Offshore Wind in cold climate

– risks and considerations

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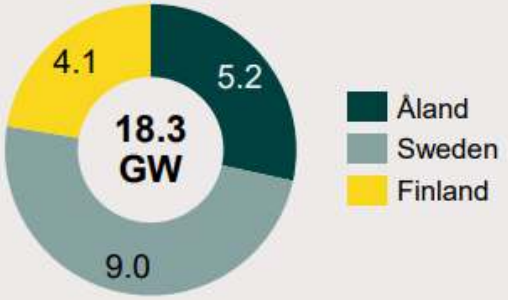
OX2 Offshore

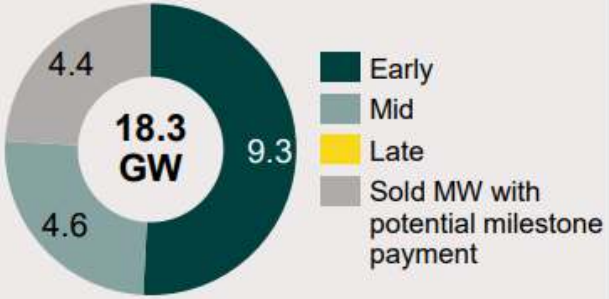
OX2s offshore portfolio

Offshore wind portfolio

Portfolio by market (GW)



Portfolio by stage (GW)



Offshore wind highlights

- OX2 started its offshore wind business in 2018
- Total portfolio today of 18.3 GW across 7 projects and 3 markets
- First farm down completed during 2022 divesting 49% of three offshore projects to Ingka

Baltic Sea - leading green energy hub in the Nordics

- Baltic Sea region holds significant offshore wind potential and OX2's projects being well positioned
- OX2 driving value through high speed, competence and quality in development and flexible business and financing model

Halla

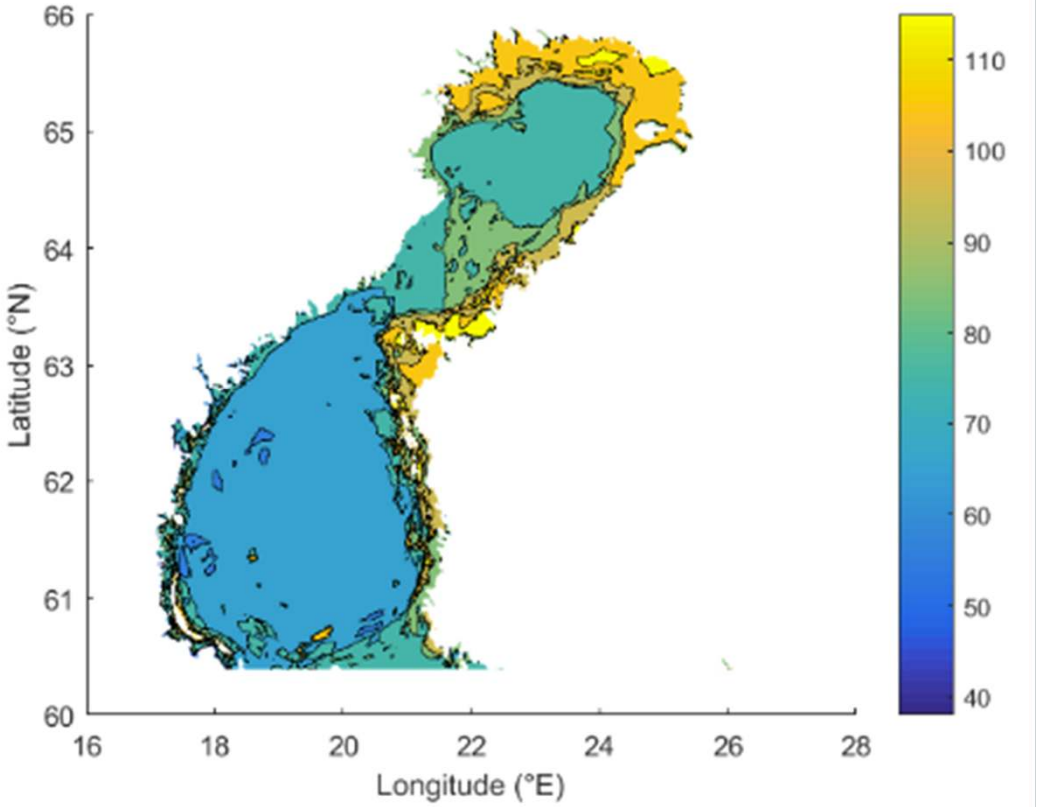
- Up to 160 turbines
- 575 km²
- 2.4 GW
- ~10 TWh
- 9.1 m/s mean wind speed at 170m HH
- 31 m mean water depth
- Construction planned ´27-´30

