



Blue Horizon 250

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 883751.



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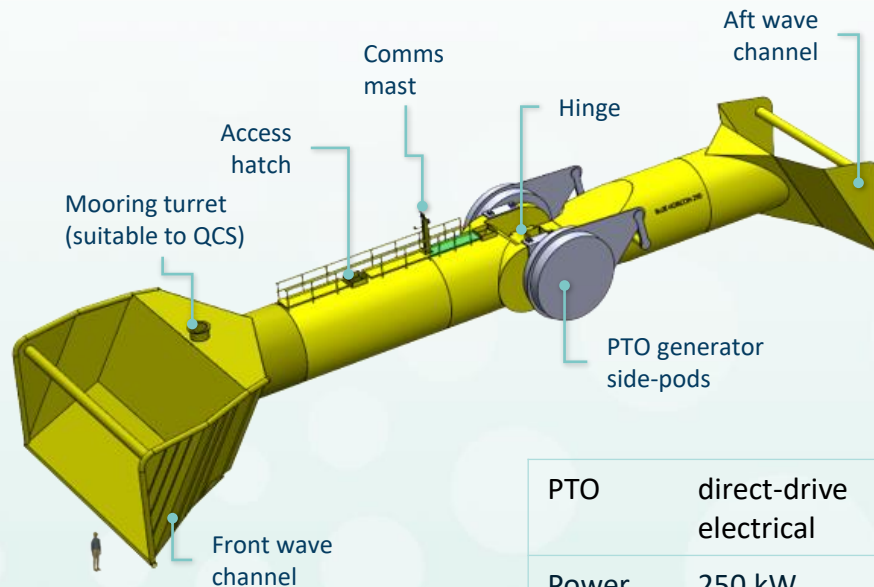


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Key features & innovations

- AI-based design for optimised geometry
- Asymmetry enhances cross-coupling between modes of motion, increasing bandwidth
- Wave channels add resonances, bandwidth, increase power absorption, and enable steep wave diving
- Self-referencing – hulls react against one another, wave contouring
- VHM generator ideally adapted to HT-LS reciprocating wave excitation



PTO	direct-drive electrical
Power	250 kW
Mass	450 tonne
Length	48 m

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Target applications

- 3 main markets identified:
 - Small islands & remote communities
 - Off-grid assets (e.g. O&G platforms, CCS)
 - Early grid projects (UK)
- Mid element in our “small-mid-grid” technology roadmap
- Longer term: further scale by size and by number



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Why EuropeWave?

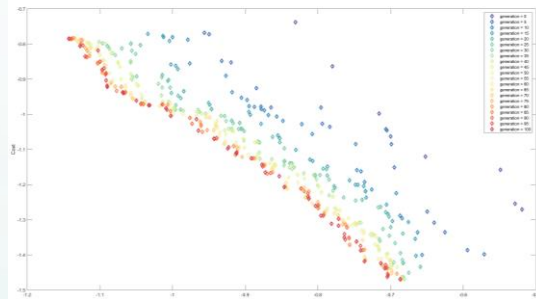
- Wave resource is Europe-wide and ultimately global, as is the market
- WEC production will require industrial resources and collaboration across Europe
- Opportunity to innovate & learn-by-doing, as per previous PCP involvement via WES NWECC program
- Mocean is ready to scale – EuropeWave provides a path and support
- Opportunity to undergo objective competitive assessment



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Phase 1: Learning and achievements

