



Progress in green power

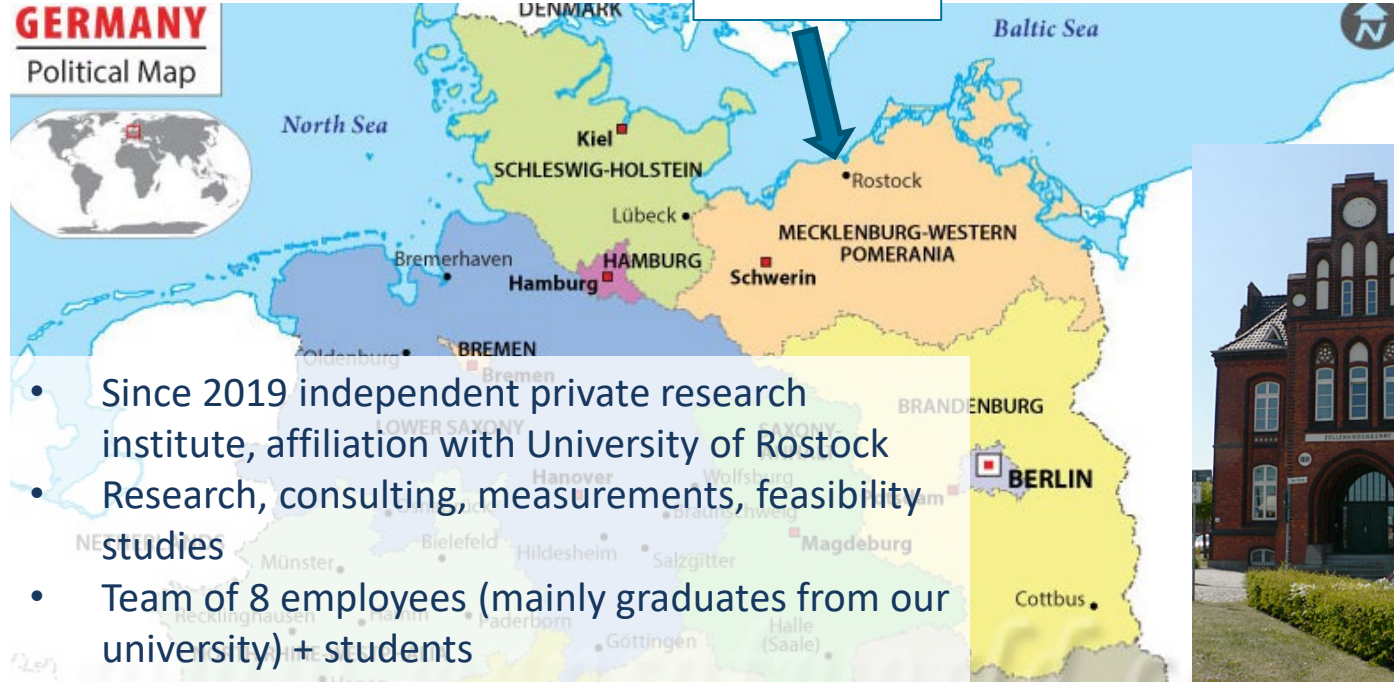
**The Energy
Transformation
Institute**

IWEN Energy Institute gGmbH · www.iwen-energy.org

Prof. Dr. Uwe Ritschel and M.Sc. Arash Ebrahimi

IWEN Energy Institute

Rostock



- Since 2019 independent private research institute, affiliation with University of Rostock
- Research, consulting, measurements, feasibility studies
- Team of 8 employees (mainly graduates from our university) + students



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Working Fields of IWEN Energy Institute



