



Latest developments in the **ACHIEVE** programme

**XII Marine Energy Conference &
Wave Energy Sectorial Forum**

27/05/2026

2026

Global potential of the wave energy market

70%

The amount of the world's surface covered by our oceans. Absorbing energy from wind, it's known as the world's biggest battery.

+100 GWh

Cumulative electricity production from ocean energy in Europe exceeded 100 GWh in 2024.

↗ €53bn

Ocean Energy market projected to be worth up to €53bn annually by 2050.

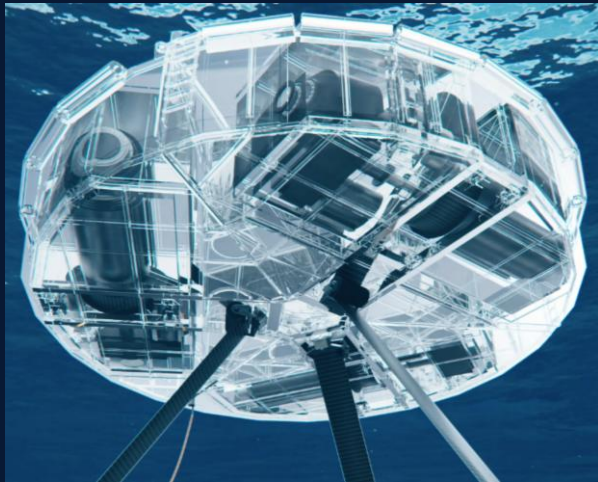
↗ 100GW

Ocean energy can deliver 100 GW of capacity by 2050 – equivalent to 10% of Europe's electricity consumption today.

Unlocking the vast power of the ocean

Challenge: transition to clean energy system able to meet future demand for sustainable, reliable and affordable energy.

Opportunity: Wave energy is an immense and untapped source of renewable energy that is consistent and predictable (350GW by 2050).



Our purpose: We harness ocean energy to make the world more sustainable

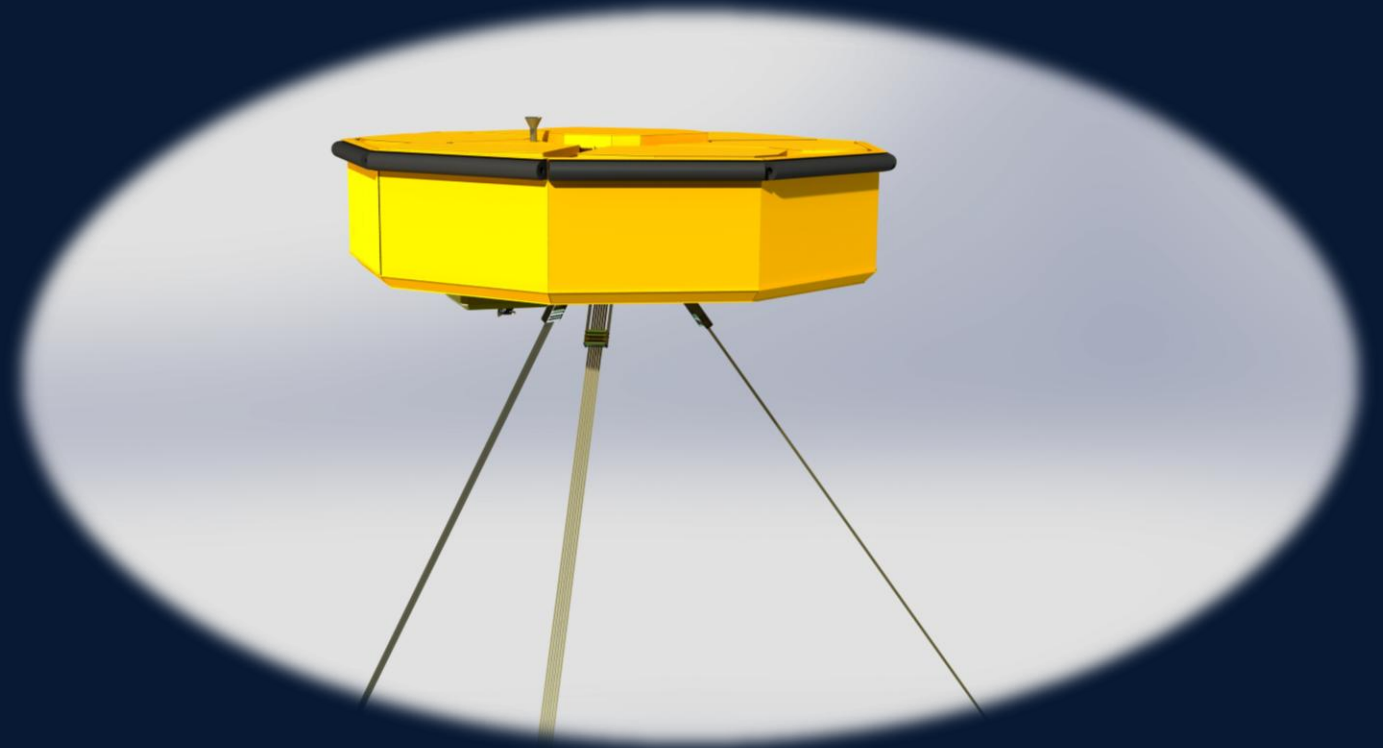
From Australia to Spain, our technology is ready to change the world.



