

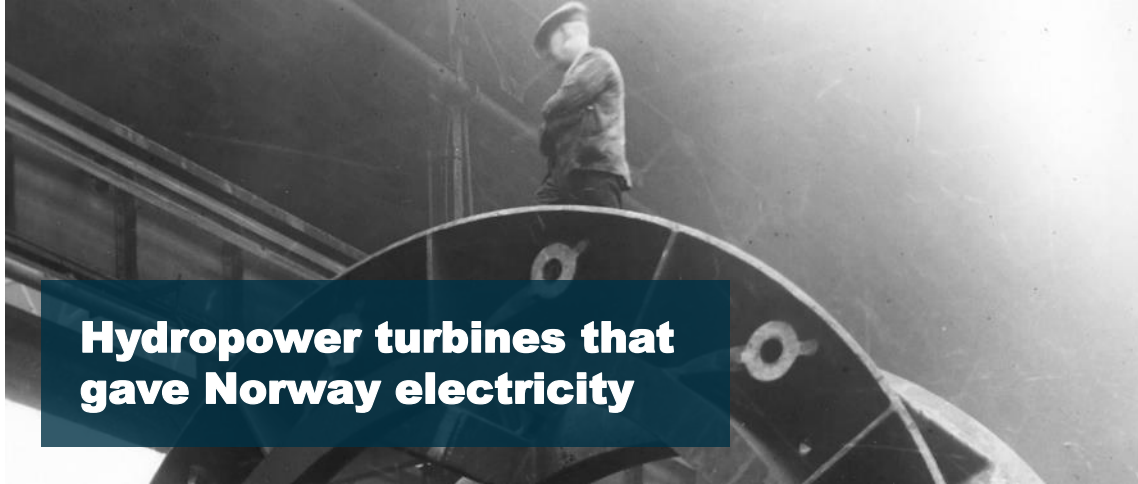
Offshore Floating Wind

JP Morgan, Energy Transition Tour, 3 Jun 2020

Astrid S. Onsum, Head of Offshore Wind
