Technical Competence Center Wind Power

General Presentation

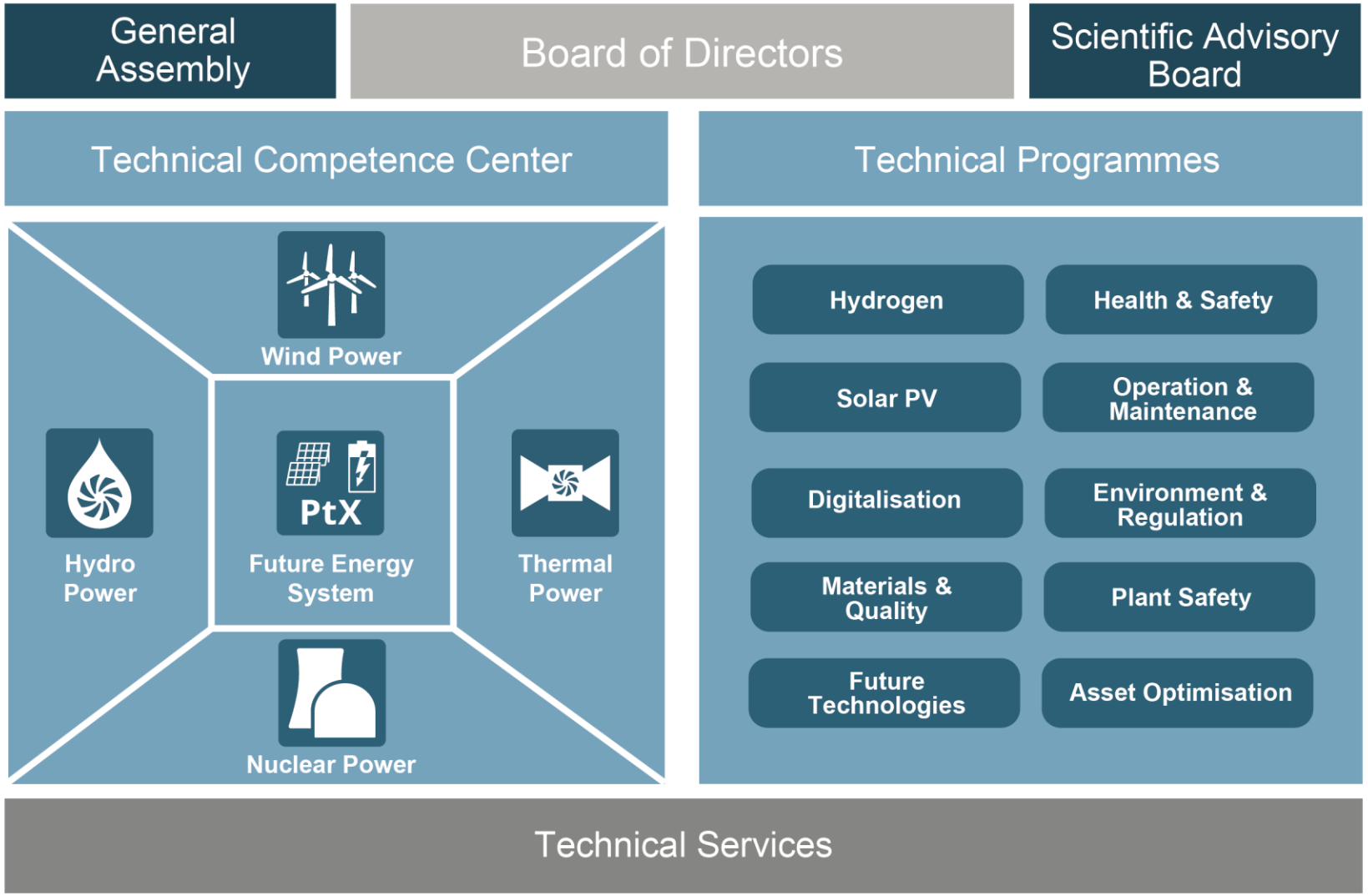
Individual success through exchange of experience within **TCC Wind Power**

ENERGY IS US

Agenda

1 The association

The association – vgbe energy e.V.



vgbe energy e.V. is the technical association of energy plant operators. Our members are companies that operate power, heat and cooling, energy storage and sector coupling plants worldwide. Since its foundation in 1920, vgbe energy has become the technical center of competence for the operators of power and energy plants.

