Prizztech

Offshore Wind Power

EWPA Estonian Offshore Wind Energy Conference
Hiiumaa 29. 10. 2013
Ari Sundelin

Offshore wind power Finland

- Introduction of Prizztech ltd
- Status of OWP in Finland
- Offshore Wind Pilots
  - Kemi, Pori
- Strategic Plans OWP in Finland
- Challeges North Baltic sea
  - e.g. O&M operations

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Prizztech ltd

- Prizztech has over 20 years experience in the world of innovation environments working to improve business performance and competitiveness.
- The company operates as an impartial, non-profit organization of experts in business development, research and project management.'
- In the company are working 70 experts
- Energy is one of our focus areas.

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Prizztech and Wind Power

- Promote Finnish industry related to Wind Power Business – in Finland and for exporting activities
- Activities on national level and cooperation with international wind power network Key actor for offshore wind power of the cold climate & icing sea areas

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Prizztech and OWP

- Work is based on 40 companies of our WP cluster
- Offshore WP is in interesting phase in Finland at the moment
- Several Finnish companies have potential in offshore projects on the Baltic sea region
- Prizztech works for offshore wind power in cold climate & icing sea areas

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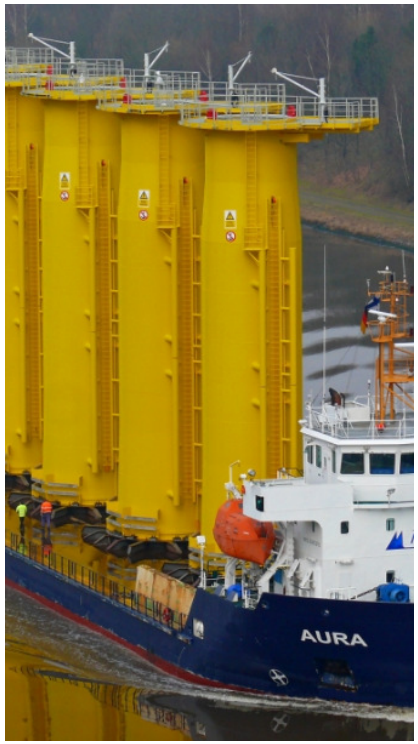
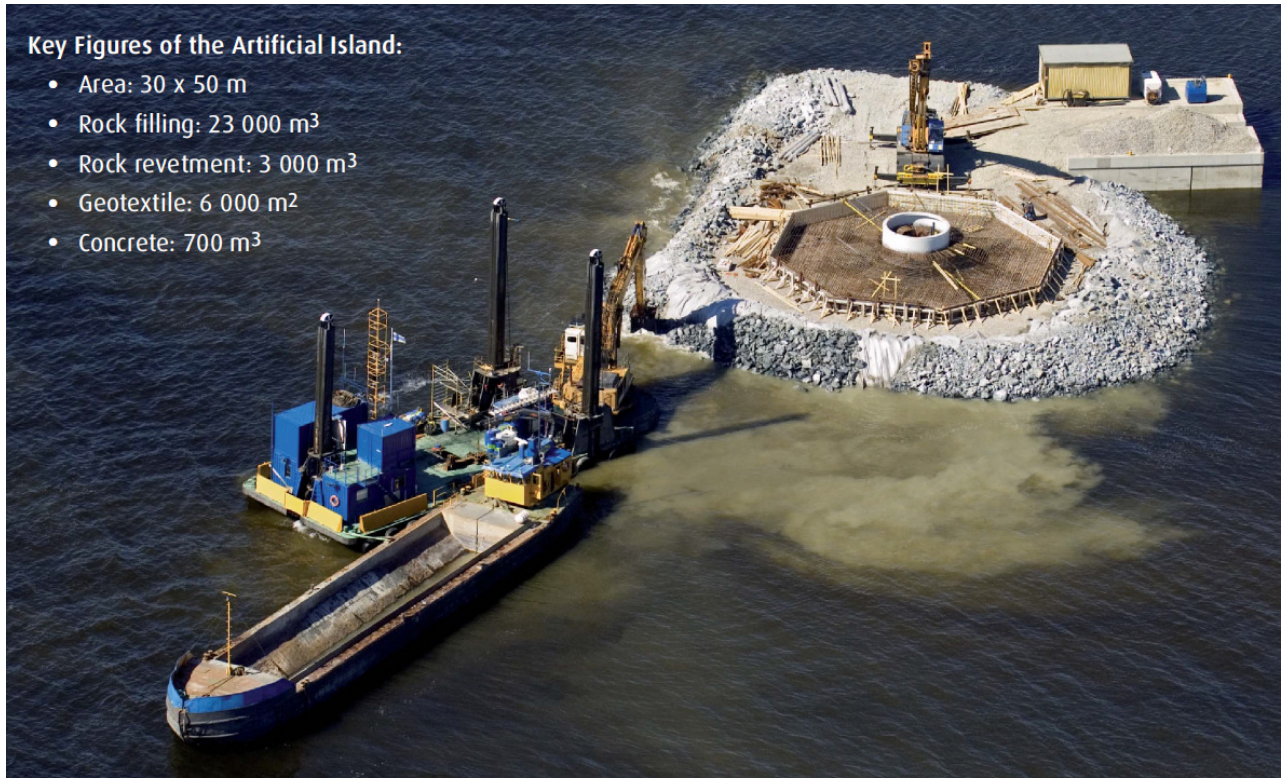
Status of OWP in Finland

