

ドイツ洋上風力フォーラム in 北九州 German Offshore Forum in Kitakyushu

「ドイツの洋上風力関連企業のご紹介」

Introduction to German companies in the offshore wind industry

Presented by



GOI

German
Offshore-Wind
Initiative

【連絡先】

ドイツ洋上風力イニチアチブ (GOI)

German Offshore-Wind Initiative (GOI)

Japan Representative

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TÜV NORD WIND ENERGY

GERMAN OFFSHORE FORUM IN KITAKYUSHU

TÜV NORD RENEWABLES IN NUMBERS



350+

Employees
worldwide



70+

Countries with
executed projects



35+

Years of
experience

SERVICE PORTFOLIO FOR WIND AND SOLAR PV

OBS Renewables is a full service provider with 35+ years of experience in the renewables business



Certification

TÜV NORD is accredited for all relevant certification schemes



Inspection

TÜV NORD provides inspections throughout the entire lifecycle



Site and Technical Assessment

TÜV NORD offers site and technical assessment services for all project phases



Testing

TÜV NORD offers testing services with own testing sites and labs

TYPE CERTIFICATION FOR THE LARGEST OFFSHORE WIND TURBINE TO DATE – SG 14-222 DD

Project: SG 14-222 DD

Client: Siemens Gamesa
Renewable Energy

Certification Scheme: IEC

Rated Output: 14 MW

Rotor Blades: 108 m