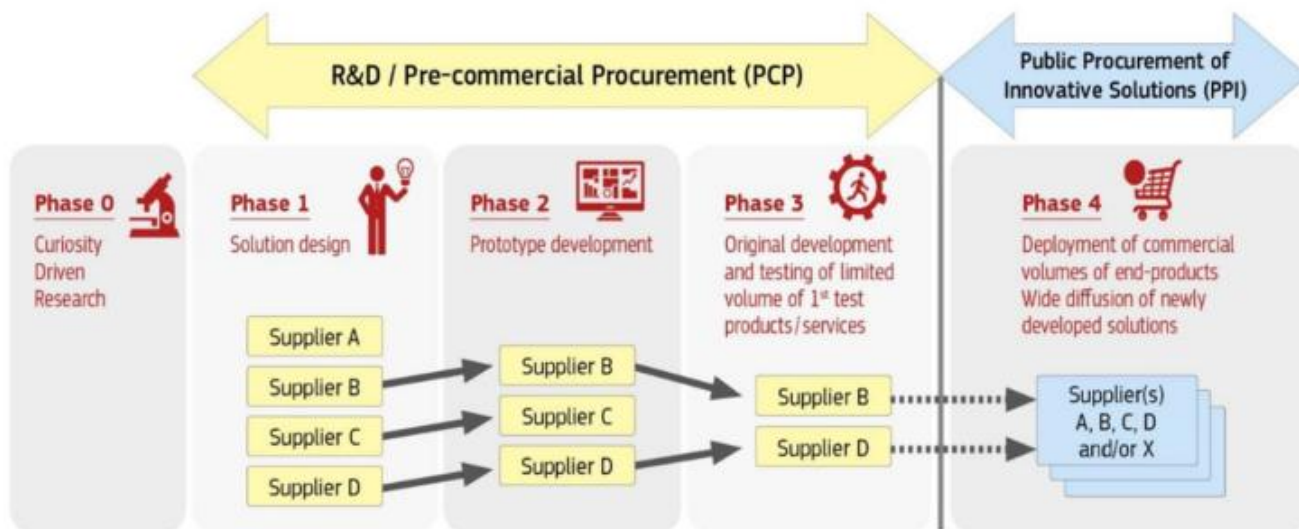


CETO Technology – Key features

- ✓ Point Absorber
- ✓ Axisymmetric
- ✓ Submerged
- ✓ Multi-moored
- ✓ Scalable
- ✓ Adapts to various depths
- ✓ Optimised for lowest LCOE
- ✓ Survivability