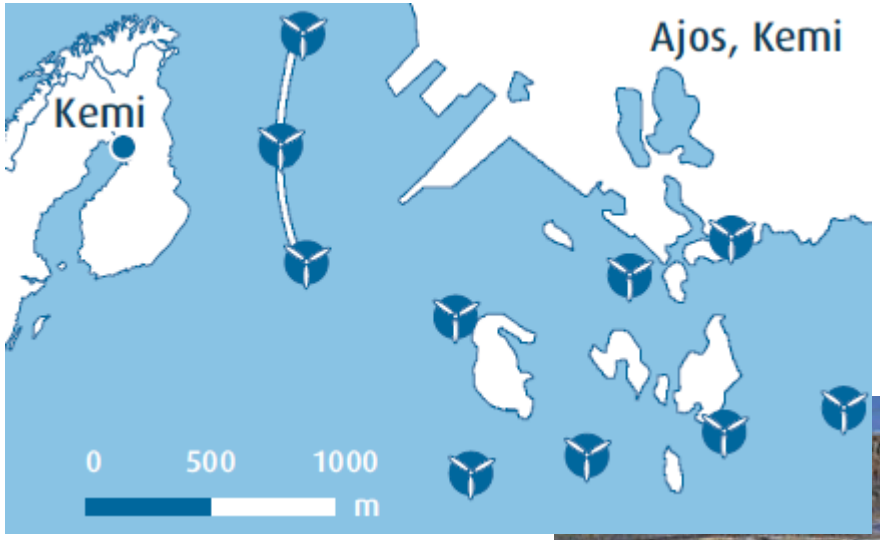


- Developers
  - 10 projects, 2 040….3 200 MW, about 670 turbines
  - Now built 500 GWh -> Target 2020 2500 6 TWh
- Projects
  - Foundations gravity based (geological properties e.g. gravel/moraine), shallow waters, seabed stability.
- Consulting companies & knowledge
  - Ice conditions, forces, drifting /packed ice, cold climate, seabed geology and research
- Manufacturing
  - Heavy metal (shippyards), Innovative solutions (vessels, ice)

Offshore Wind Pilots
Kemi- artificial islands

Kemi Ajos offshore
10 turbines (8+2) 30 MW
Project duration:
November 2006 – September 2008




