ROMOWIND

EXTRACTING THE FULL VALUE OF WIND POWER

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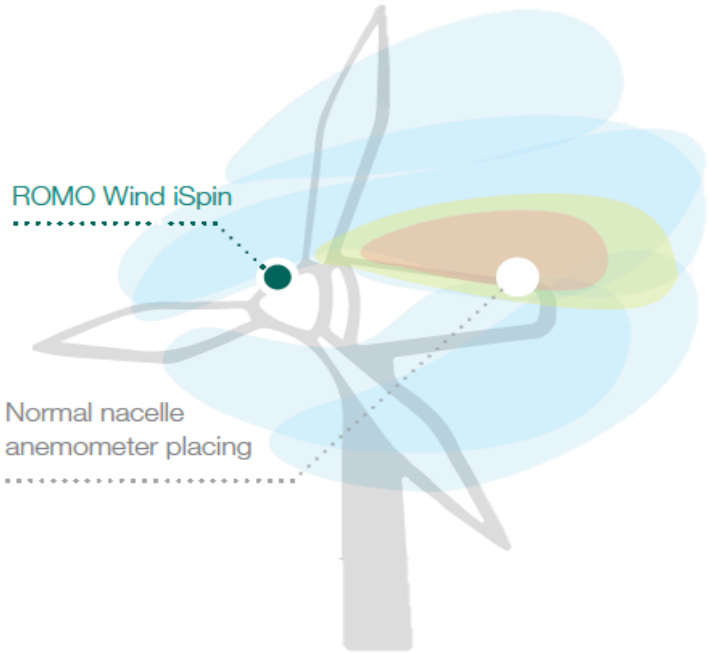
CURRENT WIND MEASUREMENTS ON WIND TURBINES ARE ARE INACCURATE



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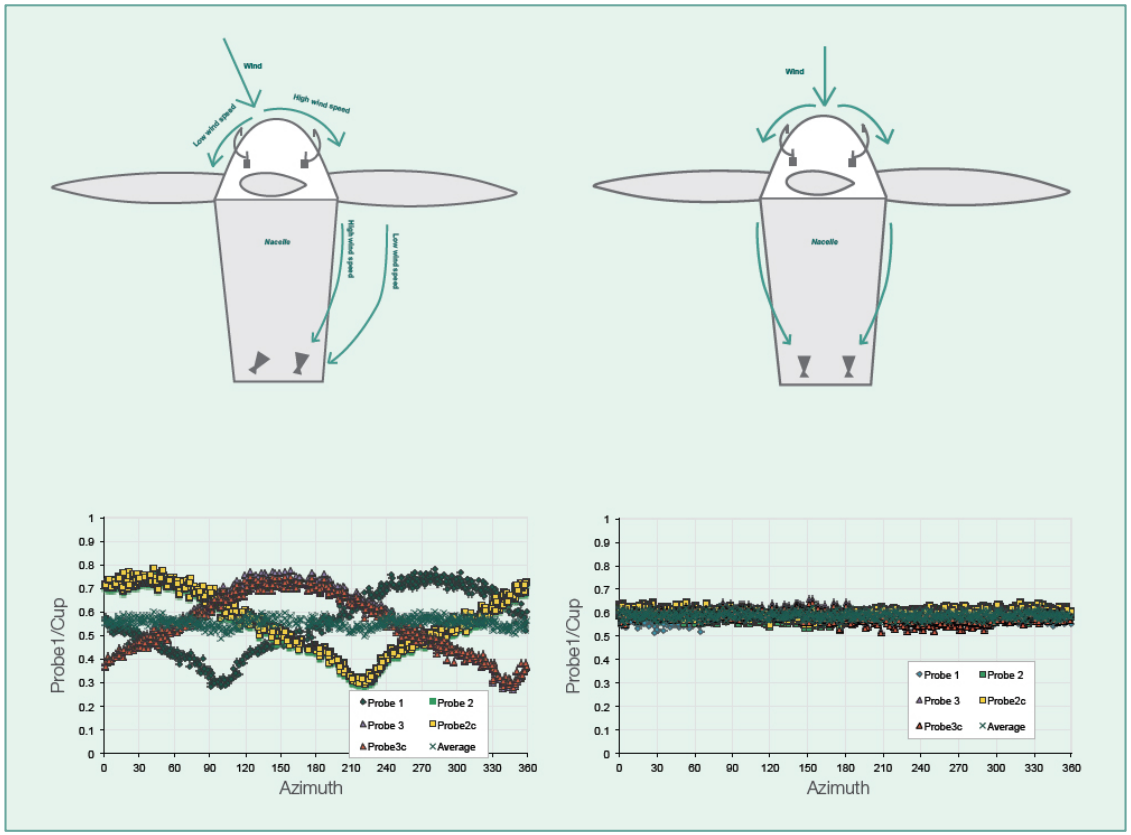
HOW THE iSPIN TECHNOLOGY WORKS