Currently, vgbe energy has 411 members, comprising operators, manufacturers, and institutions connected with energy engineering. The members come from 29 countries and represent an installed power generation capacity of 292,000 MW.

2 Technical Competence Center Wind Power

TCC Wind Power – Focus

Reduction of installation and operational costs and increase of operational safety of wind power plants require coordinated and joint analysis of operational experience.

Leading wind power plant operators bundled their interests under the umbrella of vgbe´s TCC Wind Power. In addition to the exchange of information and experience, the companies are mainly interested in cooperation to push forward standardisation (best practice) and to represent operator interest in the different user groups.

Strategic requirements on the utilisation of wind power from the viewpoint of operators are discussed and corresponding measures are launched by the different committees of TCC Wind Power.

Our slogan for our common work is:
Individual success through Exchange of Experience

TCC Wind Power – Competences

be energised
be inspired
be connected
be informed

Focus on operation and maintenance from a techno-economic and ecological perspective as well as on application-oriented research

- ***Exchange on knowledge and experience***
  - sharing knowledge in various formats and committees
  - connecting subject-specific experts from industry
  - developing and managing technical programmes
- ***Drafting of technical and operational standards***
  - creation of practice-oriented industry guidelines from the operator's perspective
  - initiating and coordinating the elaboration of international technical standards
- ***Initiating and co-coordinating national and international research projects***
  - promotion of innovations in the wind sector and exchange of expertise
  - saving expenses by joint research projects
- ***Organizing conferences and workshops***
  - presenting the state of technology and future developments
  - networking and directly exchanging experiences with experts

TCC Wind Power – Structure

Technical Competence Center Wind Power

Your engagement

Steering Forum Wind Energy

TC “Wind Energy”

- WG Wind “Corrosion Protection Offshore”
- WG Wind “Fire Protection”

Expert Groups

- Oil Monitoring
- Disposal of Rotorblades
- Cold Climate

Current Subjects

- Asset optimisation
- Digitisation measures
- Improvement of flexibility
- Damage analyses
- Repowering
- Performance optimisation
- Maintenance strategies
- Availability and reliability
- Dismantling and Recycling
- Technical benchmarks
- Risk management
- Cost comparison
- Health & Safety
- Technical lobbying

