

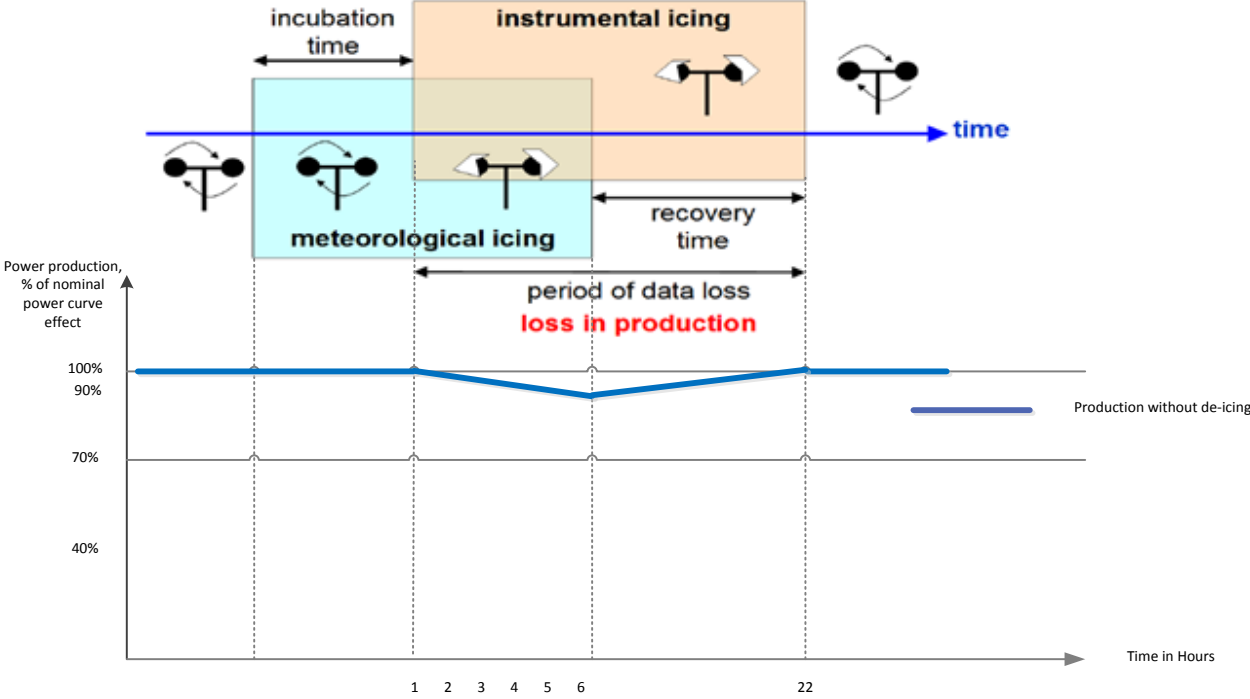
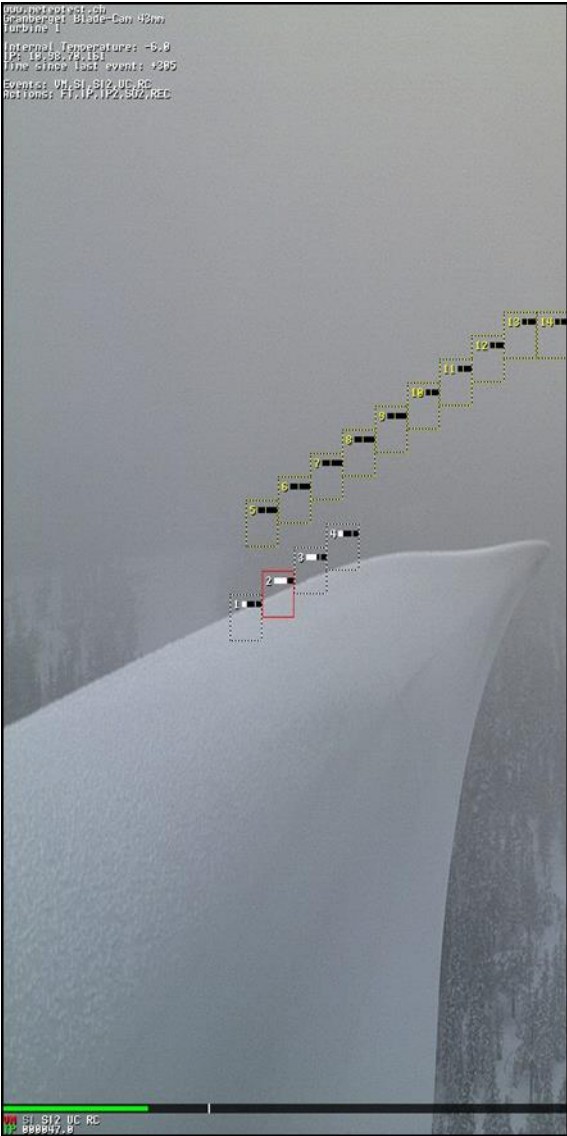


