



Operational experience of REpower
MM-CCV under icing conditions

REpower Systems Northern Europe
Winterwind 2012, Skellefteå

REpower company profile

Northern Europe



Subsidiary present in Sweden since September 2010.



REpower Systems Scandinavia AB

Office located in **Västerås**

- Sales
- Project Management
- Engineering Support

Service Center #1 in **Kristianstad**

Projects commissioned in 2011

REpower Cold Climates

Operational experience



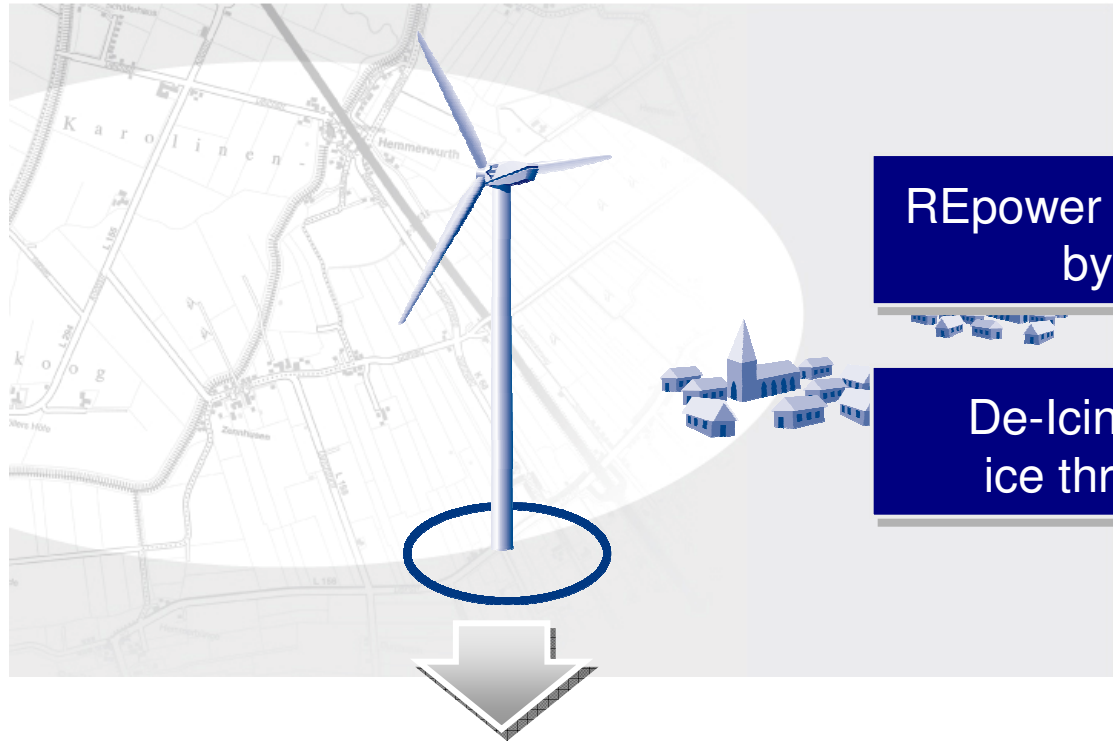
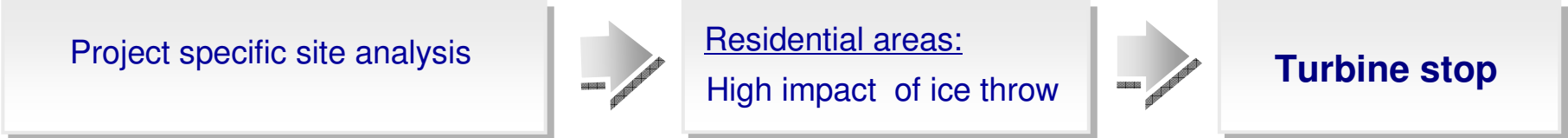
500 CCV turbines will be installed until 2015

