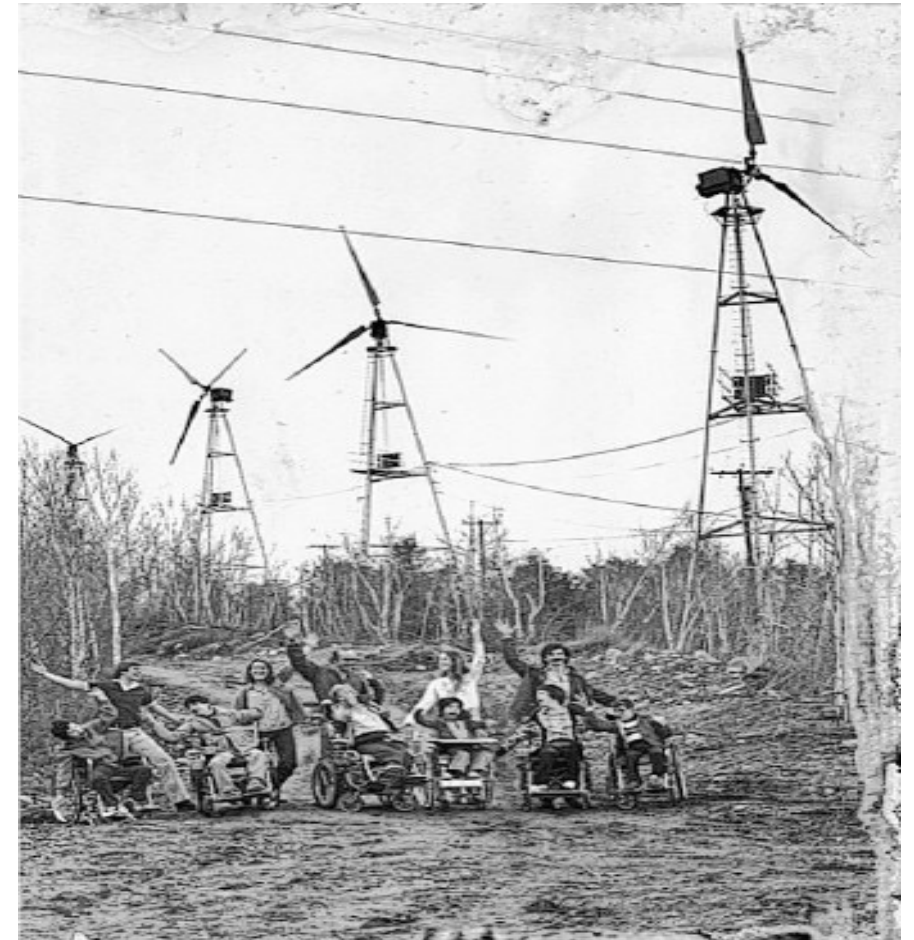




Offshore wind – way forward

Jan Fredrik Stadaas, Special Advisor Strategy, Equinor
Energiskiftet, Stavanger 2024.05.22