Market-ready: 2024



Picture: Siemens Gamesa

PROJECT CERTIFICATION FOR THE LARGEST OFFSHORE WINDFARM TO DATE – HOLLANDSE KUST ZUID 1-4

Project: Hollandse Kust
Zuid 1-4

Client: Vattenfall

Certification Scheme: IECRE
OD 502 Ed.1

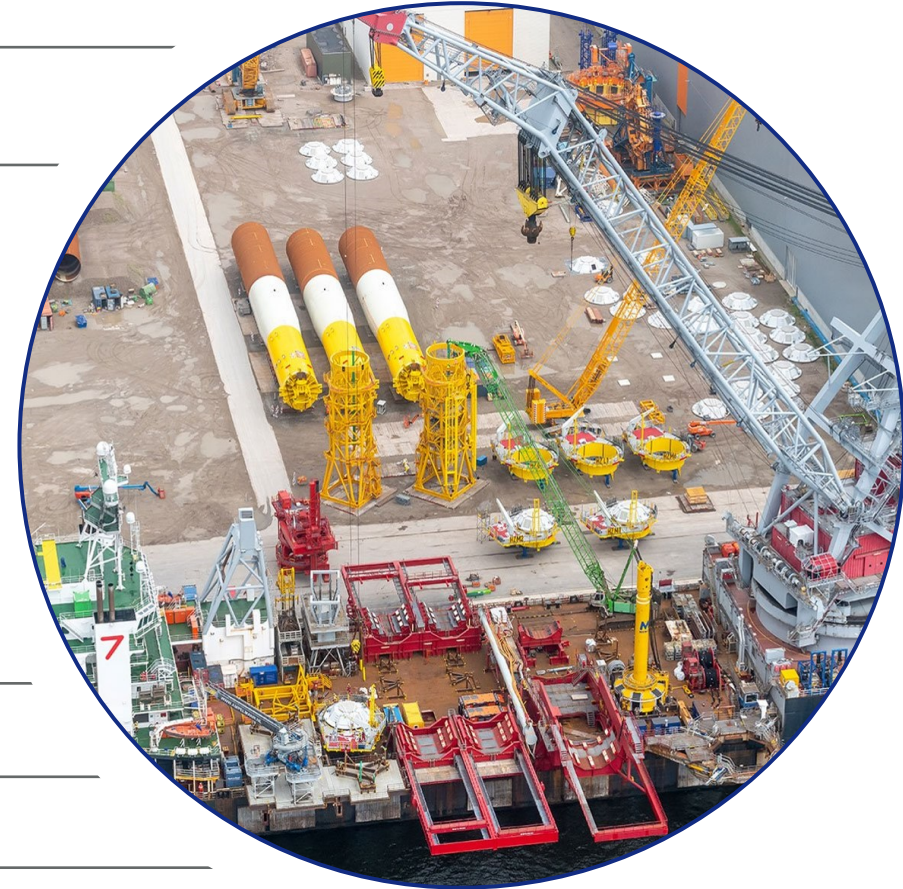
Scope (Installations): WTG,
FOU, IAC

Scope Modules: DB, SSD, MS,
TI, COM, PC

Turbines: 140x SG 11.0-200 DD

Foundation Type: Monopile

Execution Period: 2020-2023



Picture: Source

PROJECT CERTIFICATION FOR THE LARGEST OFFSHORE WINDFARM IN GERMANY – GODE WIND 3 AND BORKUM RIFFGRUND 3 OSS & IAC

Project: Gode Wind 3 &
Borkum Riffgrund 3

Client: Ørsted

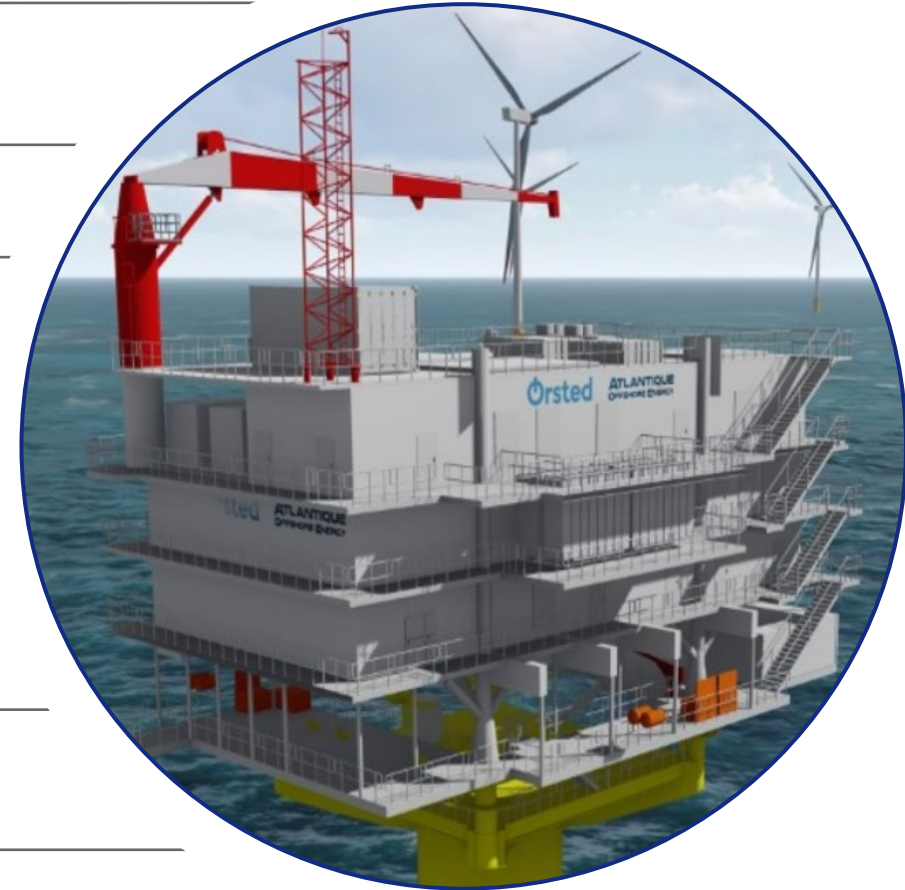
Certification Scheme: BSH

Scope (structures): OSS,
IAC

Scope Modules: DB, SSD,
MS, TI, COM, PC

Foundation Type: Monopile

Execution Period: 2021-
2023



Picture: Source

CONTACTS

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GICON®

G r o u p



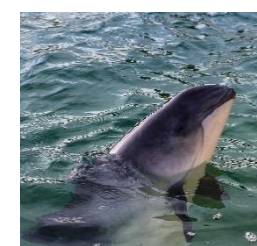
Start
in Dresden



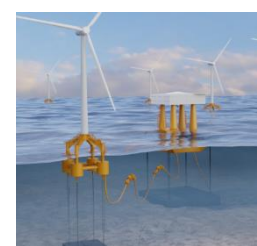
Windpower
Repowering Wind Farm
Klettwitz



Technical know-how
Workboats, Digital Flight
Systems, C-Pods, ROV and
Drones



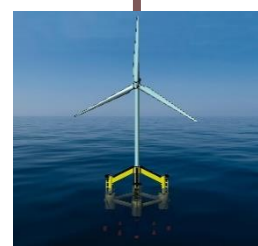
Green
Environmental and
Approval planning



