



Floating Wind for the Petroleum Industry

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Science Meets Industry

Bergen, October 25 2022



Mission:

Accelerating Floating Offshore Wind



Odfjell Drilling – from pioneers in MODUs to pioneers in MOWUs

Mobile Offshore **Drilling** Units

Mobile Offshore **Wind** Units

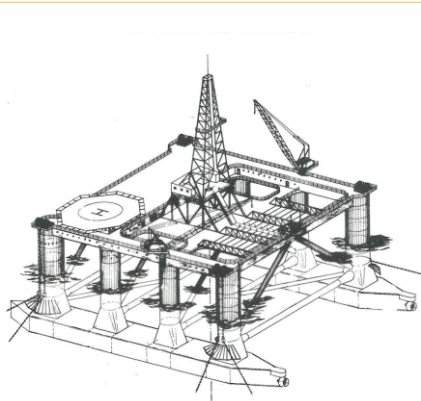
1969

1974

1983

2009

2022



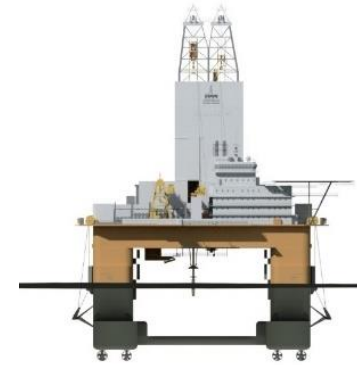
Bergen Rig



Deepsea Driller



Deepsea Bergen



Deepsea Atlantic



Deepsea Semi™

From electrifying oil and gas installations to permanent floating wind parks

Short term

Exploit near term opportunity of O&G decarbonisation



Relevant services:
Rental MOWUs incl. op's & maintenance

Longer term

A perfect partner for floating wind farm developers



Relevant services:
FOWU design, (supply chain), op's & maint.

