

Floating Wind Solutions

Provence Grand Large – Paving the Way to Commercial Floating Wind Projects

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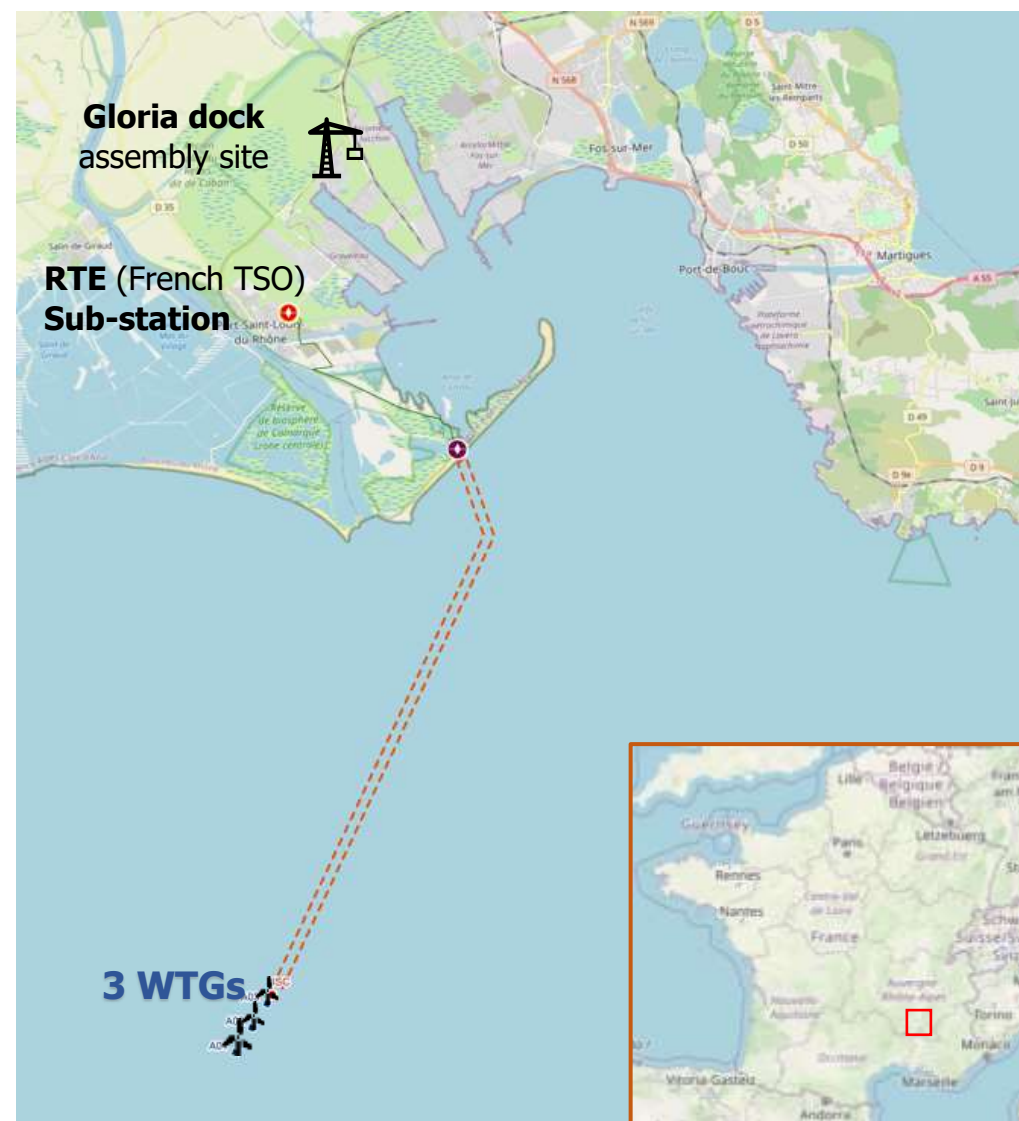


Organized by

The logo for FWS, featuring a blue stylized wind turbine icon to the left of the letters "FWS" in white.