Accompanying RDI and Consultancy,



RES-Electrolyzer-Test-Banch



Measurements on Wind Turbines



Evidence-based protection, law risk decision and validation

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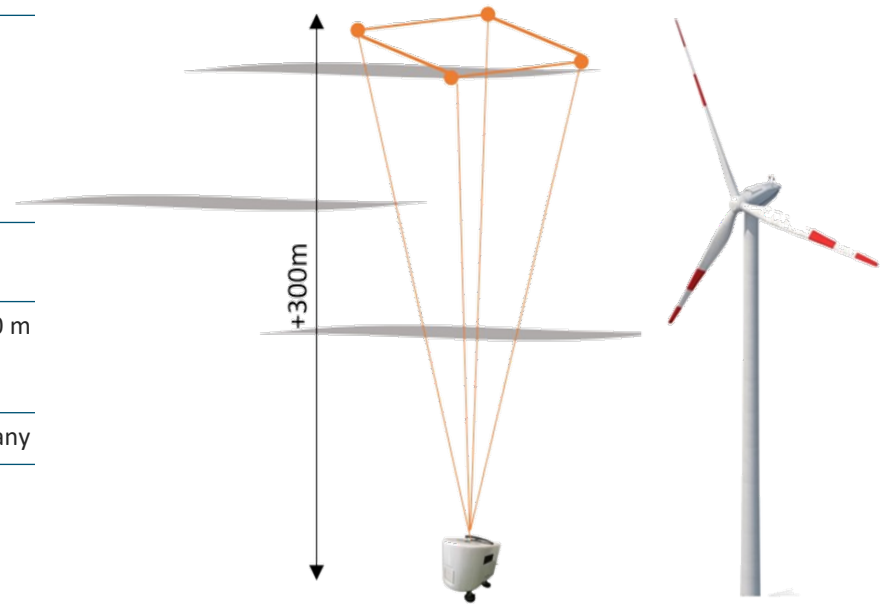
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Vertical Wind Measurement

Analysis of vertical wind shear up to 300 m and fatigue loading of large wind turbines (height > 200 m)

Challenges	Understanding wind characteristics at higher heights above ground, studying wind profiles for new wind farms and measuring wind speeds in complex terrain, analyse fatigue loads in wind turbines with measured vertical wind shear
Solution	Using a mobile adapted LiDAR system solution
Measurement	Wind speed and direction measurement from 40 m to 300 m at 12 different heights
Location	Wind farm in Mecklenburg-Vorpommern, Germany



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Vertical Wind Measurement

LiDAR Measurement System

MeteoLaser LiDAR system placed on a pallet with a 75 l water tank close to a Wind Farm with two wind turbines



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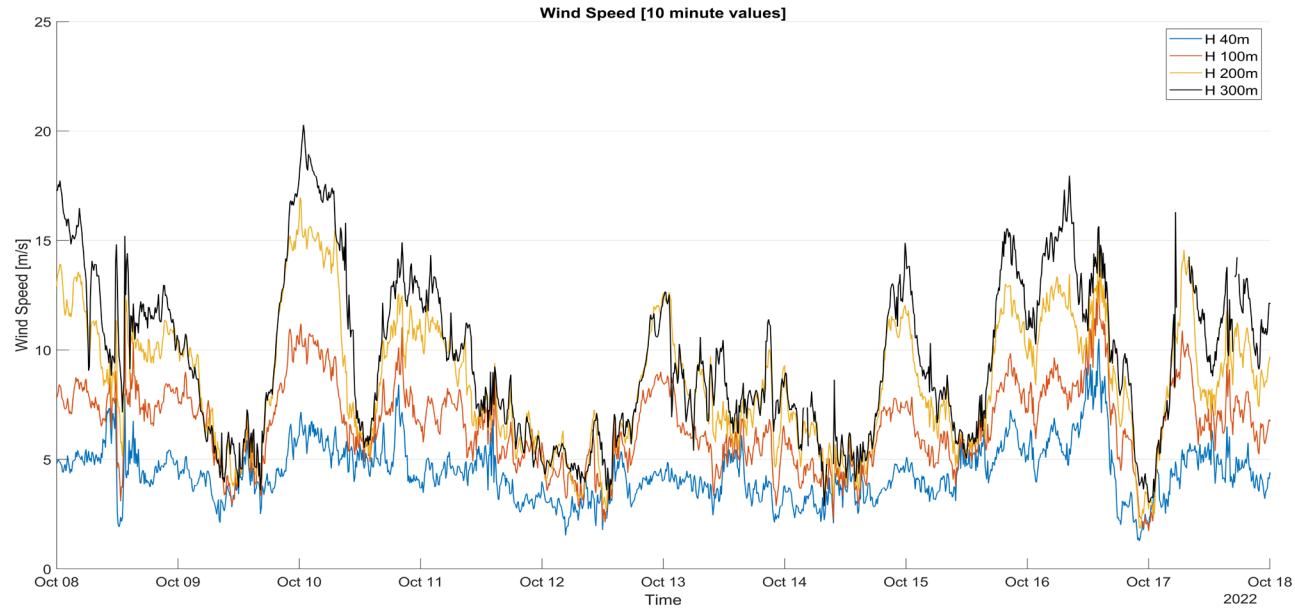