Electrifying “off grid” oil and gas installations with offshore wind

Gas turbine
generators

Wind turbine
generator

WindGrid™
module

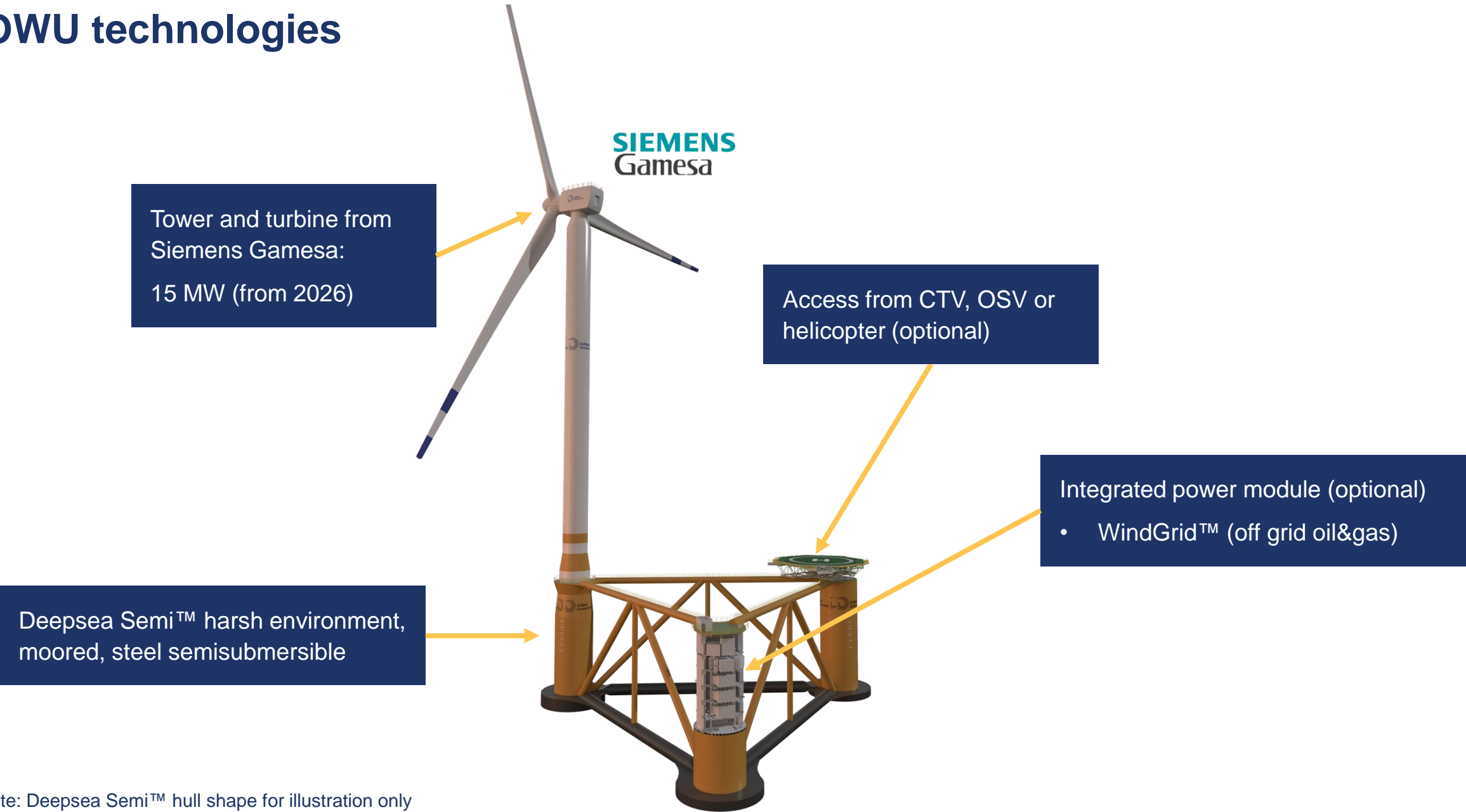
Deepsea Semi™
floating wind foundation

The WindGrid™ hybrid power module

- Uninterrupted power supply from wind power to oil and gas installations
- A combination of hybrid technologies
- Key to increase emission cuts from 35% to up to 70%

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MOWU technologies



Multi-locational, standardised design

The MOWU can be deployed in the harshest of environments

- ▶ **Environmental design**
 - ▶ Designed for harsh environments
 - ▶ Class covering the North-, Norwegian and Barents Seas
 - ▶ Multi-locational – can be redeployed to new locations
- ▶ **Mooring**
 - ▶ 3 or 6 point mooring system depending on application
 - ▶ Combination of chains and fibre rope
 - ▶ Generic mooring designs completed for water depths 60 – 1100+ meter
 - ▶ Drag embedment or suction anchors

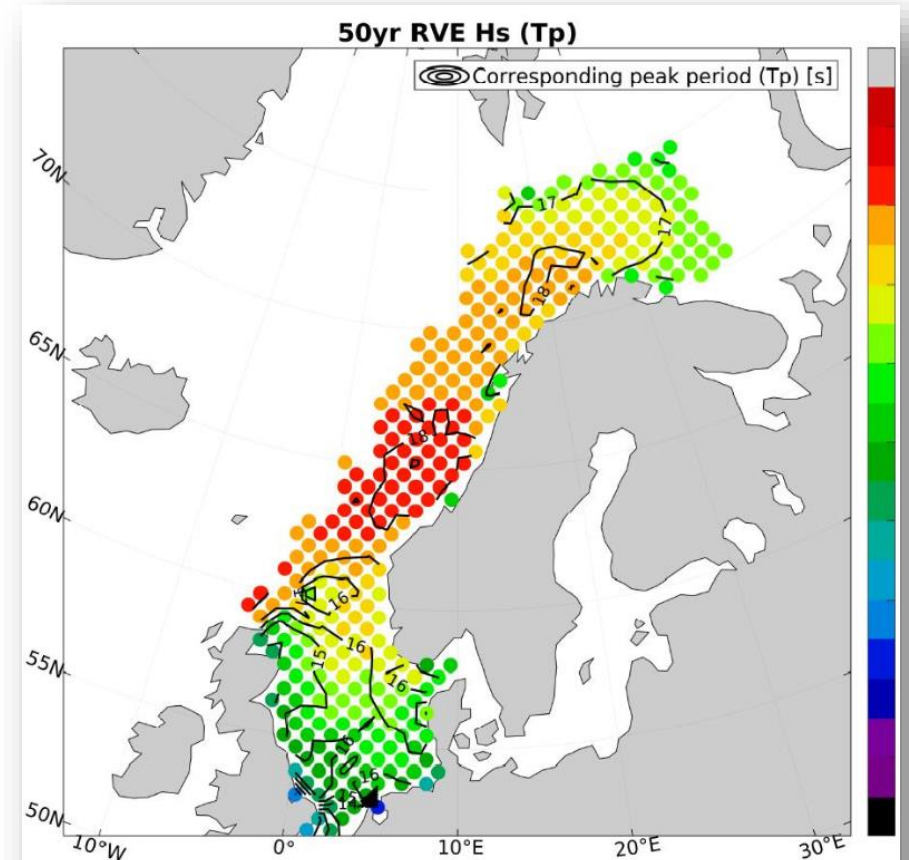


Figure 4: Map of 50-year RVE of significant wave height (H_s). Corresponding peak period

