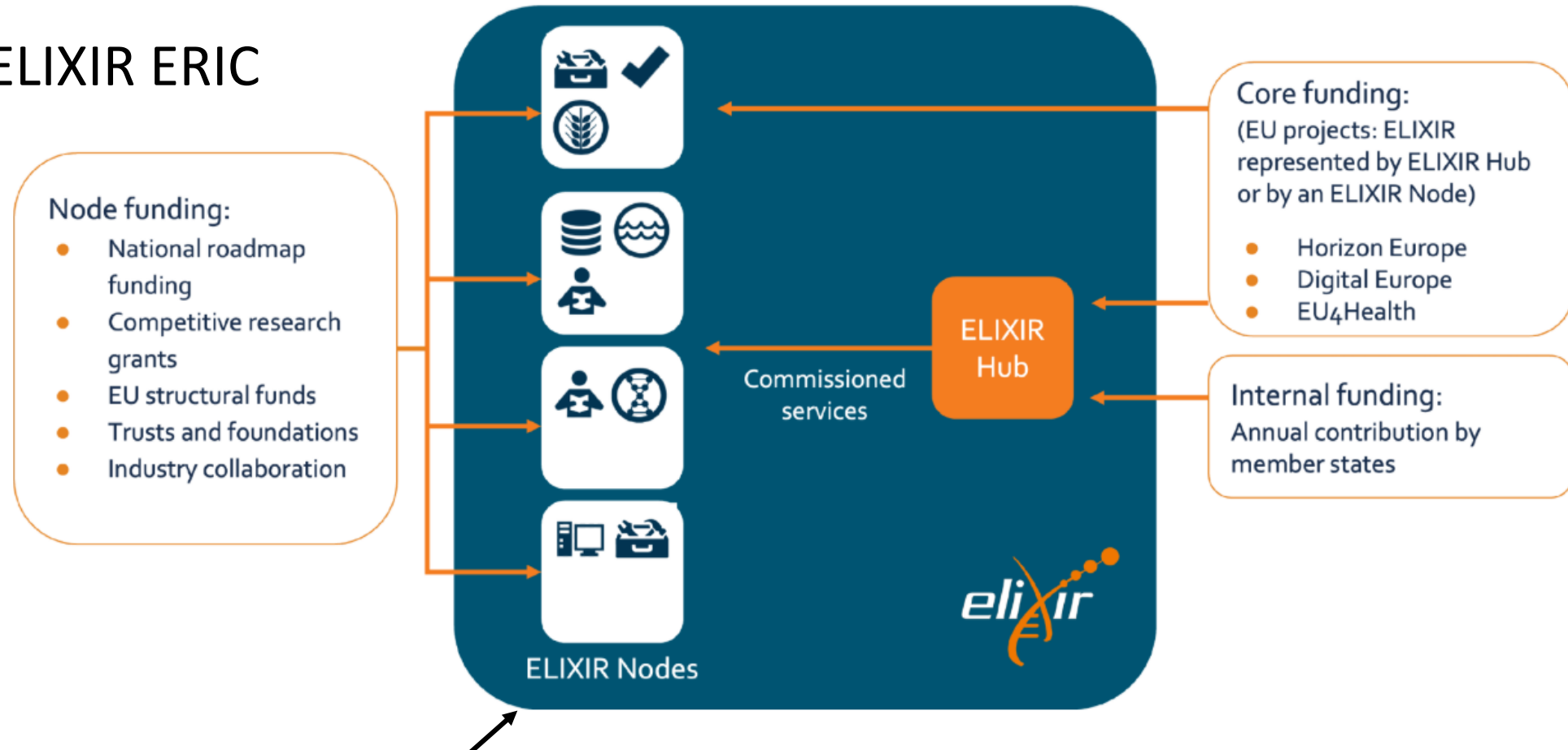


Multi-level governance ensuring scientific excellence, operational efficiency and stakeholder representation



Reviewing existing ERIC funding models

e.g. ELIXIR ERIC



In our case these nodes would be service groups

Funding Model

Central hub

Host fees, in-kind contributions & country membership fees

Core access activities

Research grants

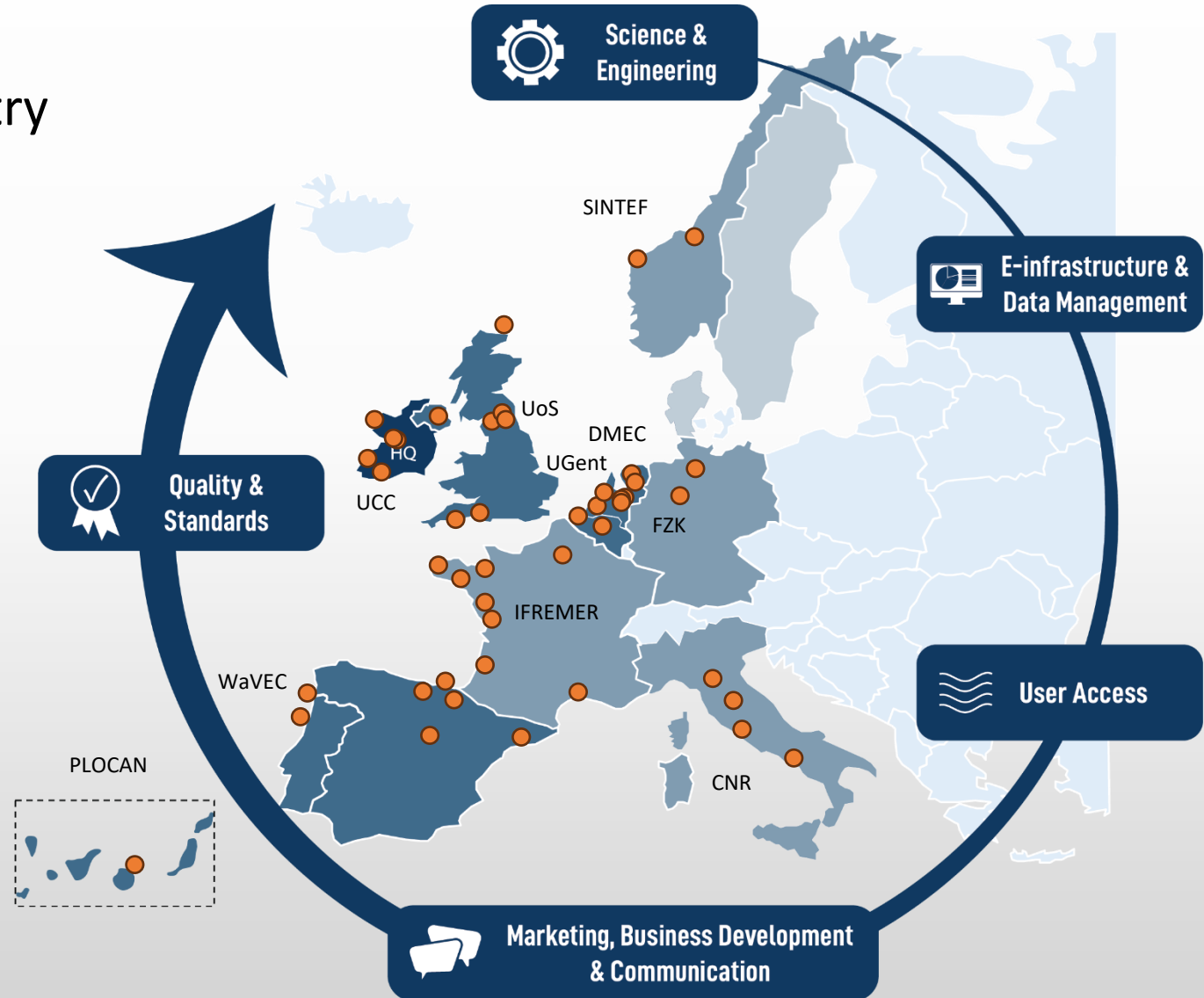
Service Groups

Membership fees, research grants and in-kind contributions

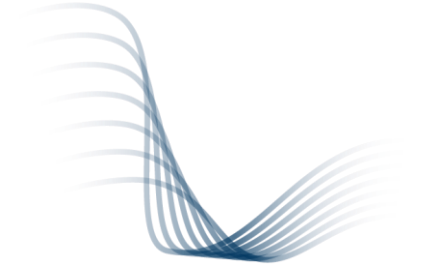
National Nodes

As above plus national roadmap funding where available

DRI economic activities



Annual Income Required for Sustainability



Hosting Partner	1
Full Members	6
Observers	2
Hosting annual fee (€) / in-kind contributions	120,000
Membership annual fee (€)	40,000
Observer annual fee (€)	15,000
Membership income (€)	390,000

EU-funded Transnational Access (TNA) programmes and research projects e.g.

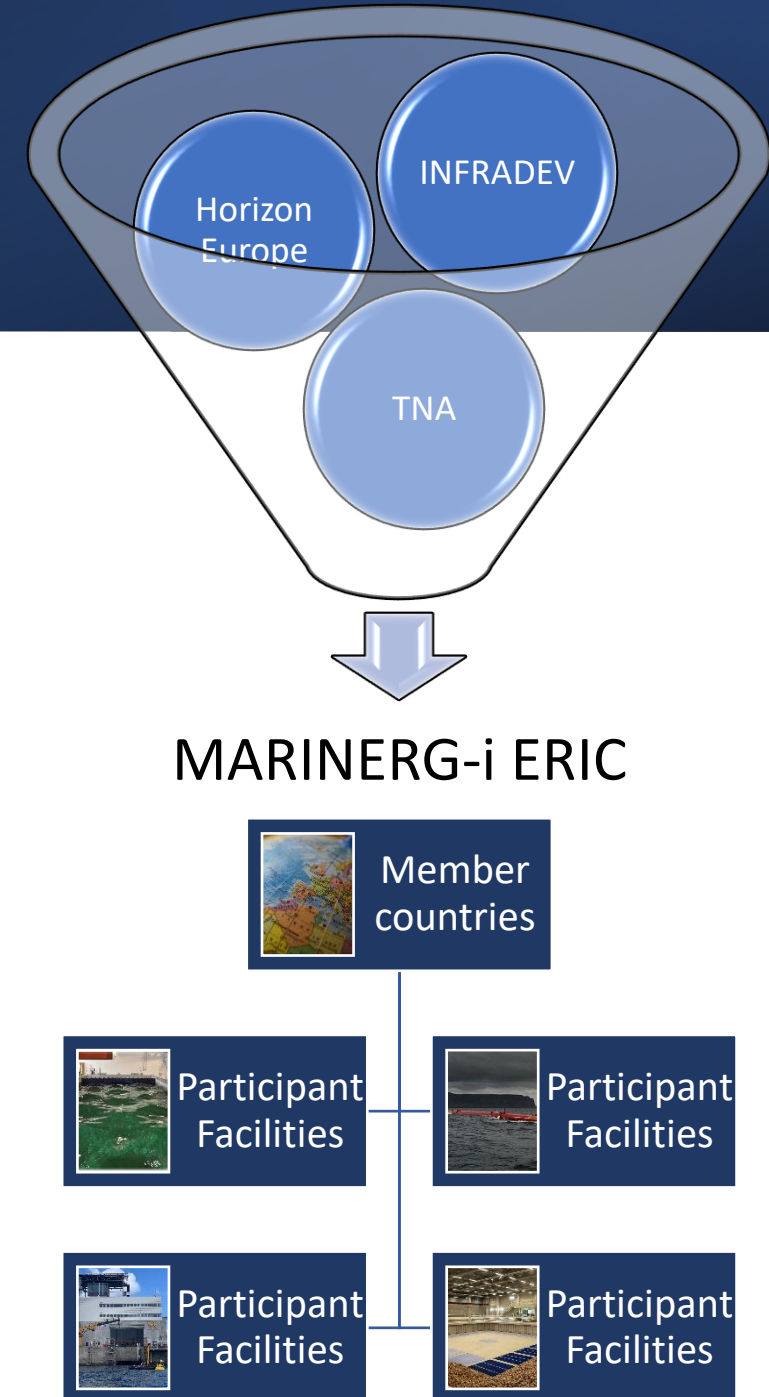
PRACE - €45.7m via PRACE-5IP; PRACE-6IP; HPC-GIG

ECCSEL ERIC – €24m via Geo-INQUIRE; STORIES

EU-SOLARIS - €19.5m via SOLARIZE; RISEnergy

ACTRIS - €15m via AMTO-ACCESS

EMSO ERIC - €14.5m via AQUARIUS



Timeline -> European Research Infrastructure Consortia (ERIC)



ERIC application October
2026

Government signatures



Established as a legal
entity 2027

*Adherence to statutes
(signature/formal
commitment)*



Services: access
programme 2028

*Membership fees
commence when entity
established c. 2028*

Q & A

Marleen Jacobs



ROLE	Policy officer international research and technology infrastructures
ORGANISATION	WEWIS
PRESENTATION	"Flemish and European policy context for research and technology infrastructures"

SHORT INTRODUCTION

- *Belgian governmental representative for MARINERG-i and SLICES*
- *Responsible for developing TI policies in line with EU RTI strategy*
- *& implementing and shaping existing RI policies*

CONTACT marleen.jacobs@vlaanderen.be

Flemish and European policy context for research and technology infrastructures

Marleen Jacobs

MARINERG-I Stakeholderevent 8.10.2026, Oostende

Agenda

0. Introduction

1. Flemish policies and financial instruments

2. European policies and financial instruments

3. Case: MARINERG-I

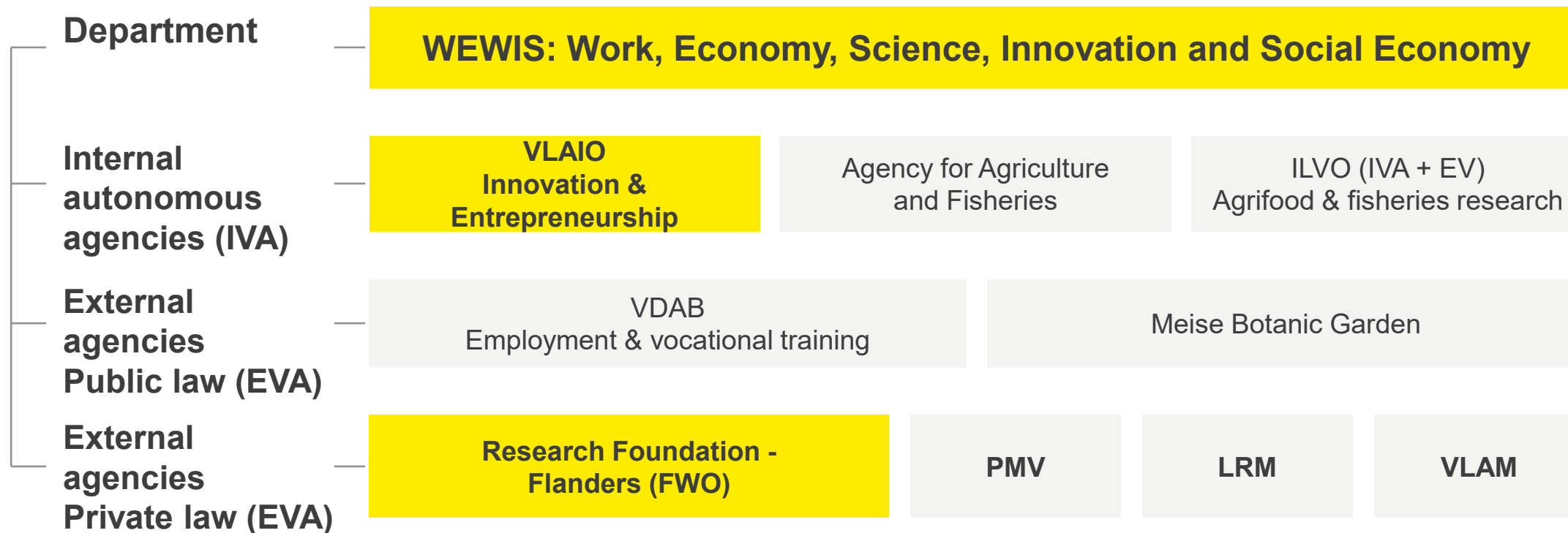
4. Current & Future developments

1.

FLEMISH POLICIES AND FINANCIAL INSTRUMENTS

WEWILS policy domain

Work, Economy, Science, Innovation, Agriculture and Social Economy



Advisory bodies: VARIO (within WEWIS) SALV (at SERV) SERV (cross-domain advice)

VLAIO support for RI & TI

Investment, project costs, access and use

ERDF (EFRO)

Research projects

Research infrastructure call

for universities of applied sciences

Moonshot LSI

Development projects

COOCK+

TETRA

Baekeland mandates

IPCEI

Cluster organisations

Business advisers

Spark: planned reform of COOCK+ and TETRA

Word size does not represent funding volume.

Research Foundation – Flanders (FWO)

RI support overview

Across disciplines: equipment, collections, natural habitats, corpora, databases and digital platforms. Facilities may be single-sited, distributed or virtual.

Medium-scale infrastructure

€150,000–€1 million*

Investment support for research facilities and resources.

Large-scale infrastructure

At least €1 million*

Investment support for major research facilities and resources.

International infrastructure

IRI programme

Flemish participation, activities and investments.
Political support and funding follow separate calls.

Digital infrastructure

VSC and Tier-1 access

FWO manages the Flemish Supercomputer Center.
Eligible researchers can request Tier-1 computing time.

Project equipment

Complementary support

Equipment costs within fundamental research projects, subject to the project regulations.

*Programme thresholds exclude co-funding and include non-recoverable VAT.
These are infrastructure funding categories, not total call budgets.

Research Foundation - Flanders

International research infrastructure

Political support and funding: separate calls

	Roadmap call	Funding call
Purpose	Political support based on the strategic importance for Flanders.	Funding or refinancing of participation costs and investments.
Entry point	Participation that still requires political support from Flanders.	Prior political support or continuation of existing IRI funding.
Outcome	Political support only. No funding through this call.	A separate assessment and a funding decision.
Budget	No grant funding. Political support only.	IRI Call 2022: EUR 58.739.212

Political support enables a funding application. It does not guarantee funding.

Research Foundation - Flanders

International research infrastructure

Funding procedure and key assessment points

- 1 Call and intake**

Prior political support or existing IRI funding.
Intake discussion before the full application.
- 2 Application**

Scientific case for Flemish participation, with planned activities, investments and a funding request.
- 3 Review and rebuttal**

At least three international reviewers assess the proposal. Applicants respond through a rebuttal.
- 4 Scientific assessment**

Science Commission assesses scientific quality and interviews the applicants.
- 5 Strategic assessment**

Very good/excellent proposals only: strategic value for Flanders and feasibility of the investment plan.
- 6 Results**

FWO communicates the evaluation outcome and the funding decision.

International research infrastructure

Flemish and Belgian responsibilities

Flanders

Decision and funding

IRI calls determine political support and funding for Flemish participation.

FWO and the WEWIS department

FWO runs calls and scientific follow-up.
The department coordinates partners and follows RI governance.

Flemish and federal authorities coordinate as equals, without a hierarchy between levels.

Belgian level

Coordination and formal membership

Belgian entities jointly agree on participation. The federal minister signs for Belgian membership.

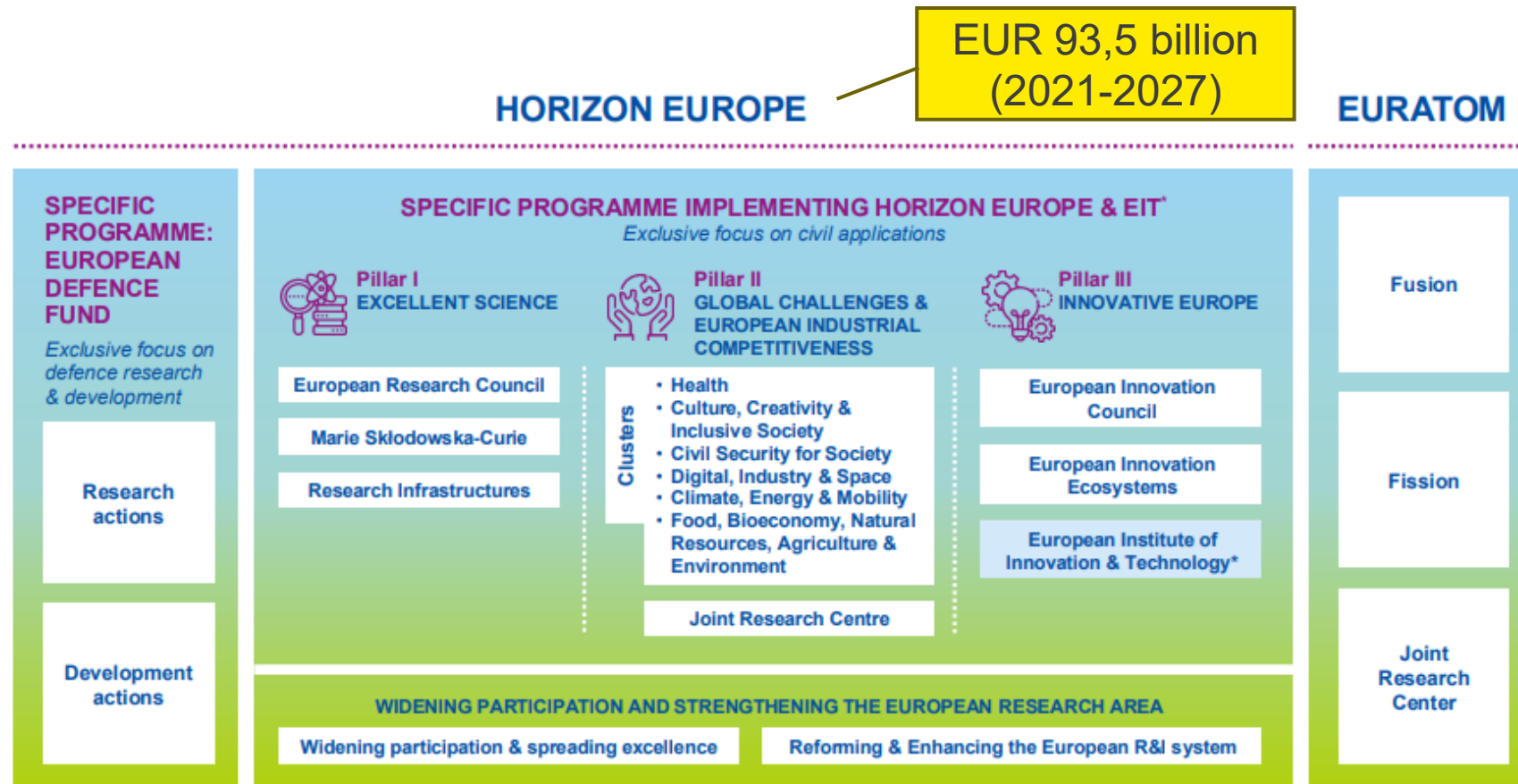
Membership fee

Belgium pays membership fees under existing arrangements. Regions fund infrastructure, staff and operations.