Ajos, Kemi
Kemi
0
500
1000
m

Offshore Wind Pilots
Kemi- test foundation and tower 2009

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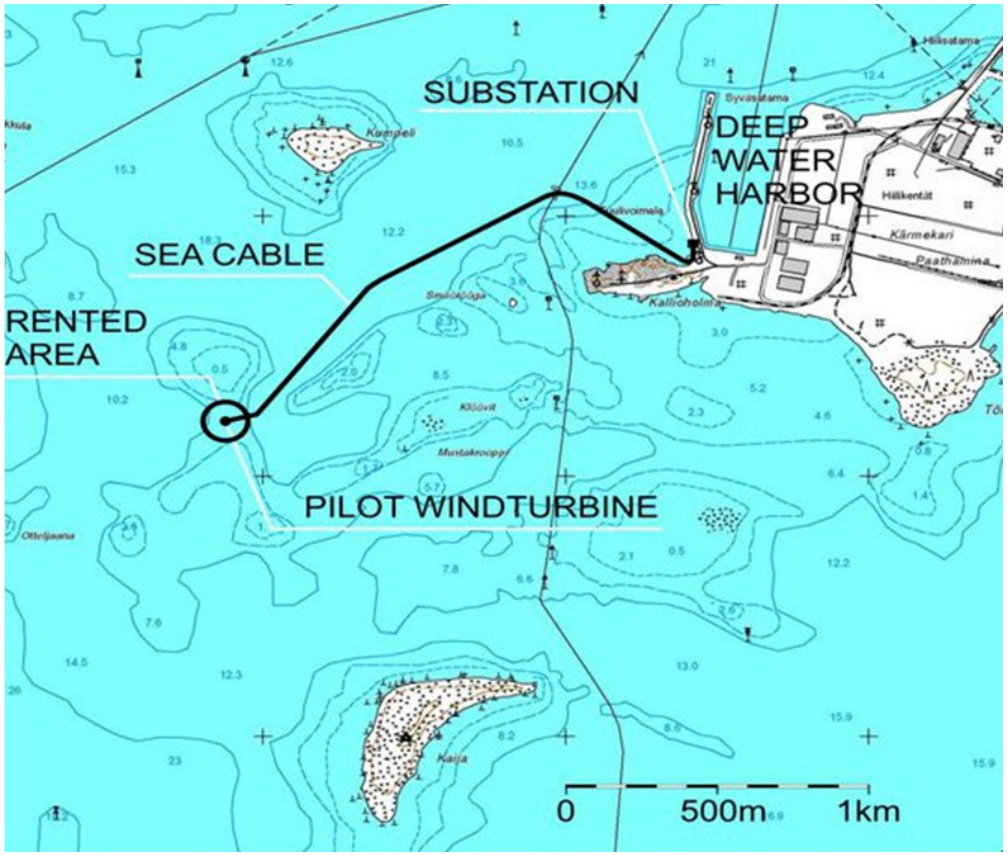
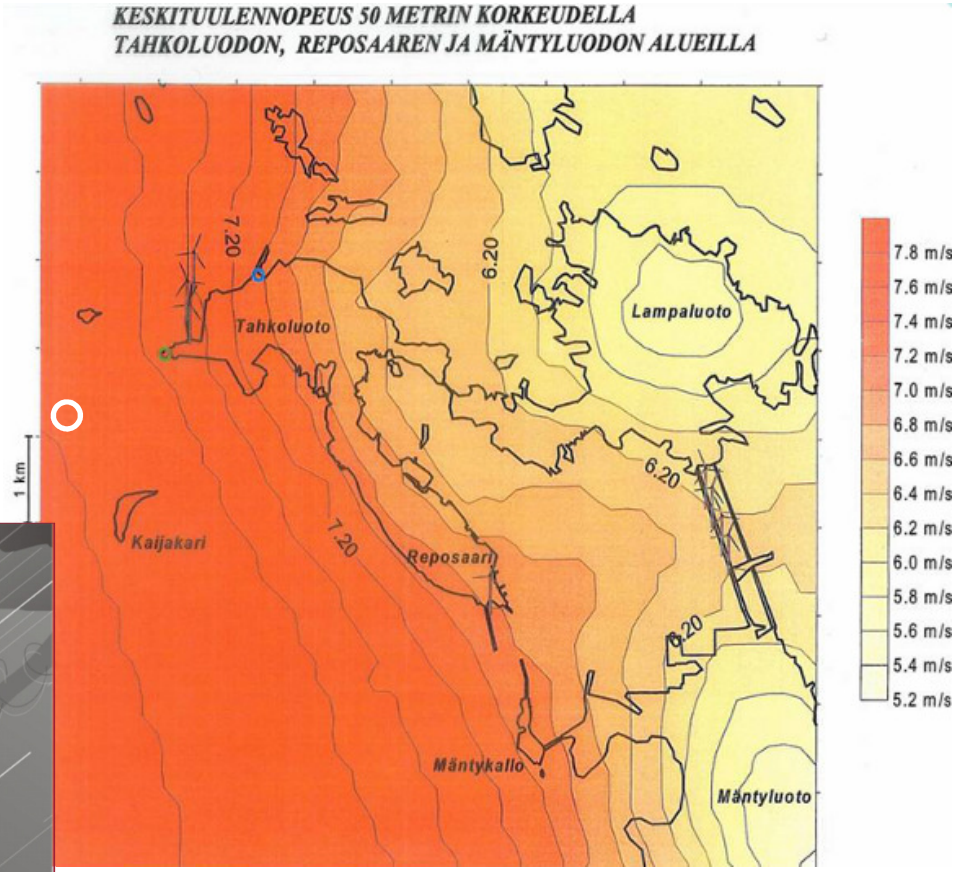
Offshore Wind Pilots
Pori offshore1

