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

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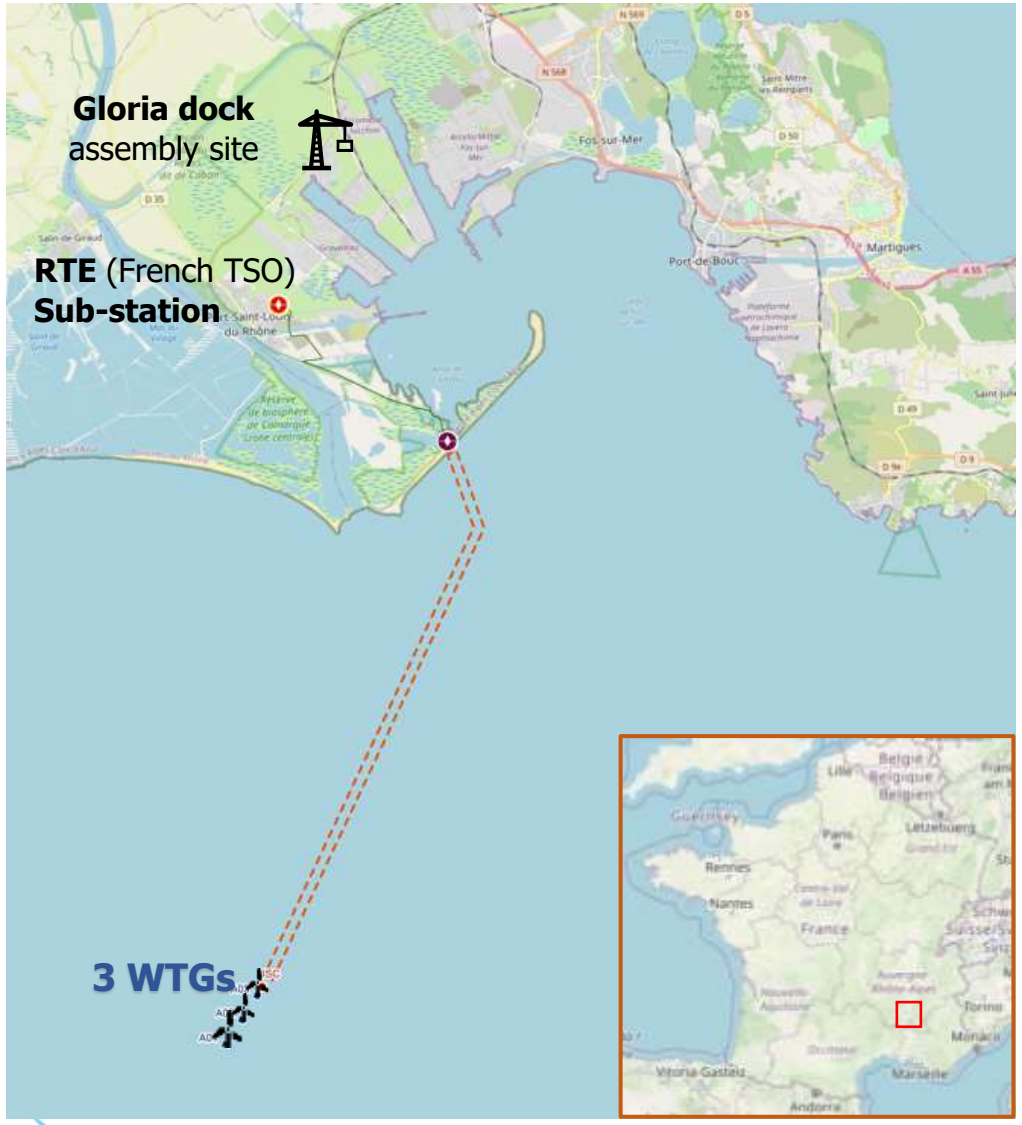
EDF renewables