- Yaw misalignments and wind directions
- Free wind speed and a corrected power curve
- 360- degree flow inclinations
- Turbulence intensity
- Allowed in the IEC standard for performance measurements

CORRECTING STATIC YAW MISALIGNMENT YIELDS CLOSE TO 2% PRODUCTION INCREASE

AW 77/1500
G83 - 2.0 MW
G87 - 2.0MW
MM92 - 2.05 MW
NM 43/600
NM 48/750
NM 64/1500
NM 64C/1500
NM 72/2000
NM 72C/1500
MM82 EVO II
NX90-2.3MW
NTK 1500/64
Siemens 2.3
Siemens 3.6
V66 - 1.6 MW
V80 - 2.0 MW
V90-1.8MW
V90 - 2.0 MW

ROMO's static yaw misalignment statistics (103 wind turbines)					
Static yaw misalignment	<4°	4°- 8°	8°-12°	12°-16°	>16°
Distribution	44%	30%	17%	6%	2%

~ up to 2% more AEP by having the static yaw misalignments corrected

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iSPIN PRODUCTS

iSpin Monitor	iSpin Lite	iSpin Sensor
Permanent installation	Temporary installation	Permanent installation
Measures all parameters	Only yaw misalignment	Measures all parameters
Turbines >= 1.5MW	Turbines <1.5MW	All turbines
Remote data collection via GSM, 3G or LAN	Local data collection and control via smartphone App	Direct feed into SCADA system or turbine control
Fixed low price + 5-year monitoring contract	Usage fee + monthly rental & service fee	Fixed price

VERY EXPERIENCED MANAGEMENT TEAM

Søren Mouritsen
Co-CEO

- Serial entrepreneur and biotech CEO
- Founder of 4 Danish companies - GlueTech, Pharmexa, Inoxell & Combio.
- Venture partner (UK/ CH)

Jan Nikolaisen
Co-CEO

- Investment Director at Good Energies (CH/ UK/US)
- Consultant at Bain & Company (NL)
- Lawyer at Thommessen (NO)

Karl Fatrdla
Head of sales

- Head of sales for Vestas in Eastern Europe
- Head of sales EWEA for Schindler Fahrtreppen
- Project management in automotive industry

Brian Sørensen
Managing Director DK

- CEO of PowerSense
- COO Suzlon Wind Energy A/S
- Head of Production and Sales at Alfred Priess A/S
- Head of Airport Applications at FKI Logistex Crisplant A/S

Juan Carlos Martinez
MD - Spain

- CEO of Itaca (wind development)
- Head of Energy finance at La Caixa
- President of Spanish Wind Energy Association

