

## WIND TURBINE OPERATION AND MAINTENANCE FORUM

DATE: 6 - 7 MARCH 2023, VENUE: BERLIN, GERMANY



Every year from now, up to 20,000 turbines around the world will be entering the second half of their 20-year design life, already having long since fallen out of standard manufacturer warranties. The turbines now increasingly attracting the attention of O&M technicians are bigger, heavier, taller and much more complex than their predecessors. The rise in installations from 2009 was accompanied by significant shifts upwards in nameplate capacity, tower heights, rotor-blade lengths and operating reliability. This enabled wind development at sites previously considered economically unviable on the grounds of, among other things, low wind speeds and extreme temperatures, remote and hard-to-access locations, hilly and forested terrains.

This expansion reflects the rate of new wind-energy installations, which really began to pick up pace ten years ago. Nearly 80% of the 570GW worldwide capacity that was operating at the end of 2018 has been built since 2009, according to Windpower Intelligence, the data and research arm of Windpower Monthly.

The O&M sector's challenges will grow alongside the expansion in the number of turbines it services, and their technical demands. The next generation of 5MW-plus onshore machines, with rotor diameters of at least 150 metres, mounted on 160-metre towers, pose a number of questions for future maintenance regimes. The cost and availability of cranes with sufficient lift and height capacity to replace, say, a gearbox, is a key priority for operators.

### Life-time extension

Life-time extension is a prolongation of the asset life span. Although wind turbines generally are designed for a service life of 20 years, many can continue to operate past their original design life. For lifetime extension, wind turbines must have sufficient structural life remaining that their safety level is not compromised. In addition, wear-out of components translates into higher operation and maintenance (O&M) costs and turbine downtime. The most common technique for life-time extension is turbine refurbishing.

## 09.00 OPENING ADDRESS FROM THE CHAIR

## KEYNOTE ADDRESS

## 09.10 DIGITALIZATION AND AI: MAXIMIZING ENERGY PRODUCTION THROUGH THE INCORPORATION OF CUTTING-EDGE TECHNOLOGIES

- Successful implementation of digital predictive maintenance tools to minimize unscheduled downtime
- Are real-time performance and reliability analyses the future of cost-effective O&M?
- The importance of AI for data management and fleet-wide analytics
- Examining the challenges in implementing innovative digital solutions into standard maintenance practices: How can we overcome them?

**Hans Bruins**  
Construction Director  
**ENGIE**



## 09.50 BEST-PRACTICE IN PREDICTIVE MAINTENANCE

- A focus on predictive, preventive, and autonomous maintenance
- Successfully overcoming the challenges posed by the increased size of the blades
- Striving towards building an optimal system for constant condition monitoring
- Identifying and overcoming the shortcomings of third-party service agreements
- Incorporating AI into standard wind blade preventive maintenance strategies

**Raphael Taucei Panizzi**  
Engineering Coordinator  
**Rioenergy**



## 10.30 COFFEE BREAK AND NETWORKING

The refreshing networking coffee breaks are always well attended allowing delegates socialize, exchange ideas and build productive relationships in a relaxed atmosphere

## 11.10 EXPLORING OPTIONS FOR WIND TURBINE LIFE EXTENSION SCENARIOS

- Identifying the best strategies to prolong asset lifetime
- Prospects for lifetime extension through smart maintenance and digitalization
- Overcoming challenges in lifetime extension planning
- An examination of repowering and refurbishment: What are the benefits and challenges?
- An examination of the economic benefits and limitations of remanufacturing

**Sónia Liléo**  
Head of Asset Optimisation -  
Renewables  
**Fortum**



## 11.50 MODELING THE LOAD-CARRYING LAMINATES IN LARGE WIND TURBINE BLADES

- Quantification of fiber orientations using x-ray tomography and advanced segmentation methods
- Precise predictions of the compression strength
- Experimental validation using enhanced test coupons and test methods
- Effect of wrinkles on the mechanical performance
- Predicting the performance of pultruded carbon fiber profiles

**Lars P. Mikkelsen**  
Associate Professor  
DTU Wind Energy  
**Technical University  
of Denmark**



DTU Wind Energy  
Department of Wind Energy

### 12.30 LUNCH

We aim to deliver our BizLunch in a friendly, relaxed and enjoyable manner that is open to all speakers and participants. The demographics of each event change constantly and this helps maintain the gathering as a fresh and lively affair.

### 13.40 A FOCUS ON ONSITE REPAIRS

- Identifying the source of the damage: operational vs. maintenance issues
- Negotiating the damage and costs: A focus on operator and contractor relationship
- The importance of scheduling in avoiding prolonged downtime
- Examining major component replacing: How to implement the most cost-effective strategy

**Ina Barge**  
Manager of Wind &  
Shore Power NL  
**ENECO**



### 14.20 TAKE CONTROL OF YOUR ASSETS – WHY ACTIVE OWNERSHIP IS THE RWE WAY

- Why we like to maintain our own assets
- Our journey to date and beyond
- Our focus areas for successful active ownership

**Roland Flaig**  
Managing Director  
**RWE Renewables**  
**RWE**

### 15.00 COFFEE BREAK AND NETWORKING

The refreshing networking coffee breaks are always well attended allowing delegates socialize, exchange ideas and build productive relationships in a relaxed atmosphere.

