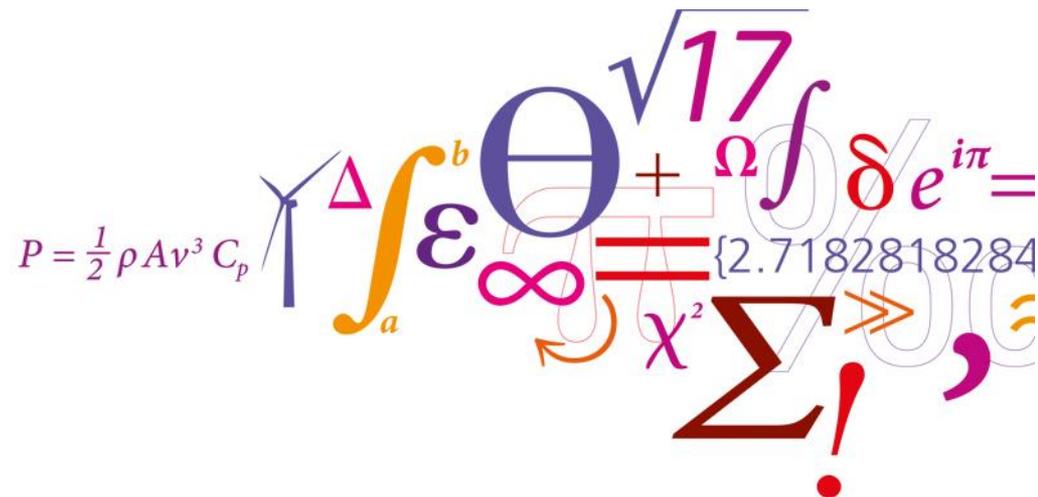


Icewind Final Conference

Niels-Erik Clausen, DTU Wind Energy

Project coordinator



Outline

- The Icewind project short
- Plan of the day

Acknowledgements to all partners, colleagues and friends

The Icewind project is co-financed by the Top-level Research Initiative, the Nordic Energy Industry and the partners



