Summary

WinterWind 2015

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Technical Tours

- SKF, SSAB, Markbygden

The Pipe organ Acusticum

Wind potential
Progress

- Global Icing maps
- Scandinavian forecasting models and maps for icing conditions
- Improved (ensemble) forecasting models, including loss of output prediction.

- Steady progress
- Validation data needed (according to standardised measuring formats)
- Involvement of universities, institutions and utilities

Acoustic noise prediction and measurements

- Increasing awareness
- Modelling methods
- Field measurements

- Validations essential; results at next conference?
- More focus needed on standardisation of measuring methods and perception

Field experiences

- Comparative mesurements
- Still correlation between icing prediction and loss of energy output has many uncertainties.

- Results of field measurements are essential for improved physical understanding of ice accretion on blades and understand loss of output.
- When will we have fully validated, reliable, models?

Operation and Maintenance

- Call for standardized blade inspection.
- Extensive dada base of material properties under relevant external conditions needed
- Condition Monitoring: interpretation of measured signals is difficult but essential

- (Very) Early failure or excessive loading detection essential.
- Demonstrations needed.

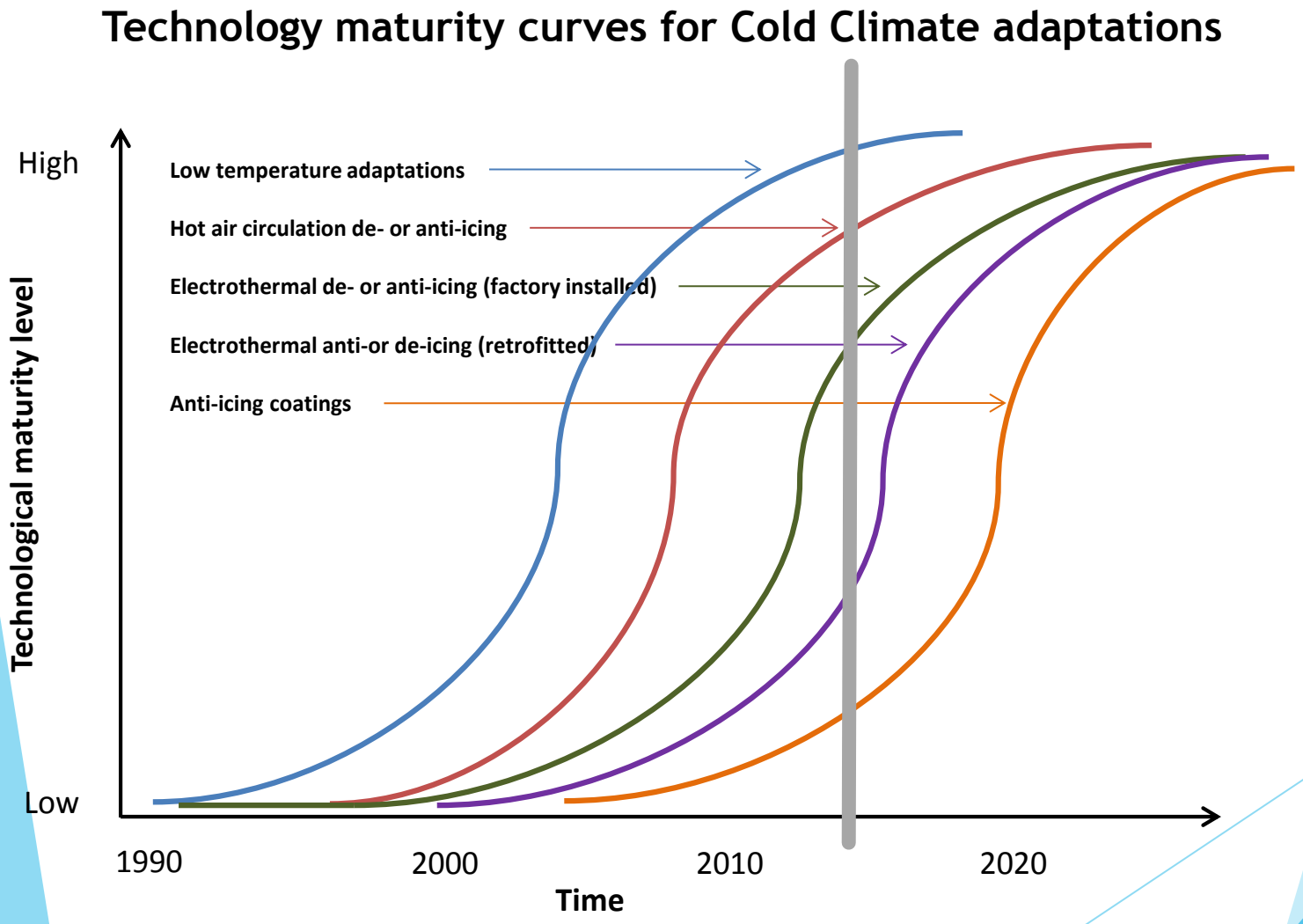
Ice detection

Challenge: economic & reliable means to detect ice.

- Eigen-frequency of the blade – accelerometers
- Load measurements
- Point sensors on the blade or nacelle – many different types of brands
- Photographic – pattern recognition
- Indirect - measurement of power performance

- Still room for improvement. Which is the most suitable one?

Anti- & de-icing



Exhibition

- Smaller than previous conference, but fine

Research and Development

- Increased CC R&D needed
  Argument: 25% of WTs are located in CC-areas, and future potential is significant
- Increase budgets for Cold Climate Research to a reasonable level with respect to future market growth

- We need a common Research Agenda
- We need to lobby for this; with a little help from our friends!
  And in a coordinated way !!

Presentation of Task 19 survey on barriers

Panel discussion:

- 1. Standards, certifications and recommended practices
- 2. Financing including risk, uncertainty and ice assessment
- 3. De/anti-icing, equipment and procedures

Questions for each topic

- 1. Define main challenges per topic
- 2. Next steps towards solutions

- This was a very interesting panel discussion, which we should have together will all participants in the conference at the next conference

Proposed dedicated CC R&D agenda

- Health, safety, environment, warning systems
- Mapping of icing probability
- Instruments and measuring for resource assessment and load prediction
- De-icing add-ons
- Anti-icing technology

- Foundations
- Installation technology
- From corrective and preventive maintenance towards fully fledged condition based maintenance
- Materials research under relevant external conditions
- Standardised measuring practices for CC circumstances (validation of models!)
- Dedicated test sites for CC (= Quebec)

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