FLAGSHIP Project:

New Horizon for Offshore Wind Energy Optimization

FLoAtinG offSHore wInd oPtimization for commercialization

This project has received funding from the European Union's Horizon 2020 Research And Innovation programme under Grant Agreement Nº 952979

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Agenda

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Project overview – WHAT'S FLAGSHIP?

Flagship originates from a **Consortium** created to participate in the European programme **Horizon 2020**, to develop a full-scale turbine in a site with replicable weather conditions for future potential projects.

Platform type: a **concrete semi-submergible** with a **+10 MW WTG**.

Goal: to prove **industrial-scale** fabrication is possible reducing **LCoE** to around **50 € / MWh**.

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Awarded a **25 MM €** grant from the **European Commission** (EC).

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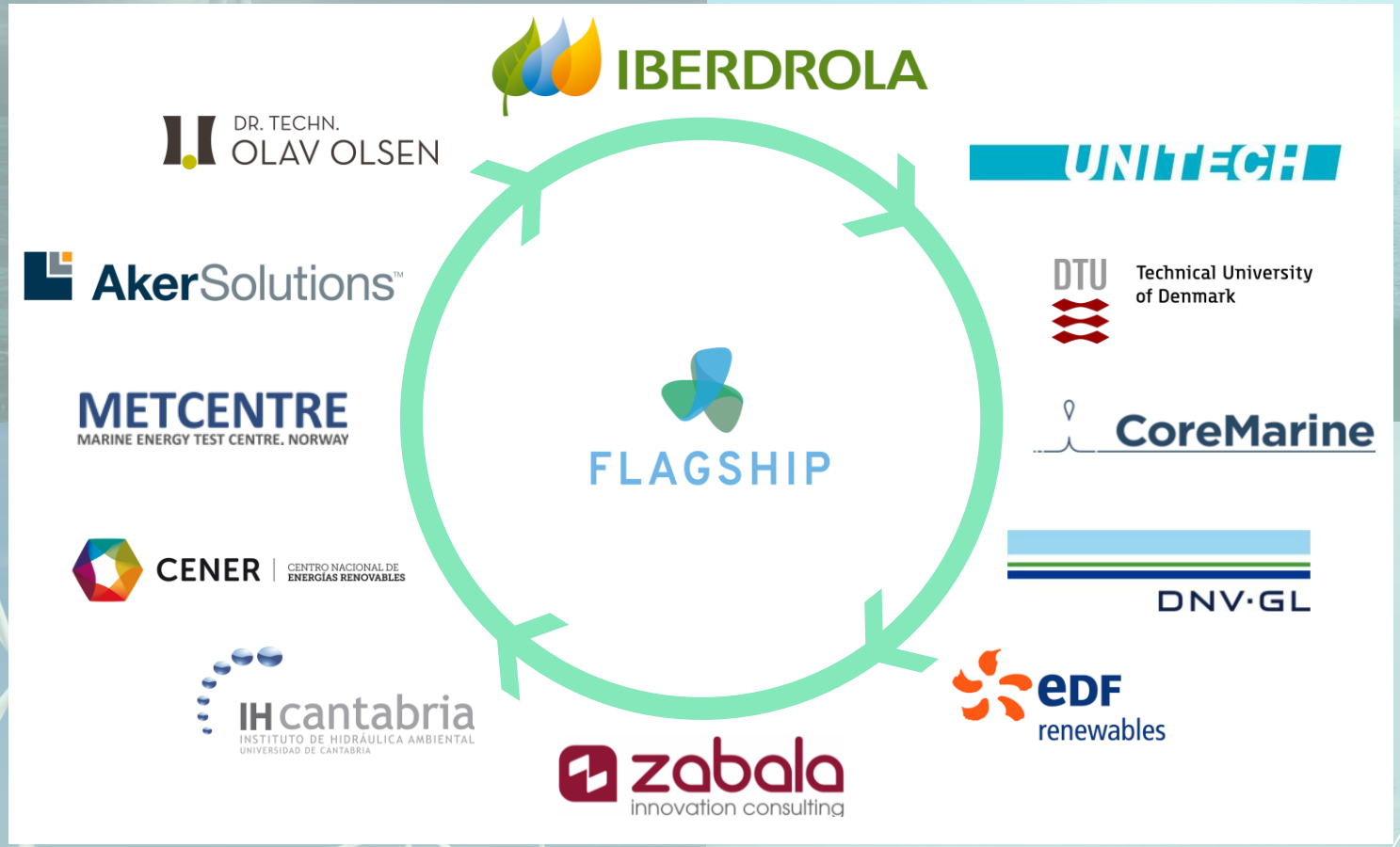
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Consortium