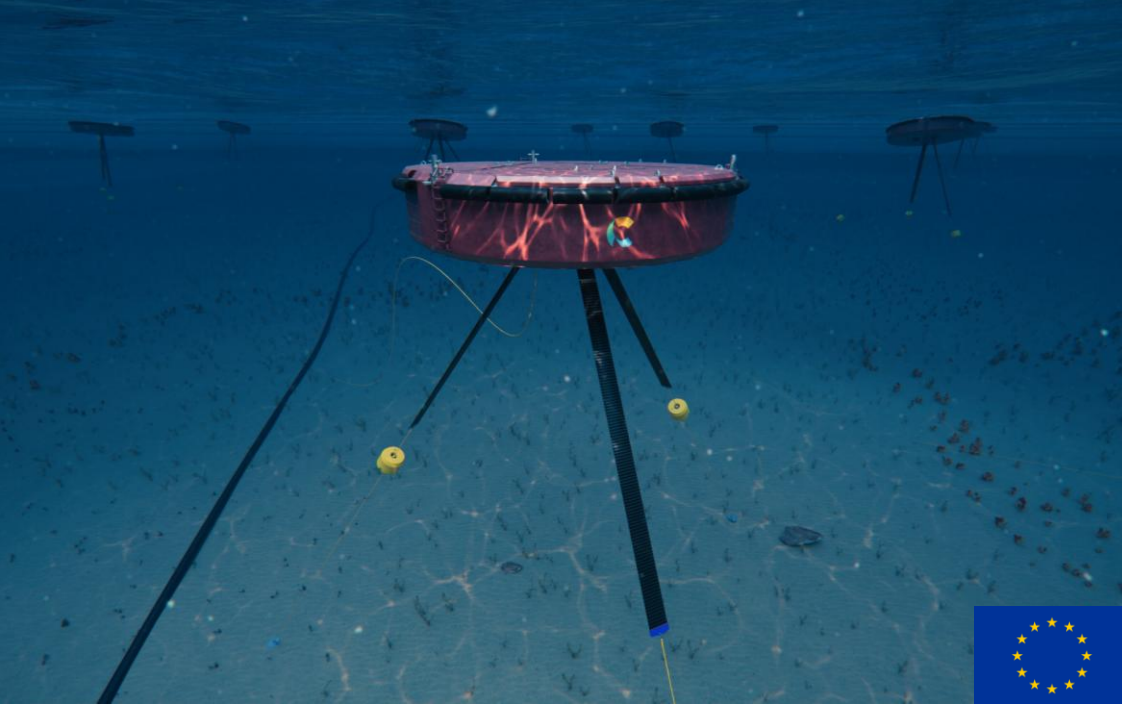
EuropeWave opportunity



	Call-off contracts			
	Quantity		Maximum value	
	Minimum	Anticipated	exc. VAT	inc. VAT
Phase 1 [Concept Development]	5	7	€291,667	€350,000
Phase 2 [FEED and Modelling]	4	5	€608,333	€730,000
Phase 3 [Open-water deployment]	3	3	€3,750,000	€4,500,000
	Totals		€4,650,000	€5,580,000

- Phase 3 includes physical deployment at EMEC or BiMEP

Phase	Start date	End date	Phase duration	Evaluation duration
1	03 Jan 2022	29 July 2022	7 months	2 months
2	26 Sept 2022	30 June 2023	9 months	2.5 months
3	11 Sep 2023	29 May 2026	33 months	n/a



