Contractor & Developer Partnerships
The smart way to commercialize projects

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Offshore Wind Development
Havfram leverages on the experience from subsea into its offshore wind initiatives

Havfram Introduction

Offshore Wind Development
- Early phase offshore wind development partner
- Offshore wind developer for O&G electrification
- Partnership with RWE and NTE for Norwegian license

Offshore Wind Installation
- 20MW WTG installation vessels on order (US and EU)
- Supporting projects in APAC and EU
- Established team with 8+ years experience from Offshore Wind

Floating Installation
- Complete installation services for floating projects
- 10+ years of complex subsea project experience from O&G
- 300+ subsea engineers
A truly independent installation contractor, bringing a decade of experience to floating wind

### Experience and Skillset
- 10+ years of delivering large and complex subsea projects
- Strong mooring track record, floaters towing and hook-up in shallow and deep water
- Strong track record in laying and hooking up dynamic risers
- Extensive EPCI track record
- Current involved in studies and RFQs beyond Utsira

### Strong Client Relationships
- Work performed for all major Oil & Gas companies
- Many of which are now moving into renewables

### Strong Safety and Quality Record
- Strong safety culture embedded in organisation
- Always delivered according to client’s first oil/gas production date
- More than 8 million man-hours and 11,000 vessel days completed
- 2 lost time incidents in 10 years and zero last 4 years

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The Marriott Marquis, Houston  1-3 March 2022
Global provider of mooring related services

Track-record in both remote and harsh environment, and benign inshore waters

1. Johan Castberg – Equinor:
   - T&I of mooring system
   - Tow out of FPSO
   - Hook-up of the mooring line system

2. Kraken – Enquest:
   - FPSO mooring line installation and rectification

3. FSU Storm – ElectroGas Malta:
   - EPCI of mooring system

4. Chinguetti – Petronas and BW Offshore:
   - Disconnection of FPSO
   - Recovery and disposal of risers

5. Aje – Yinka Folawiyo Petroleum
   - EPCI and hook-up of complete mooring system
   - Including STP buoy and suction anchors

6. BW Pioneer – BW Offshore
   - Mooring line recovery
   - Reinstallation at 2500 meter of water

7. Sangomar – MODEC
   - T&I of Permanent Mooring Spread and Hook-up to FPSO
   - 780m water depth

8. Tortue FPSO – Technip Energies:
   - T&I of FPSO mooring
   - Hook-up of the mooring line system

The Marriott Marquis, Houston  1-3 March 2022
A race to the bottom

The rising uncertainty in future offshore wind costs

- Cost of offshore wind has decreased significantly in the past decade with the majority of new projects globally being proposed as zero subsidy.

- This cost reduction has predominantly been a result of CapEx reduction through:
  - Technology innovation
  - Larger turbine sizes
  - Economies of scale
  - Industry learning
  - Manufacturing

Cost declines in offshore wind are being driven by external factors, technology development, and excellence.

Potential levelized-cost-of-electricity path, €/mWh, normalized

- External factors:
  - Base case (FID, 2010)
  - Interest rates
  - Steel prices

- Technology development:
  - Turbine size 9 mw
  - Turbine size 12 mw

- Excellence and maturation:
  - Capex excellence
  - Opex excellence
  - Financing margin compression

Source: Wind Power Engineering and Development

1Megawatt-hour.
2Final investment decision.
3Megawatts.

Source: Jens Hohorn, et al., Cost reduction potentials of offshore wind power in Germany, a joint report from the Fichtner and Prognos, 2013, prognos.com; Cost reduction options for offshore wind in the Netherlands FID 2010-2020, TKI Wind op Zee (TKI Offshore Wind), October 2015, tkwindopzee.nl; McKinsey analysis