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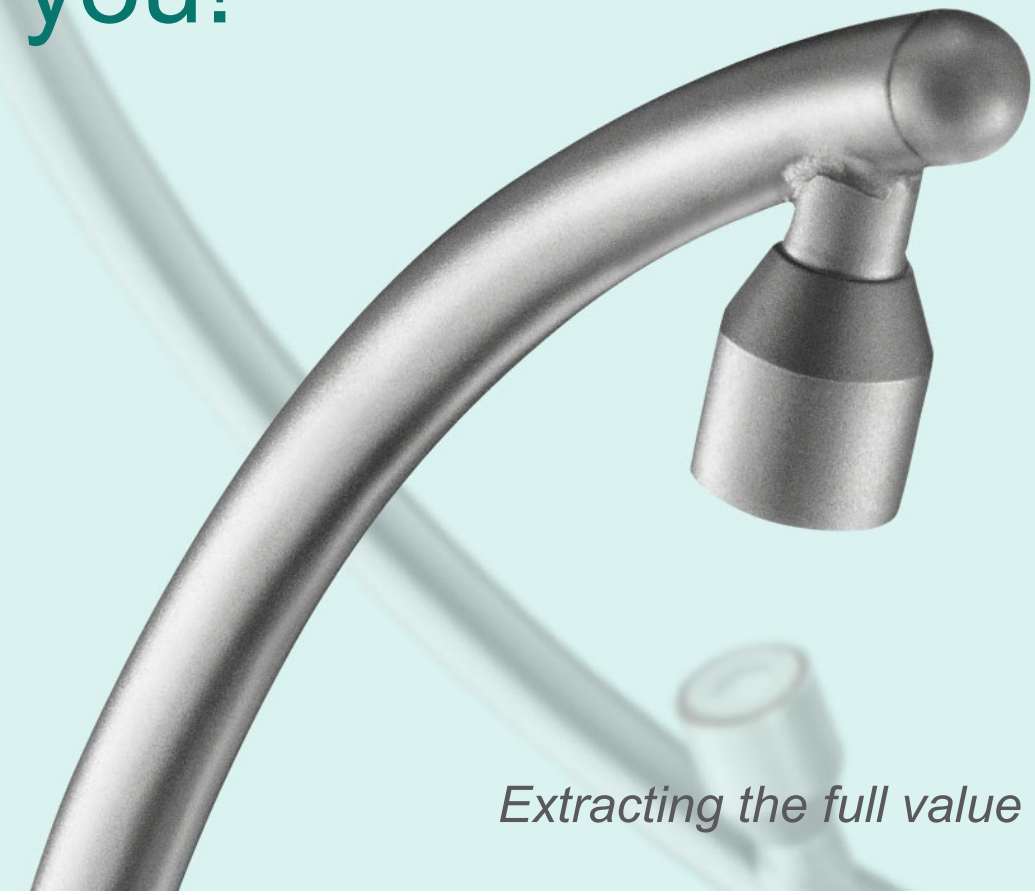
Thank you!



Extracting the full value of wind power

iSPIN MONITOR

Basic: never again static Yaw Misalignments

- Continuous measurement and correction of Yaw Misalignments

Advanced: transform your turbine to a “Measure-Mast”

- Monitoring of complex locations and critical plants
- Strategies to extend the lifetime
- Development of optimal strategies for operating
- Expansion of wind farms and repowering

Complete: monitor your wind turbine performance

- Define a reference-power curve
- Monitoring of services, upgrade and other activities of your plants
- Warranty-inspection: comparing the power curves
- Continuous monitoring of the powering of your wind farm

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iSPIN MONITOR

iSpin Monitor	Basic	Advanced	Complete
Permanent installation on one specific wind turbine	✓	✓	✓
Data collection, analysis and reporting by ROMO	✓	✓	✓
Yaw misalignment correction	✓	✓	✓
Static and dynamic yaw misalignments	✓	✓	✓
360-degree flow inclinations		✓	✓
Turbulence intensity		✓	✓
Measurements in the entire wind rose		✓	✓
Time stamped measurement data available		✓	✓
Air density measurements			✓
Power measurement from SCADA or independent measurement			✓
Relative power curve monitoring			✓