ACHIEVE Programme – CETO Basque Country Deployment

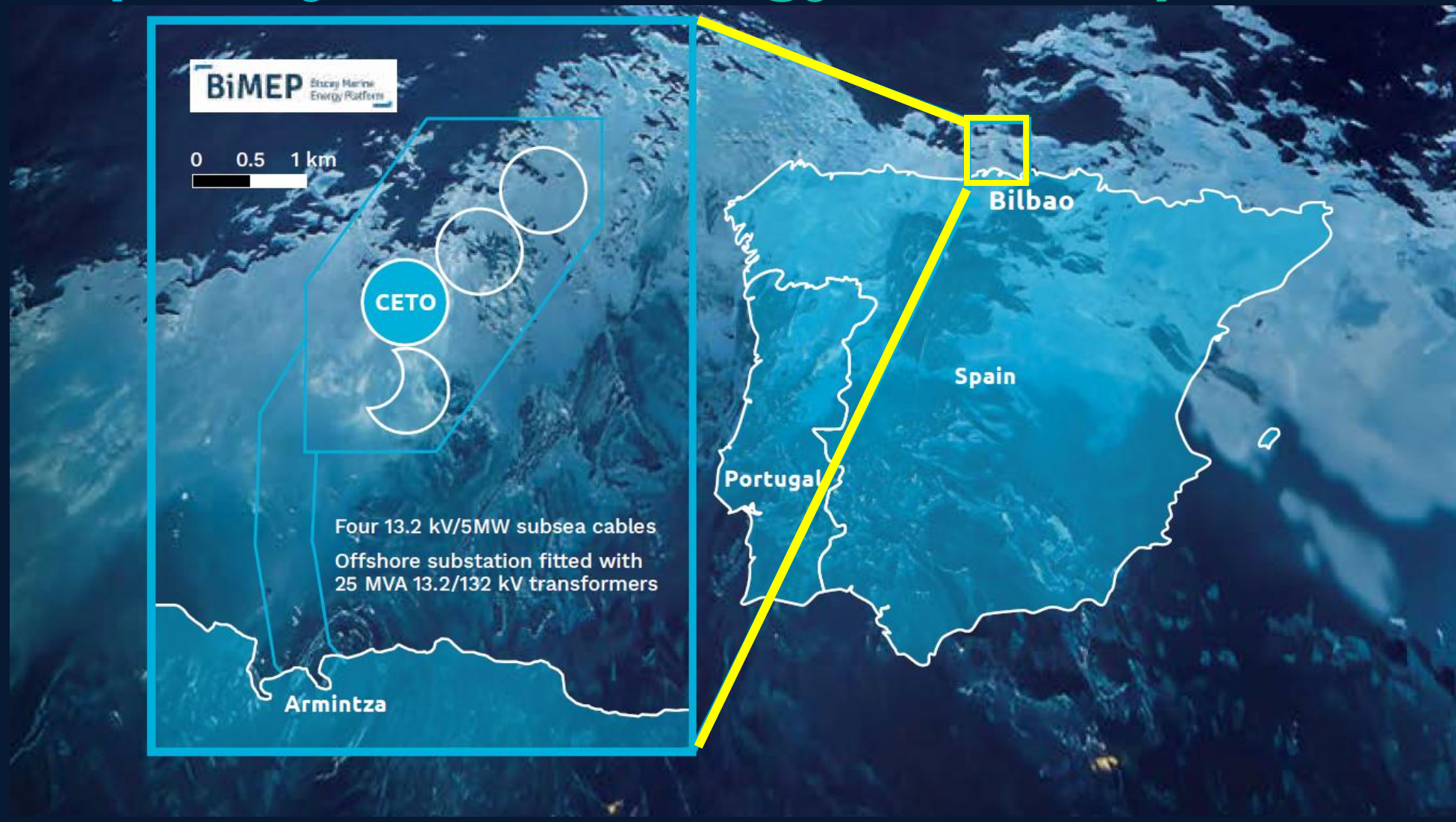
EuropeWave Contracted Deployment

- ✓ Phase 1 – Concept and tank test [**COMPLETE**]
- ✓ Phase 2 – Prelim design [**COMPLETE**]
- Phase 3 (final) – Build and deploy [**IN PROGRESS**]
- From initial 36 applicants, Carnegie's ACHIEVE project ranked **number one** at commencement of Phase 3 (€3.75m)
- Judged on independently validated criteria including **LCOE**, performance, **reliability**, availability and **survivability**
- Deployment at BiMEP with real-time stream of performance data
- Carnegie office in Spain (Biscay) driving the project

Additional National Recognition to Support and Enhance Project

- Spanish Government (IDAE - Renmarinas) awarded €1.2m Dec 2023
- Basque energy agency EVE awarded €2.1m March 2024

BiMEP (Biscay Marine Energy Platform)