Aker Solutions



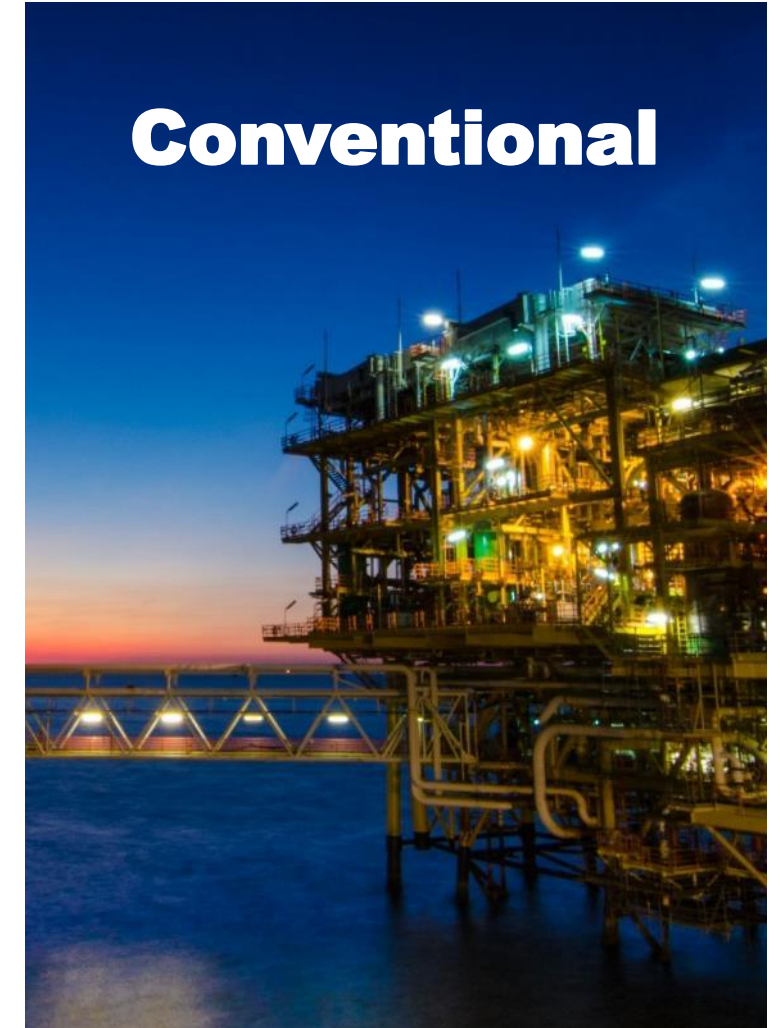
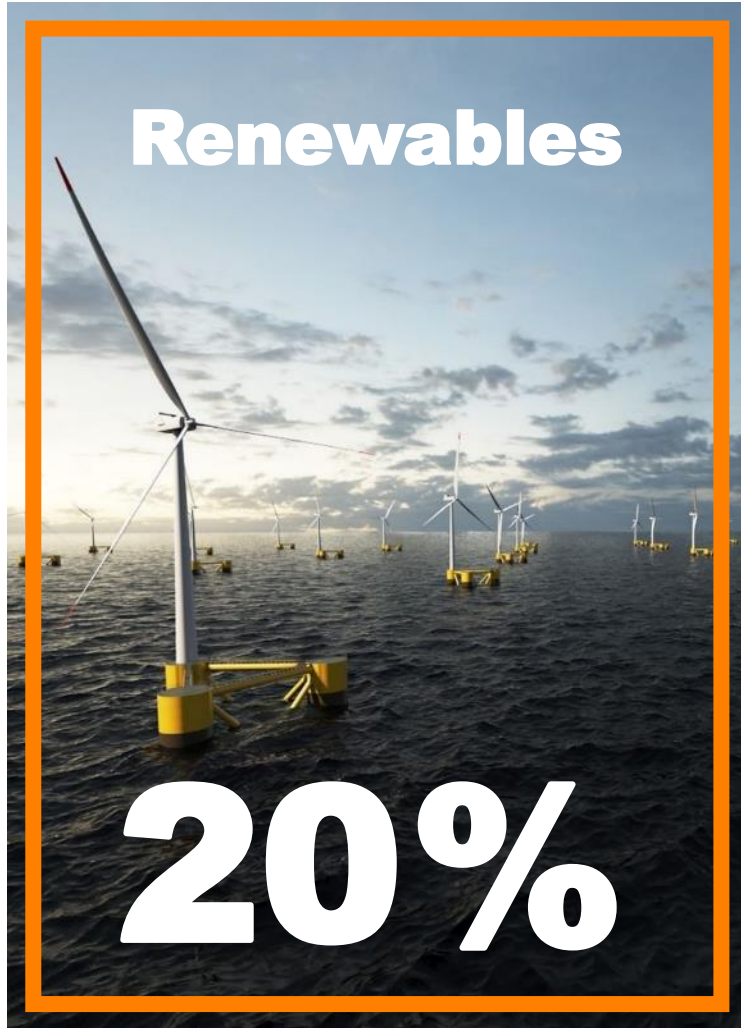
Aker Solutions – Nearly 200 Years of Change



