Maximising The Floating Opportunity For Ports

John MacAskill. ABL Group Marketing Director/OWC Director
The Opportunity

- Ports are the enabler for projects and industrial content
- ...and so local content
- The focus is usually on the floating technical demands (rightly)
- If a region or State does not have the right Port infrastructure...at the right time, projects may go elsewhere
- A duality, you are in competition with other ports...
- ...but you need to collaborate (clustering)
- When you get the contract...it will be too late to develop / modify the Port
ABL Group is a leading global independent energy and marine consultant working in energy and oceans to de-risk and drive the transition across the renewables, maritime and oil and gas sectors, offering our customers the deepest pool of world-class expertise across marine, engineering and adjusting disciplines from more than 300 locations worldwide.

- Above figures from end of Q1 2021
- In 2021 in total we worked on 99 new offshore wind farms, representing 69GW of capacity
- The lead technical consultant in offshore fixed & floating wind

**OWC....The Offshore Wind Consultants**
Service Portfolio

CONSULTING & ENGINEERING
- Technical due diligence
- Owner’s engineering & construction monitoring
- Geotechnical & geophysical
- HSEQ & risk
- Marine operations
- Marine design, upgrade & conversion
- Site investigations
- Clean shipping
- Engineering & design
- Jack-up & wind farm installation vessels
- Advance analysis & simulation
- Digital services
- Cable engineering
- Marine consulting
- Client Reps & secondments

LOSS PREVENTION
- Marine surveys, inspections & audits
  - Vessel and marine assurance
  - Rig inspections and assurance
  - Industrial standard audit
  - Vessel condition survey
  - Pre-purchase survey
- Marine warranty survey
  - Renewables
  - Oil & gas
  - Operations
  - Project cargo
  - Rig moving
  - Decommissioning

LOSS MANAGEMENT
- Marine casualty support & management
  - Salvage & wreck removal
  - Hull & machinery (H&M) claims
  - P&I claims
- Loss adjusting & claims management

Expert witness & litigation
- Energy expert witness & litigation
- Marine expert witness & litigations
- Marine casualty investigations
The Anatomy Of A Floating Wind Port
The Scottish Perspective

- 15GW of leases out of 25GW awarded in Jan 2022
- First floating projects ‘possible’ 1st generation 2029-2031
- No hub or ‘super-ports’
- Adequate O&M capacity / capability
- Limited capacity for manufacturing / fabrication and marshalling / assy
  - No existing facilities with 20-25m water depth quays
- All Ports are free market – so requires co-ordination

(Not me or 100% representative)
Port Needs For A Floating Wind Project

Port Uses fall into 3 main categories:
1. Fabrication and/or manufacturing ports
2. Marshalling and/or assembly ports
3. O&M (CTV and/or SOV based) ports

If parts of the top 2 are combined:
4. Integrated/co-located Manufacturing Port/Hub
Towers, nacelles & blades - laydown

Fit-out/integration

WTG component manufacturing / Assy

Fabrication

Assembly

Loadout onto a submersible barge

Wet storage

Tow-out

Image: APB Port Talbot, Wales
Example Port Demands/Requirements

- For a 300MW project
- 6 units in port process at any one time
- Steel
  - Skilled labor – eg welders
- Concrete
  - Brings high local content opportunities
    - Aggregates & cement
    - Rebar, form work
    - Pre-tensioning
  - Semi-skilled labor

<table>
<thead>
<tr>
<th></th>
<th>Semi-sub</th>
<th>Barge</th>
<th>Spar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower manufacture</td>
<td>25hec</td>
<td>25hec</td>
<td>25hec</td>
</tr>
<tr>
<td>Nacelle manufacture</td>
<td>25hec</td>
<td>15hec</td>
<td>15hec</td>
</tr>
<tr>
<td>Blade manufacture</td>
<td>25hec</td>
<td>32hec</td>
<td>32hec</td>
</tr>
<tr>
<td>Channel width</td>
<td>140m</td>
<td>110m</td>
<td>90m</td>
</tr>
<tr>
<td>Quay length</td>
<td>120m</td>
<td>60m</td>
<td>80m</td>
</tr>
<tr>
<td>Water depth</td>
<td>12-14m</td>
<td>10-12m</td>
<td>90m</td>
</tr>
<tr>
<td>Dynamic cable storage</td>
<td>25hec</td>
<td>25hec</td>
<td>25hec</td>
</tr>
<tr>
<td>Export cable storage</td>
<td>25hec</td>
<td>25hec</td>
<td>25hec</td>
</tr>
<tr>
<td>Suction piles</td>
<td>15hec</td>
<td>15hec</td>
<td>15hec</td>
</tr>
<tr>
<td>Drag anchors</td>
<td>10hec</td>
<td>10hec</td>
<td>10hec</td>
</tr>
<tr>
<td>Chains only</td>
<td>12hec</td>
<td>12hec</td>
<td>12hec</td>
</tr>
<tr>
<td>Clump weights</td>
<td>9hec</td>
<td>9hec</td>
<td>9hec</td>
</tr>
<tr>
<td>Shipyard</td>
<td>6hec</td>
<td>4hec</td>
<td>5hec</td>
</tr>
<tr>
<td>Area fit out</td>
<td>6hec</td>
<td>6hec</td>
<td>6hec</td>
</tr>
<tr>
<td>Fit out quay</td>
<td>10-20 t/m2</td>
<td>10-20 t/m2</td>
<td>10-20 t/m2</td>
</tr>
</tbody>
</table>