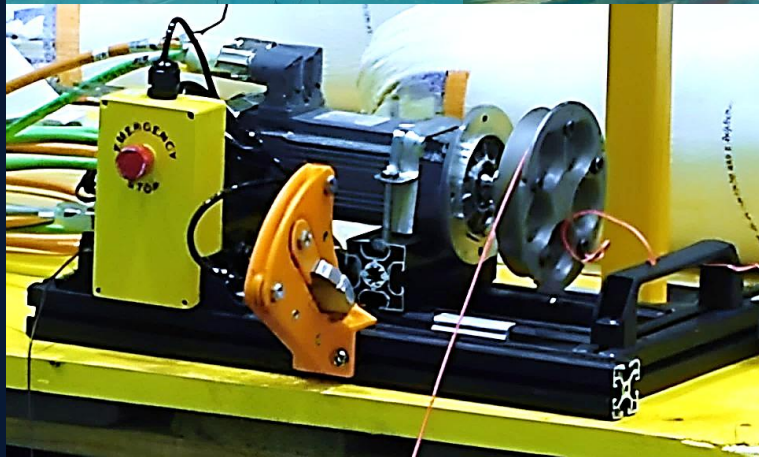
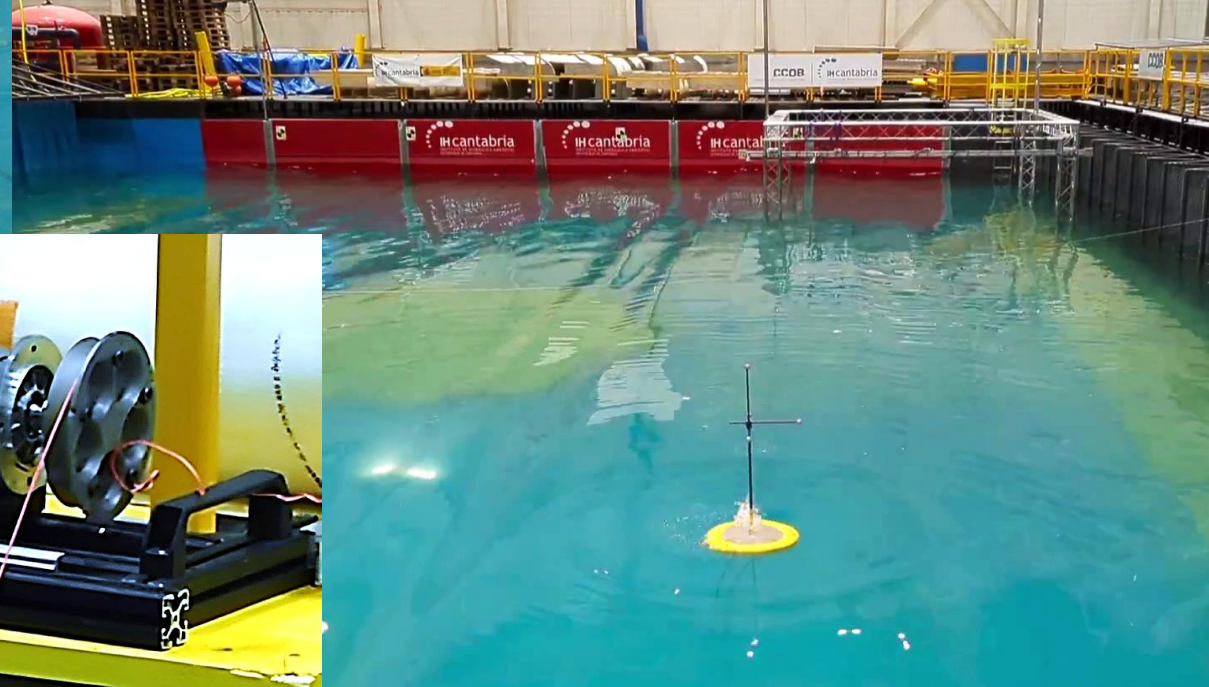
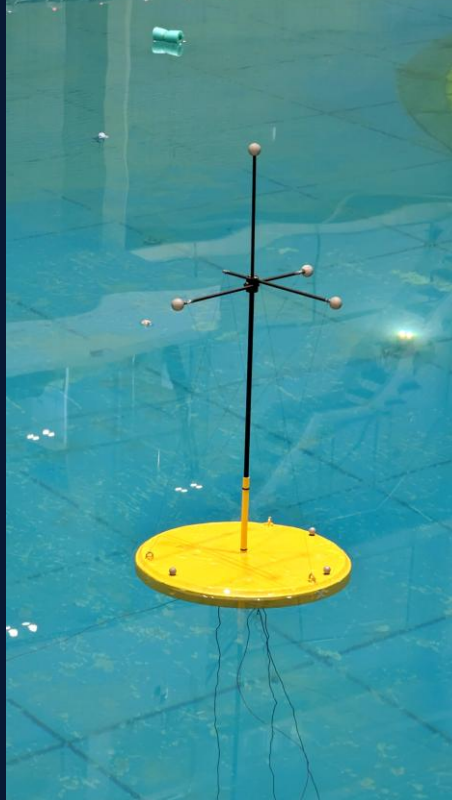


Tank testing

RL control tested in real world at IH Cantabria

World first implementation of RL controller on WEC

Performed similarly to baseline controller



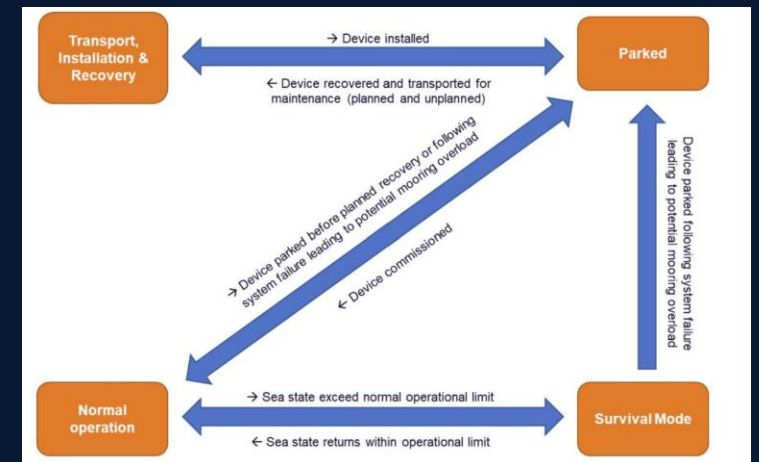
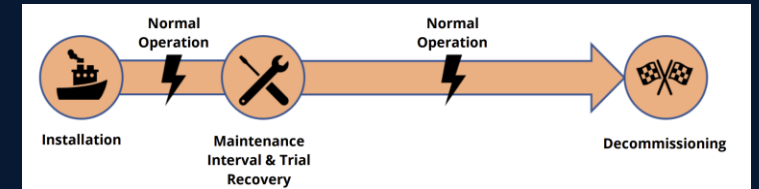
Belt testing