2.

EUROPEAN POLICIES AND FINANCIAL INSTRUMENTS

European RI Ecosystem: Financial Framework (Horizon Europe)



* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme



Pillar I

EXCELLENT SCIENCE:

reinforcing and extending the **excellence of the Union's science base**

European Research Council

Frontier research by the best researchers and their teams

€15.7 billion

Marie Skłodowska-Curie Actions

Equipping researchers with new knowledge and skills through mobility and training

€6.5 billion

Research Infrastructures

Integrated and inter-connected world-class research infrastructures

€2.3 billion



European RI Ecosystem: Strategic Framework (ESFRI)

ESFRI mandate

Set the European RI Roadmap, assess strategic relevance and monitor implementation.

Funding responsibilities

Horizon Europe: separate proposals and competitive evaluation.

Countries and regions: long-term investment and operating support.

Horizon Europe: INFRADEV calls

HORIZON-INFRA-2026-DEV-01-01

Concept development for new infrastructures and major upgrades or extensions.

HORIZON-INFRA-2027-DEV-01-01

Preparation of new ESFRI Roadmap 2026 projects: legal, financial and technical readiness.

HORIZON-INFRA-2026-DEV-01-03

Evolution and long-term sustainability of pan-European research infrastructures.

ESFRI recognition can open access to targeted EU calls.

Funding requires a separate application.

Countries and regions provide the long-term funding base.

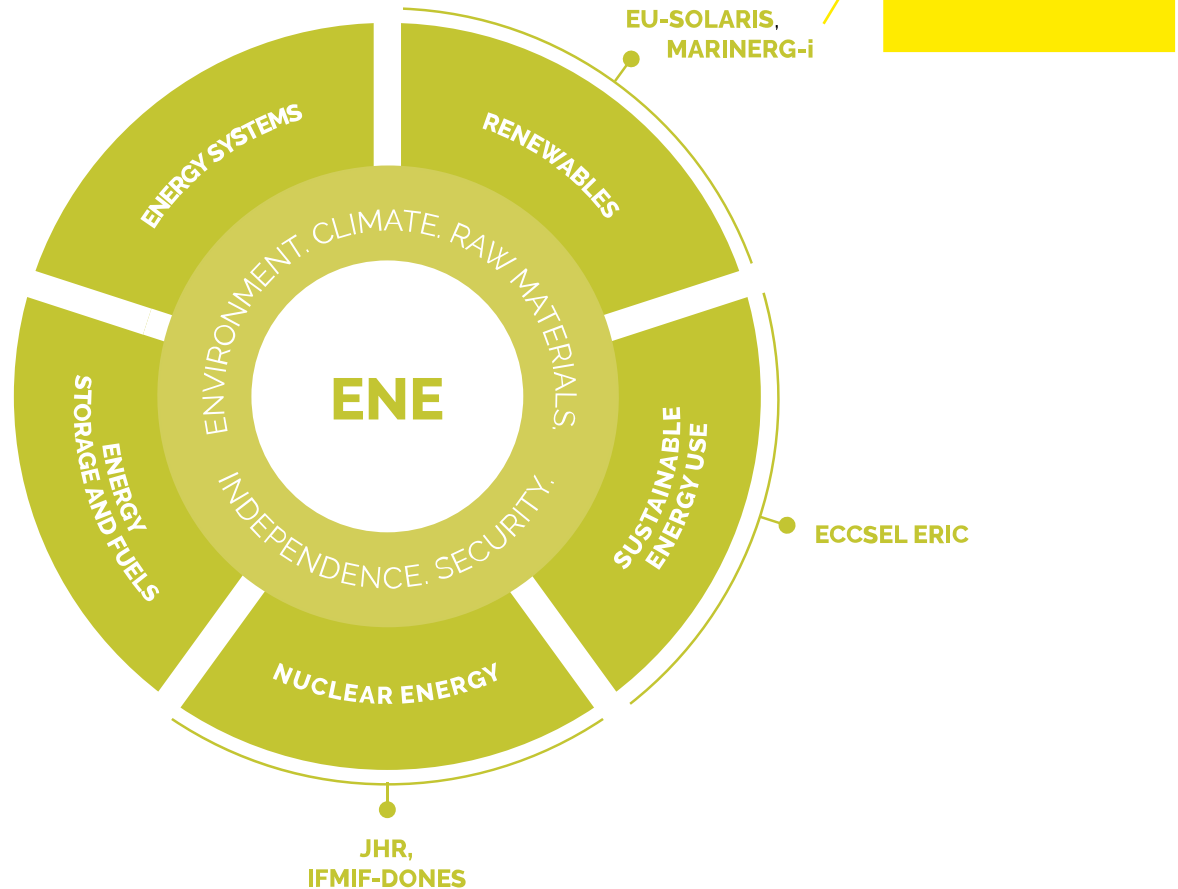
European RI Ecosystem: ESFRI

Landscape analysis 2024

- Framework and rationale for the Roadmap
- ESFRI RI's Portfolio (online)
- 6 Scientific domains (& cross-over analysis)
 - Data, Computing & Digital RI
 - **Energy**
 - Environment
 - Health & Food
 - Physical sciences & Engineering
 - Social Sciences & Humanities

Roadmap 2026

- To be published 2.12.2026



European RI Ecosystem

ESFRI Roadmap procedure

New RI proposals and major upgrades: the Roadmap 2026 route

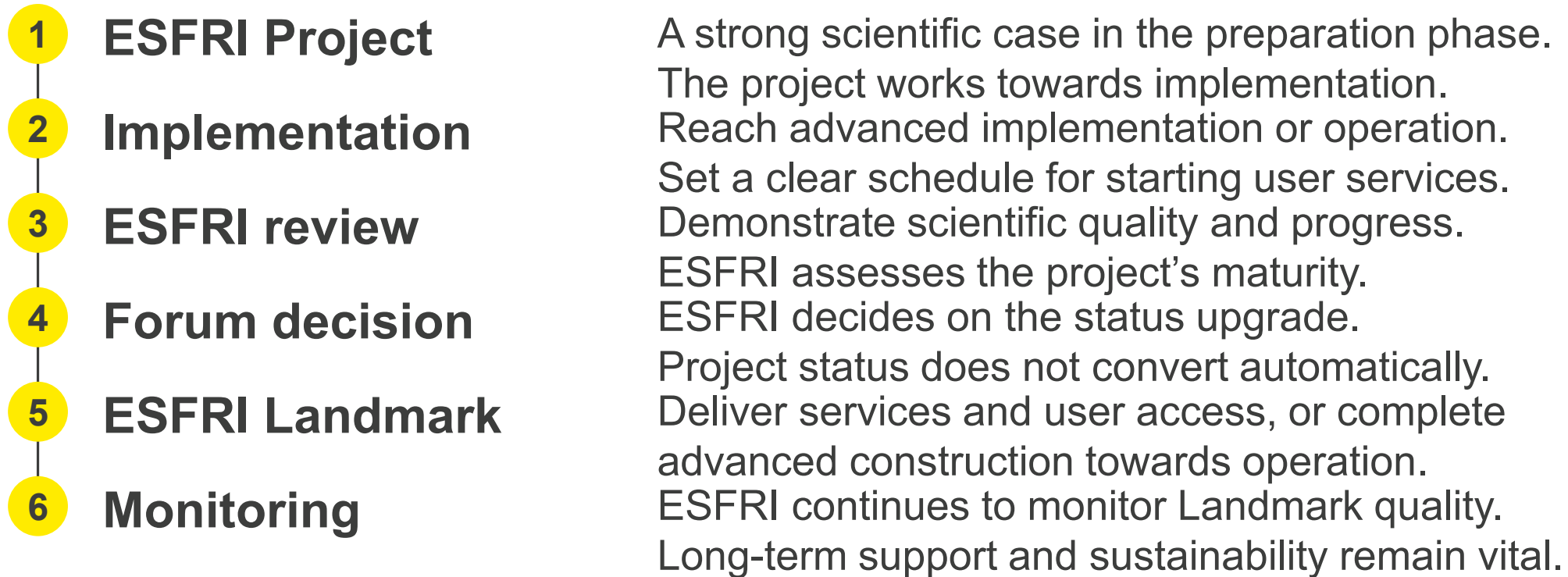
- 1 Preparation**
Develop the scientific case and consortium.
Seek political support via national delegates.
- 2 Submission**
Submit through ESFRI MoS+.
- 3 Evaluation**
Follow European and national requirements.
Strategy Working Groups assess the science and pan-European relevance of the proposal.
- 4 Hearing**
Address critical questions from the review.
Present the proposal at the hearing.
- 5 Forum decision**
The Forum decides which proposals to include in the ESFRI Roadmap.
- 6 Roadmap inclusion**
Selected projects enter the Roadmap.
ESFRI follows implementation progress.

Sources: ESFRI Roadmap 2026 Public Guide, official FAQ and InfoDay materials. New-proposal route only.

European RI Ecosystem

ESFRI Project to Landmark

Landmark status requires proven maturity and an ESFRI decision



Sources: ESFRI RI Portfolio, Roadmap 2026 and Landmark monitoring guidance. Schematic overview.

European RI Ecosystem: Legal Framework (ERIC, ...)

Role of an ERIC

A European legal entity to establish and operate a shared research infrastructure.

Members' commitments

Members agree on governance and their financial contributions. Countries and regions underpin long-term investment and operation.

Establishment procedure

1. Agreement between future members

Agree the statutes, seat and governance, including members' financial commitments.

2. Application and Commission assessment

Submit the dossier. The Commission checks compliance with the ERIC legal framework.

3. Commission establishment decision

The ERIC acquires legal personality when the Commission decision takes effect.

ESFRI provides strategic recognition. ERIC provides a legal structure*.

Horizon Europe funding requires a separate application.

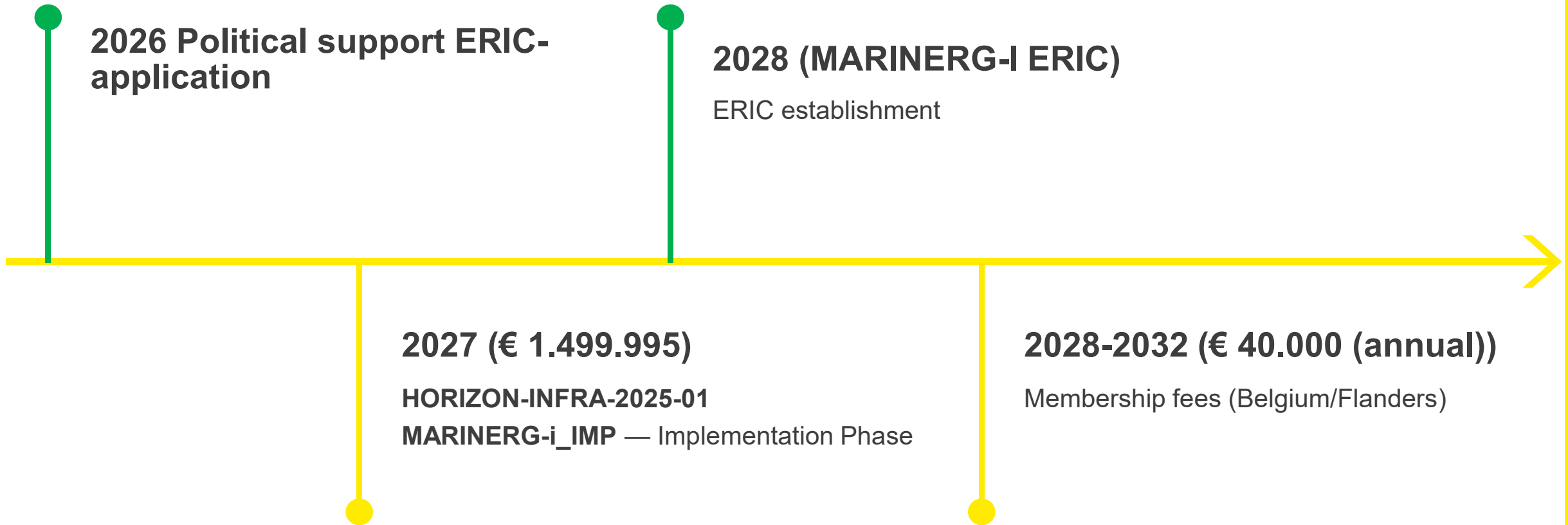
ERIC status gives neither automatic Landmark status nor EU funding.

* ERIC is one possible legal form. Alternatives include an intergovernmental organisation or a company under national law.

3.

Case: MARINERG-I

Support MARINERG-i-ERIC



4.

Current & future developments

Recall that...

Relatively few ESFRI-RI's in the energy domain:

- “Many potential energy RI's do not fit optimally with the current ESFRI concept, due to intimate interactions with the commercial/industrial sector.”
- “The distinction between RI & TI is not applicable in the energy field.”
- “Infrastructures in the field should include several TRL's (Technological Readiness Levels) and should not only cover basic research”
- “A vigorous program to encourage the establishment of new RI's and TI's should be considered to remediate existing needs.”
- Private Public Partnerships (PPP): an agreement between RI & Industry, Joint Undertaking (JU), European Technology Platforms (ETP's), Contractual Public-Private Partnerships (CPPP's), Milestone-based PPP)

Source: ESFRI Landscape Analysis 2024

EU Strategy for RI and TI (sept. '25)

*“The strategy’s overarching objective is to **ensure that scientists, researchers, innovators, inventors, and industry in Europe have at their disposal easily accessible, cutting-edge facilities, high-quality data and tailored services that drive scientific and technological excellence, industrial competitiveness and well-being of people.**”*

Objectives:

1. strengthening the European **ecosystem** of research and technology infrastructures through a holistic approach to capacity building and mobilising investments, improving the alignment of user needs and available facilities and services
2. bolstering the **accessibility** of research and technology infrastructures as a continuum of complementary services for researchers and innovative companies, including startups and scaleups
3. attracting and cultivating **talent** in Europe
4. improving and simplifying the **governance** framework for research and technology infrastructures
5. improving the **international** dimension and **resilience** of research and technology infrastructures

“Implementing the strategy would boost European infrastructure capacities through increased investments and new funding models, new infrastructure technology developments, adoption of digital technologies and AI, and boosting skills. It will improve, secure and harmonise access to infrastructure services, strengthen governance, and strengthen their international dimension, including achieving critical data sovereignty, while protecting European assets.”

→ 22 ACTIONS

Key elements

1. Governance
2. Funding
3. Acces

Governance

- The existing ESFRI governance framework for RI, with room for improvement, and the question: is this applicable for TI?
 - State aid rules
 - Flexibility
 - ...
 - A lack of governance for TI
- Ongoing discussions

Funding: Horizon Europe 2028–2034: proposed structure

Commission proposal (July 2025) EUR 175 billion proposed for 2028–2034



¹ Pillar II competitiveness aligns with the ECF's four strategic areas. RI/TI remain in Pillar IV. EC proposals (2025), subject to negotiations.

Funding

FP10: funding for RI and TI

7 October 2026 · Latest verified legislative update: 20 September 2026

Proposed funding architecture

RI and TI together under Pillar IV “European Research Area” in the Commission’s FP10 proposal.

€16.3bn proposed for all of Pillar IV, including ERA policies and widening. This is not an RI/TI-only budget.

Strategy priorities: new capacities, coordinated investment and better access to facilities and services.

Negotiations and open choices

Council agreed a partial position in June 2026, excluding budget matters. Parliament’s work remains ongoing.

Overall FP10 budget still contested: Commission: €175bn. Parliament’s Budget Committee supports €200bn.

Key open issues: final RI/TI allocation and the funding interface with the European Competitiveness Fund.

RI and TI have an explicit place in FP10. Final funding commitments remain open.

Horizon Europe Work Program 2026-2027

BRIDGING-2027-03-04: Secures long-term data resilience and sovereignty in life sciences.

BRIDGING-2027-03-06: Direct funding for **industry** to **access** infrastructure services and solve R&I bottlenecks.

BRIDGING-2027-03-07: Positions European RIs and TIs as global magnets to attract top talent (*Choose Europe*).

Horizon Europe Work Program 2026-2027

INFRADEV (Upgrades & Sustainability): Focuses on long-term sustainability and major upgrades of existing pan-European facilities.

› *Key Call:* HORIZON-INFRA-2026-DEV-01-01 (Major technical upgrades).

INFRA SERV (Transnational Access): Funds open **access** to facilities for health, climate, and digital research.

› *Note:* **Simplified cascade funding makes it easier to welcome external and industrial users.**

INFRA TECH (Next-Gen Tools & Industry): It funds the co-creation of advanced instruments and software *together* with industrial partners.

INFRAEOSC & INFRA NET (Data Highways): Drives the European Open Science Cloud (EOSC) and FAIR data sharing.

Access

Charter of access for industrial users to RI and TI

European Commission, 28 July 2026

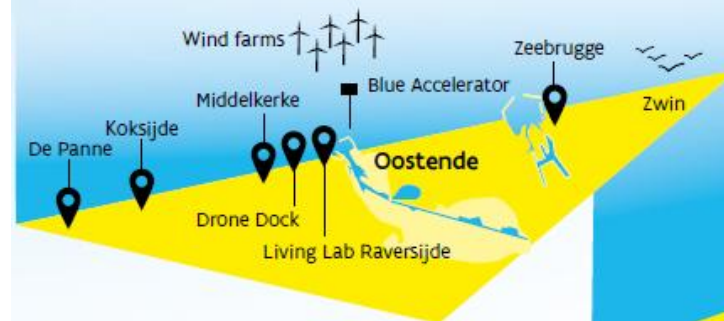
6 key principles, designed to improve the access conditions for businesses to RI and TI:

- Increased visibility and availability of services
- Transparency and quality of services
- Simplified contract and agreement procedures
- Safe intellectual property management
- Tailored support to companies
- Cooperation between infrastructures and access to data

→ Research and technology infrastructures are invited to endorse the Charter [here](#) !

Ostend Maritime Hub

A local ecosystem with a high density of innovative businesses, cluster organisations, research institutions and public authorities collaborating intensively together for impact ranging from the local to the international level.



OSTEND SCIENCE PARK

A deep tech knowledge hub fueled by Ghent University and supported by Port Oostende and POM West-Vlaanderen, entirely dedicated to marine and maritime research and business. It is the perfect breeding ground to further boost and expand blue innovative businesses and organisations. Research institutions and facilities, public authorities and cluster organisations and businesses - all specialised in blue economy - are closely working together in a vibrant blue community excelling in e.g. offshore wind, maritime safety and surveys.

Bluebridge - based at Ostend Science Park - is the hub for blue economy related events, training activities, co-working and office rent in our region. Blue Cluster, Belgian Offshore Cluster and the Provincial Development Agency's Blue Energy team, Marine@Ugent and businesses are operating from this innovative blue hub. The Reef-Training Lab Blue Energy attracts students with its state-of-the-art infrastructure to prepare the workforce for the future.

INNOVOCEAN CAMPUS

Hosts the UNESCO/IOC Project Office for International Oceanographic Data and Information Exchange (IODE), European Marine Board (EMB), European Marine Observation and Data Network (EMODNet), Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans), Flanders Marine Institute (VLIZ), Flanders Research Institute for Agriculture, Fisheries and Food (ILVO), Province of West-Flanders Streekhuis Kust and the Coastal Heritage Unit. Physical proximity contributes to fruitful formal and informal exchanges between regional and international organisations. A concrete example is the provision of EMODNet data by VLIZ to The Reef-Training Lab Blue Energy.