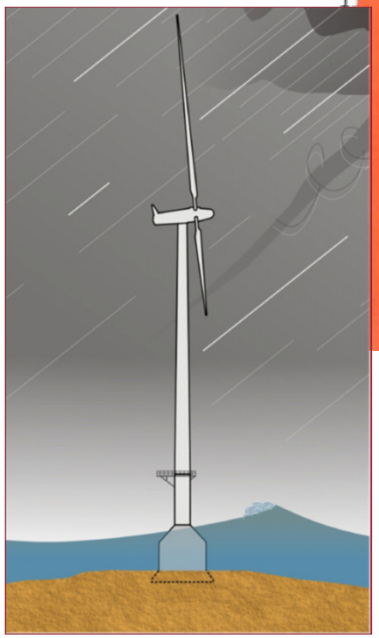


- First offshore wind turbine summer 2010
- 2,3 MW / 101 m, 80 m
- Exellent infrastructure
  - Harbour
  - Road connections
  - Grid connection
  - Industrial district
  - Neutral public opinion for WP

Offshore Wind Pilots
Pori offshore1

- The location offers one of the best wind speeds available in Finland
- Mean wind speed > 7m/s
- Water depth ~ 10 m





Pori offshore1 – gravity based foundation


1350SJP
SWPU

Pori offshore1 – Lifting & installations

Pori offshore1 – challenging ice conditions

- Consolidated, compact or very close ice
- Ridged or hummocked ice
- Rafted ice
- Three winters in ice, one was very heavy
- No damages, no variation in straightness (significantly below tolerance)