- ✓ Belt testing at VGA
- ✓ Belt bending cycles over sheaves
- ✓ Fleet, Twist and Tension set by rig
- ✓ Tracking behaviour and belt damage evaluated



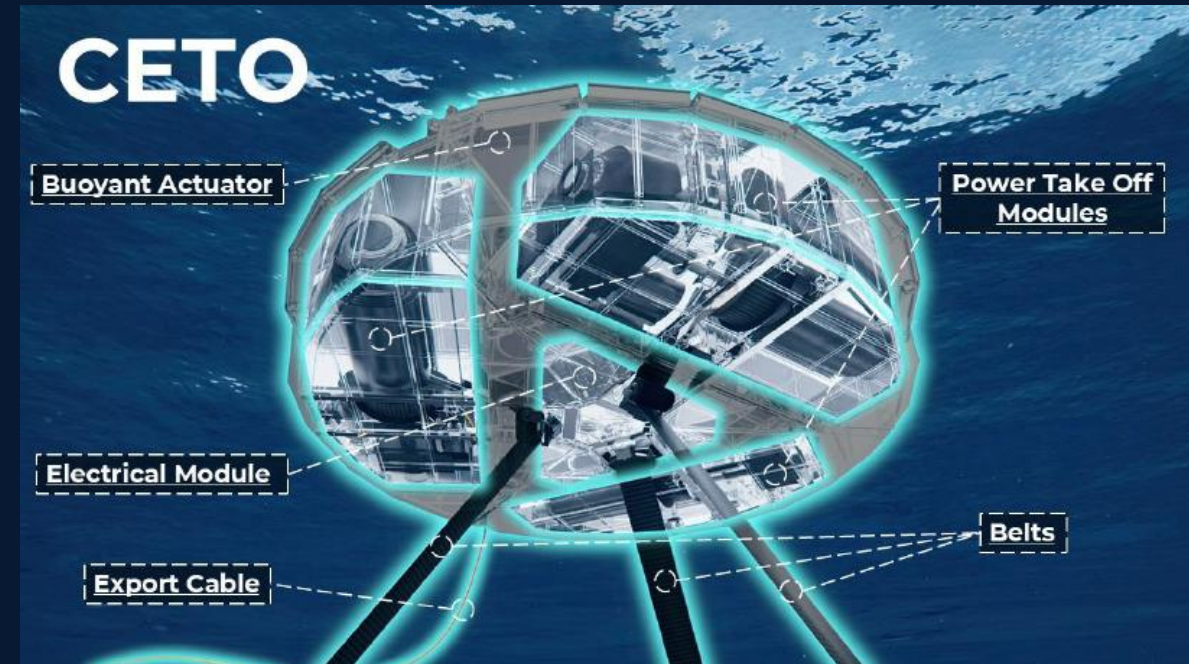
ACHIEVE Phase 3 EW – Target outcomes

- ✓ Complete **detailed design** compliant with Phase 3 deployment
- ✓ Obtain licensing and comply with **HSE** requirement
- ✓ Manage successfully **manufacturing and assembly** of WEC
- ✓ Demonstrate effectiveness of **operational strategies**
- ✓ Produce energy continuously and demonstrate **reliability**
- ✓ Demonstrate effectiveness of **survival strategies**
- ✓ Complete **Stage 3** of IEA Framework
- ✓ Unlock learning and confidence for **commercial roll-out**



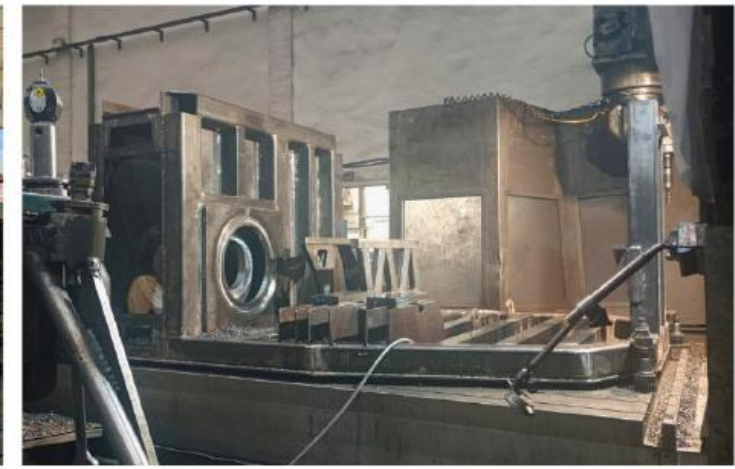
Latest developments - Overview

- ✓ System architecture:
 - ✓ Submerged Buoyant Actuator (BA)
 - ✓ Seabed-connected PTO modules (belt-driven generators)
 - ✓ Mooring & tensioner system (energy storage + load management)
 - ✓ Electrical Module (EM) for power conditioning + control
 - ✓ Grid connection via dynamic cable + subsea infrastructure