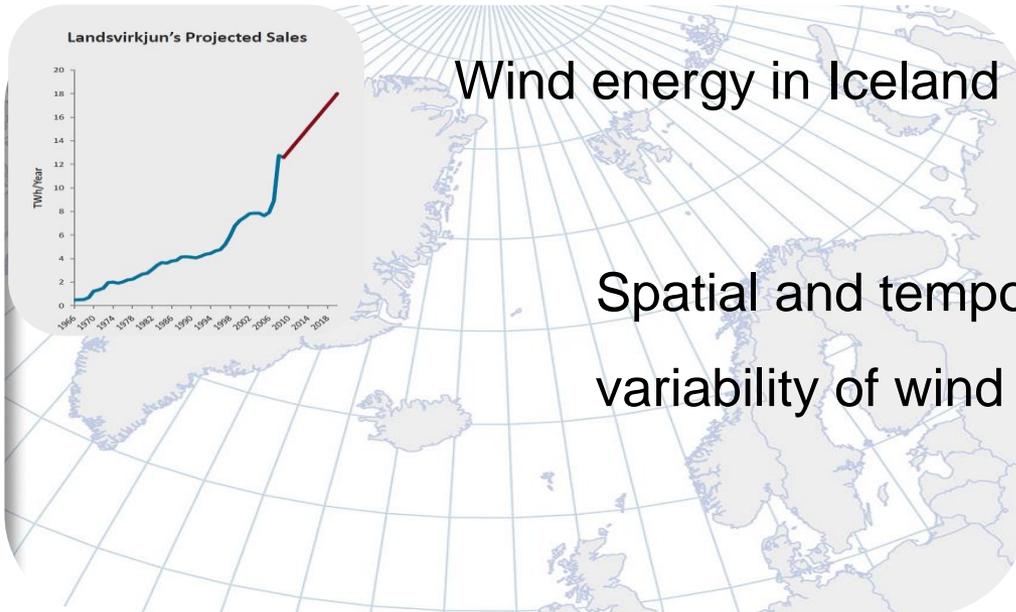
norden

Top-level Research Initiative
Integration of large-scale wind power

Icewind a Nordic research project



Prediction of icing on turbines and power lines



FOB Swath



Offshore wind farm maintenance

IceWind Partners

- DTU Wind Energy (DK)
- Vestas Wind Systems (DK)
- Kjeller Vindteknikk AS (NO)
- Meteorologisk Institutt (NO)
- Statoil AS (NO)
- Oceaneering Asset Integrity (NO)
- Odfjell Wind AS (NO)
- VTT (FI)
- Uppsala University (SE)
 - Weathertech Scandinavia
- Icelandic Met Office (IS)
- University of Iceland (IS)
- Landsvirkjun (IS)
- Landsnet (IS)



IceWind project – key figures

- Title: **Improved forecast of wind, waves and icing**
- Project period 1 September 2010 – 28 February 2015
- Overall budget 22.1 mill NOK
- Supported by Top-Level Research Initiative (TFI) 12.3 mill NOK
- Nordic Energy Industry and own financing 9.8 mill NOK (44%)
- Partners: 13
- Coordinator: DTU Wind Energy
- 4 PhD projects: Two in Iceland, one in Sweden and one in Denmark
- 1 postdoc

IceWind objectives

The overall objective of the project is to support the deployment and integration of wind energy in the five Nordic countries by focussing on three main areas:

1. Icing on wind turbines (atlas, forecasting and losses)
2. Integration of wind energy on land (Iceland and Scandinavia)
3. Offshore wind energy (forecasting and access)

A key issue is to share knowledge among the five Nordic countries and to work in areas where differences in know-how exist and where barriers or challenges prevent or slow down a large penetration of wind energy in the Nordic grid.

ICEWIND work packages

- WP 1 Icing (lead VTT, Finland)
 - Atlas of icing for Iceland and Sweden, forecast of atmospheric icing, estimate of production losses due to icing
- WP 2 Iceland (lead Icelandic met office - IMO)
 - (Wind atlas of Iceland, identification of sites for wind farms, technical and market integration studies
- WP 3 Forecast and O&M (lead Oceaneering)
 - Offshore meso-scale effects of large wind farms incl. wakes, short term forecasting, maintenance strategies and availability of wind farms
- WP 4 Power and energy aspects (lead DTU Wind)
 - Spatial and temporal variability of wind resource, forecast errors and their impact on the Nordic power grid and balance market

TFI Flagship Conference 18-19 Nov 2014



Arctic Valley, Svabød, Photo: Torbjørn Engen Jensen



Flagship Conference 2014 Programme



The Top-level Research Initiative
A major Nordic venture for climate, energy and the environment