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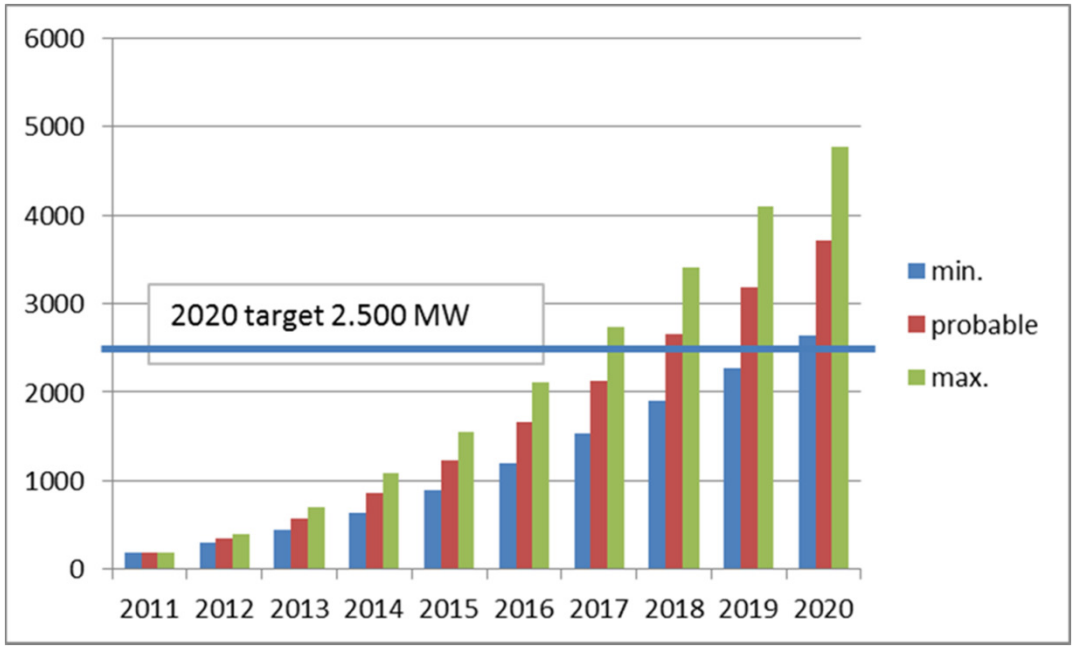
Strategic Plans OWP in Finland

- Political decissions and strategy for WP 6 TWh 2020 -> 9 TWh 2025
  which is 2500 MW -> 3800 MW
- At the end 2012 was built 300 MW and production 500 GWh/a
- To reach the objectives → Building offshore is essential
- There is strong political will behind the wind power!



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Strategic Plans OWP in Finland

- Feed-in-tariff was implemented in 3/2011
- Demostration support for one offshore wind farm 2014.
  - The competition is underway
  - Can be seen starting input for OWP in Finland
- Potential exists, fine opportunities (grid, shallow waters, short distances) But also challenges like cold climate, icing sea…

