

Hywind

Floating Offshore Wind 2017 - Oslo

NES Strategy

Build a **profitable renewables business**

OFFSHORE WIND



SOLAR

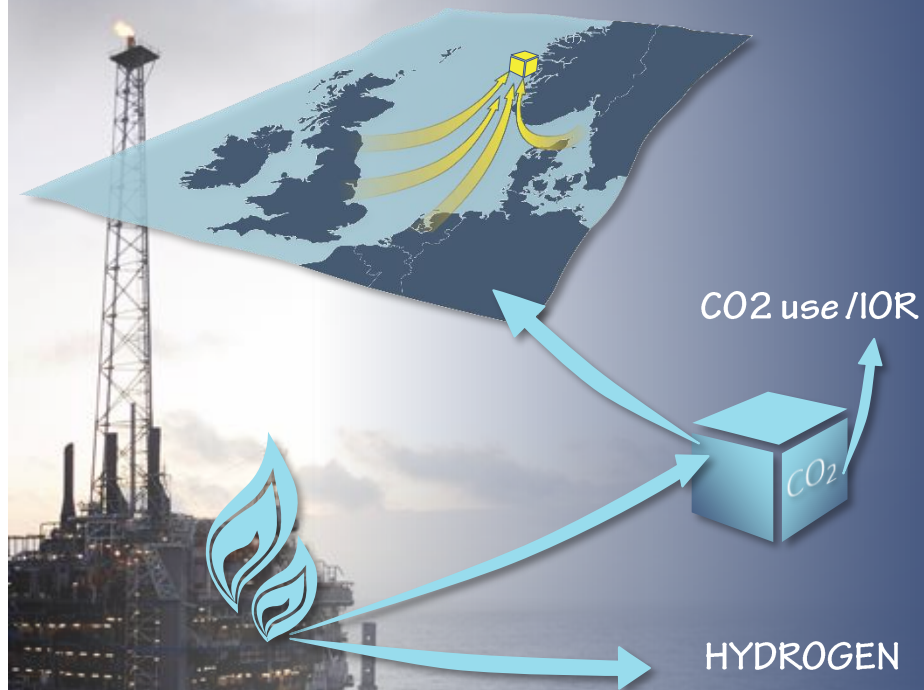


ENERGY STORAGE



Develop **new lower-carbon business opportunities** for Statoil's core products

NCS - CO2 STORAGE



Statoil and offshore wind

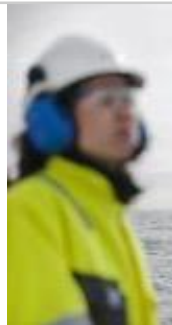
Playing to our strengths

- Complex projects
- Marine operations
- O&M & HSE ability
- Leading floating tech.