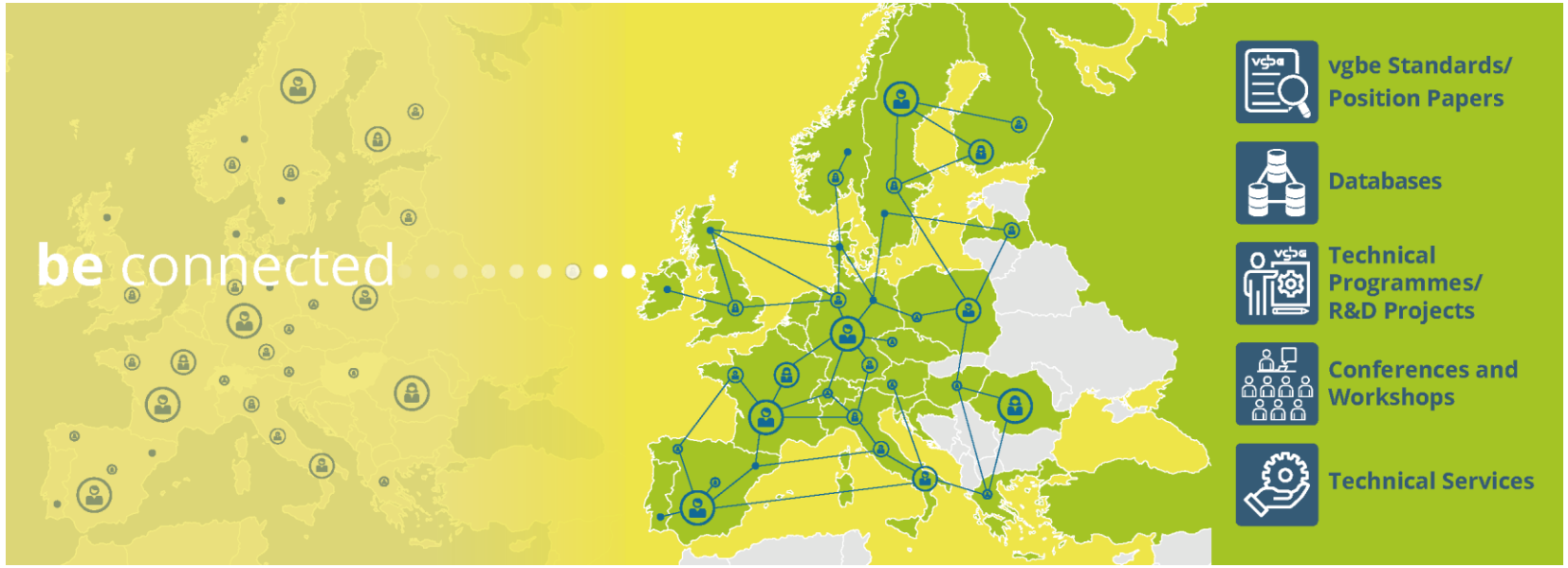
Activities

- Exchange of experiences and information
- Position papers
- Publications
- Conferences
- Participation in other organisations
- vgbe-Standards
- Research projects
- Technical Programmes
- Databases
- Platform
- Subject-specific workshops

TC … Technical Committee WG … Working Group

TCC Wind Power – Exchange of experience

be energised
be inspired
be connected
be informed



Comprehensive experience transfer and exchange

- operational issues
- techno-economic issues
- environmental issues
- energy strategies
- energy policy aspects

Networking throughout Europe

More than 130 professionals participating in vgbe energy | Wind Power committees.

25 Operators

35 Suppliers

vgbe energy pushes the practical exchange of experience.

TCC Wind Power – Members

be energised
be inspired
be connected
be informed

Operators (25)

Suppliers, Service Providers and Institutions (35)

TCC Wind Power

Reduction of installation and operational costs and increase of operational safety of wind power plants require coordinated and joint analysis of operational experience. Leading wind power plant operators bundled their interests under the umbrella of TCC Wind Power.

In addition to the exchange of information and experience, the companies are mainly interested in cooperation to push forward standardisation (best practice) and to represent operator interest in the different user groups.

Strategic requirements on the utilisation of wind power from the viewpoint of operators are discussed and corresponding measures are launched by the different committees of TCC Wind Power.

3 Committees and Expert Groups

Committees and Expert Groups – Introduction

Objectives

vgbe energy with its leading role in techno-economic and environmental understanding about good and best practices in wind energy operation and maintenance offers an exchange between operators on expert level.

vgbe energy provides a platform for networking knowledge sharing, and professional development among its members to address specific challenges in the wind industry.

Networking

Knowledge sharing

Technical Committees Working Groups

- Regular exchange of operating experience and development of best practice approaches for wind power operators

Expert Group

- Exchange on an as-needed basis on topic-specific issues in the form of consulting experts in this field

Benefits

- **Improve your business**
  Benefit from mutual exchange and support each other through best practices in their professional endeavours.
- **Expand your network**
  Through a topic-specific assignment, you gain access to a valuable and targeted network in your field of expertise.

vgbe's contribution

- Organizing, managing and supporting the work in the committees, working groups and expert groups

4 Services and Products

vgbe-Standards – Introduction

Objectives

vgbe-Standards are guidelines, specifications or best practices that serve as a common framework in the wind energy sector. These standards are developed and agreed upon by experts, organisations, and stakeholders within the industry to ensure uniformity, quality, safety, and interoperability.

This may involve terminology, structural measures, plant-specific features, fire protection measures or even operational aspects.

vgbe-Standards

Some vgbe-Standards

- Reference Designation System for Wind Power Plants (RDS-PP)
- Fire Protection in Offshore Wind Turbines
- Corrosion Protection for Offshore Wind Structures (Part 1-4)
- …

Benefits

- **Quality Assurance:** Standards help ensure that services, and processes meet established quality and performance criteria.
- **Safety:** Safety regulations and guidelines help to reduce risks and prevent accidents.
- **Interoperability:** Standards enable different products or systems to work together smoothly. This is particularly important in fields like technology and communication, where compatibility is crucial.
- **Cost Reduction:** Standardized processes can lead to cost savings through economies of scale and reduced complexity.

vgbe's contribution

- Initiating and coordinating (Initiation of a working group, engagement of external experts, contract formulation, session organisation, publication)

vgbe-Standard
Reference Designation System for Wind Power Plants (RDS-PP®)

RDS-PP is based on international standards, thus providing a globally recognized standard for the labelling of wind turbines and their components.