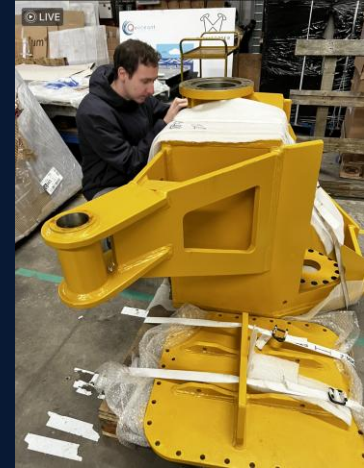
Latest developments – Fab & procurement

- ✓ BA & metal works:
 - ✓ EM complete, fitted, integrated with control systems
 - ✓ PTO compartments being finalised before shipping for assembly and B2B
 - ✓ Intensive QC



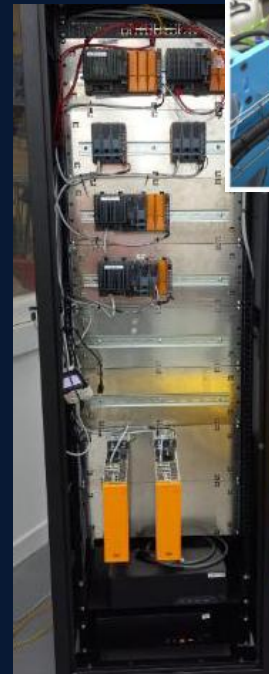
Latest developments – Fab & procurement

- ✓ Dynamic cable:
 - ✓ Cable and connector to static export cable delivered
 - ✓ Progressing on bespoke Q-connect to WEC
- ✓ Moorings:
 - ✓ Procured belts
 - ✓ Manufactured bespoke mooring connectors
- ✓ PTO:
 - ✓ Manufactured tensioner, SAS, main drum, cooling system, ...
 - ✓ Procured gearboxes, generators, ...



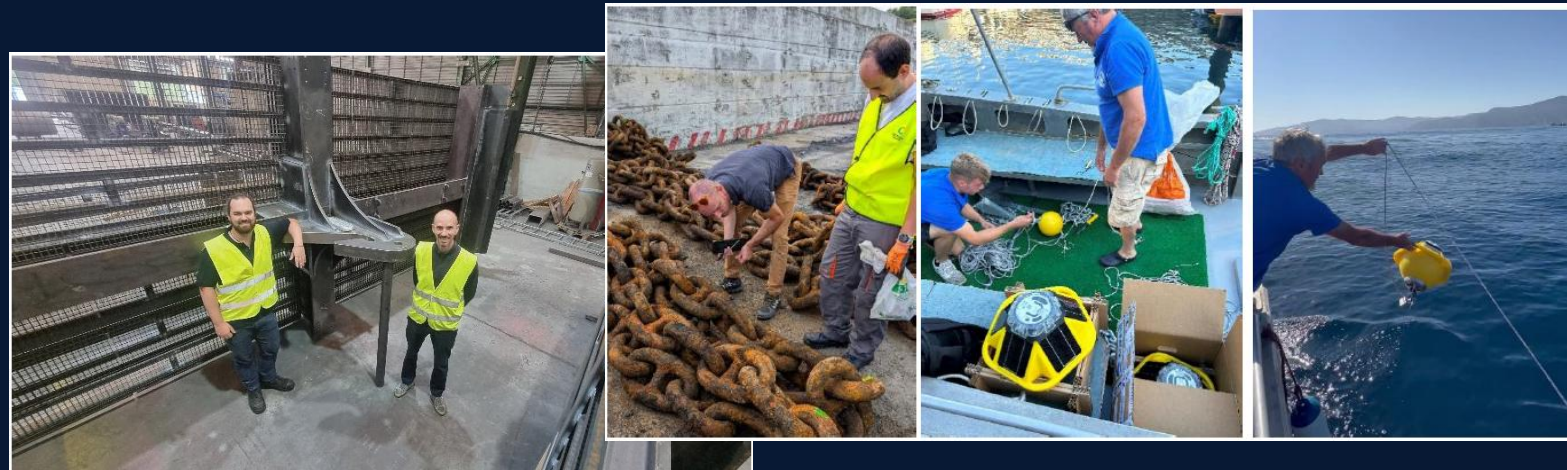
Latest developments – Control & electrical