MARIFISH.INC

Promotes innovative concepts, start-ups and scale-ups in aquaculture and mariculture and supports the transformation of traditional fisheries by providing housing, coaching and community services. This on- and offshore incubator and living lab - and in particular the entrepreneurs they serve - receives scientific technical advice from researchers at Ghent University, VLIZ and ILVO. For coaching services, they can count on the expertise of the Flanders Chamber of Commerce and Industry (VOKA).

BLUE ECONOMY SCIENCE SUMMIT

A recurring event, co-organised by Blue Cluster and VLIZ, where entrepreneurs and scientists are challenged to collaborate on key marine and maritime topics and jointly develop solutions. The goal is to enhance cooperation and develop a shared vision and strategy for the future of the blue economy. ²⁶

Blue Economy actors in Ostend

- 📍 Knowledge and research institutions - test sites
- 📍 Government and public authorities
- 📍 Industry & commercial
- 📍 Other

Living Lab Raversijde

Marine Station Ostend incl. Marine Robotics Centre

Agency for Maritime and Services and Coast

Rederscentrale

Marifish.Inc.

Port of Oostende

RBINS (Management of the marine environment)

Maritiem Instituut Mercator - Oostende

Drone Dock

Blue Accelerator: test and demonstration platform

Duin voor Dijk

InnovOcean Campus

Kusterfgoed

Territorial Development Coast/Province West - Flanders, VLIZ, ILVO, EMB, JPI Oceans, EMODnet, IODE

De Oesterput

Ostend Science Park

Flanders Maritime Laboratory

Innovative business specialised in network infrastructure

The Reef Digital Training Lab Blue Energy

Marine@UGent Core Facility

Bluebridge Incubator & Innovation Center Blue Cluster POM WV

VITO Water Climate Hub

Innovative business focusing on marine surveys and offshore renewable support activities

Belgian Offshore Cluster

DEPARTMENT OF
**WORK, ECONOMY
SCIENCE, INNOVATION &
SOCIAL ECONOMY**

Contact

Marleen Jacobs
Policy officer International Research and Technology Infrastructures
Marleen.jacobs@vlaanderen.be

Address

Marie-Elisabeth
Belpairegebouw
Simon Bolivarlaan 17
1000 Brussel

Q & A

Expert and stakeholder perspectives



Michael Murphy

Blue Cluster

Project manager

michael.murphy@blauwecluster.be



Christiaan Schuiling

MULTI Engineering

*Product Development Manager
Maridea*

christiaan.schuiling@multi.engineering



Tine Boon

Seavolt

Founder & CEO

tine.boon@seavolt.be



Ewout Vandorpe

POM West Flanders

Site Manager Blue Accelerator

ewout.vandorpe@pomwvl.be



**Dr. Efrain
Carpintero Moreno**

Ghent University

*Offshore renewable energy
researcher*

Efrain.CarpinteroMoreno@UGent.be

Blue Cluster: accelerating innovation in the blue economy



Connecting companies, knowledge institutions and public actors

INNOVATION AREAS



WHAT BLUE CLUSTER DOES



Our focus across offshore renewable energy

Lifetime and performance



- Monitoring and life extension
- Digital twins and digitalisation
- Reliability and resilience

Smarter offshore systems



- Services and logistics
- Smart operations
- Energy balancing

New applications



- Emerging technologies
- Multi-use
- Scaling new offshore technologies

Enabling capabilities

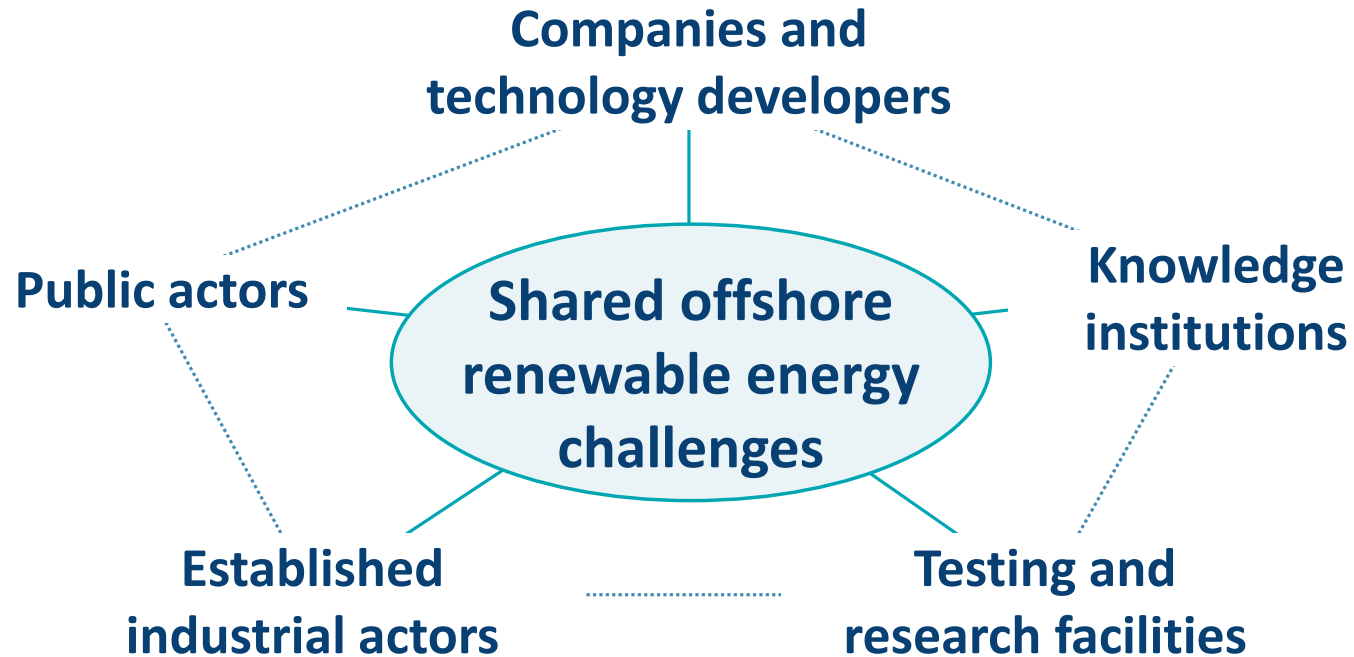


- Resource and capacity constraints
- Internationalisation
- Access to complementary expertise and infrastructure

Across these focus areas, Europe faces shared challenges that cross borders and value chains.

Progress requires collaboration, testing and validation.

The role of clusters in an innovation ecosystem



Cluster facilitation

-  Understanding shared needs
-  Connecting complementary actors
-  Facilitating knowledge exchange and collaboration
-  Linking regional and European ecosystems

Clusters help connect actors and capabilities around shared innovation challenges.

Connecting complementary capabilities across Europe

The challenges are shared across Europe, while the capabilities needed to address them are distributed across Europe. The task is to connect them.



European project partnerships



Cluster-to-cluster cooperation



International missions and matchmaking

The right expertise, partner or testing capability may be located in another European region.

Illustrative connections, not a map of formal MARINERG-i partners.

Opening the discussion

Where do you see the greatest need for cross-border collaboration between innovators and testing facilities?

- 1 Finding complementary expertise or infrastructure
- 2 Connecting users with the right testing capabilities
- 3 Developing testing and validation approaches together
- 4 Sharing knowledge and lessons between regions

Where could an innovation cluster add the most value?

Q & A

 **MULTI**.engineering

Part of the I3Float project

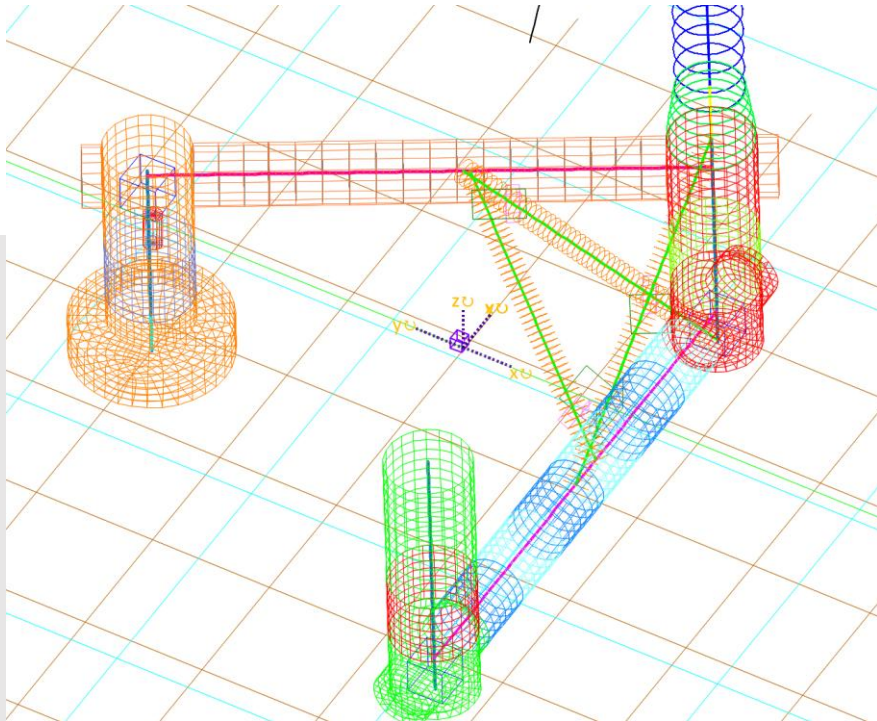
Testing Moray Base in Oceanide model basin

Christiaan Schuiling
8 October 2026, Oostende

Contents



1. Test program
2. Basin model
3. Growing complexity of the basin model
4. Typhoon testing
5. Results
6. Conclusion



Test program

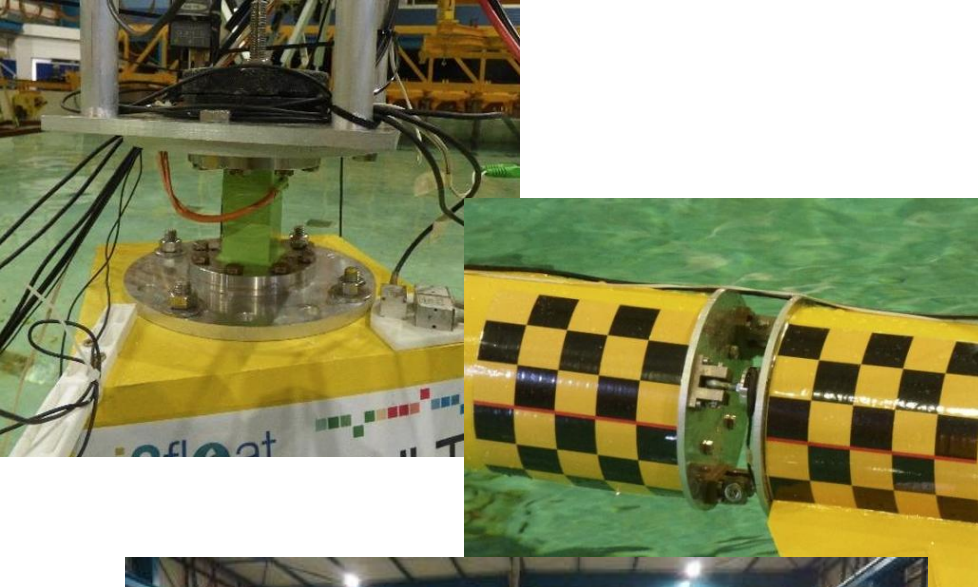
- As part of I3Float project model tests on Moray Base have been executed at the basin of Oceanide
 - Purpose of tests:
 - Validation of digital modelling:
 - Hydrodynamic drag
 - Aerodynamic load and damping
 - Hydromechanic mass
 - Reality check for typhoon design conditions
 - Focus on digitally closely reproducible tests:
 - Decay testing
 - Current load testing
 - Regular wave testing in constant wind
- Simple tests



Basin model

- Largest scale possible while still allowing longest waves
- 1 : 35

Quantity	Full scale	Basin model
Mass	19561 ton	456 kg
Centre spacing columns	84 m	2.40 m
Column diameter	13.5 m	0.39 m
Draught	24 m	0.68 m
Depth	42 m	1.20 m
Tower length	137 m	3.91 m



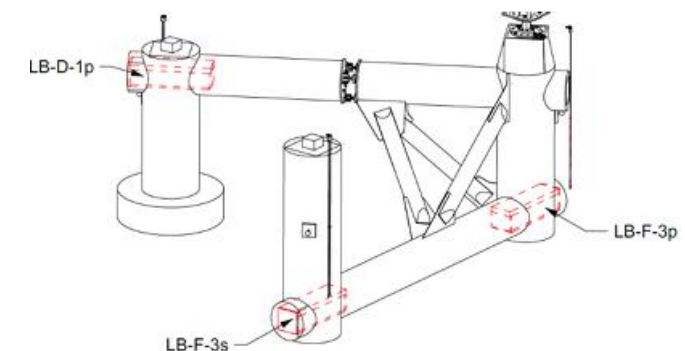
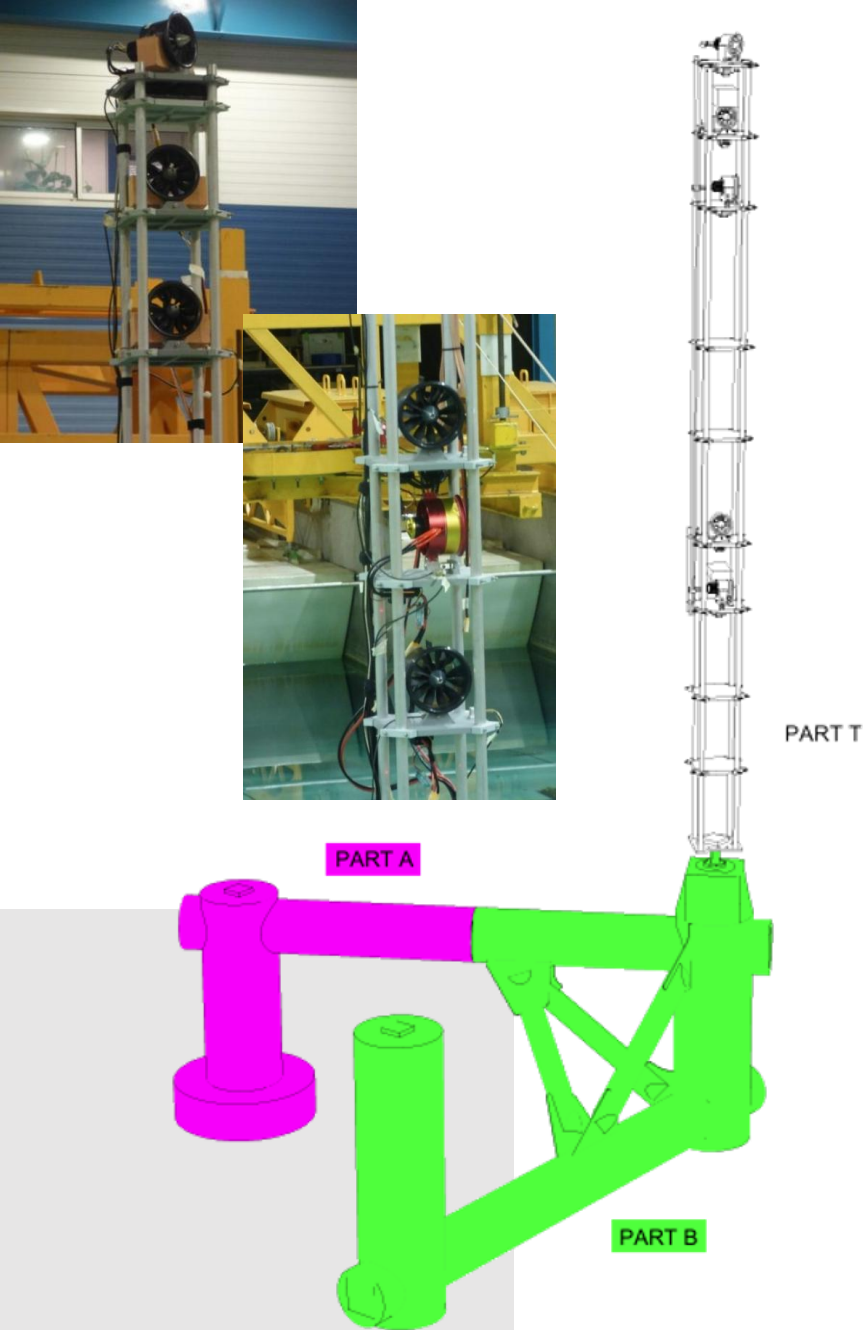
Complexity of basin model kept growing (1)

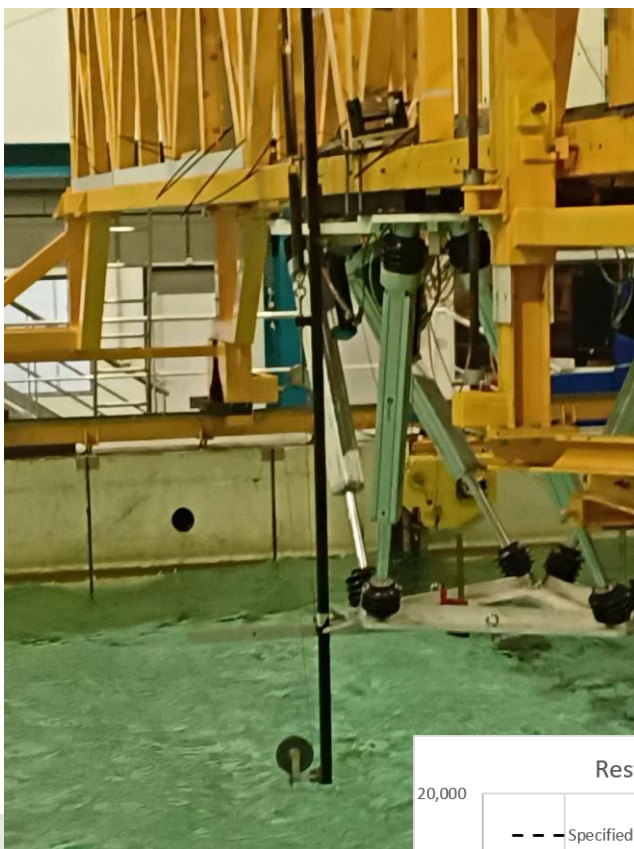
- Validation of numerical models:
- 5 Headings, 2 regular waves, 2 typhoon seas
 1. Measuring of internal forces:
 - Tower base (2 directions)
 - Common load cell + Large scale → Soft suspension of tower
 - Centre of decktube (6 directions)
 - Available space for 6D sensors
 - Model needed supporting during fabrication/hoisting
 - Reset point of force sensors
 2. Applying wind loads, aerodynamic damping
 3. Applying mooring system



Complexity of basin model kept growing (2)

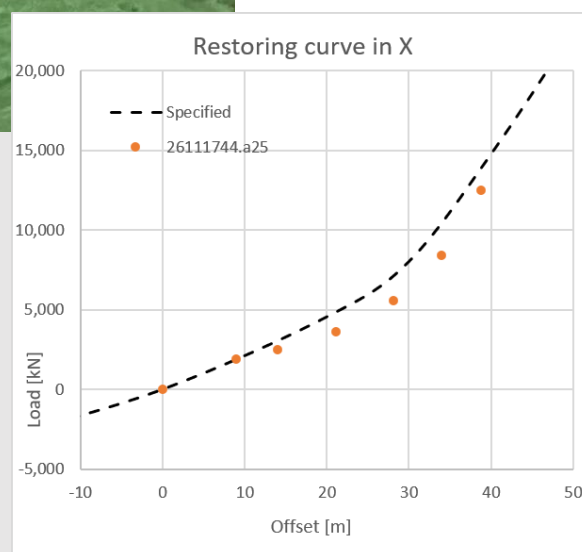
- Validation of numerical models:
- 5 Headings, 2 regular waves, 2 typhoon seas
 1. Measuring of internal forces
 2. Applying wind loads, aerodynamic damping
 - Windload during typhoon → tower drag → fans in middle of mast → truss mast
 - Truss mast + Large scale → Structurally soft
 - Operational windload → Ballast
 - 5 headings → 5 ballast configurations
 - Ballasting below waterline
 - Asymmetric location of turbine
 - Unit yaws 15deg → Aerodynamic load must rotate
 - Fans in multiple directions
 - Aerodynamic damping of motions → software in loop
 - Large number of drive wires → heavy umbilical
 3. Applying mooring system