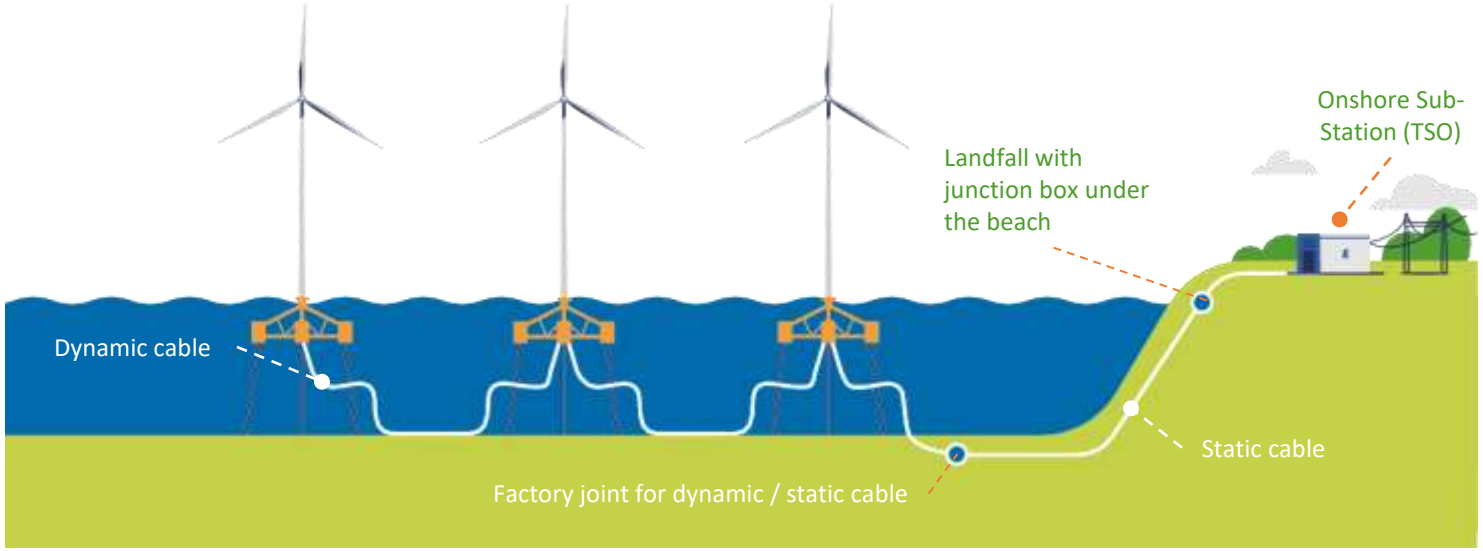
Organized by FWE Quest Offshore

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

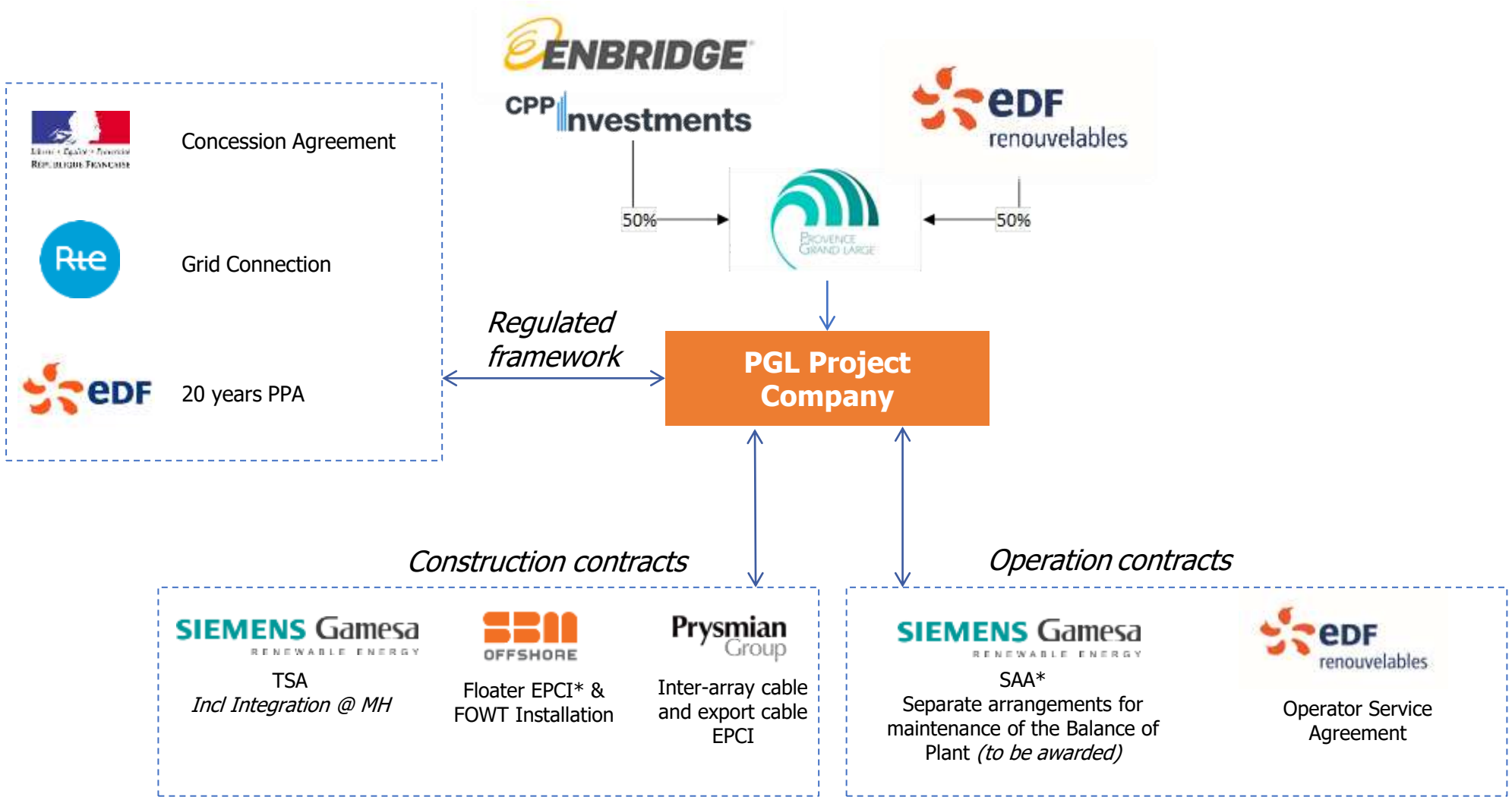


Project description:

- **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

2010
- Start of the project
- Initial concept: Vertical Axis Wind Turbine (VAWT)

2011
- European award for NER300

2016
- Concept changed to Horizontal Axis Wind Turbine (HAWT)
- Selection in French State floating wind pilot projects program

2017
- Public consultation and permits submitted

2018
- Supply chain engagement
- Engineering works starts with Tier 1 contractors
- Early work with SBM on a proof of concept

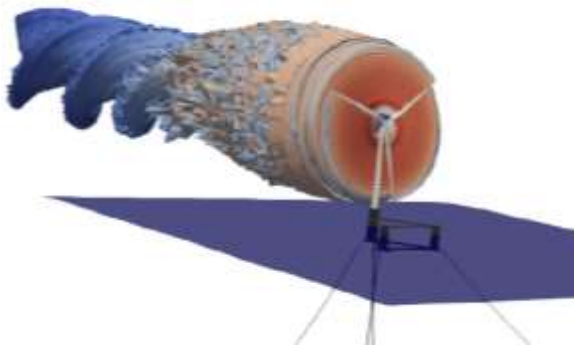
2020
- Onshore works start