Floating Substructure
GICON®-SOF reaches TRL 6



Geotechnical investigations
Suveys On- and Offshore



Future Technology
Floating Wind - Experience
since 2009

1994

now

10T

More than 10000
Successful contracts

400+

Approx. 400
Employees

18

18 Branches
In Germany

60T

More than 30.000 MW
Accompanied Wind Energy
projects

40M

40 Million
Annual turnover

**DIN
ISO EN
9001**

GICON®

Group

Wind
Engineering

Ecosystem
Survey

Geotechnical
Investigations



Wind engineering services/ main focus



GICON®
Großmann Ingenieur Consult GmbH

GICON®

1

Design, engineering, load calculation and production engineering for fixed and floating on-/ offshore wind primary/sec. steel substructures

2

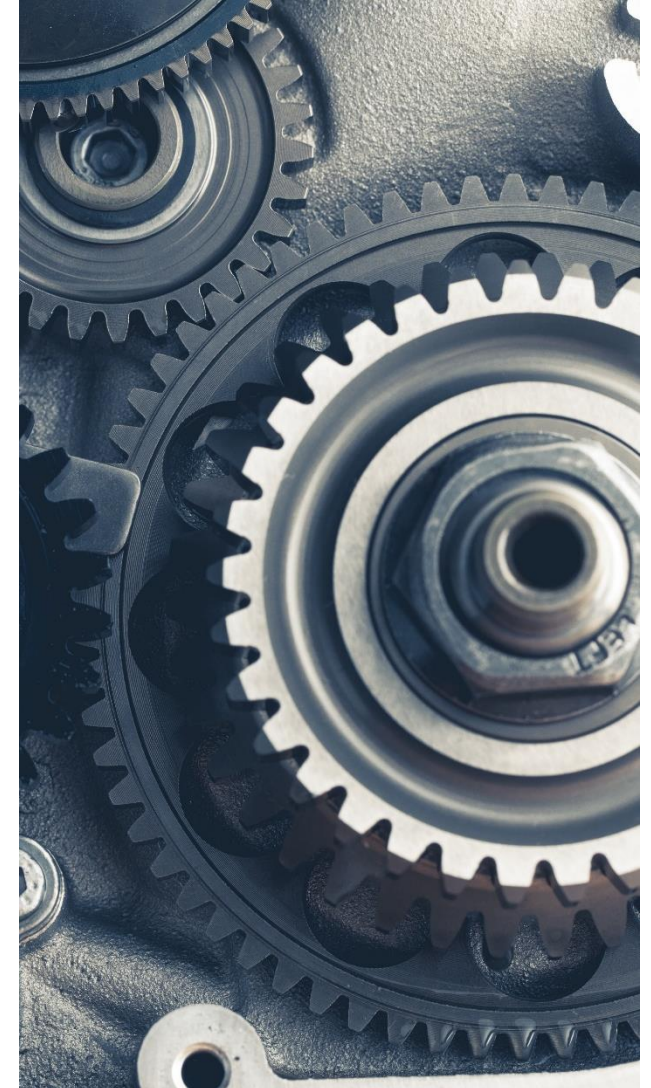
Design, engineering and production engineering for on-/offshore wind foundations

3

Design, engineering, load calculation and production engineering for onshore wind towers and foundations