*AiP: Approval in principle**ILA: Integrated load analysis**MSA: Main Scantling Approval*

Deepsea SemiTM Hull Design – Historical timeline

2021

2022

✓ MoUs
Siemens Energy
& Siemens
Gamesa

✓ Concept
Select +
Initial Tank
test

✓ 3rd Party
Feasibility
Verification (DNV)

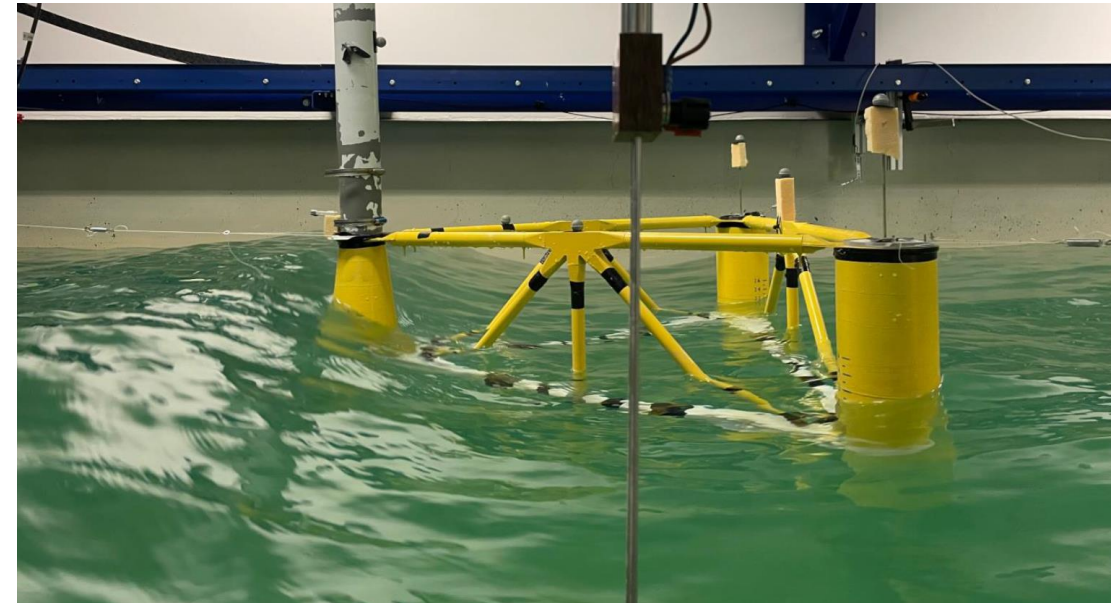
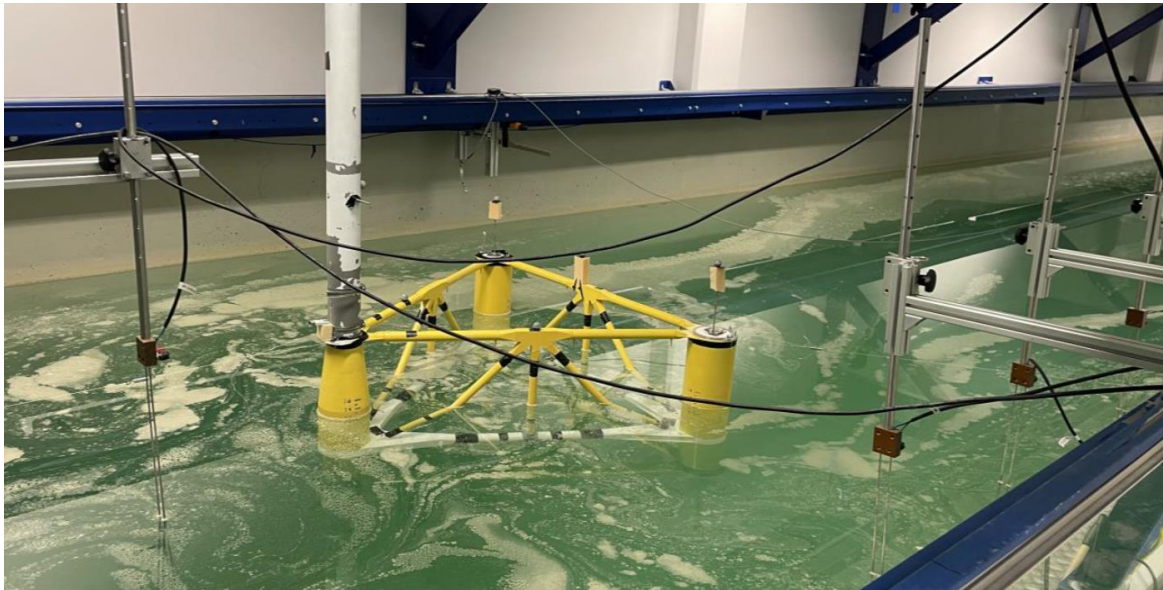
✓ Design
Brief

