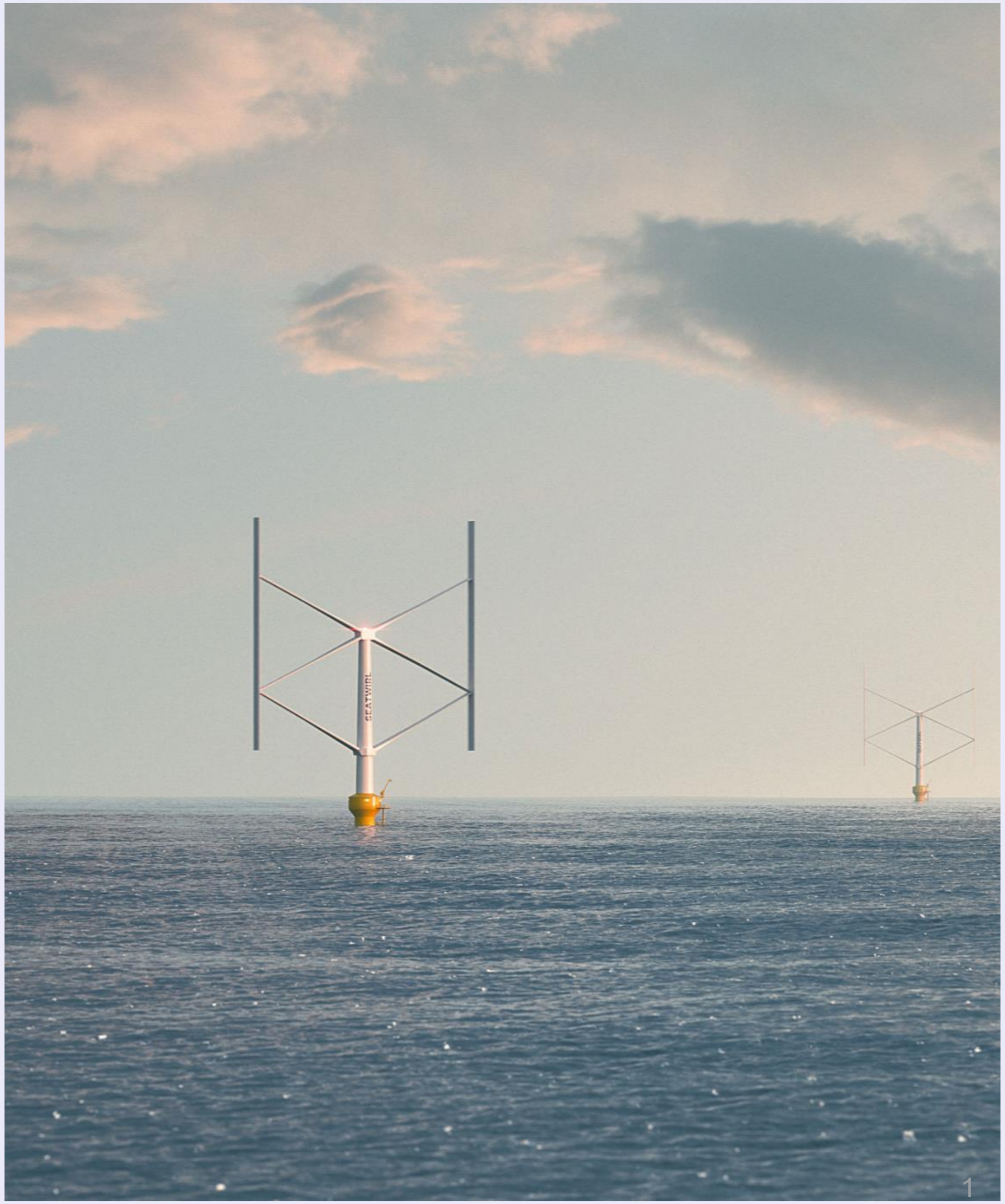
VERTI-GO

VERTI-GO

Demonstration of a VERTIcal-axis floating wind turbine for offshore energy Generation with improved performance and accessibility for Operation & maintenance

