

Insurance angles surrounding floating wind concepts, are they affected by Geo Industrial factors?

Mr Sigurd Willoughby, Equinor ASA



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IUMI 2023, Edinburgh
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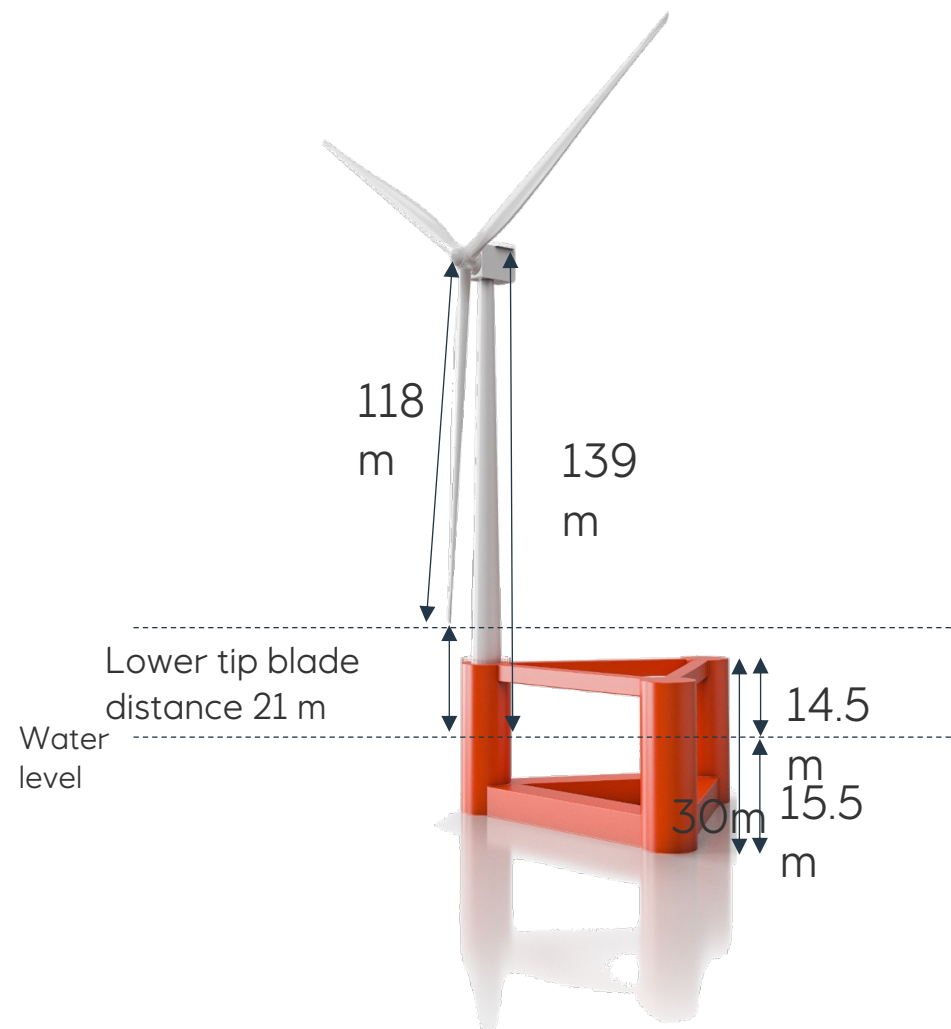
Agenda

- A big thank you
- A short introduction to Equinor's FOW concepts
- Our current FOW and possible future portfolio
- Costing Exercise Bottom Fixed (BF) versus Floating (FOW)
- Insurance angles
- Improving quality

A big thank you to all those who have supported us in the Energy Transition,
and it has only just started!

A short introduction to Equinor's FOW concepts

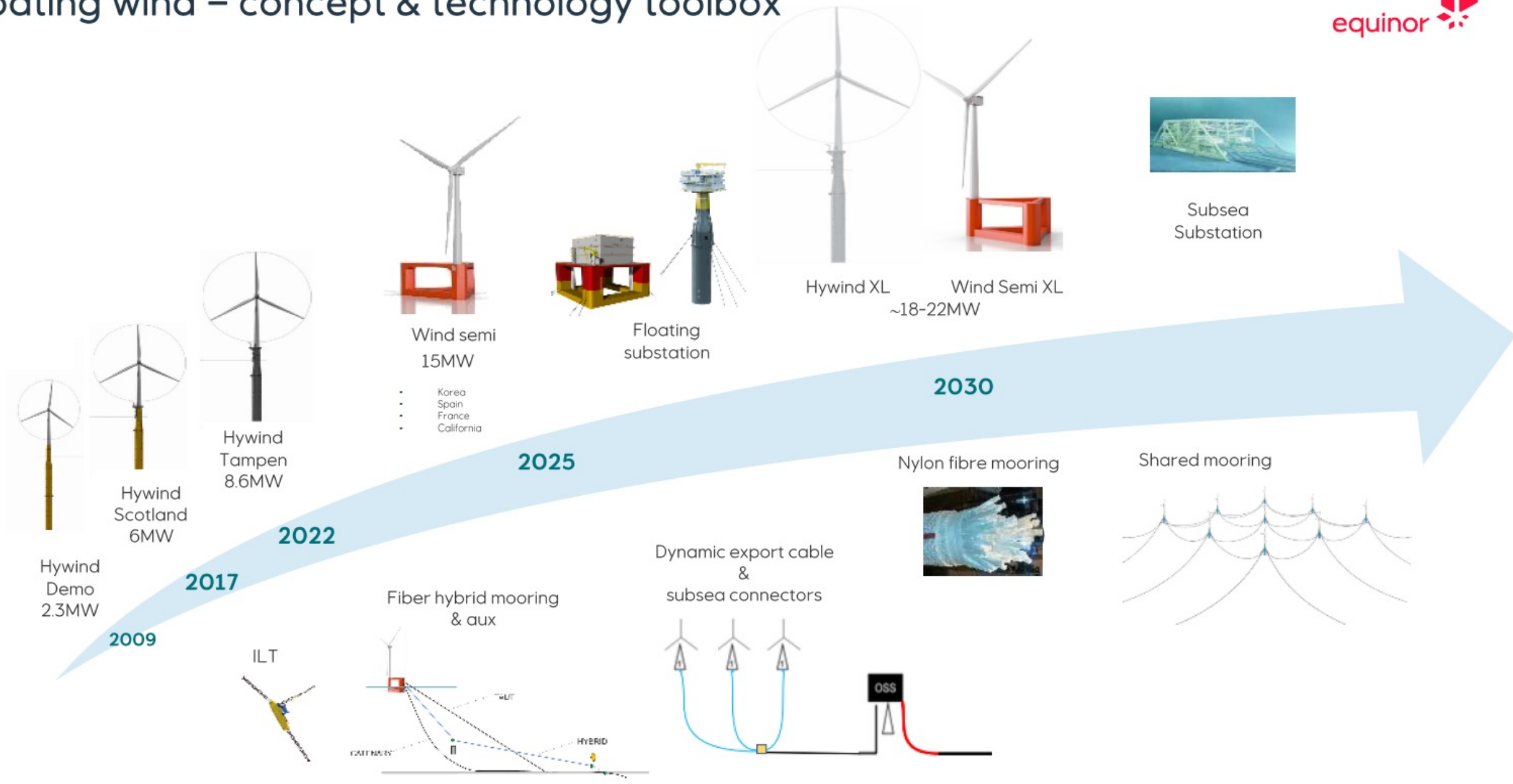
- Two types
 - Spar
 - Semi



Our current FOW and possible future portfolio

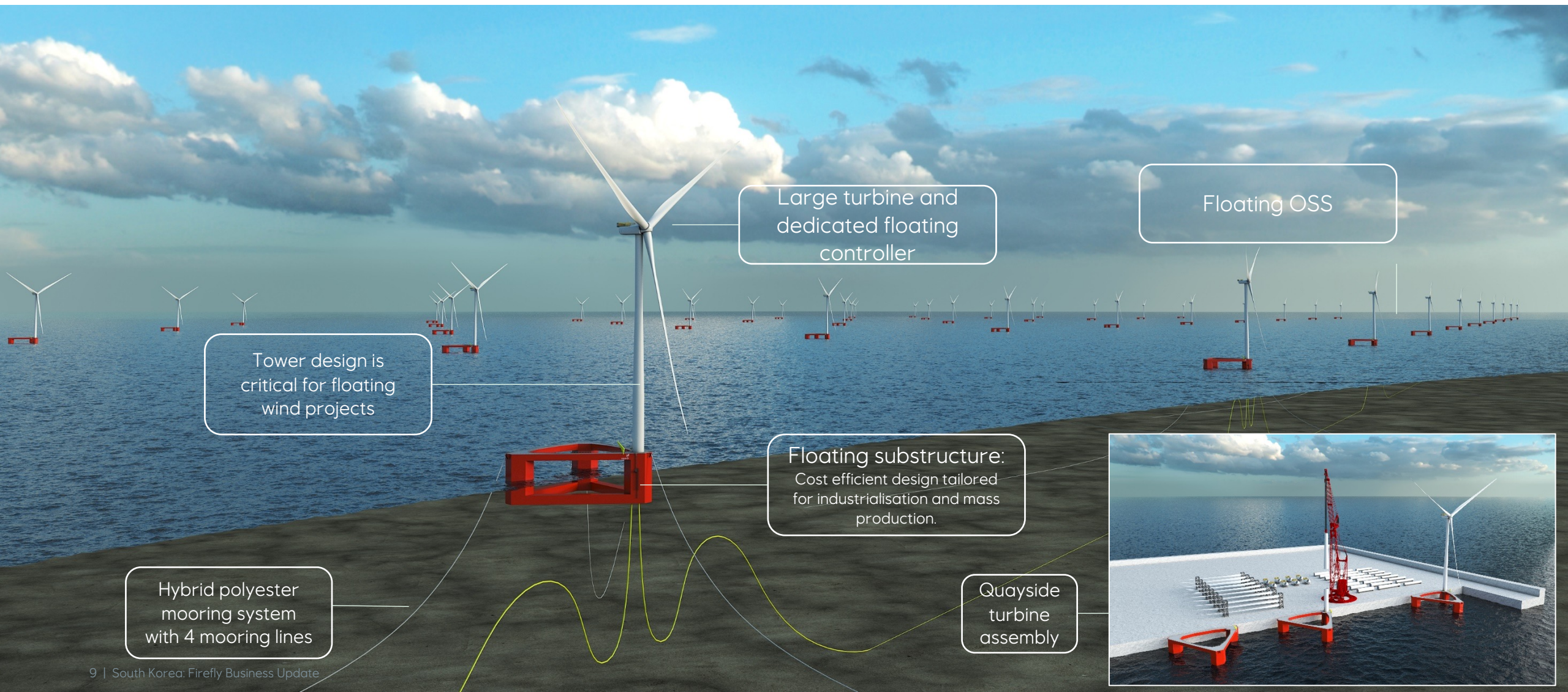
- Current
 - Hywind Scotland
 - Hywind Tampen
- Future, to name a few
 - Firefly – Korea
 - Other activities include
 - France
 - Spain – Canary Islands
 - Vietnam

Floating wind – concept & technology toolbox



Base case

| Floater concept for Firefly



Large turbine and dedicated floating controller

Floating OSS

Tower design is critical for floating wind projects

Floating substructure:
Cost efficient design tailored for industrialisation and mass production.

Hybrid polyester mooring system with 4 mooring lines

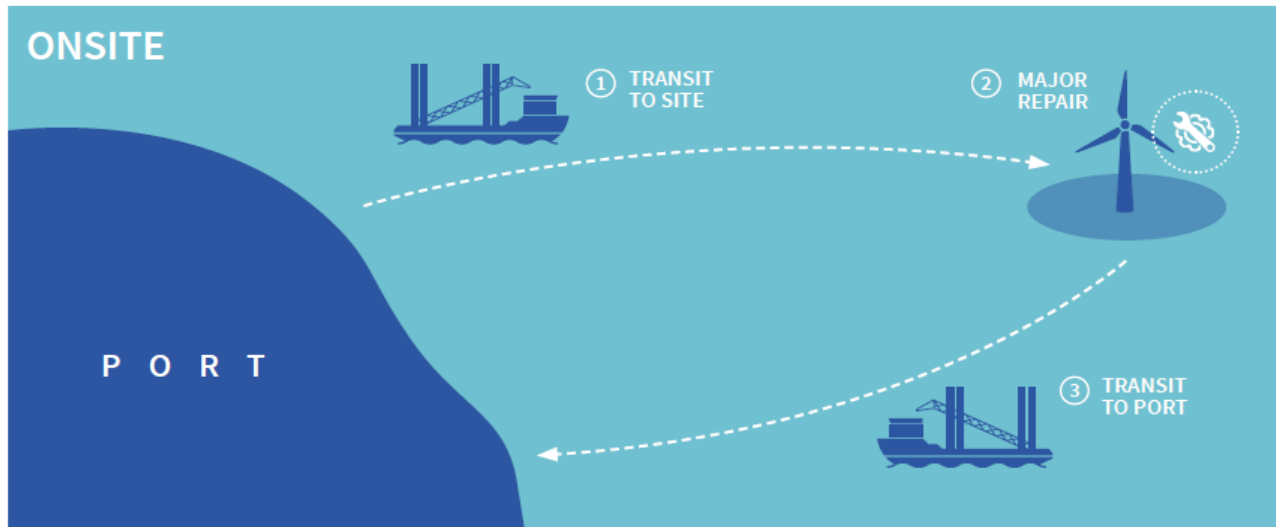
Quayside turbine assembly



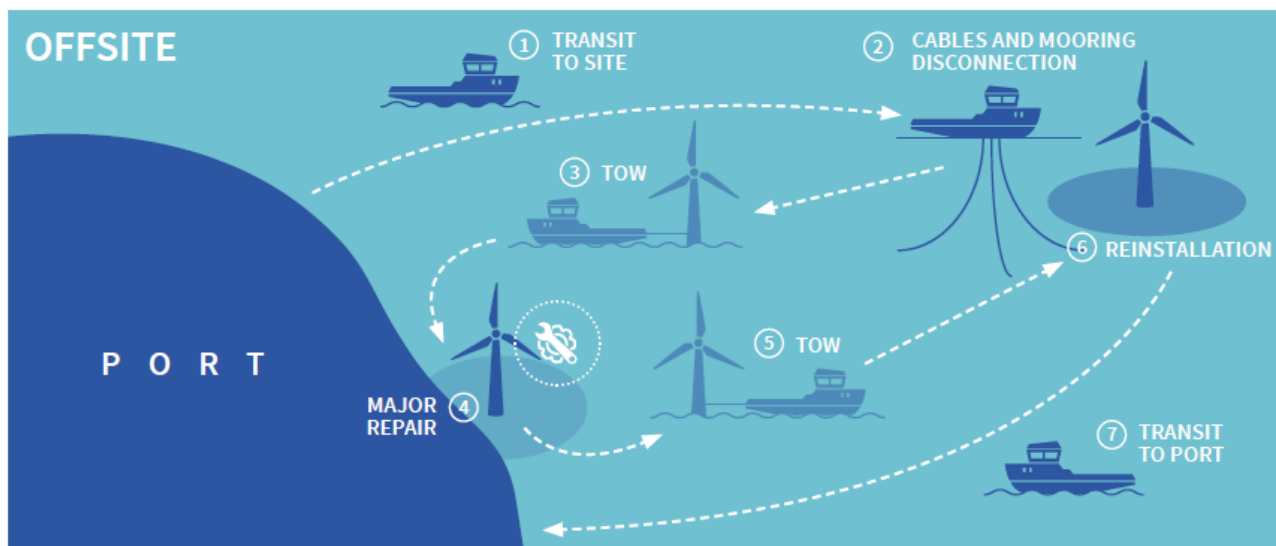
Costing Exercise Bottom Fixed (BF) versus Floating (FOW)

- Bottom fixed component exchange done with heavy lift vessel
- Floating major component exchange with tow-to-shore principle
- Not considered any campaign based Main Component Replacement (MCR) but only a single MCR for BF and FOW
- Availability impact not assessed
- FOW vessel rates assumptions based on Firefly
- BF HLV rate assumed local

Bottom-fixed versus floating approach



Onsite (Heavy lift vessel) repair



Offsite (tow-to-port) repair

Cost picture (mill USD, real 2023)

Floating (assuming jack-up barge):

Vessel Type	Mob/demob time	Weather time	Repair time	Charter days	Mob/demob cost	Logistics cost per MCR
Lead AHT	2	3	18	23	-	2.3
Trailing AHT	2	3	18	23	-	2.3
Harbour Tug #1	2	3	18	23	-	0.3
Harbour Tug #2	2	3	18	23	-	0.3
Jack-Up Barge	0	3	4	7	4.1	5.0
Total MCR Cost						10.2

Bottom-fixed (assuming HLV):

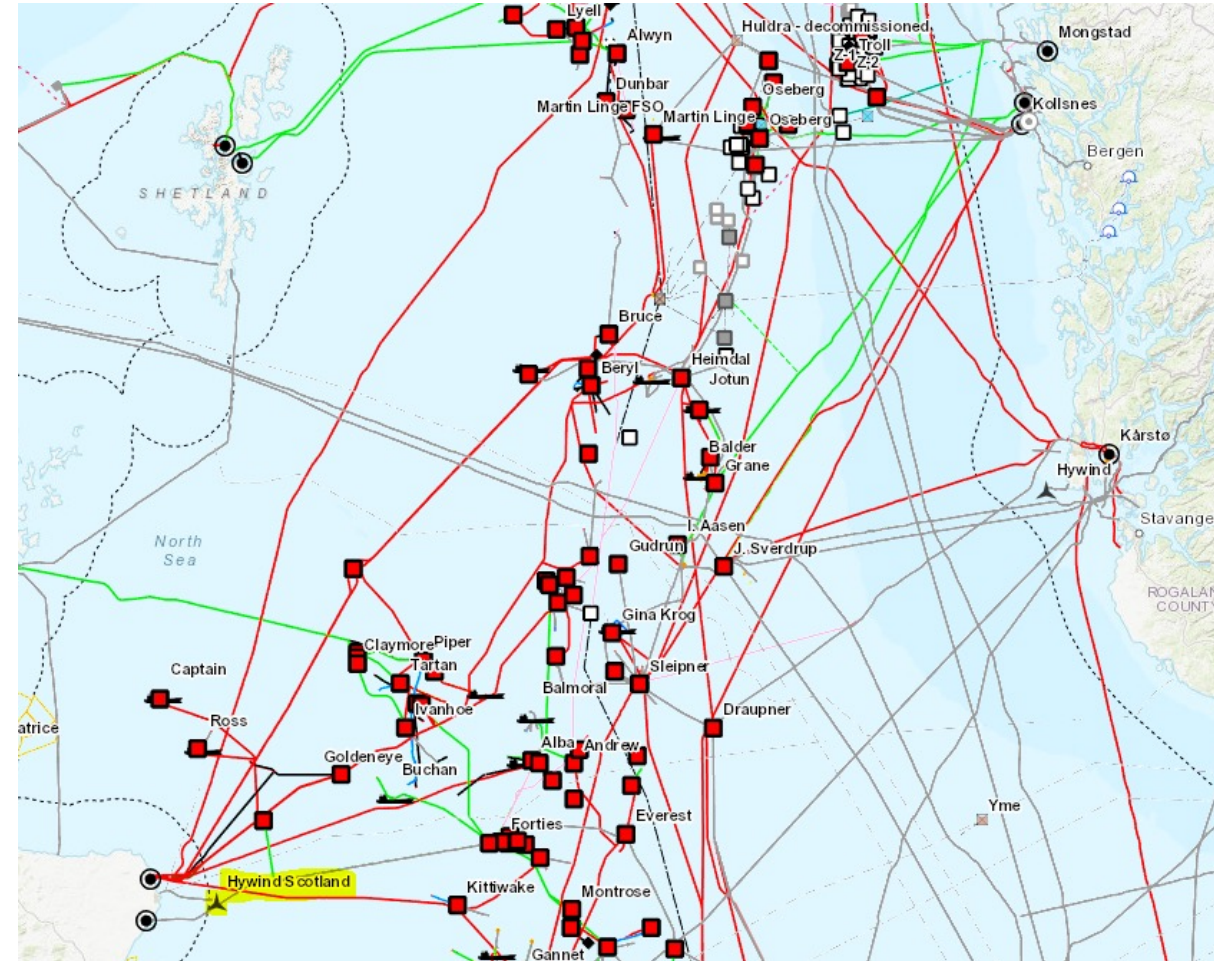
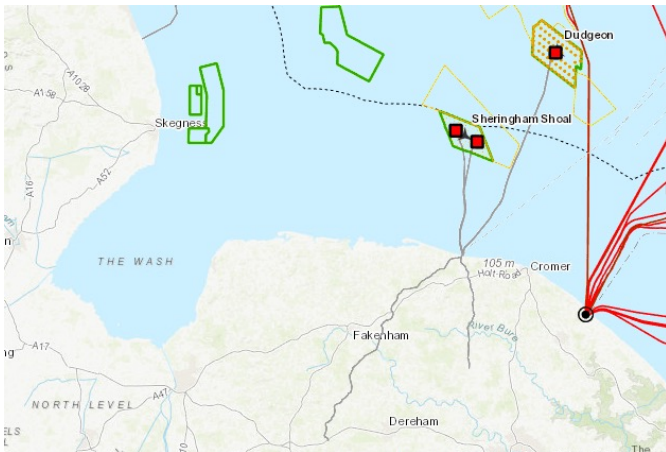
	Mob/demob time	Weather time	Repair time	Charter days	Mob/demob cost	Logistics cost per MCR
Total MCR Cost	0	3	4	7	4.2	6.5

Insurance Angles 1/2

- Maturity of the FOW industry
- The drive for economies of scale
 - 2.3MW – 6MW – 8MW
 - We planned 15MW turbines for Trollwind, and the same for Firefly, 20.8MW for Jupiter
 - Can quality be maintained?
- Will FOW design will have an effect on repair costs?
 - Draft
 - Maturity of local industry
 - Availability of vessels
 - Repair contingency plans

Insurance Angles 2/2

- FOW repair costs are expected to be greater than OWF repair for the same damage
 - FOW rates are higher than OWF rates
 - Does the increased investment assist premium income?
 - Little or no statistical data
 - Hywind Scotland main bearing repair compared to Dundgeon's. One will be over the deductible, the other is likely to be under.



Improving Quality

- Operator's experience / background
- Is there a quality clause in the procurement contract?
- Can operator impose their testing regime on contractor?

- The UK government is working to improve quality
 - In 2Q23 Global Underwater Hub (GUH) www.globalunderwaterhub.com had a workshop on cables, recent comments made by GUH
 - As the leading trade and industry development body representing the underwater supply chain, the Global Underwater Hub is ideally placed to take forward a risk reduction strategy for and on behalf of industry
 - As a result, a Subsea Cable Industry Forum has been convened to focus on areas of opportunity, improvement and cross functional learning across the life cycle functions of subsea cables to improve reliability, longevity and reduce failures. The forum includes representation from across the life cycle and related parties concerned with subsea cables
 - GUH is getting broad support from developers and contractors.
 - A step in the right direction.



POLLING QUESTION

Insurance angles surrounding floating wind concepts, are they affected by Geo Industrial factors?

- Yes
- No



Thank You

Presentation by:

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