McKinsey&Company
**The rising uncertainty in future offshore wind costs**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Development &amp; Consenting</th>
<th>Component manufacture</th>
<th>Installation</th>
<th>Operations/ Maintenance</th>
<th>Decommission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Turbine manufacture</td>
<td></td>
<td>Support services</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>4 – 5 years</td>
<td>1 – 2 years</td>
<td>1.5 – 2.5 years</td>
<td>20+ years</td>
<td>1 – 2 years</td>
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<tr>
<td>Stage</td>
<td>CAPEX 70-80%</td>
<td></td>
<td></td>
<td>OPEX 20-30%</td>
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<tr>
<td>Costs</td>
<td>5-10% CAPEX</td>
<td>Components &amp; structure</td>
<td>Turbine</td>
<td>Vessel &amp; equipment</td>
<td>0 – 5% OPEX</td>
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<tr>
<td></td>
<td></td>
<td>20–30% CAPEX</td>
<td>20–30% CAPEX</td>
<td>20 – 30% OPEX</td>
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<tr>
<td>Risks</td>
<td>Regulatory uncertainty;</td>
<td>Multiple contracting;</td>
<td>Lack of</td>
<td>Heavy dependence on</td>
<td>Low EOL</td>
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<td></td>
<td>Costly surveys;</td>
<td>Lack of standardisation</td>
<td>risk sharing;</td>
<td>subsides; Reliability</td>
<td>value; Recy-</td>
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<tr>
<td></td>
<td>Risk bias on developers</td>
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<td>Insufficient capacity</td>
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<td>clability</td>
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- More recently there has been a growing popularity globally for governments to use auction mechanisms to lease offshore wind sites.
- This enables governments to achieve the lowest price possible for offshore wind energy by significantly increasing the competition.
- **However...**
- In order to win sites, developers are forced to seek every solution possible to propose the lowest project cost.
- In many cases developers have had to propose project costs, based on big assumptions that the supply chain:
  - Will lower their costs
  - Can take on more of the project risk
  - In making these assumptions, there is increased uncertainty in the successful delivery of the project, in:
    - Achieving the proposed low cost
    - Assuming the supply chain will take the risk
    - Achieving the proposed delivery schedule

Source: EIRWIND project
Developer / Contractor partnerships

Involving the supply chain early can reduce risk and increase project certainty

- Until recently common practice has been for high-level early engagement with the supply chain
  However...
  - With governments stipulating increased local content requirements, developers are changing their approach and, more and more starting to engage with different EPCI package contractors and the supply chain at the bid phase of the project.
  - This has many benefits, in that:
    - The EPCI package contractors can input on project design including feasibility of delivery, cost and schedule
    - Provides greater confidence to the developer, investors and awarding government agency in the successful delivery of the project
    - The EPCI package contractors can identify and engage with local suppliers to increase local content early on
    - The procurement process and timeframe can be shortened due to early engagement
    - It strengthens the relationship between the developer and EPCI package contractors

“If you don’t change what you are doing today, all of your tomorrows will look like yesterday.”  Jim Rohn
Havfram partnership with RWE and NTE on Norwegian floating wind project

• Havfram is in partnership with RWE and NTE for the Norwegian floating wind site Utsira Nord.

• Being an installation contractor partner on the project allows us to:
  o Identify and input on the best equipment to support project delivery incl. input on project design parameters
  o Assess and manage market availability in certain areas
  o Lock in assets to secure delivery
  o Ensuring equipment are designed for efficient marine operations – with the assets available at the correct price
  o Identify local supply chain capabilities to achieve local content requirements.
  o Assess latest and future technologies which could be implemented to reduce costs and improve safety during project execution.

• Havfram will follow the process from pre-acreage award until the constructions phase.
Relevance for US and globally

• Havfram is already present in US for subsea and bottom fixed wind

• US supply chain is limited for floating wind
  o No firm pipeline - TBC
  o Needs to be built from scratch based on oil & gas and relevant bottom-fixed offshore wind experiences

• US specials
  o Foundation manufacture/assembly (ports, quays, bearing capacity etc..)
  o Local content and working with unions – state by state
  o In country vessel capacity
  o Site specifics weather analysis
  o Overall installation philosophy (such as number of seasons, mooring and cable wet storage, tow-out sequence etc.)
Winning projects with smart partnering

- With growing need to reduce costs and increase local content in offshore wind projects, it is inevitable that developers and contractors will need to partner and collaborate more at an early stage.

- This need is even more so when it comes to floating wind, where there is considerable pressure for the cost of floating wind to reach parity with fixed bottom wind.

- Developer / contractor partnerships are a smart solution to achieving successful projects in a competitive environment.

Summary

- Increase local content
- Increase ability to deliver proposed project
- Increase certainty of project schedule
- Increase government and investor confidence
- Increase certainty on project costs

Floating Wind Solutions
Thank You

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