4

**Risk assessment for on-/ offshore wind applications
&
HSE analysis for offshore wind applications**



Ecosystem surveys/ main focus

1

Marine Environmental
and Approval Planning

2

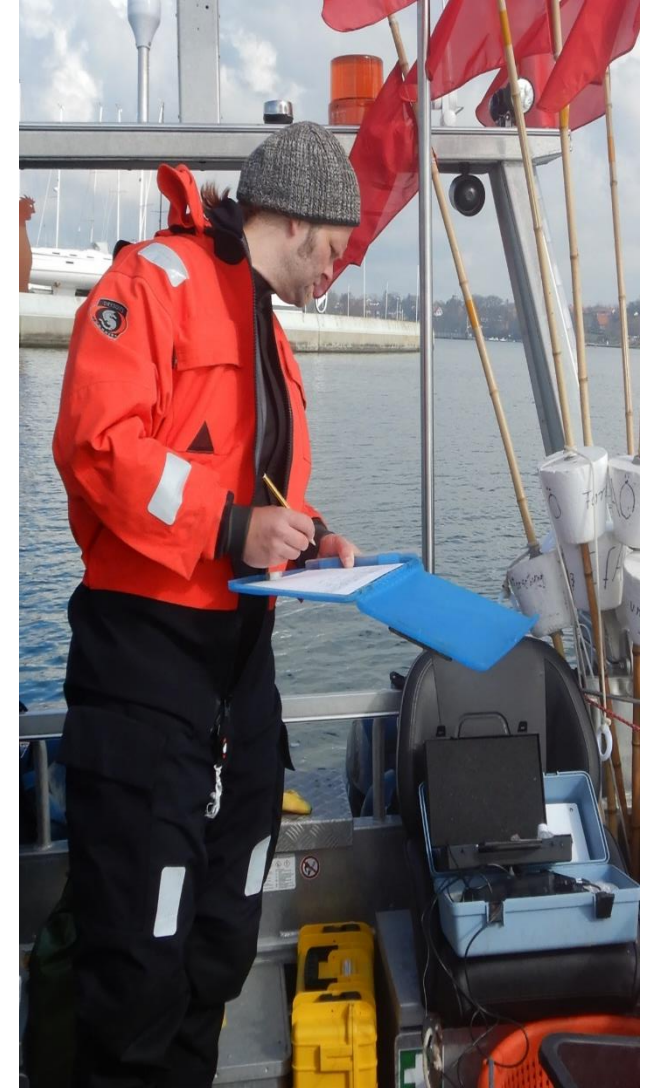
Offshore
Surveys & Investigations

3

Offshore-Monitoring

4

Support of approval
procedures



Geotechnical investigations/ main focus



Geologische
Landesuntersuchung
GmbH Freiberg

GICON®

1

Preliminary geological site assessment

- Geohazard risk assessment
- Principal classification and suitability of seafloor for gravity foundation

2

Geophysical Survey

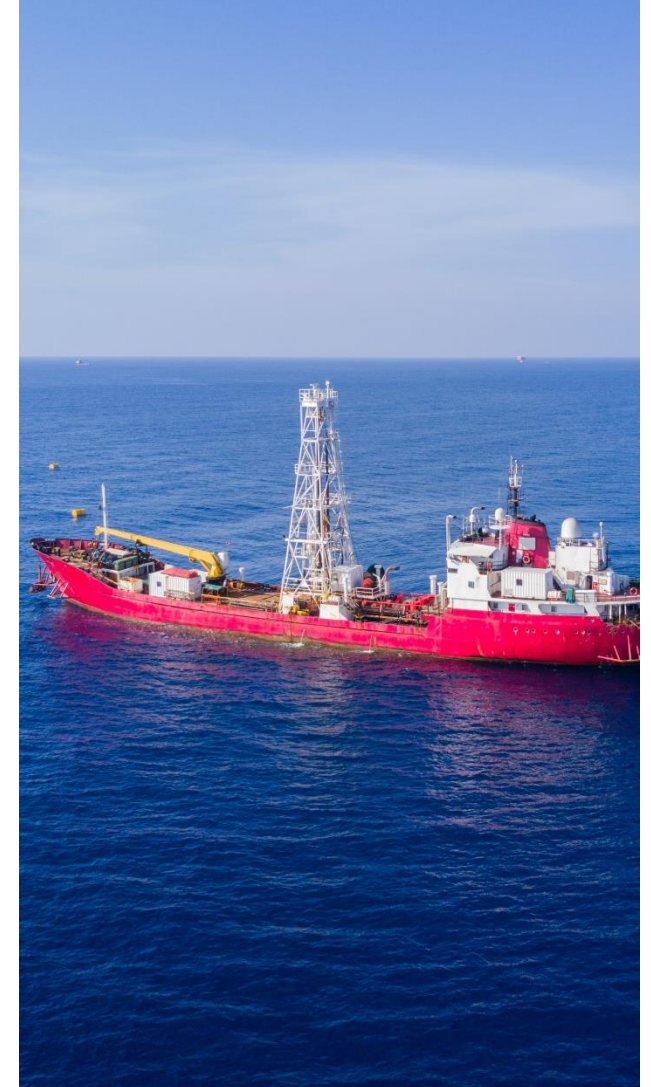
- Multi beam Echosounder, Side Scan Sonar, UHR Seismic Survey with 50m line spacing

