

# Floating Wind Solutions

## Defining and optimizing strategy for floating wind installation in challenging environmental conditions

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IMDC - Tractebel



TRACTEBEL



Organized by



Quest Offshore



## Within Our Group

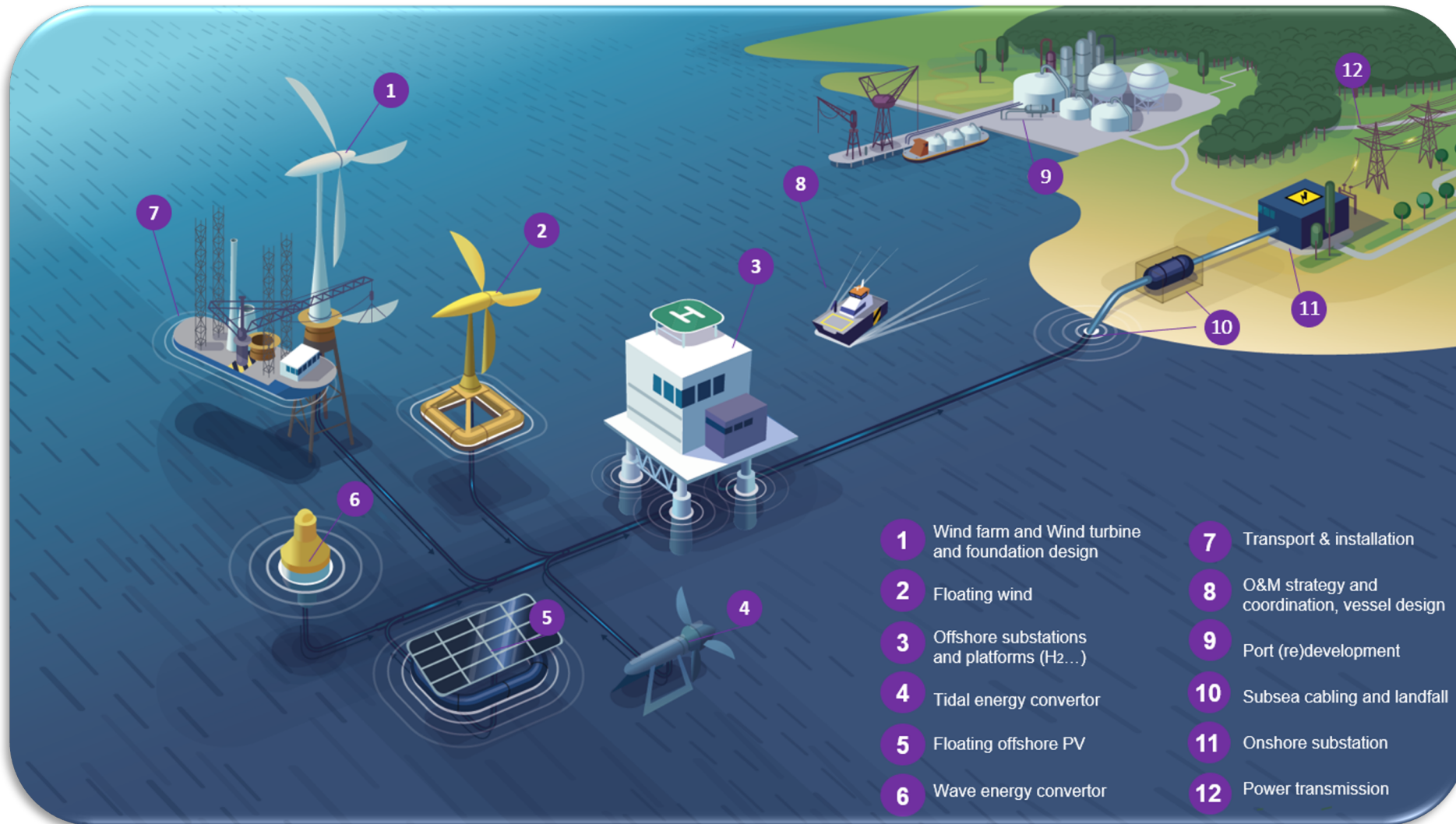
The ENGIE logo features a blue wave-like graphic above the word "ENGIE" in a bold, blue, sans-serif font.The TRACTEBEL logo consists of the word "TRACTEBEL" in a bold, blue, sans-serif font, with the smaller "ENGIE" logo (wave and text) positioned below it.The IMDC logo features a circular icon composed of horizontal wavy lines in shades of blue and green, followed by the letters "IMDC" in a bold, blue, sans-serif font.