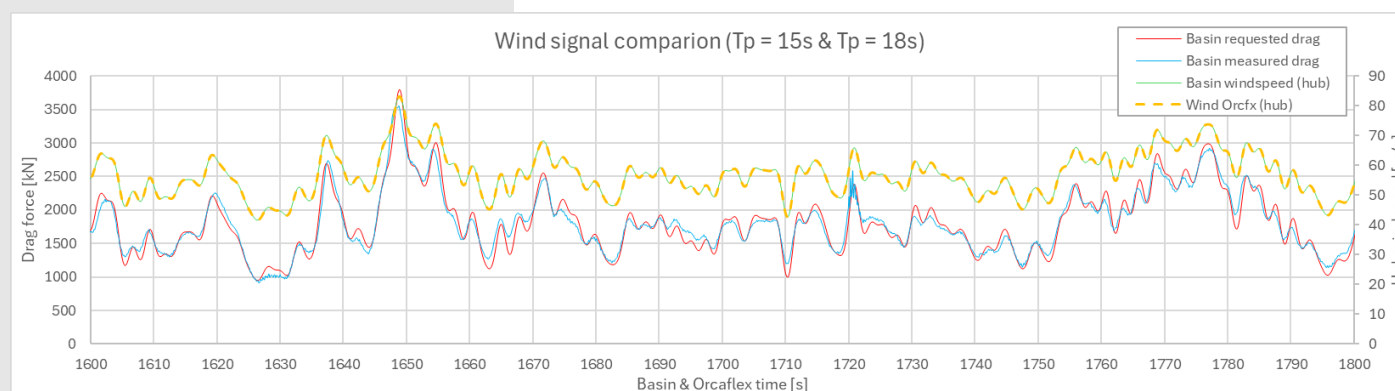
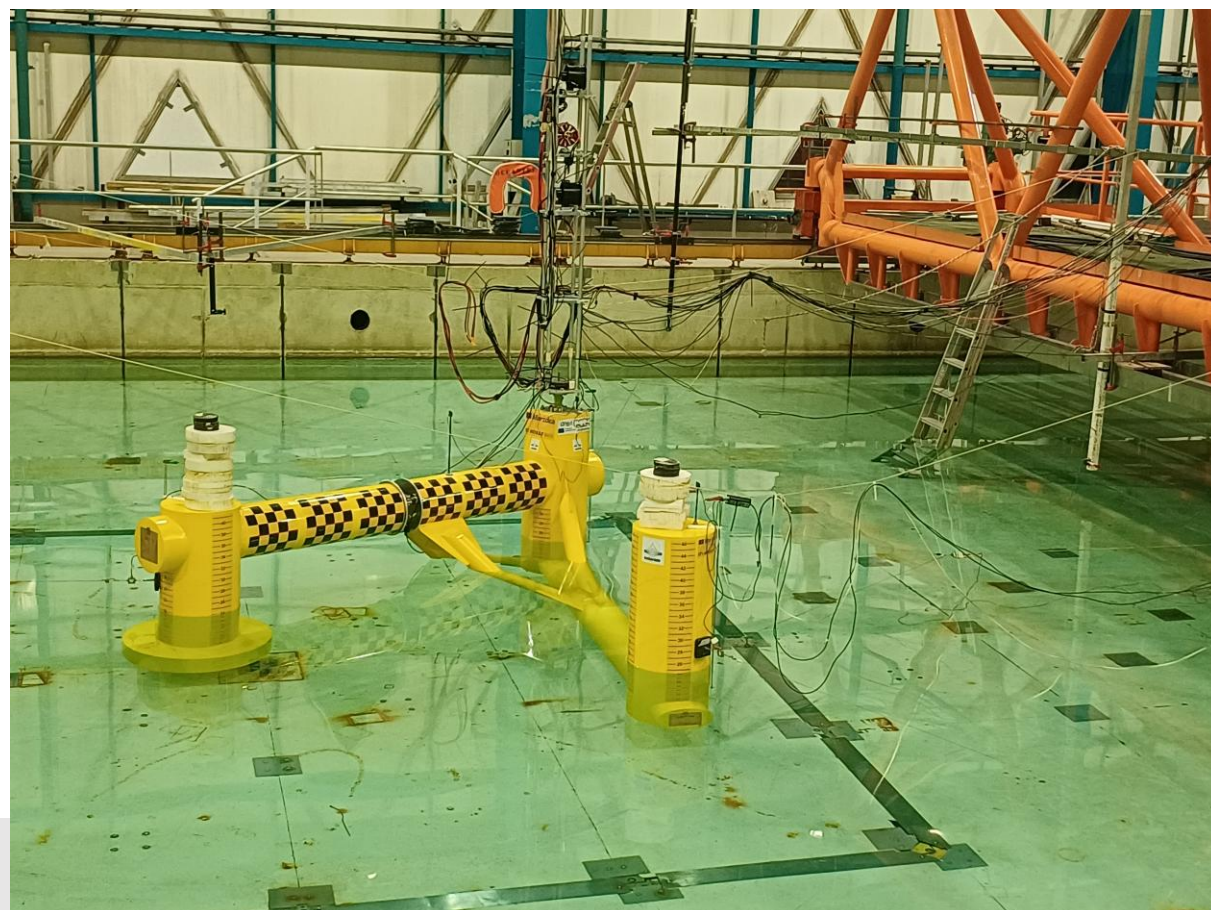
Complexity of basin model kept growing (3)

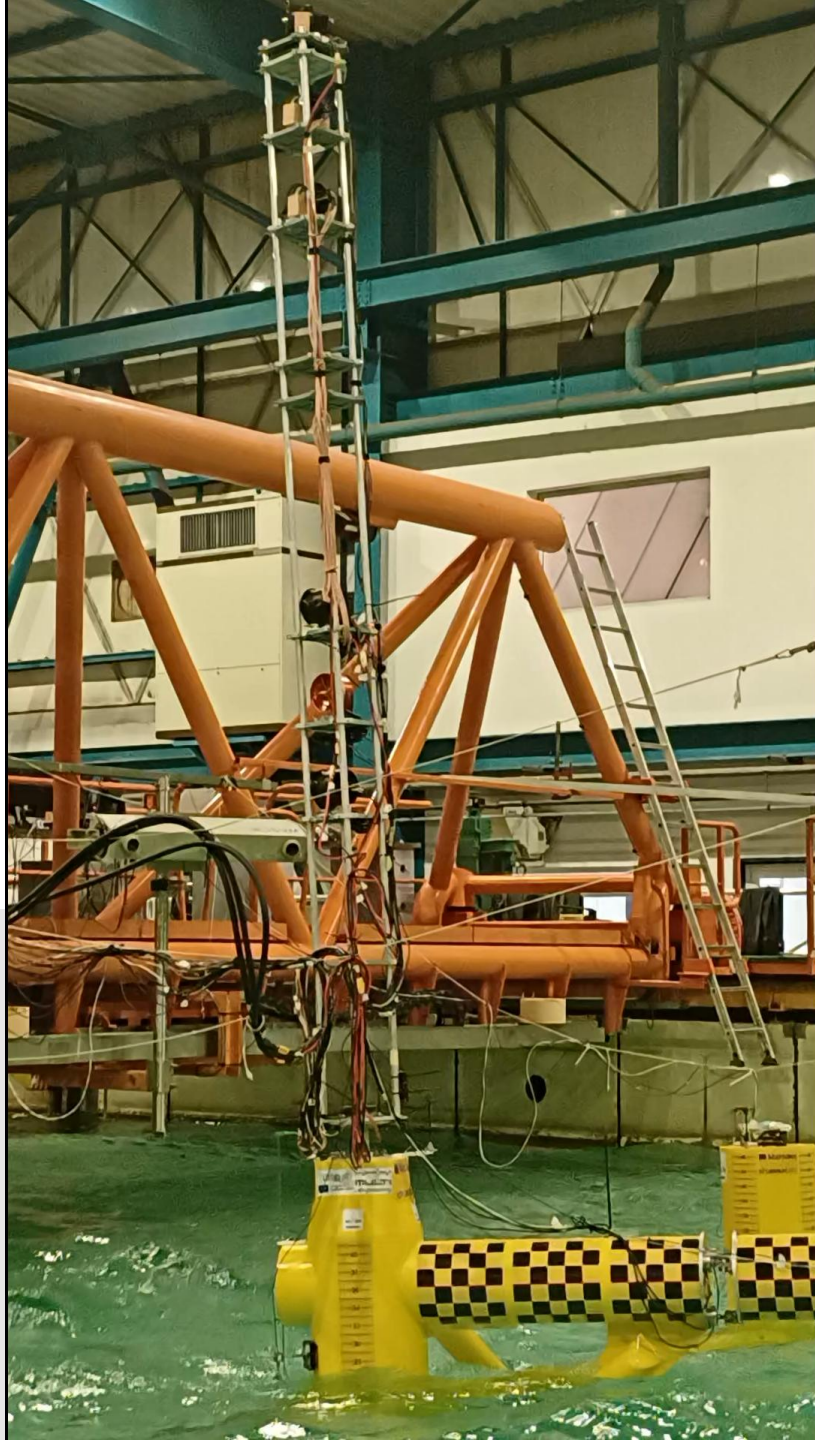
- Validation of numerical models:
- 5 Headings, 2 regular waves, 2 typhoon seas
 1. Measuring of internal forces
 2. Applying wind loads, aerodynamic damping
 3. Applying non linear mooring system
 - Large scale demands truncated system
 - Non linearity → Set of serial springs
 - Long set → intermediate sheave → gravity acts partly opposite
 - Multiple headings demand 5x retuning of system



Complexity

- A lot instrumentation:
 - 7 wave probes
 - 1 current probes
 - 1 Krypton camera (motion measurements)
 - 8 internal loads
 - 3 mooring loads
 - 2 mooring excursion loads
 - 6 speed controlled fans
 - 9 tower accelerometers
 - 3 wave run-up probes
 - 2 high-speed, high resolution cameras
 - (1 drone)
- All proofed solvable, but:
 - 4 weeks delay
 - 90 tests took 5 weeks
 - Multiple corrections necessary months after the tests
- Software-in-loop worked immediately
 - Requested wind drag/thrust matched closely to measured values

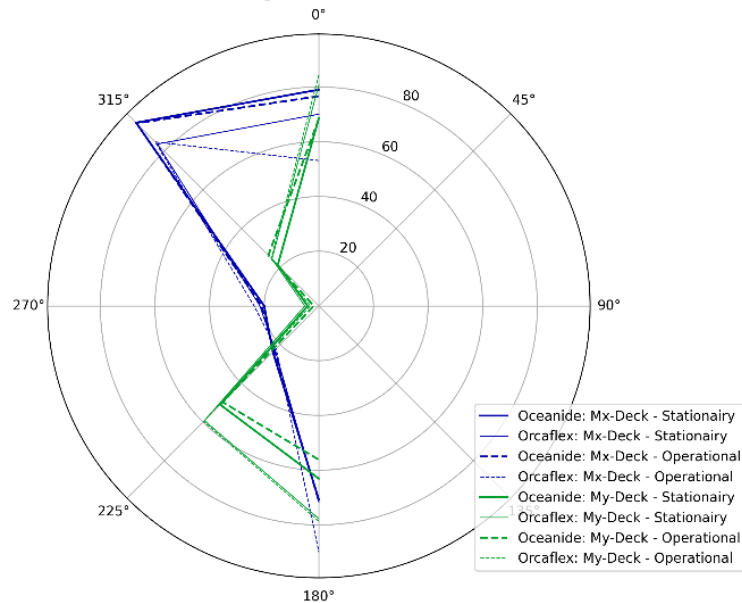




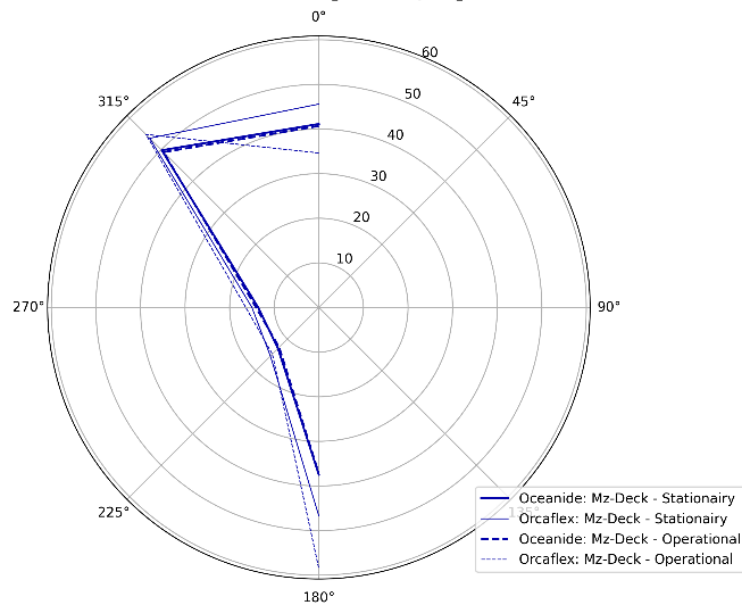
Typhoon test

- Second order effects not seen in Orcaflex get visible:
 - Wave run-up on column
 - Slamming on Decktube → No substantial impact measured on internal loads
- Tower started shaking
 - Solvable with filters
- ... a mooring line broke

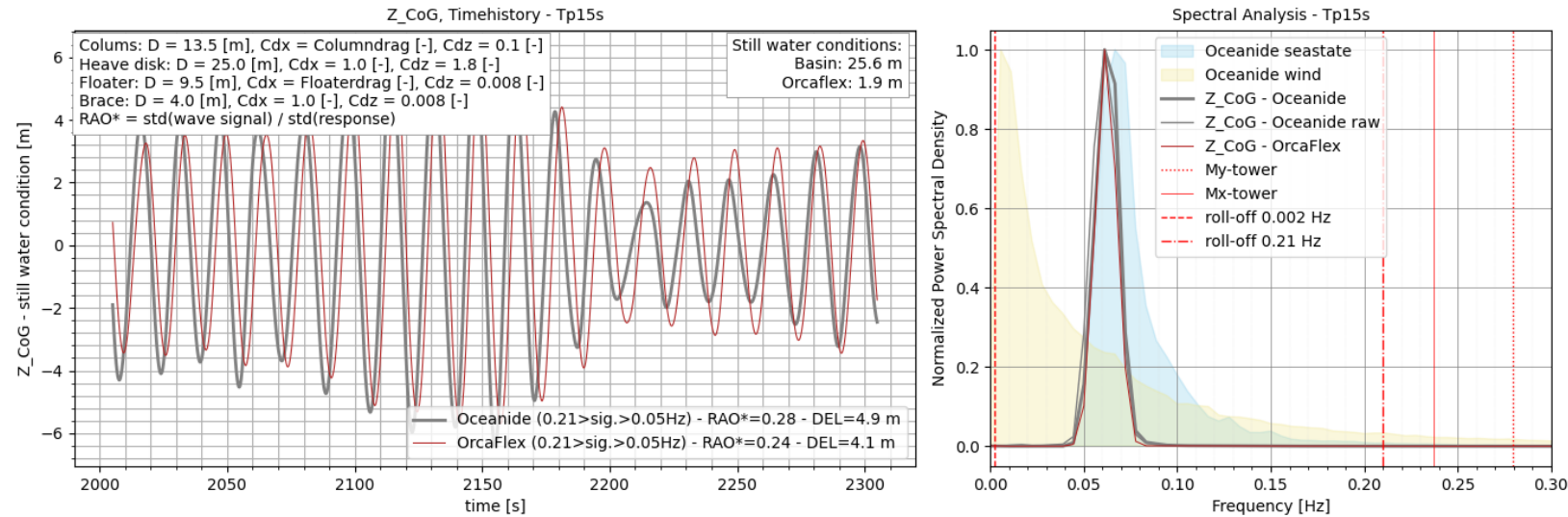
RAOs in T11s per heading
Mx-Deck, My-Deck in [MN.m/m]



RAOs in T11s per heading
Mz-Deck in [MN.m/m]



01 - I3Float Typhoon 0deg Vw57ms Hs11.77m Vc2ms - Z_CoG
0.05 < freq. window < 0.21 [Hz]



Most important test results

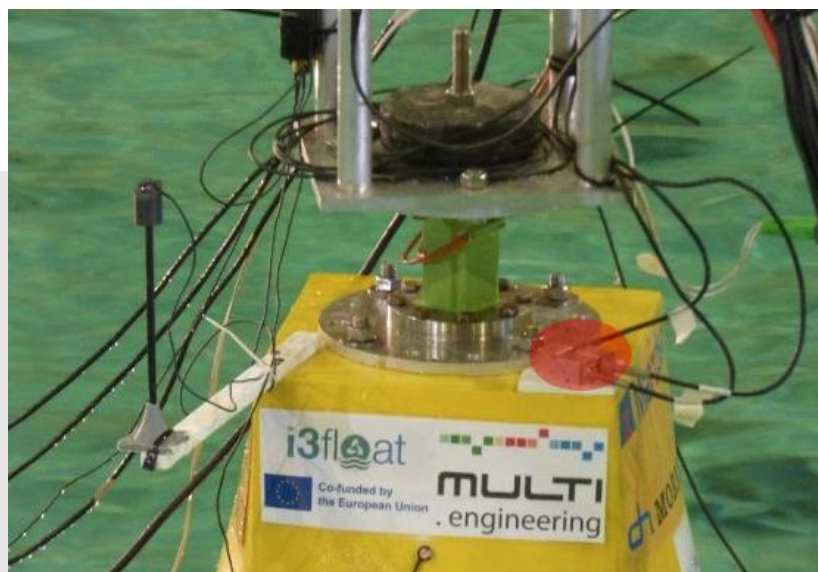
- Motions predicted by OrcaFlex correlate well
 - Internal forces correlate reasonably
 - In basin: Current drag less than surge decay drag ($T_n = 80s$)
 - Reynolds dependency?
 - Strouhal dependency?
- Appears solvable with Reynolds dependency

Conclusion

- ✓ ■ The numerical model was properly validated and found to be representative
- ✓ ■ Numerical design loads (typhoon) have proved representative

■ Complexity:

- Coupled basin tests with floating wind turbines are **not simple**:
 - Hydro-Aero mechanic coupling
 - Ballast systems
 - Measuring of structural loads (mostly driven by inertia)
- But was our focus on simplicity sufficient?
 - Tests are used to reproduce numerical simulations, but shouldn't it have been the other way around?
 - Allow for yaw misalignment wave/wind and adapt OrcaFlex → simplified tower
 - 2 linear moorings, rather than demanding a non linear stiffness curve
 - Etc.
 - Stiffness checks could have been done upfront





MULTI .engineering

Thank you!

christiaan.schuiling@multi.engineering



NO ENGINEERS, NO FUTURE !

Q & A



MARINERG-i Stakeholder's perspective

08/10/2026

— WHY?

Europe urgently needs massive new local renewable capacity

but is running out of suitable space and time

01

Land scarcity

Onshore projects are capped at MW scale and permitting takes 2–4 years.

02

Grid bottleneck

Grid congestion across Western Europe, NL has 70 GW of connection requests on the waiting list

03

Climate urgency

The EU needs 400+ GW of new PV by 2030 and 1 TW+ by 2040, today's pace falls short.

04

Energy independence

The growing uncertainty of global energy markets has become an increasingly strategic vulnerability for Europe.

Four independent pressures make offshore solar relevant across transition scenarios

— SEAVOLT'S SOLUTION

Unlocking immense offshore solar capacity

SeaVolt is an offshore floating solar platform engineered for harsh ocean conditions. Purpose-built for North Sea-grade waves, salt spray and storms, and co-located with offshore wind to unlock gigawatt-scale clean energy.



Scalable

Modular, MW to GW - adaptable across offshore sites and deployment configurations.

Wind-farm hybridisation

Capex-efficient; complementary production profile.

Proven in harsh conditions

Patented design survives open-sea waves and storms.