3

Preliminary Geotechnical site investigation

4

Geotechnical main site characterization



Contact us

GICON®



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sowento - Services and Collaborations

sowento GmbH,
Dr.-Ing. Steffen Raach, Dr.-Ing. Frank Lemmer,
Prof. Dr.-Ing. David Schlipf

sowento key facts

- sowento is an engineering consultancy and technology advisor for wind energy applications. Our contribution to realize a strong wind energy is to strengthen the industry through innovation from research to develop high quality results, knowledge and technical solutions and to aim for the problems of today and tomorrow. sowento has a team of senior experts in the fields of wind turbine engineering, lidar remote sensing, and floating wind turbines which delivers engineering services, technology advice, and software solutions for our clients.
- Established in 2016 with 40+ projects until today
- sowento methods are applied at more than 1000 wind turbines
- Strong connection to academia, large network in wind industry
- sowento staff includes specialists from control, aerospace and offshore engineering



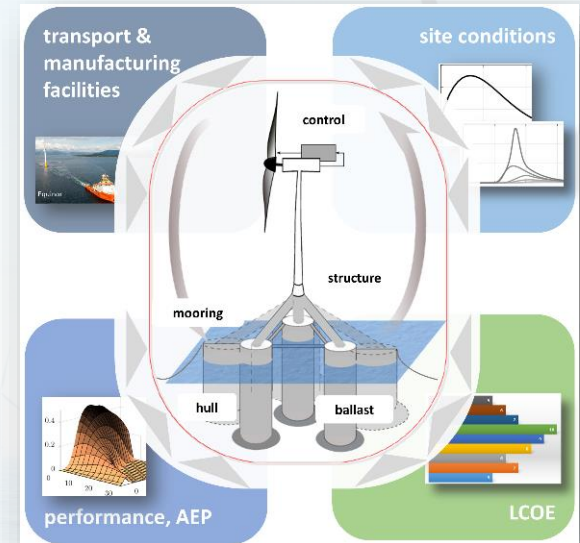
What we offer to enhance Lidar Technology?

- **Technology Consultancy** – Proof of Concepts and Feasibility Study of Lidar-assisted Control.
- Advanced Lidar-assisted **Controller Design** and **Data Processing**
- Wind Turbine **Performance Assessment** and **Optimization**: Power and Loads
- **Field-Testing** and Integrated Design of Lidar Control
- Advanced **wind field reconstruction** solutions (e.g. turbulence intensity)
- **Software Solutions** for Lidar Technology (Smart Lidar, DLL Framework, Wind Field Reconstruction)



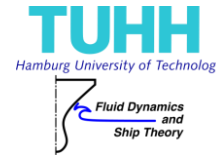
What we offer to enhance Floating Wind?

- **Technological Consulting**, Design Review, Technical Due Diligence, OpenFAST source code adaptation
- Coupled **Design Load Simulations** (IEC 61400-3-2, etc.)
- Advanced **Controller Design** for Floating Wind Turbines
- Scaled Experiments and **Tool Validation**
- **Integrated Design** and Optimization
- Advanced **Monitoring Solution** for Floating Wind Turbines



Collaborations and Partners

- We cooperate and work internationally in the areas of onshore and offshore wind energy to help shaping the technological future of renewable energies.
- Some collaboration partners of sowento:



Working with



Why working with us on Lidar Applications?

- Lidar Technology Consultancy:
 - Lidar experts with more then 10 years of experience
 - Support technology decision-making by experiences and advanced in-house software
- Lidar-assisted Control:
 - Most-experienced group with proven algorithms
 - Advanced and tested control and data processing on the market
- Performance Assessment:
 - Advanced controllers that optimize power production, realistic lidar simulations for lidar control
 - Simulation studies to address normal operation as well as extreme events
- Track Record:
 - Certified lidar-assisted control design (Goldwind)
 - Consulting and design works for numerous wind turbine OEM's worldwide, lidar manufacturers
 - Controller design, implementation and commissioning on various turbines



Why working with us on Floating Wind?