“with its international, independent and multidisciplinary expertise, IMDC with partner companies provides as Owner’s Engineer and Consultant Engineer integrated and tailor-made expert advisory services and innovative solutions for your offshore wind projects (fixed and floating)”

The LAHMEYER INTERNATIONAL logo features a stylized "LI" icon with a red dot above the "I", followed by the text "LAHMEYER INTERNATIONAL" in a bold, black, sans-serif font.The ENGIE Laborelec logo features the "ENGIE" logo (wave and text) above the word "Laborelec" in a smaller, blue, sans-serif font.The OVERDICK logo consists of the word "OVERDICK" in a bold, blue, sans-serif font.The DOC OFFSHORE logo features a yellow square icon with a white wind turbine silhouette, followed by the text "DOC OFFSHORE" in a bold, blue, sans-serif font.The IMDC logo features the circular wavy icon from the main logo, followed by the letters "IMDC" in a bold, blue, sans-serif font.

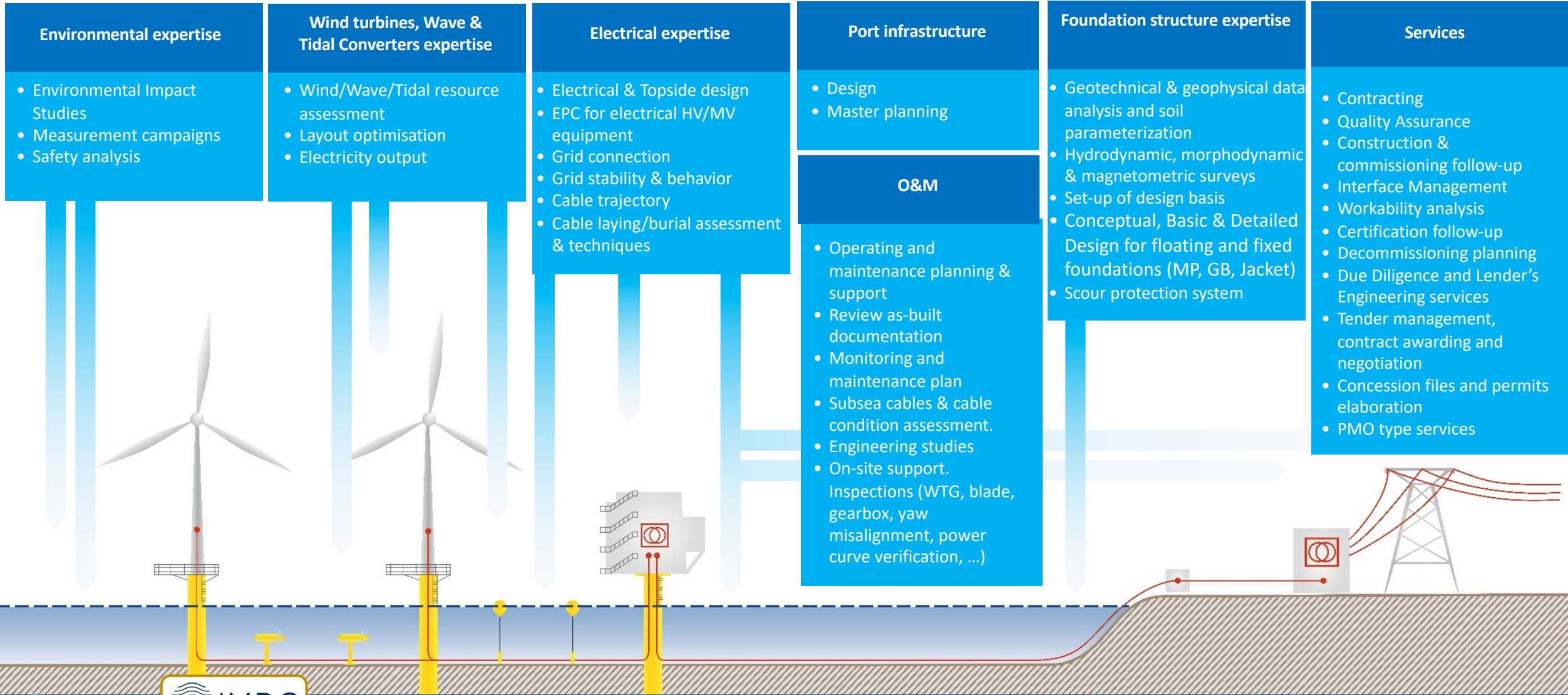