Eco-integrated

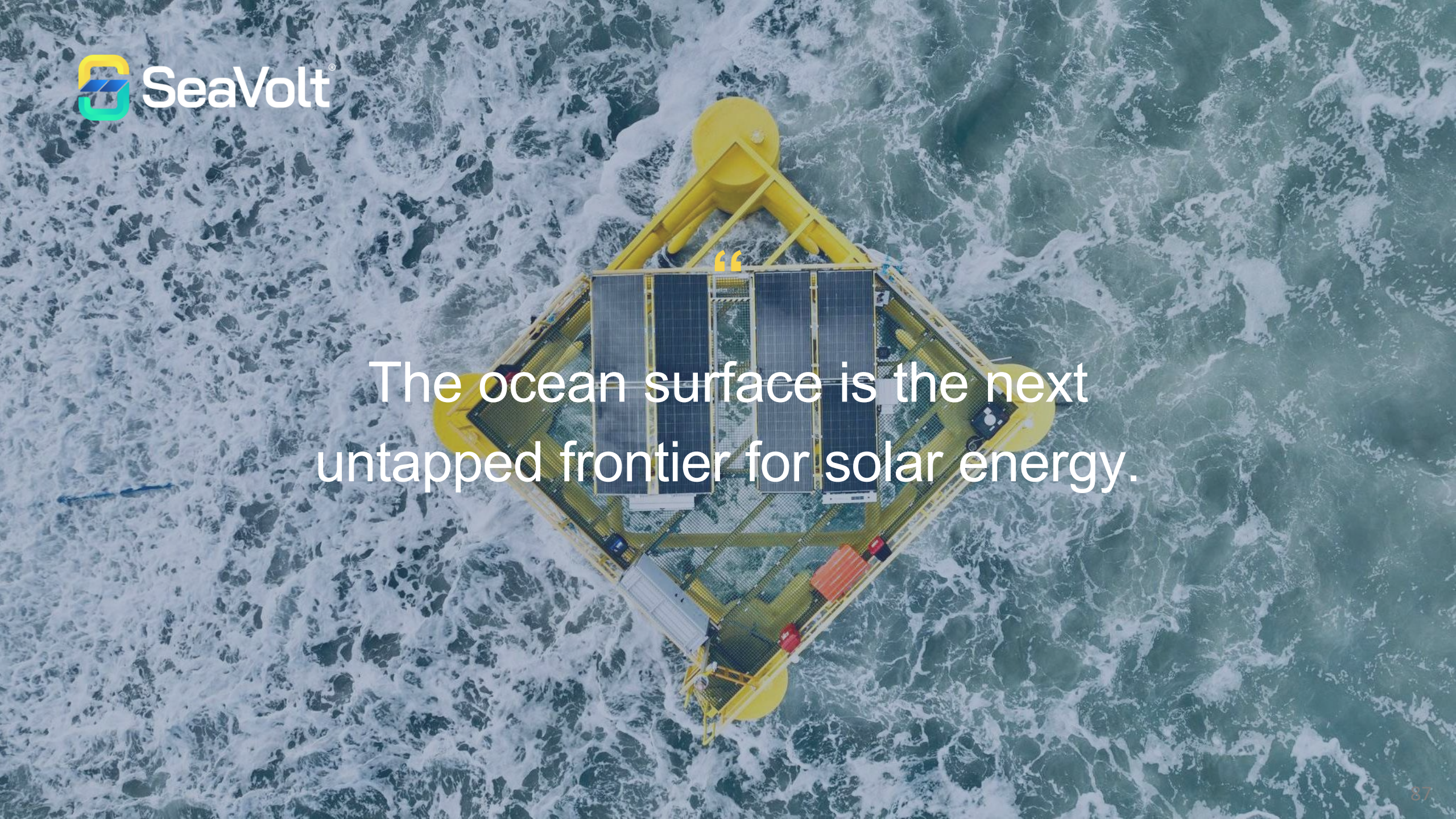
Low ecological footprint; optimised artificial-reef effect.

Increased irradiance

Offshore sites gain irradiance and a shifted output profile.

5+ years of engineering

Built by Tractebel, DEME, JDN, UGent and RBIN.



“
The ocean surface is the next
untapped frontier for solar energy.”



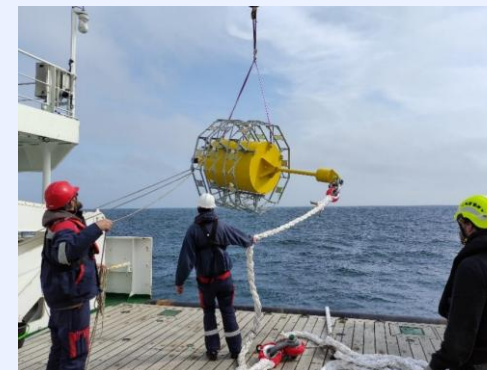
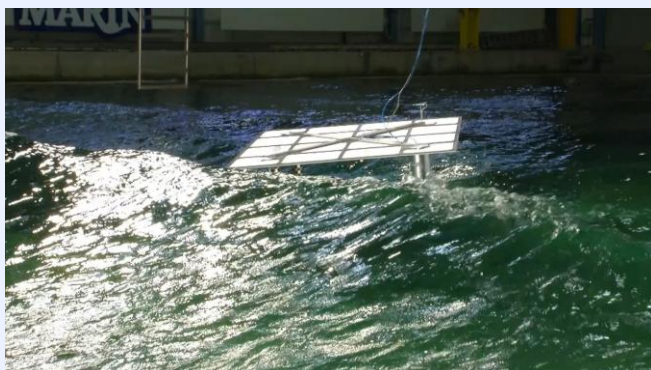
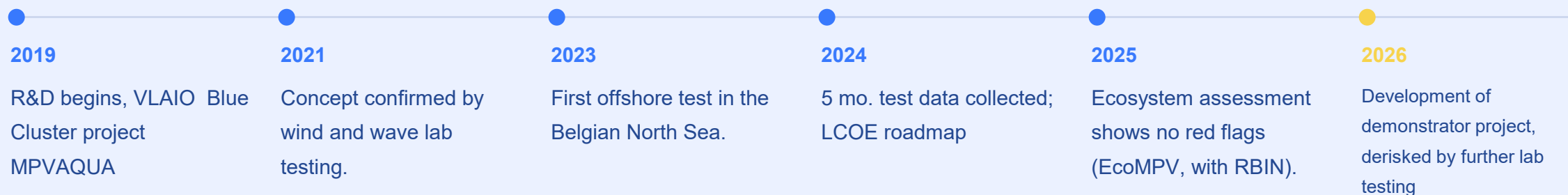
THE INEVITABLE

Solar is coming anyway.

The question is how technology maturity is reached
in the most effective and efficient way

TECHNOLOGY TRACK RECORD

5+ years of industrial R&D, now entering the validation phase



Lab testing

Wave lab **MARIN** (NL) : floater concept hydrodynamic behavior

Wind lab **VKI** (BE) : assess wind loads to refine design

Field testing

Blue Accelerator (BE)

- Hydrodynamic behavior
- Solar PV performance
- Aquaculture co-use of floater

Lab & Field Eco testing

KBIN & UGENT (BE)

- Primary production
- iNIS
- biofouling

Field testing

Test scope

PV technology

Hydrodynamic performance

Structural health and materials

Aquaculture

Fouling

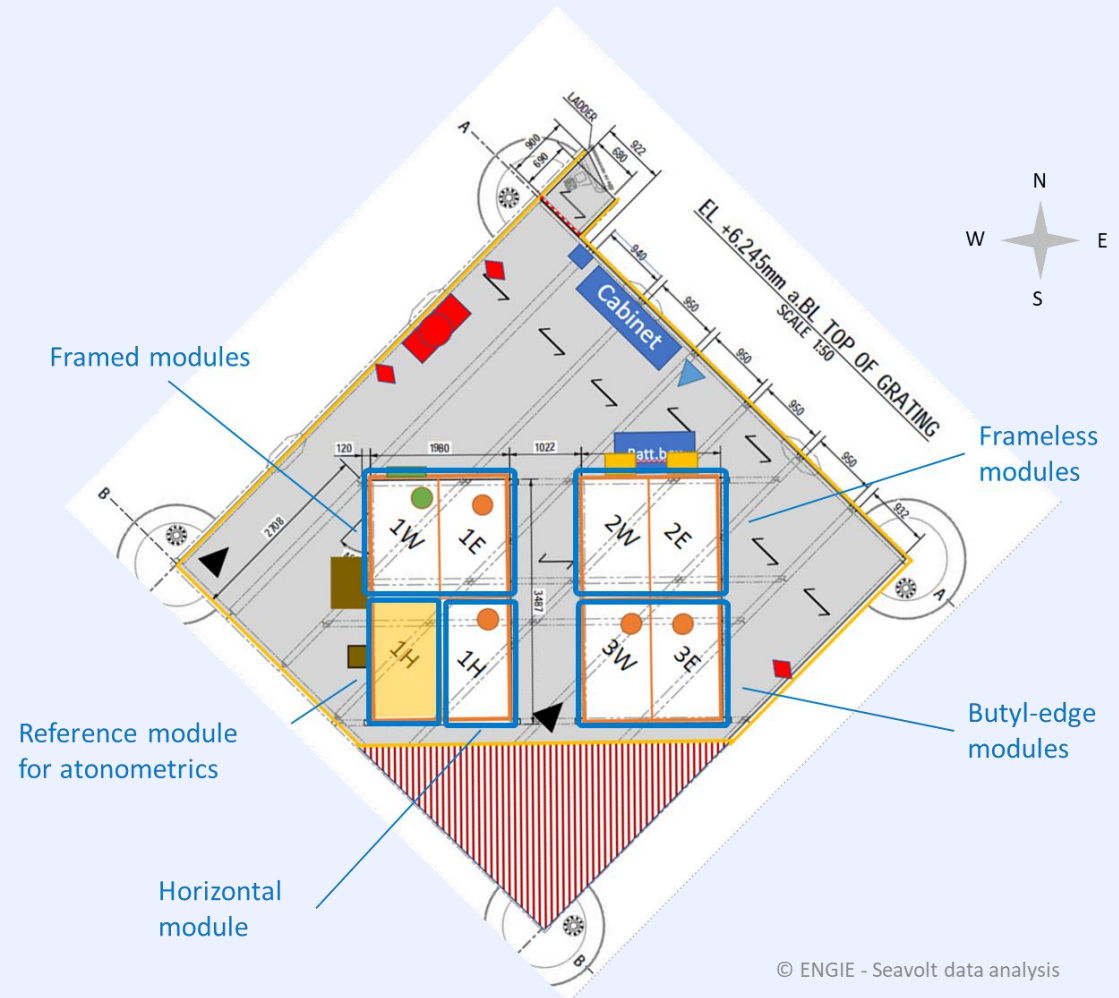
Coatings



East, west and flat

Three strings of two modules, each with a different module type: framed, frameless and butyl-edge.

One flat module and one dedicated to the RDE300 soiling measurements.



Test Results – Energy yield

Motion impact <3%

No wave-slamming impact. Cooling impact assumed limited, but not measured accurately in this test set-up.

Soiling observations

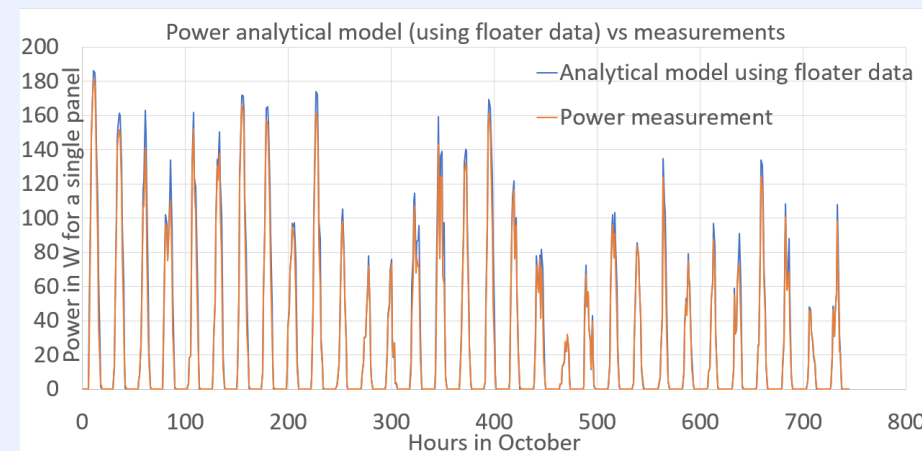
No birds observed during sunny periods. Rain removes bird soiling within a few days.

Bird droppings have a limited effect on overall production (~5%).

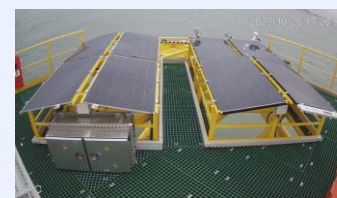
More harbour dust than salt. Site-specific soiling still needs assessment.

Overall: limited effect

Potential mitigations: stabilisation and/or cleaning. Further comparison with actual onshore installations is ongoing, rather than a theoretical case.



Bird presence



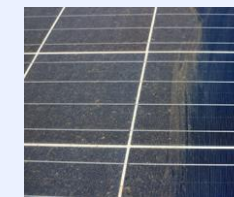
Salt spray



Bird soiling

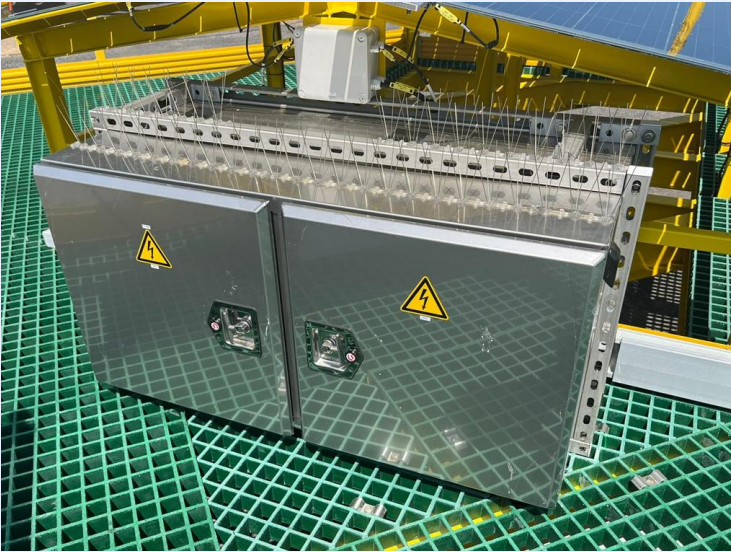


Dust spray



— TECHNOLOGY DERISKING

Test Results – Electrical



Connections remained secure

No electrical parts came loose.



Electrical protection

The control box, battery and other electrical assets remained well protected from seawater.



Structural protection

All structural frames and secondary steel infrastructure remained well protected from seawater.

Test results – Hydrodynamics



Wave-lab observations confirmed

Observed movements match the simulations.

Tension and buoyancy

Correct tension matters across the floater, mooring and anchor assembly.

Technical specifications must include the weight of every component because it is critical for buoyancy.



Test Results – Environmental impact



Aquaculture on MPVAQUA

Oyster baskets and mussel lines: basket-design testing, floater integration and farming.

Multi-use of a floating structure is complex and is not the short-term focus of SeaVolt development.



Biofouling testing

Evaluation of fouling on different materials.

Collection and investigation.

Production, transport and installation



Logistical challenges

Suitable weather windows for transport and installation.

Vessel availability for short-term jobs requires access to the spot market.

Transport and mooring

Towed from the inner harbour to the test site.

1. Pre-laid drag anchors and mooring lines
2. Connected to the platform
3. Tensioned to final tension

Technical challenge

Shallow water makes pre-tension critical.

Account for it from concept development through design, manufacturing, installation and monitoring/maintenance.

Test Results – Accessibility



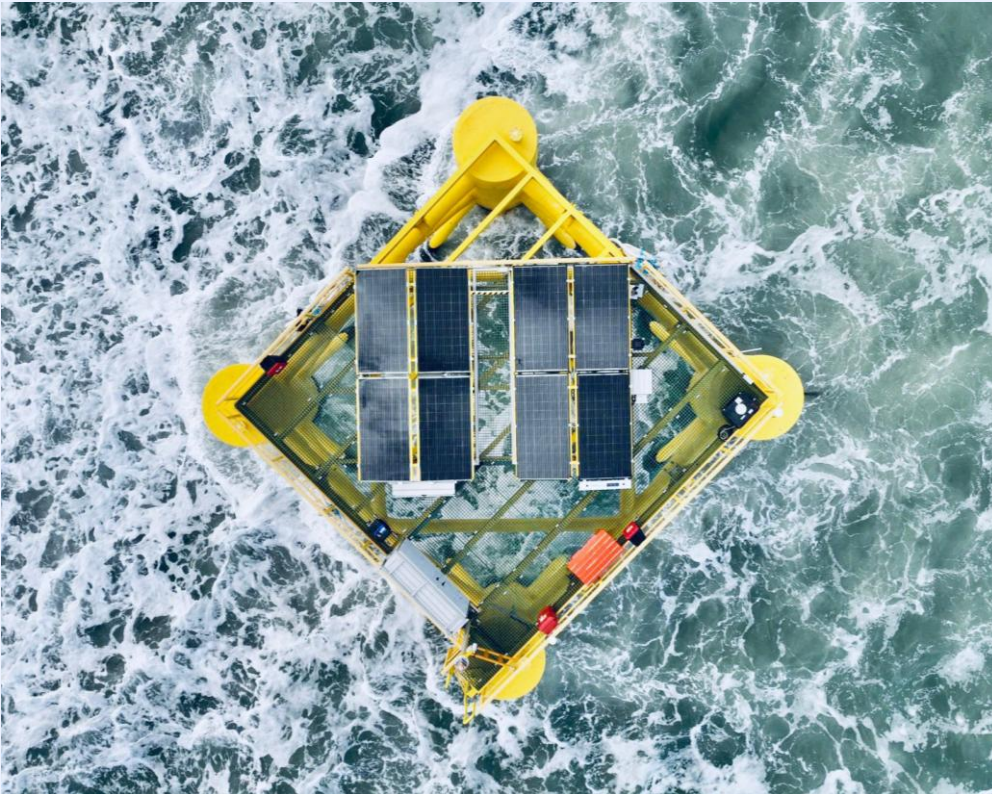
Access only in the calmest sea conditions

Rehearse platform access in the harbour before tow-out.

Use trained and certified personnel.

Carry out activity-specific risk assessments, for example before battery replacement.

Test Results – Overall conclusions



What the tests show

- Solar panels produce better than expected.
- Cleaning-technology development is not a priority.
- Hydrodynamic behaviour is under control.

Current and future design priorities

- Full-scale steel floater
- Mooring and anchoring system
- Dynamic cabling
- Integration into an offshore wind farm

TECHNOLOGY DERISKING

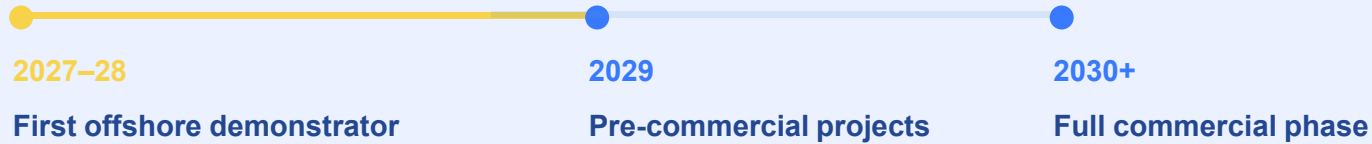


A strong North Sea offshore sector



FUTURE STEPS & MILESTONES

The path from validation to first commercial deployment



2027-28 DEMONSTRATOR SCOPE

SCALE

1 MW - 4 platforms

INTEGRATION

Belgian North Sea

Strong sector partnership

DE-RISKING

Extensive design checks and lab testing

Certified project

Extensive environmental monitoring

Health and Safety procedures



STAKEHOLDER'S PERSPECTIVE

Marinerg-I discussion

Purpose of Testing Infrastructure

01

Lab testing



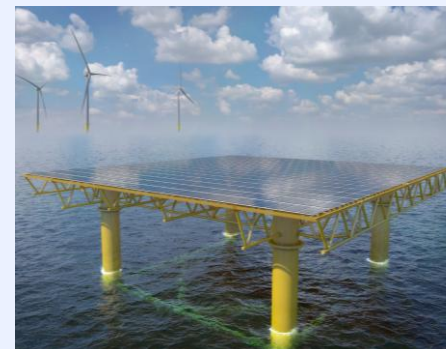
02

→ Field testing



03

→ Demonstration phase



04

→ Commercial phase



Capex increase

Risk decrease

Cost-effective lab testing is crucial before offshore implementation

Expectations for MARINERG-i



Strong link with industry

Early involvement of expert suppliers and relevant stakeholders for later deployment

Access to expertise

Access the most suitable combination of infrastructure and expertise, applicable for the specific derisking question

Integrated testing

Combined testing of different aspects, e.g. wave and wind, ecological testing integration. Holistic approach defining test setup.

Standard approach

Aligned approach on contractual procedures / data accessibility / improved interpretation of results

Re-use of material

Reuse of test set-ups, data, knowledge for next phase or different field testing

Time- and Cost-effective programmes

Complete testing roadmap established avoiding duplications or waiting times

Combination of lab/field test infrastructure

Allow for synergies, smooth testing roadmap and collect next-step REX.

Existing infrastructure like windfarms or grid infrastructure to be considered as cost effective field test / demonstrator infrastructure ? How can MARINERG-i facilitate and derisk this next step?



Reliable. Sustainable. Affordable.