### 15.30 THE GLOBAL MARKET FOR OFFSHORE WIND ENERGY - STATUS QUO AND MARKET POTENTIALS UNTIL 2030

- Initial situation and framework conditions
- Status quo: Climate protection and expansion targets for offshore wind energy worldwide
- (selected countries)
- Market development (selected countries) & Conclusion

**Dirk Briese**  
Managing Director  
**trend:research**



### 16.10 MAXIMIZING WIND BLADE PERFORMANCE WITH EPOXY PULTRUSION

- A focus on achieving superior mechanical performance
- Traditional epoxy systems vs. epoxy pultrusion
- Shortening the production time and costs
- Achieving the current and future targets for light, stiff and high-performance blades
- What are the challenges for incorporating epoxy pultrusion and how can they be overcome?

**Alexander Krimmer**  
Senior Engineer  
Composite Materials and  
Structures  
**TPI Composites**



### 16.50 CLOSING PANEL DISCUSSION HOW CAN WE OPTIMIZE O&M PRACTICES THROUGH DIGITAL SOLUTIONS? HOW CAN THEY REVOLUTIONIZE PREDICTIVE AND PREVENTIVE MAINTENANCE?

- Maximizing operational efficiency through increased collaboration and standardization
- What are the key optimization actions to achieve operational efficiency?
- Rethinking O&M practices in an era of emerging technologies
- Strategic approaches to bring down costs in O&M

Panel Speaker

## DAY 2

### 09.00 OPENING ADDRESS FROM THE CHAIR

#### OPENING ADDRESS

##### 09.10 UNLEASHING THE POTENTIAL FOR WIND TURBINE RECYCLING

- Achieving life-cycle sustainability through effective waste management practices
- Successfully implementing optimal and cost-effective procedures for wind turbine recycling
- Wind blade recycling: Where do we stand?
- A focus on the European ban of decommissioned wind blade disposal in landfills
- Ensuring wind turbine recyclability with the aid of developing technologies

**Piotr Maciołek**  
Board Member  
Renewable Energy &  
Distribution  
**polenergia**



##### 09.50 CASE STUDY: CHOOSING THE BEST O&M STRATEGIES FOR TURBINES NEARING END-OF-LIFE

- Identifying the most critical maintenance issues for ageing turbines
- Ensuring the cost-effectiveness of older assets
- Successfully implementing efficient O&M procedures to prolong remaining lifetime
- Discussing the best options for end-of-life strategies

**Daniel Gaescu**  
Manager  
**VERBUND Wind Power**



##### 10.30 COFFEE BREAK AND NETWORKING

The refreshing networking coffee breaks are always well attended allowing delegates socialize, exchange ideas and build productive relationships in a relaxed atmosphere

##### 11.10 SUCCESSFUL OPTIMIZATION OF THE WIND BLADE PRODUCTION PROCESS

- Ensuring the highest quality of blades under steadily increasing demand
- A focus on automated wind blade production
- Increasing the flexibility of material usage
- Achieving cost reductions through manufacturing process optimization
- Effective alignment of materials with manufacturing objectives

**Steffen Czichon**  
Head of Department  
**Fraunhofer IWES**



##### 11.50 A FOCUS ON DATA-DRIVEN O&M

- The importance of Big Data and IoT in enhancing data-driven decision-making
- An analysis of developing digital innovations for data optimization
- Driving down maintenance costs with advanced data analytics
- Advancements in fault and failure analysis for downtime risk mitigation
- Effective implementation of diagnostic data for corrective actions

**SPONSOR SLOT**

## 12.30 LUNCH

### 13.40 LATEST DEVELOPMENTS IN RECYCLABLE WIND BLADE MATERIALS

- Opportunities and challenges for developing new wind blade designs to achieve 100%
- Potential for thermoplastic resin: recyclable, cheaper, and lighter blades
- A scrutiny of advances in sandwich materials
- Advances in hybrid composite development
- New strategies for sustainable end-to-end management of materials
- A focus on process assessment of materials in relation to cost

**Leon Mishnaevsky**  
Jr Expert in computational materials science, wind energy technology, composites and nanomaterials.  
**Technical University of Denmark**



### 14.20 TRAINING WIND TECHNICIANS FOR WTG MAINTENANCE AND CORRECTIVES

Experienced Operations Training Manager with a demonstrated history of working in the renewables and environment industry. Skilled in Power Plants, Management, Strategic Planning, Project Management, and Energy. Strong human resources professional graduated from University of Louisville, College of Education



**Samuel Akey**  
Manager, Renewables Training & Training Innovation  
**Avangrid Renewables**



## 15.00 COFFEE BREAK AND NETWORKING

### 15.30 REVIEWING THE ECOLOGICAL IMPACTS OF OFFSHORE WIND FARMS

- Introduction
- Scientific knowledge on environmental impacts of wind energy devices
- Environmental impacts from wind energy production devices on marine ecosystems
- Impact type and magnitude
- Implications for management and decision making