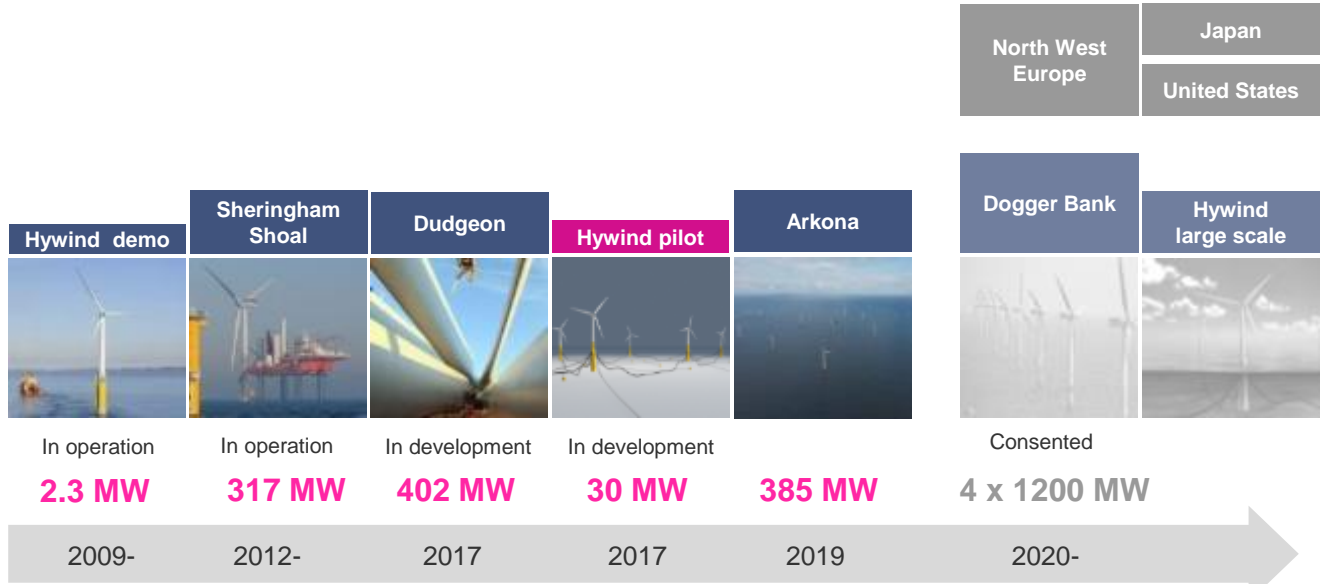
Attractive market

- Attractive risk/return
- Predictable revenue
- OECD countries
- High entry barriers



Offshore wind projects currently in progress delivering >1100 MW

Additional 4800 MW consented / ~5 mill. homes



North West Europe	Japan
	United States

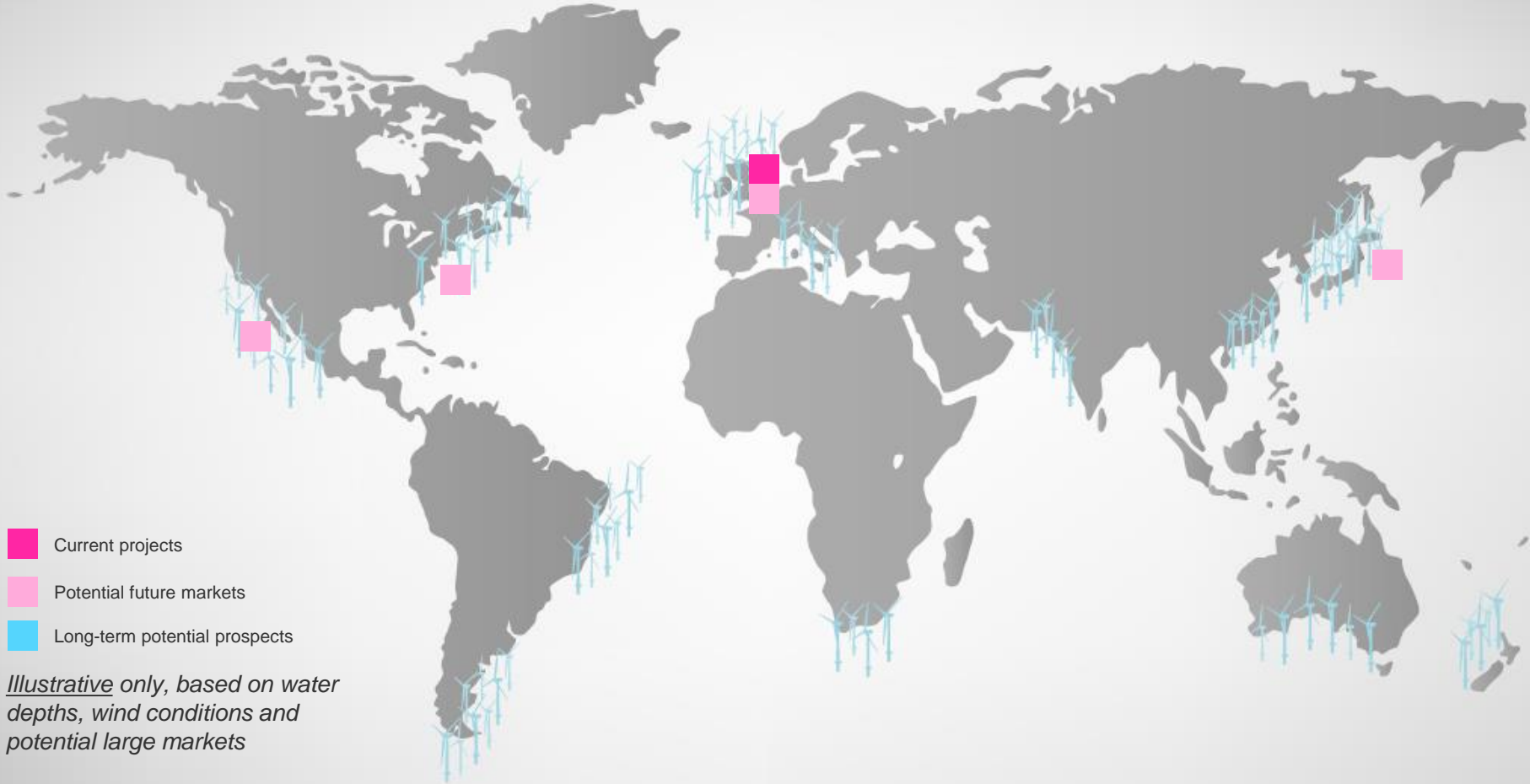
Masdar 25% share

New York Licens

* All capacity figures on 100% basis



Expanding the potential floating wind market



The Hywind Concept

Proven technology in a new setting

- Simple spar-type substructure
- Standard offshore wind turbine
- Conventional 3-line mooring system
- Blade pitch control system for motion damping
- Suitable for harsh conditions