Q & A

Blue Accelerator offshore testing

Stepping up the TRL ladder

MARINERG-i, 8 October COB



FABRIEKEN VOOR
DE TOEKOMST

Blue Accelerator Tower

- Near shore
- Test and demo platform
- Exclusive, safe and pre-consented test zone
- 6 years operational



Blue Accelerator Tower offshore test platform

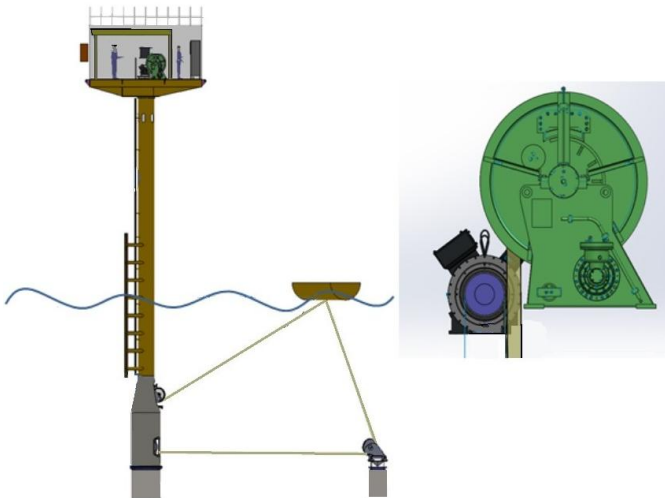
Open for **industry, SMEs, developers, project consortia, knowledge centres**

- Floating energy conversion
- New materials, coatings & sensing
- Drone solutions



Blue Accelerator Ocean energy tests

- First offshore testing of 2 wave converters
- Hydro dynamic duration tests
- TRL 4/5 -> climbing up TRL Ladder
- No grid connection





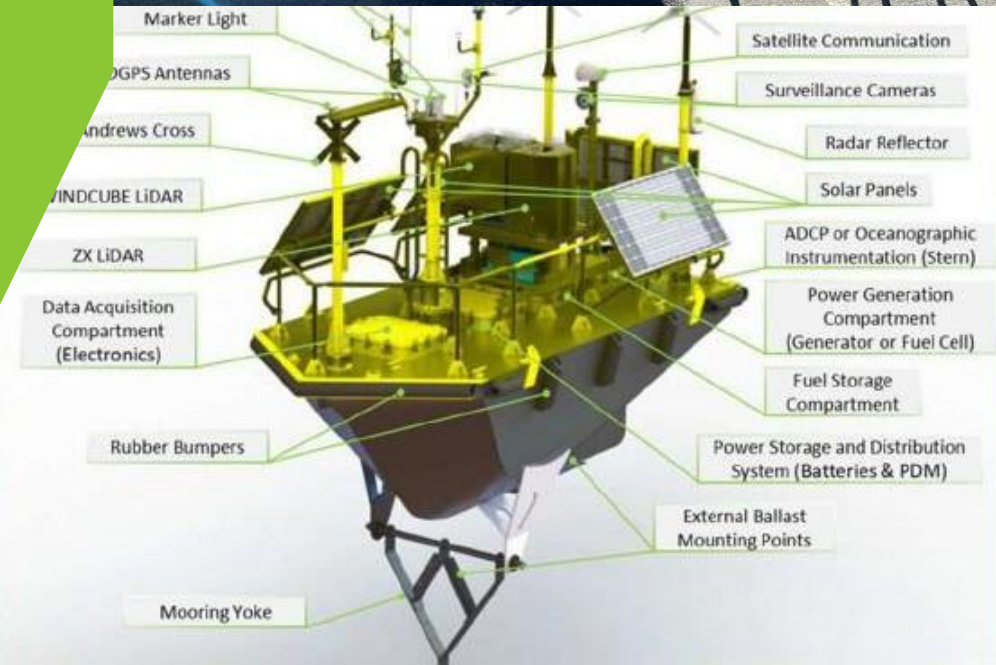
Blue Accelerator Platform

- Offshore, LAT 25m, harsher conditions
- In belgian existing windfarm
- floating energy convertors, mooring design
- Potential grid connection
- Operational mid 2027



Blue Accelerator Buoy

- Offshore, LAT 25m, harsher conditions
- Eastern part of Belgian part of North Sea
- 3km – 2km wider test zone
- Drones, (environmental) monitoring
- Operational mid 2027



Collaborations and partnerships

- Professionalization, business development (leads, network)
- COB – climbing up the TRL of innovative technologies
- International Waters – informal network of offshore test sites
- Offshore Proof
 - Interreg NWE
 - 6 partners including UGent and POM West-Vlaanderen
 - Network of accredited IECRE test sites

MARINERG-i

- Participating by end of 2026
- Member of a sustainable and legal partnership on research infrastructure
- Closer collaboration with leading test centres e.g. EMEC
- Direct leads for tests in our specific test zones conditions
- Consortia on European funding programmes e.g. HORIZON EU
- De-risking Offshore Renewable Energy sector

Contact details POM West-Vlaanderen – Blue Economy & Blue Accelerator:

Email: info@blueaccelerator.be or visit www.blueaccelerator.be
Ostend Science Park (BE)

Q & A

Offshore Renewables at UGent: Numerical and Experimental modelling

Coastal Engineering Research Group

Dr ir. Efrain Carpintero Moreno



Who are CERG - Coastal Engineering Research group?

The **coastal engineering group** is a dynamic research group at UGent

Research expertise:

- ☐ Coastal resilience and hard coastal structures
- ☐ Wave energy converters
- ☐ Floating offshore wind
- ☐ Wave structure interactions
- ☐ Wave propagation

professors: Peter TROCH, Andreas KORTENHAUS, Maximilian STREICHER,
em. Julien DE ROUCK

Postdocs and associated staff: Efrain CARPINTERO, Annelie BAINES-MAITLAND,
Ben SHABARI, Rafail IOANNOU, Vicky STRATIGAKI

number of researchers: 30

number of technical and administrative staff: 10

telephone: +32 (0)9 264 54 89 website address: www.ugent.be



**GHENT
UNIVERSITY**



Research Facilities:

Expertise in **physical modelling** for coastal and offshore applications

Research facilities

❑ Large wave flume at CERG in Ghent

- 2D waves & current generation: 30m x 1m x 1.2m

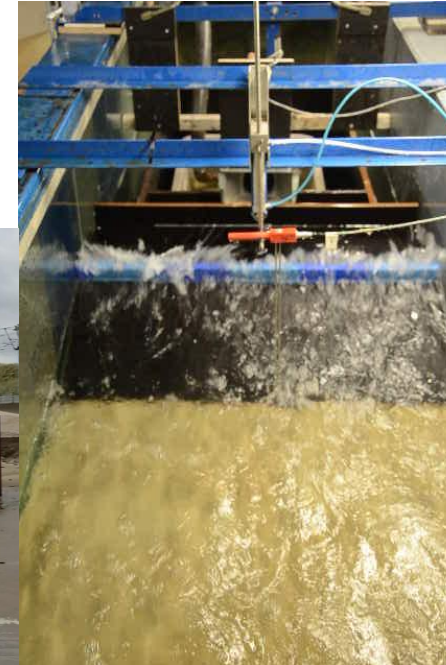
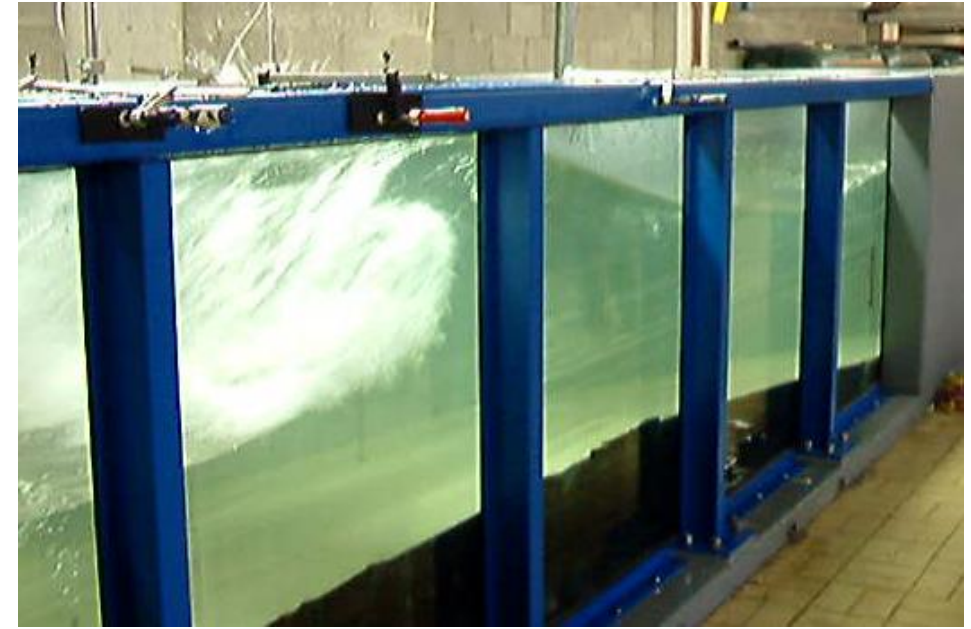
❑ Coastal & Ocean Basin: 3D wave basin

- 3D waves and current generation
- 30m x 30m, up to 1.4 m depth

❑ Saltwater flume

❑ Field measurements

- Living Lab Raversijde



Numerical modelling for renewable energy

Expertise in **development of numerical modelling** for coastal and offshore applications

❑ MILDwave

- Mild slope equations solver developed at UGent

❑ SWASH

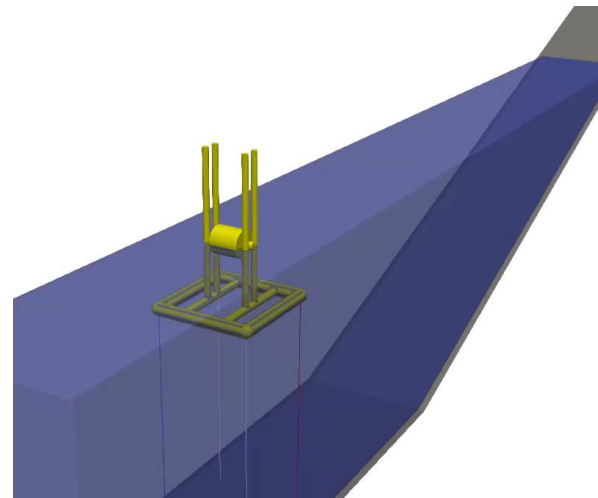
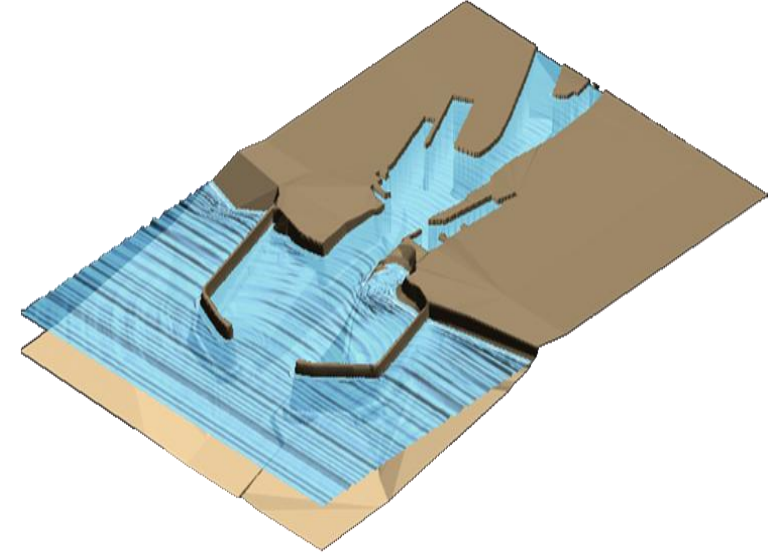
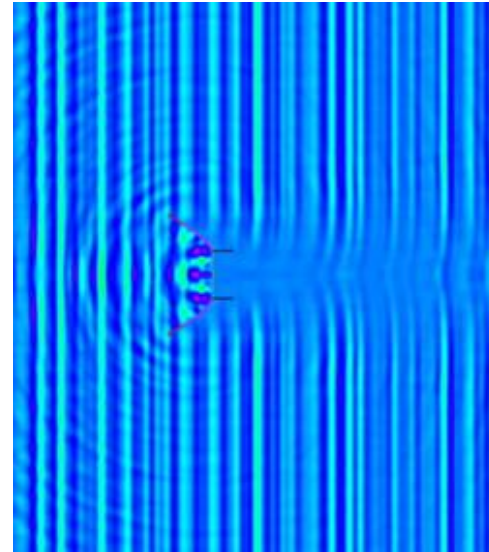
- Shallow water equations
- Collaboration with TU Delft (IG waves)

❑ OpenFOAM

- High fidelity Navier-Stokes solver
- Modelling flow around Nature Inclusive Designs

❑ DualSPHysics

- High fidelity Navier-Stokes solver
- Extreme waves and large motions of renewable energy systems