Shifts starts with new demand, crises or technology break through



Offshore wind is still under development

10 years (2013-2023) of development in offshore wind

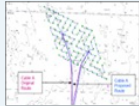
Wind turbines



4 MW → 14 MW



Wind farms size



300 MW → 1300 MW



Distance from shore



30 km → 110 km



Water depth



20 meter → 40 meter



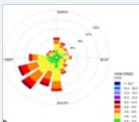
Access limits



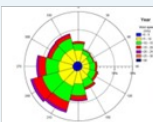
1.5 meter → 3.5 meter



Avg wind speed

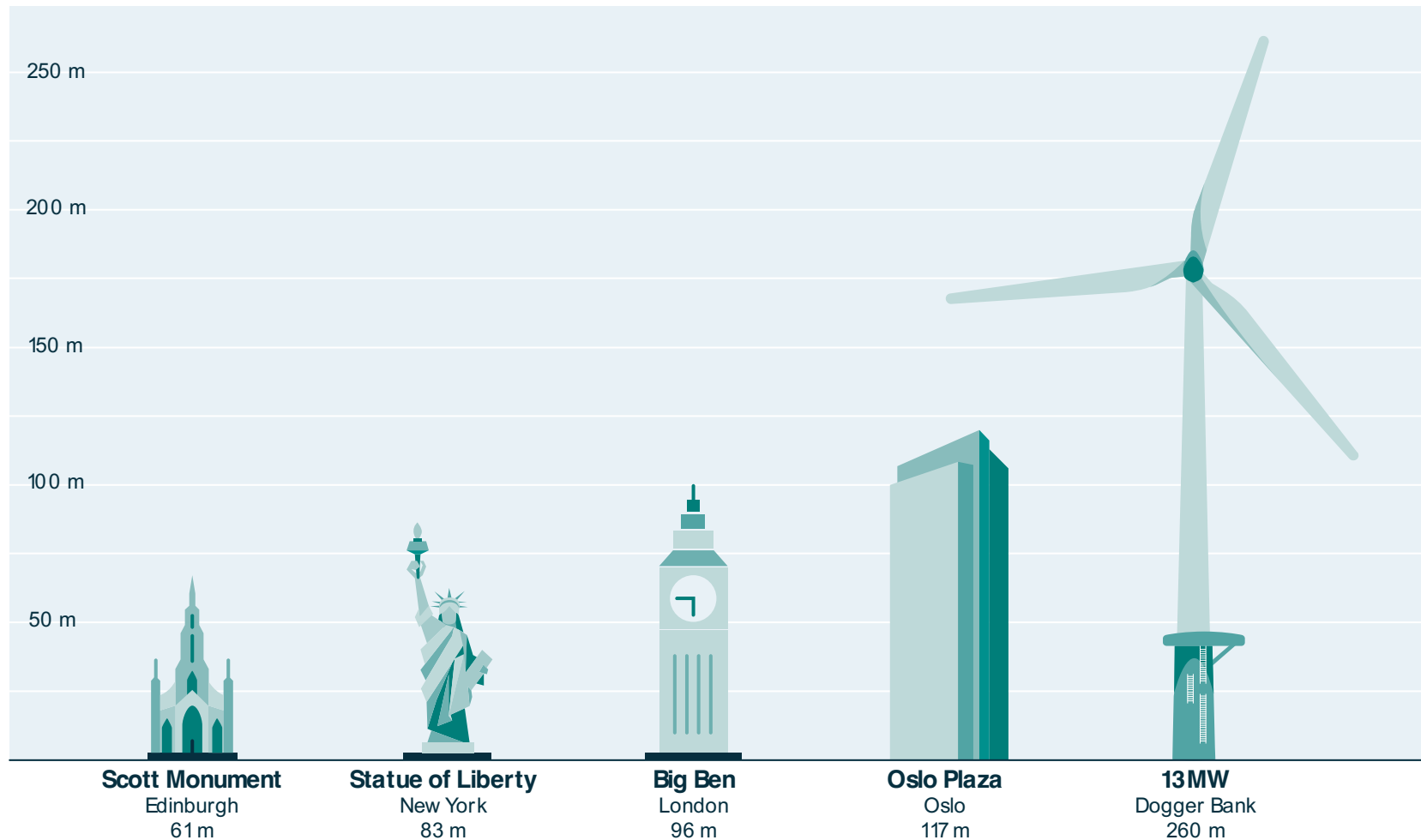


8 mps → 10 mps



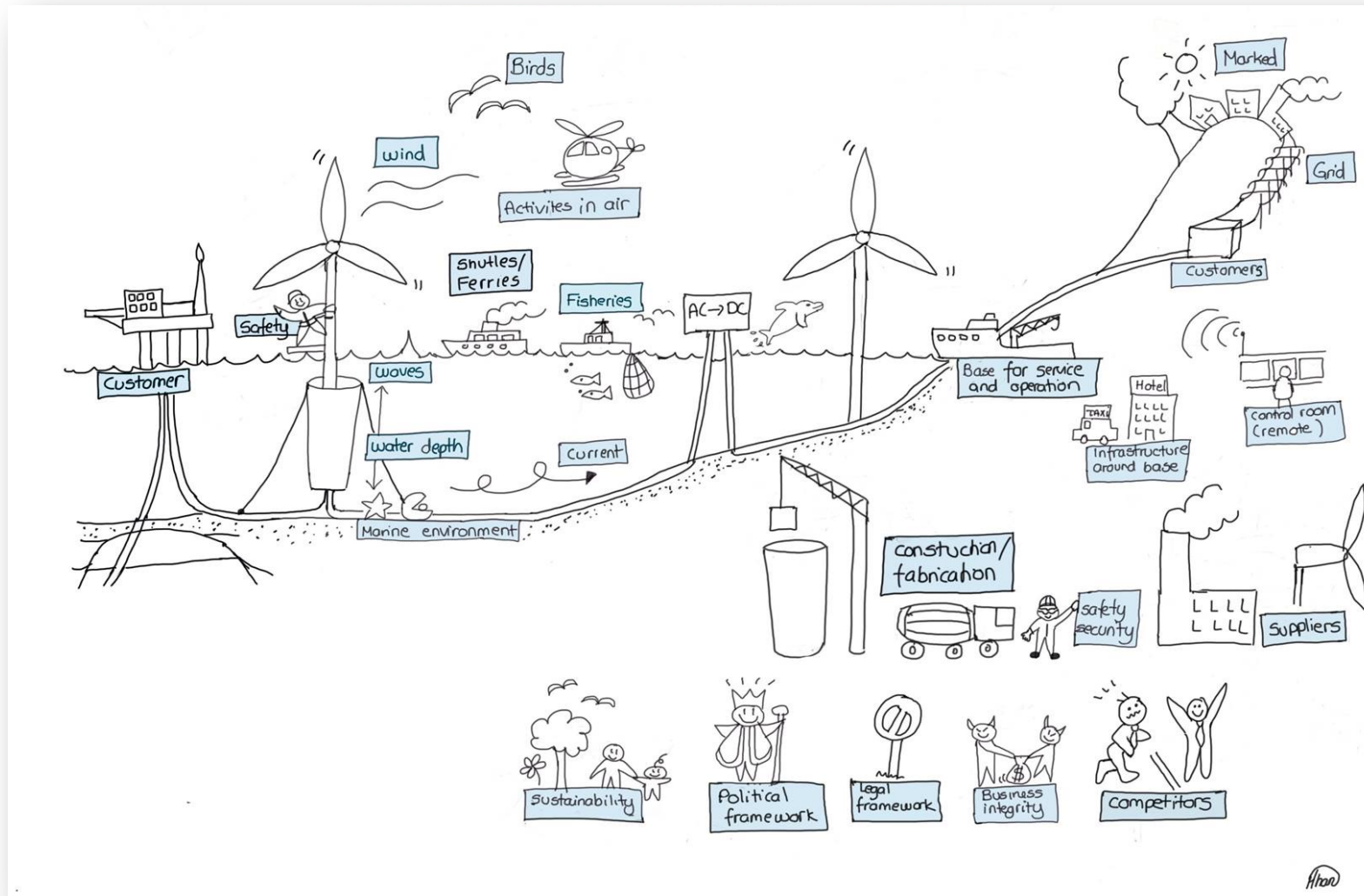
- Reduced LCOE
- Reduced WACC
- Increased targets
- Global industry
- Increased footprint