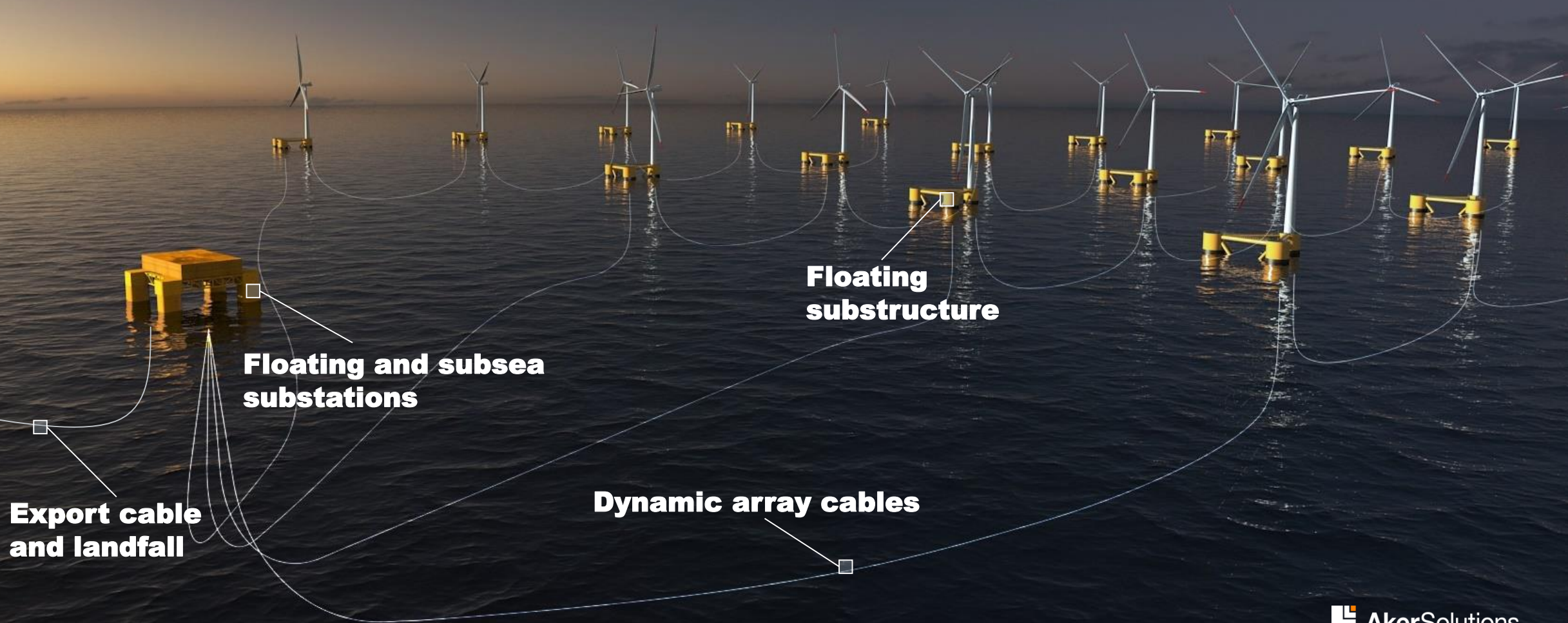
Rapid and Interconnected Change



Aker Solutions – Leading a Sustainable Energy Future



Aker Solutions will lead the **industrialization** of offshore floating wind



Principle Power Inc.