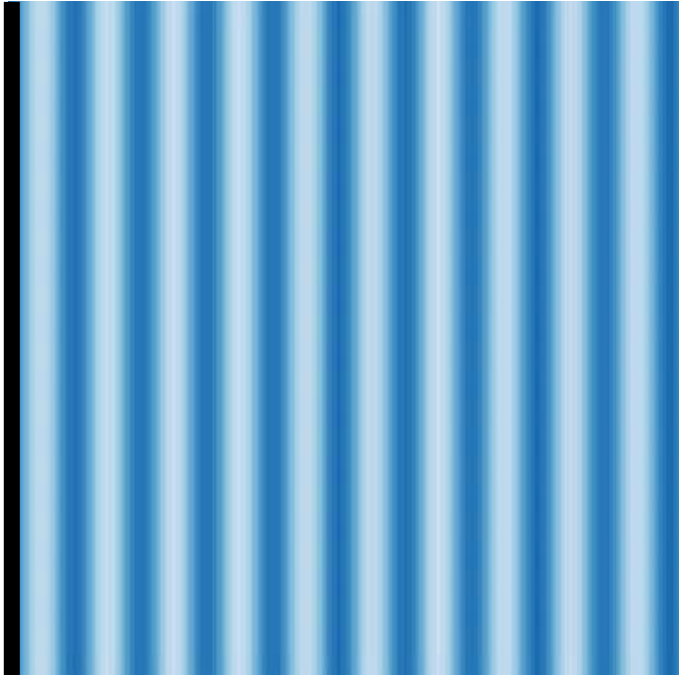


Wake effects behind a WEC farm: MILDwave

MILDwave-NEMOH coupled model

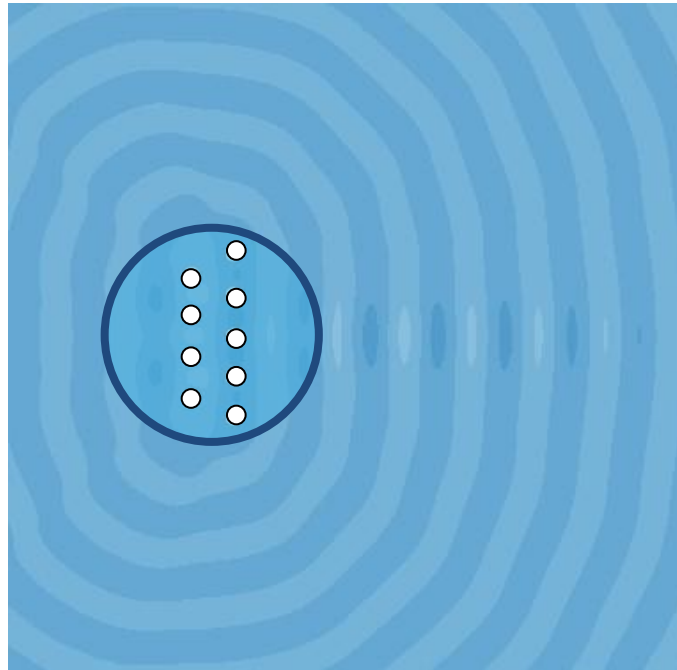
MILDwave

INCIDENT RUN



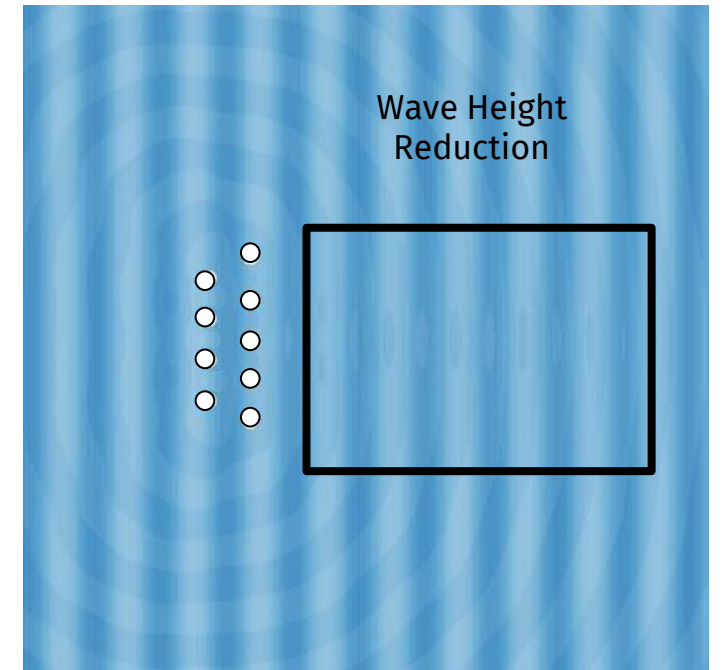
NEMOH -> **MILDwave**

PERTURBED RUN



MILDwave

TOTAL WAVE FIELD



Wake effects behind a WEC farm: MILDwave

MILDwave-NEMOH coupled model

MILDwave

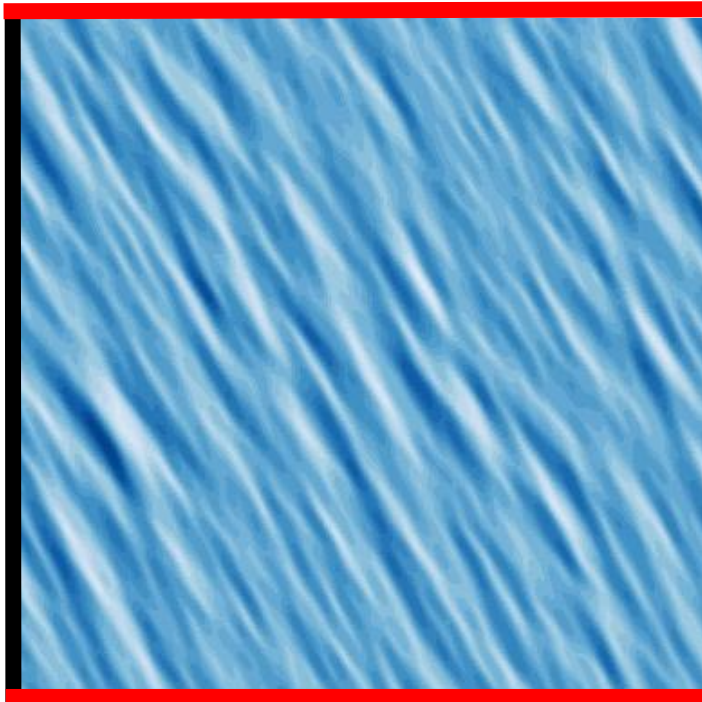
INCIDENT RUN

NEMOH -> **MILDwave**

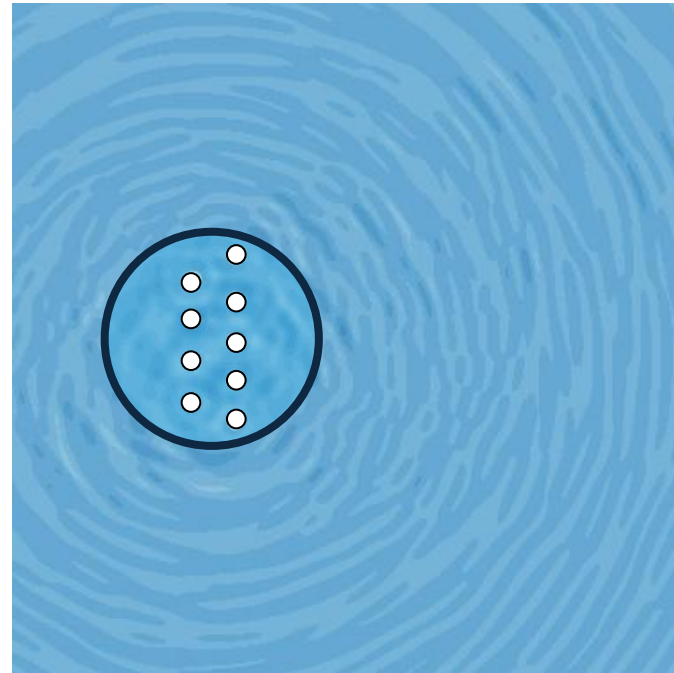
PERTURBED RUN

MILDwave

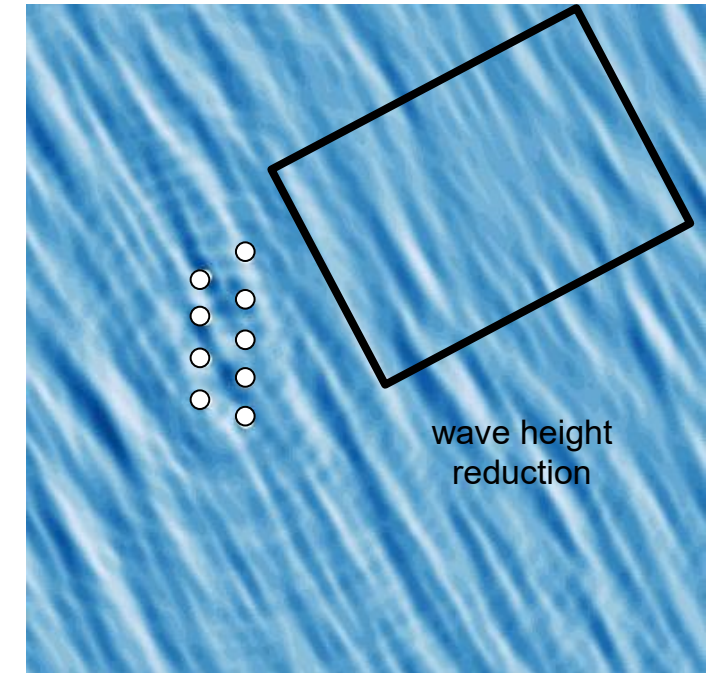
TOTAL WAVE FIELD



+



=



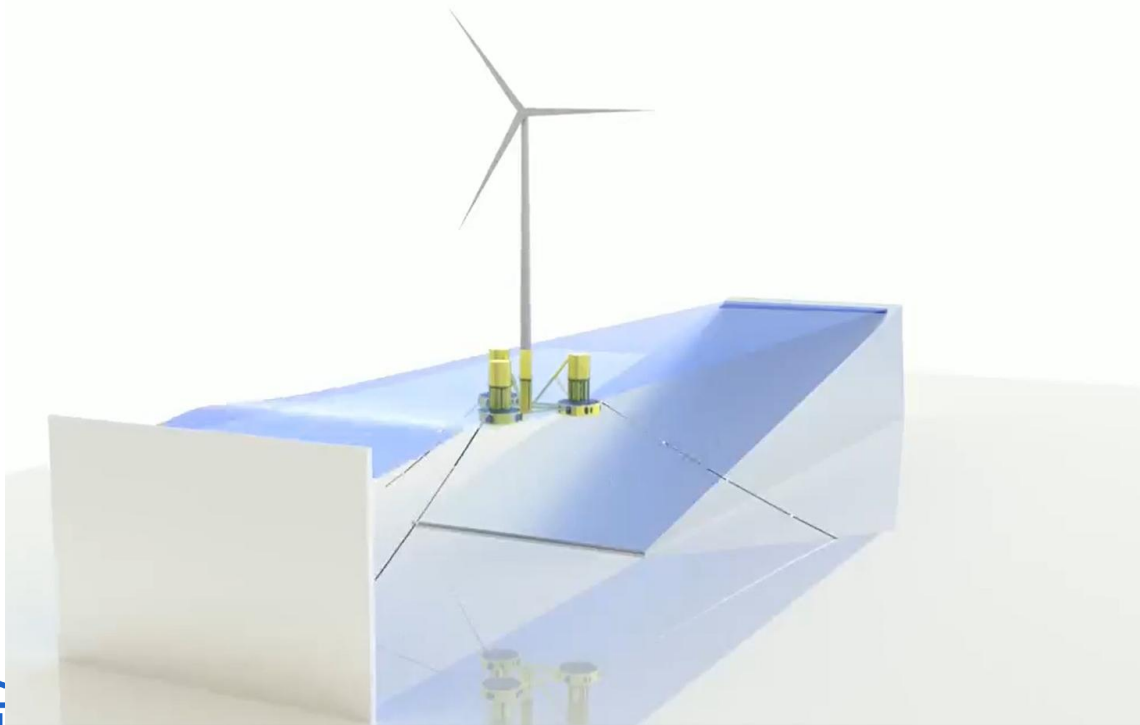
SPH Modelling

DualSPHysics software

SPH: meshless method

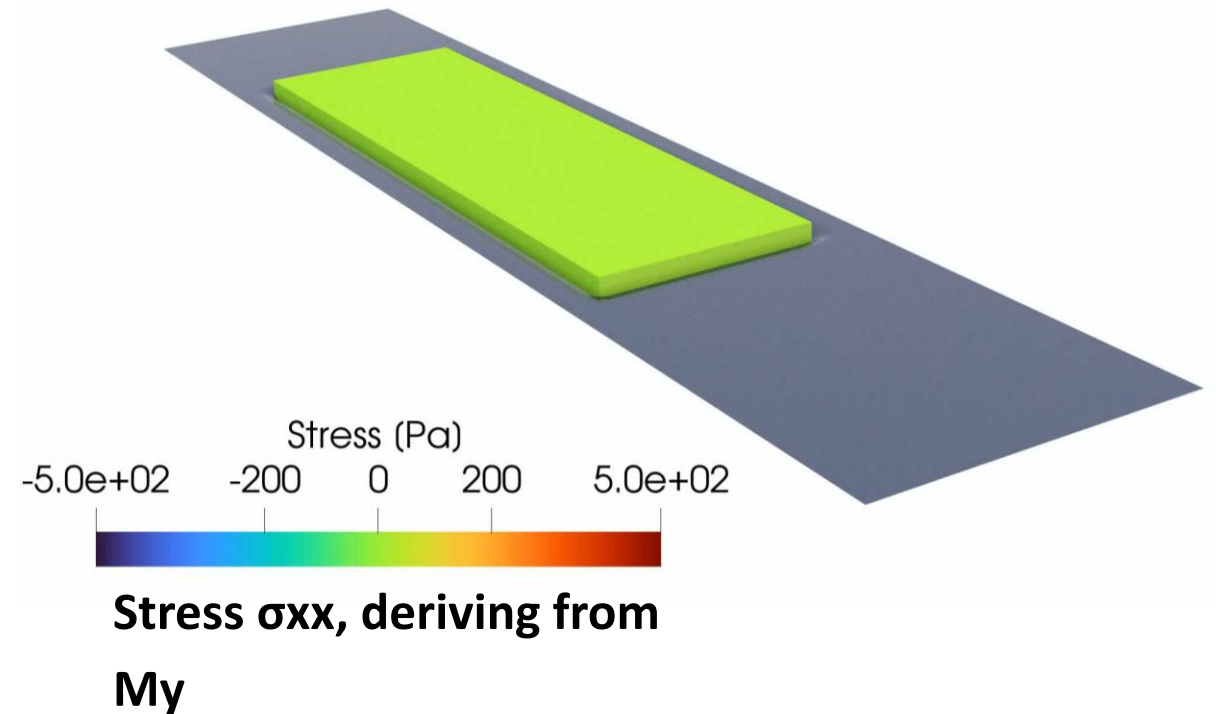
Coupled with “**Project Chrono**” and “**MoorDyn**”

Suitable to simulate more extreme environments



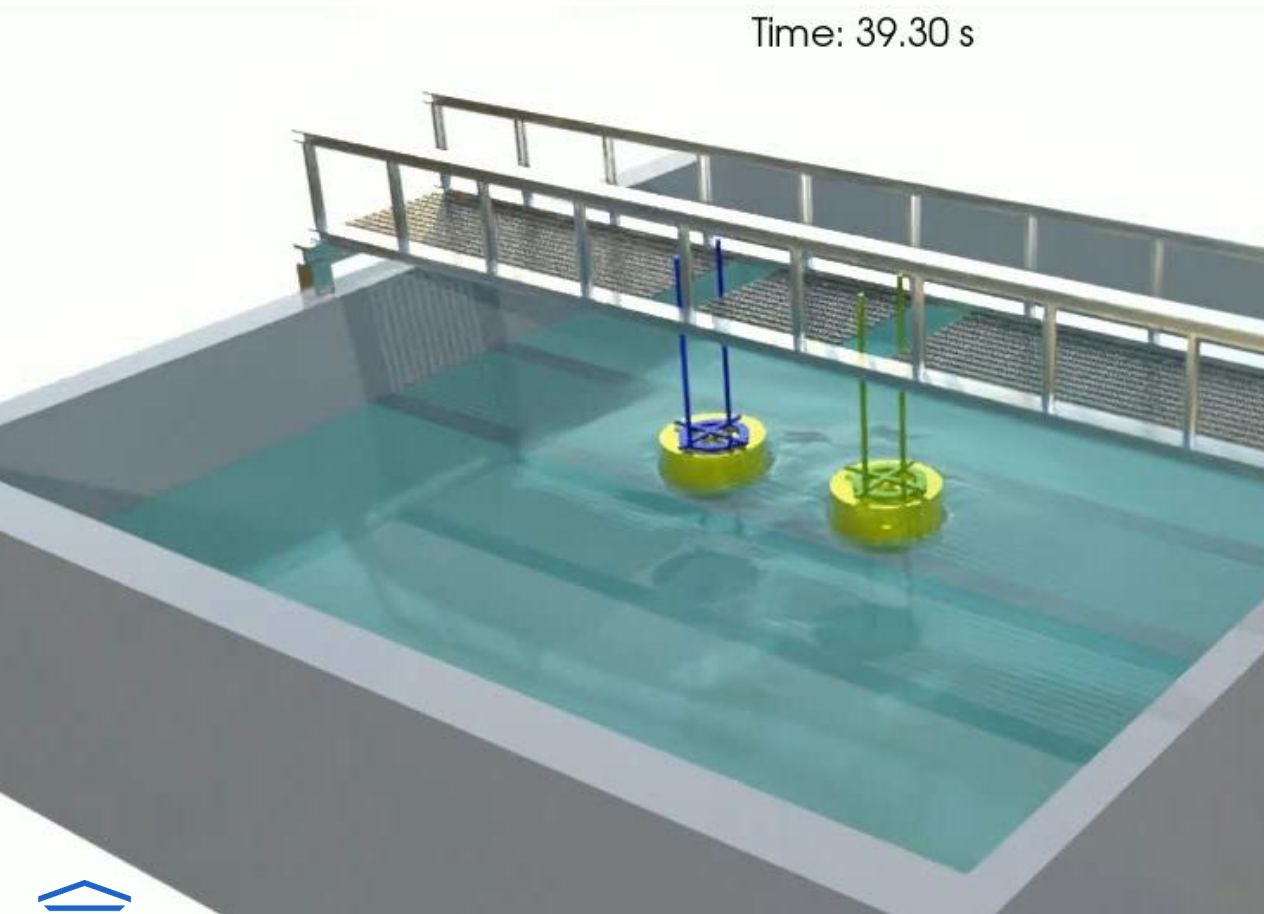
FOWT: DualSPHysics and MoorDyn+ modelling
DeepCwind OC4

2D & 3D numerical hydrodynamic validation of **very flexible floating solar platforms**



In-house ORE research: WECfarm

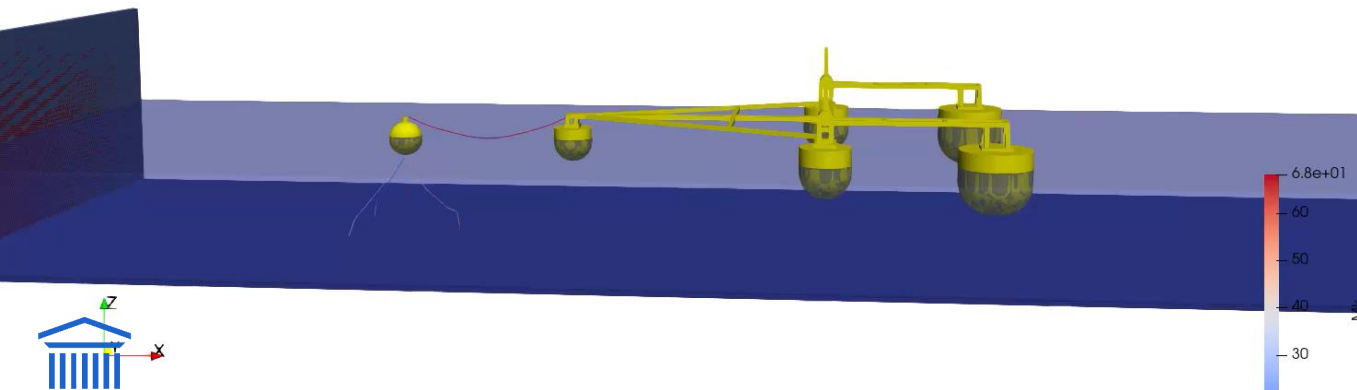
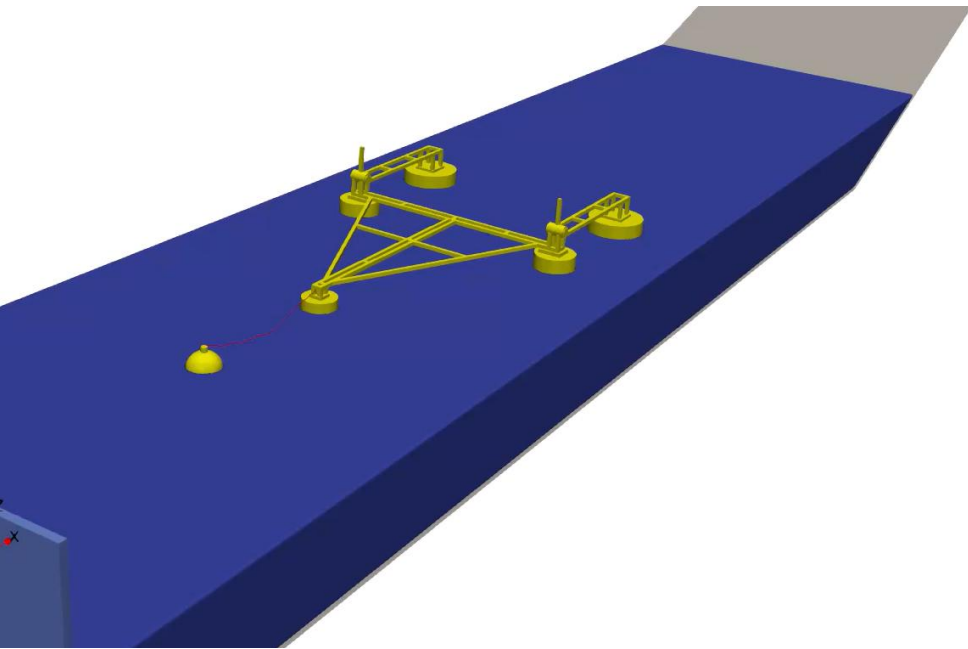
DualSPHysics Simulation



Experimental tests



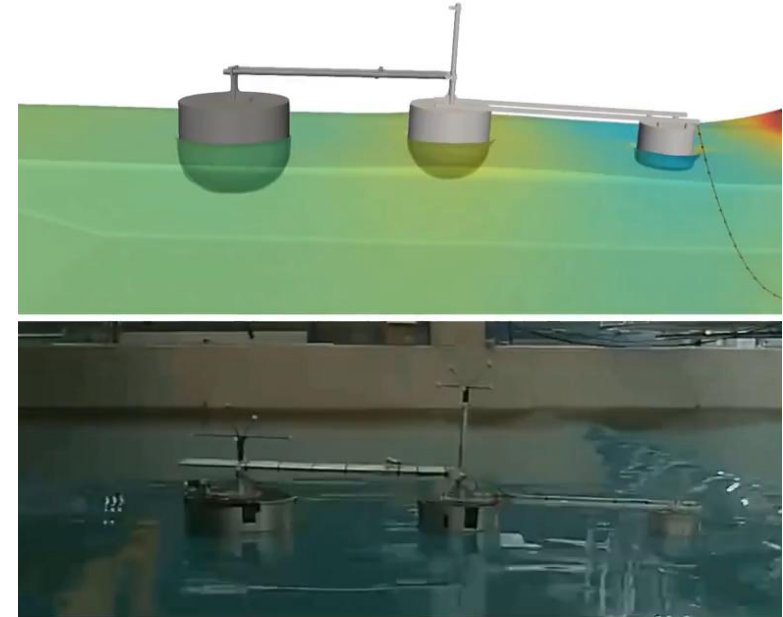
In-house ORE research: M4 wave energy converter



Simulating M4 WEC with DualSPHysics

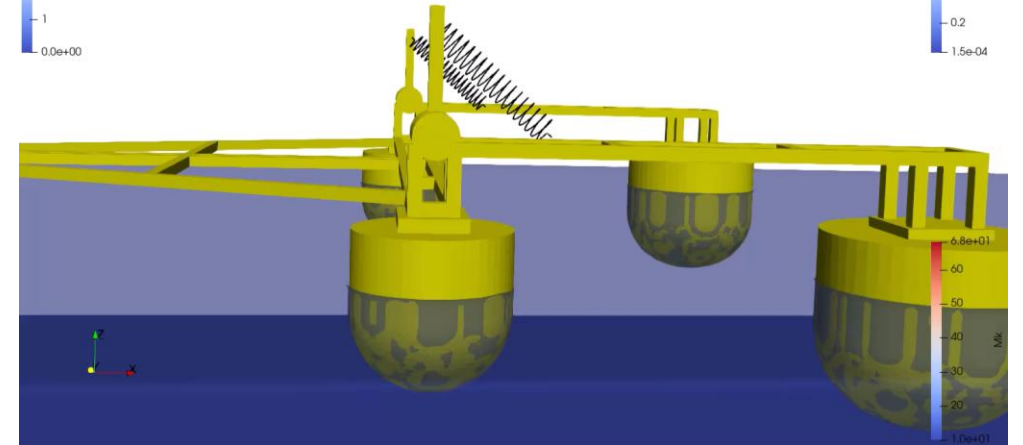
Focused waves: $T_p=1.0s$, $A_c=0.08m$

Time: 9.94 s



2
1
0.0e+00

0.4
0.2
1.5e-04



Research and Collaboration Projects for ORE industry

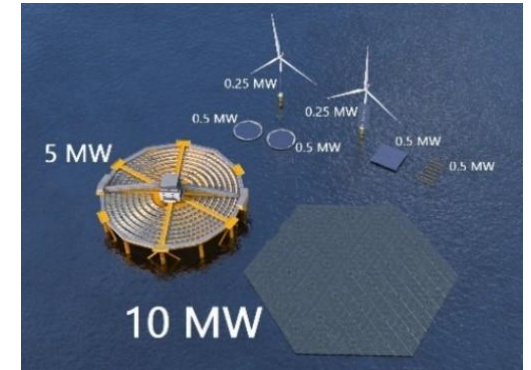


Nature inclusive designs for subsea components of floating offshore wind installations



Catalyzing the Belgian industrial expertise in floating wind through academic innovation

MP Multi Use
Multi-(re)-use scenarios for existing offshore infrastructure



European Research Infrastructure for offshore renewables



To accelerate the regional energy transition while stimulating blue economy



OFFSHORE PROOF

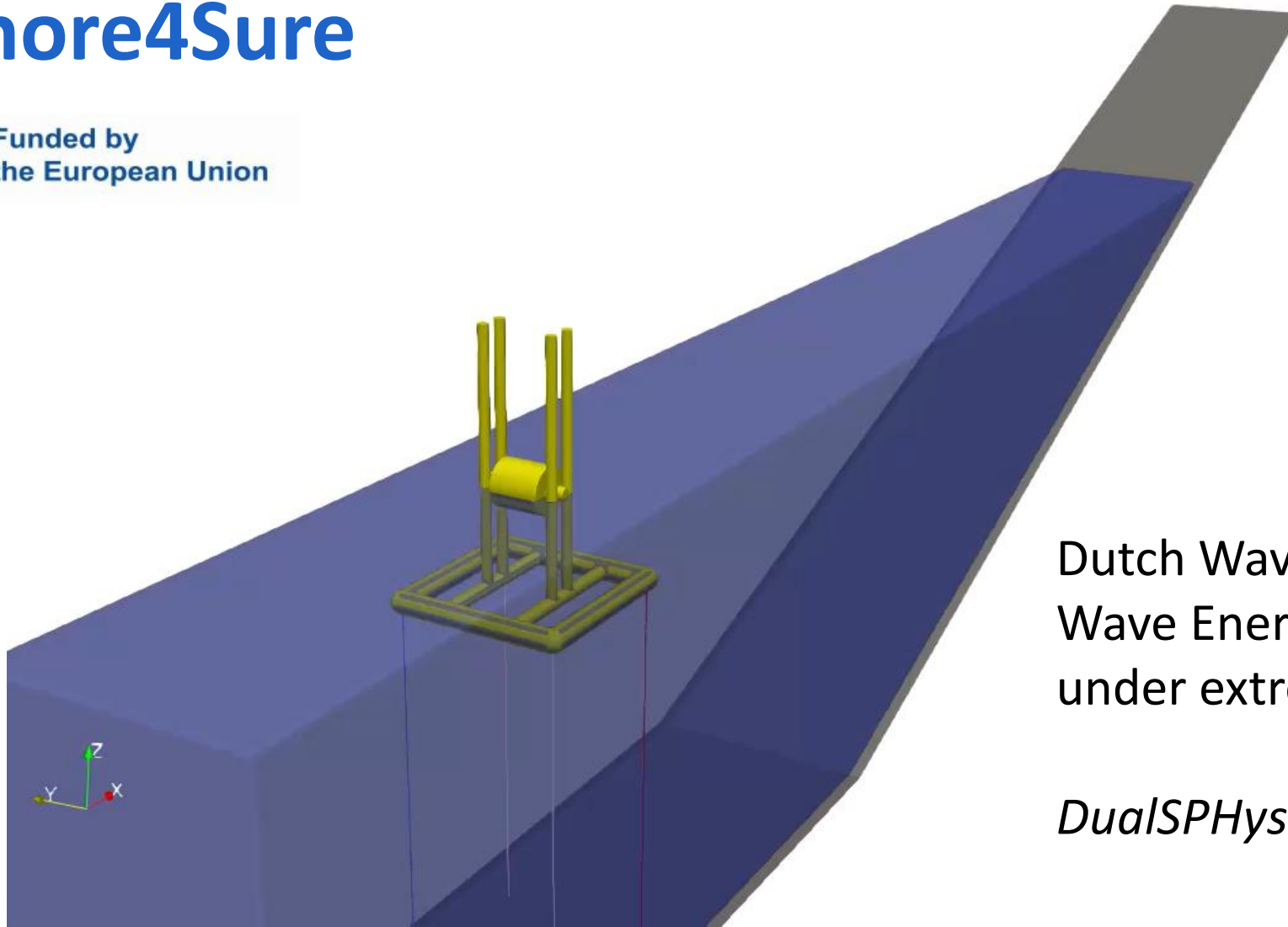
Accredited offshore testing network driving renewable energy uptake at sea