Offshore wind is heavily impacted by scale effects



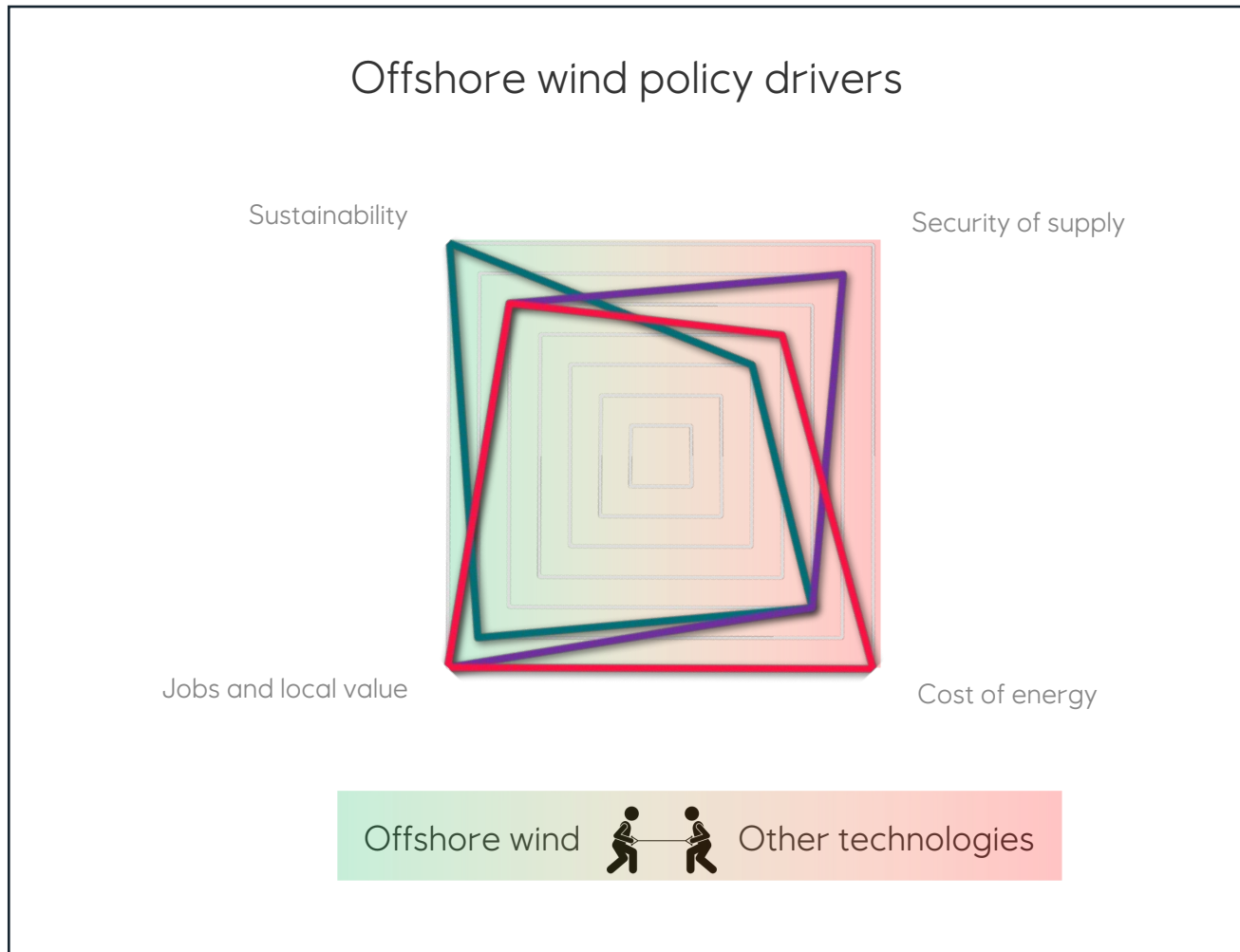
- 
- ✓ Increased production
 - ✓ Reduced cost
 - ✓ Lower impact
 - ✓ Increased complexity
 - ✓ Added flexibility