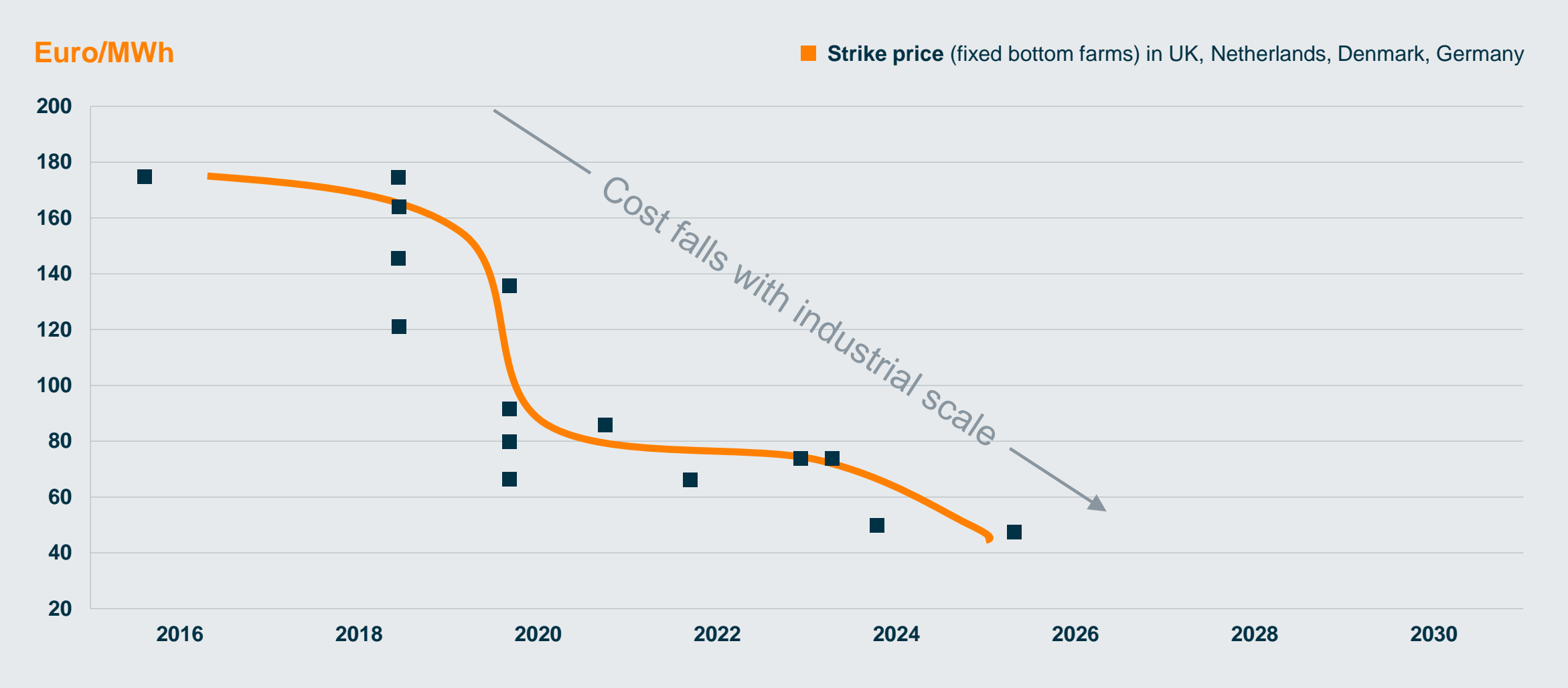
- **Founded in 2007**, headquartered in California, USA
- **Technology and service provider** to the offshore deep water wind energy market
- **Co-owners** include EDP Renewables, Repsol and Tokyo Gas

The WindFloat

- A **leading, field proven** floating offshore wind concept
- **One of only two field proven** floaters in the world
 - Pilot from 2011-2016
- **World's first 8.4 MW** floating wind turbine installed offshore Portugal 2019
- **100 MW** in the water already by 2022



Falling Cost of Offshore Wind Projects



Drivers for Deepwater Wind Power

- 80% of offshore wind resources found in water depths of >60 meters
- Deepwater technology readily available
- Not In My Back Yard (NIMBY)
- More wind resources further from shore

Offshore Floating Wind – highest **capacity factor** of wind concepts:

~30%

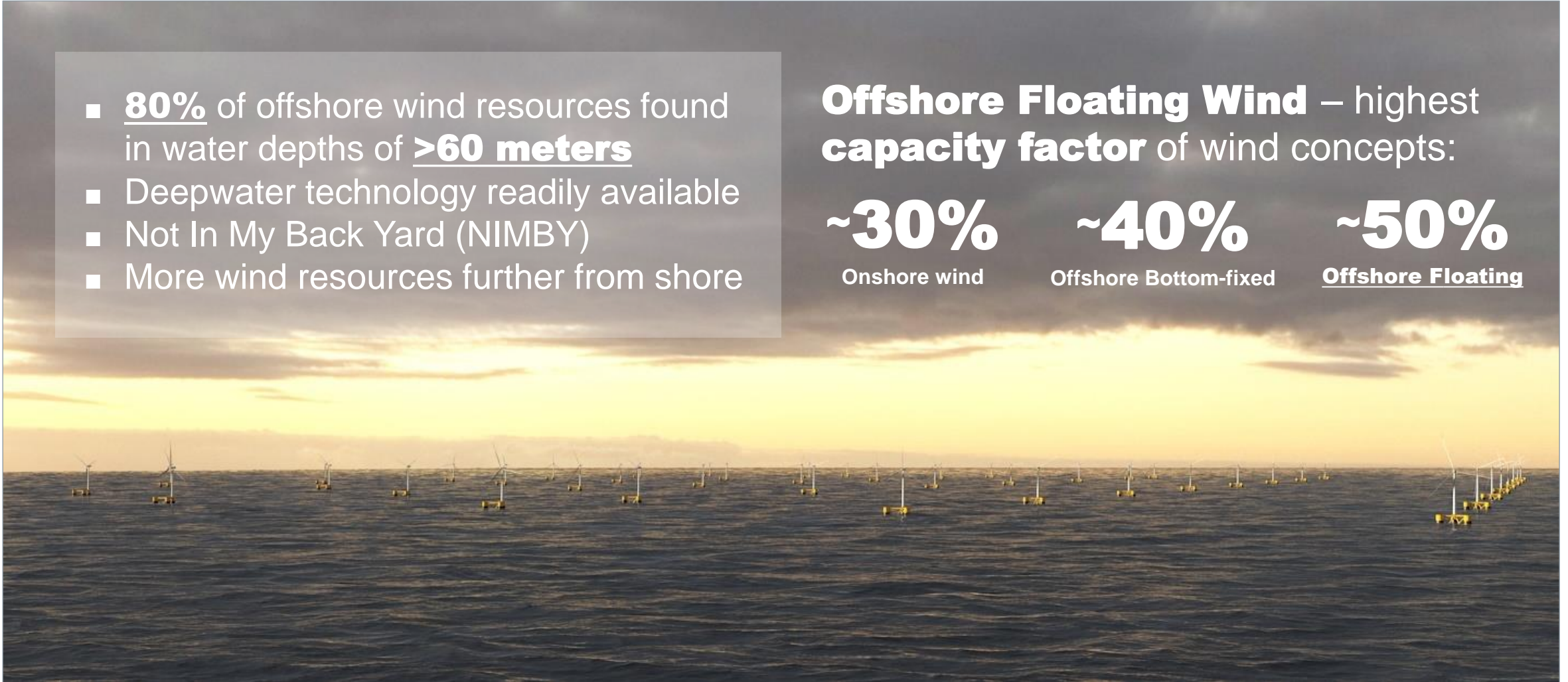
Onshore wind

~40%

Offshore Bottom-fixed

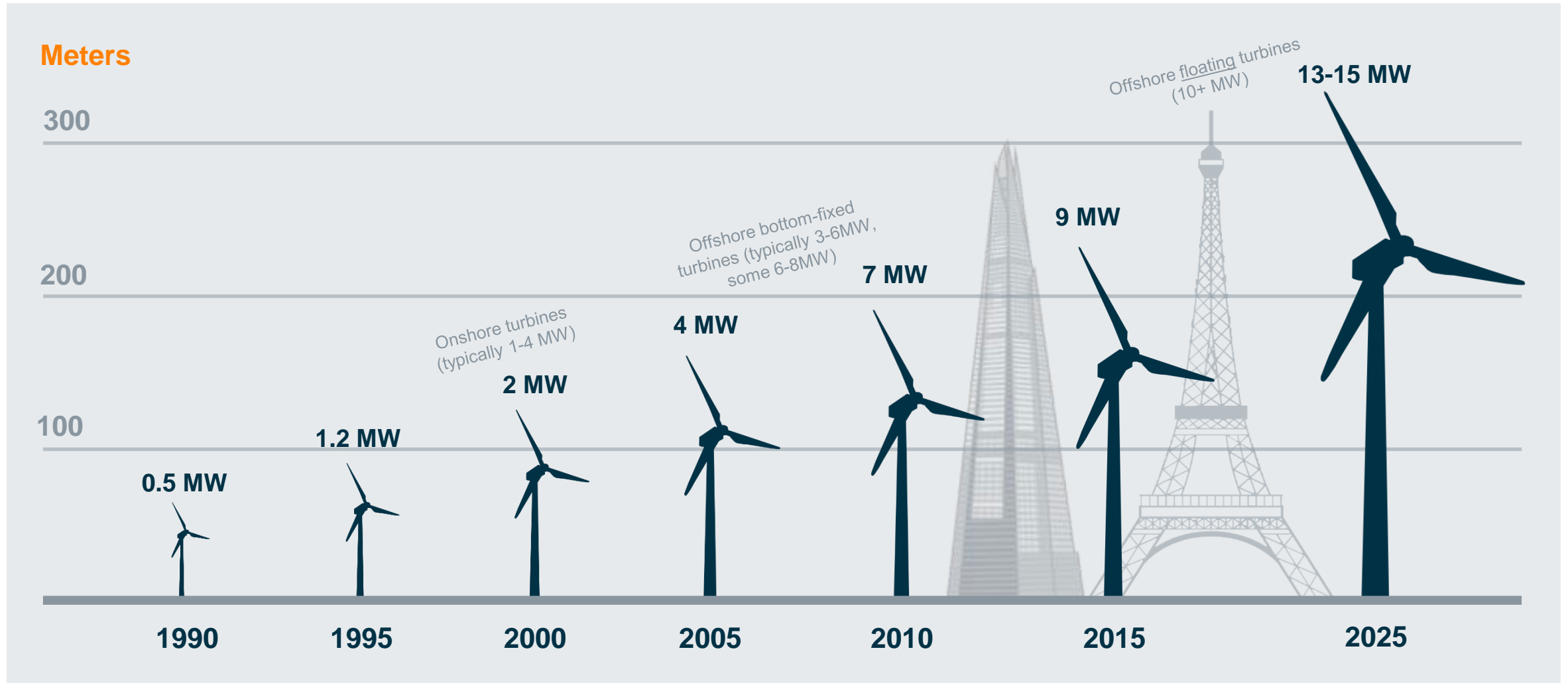
~50%

Offshore Floating



(sources: EIC Global Offshore Wind report 2019; Norwep, internal analysis)

Economy of Scale – Increasing with Turbine Size



(sources: Bloomberg New Energy Finance; various)

Global Market

Europe

Americas

Asia Pacific

■ Aker Solutions Presence

● Active Markets



A world map with a dark blue background and white outlines of continents. Five orange location pins are placed on the map, each corresponding to a project location. The pins are located in California, Scotland, Portugal, France, and South Korea. Each pin is accompanied by a text box containing the project name and its location and capacity.

WindFloat Kincardine

Scotland | 50 MW

Redwood Coast

California | 150 MW

Golf de Lion

France | 30 MW

WindFloat Atlantic

Portugal | 25 MW

KFWind

South Korea | 500 MW

This is Happening. Now.