Offshore4Sure



Funded by
the European Union



Dutch Wave Power:
Wave Energy Converter
under extreme loads

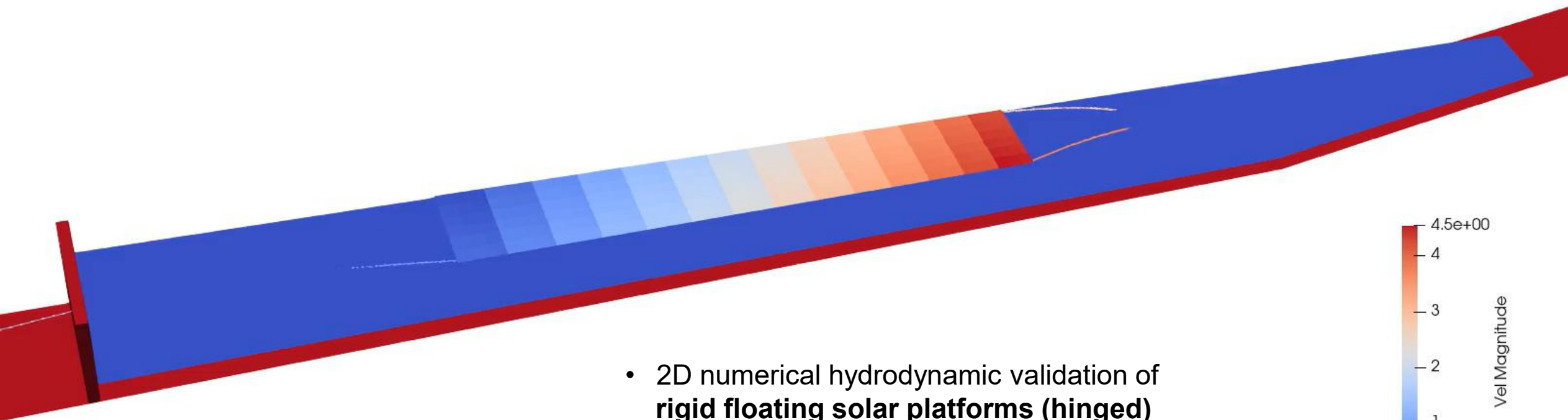
DualSPHysics Simulation



Offshore4Sure



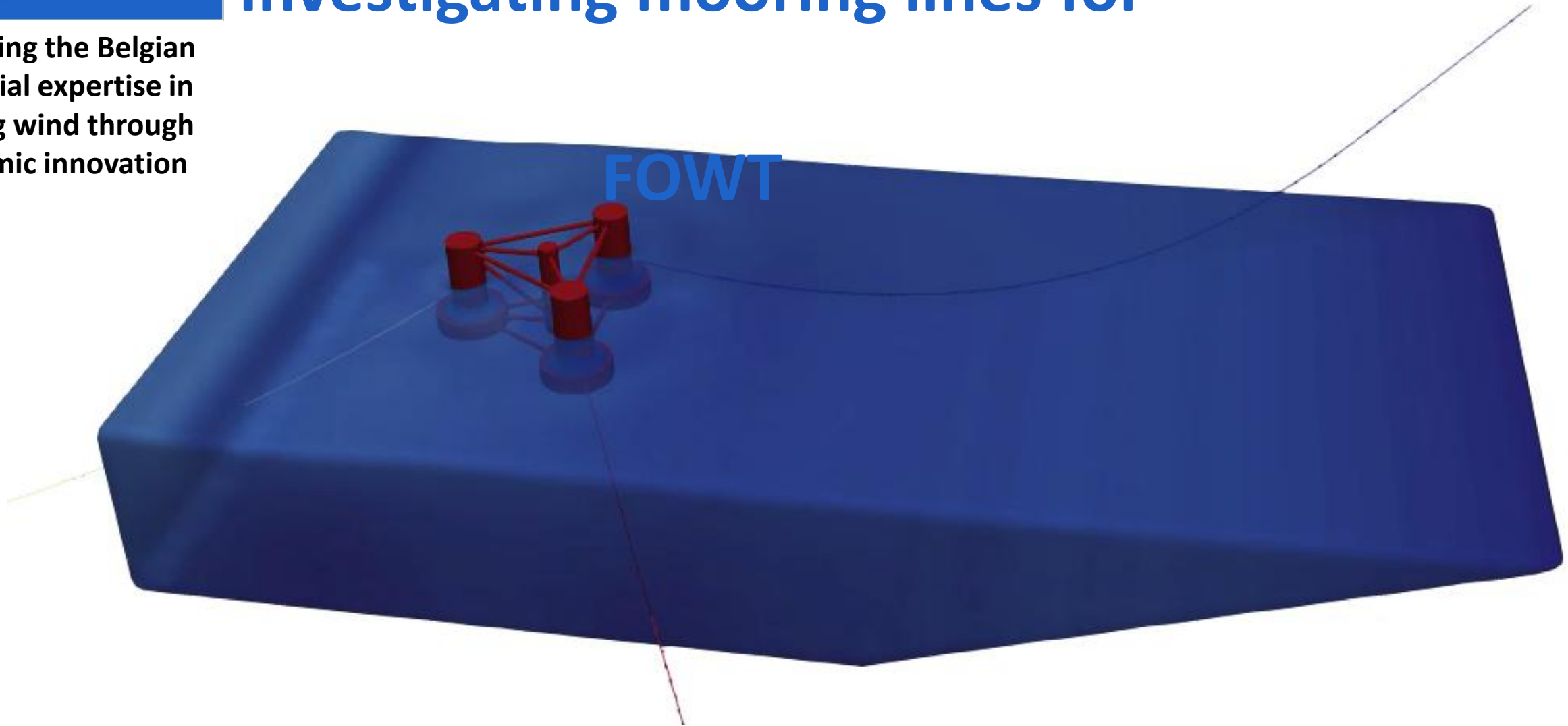
Funded by
the European Union



- 2D numerical hydrodynamic validation of **rigid floating solar platforms (hinged)**
 - * floating solar panels
 - * hinged connections
 - * mooring lines
 - * irregular waves

Catalyzing the Belgian
industrial expertise in
floating wind through
academic innovation

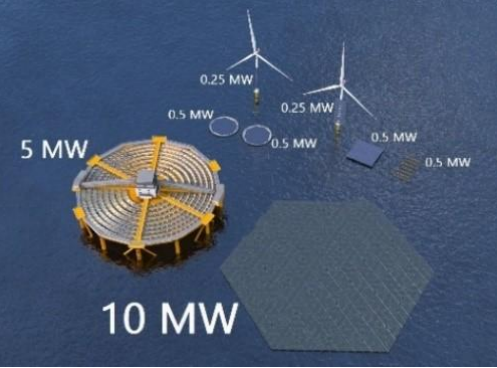
Investigating mooring lines for



*DualSPHysics Simulation
planned Q4 2026!*

of the OC4

Experiments at COB

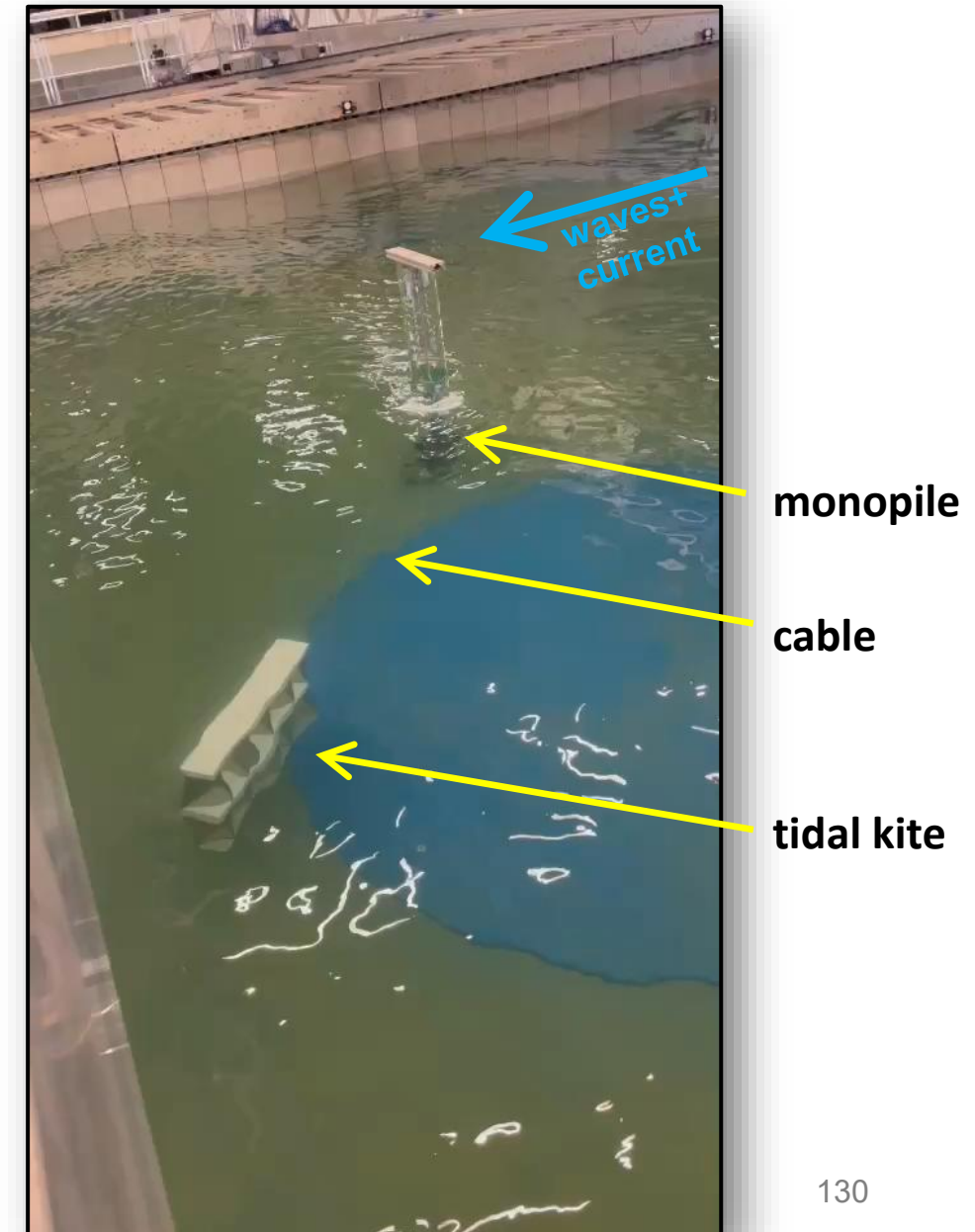
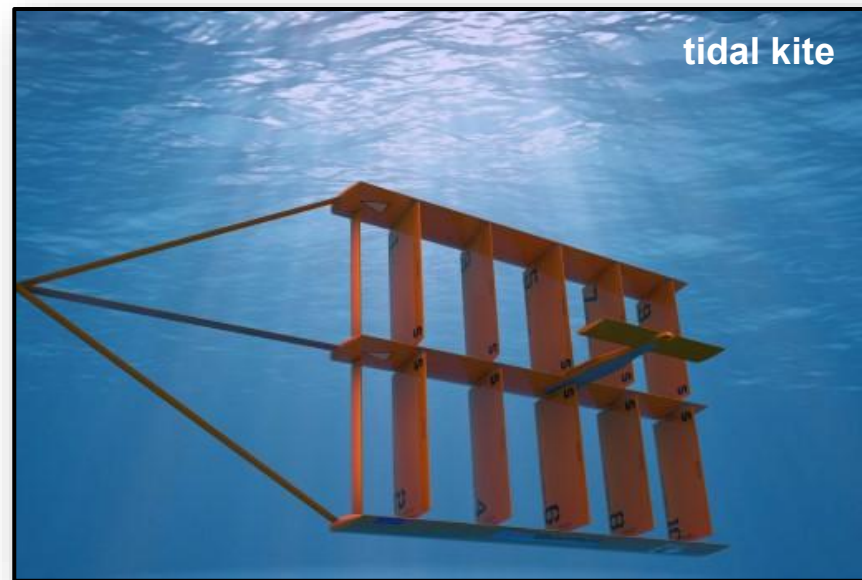


MP Multi Use: Experimental modelling of a tidal kite

Multi-(re)-use scenarios
for existing offshore
infrastructure

Experiments at the COB

- first ever use of the wave & current systems combined



UGent ↔ MARINERG-i

From transnational access to shaping a European research infrastructure

UGent participation grows with the consortium: ACCESS → CORE PARTNER → WP LEADERSHIP → IMPLEMENTATION

1

MARINET / MARINET2

Transnational access

2 successful UGent applications

2

MARINERG-i

Core consortium partner

European RI development

3

MARINERG-i PP

Core partner · Co-leader WP5

Profiling · capacity · impact

UGent contribution in PP

T2.2 Infrastructure profiling & GAP analysis
T5.2 Capacity building & infrastructure development
T5.4 Technical impact management

4

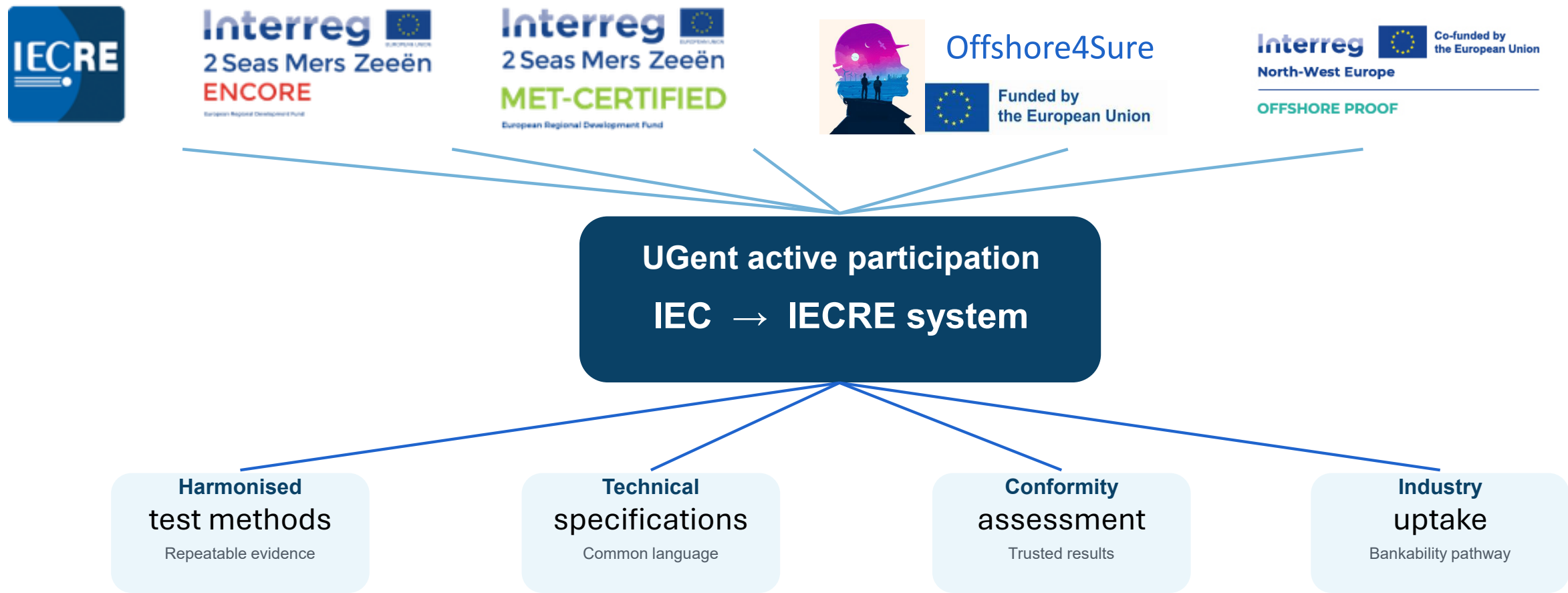
MARINERG-i IMP

Core consortium partner

Implementation & consolidation

Projects → standards → certification

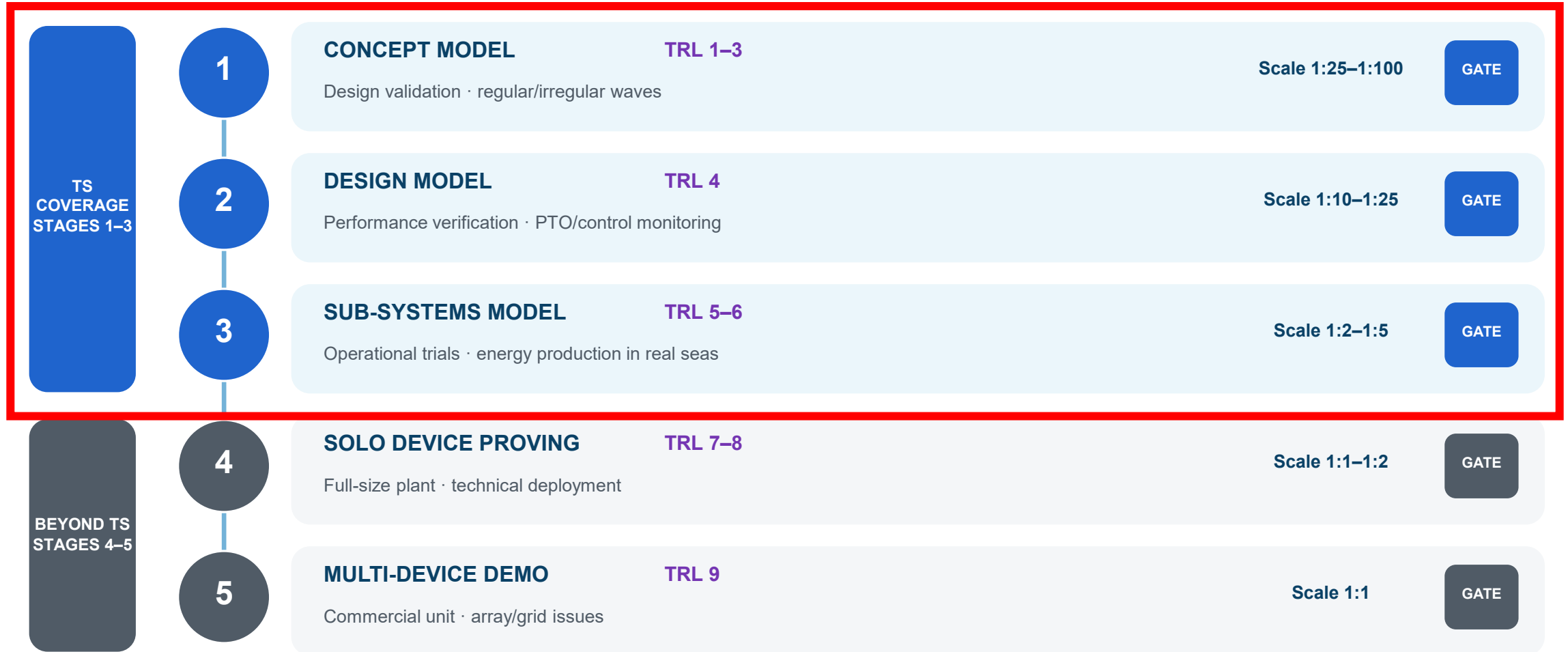
UGent connects applied ORE projects with active participation in the IECRE conformity-assessment ecosystem



PROJECT EXPERIENCE ⇄ STANDARDISATION ⇄ CERTIFICATION PRACTICE

Testing development pathway

A stage-gated sequence: evidence matures as technology progresses from concept to commercial readiness



Each gate asks a different question: Does the evidence justify moving to the next level of realism, scale and risk?

Thanks !!!

Dr ir. Efrain Carpintero Moreno

Research & Academic staff

Prof. Peter TROCH

Director Coastal Engineering Research Group

DEPARTMENT OF CIVIL ENGINEERING

COASTAL ENGINEERING RESEARCH GROUP



Ghent University



@ugent



@ugent



Ghent University

E peter.troch@ugent.be; efrain.carpinteromoreno@ugent.be

T +32 9 264 54 89

www.ugent.be

awww.ugent.be

cob.ugent.be



Q & A

AGENDA

12:00	Welcome and Networking Lunch
12:45	Introduction and Context
13:00	MARINERG-i
13:20	Flemish and European Policy Framework
13:45	Expert and Stakeholder Perspectives
15:00	Closing Remarks
15:15	Tour of the COB Lab