- Advanced FOWT control:
 - Most advanced and tested control and monitoring solutions on the market for FOWTs
- FOWT DLC simulation:
 - Recognized software for load analysis and certification support (Bladed, FAST)
 - Highly skilled team for multidisciplinary, multi-fidelity simulations
- Reduced-order FOWT simulation:
 - Support decision-making during predesign design by identification of critical load cases
 - Multidisciplinary design and optimization (MDAO)
- Track record:
 - Completion of FOWT design calculation and controller development, approved feasibility by DNVGL; Full-scale test of lidar-assisted wind field reconstruction on FOWT (VAMOS)
 - Participation of team members in high-profile European research projects on simulation and controller design (H2020-LIFES50+, H2020-COREWIND, H2020-TELWIND, EUROSTARS-CROWN)



Summary

- sowento is the **world-leading expert** on Lidar-assisted controls and wind lidar applications
- sowento staff has **10 years of experience** in floating wind turbine coupled simulation and controls with strong links to academia
- sowento offers dedicated solutions for **wind turbine control** (onshore & floating) and **wind farm control**
- sowento offers **in-depth design analyses** and tailored coupled load simulation models including **holistic optimization** of floating offshore wind turbines
- sowento operates **recognized in-house software** for control-oriented modeling of floating wind turbines, load case management and postprocessing, Lidar data processing, controller design etc.
- sowento team consists of **independent experts** of the fields of wind turbine design and analysis, control engineering, aerospace engineering, offshore hydromechanics, software development



Let's talk...



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Amtsgericht Stuttgart HRB 767045,

Managing Director: Steffen Raach





DEHNdetect Lightning **M**easurement **S**ystem (**LMS**)



Facts DEHNgroup



DEHN protects

DEHN is the globally leading specialist in the field of **lightning protection** and provider of **smart protection solutions**.



Competence and expertise

111 years of experience, innovation and market success

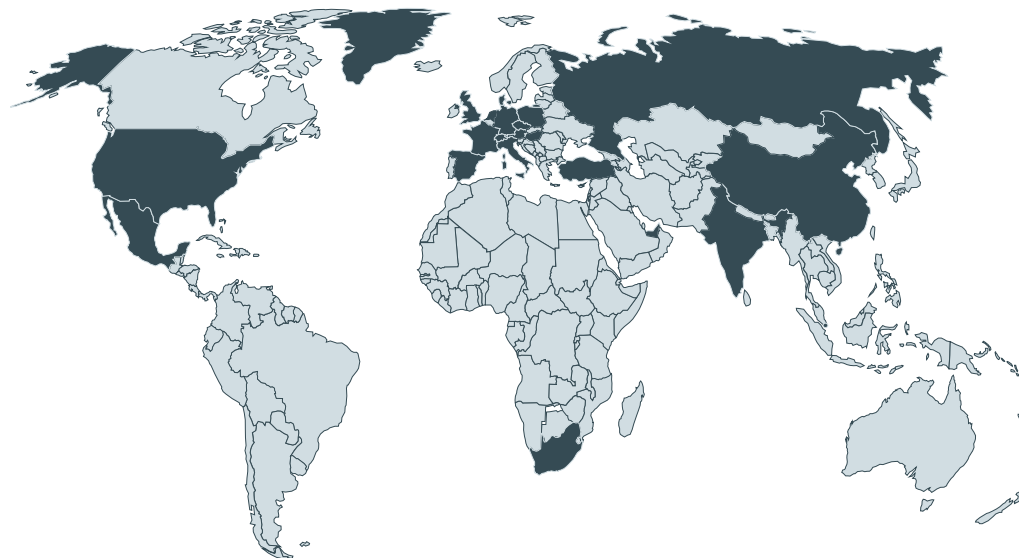


Global player

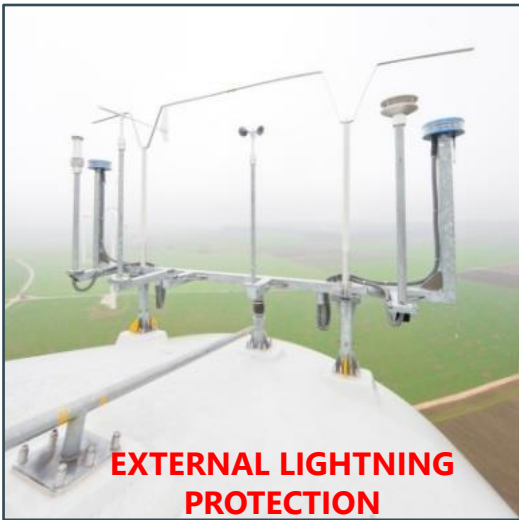
23 subsidiaries and representative offices