✓ Tank
test

✓ AiP
by DNV

✓ ILA by
Siemens
Gamesa

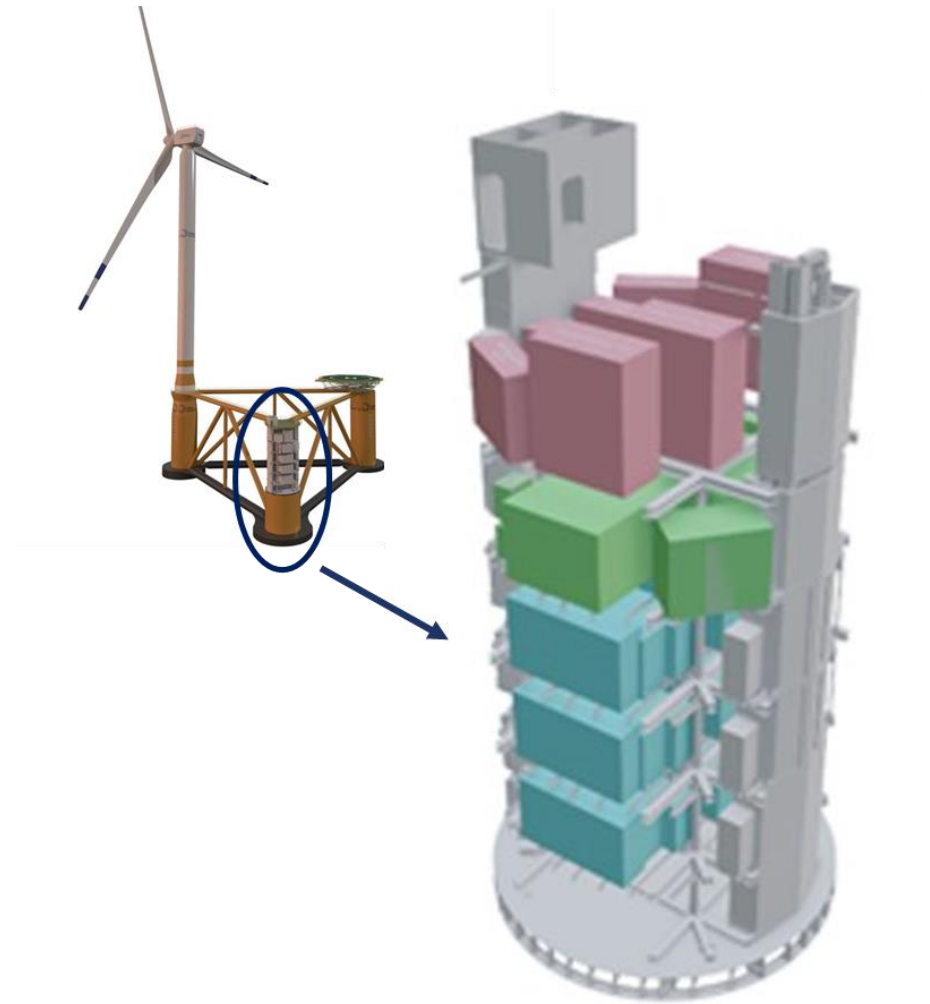
✓ MSA
by DNV



The WindGrid™ Module

Highlights

- Function: seamless integration with gas turbine generators in offgrid mode
- The Power Module secures power distribution, grid stability and energy storage
- Main components:
 - Battery modules (energy storage)
 - Converters (energy control to/from batteries)
 - Transformers (secure correct voltage level)
 - Switchgear (power distribution)
- The Power Module is developed in cooperation with Siemens Energy
- The functionality of the system has been verified by independent third party (DNV)
- Design status: mature, ready for detail engineering



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