Demo



Pilot Park



Large parks

Hywind Demo Experience

- Excellent HSE record - No serious incidents
- Produced 55 GWh since start-up in 2009
- Production as good as or better than other 2.3 MW Siemens wind power turbines
- Experienced storms with wind speed over 44 m/s and maximum wave height of 19 m
- Verification of system integrity in operational mode


Realising the Hywind Scotland pilot park

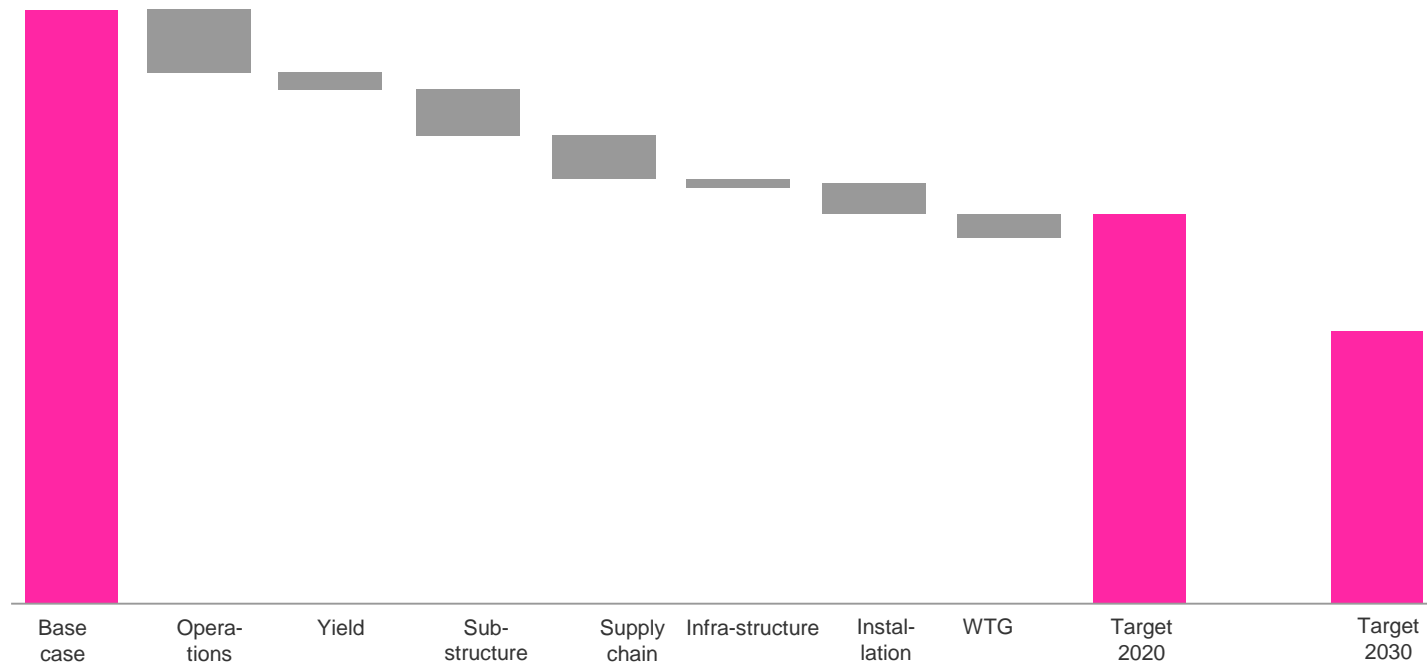


- **Investing around NOK 2 billion**
- **Partner: Masdar 25%**
- **60-70% cost reduction** from the Hywind Demo project in Norway
- **Powering ~20,000 UK homes**
- **Installed capacity: 30 MW**
- **Water depth: 95-120 m**
- **Avg. wind speed: 10.1 m/s**
- **Area: ~4 km²**
- **Average wave height: 1.8 m**
- **Export cable length: ~30 km**
- **Operational base: Peterhead**
- **Start power production: 2017**