The business environment is different



- Customers
- Stakeholders
- Local community
- Infrastructure
- Local industry
- The politicians and the public

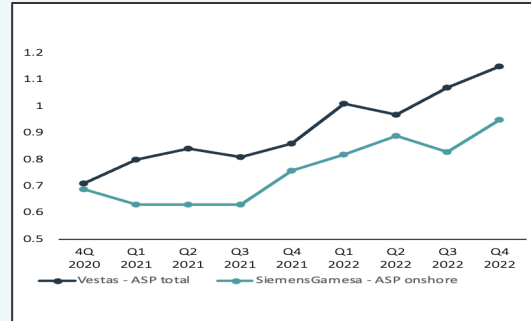
Governmental policies defines the rules of the game



- Volume ambition, policy credibility
- Role of industry vs government
- Auction system design
- Local content requirements
- Offtake arrangements

Some headwinds on the way

Increased costs – short term ?



mEUR price per MW for WTGs

Industry profitability as a whole challenged – supply chain costs are increasing making delays inevitable

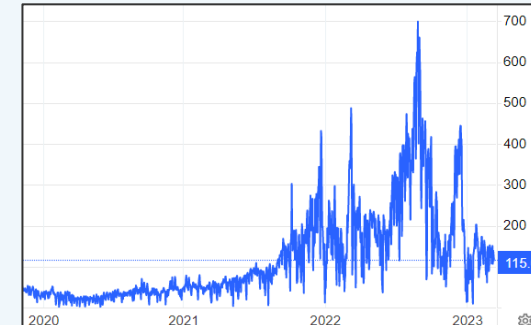
Increasing cost of capital



Cost of capital (Euro 10Y swap rate %)

Impacts investment levels across the board due to higher upfront costs

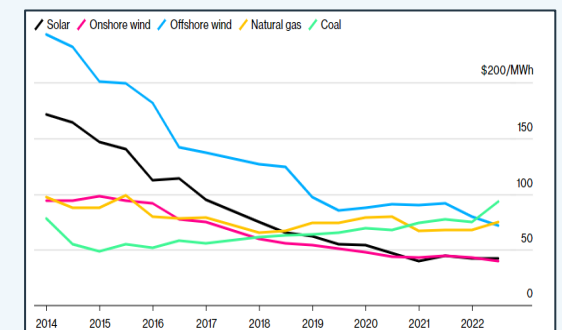
Power price volatility



Germany electricity spot prices (€/MWh)

Set higher requirements to power market capabilities and impacts overall risk position