Laine

- Up to 150 turbines
- 451 km²
- 2.26 GW
- ~9.5 TWh
- 9.5 m/s mean wind speed at 170m HH
- 46 m mean water depth
- Construction planned ´27-´30

Risks and considerations

- Sea-ice
- Icing on blades
- Extreme low temperatures



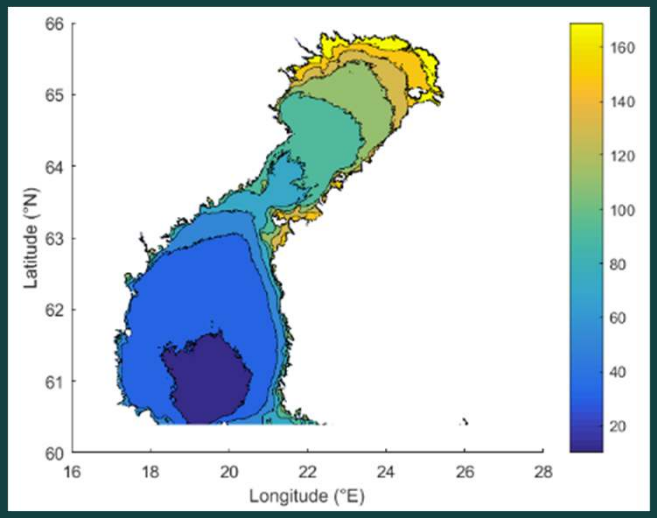
Maximum ice thickness occurring once in 50 years in the Gulf of Bothnia, based on the ice charts of the Finnish Ice Service from the winters of 1980/1981 to 2016/2017*.

*Finnish Meteorological Institute, Helsinki, Finland

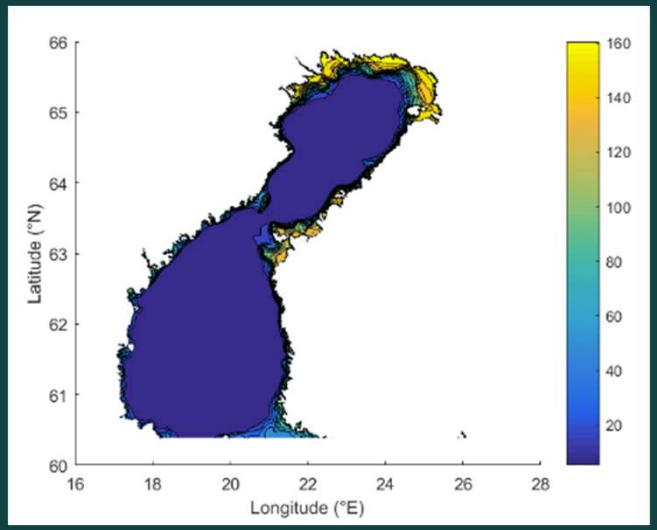
Sea-ice risk

Impact: Energy production loss (availability), safety, CAPEX increase, delay

- Boat landing blocked with ice
- Health and Safety risk climbing boat landing
- Installation window/delay
- Ice loads on foundation
- Navigational risk
- Export cable damage



Long ice winter in days during a winter season*



Short ice winter in days during a winter season*

*Finnish Meteorological Institute, Helsinki, Finland

Sea-ice mitigation

- Flexible (start/end) installation contracts
- Ice breaking construction support vessels
- Ice breaking service vessel
- Service port choice
- Heated boat landing
- Mock up and studies during development
- Ice cones
- Ice protection for export cable close to shore

Icing on blades

Risk:

- Health and safety from falling down ice
- Energy production losses

Mitigation

- Ice detection
- Assess and evaluate (consider mitigation or accept)

Extreme low temperatures

Risk

- Health and Safety risk
- Stand still damages
- Additional downtime for warm up

Mitigation

- Additional PPE
- UPS and heating systems
- High grid availability

Conclusion

Sea-ice, extreme low temperatures, icing on blades are risk factors, which need to be considered, evaluated and impacts mitigated.

Risks of up to 8% of lower AEP, 10-20% construction cost increase and up to 25% higher operation cost, resulting in uncertainties and higher electricity prices, compared to other wind farms in Europe.

Developers, Designers, Institutes and Authorities need cooperate to establish a market environment with a good level of understanding and certainty to develop Offshore Wind in cold climate conditions.

Thank you!

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