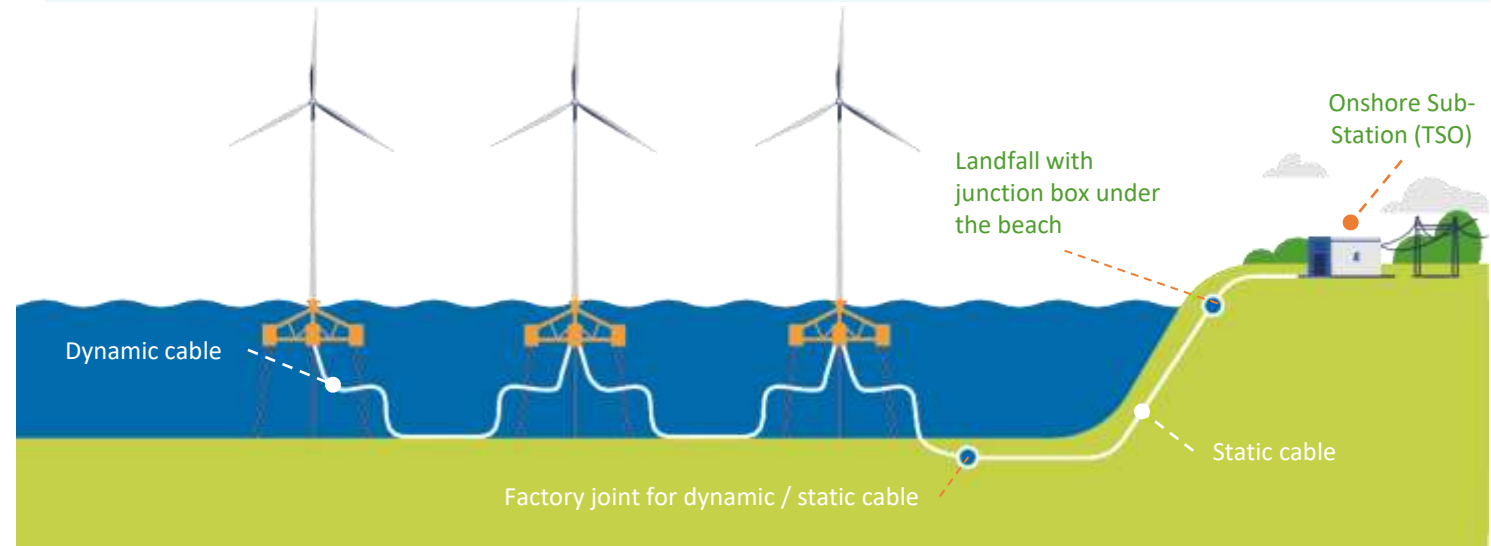
Hilton Americas, Houston February 5-7, 2024