## Ice Wind

Challenges for the manufacturer in connection with design and operation of wind farms in cold climate

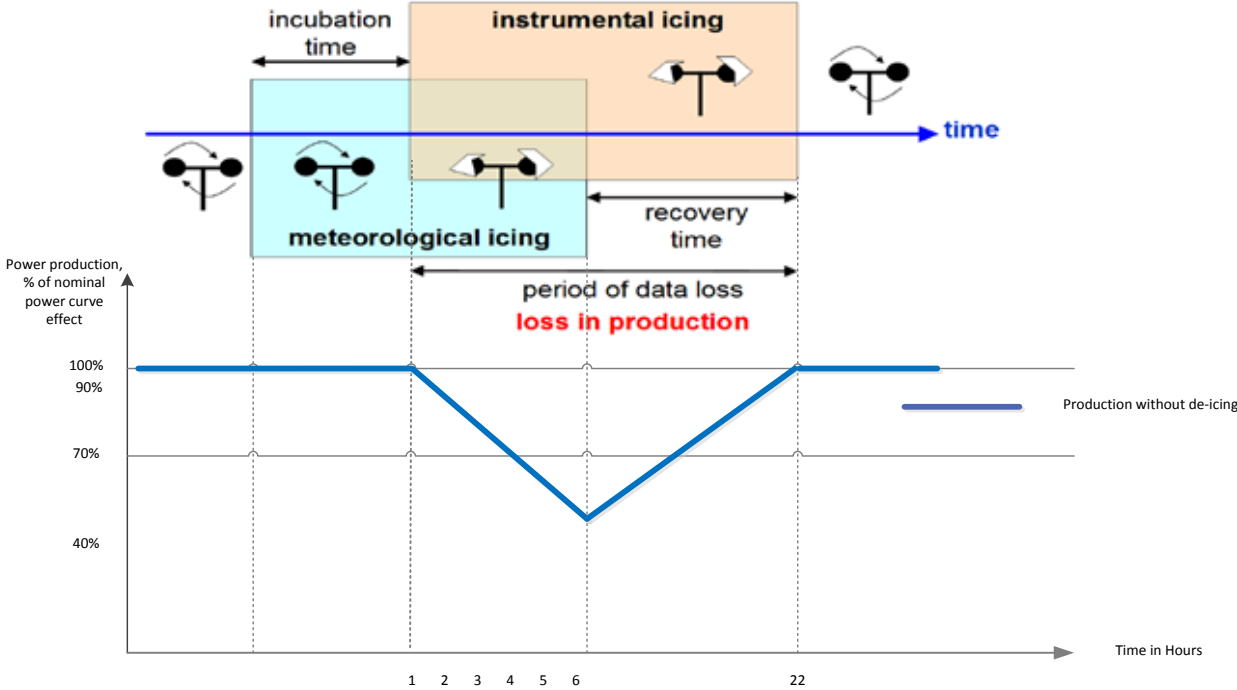
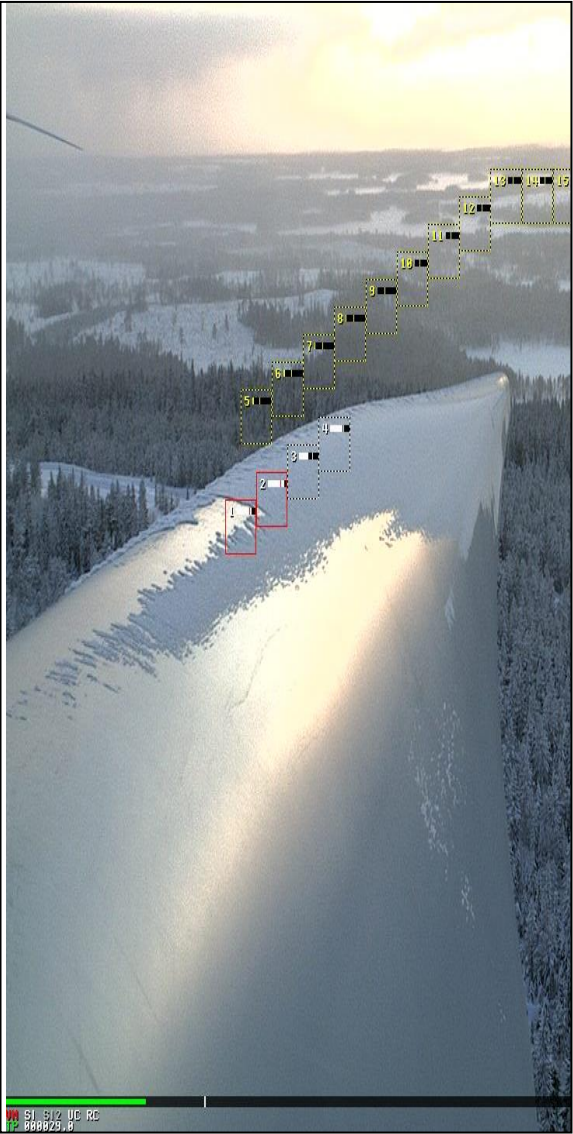
# Icing Scenarios