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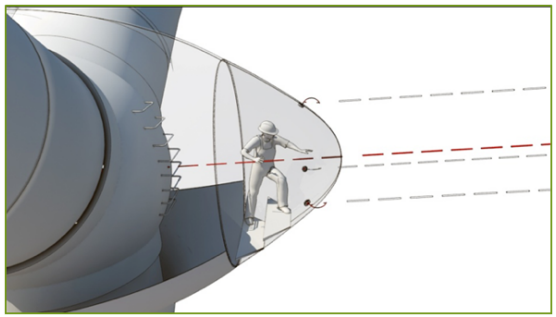
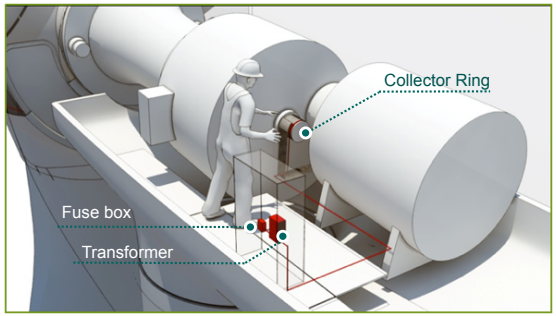
INSTALLATION OF iSPIN MONITOR



- Installed from the inside of the spinner in all kind of weather conditions
- Spinner anemometers aligned with the centre line
- Completed within 4 to 6 hours



- The iSpin Monitor system consists of the spinner anemometer, Wi-Fi and a data collection system.
- Installation is independent of all other equipment of the wind turbine except from 24 V power in the spinner