- ✓ Electrical & control system testing completed
 - ✓ Verified system integration and communications
- ✓ Hardware-in-the-Loop (HIL) testing completed
 - ✓ Control validated against simulated extreme sea states
- ✓ Integration into Electrical Module (“system brain”)
- ✓ Control architecture enables:
 - ✓ Real-time PTO control
 - ✓ System coordination across mechanical/electrical subsystems

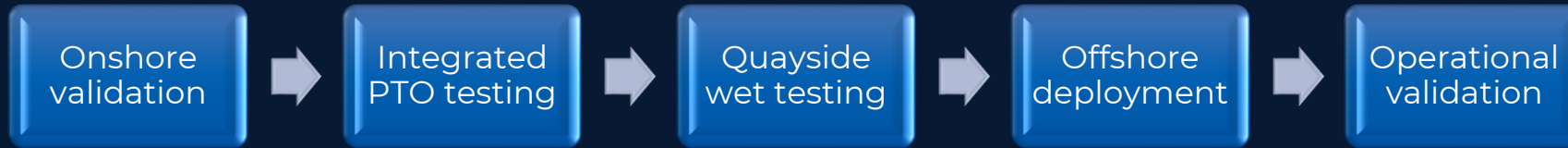



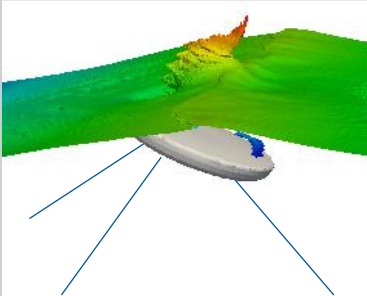
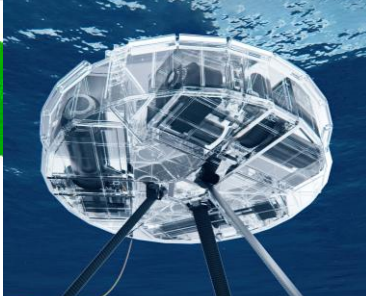
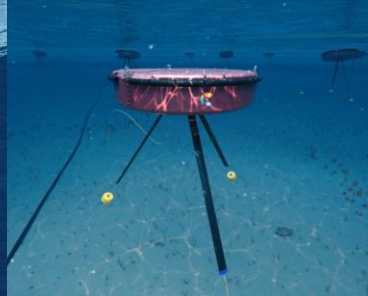
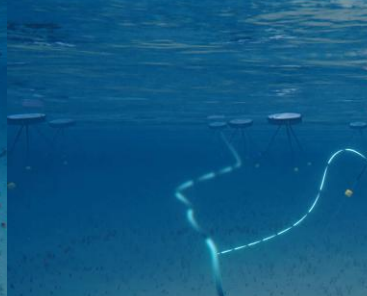

Latest developments – Site preparation

- ✓ BiMEP berth preparation:
 - ✓ Removal of legacy infrastructure
 - ✓ Cable connector substitution
- ✓ Grid connection infrastructure commissioned (electrical + fibre)
- ✓ Wave measurement buoys deployed for real-time conditions monitoring
- ✓ Consenting: obtained both Energy and Coastal authorisations
- ✓ Pre-installations:
 - ✓ Foundation fabricated and FAT completed
 - ✓ Recovered Wello chain



What's next?



← 2010-2020 →	2020 →	2023 →	2026 →	2029 →	2032 →
<p>Early Generation CETO development & deployments</p> 	<p>Digital Dev of New Generation CETO. Tri-moored, all-electric</p> 	<p>EuropeWave / ACHIEVE design & deploy scaled CETO. BiMEP Basque Country</p> 	<p>6 MW Commercial Pilot. Full-scale CETO. BiMEP Basque Country</p> 	<p>Pre-commercial</p> 	<p>Commercial farms</p> 



EUROPEWAVE

Thank you!



**RENOVABLES
MARINAS
DEMOSTRADORES**



Funded by
the European Union
NextGenerationEU



Plan de Recuperación,
Transformación y Resiliencia

¡Gracias!



**EUSKO JAURLARITZA
GOBIERNO VASCO**

**ENERGIAREN
EUSKAL ERAKUNDEA
ENTE VASCO
DE LA ENERGÍA**



Eskerrik asko!



**Be part of the innovation that will unlock the
power of the world's oceans**