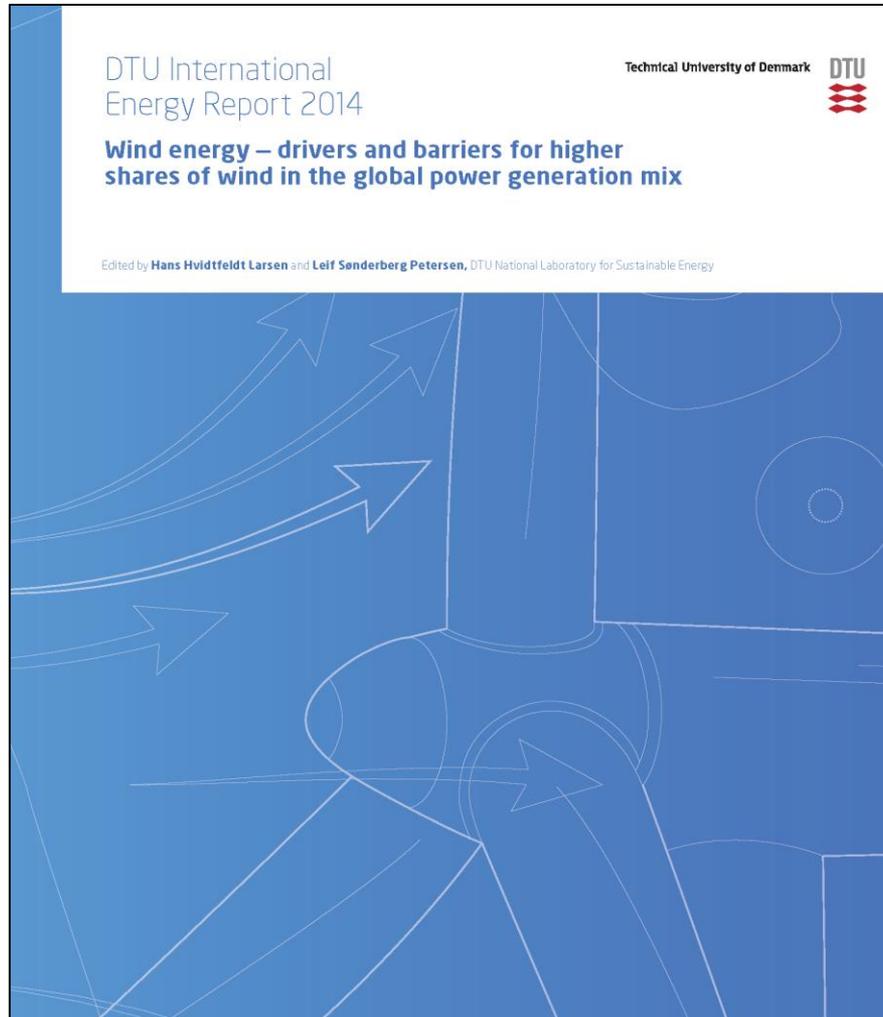
Agenda - morning

- 09:00 Welcome to Vestas Wind Systems A/S, Line Gulstad, Vestas Wind Systems
- 09:15 Icewind project & overview of the day, Niels-Erik Clausen, DTU Wind Energy
- 09:30 Keynote: Experiences and challenges with wind farms in cold climate, Göran Ronsten, WindREN
- 10:10 Icewind Inter-comparison of icing production loss models, Neil Davis, DTU Wind Energy
- 10:30 *Coffee break*
- 11:00 Icing atlas of Iceland, Halfdan Agustsson, Icelandic Met Office, Reykjavik
- 11:20 Design and operation of wind farms in cold climate-challenges for the manufacturer, Brian Daugbjerg Nielsen and Ole Hangaard, Vestas Wind Systems A/S
- 11:40 Impact of ice in large wind farms, Stefan Ivanell, Uppsala University Gotland
- 12:00 *Lunch courtesy of Vestas Wind Systems*

Agenda - afternoon

- 13:00 Icing production loss module for wind power forecasting system, Timo Karlsson, VTT
- 13:20 Wind atlas of Iceland, Nikolai Nawri, Icelandic Met Office, Reykjavik
- 13:40 Wind in the Sea around Iceland, Charlotte Hasager, DTU Wind Energy & Nikolai Nawri, Icelandic Met Office, Reykjavik
- 14:00 Does skill of wind power forecasts depend on the spatial resolution of NWP models?
John Bjørnar Bremnes, Norwegian Meteorological Institute, Oslo
- 14:20 Integration of wind energy in Iceland, Gunnar Petursson, University of Iceland
- 14:40 *Coffee break*
- 15:10 Nordic wind power variability and forecast errors and impact on balancing needs,
Hannele Holttinen, VTT, Finland
- 15:30 Challenges and opportunities for Offshore DC grids in the Baltic Sea, Nicolaos Cutululis,
DTU Wind Energy
- 15:50 O&M planning for offshore wind farms, Haaken Annfelt Moe, Oceaneering, Norway
- 16:10 Nordic Flagship call on Energy Research, Niels-Erik Clausen, DTU Wind Energy
- 16:30 Discussion of project ideas in plenum
- 17:00 - Reception and further discussion of project ideas

DTU International Energy Report 2014



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11 November 2014

Download of report:
http://www.natlab.dtu.dk/Energirapporter/DIER_2014



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