LCOE down, local content high

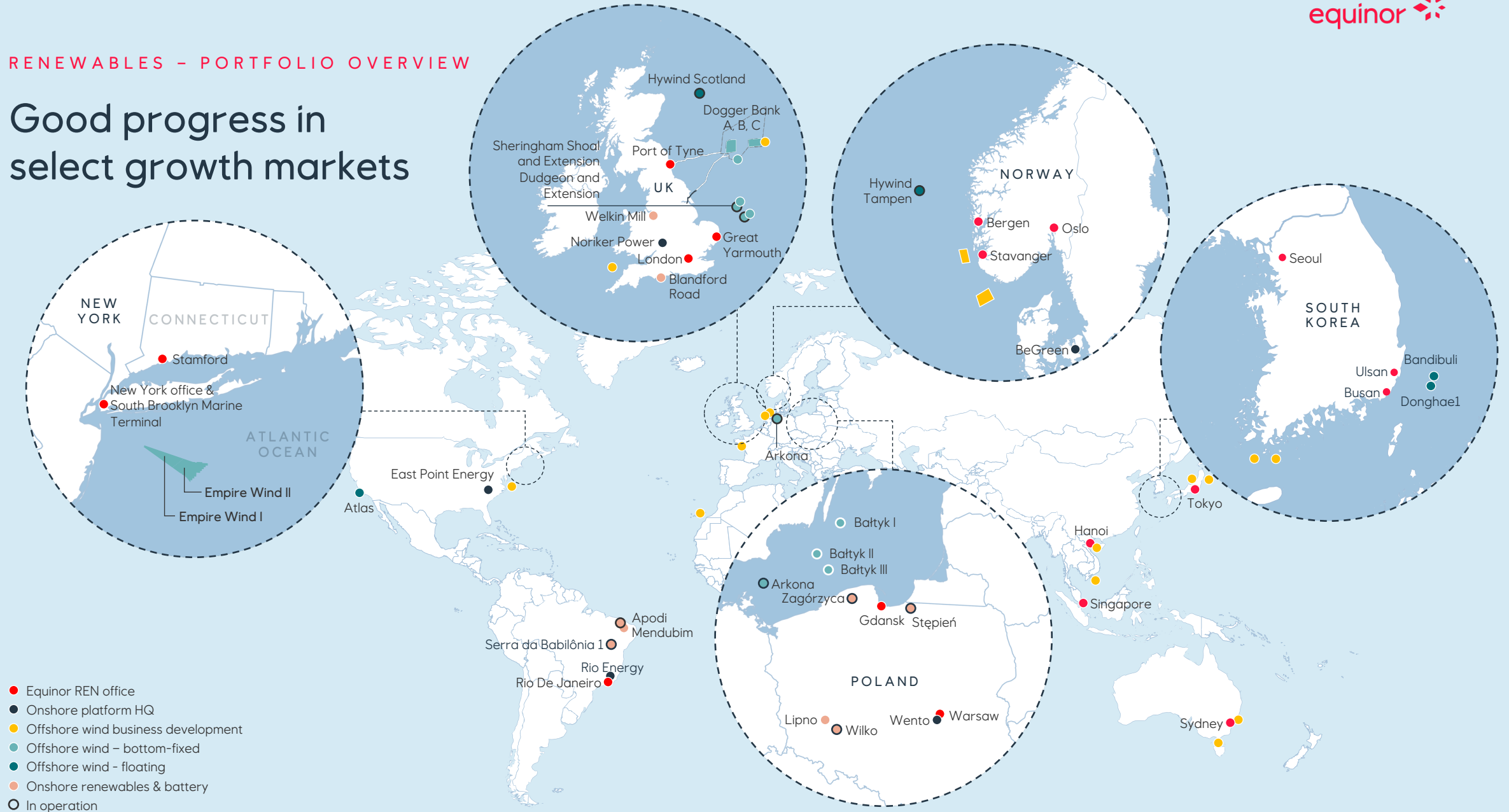


Global LCOE development by technology

Lower LCOE urge governments to cut subsidies, while still expecting high local content levels – requiring a constant focus on cost.