International consortium created including companies and institutions from 5 different countries:

- Spain
- Norway
- Denmark
- Germany
- France

Multi-disciplinary profile of the partners to offer an appropriate balance.

Background – WHY FLAGSHIP

- **Floating Offshore Wind** (FOW) technology holds the key to an **inexhaustible resource potential** in Europe for waters deeper than 60 m.
- FOW may host larger turbines in deeper waters.
- Aiming for areas with higher average wind speeds.
- FOW technologies still have to progress further.

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Challenges

- Achieving a higher **level of maturity** for FOW technologies.
- Developing suitable and replicable technologies for waters depth higher than 60 m and for distinct geographical areas.
- Boosting the **supply chain** to feed a higher demanding construction rate.
- Targeting a decrease of the FOW's **LCoE** under **60 €/MWh** to compete with fixed-bottom technology.

Project expected outputs

- To test the supply chain for concrete solutions.
- Benchmark with other floating technologies.
- Testing, constructing and cost-scaling for industrial production.

- LCoE estimation for different marine regions: North Sea, Baltic Sea, European and North American Atlantic, Asia-Pacific, Mediterranean Sea, etc...
- Ramping up in a promising market for floating projects in Europe.

Highlights

- Central tower for the turbine + 3 sym. pontoons

First 1:1 fully concrete semi submersible platform demonstrated

- Fully designed in **concrete** and to have a moderate draft in operation and a very shallow minimum draft.
- **Control System** developed to optimise the power generation.
- **WTG digital twins** built to replicate the platform of similar and larger capacity in different sea regions.
- Innovations in the **dynamic cable** consisting of a new aluminium-based section and accessories.

Here are it's technical details:

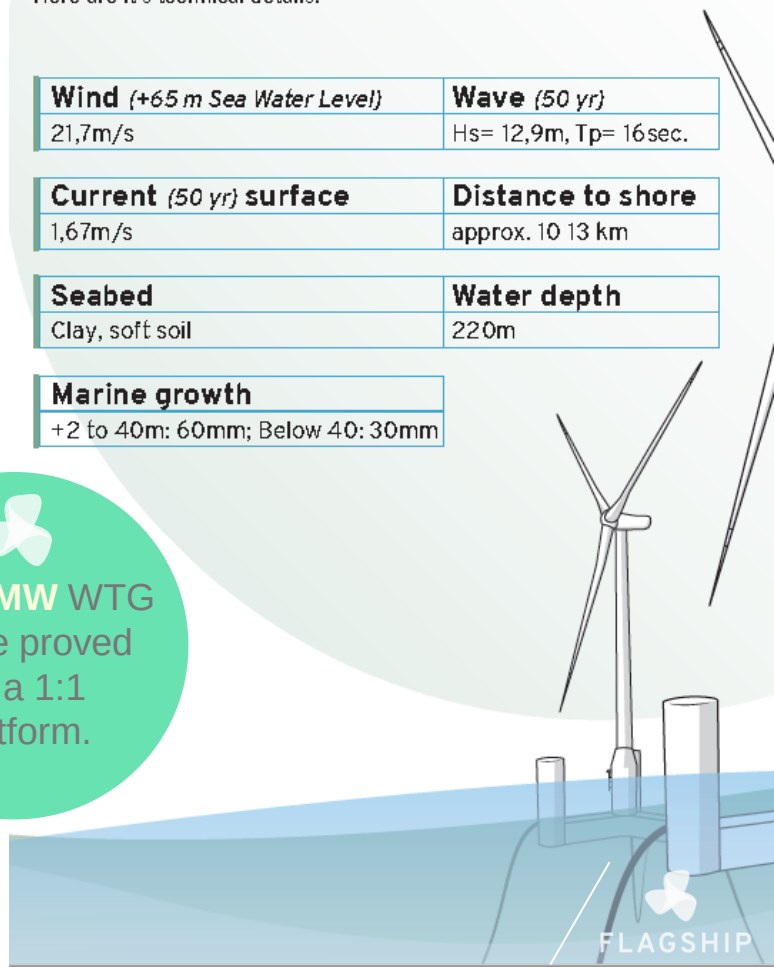
Wind *(+65 m Sea Water Level)*	**Wave** *(50 yr)*
21,7m/s	Hs= 12,9m, Tp= 16sec.