Collaboration is Key to Success – California, US

Redwood Coast Offshore Wind Project

Local Community | Fisheries | Port | Unions

150

MEGAWATT



renewables



AkerSolutions



REDWOOD COAST
EnergyAuthority

HUMBOLDT STATE UNIVERSITY



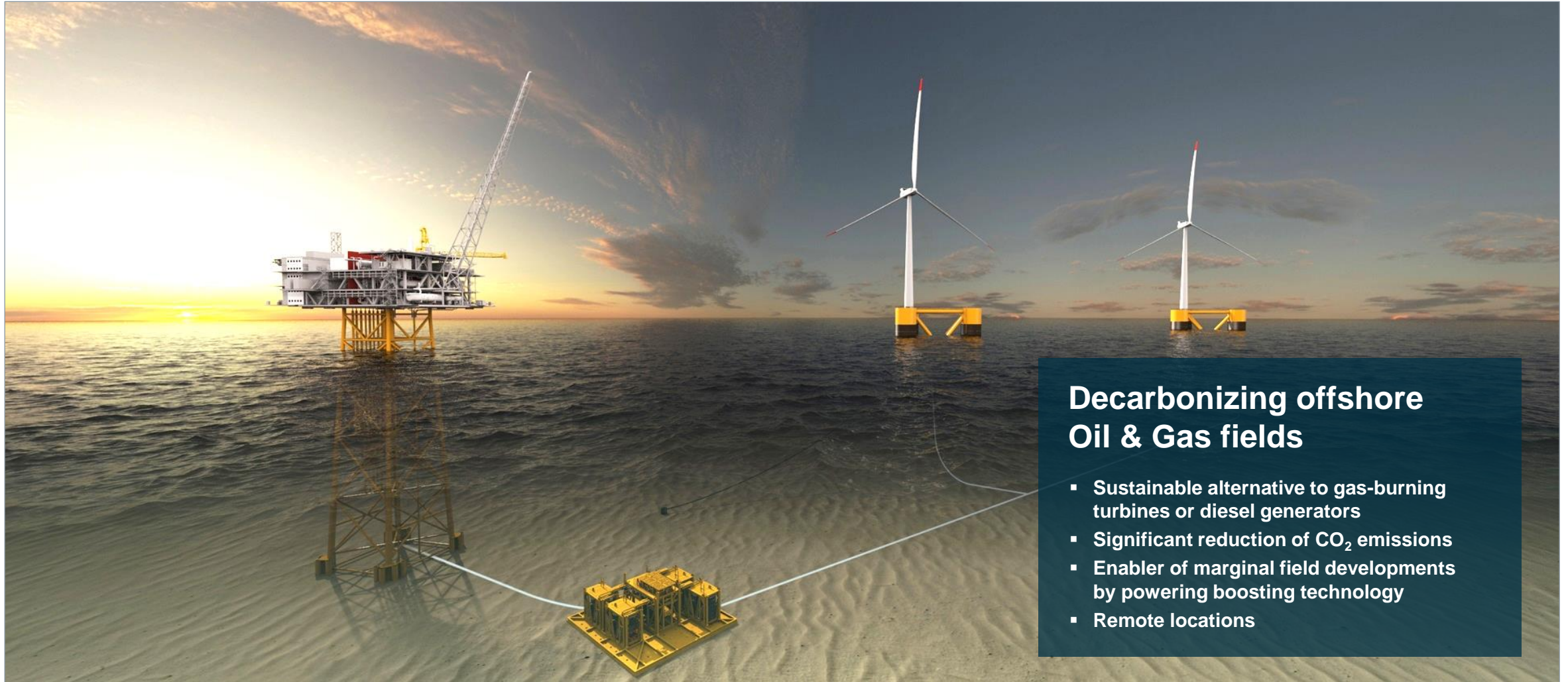
Principle Power

Major Wind Farm development – Ulsan, South Korea



- **Aker Solutions, EDP Renewables and WindPower Korea** have formed a consortium
- Ambition to develop an initial **500 MW** floating wind farm off the coast of Ulsan Metropolitan City in **South Korea**
- The South Korean Government has called for **13 GW** of offshore wind to be installed **by 2030**
 - Target of at least 30 percent renewable energy by 2040
 - 7 GW targeted by Ulsan City

Floating wind – decarbonizing offshore oil and gas fields



Decarbonizing offshore Oil & Gas fields

- Sustainable alternative to gas-burning turbines or diesel generators
- Significant reduction of CO₂ emissions
- Enabler of marginal field developments by powering boosting technology
- Remote locations

New Era of Ocean Economy Opportunities

**FLOATING
WIND POWER**

**Hydrogen Production
and Offloading**

**Offshore
Aqua Culture**

**Landfall and Power
Storage / Balancing**

**Floating and Subsea
Power Stations**

Power Hubs

Critical Infrastructure

Subsea Data Centers

Data and Software

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