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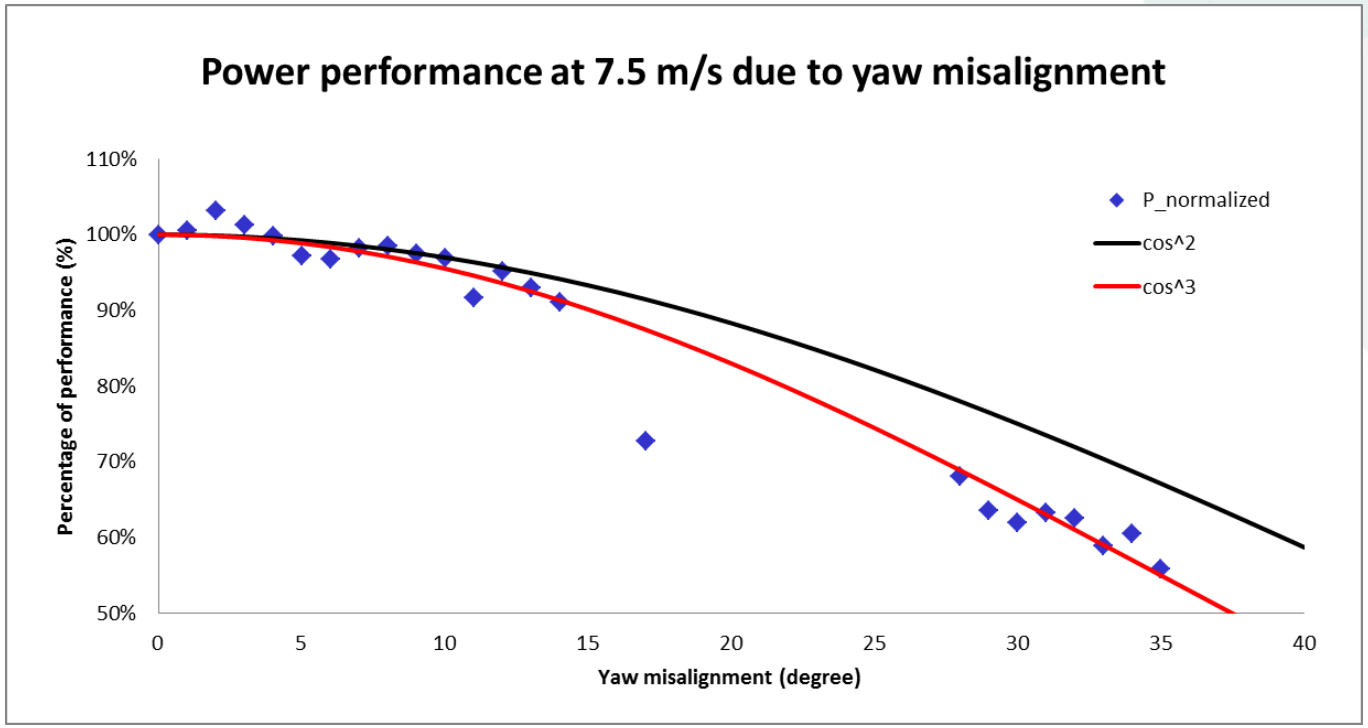
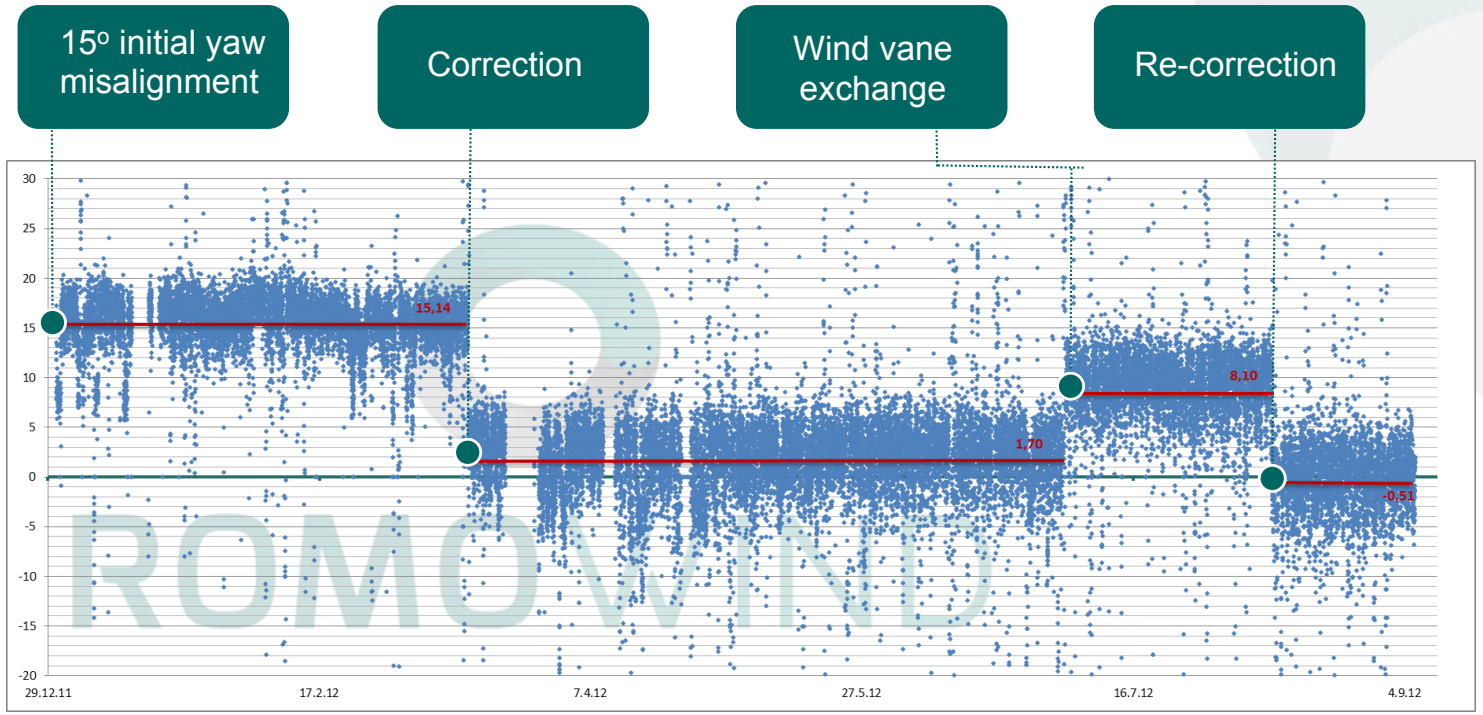
YAW MISALIGNMENT = LOWER PRODUCTION