General Presentation

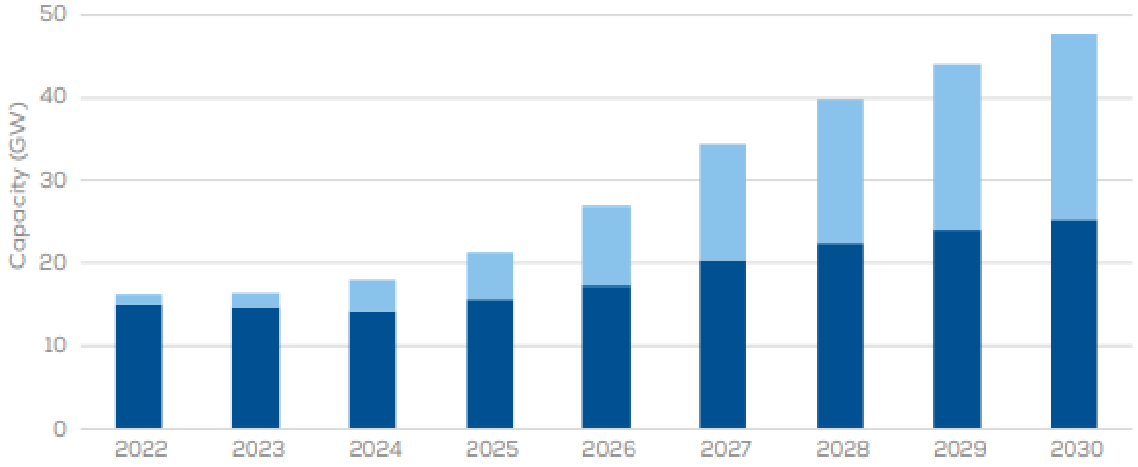


Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Europe’s Accelerating Renewable Transition

- By 2025, wind is projected to be the EU's main electricity source, supplying 50% of total power demand.
- Floating offshore wind is expected to reach 264 GW by 2050, contributing to 15% of offshore wind generation.



	2022	2023	2024	2025	2026	2027	2028	2029	2030
Onshore wind	14.9	14.7	14.2	15.7	17.2	20.3	22.3	23.9	25.2
Offshore wind	1.2	1.8	3.8	5.7	9.8	14.1	17.5	20.1	22.4

Source: WindEurope

Fig. 1 Build out capacity of wind energy in the EU under the REPowerEU scenario

VERTI-GO

Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Opportunities in Floating Offshore Wind Deployment

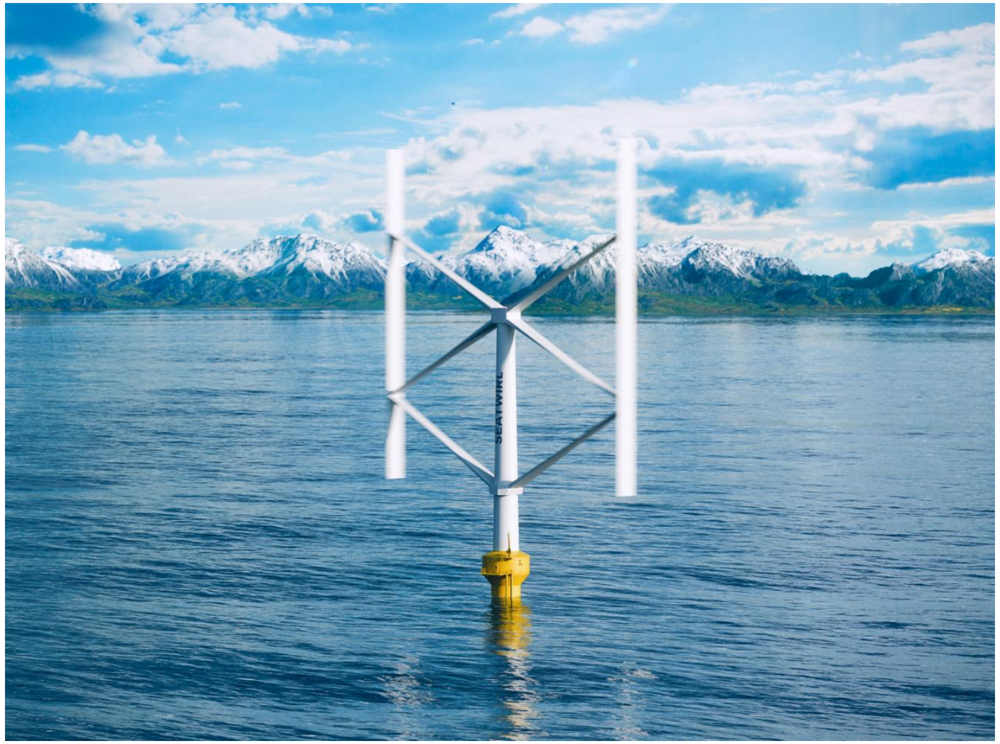


Fig. 2 Floating offshore wind turbine models by SeaTwirl

Fixed-bottom offshore wind is reaching its limits: suitable shallow sites are scarce, and visual/noise concerns often delay or block projects.