**Ibon Galparsoro**  
Principal Researcher  
**Azti**



### 16.10 IDENTIFYING BEST PRACTICES FOR WIND BLADE REPAIR

- A focus on unique damages: What procedures are necessary for quick and efficient reactions?
- Drones: Increasing safety and minimizing costs
- Cutting-edge robotic solutions for the wind blade inspection and repair
- Examining repair procedures for sectional and modular blades
- Developing tools for wind blade repair
- The importance of data in optimization of inspection and repair decisions

**Gareth Jackson**  
Head of Operations and Maintenance  
**EDF Renewables UK**



### 16.50 CLOSING PANEL DISCUSSION A FOCUS ON O&M PROCESS OPTIMIZATION: WHAT NEEDS TO CHANGE WITH THE ARRIVAL OF BIGGER TURBINES?

Panel Speaker

REGISTRATION CODE: GWIN

Please complete this form, scan and send to:

ADAM BARES

Standard In-person Registration Fee (per pass)	= € 2899
Virtual Pass(Attend Online)	= € 2499
Speaker Package	= € 3999
Group Discount (3 and more people per pass)	= € 1999

E-mail: adam.bares@berlin-energy-forum.com

## DELEGATE(S) INFORMATION:

Ms. Mrs. Mr. Name: \_\_\_\_\_  
Surname: \_\_\_\_\_  
Job Title: \_\_\_\_\_  
E-mail: \_\_\_\_\_

Ms. Mrs. Mr. Name: \_\_\_\_\_  
Surname: \_\_\_\_\_  
Job Title: \_\_\_\_\_  
E-mail: \_\_\_\_\_

Ms. Mrs. Mr. Name: \_\_\_\_\_  
Surname: \_\_\_\_\_  
Job Title: \_\_\_\_\_  
E-mail: \_\_\_\_\_

## COMPANY INFORMATION:

Organisation: \_\_\_\_\_  
VAT number: \_\_\_\_\_  
(VAT No. for EU members / Tax number for non-EU members)

Mobile Number: \_\_\_\_\_  
Office Phone Number: \_\_\_\_\_  
Fax Number: \_\_\_\_\_  
Email: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
Country: \_\_\_\_\_

## AUTHORISATION AND ACCEPTANCE OF TERMS & CONDITIONS:

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

This booking is invalid without a signature authorisation.  
The signatory must be authorised to sign on behalf of the contracting organisation.

### Terms and Conditions:

By submitting this signed booking form, I agree that the following terms and conditions have been read thoroughly and the content is well understood.

### Payment Conditions:

Payment should be made in full immediately after submitting the signed booking form. Payment should always be made in Euros unless indicated otherwise. STMI Forum accepts all kinds of credits cards. Although the preferred means of payment is credit card, in a few cases the bank transfer option may be allowed ONLY on condition that the payment is made within 10 working days upon receiving the proforma invoice. The fee of the event includes the possibility to download speakers' presentations, access to the conference hall & materials, refreshments, lunches and snacks. Each delegate will be responsible for their own hotel accommodation and travel expenses, however STMI Forum will negotiate and offer the best possible hotel rates for its delegates in the same 4-star or 5-star hotel in which the event will take place.

### Substitution Policy:

Substitution of delegate(s) is possible at any time without any extra fees. Nevertheless, STMI FORUM would need at least 3 days prior to the event to make arrangements for the substitute(s).

### Cancellation Policy:

Incase a delegate would like to cancel their participation for some unexpected eventualities, such requests must be submitted in written and sent by post 4 weeks prior to the event in order to obtain a full credit note for any future event organised by WTOM Forum. The fees charged are strictly non-refundable. If WTOM Forum would decide to cancel an on-going event, the delegate would receive a 100% refund of their payment. Non-attendance, otherwise referred as a "no show" does not signify cancellation. WTOM Forum will not be held responsible for events cancelled for reasons beyond its control such as natural disasters, accidents, sabotage, trade or industrial disputes, outbreak of disease, hostilities, terrorism, etc. However, a full credit note would be given in each of these cases.

### Data Protection:

WTOM Forum agrees to keep clients' information confidential in its database. The client gives WTOM Forum the authority to keep their information in its database and use the information in any way necessary in connection with the event, otherwise consent should be sought. Client information will be removed immediately after receiving a written request by post.

### PLEASE NOTE:

All booking forms submitted without a signature are considered invalid. WTOM Forum reserves the right to postpone the event to a later date or make changes to the location or confirmed speakers. If a client decides to cancel their participation for these reasons the client will receive a full credit note which covers the amount paid to attend any future event organised by WTOM Forum. The hotel information may not be provided at the time of booking but should be ready at least one month prior to the event. In such case, please bear with us.

### Copyright:

The information included in this agenda is strictly meant for the company or person who directly received this agenda from WTOM Forum. Under NO circumstance should this agenda be published on the internet or be made available to the general public without the prior consent of WTOM Forum. All intellectual property rights in all materials produced and distributed by WTOM Forum in connection with this event are expressly reserved and any unauthorised duplication, publication or distribution is strictly forbidden.