- Primary structure analysis finalized

2021
- Final Investment Decision

2022
- Environmental surveys
- Floaters assembly
- Onshore grid ready
- Structural design certified

2023
- WTG components delivery at marshalling harbor
- Floaters launching and WTG integration
- FOWT towing and installation
- Offshore cable installation

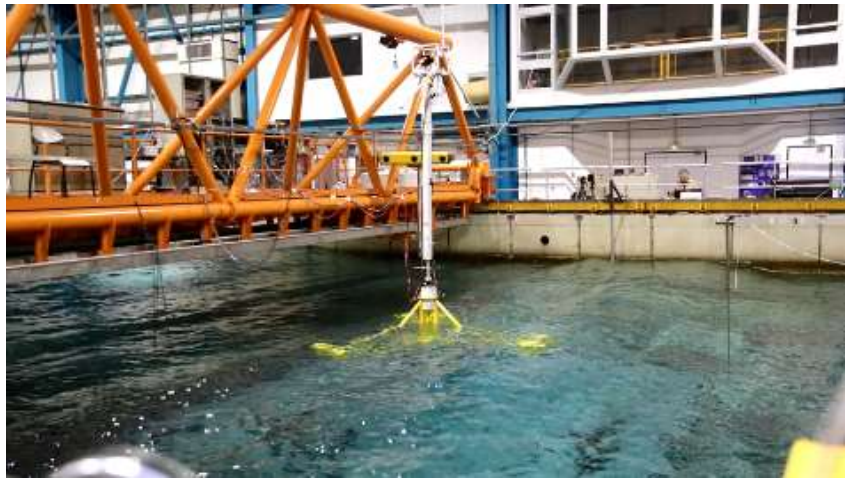
Commissioning (Spring 2024)



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**



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

Floating Wind Solutions

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**

Thank you!

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CPP Investments

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