DEHN presence in **>70** countries

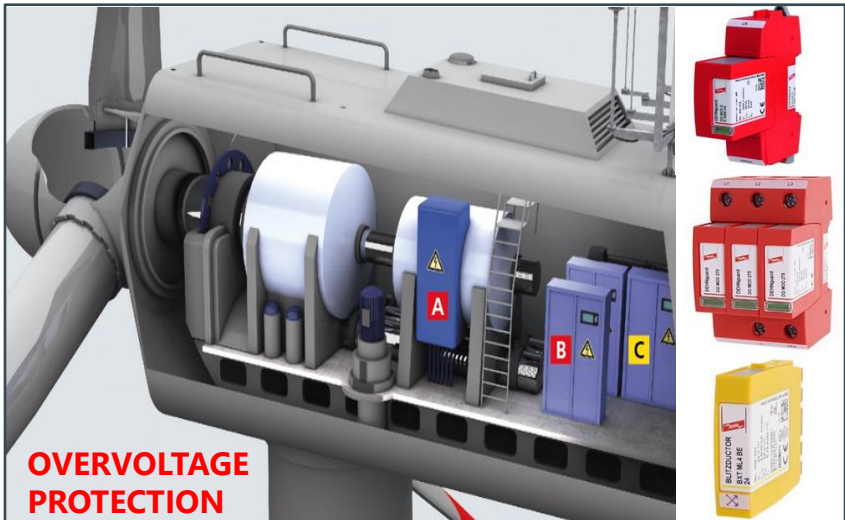
~2,000 employees worldwide



Solutions from a single source (DEHN protects wind turbines)



EXTERNAL LIGHTNING PROTECTION



OVERVOLTAGE PROTECTION

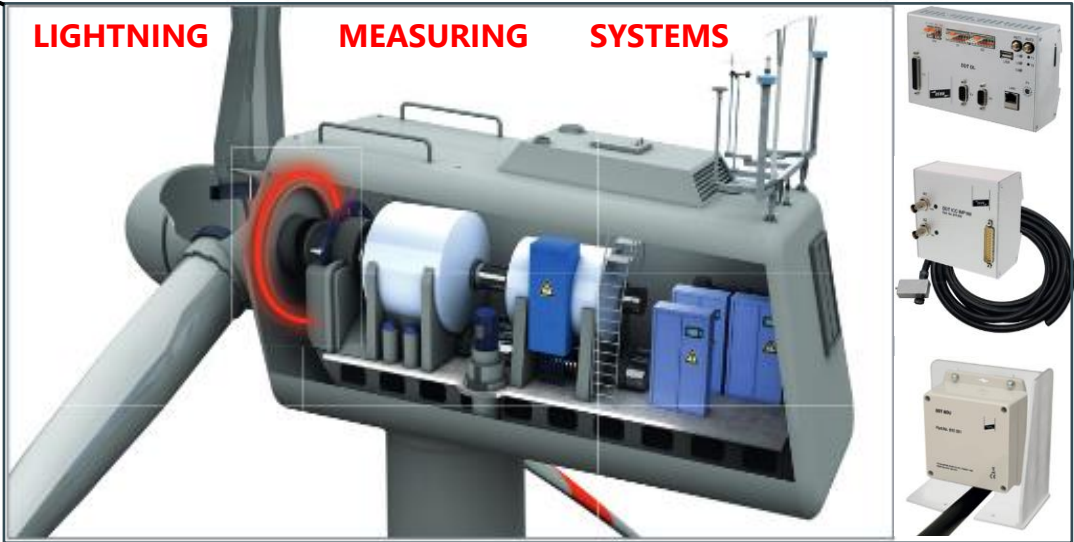


EARTHING & EQUIPOTENTIAL BONDING

SERVICES & SUPPORT



TEST FACILITY - 400 kA



LIGHTNING MEASURING SYSTEMS

Risk introduction & purpose of LMS (Lightning Measuring System)



- High structures like wind turbines will be often affected by lightning strikes
- Especially the risk for upward lightning with Initial Continuous Current (**ICC**) is very high
- The risk for damage of rotor blades and bearings due to **lightning** is very high



Goal is to get reliable evidence to know who needs to cover damage costs & to detect small-size damages so to avoid high down times caused by later evolved big damages



Thereby preventing high repair costs & high insurance fees

DDT Benefits for the customer



On demand-based rotor blade inspection



Prevention of bigger subsequent damage and thus reduction of down times



Reliable evidence for discussions with OEMs and for insurance companies

DEHNdetect