## Light icing



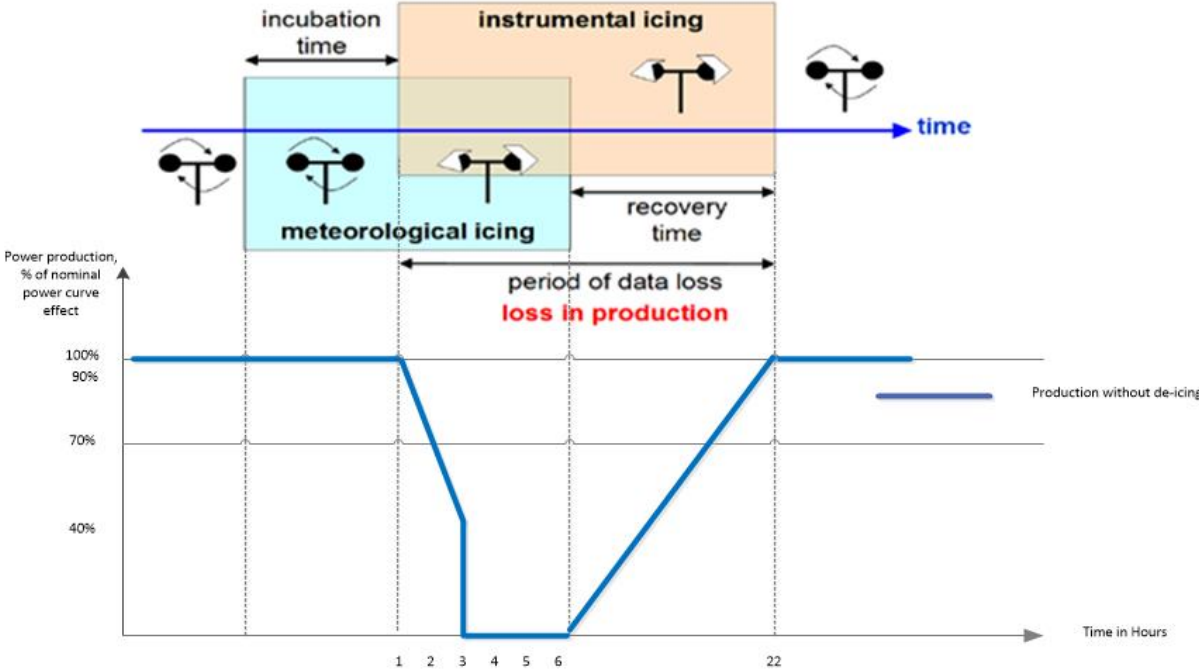
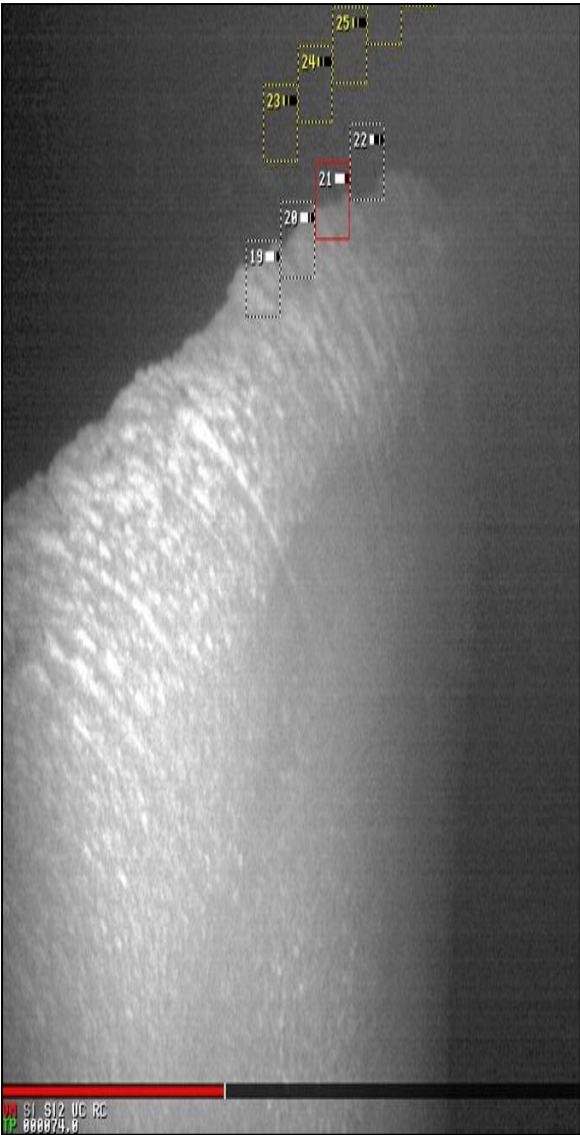
# Icing Scenarios