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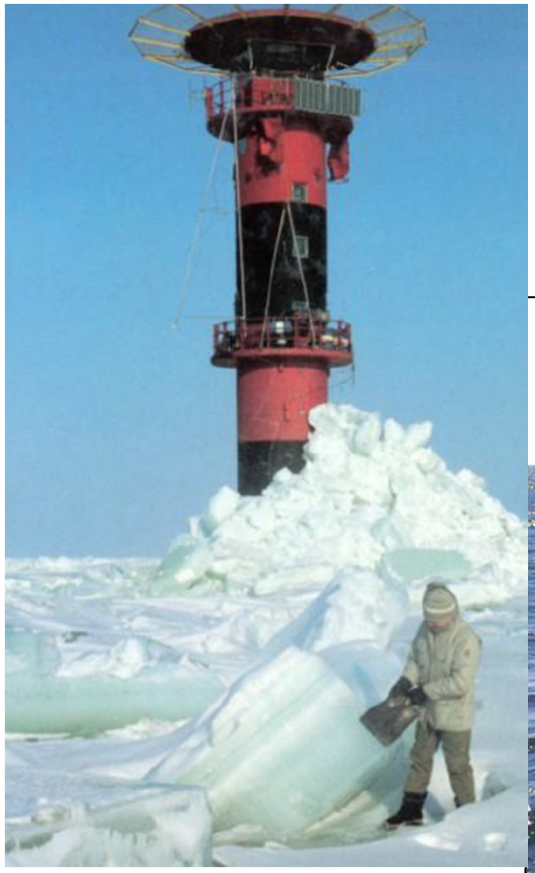
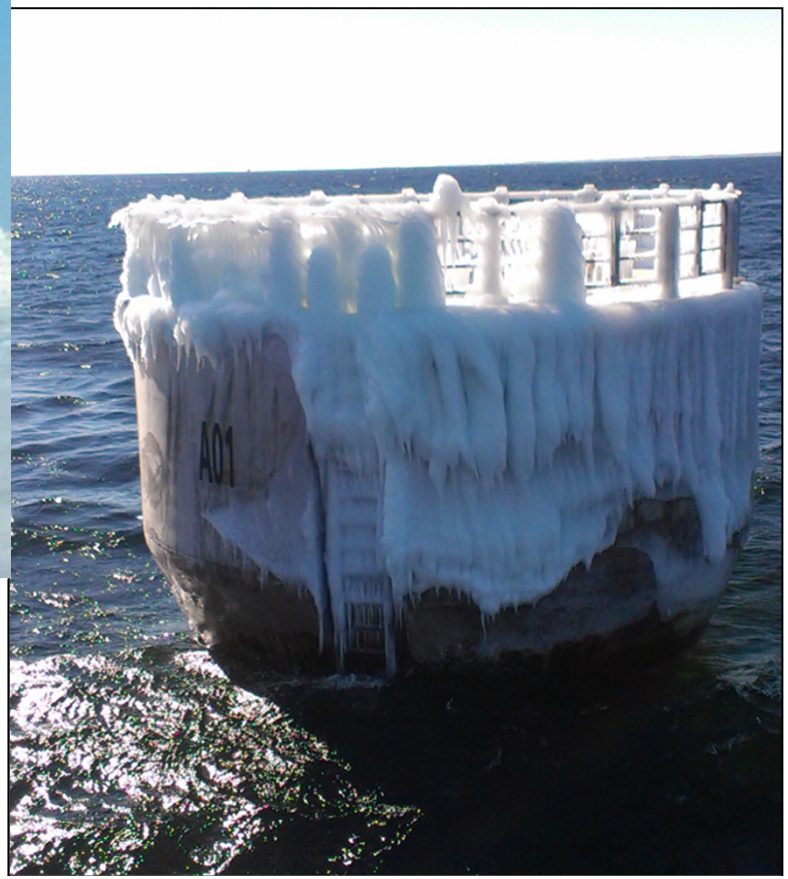
Challenges to reach the wind farm site