Provence Grand Large (PGL) – First Floating Offshore Wind Farm in France

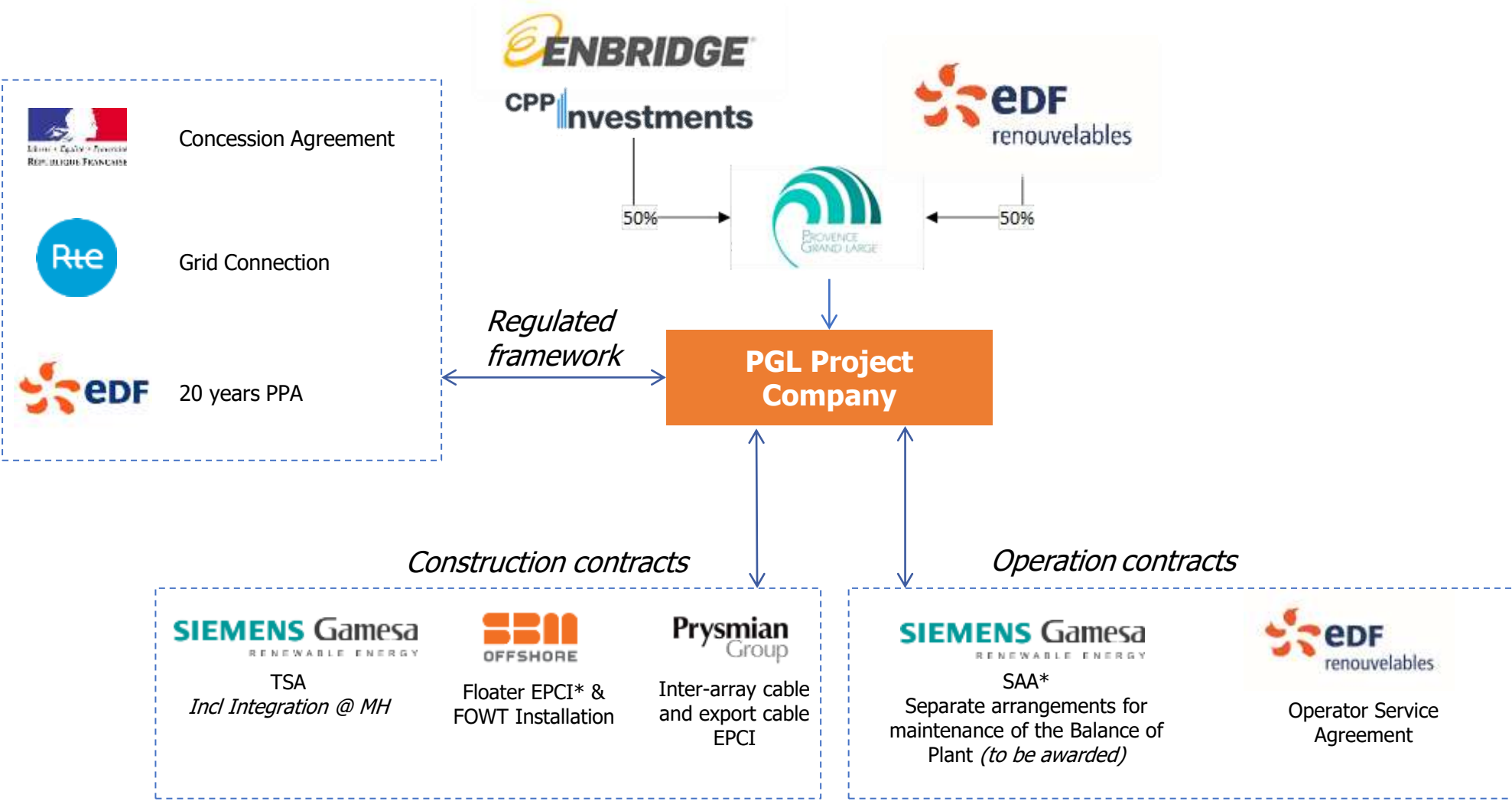


Project description:

- **17 km** from Port-Saint-Louis-du-Rhône (close to Marseille)
- Installed power : **25 MW**
- Water depth : **100 m**
- Average wind speed: **10 m/s**
- Turbines: Siemens Gamesa / **8.4 MW direct-drive**
- Floaters: SBM Offshore / **Tension Leg Platforms**
- Grid: Prysmian / **66kV – dynamic cables** – direct link to shore
- **19km** of offshore export cable and **9km** of onshore cable