## Moderate icing



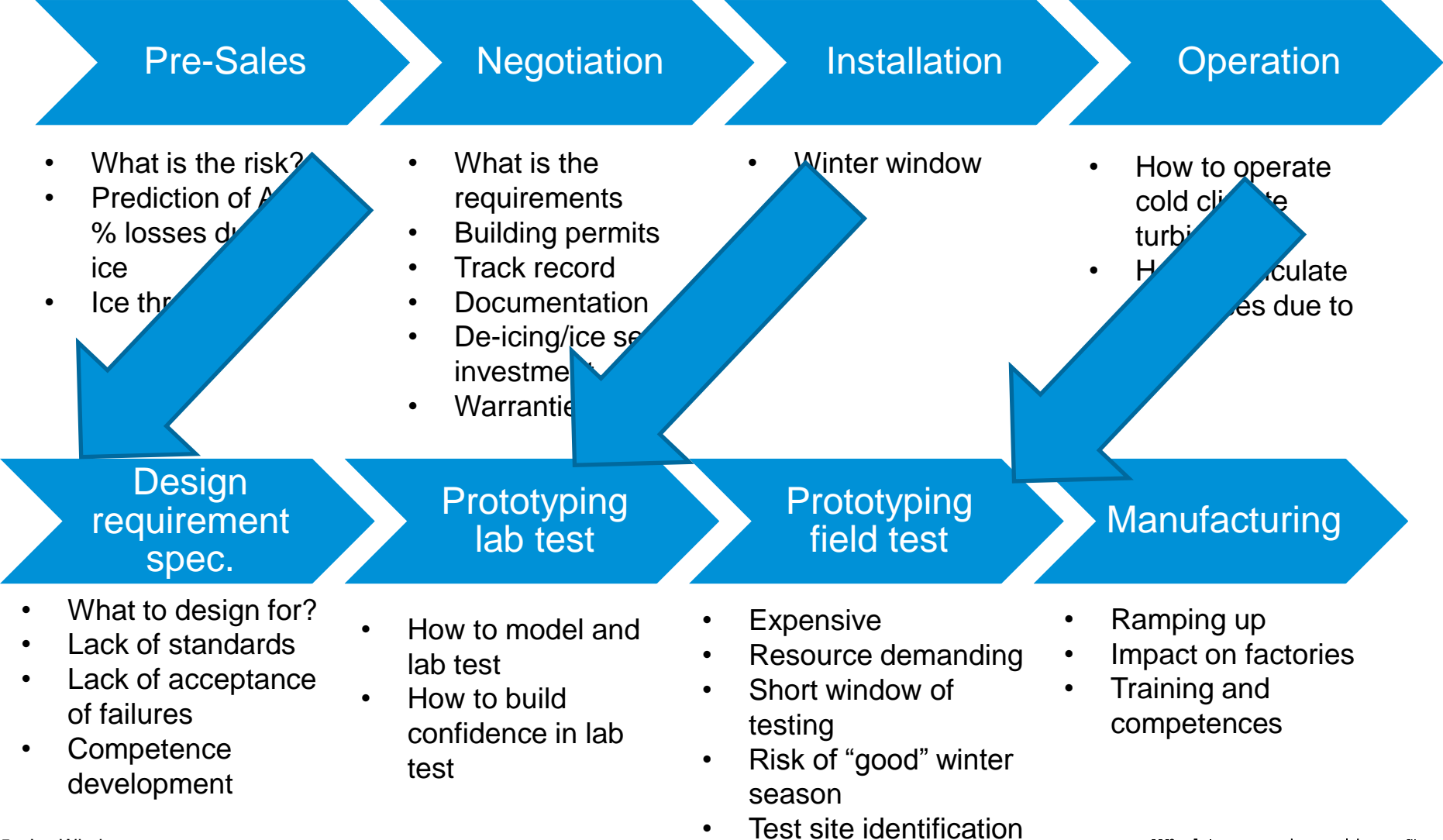
# Icing Scenarios

## Heavy icing



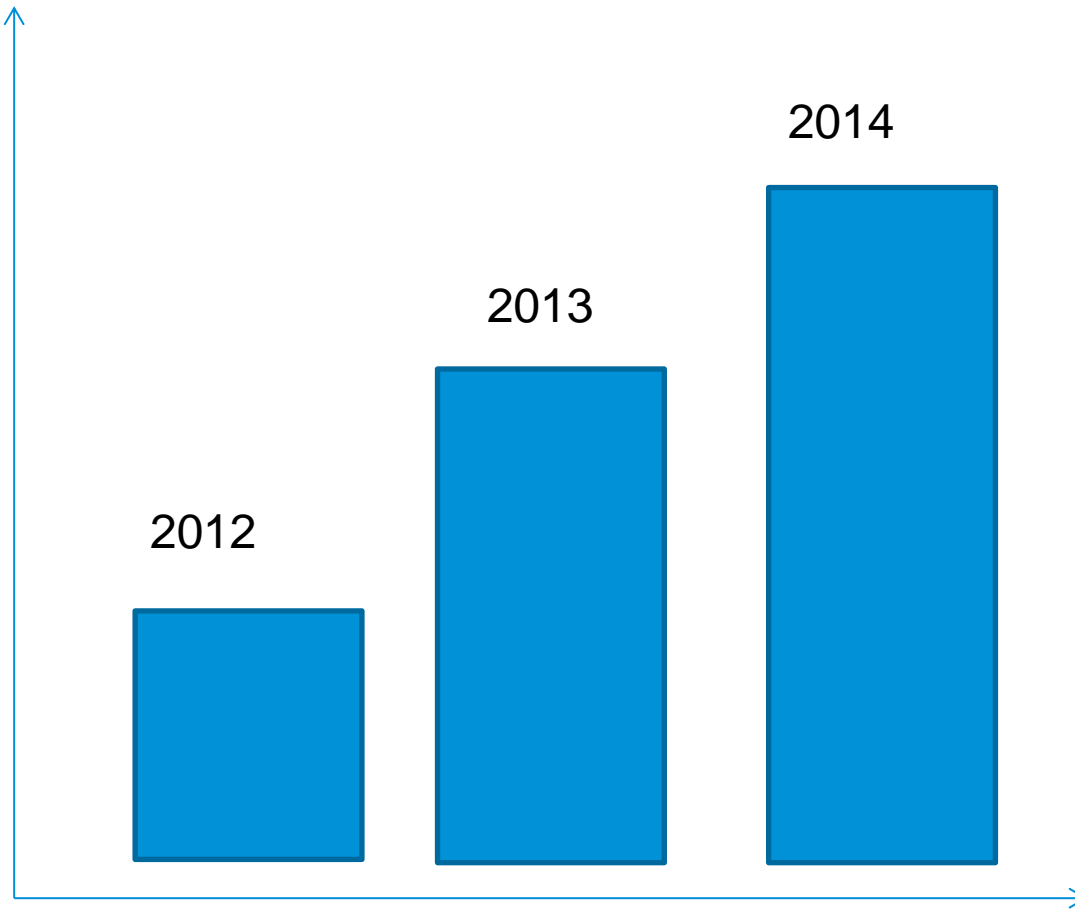
# Risk vs. Reward

Designing and Building cold climate turbines has challenges



# Risk vs. Reward

Requirement



Challenges in the industry:

- Competence development
- Meteorological input in relation to turbine behavior
  - Standard models
  - Agreed standards
- Prediction needs to be bankable

Time



Thank you

The Vestas logo is positioned in the top left corner of the slide. It features the word "Vestas" in a bold, italicized, white sans-serif font, followed by a registered trademark symbol (®). The background of the top half of the slide is a vibrant blue sky with wispy white clouds, and a subtle, curved white graphic element is visible on the left side.

**Wind.** It means the world to us.™

# Thank you for your attention

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