Source: AP Crowle / PR Theis, IMechE 2022 / OWC
Challenges
Different Floaters = Different Needs/Requirements

<table>
<thead>
<tr>
<th>Semi-sub</th>
<th>Barge</th>
<th>Spar</th>
<th>TLP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draught 10-12m (steel)</td>
<td>Draught 6-8m (steel)</td>
<td>Draught 70-80m (steel)</td>
<td>Draught 10-12m (steel)</td>
</tr>
<tr>
<td>Draught 12-15m (concrete)</td>
<td>Draught 10-12m (concrete)</td>
<td>Draught 80-90m (concrete)</td>
<td>Negative to low stability making assy complex, some options:</td>
</tr>
<tr>
<td>WTG on corner/side to optimise onshore crane capacity</td>
<td>Suitable for shallow draft ports</td>
<td>Complex assy &amp; T&amp;I – needs a Fjord!</td>
<td>- Temp buoyancy</td>
</tr>
<tr>
<td>Drydock float out may need temp buoyancy</td>
<td>Assy of structure performed onshore</td>
<td>Large SSCV needed to instal WTG in sheltered deep water location</td>
<td>- Build offshore using crane vessel with active heave compensation</td>
</tr>
<tr>
<td>2,500-5,000 tonnes</td>
<td>2,000-4,000 tonnes</td>
<td>2,500-5,000 tonnes, pre-ballasted</td>
<td></td>
</tr>
</tbody>
</table>

- Currently projects decide floater early, then look at port infrastructure
- ...
Location, Location, Location

- Distance sensitivity from the project (s)
- Distance is a variable risk factor for offshore wind projects - delays
- Marshalling/assy ports with 108nm zones
- O&M sensitivities
  - CTV (41nm)
  - SOV (81nm)
- Floating brings more uncertainty than fixed
  - Low cost (tug or anchor hander) vessels could reduce costs and so distance sensitivity
  - Weather risk – floater +WTG before they get to their perm station

Source: ‘Ports for offshore wind’, CES. Sept 2020
Logistics

- Lack of heavy lift cranes
  - Lifting radius can be >55m for 14MW WTG
  - Nacelle weights c 1,000t
  - Hub heights <170m expected

- Quayside loads
  - Storage & transport of WTG components - 5 t/m²
  - Storage of large floater components, towers & nacelles - 10 t/m²
  - Tower build prior to integration – 20 t/m²
  - Heavy crane integration berth - 15-25 t/m²
Getting Fit For Purpose
The Scotland Experience – ‘The Market’

- Port expansion/upgrade decisions based on business confidence in future demand
  - Risks continual under-supply in suitable port capacity due to the lead-time between demand forecast, financing and build

- Lack of readiness:
  - Restricting optimum methodologies used by developers / OEMs / EPCs = increasing costs and risks
    - Impact commerciality of market (worse), the competitiveness of the port (best)

- Ports not collaborating will make big land grabs

- Risks incl., co-situating O&M operations within ports where ‘large’ offshore wind port functions could otherwise be supported could be less than optimal, so ports need to decide it’s offering carefully
The Scotland Port Solution

• Increase large port capacity suitable for marshalling / assy activities
  • Increase longer-term market confidence
  • Encourage pooling of funds from multiple projects to support port enhancements, possibly clustering, regional govt. support / co-ordination and larger annual builds
  • A major ‘hub’ would be most cost-effective depending on project development proximity

• Strategic port planning
  • Timescales inadequate for ‘business-as-usual’ market iteration approach
  • Public and private partnership
  • Regular publication of demand projections with uncertainties and risks
  • Cross-industry involvement in the generation of a standardised guidance on infrastructure requirements for offshore wind for the ports industry, warning...floating brings more uncertainty than fixed

• The ideal port has a large industrial hinterland bringing skilled workforces and Tier 2 supply chain companies
  • Co-ordination with other industrial / commercial bodies / local govt
If You Are A Port...
Engaging During Development

Confidence and clarity, but also commitment!

Engage with OW market

Future Port Strategy

OW market look ahead

Port Requirements

Market Port

Developers, OEMs, EPCs

Ind bodies, govt, etc

Pre-FEED Feasibility

Process & respond

Shortlist

Port strategy

Development phase

1st iteration Baseline

2nd - Detailed Port Assess’t

ITT (first)

3rd – incorp. EPCI responses

Inform market based cost & install strategy

Detailed CAPEX / OPEX

FEED

T&I Strategy
The Opportunity

- Ports are the enabler for projects and industrial content
- ...and so local content
- The focus is usually on the floating technical demands (rightly)
- If a region or State does not have the right Port infrastructure...at the right time, projects may go elsewhere
- A duality, you are in competition with other ports...
- ...but you need to collaborate (clustering)
- When you get the contract...it will be too late to develop / modify the Port
Conclusion

- Have a clear port strategy, but one that is incorporates the wider port infrastructure available
  - Look at your current state
  - Carefully understand the needs / requirements and timescales
  - Develop your strategy to maximise your port and area
  - Do you need to work in clusters?
- Understand the floating technologies and the project pipelines
- Engage with developers, help them in their development process
- Obtain the necessary confidence to make port expansion / modification decisions
Contact details:
John MacAskill, OWC  
john.macaskill@owcltd.com 
+44 7899 684411

If you found this valuable, please feel free to leave me a recommendation on LinkedIn => www.linkedin.com/in/JohnMacAskill-OffshoreWindExpert