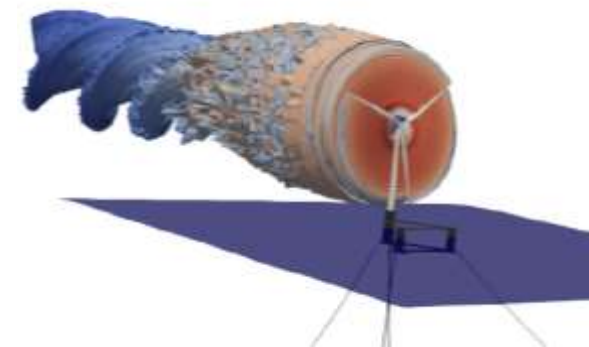
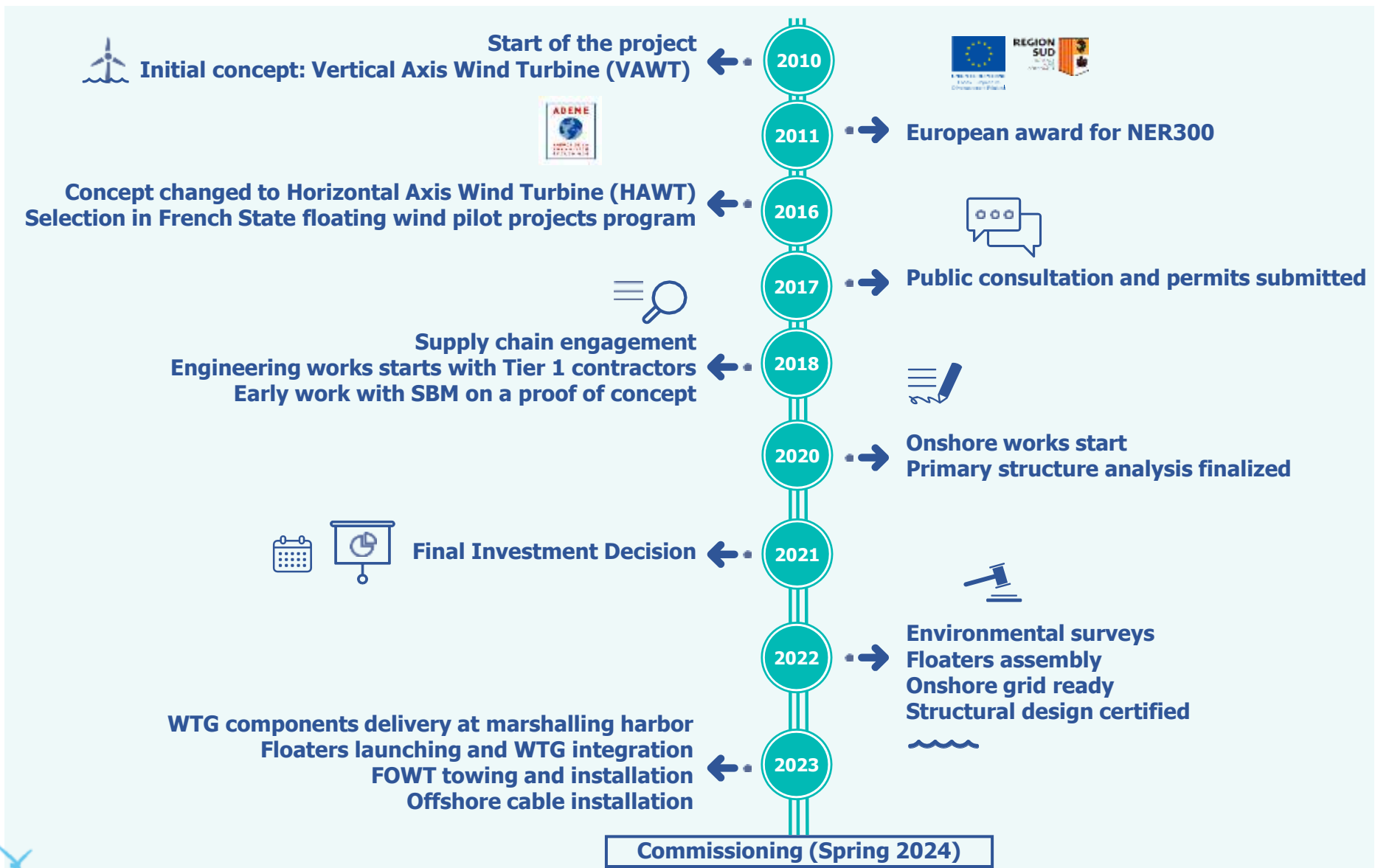
PGL Main Stakeholders Overview



- EPCI: Engineering, Procurement, Construction and Installation
- TSA: Turbine Supply Agreement
- MH: Marshalling Harbor