Floating wind unlocks new areas by accessing deeper waters (>50 m), opening up 80% of Europe's marine space with stronger, steadier winds.

Floating wind reduces seabed impacts compared to fixed-bottom foundations, easing environmental and regulatory pressures.

VERTI-GO

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Challenges in Floating Offshore Wind Deployment

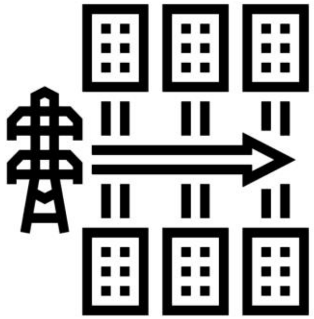
- **HIGHER UPFRONT COSTS**

30–50% more CAPEX than fixed-bottom wind, with widely varying LCOE (≈95–160 €/MWh)

- **EMERGING SUPPLY CHAIN**

Limited production capacity for platforms, moorings, and vessels creates bottlenecks

- **GRID CONNECTION COMPLEXITY**



Far-offshore projects need advanced HVDC systems and grid upgrades

- **CHALLENGING OPERATING CONDITIONS**

Harsh offshore environments lead to demanding maintenance (50–80% total OPEX)

VERTI-GO

Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Opportunities for Vertical Axis Wind Turbines (VAWT)

HAWT rely on mature fixed-bottom tech, but face issues:

- complex installation
- high centre of gravity
- expensive O&M

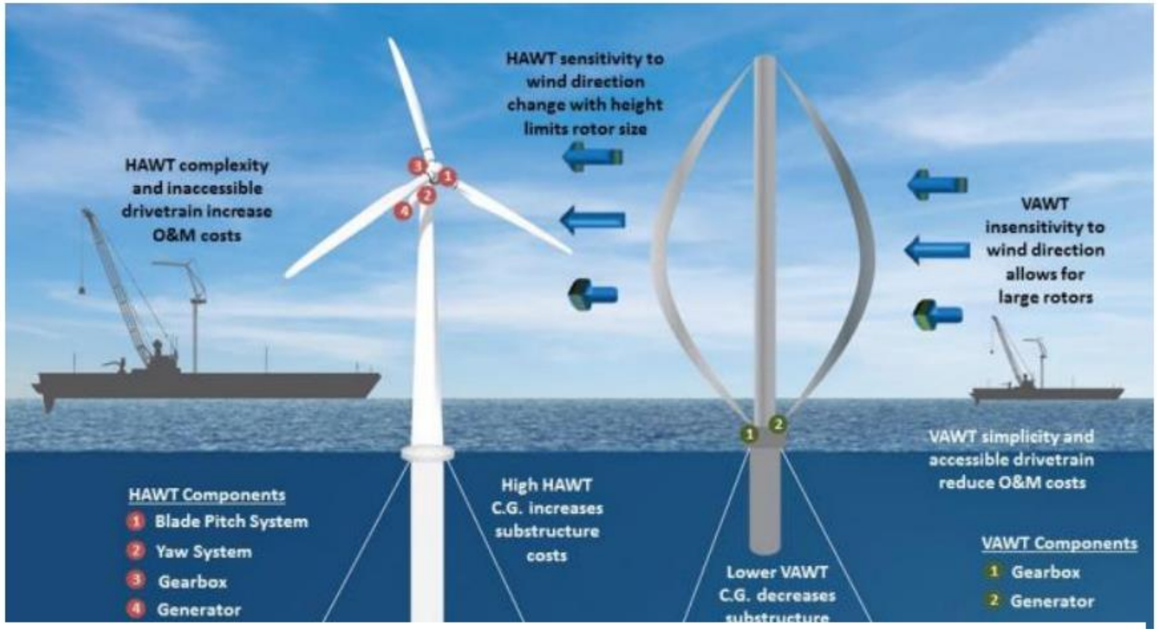


Fig. 3: HAWT vs VAWT showing main components

VAWT advantages

- **Easier and cheaper to maintain:** simpler access reduces downtime and lifecycle costs
- **More stable design:** lower centre of gravity improves reliability in harsh offshore conditions
- **Higher energy density:** reduced wake effects allow turbines to be placed closer together
- **Scalable and cost-reducing:** large-scale demonstrators cut LCOE with simpler foundations and manufacturing
- **Enables new design innovation:** advanced blade, structural, and mooring address fatigue and load challenges

Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

VERTI-GO Project's Aim

"to address the **key challenges** faced by floating offshore wind turbines today, **offering a solution** that is not only **more efficient** and **cost-effective** but also **simpler to operate** compared to state-of-the-art floating wind turbine technologies"

Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

VERTI-GO Project Overview and Key Facts

- **Grant Agreement No.** 101235735
- **Participants:**
- 11 partners from 9 European countries

- **Coordinator:** University College Cork (Ireland)

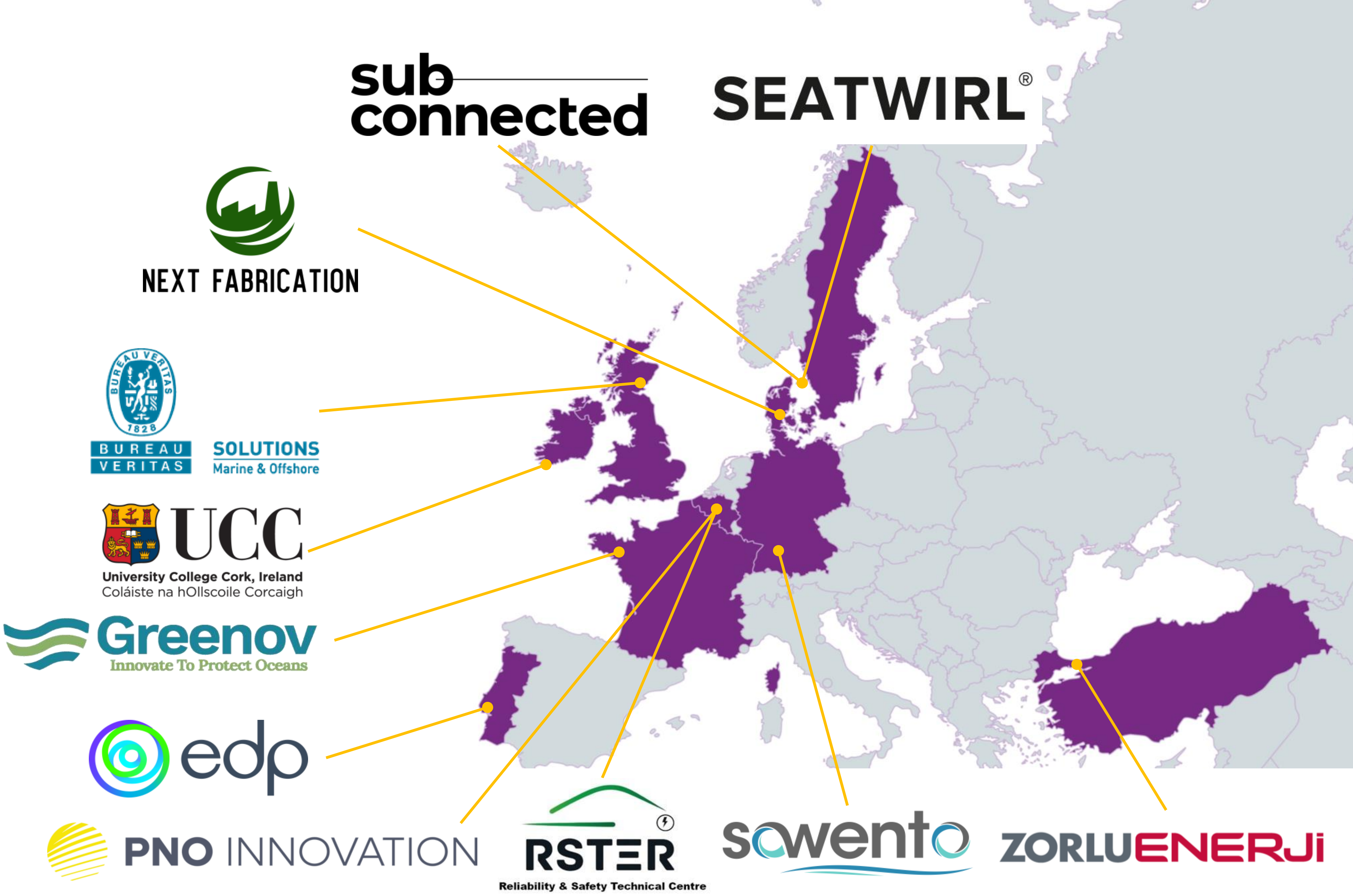
UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

- **Duration:**
- 48 months (1 Oct 2025 – 30 Sept 2029)
- **Project budget:**
- **Total Budget:** € 20.9 Million
- **EU Funding Budget:** € 15.0 Million

Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

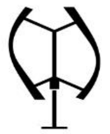
Consortium Partners



Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

OBJECTIVES



1. Develop and validate a **2 MW floating VAWT** (85–100 €/MWh LCOE) at an 8 km offshore site (200 m depth) to operate for 15 months for data collection and optimisation of O&M (20% downtime reduction)