Objective

- RDS-PP provides a structured and systematic way to label and reference components and equipment (e.g. locations, plants, systems, functions, and equipment).
- The created labels serve as the basis for encoding signals, connections, and documents.
- The latest version (2nd edition) was published under the title "RDS-PP Application Guideline Part 32: Wind Power Plants" as vgbe-Standard VGB-S-823-32-2021-12-EN in May 2022.

Some benefits

- Based on international standards, RDS-PP is globally recognized and can be applied to various generation technologies.
- RDS-PP provides a consistent and standardized way to name and label components and equipment.
- It was developed in close co-operation with manufacturers, operators and maintenance staff in the wind industry.

- **vgbe-Standard**
- **2022**

vgbe-Standard
Fire Protection in Onshore Wind Farms

The vgbe-Standard provides comprehensive guidelines for fire prevention, evacuation, and fire protection measures in wind power plants, emphasizing practical strategies.

Objective

- The vgbe-Standard addresses both fire prevention and the evacuation of individuals in wind power plants during fire incidents.
- It covers structural, technical, organisational, and defensive fire protection measures.
- While the recommendations primarily pertain to new-build units, they may also be applicable to retrofits of existing units.
- The vgbe-Standard highlights practical approaches to mitigate fire hazards through operational and tailored technical measures.

Some benefits

- The vgbe-Standard aims to establish essential technical requirements to expedite the development and approval of fire protection concepts for vgbe members.
- It is designed for manufacturers, operators, engineers, public authorities, and authorized experts involved in addressing fire protection in wind turbines and related personnel safety matters.

- **vgbe-Standard**
- **Start: 2018**

vgbe-Standard
Fire Protection in Offshore Wind Farms

A corresponding BWO/vgbe-Standard is being created in cooperation with BSH (Federal Maritime and Hydrographic Agency of Germany) and with the transmission system operators.

Objective

- Harmonisation and hierarchization of existing regulatory documents with respect to fire protection in the offshore wind business.
- Acceptance of the vgbe-Standard by the as mandatory in the German Exclusive Economic Zone (EEZ).
- To be considered components: Wind turbine, living platform, transformer platform.
  - The integration of converter platforms is being planned and will be coordinated with the transmission system operators

Some benefits

- Faster preparation and approval of the fire protection concepts for vgbe members companies active in the EEZ according to the requirements of the BSH.
- Standardized solutions for fire protection in offshore wind farms to decrease costs for planning, operation and maintenance and to ensure the highest H&S standard.

- **vgbe-Standard**
- **Start: 2022 - ongoing**

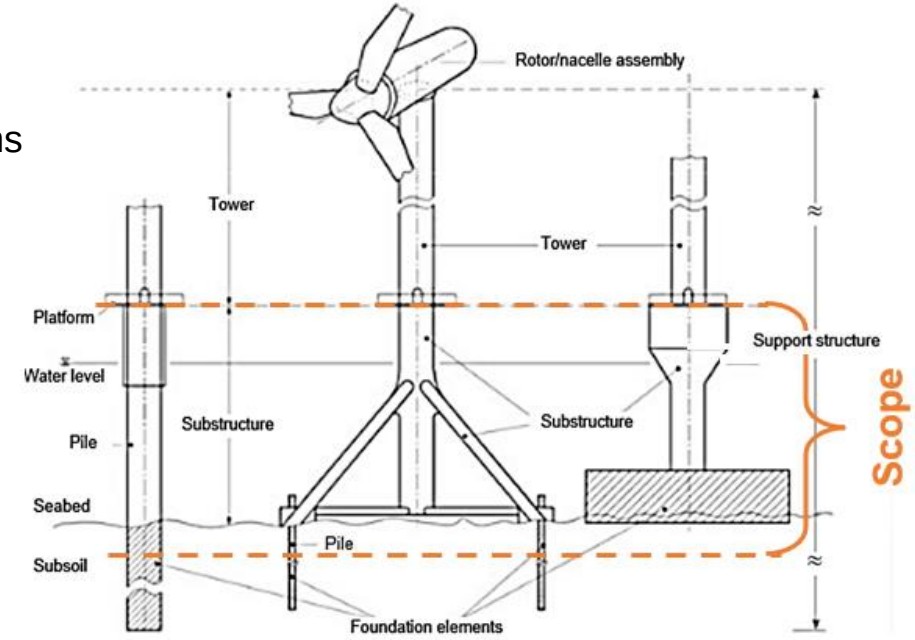
vgbe-Standard
Corrosion Protection for Offshore Wind Structures

The aim of this standard is to ensure that the considerable investments in offshore structures are safeguarded by appropriate corrosion protection systems.