# Offshore Activities





# Offshore Services







# Our Expertise Applied on Floating Wind Projects



Raf Somers

The Marriott Marquis, Houston 1-3 March 2022

**Floating Wind Solutions**

Installation in challenging conditions





# Quay Side Installation

# Types of Installations at Ports

- Grounded Installation

- Seabed foundations to be installed at quay
- Stable working conditions
- Environmental site conditions less critical during installation
- [Applied @ Ferrol \(Portugal\) on WindFloat Atlantic Project for WindPlus](#)

- Floating Installation – Emergency Grounding

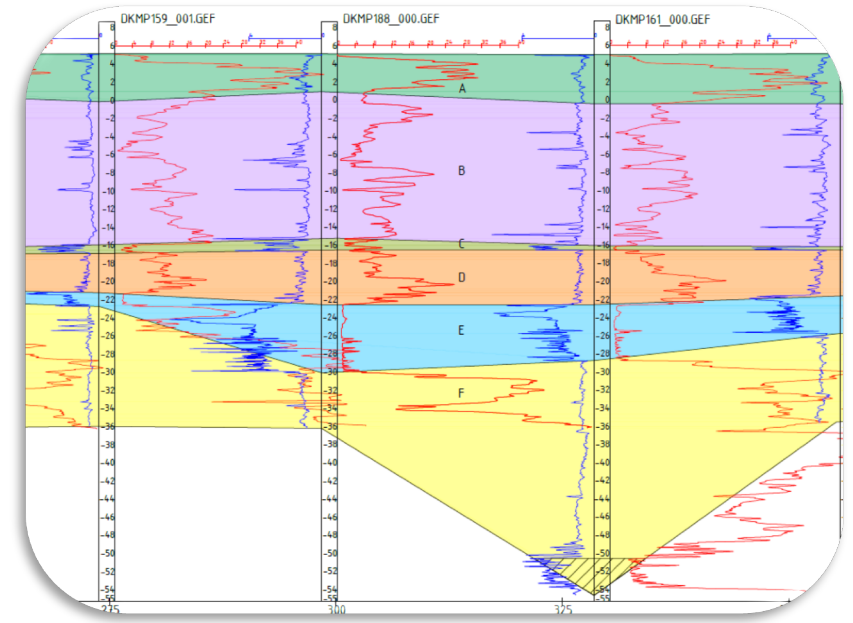
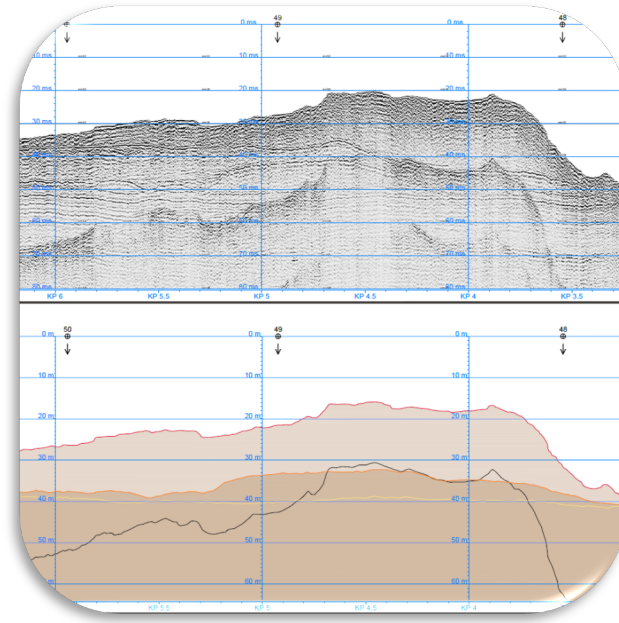
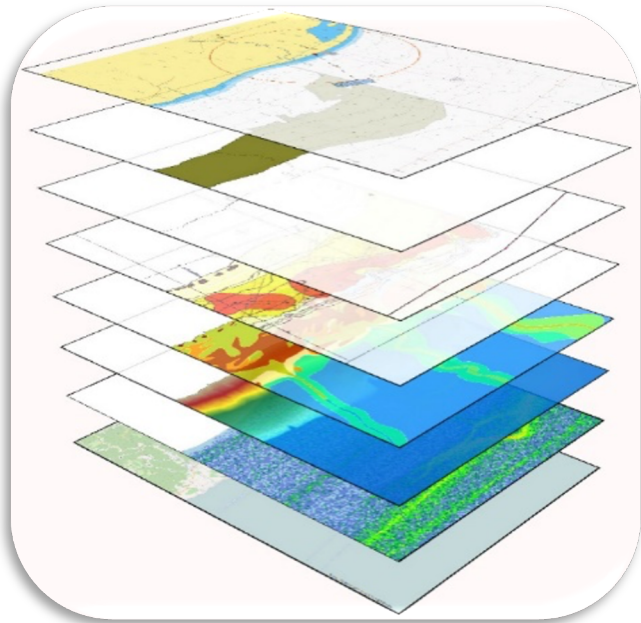
- No foundations needed (if bed can bear load)
- Environmental site conditions can become critical during installation
- Flexible working conditions
- [Applied @ Rotterdam \(The Netherlands\) on Kincardine OWF Project for Cobra Inte'national](#)