2. Ensure **use ≥ 25% recycled/low-carbon** materials & ≥ **50 wt. % EU-sourced components**, leading to 10% CAPEX/MWh reduction

3. Develop a **Digital Twin** using structural, aerodynamic, and weather models to improve design and reliability

4. Conduct **environmental assessment** to achieve reduction of carbon footprint (15%) and noise (10%)

5. Engage stakeholders and build business models to support **commercialisation**

VERTI-GO

The VERTI-GO concept

The technology

Integration tower-spar into one vertical rotating unit	Simpler manufacturing process	- CAPEX
Lower centre of gravity	High stability with smaller floating system	- CAPEX
Improved accessibility to the rotating parts	Maintenance onshore, no big vessels	- OPEX

Lower LCOE

30kW prototype (TRL 5) in operation since 2015

Operating 2MW demonstrator (TRL 8)

Stage 1: Planning & design

- Feasibility study for different use cases (edp, ZORLUENERJI)
- Permits, site & certification (BUREAU VERITAS, SEATWIRL)
- Demonstrator design (SEATWIRL)
- Simulation & DT foundation (sowento, RSTER)
- Supply assessment (NEXT FABRICATION, BUREAU VERITAS, SEATWIRL)

FID (go/no-go upon **ALL** partners agreement)

Stage 2: Procurement & Commissioning

- Component manufacturing and Assembly (SEATWIRL, NEXT FABRICATION)
- Grid connected: Demonstrator Deployment on testing site (BUREAU VERITAS, subconnected)

Stage 3: Operation & Monitoring

- Operation for 18 months (SEATWIRL)
  - Optimize O&M Strategy (UCC)
  - Data gathering & model refinement (RSTER) → Real-time Digital Twin (sowento)

Environmental Assessment & Monitoring (sowento, Greenov – Innovate To Protect Oceans)

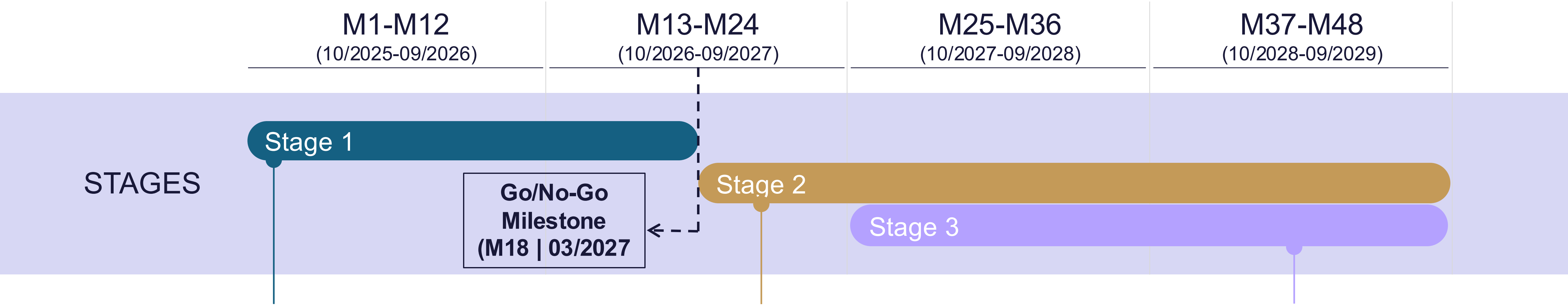
Communication, Dissemination & Exploitation including business development (SEATWIRL, PNO)

VERTI-GO

Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Work Plan



Planning and Design (M1-M18)

- Conduct feasibility studies
- Advance design from concept to detailed engineering
- Develop physical models for performance validation
- Define Digital Twin architecture for monitoring and maintenance
- Plan procurement and supplier selection for key components

Procurement and Commissioning (M19-M48)

- Manufacture and procure components and systems
- Assemble 2 MW demonstrator
- Optimize blade manufacturing for cost efficiency
- Manage safe and efficient offshore installation
- Implement dynamic cabling for reliable floating operation

Demonstrator Operation and Monitoring (M25-M48)

- Operate the 2 MW demonstrator for 15 months
- Collect and analyse operational data to refine design and improve performance
- Implement Digital Twin for monitoring and predictive maintenance
- Optimize O&M strategy for efficiency/scalability
- Conduct environmental impact assessment

VERTI-GO

Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

VERTI-GO

Thanks for Listening!

https://www.vertigo-project.eu/

https://www.linkedin.com/company/verti-go-project

Co-funded by the European Union

Co-funded by the European Union under Grant Agreement No. 101138353. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.