Structure

Corrosion Protection for Offshore Wind Structures:

- Part 1: General
- Part 2: Requirements for Corrosion Protection Systems
- Part 3: Application of Coating Systems
- Part 4: Cathodic Protection



- **vgbe-Standard**
- **4th Edition (May 2023)**

vgbe-Standard
Corrosion Protection for Offshore Wind Structures

Objective

- Improved safety/availability beyond the warranty and thus increased reliability
- Coordinated agreement with all parties involved: Developed by system operators and federal authorities
- Ensuring practical suitability and improving the life expectancy of corrosion protection systems

Development of the Standard

- 2013 – Start of development
- 2016 – 1st Version
- 2017 – 2nd Version
- 2018 – 3rd Version
- 2023 – 4th Version

Scope of application

- Foundation structures for every permanent installation in the German EEZ
- Mandatory (part 1-3) since 3rd edition (2018) for all German offshore projects

Technical Programmes – Introduction

Objectives

vgbe energy with its leading role in understanding about good and best practices in hydropower operation and development launches different Technical Programmes in cooperation with its members.

These programmes are part of the comprehensive activities of vgbe energy for the hydropower sector to support the daily work in operation, maintenance and plant optimisation as well as in techno-economic, environmental and strategic challenges. Therefore, the programmes are open for vgbe members as well as vgbe non-members.

Database

Industry funded project

Some Technical Programmes

- Implementing the EU Taxonomy in the energy industry
- Wind Database: Wind Power Performance Data Exchange (WiPPeX)
- Digitalisation barometer for wind power operators
- …

Benefits

- **Management of industry funded projects** vgbe energy initiates, coordinates and/or conducts industry funded projects together with scientific partners.
- **Development and management of databases** vgbe energy develops databases or IT-based tools to support the optimisation of operation and maintenance.

vgbe's contribution

- Initiating and coordinating industry-funded projects (e.g. description of the programme, contracts and organizing the meetings)
- Developing databases (e.g. description, implementation, recruiting of participants, hosting and operation)

Technical Programme
WiPPeX – Wind Power Performance Data Exchange

Share data with other operators to optimise your own wind power plants. Users have direct access to the processed operational anonymised data in order to create their own benchmark.

Objective

- Create a database that supports operators to jointly optimise the operation of their wind power plants
- Provides different turbine platforms of various manufacturers (e.g. Enercon, Siemens, Vestas, Nordex, GE).
- The time series are SCADA-based data with a resolution of 10 minutes.
- Only companies providing operational wind power plant data can download raw and unfiltered data of the individually booked database platforms in order to create their own benchmark.

Some benefits

- Have direct access to the processed operational anonymized data in order to create your own benchmark.
- Benefit from a large pool of data to carry out meaningful analyses and compare yourself with others.
- High data anonymity and compliance to confidentiality are ensured. The data are stored on devices installed in Germany to ensure maximum level of data security.

- **vgbe-Standard**
- **Start: 2021 - ongoing**

Access to the WiPPeX-Database is free of charge for vgbe members.

Research Projects – Introduction

Objectives

vgbe energy offers collaborative research activities to meet new challenges. In these projects, manufacturers and operators, universities, research institutes and the public sector pool their specific know-how and financial resources.

- Initiation and coordination of national and international research projects
- Building of know-how and knowledge transfer

Research project

Some Research Projects

- Condition monitoring of wind turbines II
- Ice Detection Systems for Wind Turbines, Part I: Best Practice Study
- Smart Operation of Wind Power Plants in Cold Climate
- …

Benefits

- **Improved funding opportunities**
  Higher likelihood of being awarded a contract due to our network with various stakeholders and institutions.
- **Expertise in submission phase**
  Benefit from vgbe's expertise in developing a dissemination, exploitation and communication plan for submission.
- **Dissemination network**
  Events and conferences across Europe, partner organizations and editors of journals.

vgbe's contribution

- Recruiting project partners and/or self-participation
- Co-coordinating the submission proposal
- Responsible for different WPs (e.g. dissemination, exploitation and communication)

Research Project
Smart Operation of Wind Power Plants in Cold Climate

Fact Sheet

Role of vgbe

The vgbe project will be coordinated with an Austrian initiative (FFG) partly dealing with the same research aspects.