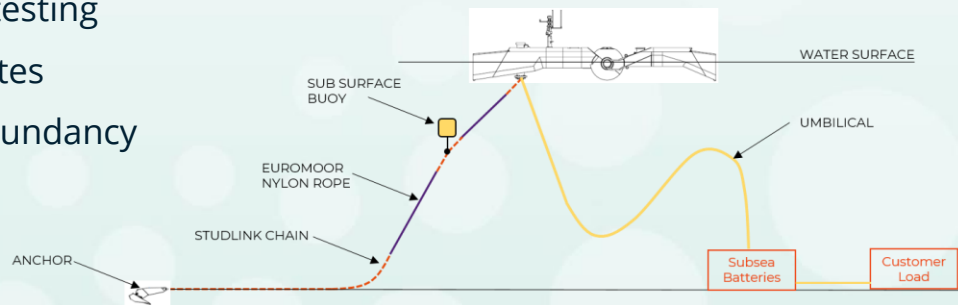
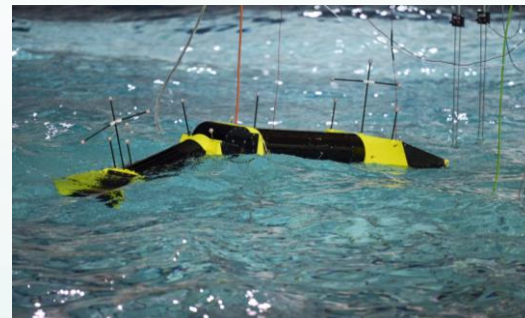
- Upgrade of numerical model: more elaborate shapes, higher fidelity, overcoming computational burden
- Reinforcement learning (RL) – accommodate goals beyond power performance, such as reliability via loading control
- Vernier Hybrid Machine (VHM): hybrid of PM and VR generators, smooths rotation and provides gearing
- Mooring concept established for station-keeping, anchoring and power export; storyboarding of mooring hook-up
- Implementation of lessons learned register
- 12 initial customer case studies conducted, informed by market analysis & customer discovery interviews



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Phase 1: Learning and achievements

- Tank tests @ two scales – validation & survival; very good agreement between measured & modelled power predictions in irregular waves
- Basis of Design (BoD) established
- TPV of tank testing and of structural design
- Survivability: hinge design and survival testing
- Manufacturability: visited 7 fabricator sites
- Reliability: modularity & sub-system redundancy
- Technical & project risk registers



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Phase 2: Activities and Team

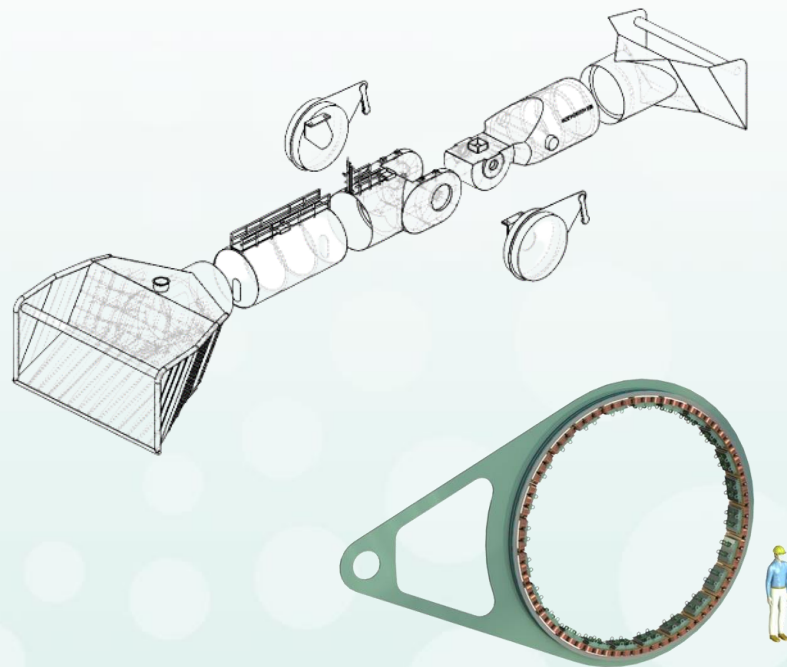
- Activities are spread across 10 work packages; aim to refine technical & commercial proposition
- From 6 partners in Phase 1 to 12 in Phase 2
- Optimisation – hydrodynamic, structural, RL
- Improve fidelity and traceability of LCOE, particularly O&M modelling
- Optioneering of QCS for moorings & selection of appropriate wet-mate connector
- Technology Qualification process
- RFQs already issued to potential fabricators



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Phase 2: Objectives and milestones

- Modularity & materials: internal stage-gate
- “Freeze” prime mover geometry
- VHM – scale up & dedicated rig build
- Assessment of local facilities & storyboarding of wider operations
- Continue to improve across IEA-OES evaluation areas
- Target early project LCOE to be within viable commercial range (2-3 case studies focus)
- Industrial advisory panel



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Phase 3: Ambitions

- Build & deploy full-scale WEC – product vs prototype
- Achieve Stage 4 of IEA development: commercial-scale single device demonstration (TRL 7)
- Demonstrate power performance and O&M over a period of 12 months at sea; de-risk manufacturability; gather more learning
- Establish commercialisation strategy
- Meet IEA-OES metrics – exceed cost of energy targets identified via case studies





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