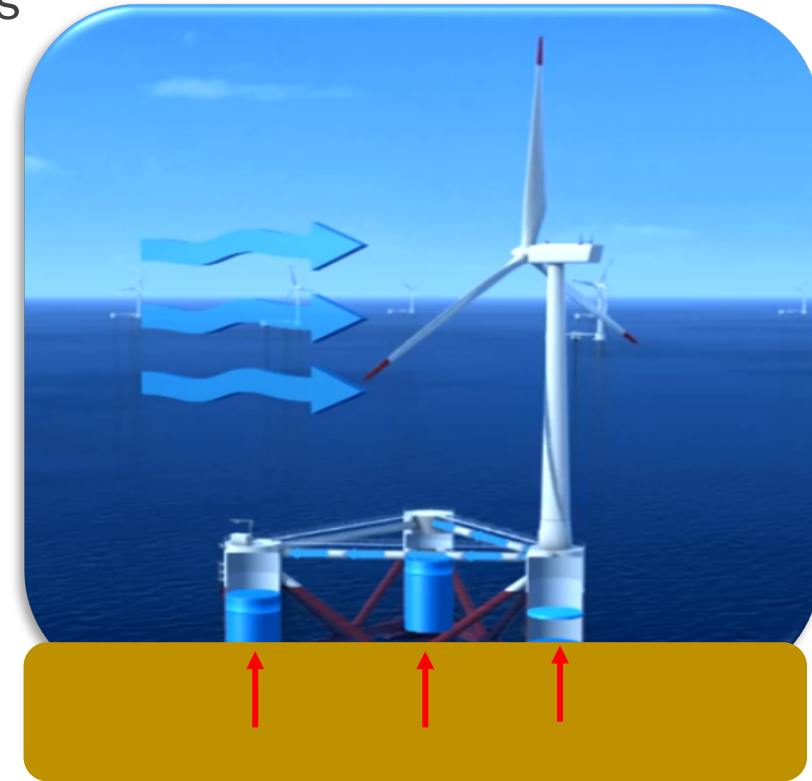
# Installation Site Characterization

- Water depth
- Waves & Currents
- Wind conditions
- Seabed Geotechnical conditions



# Design / Verification Steps

- Determine all loads acting on turbine & floating platform
  - External loads, depend on site conditions: wind, waves, water level, currents, ...
  - Loads depending on ballast water in floating platform's ballast tanks
- Convert those to loads acting on the seabed or foundation
  - Applying laws of structural mechanics
- Define subground strength & stiffness
- Geotechnical stability calculations of sub ground
  - Bearing capacity / curved slip sliding surfaces
  - Horizontal sliding & overturning
- Hydraulic rock stability calculations for foundation bed