- SAA: Service Availability Agreement

Long Road from Project Inception to Commissioning



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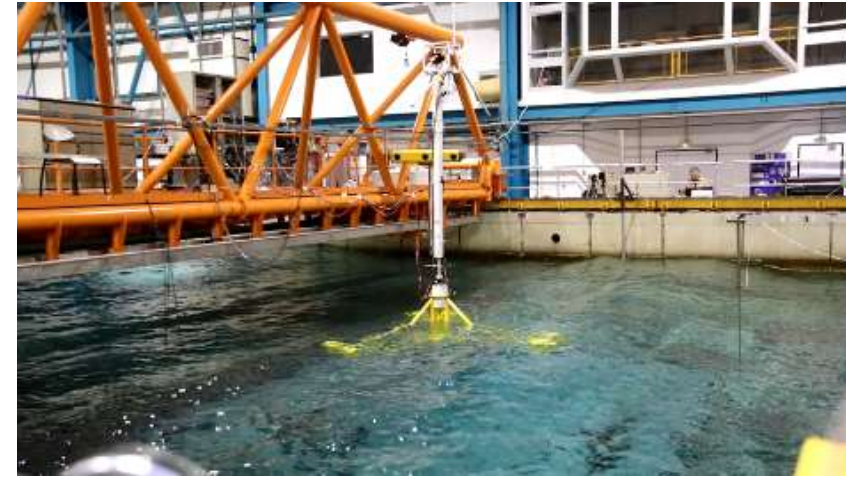


PGL demonstrates the technical and economic feasibility of an innovative technology

✓ **Demonstration of the technical feasibility**

- Validation and calibration of numerical modelling by reduced scale **experimental tests in wave tank.**
- **Innovations on dynamic cables**
 - Fast disconnection system (hang-off and bend stiffener quick release)
 - 66kV factory seal between static export and dynamic cables
 - Inter-array cables fatigue tests to demonstrate long-term integrity and global behavior of the cables

✓ **First floating project financed by commercial banks, thanks to detailed due diligences of legal, technical and commercial aspects of the project**



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Harbor Operations Overview

Assembly Site
1 Final assembly
2 Load-out on barge

Deep/wide area
3 Float-off

Marshalling Harbor
5 WTG integration

Storage Quay
4 Storage
6 Pre-commissioning

To Offshore Site
7 Towing
8 Hook-up

O&M
9 O&M Base



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Marshalling Harbor Operations Overview

✓ Extensive preparation ahead of operations:

- Ground re-enforcement
- Quay and bollard upgrade
- Living quarter development
- Crawler cranes assembly

✓ Main challenges:

- Interface management
- Harbor co-activities
- Floater stability during WTG integration





PGL offers crucial learnings for the future commercial wind farms

- ✓ PGL relies on **technical innovations**, notably on methods and tools that create new references for floating wind and open the path to specific certification
- ✓ PGL offers unique learnings to EDFR as a Developer, but also to **the Industry in general**: Supply Chain, Harbors, Government, Regulatory, etc
 - **Harbor infrastructure upgrades** need to be anticipated as early as possible (especially for commercial scale)
 - **WTG integration must be improved** by engaging early and collaboratively with OEMs
 - Clarification of the **applicable regulatory framework** creates a precedent for future windfarms
- ✓ PGL also offers **direct synergies and benefits** to the upcoming commercial floating wind farms:
 - Contribution to **industrial partners development**: workforce, manufacturing sites, infrastructures, technology development, etc.
 - Potential **re-use** of some infrastructure developed for PGL
 - Part of the **learning curve for all stakeholders** for future commercial floating wind farms
 - These synergies and benefits are particularly relevant to upcoming **Mediterranean tenders**
- ✓ PGL demonstrated **TLP concept feasibility and associated benefits**: small footprint (ideal for compatibility with fishing activities), excellent in-place performance, etc. However, learnings are relevant to other concepts than TLP
- ✓ PGL opens the road to all **financing stakeholders** (banks, insurances etc.) by contributing to the global floating wind track record



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Thank you!

Project co-developed with:



Project supported by:

