

# Overview of Floating Offshore Wind Port Requirements

**Northwest Seaport Alliance**

Tacoma, Washington

May 24, 2023



# Ramboll – World-leading Offshore Wind Consultant with Nationwide U.S. Presence

World-leading offshore wind consultant with more than 30 years experience and a powerful global work force

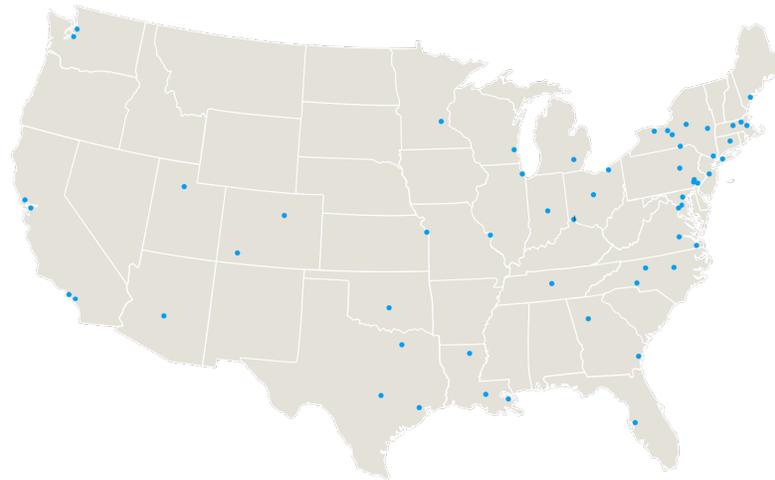


500  
wind  
experts

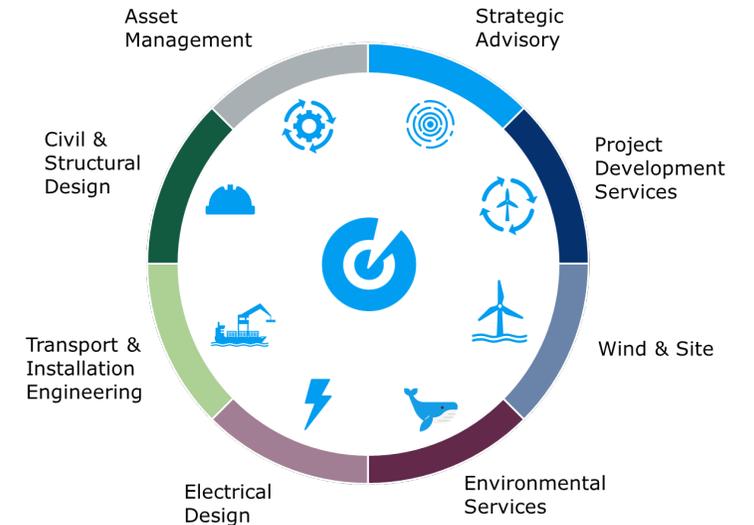
4,500  
projects

35+  
countries

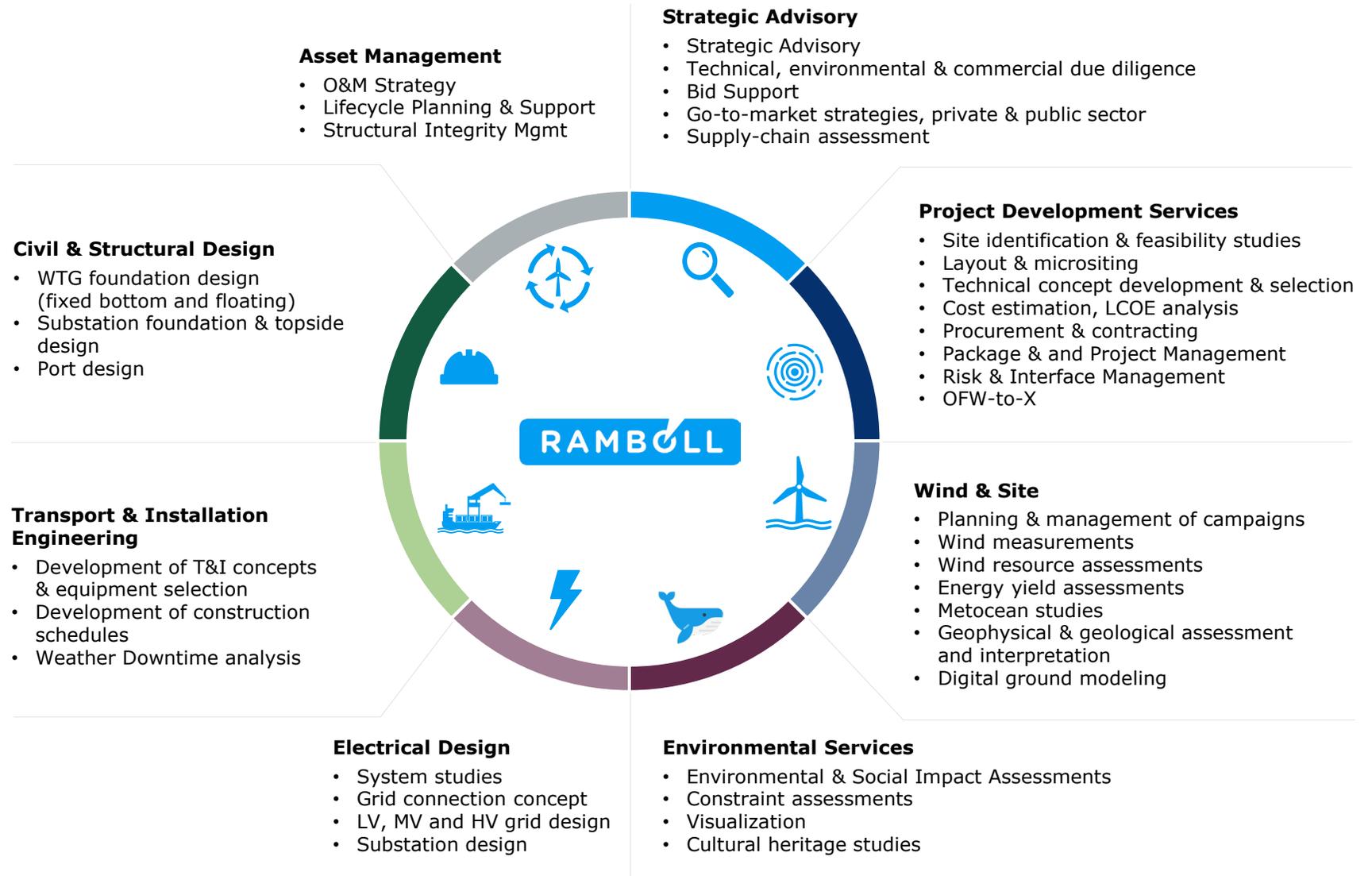
60 locations across United States, with 2,000+ local experts working on innovative solutions and projects



30 local plus more than 500 global colleagues offering a comprehensive range of offshore wind services covering the entire value chain



# Ramboll's offshore wind services cover the full project lifecycle

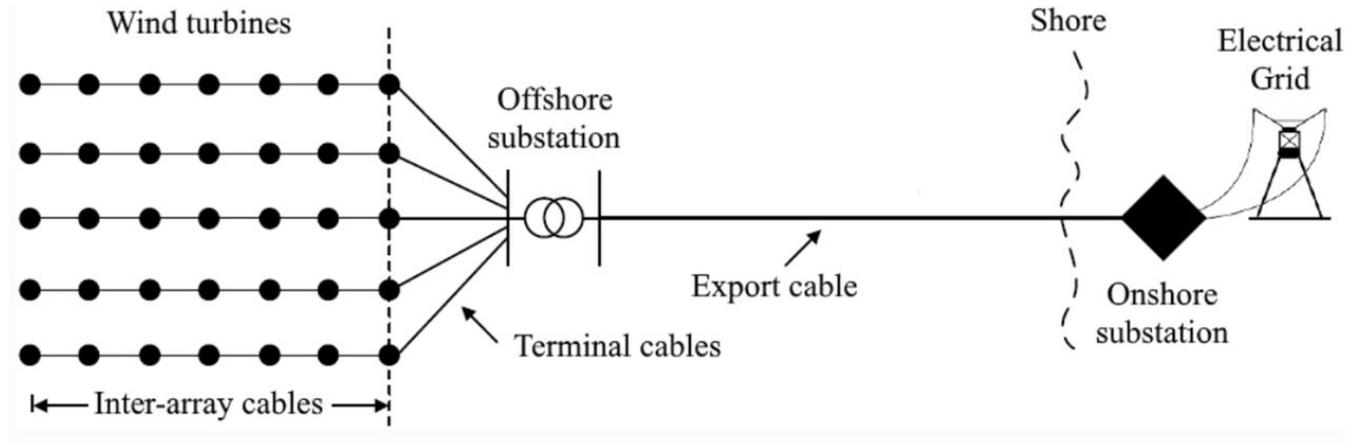


# Ramboll provides holistic solutions to clients to enable thorough decision making

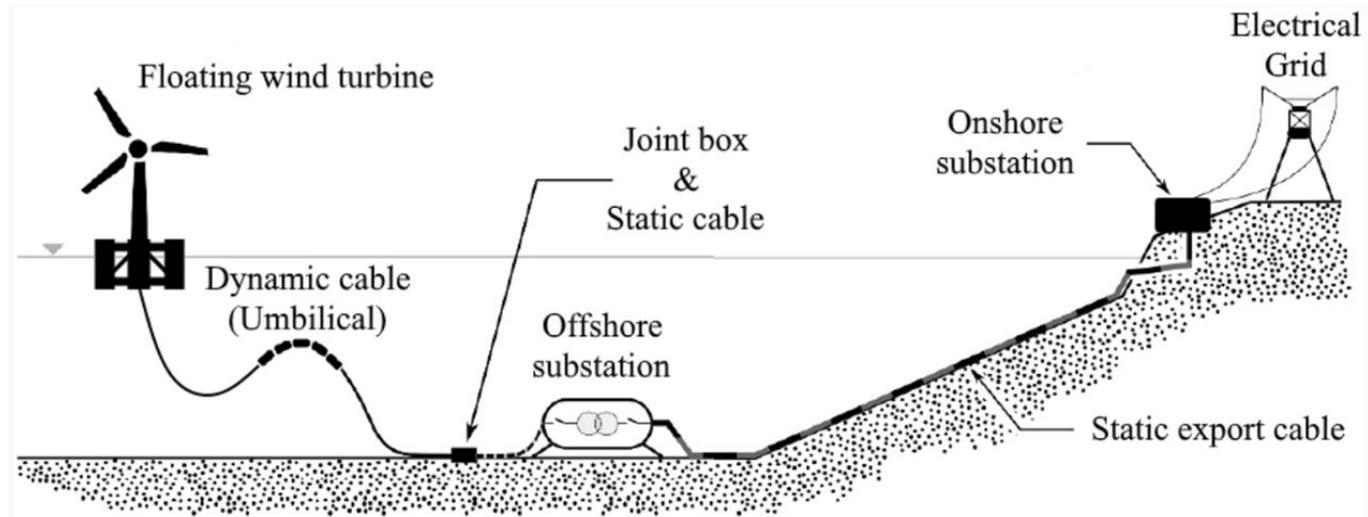


# Overview of an Offshore Wind Project

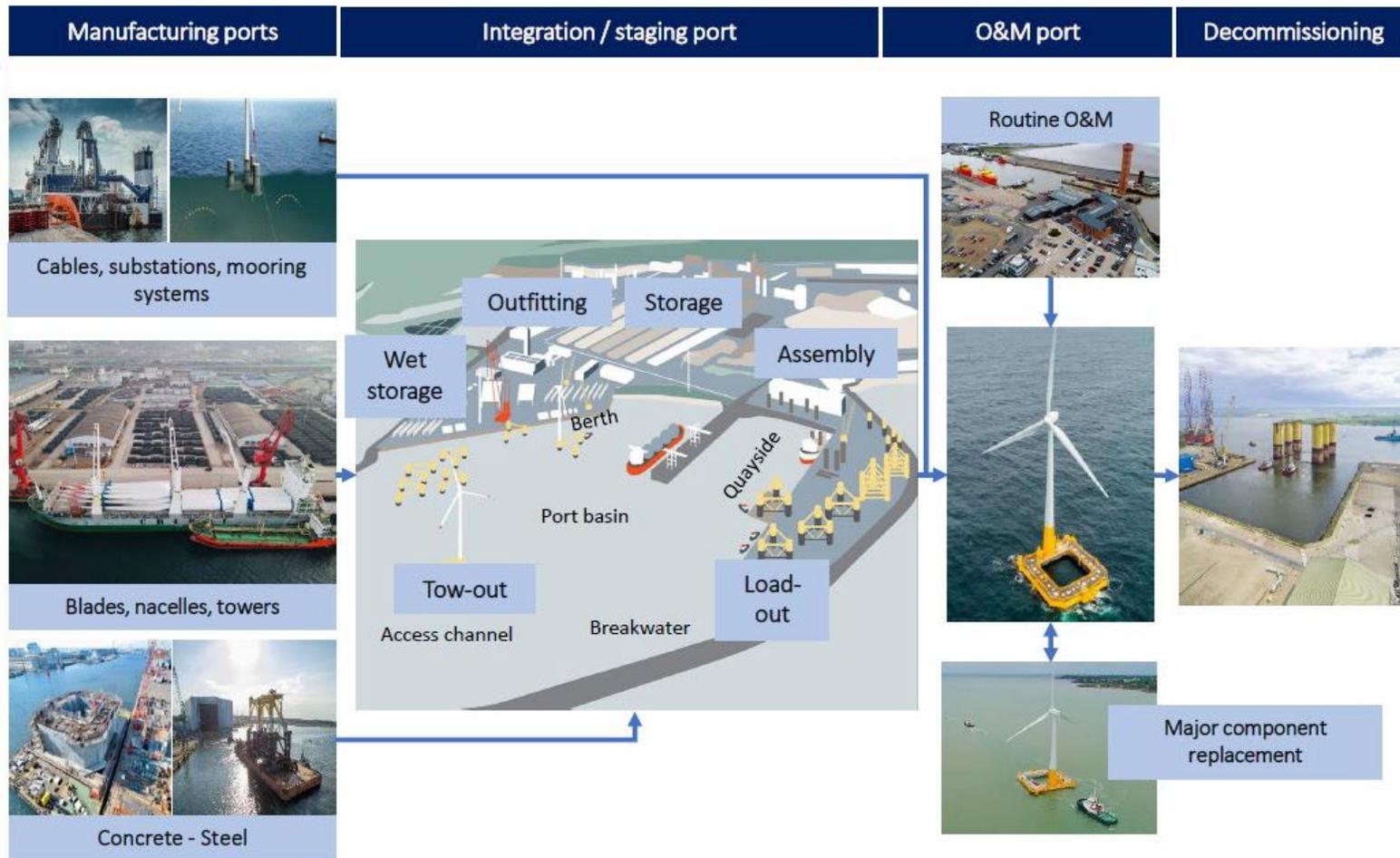
• Topview



• Sideview



# Floating Offshore Wind Ports – General Requirements



Facility requirements for **installation of floating offshore wind projects** are somewhat different from requirements when installing fixed-bottom offshore wind projects.

Ports can offer facilities for the whole supply and installation chain, or parts of the chain.

# Floating Offshore Wind Ports

## Heavy Lift Equipment

### Launching of Floaters & Turbine Integration

- Future crane capacity requirements for floating offshore wind uses may exceed 1,000 tons
- Special heavy-lift equipment ("Ring Cranes") are needed



Source: Mammoet



Source: Mammoet

Ring cranes are used either:

- (a) when exceptionally large single lifts are essential, or
- (b) when the ability to repeatedly perform such lifts would accelerate a construction project sufficiently to make the use of such a specialized crane cost-effective.

Ring cranes combine:

- Lifting capacity (up to 5,000 tons)
- Long reach (jib lengths up to 160 m give a lifting radius of 50-70m for a 1,000 ton lift)

Typical ring crane lifts:

- Petrochemical plant modules
- Nuclear reactor vessels
- Bridge components
- Offshore O&G and wind equipment

# Floating Offshore Wind Ports

## Heavy Lift Equipment

### Launching of Floaters & Turbine Integration

As an alternative, two heavy crawler cranes by tandem lift could be used instead of a single ring crane.

Two crawler cranes could be a more flexible and cost-efficient solution.

An example on right is Vestas' onshore installation of a V-236-15.0 MW prototype unit.



# Floating Offshore Wind Ports

Example – WindFloat Atlantic (Principle Power)



Source: NREL

# Floating Offshore Wind Ports

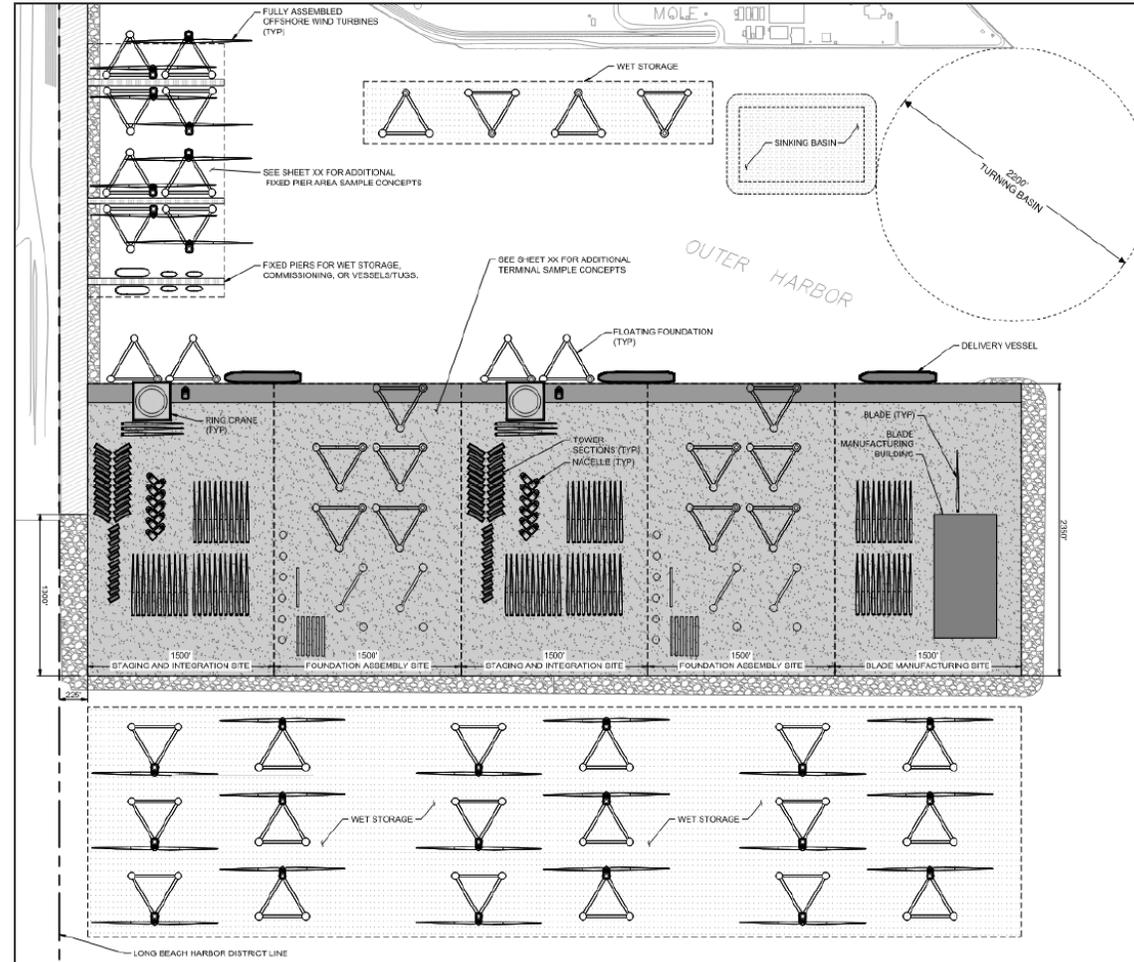
Example – Hywind Tampen (Equinor)



Source: Mammoet

# Floating Offshore Wind Ports

Example – Pier Wind (Long Beach, California)



Source: Moffat & Nichol, Pier Wind Project Final Conceptual Report

# Let's connect!

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Sustainable change.

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