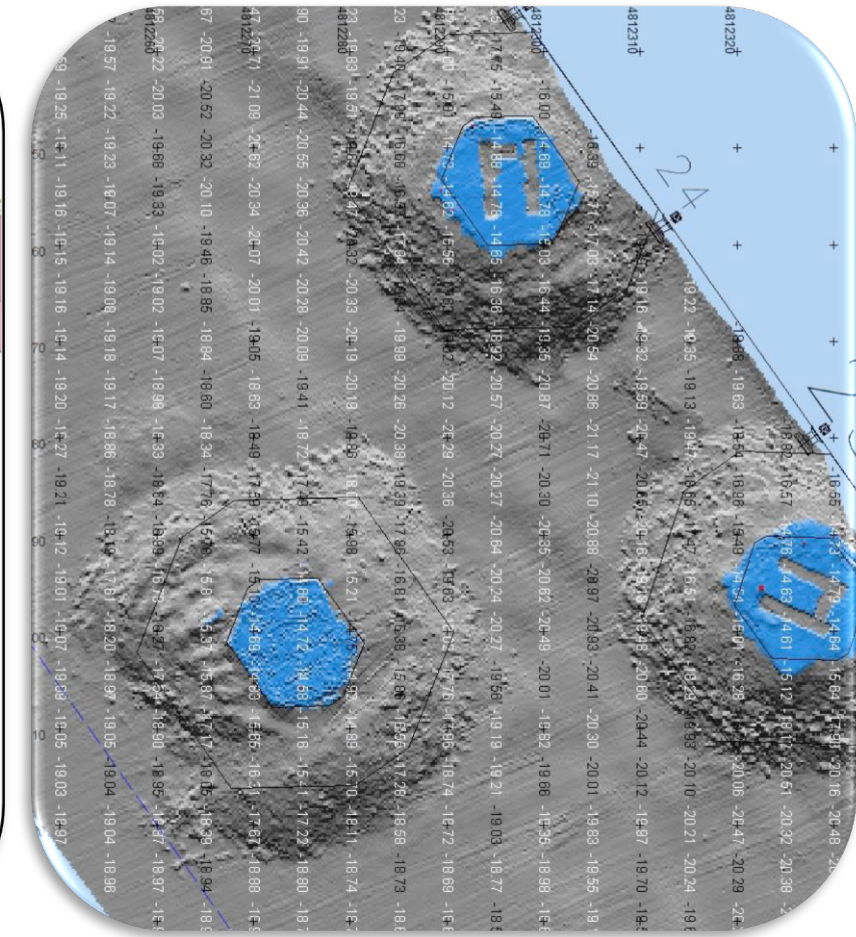
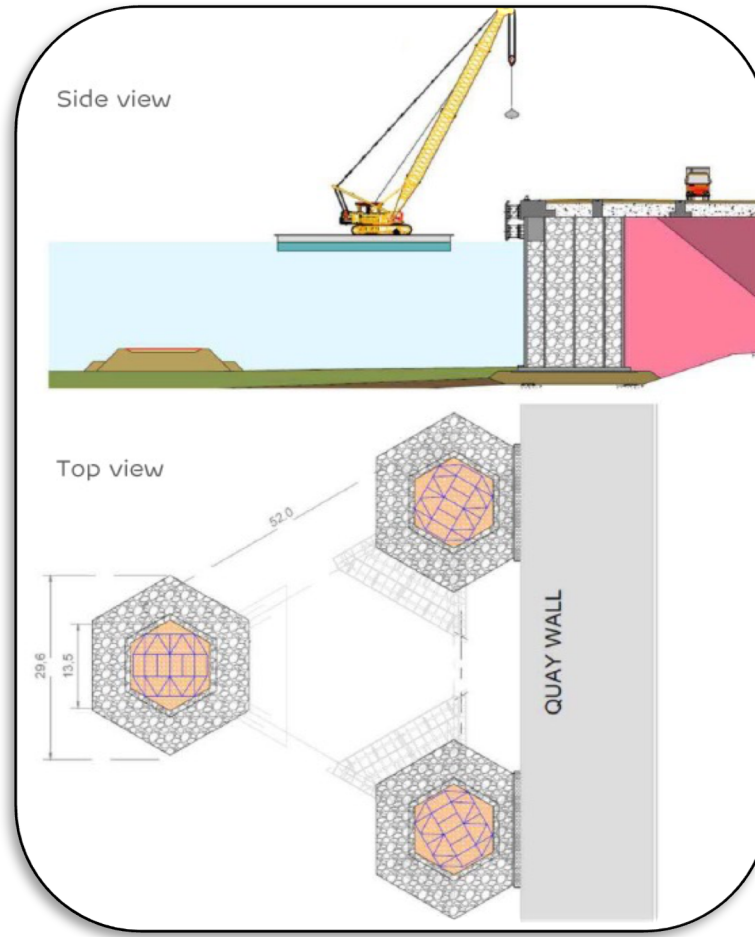
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# Foundation Beds – Grounded Installation

- Installed on seabed prior to arrival of floater
  - Rock placed on seabed in different layers
  - Correct placement monitoring
- Floater must be grounded/refloated slowly with controlled (de-)ballasting
- After installation foundations can be removed





PORTUGAL

25MW

WindFloat Atlantic



WF1



WFA

Capacity: × 4

Unit cost: × 1.75

Life extension: × 5

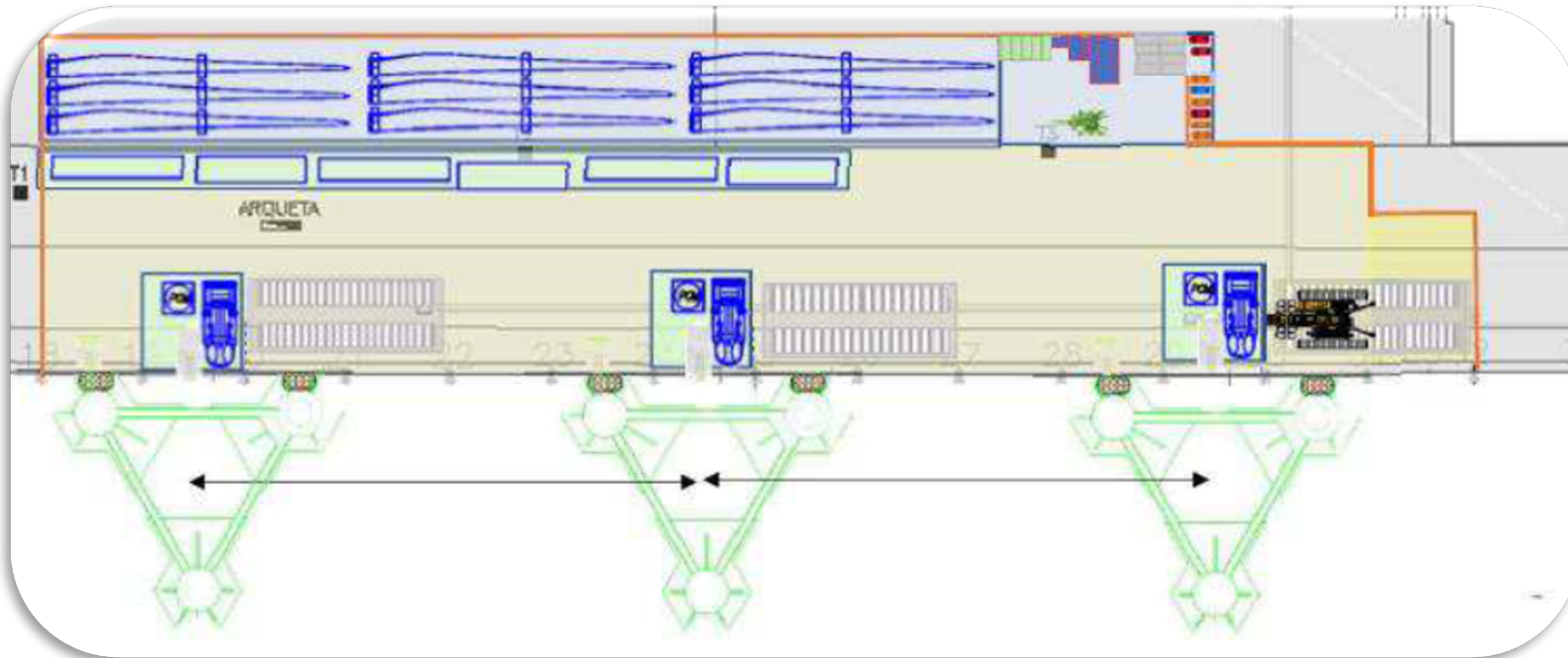
- Sizing ("smaller" platform)
- Structural optimizations
- Other improvements on equipment, accessibility, mooring, installation, O&M

# Other Services WindFloat Atlantic Project



# Coordination management during construction

- Mooring the platforms
- Construction of the bed layers for stabilization of platforms at port
- Ballasting and stabilization of platform
- De-ballasting and mooring of platforms
- Survey, installation and removing the bed-layers during assembly of platforms
- Site-manager during unloading and assembling the turbines



# Support during Commissioning

- Contacts with the local and official authorities, licenses, rescue plans
- Follow and participate in commissioning of floaters (shipyards)
- Organize and coordinate use of CTV during offshore installation phase and afterwards
- Close contact with the maritime authorities and coast guard
- Monitoring and following the environmental issues, bird radar, bats
- Weather forecast monitoring in order to schedule operations



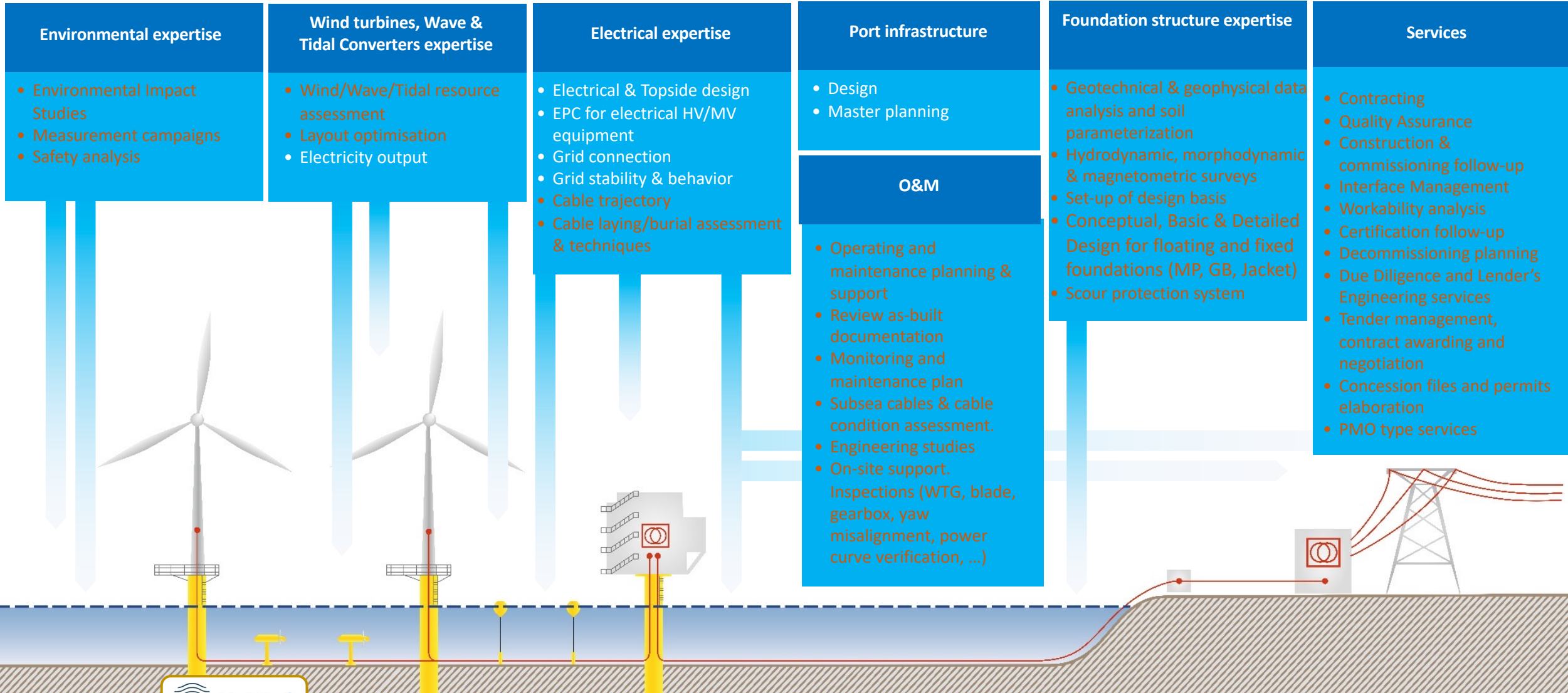


# Operations and Maintenance (O&M) Manager

- Define O&M strategy and prepare implementation
  - O&M based at nearby port
  - Onshore based O&M strategy with CTV support service
  - Fully dedicated team able to operate the offshore windfarm 24/7
- Manage and coordinate the daily O&M activities for the WTG and the floaters.
- Follow up the execution of the new O&M building activities
- Training: wind turbines and wind energy



# Services IMDC





# More details? Contact me!

By E-mail

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