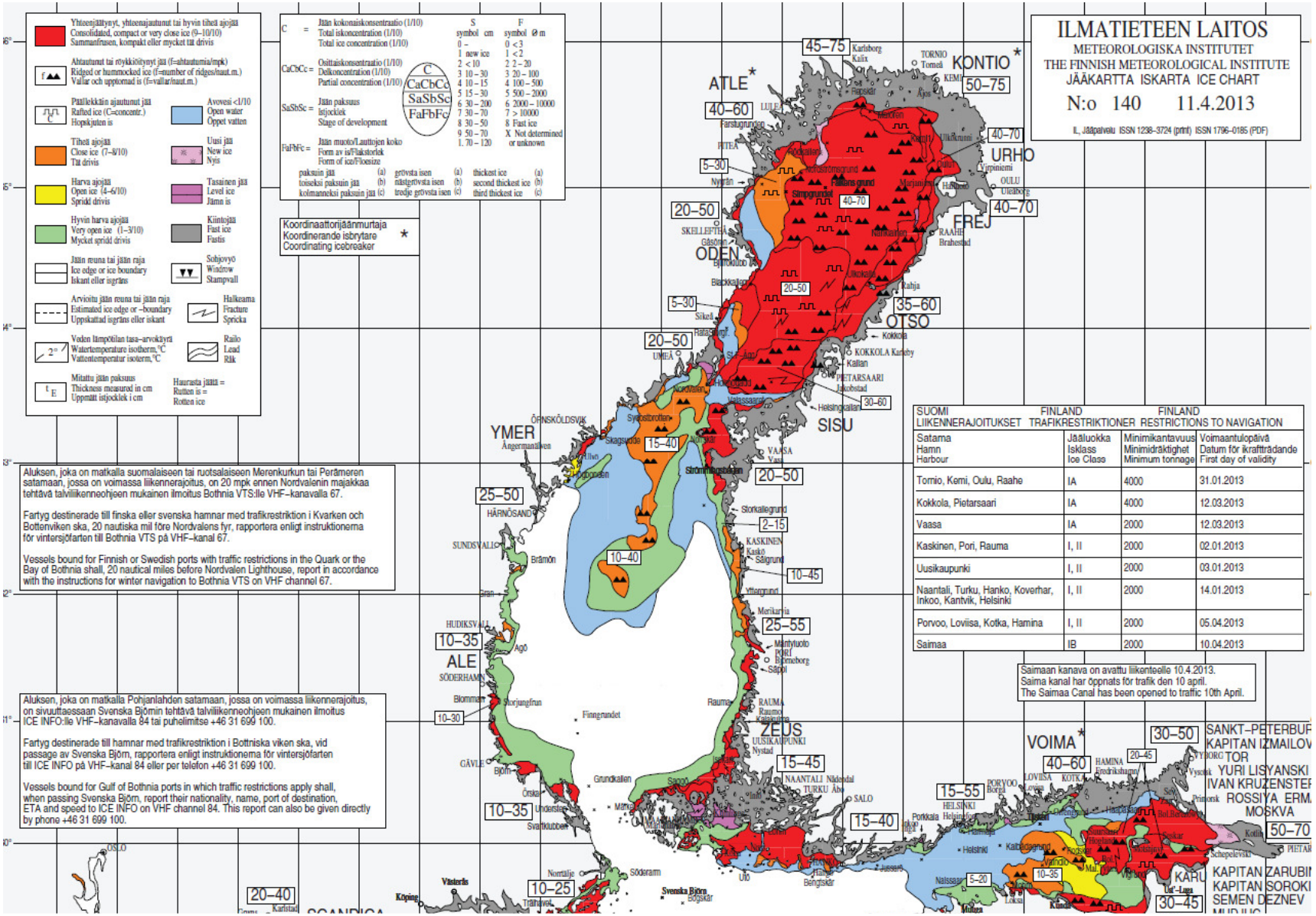


- Normally on mainland 4 seasons
- The Nordic Baltic sea offers at least 7



From a harbour to site mid April

-> fast ice near the coast, then ridged ice, then open water with ice floats, then ridged ice again…



- Long distances
- All kind of ice, low temperatures (… -35 °C)
- Only a few hours of daylight winter time
- Ordinary transportation options don't always work

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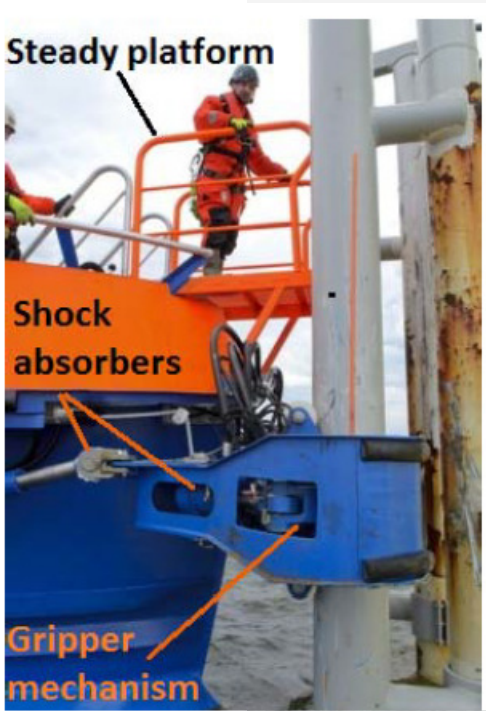
Industrial Strengths

- Heavy metal industry is located in West Finland
  - Foundations, steel structures
- Several manufacturers related Offshore WP
  - components, vessels, services
- New innovations
- Cold climate knowledge



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Baltic sea – common interests and cooperation

- Companies in Finnish Wind Power cluster consider the cooperation extremely important when building OWP
  - Not only on a national level
  - But over the whole Baltic Sea region
  - And in some cases wider

Thank You

www.prizz.fi