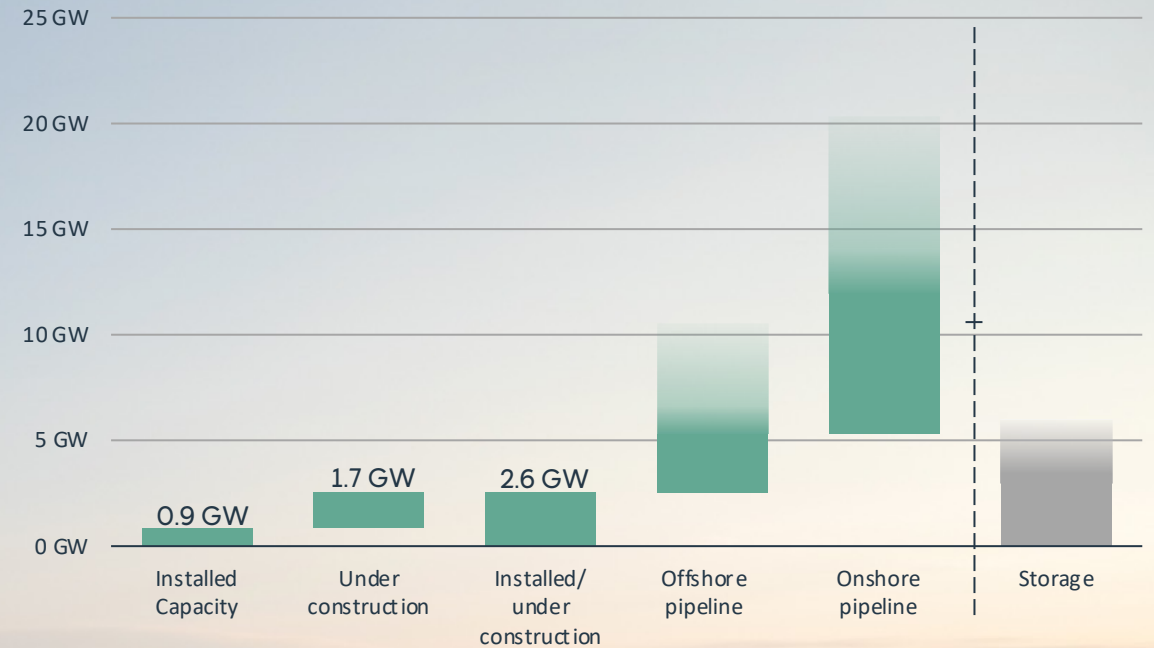
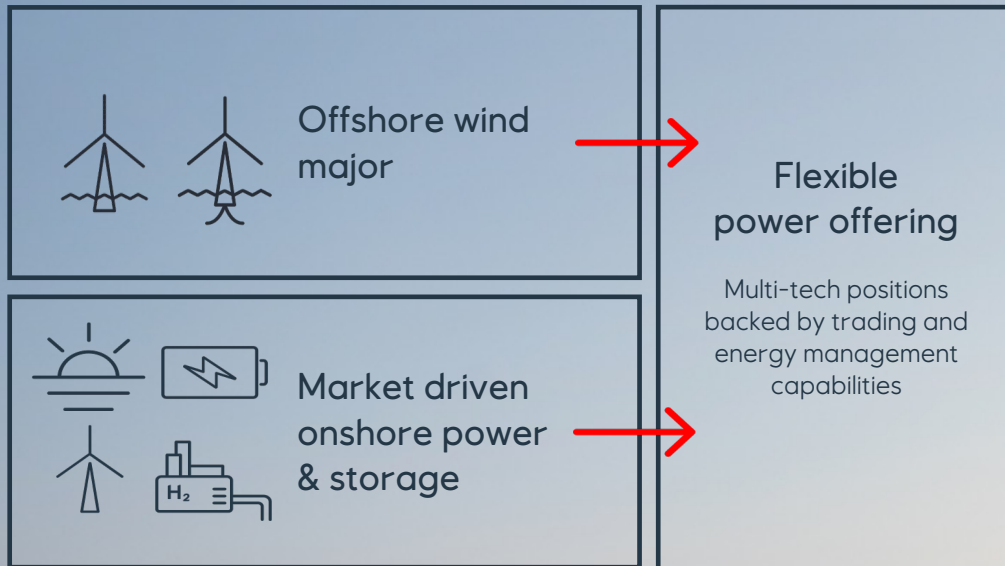
RENEWABLES - PORTFOLIO OVERVIEW

Good progress in select growth markets





Firm on strategy, flexible on execution



What does it take?

Transparency and effectiveness in regulatory regimes

Scale to reduce cost and infrastructure investments

Continue technology development and a healthy supplier industry

Understanding environmental effects and facilitating for coexistence



What's next ?

- A global industry ?
- New type of customers ?
- Broader energy offerings ?
- Integrated infrastructure
- Digital wind farms
- Remote operated set up





Thank you

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Energiskiftet, Stavanger 2024.05.22