These activities support the information gain and lead to an optimised operation of the wind turbines in cold climate regions.

Project duration
2022 – 2025
ongoing

Smart Operation of Wind Power Plants in Cold Climate (SOPWICO): Interconnect all components and data streams in real-time and combine them with smart decision making algorithm

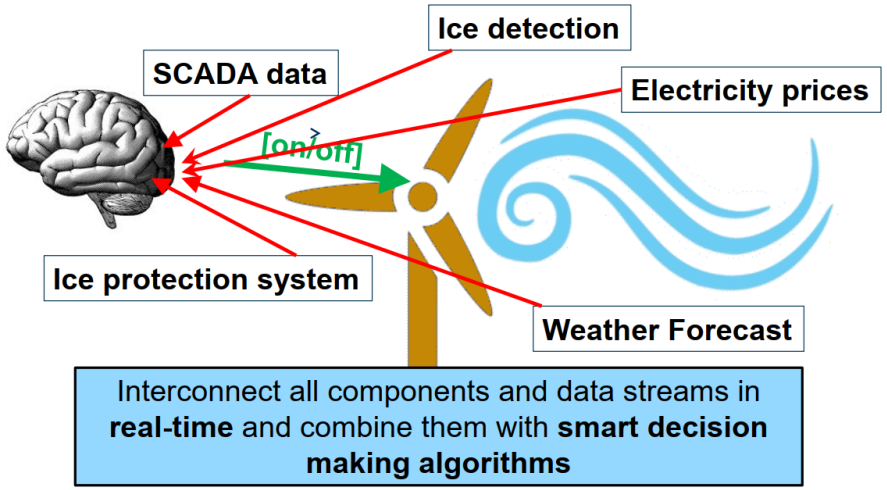
Objective

The main objective of the project is to create a prototype for intelligent wind turbine control under icing conditions based on

- a smart combination of SCADA data
- ice detection data
- a blade heating performance envelope
- and weather forecasts

Some benefits

Suitable methodologies especially with regard to the optimal timing of blade heating control will be identified, developed and validated



vgbe Expert Workshop – Introduction

Objectives

vgbe energy organises topic-specific expert workshops for vgbe members only to foster exchange and problem-solving between experts with extensive practical experience.

The Expert Workshops are targeted at operators that are vgbe members and require an active participation according to the policy **“Give and Take”.**

Therefore, it is mandatory to give a presentation in order to join the active discussion and benefit from the experience of the other participants.

Networking opportunity

Topic-specific workshops

Some Expert Workshops

- Workforce management
- Digital documentation system
- Bird protection systems
- Blade condtion monitoring
- Grid integration of large renewable capacities
- Digital solutions for O&M
- …

Benefits

- **Proactive approach**
  Overcome emerging challenges before they become an issue at your company.
- **Expert talks**
  Discuss with experienced and specialized experts.
- **Train young professionals**
  Take the opportunity to train your young professionals on specific topics through exchanges with experienced industry experts.
- **Documentation**
  Presentations available to all members.

vgbe’s contribution

- Organizing the expert workshops

vgbe Expert Events – Introduction

Objectives

vgbe energy organises Experts Events for vgbe members and non-members to foster exchange and networking between experts.

The Expert Events are planned by vgbe energy in cooperation with its members and cover a broad variety of applications that include established and emerging technologies for energy generation and storage.

Networking opportunity

Knowledge transfer

Some Expert Events

- Maintenance of Wind Power Plants
- Digitalization in the Wind
- Operation of Wind Power Plants in Cold Climate
- …

Benefits

- **Onsite Expert Events**
  Challenges, problems and questions can sometimes be better addressed in a relaxed onsite atmosphere. Deeper exchange and increased learning effects improve the benefits for all participants.
- **Online Expert Events**
  Online events enable a location-independent exchange of information with the flexible option of participating in sessions. The costs and time required are significantly lower (no travel).
- **Documentation**
  Presentations available to all participants

vgbe's contribution

- Organizing the expert events including moderation

5 Contact

Benefit from our expertise – Get in touch with us

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Your contact

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Technical Competence Center Wind Power

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Being the first address for all operators of wind power plants regarding technical, environmental as well as strategic issues.

Performing as the collective European platform and key representant for the wind energy community.