Current *(50 yr)* **surface**	**Distance to shore**
1,67m/s	approx. 10 13 km

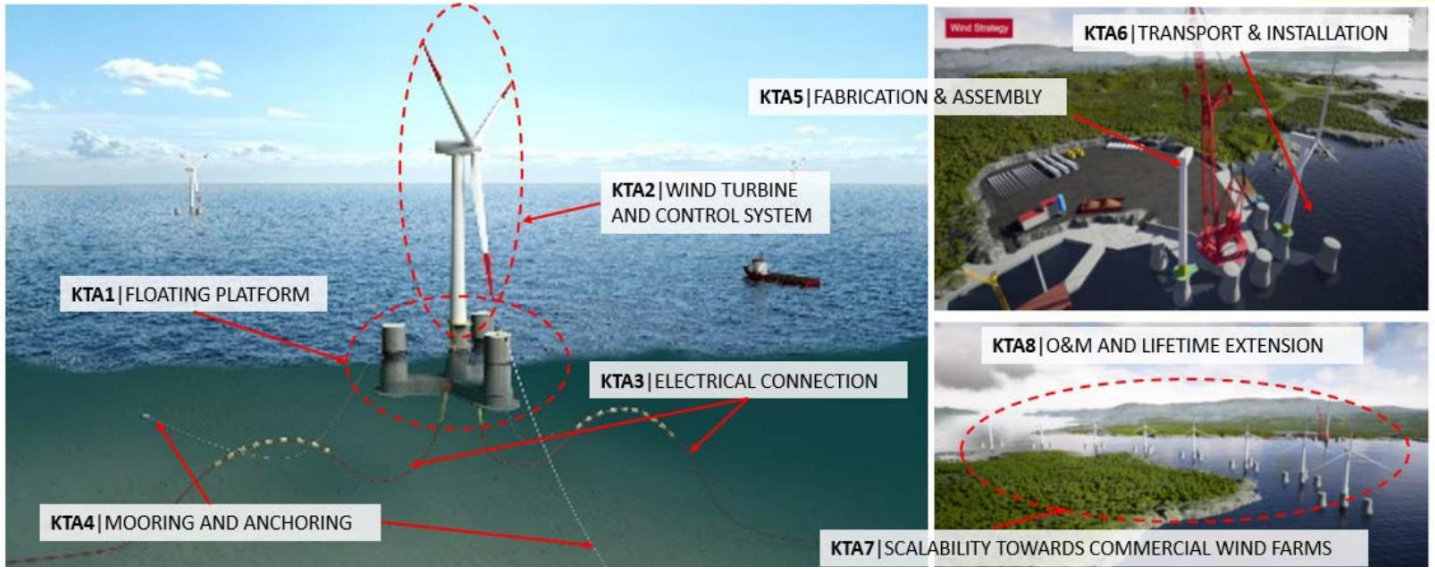
Seabed	**Water depth**
Clay, soft soil	220m

Marine growth
+2 to 40m: 60mm; Below 40: 30mm

A **+10 MW** WTG will be proved on a 1:1 platform.