MONITORING IS INSURANCE AGAINST RE-APPEARANCE OF YAW MISALIGNMENT



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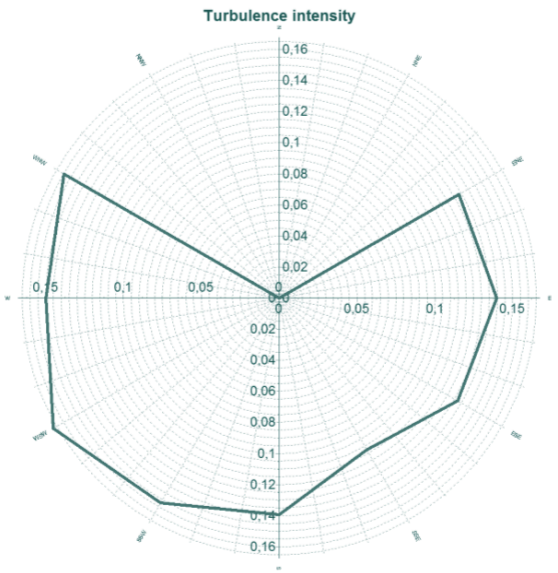
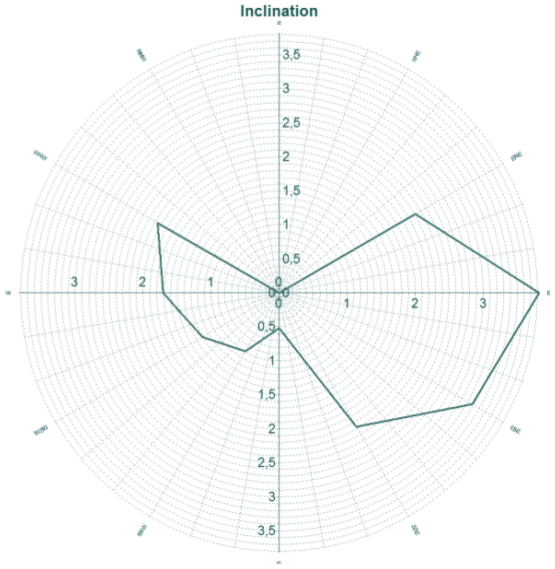
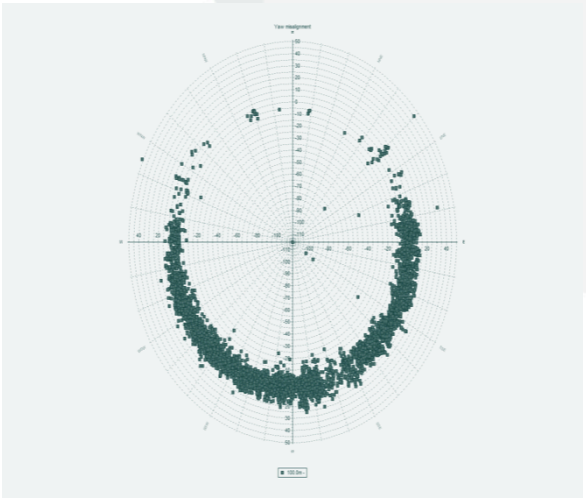
GET INSIGHTS NOT PREVIOUSLY POSSIBLE

Turbulence intensity by sector	Flow inclination by sector	Yaw misalignment by sector







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iSPIN MONITOR SOLUTION

- Better performance measurement and monitoring
- Permanent installation
- Data can be integrated with wind turbine monitoring system(s)
- Full service solution, including
  - Data collection, analysis and reporting
  - Monitoring and correction of static yaw misalignment
  - Service and repair

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