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Vertical Wind Measurement

Wind Speed & Direction



Example of time series of wind speeds to analyse vertical wind shear in different atmospheric conditions

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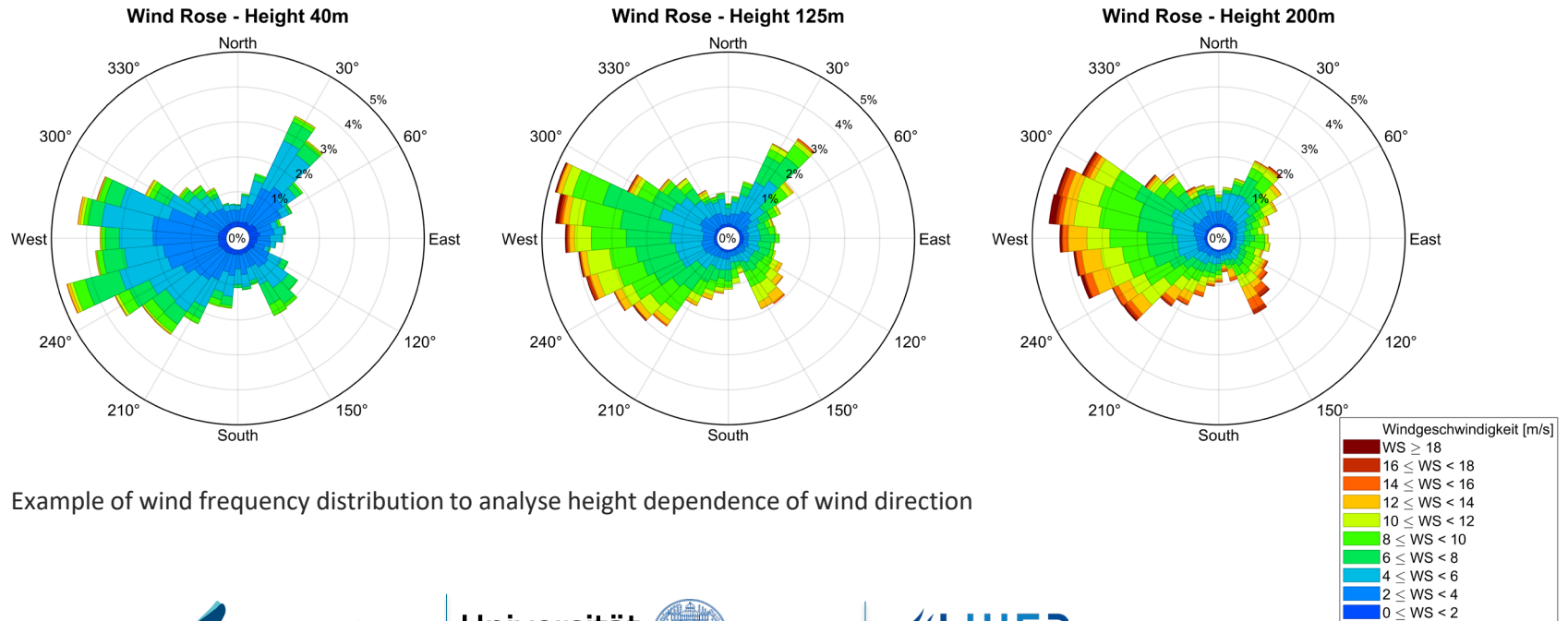


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Vertical Wind Measurement

Wind Speed & Direction



Example of wind frequency distribution to analyse height dependence of wind direction

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