Key Technology Areas



- Gulen Wergeland dry dock selected for construction that allows for 20m draught.
- Flagship will have access to the dry dock and surrounding areas for storage & assembly.
- The tower and turbine will be installed with the floater in dock, seated on the seabed.

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Achievement to date

- **FEED** completed:
  - Platform basic design completed including outfitting.
  - Tower design completed.
  - WTG controller tuning progressing
- WTG Twin models built
- Floating platform construction procedure in place

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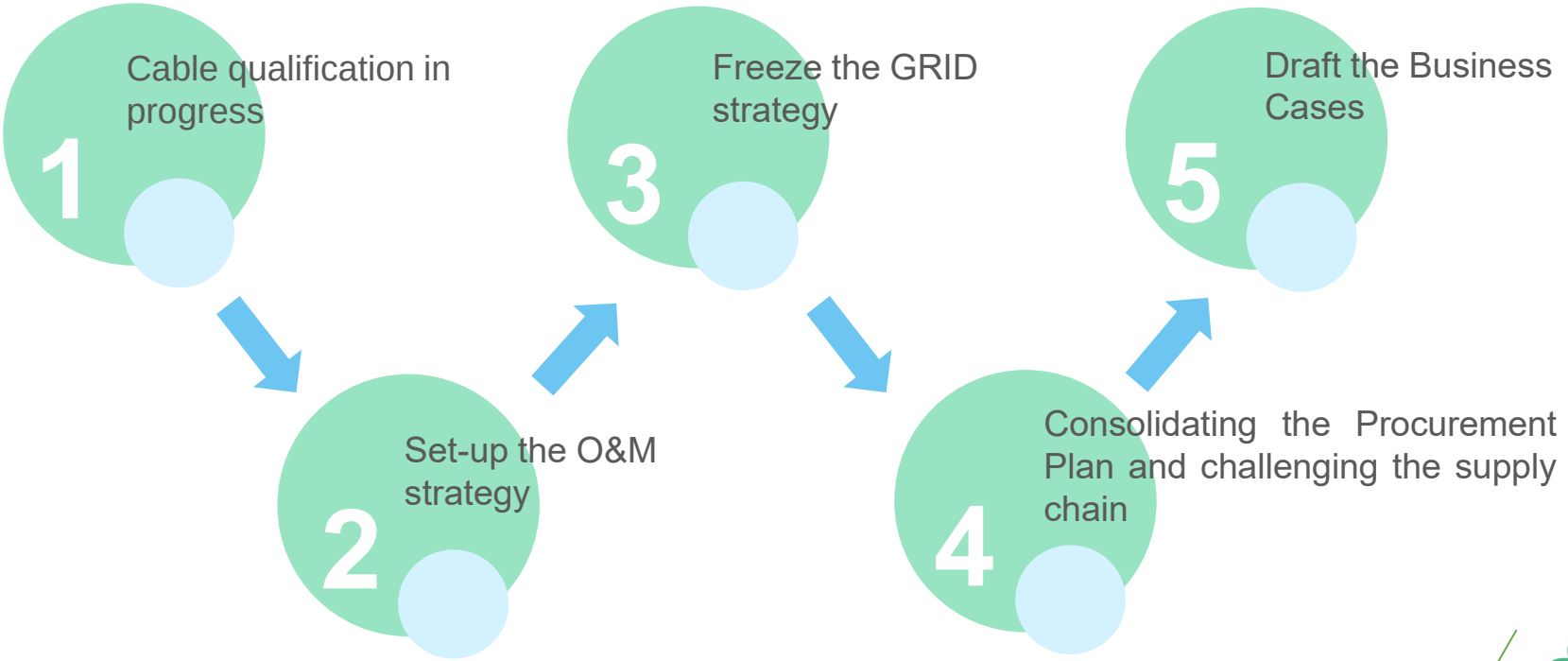
Next Steps



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Social Media

https://flagshiproject.eu/

Flagship Project

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