Challenges - Bringing down the cost

Cost reduction of 40-50% by 2030 a realistic target

 LCOE (NB: Illustrative)



Piloting Batwind concept for Hywind

Floating Wind + Storage + Grid

- ✓ *Increase the value of floating wind*
- ✓ *Start developing new business models around storage in Statoil*



1
Capture wind overshoots
Ability to store excess electricity for sale when capacity is free

2
Reduce balancing cost
Counter impact of wind forecasting errors

3
Increase power market value
Capture price peaks through arbitrage

4
Deliver power system services
Provide frequency reserve response and other ancillary services

The future for Hywind



Large resource potential

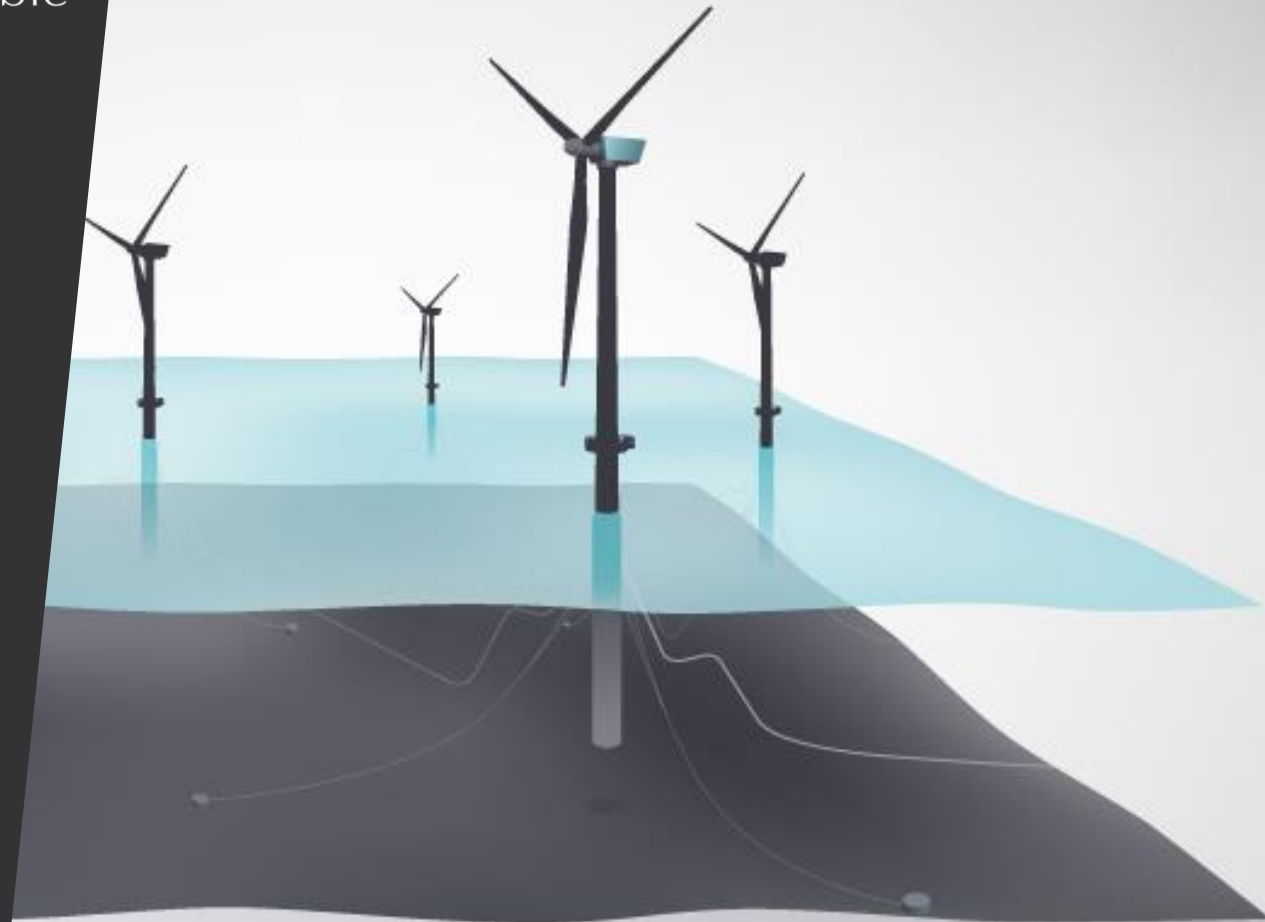
Hywind is the most mature concept

Statoil is an experienced developer with a strong financial position

Target markets for the next step



Statoil. The Power of Possible



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