- Severe icing conditions / Long winter periods
- CCV turbine adapted to cold climate
- Equipped with various icing solutions
- Validation in cooperation e.g. with local research institutes



Operation under icing conditions

Residential areas



REpower solution assessed by third party

De-icing will not avoid ice throw completely

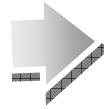
- Immediate & reliable turbine stop in case of ice detection ✓
- Reliable restart after ice melting ✓

Operation under icing conditions

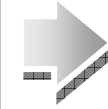


Remote areas

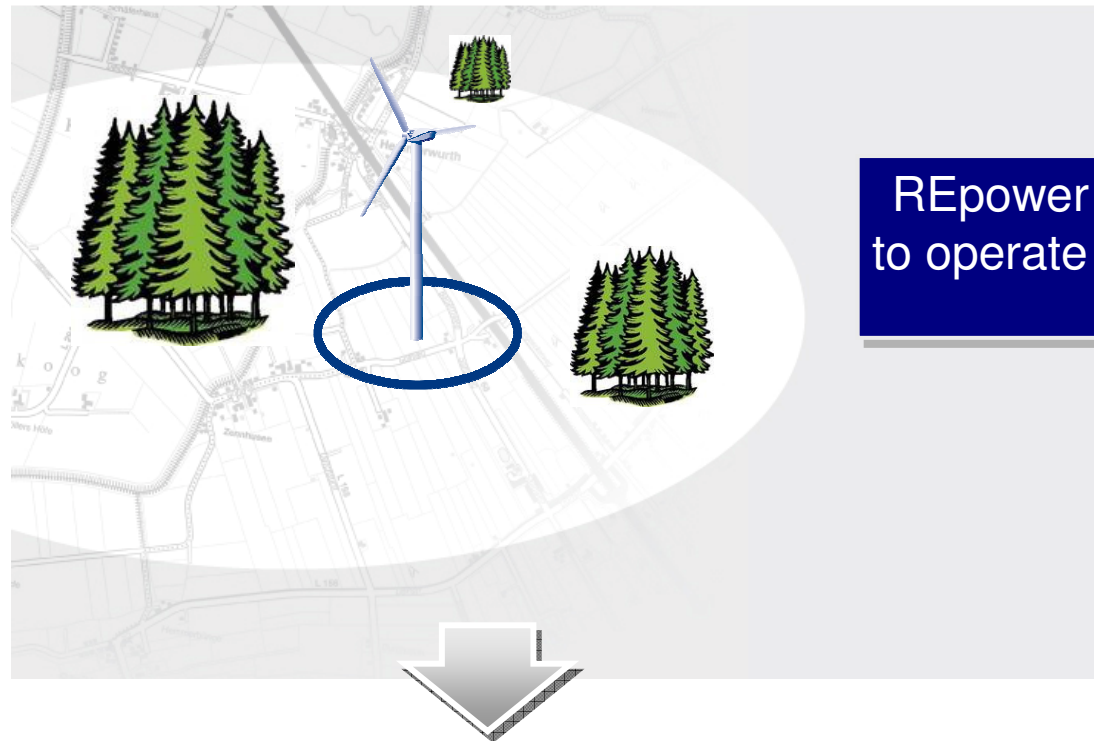
Project specific site analysis





Remote areas:
Low impact of ice throw



Keep turbine
operating



- Load and vibration management by REpower smart control algorithm 
- Rugged aerodynamic design for high performance (even with iced blades) 

Operation under icing conditions

Optional icing solutions



- De-icing / Anti-icing to further increase efficiency at severe icing conditions
- Different de-icing and anti-icing systems implemented worldwide
- Validation process ongoing to decide for solutions
 - Low lifecycle costs
 - Efficiency
 - Reliability
 - Ability to retrofit

Site specific determination of best solution package

Operation under icing conditions

Summary



- REpower has long year experience in cold climates with high turbine availability
- REpower turbines allow safe and economic operation under icing conditions
- REpower support your projects with site specific ice assessments and tailored icing solutions





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