FOW and Ports Infrastructure – Synergies & Challenges
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DNV’s Floating Wind activities:

Feasibility studies, pre-dimensioning, tech. benchmarking

Cost modelling / lease area valuation

Ports and infrastructure assessment

Transmission strategy and technology

Permitting (SAP, COP, NSRA, EIS...)

Certification (CVA) & Classification

Technical Due Diligence & LTA

Energy Assessments
DNV’s Floating Wind LCoE Forecasts
By 2050: 80% reduction in LCoE and 2000 fold growth
Several Factors Leading to Cost Reduction

Key Drivers
- Larger windfarms
- Cooperation and sharing
- Financial incentives
- Auctions
- Larger wind turbines
- Reduced risk
- Standardisation
- Technology development
- Industrialisation
- Construction and operational experience
- Higher capacity factors
- Longer lifetime

Construction & ports infrastructure as common denominator for cost reduction of Floaters and OPEX
Floating Wind development generate more port infrastructure needs than bottom-fixed

- Increased mass and volume of the foundations
- More construction activities in port
- Floating foundation assembly and commissioning
  - Integration of the turbine on the foundation
  - Deeper draft required
- Laydown area + 300 %
- Berth length + 400 %
- Water depth 0 to +50 %
- Different equipment: cranes, launching docks, ...
Current conditions required for FOW are challenging

- The current port infrastructure was not designed for FOW and usually needs:
  - Deeper draft
  - Higher bearing capacity
  - Heavy lifting construction cranes
  - Vast laydown areas
  - Different characteristics than most shipping ports
  - Existing ports are already extremely congested
Port Requirements – US west coast example

By 2034:
~ 450 Acres
~ 7000 m of berth

nearly 25 % of the existing West Coast ports capacity
3 main axis to make it happen

Invest and increase ports space

Higher degree of industrialization

Adapt and diversify floater concepts to the infrastructure
Floating Wind industry scaling & infrastructure

- FOW transitioning into industrialization stage
- Scaling and industrialization needs will shape port investments
  - Hull Fabrication lines
  - Hull assembly facilities (drydocks, lifts...)
  - WTG integration berth and cranes
  - Marshalling of construction and O&M
Innovations in floaters concepts to facilitate the construction

- Reduced WTG integration draft
  -> flexibility of integration locations

- Standardisation of elements
  -> efficient industrialisation

- Diversification of materials (concrete / steel)
  -> Diversify the supply chain and enable more local content
Other strategies to get around ports limitations

• Jack-up vessels or other construction vessels/barges as temporary construction dock (floating-to-floating WTG integration).

• Long distance transport of fully-assembled floating foundations from other locations

➢ Increased costs

➢ Less local content
The US West Coast example

- Currently, no port has the sufficient capacity to support all FOW deployment needs
- The ports with the greatest capacities are far from the Lease areas
- Major investments and port infrastructure upgrade are necessary to meet the offshore wind targets
Take-aways

• The available port infrastructure in the US is not sufficient to support all phases of FOW development and significant investments will be required to meet the states goals.

• The available fabrication and port infrastructure is a key factor for the selection of floating foundation concept.

• Upgrading the infrastructure is essential to harness all the benefits of offshore wind.