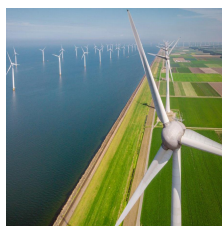


## **GLOBAL WIND TURBINE MANUFACTURING & SUPPLY CHAIN CHALLENGES: How to boost competitiveness and balance risks?**



### **2022/ 23: Strong installations and all gear up for further acceleration**

Wind energy is one of the fastest-growing energy sources in the world driven by supportive legislations in the US, the European Union, India and China yet spare capacity is limited and will likely disappear by 2026.



## Improve Performance and Manage Uncertainties

### Supply chain challenges and growth potential coexist

Wind energy is one of the best source to alleviate the pain and challenges of climate change. With the **increasing demand of global electricity**, which is forecasted to grow by 25% and reach ~30k TWh<sup>1)</sup> by 2030, development and utilization of wind plus other renewable energy sources are indispensable and have been prioritized by farsighted governments as well as businesses.

Accordingly, all major economies have set up ambitious goals to reach renewable energy utilization targets to **realize high-level of energy independences**. Therein, wind energy is expected to increase its share in net electricity generation from 7% in 2020 to 12% in 2030. Consequently, EAC is continuously monitoring changes and potential challenges in the global wind industry.

### Stumbling blocks in global supply chain may hurdle future growth

The wind industry is facing increasing challenges from geopolitical uncertainties. The Russia-Ukraine war and the ideological clashes among international forces have eliminated globalization efforts. Adding on, the global recession concerns and slowing economic growth in major global markets seem to be the continuing theme of 2023. Given this complex global environment, multiple stumbling blocks are recognized for the wind industry:

- **Disruptions to global supply chains are still going on:** Uncertainties of raw material accessibility, production and logistic availabilities, price volatility and trade barriers are prevailing. Metals such as aluminum and copper are scarce – not even mentioning rare earth. Besides, unplannable lead times and shortages will continue being a problem for semi-fabricated and finished components, for instance, electrical parts, stators and rotors.
- **Global economic slowdown of major economies are expected:** According to IMF's estimation, GDP growth for developed economies is estimated to reach 1.3% in 2023 while 2.8% is the expectation for the global economy. The international investment confidence is uncertain. Energy crisis and high inflation will continue interrupting global wind supply chain and demand.
- **Rising China dependency is expected to attract more attention in global supply chain:** China has occupied over 50% share in global wind supply chain in terms of both raw materials and major components, such as bearings and pig iron. To balance potential risks, companies must manage their China dependency while utilizing the enormous market and supplier potential.
- **The shift of wind supply chain to Asia requires global communication:** Considering low-cost advantage, available capacities and easing logistic costs, Asia emerged as concentrated supply chain hub despite regionalized sourcing requirements. Local content requirements are endorsed in many regions which requires extra efforts to understand local regulations and to facilitate sufficient and effective communication with global partners.



## Improve Performance and Manage Uncertainties Supply chain risk exposure and resilience assessment

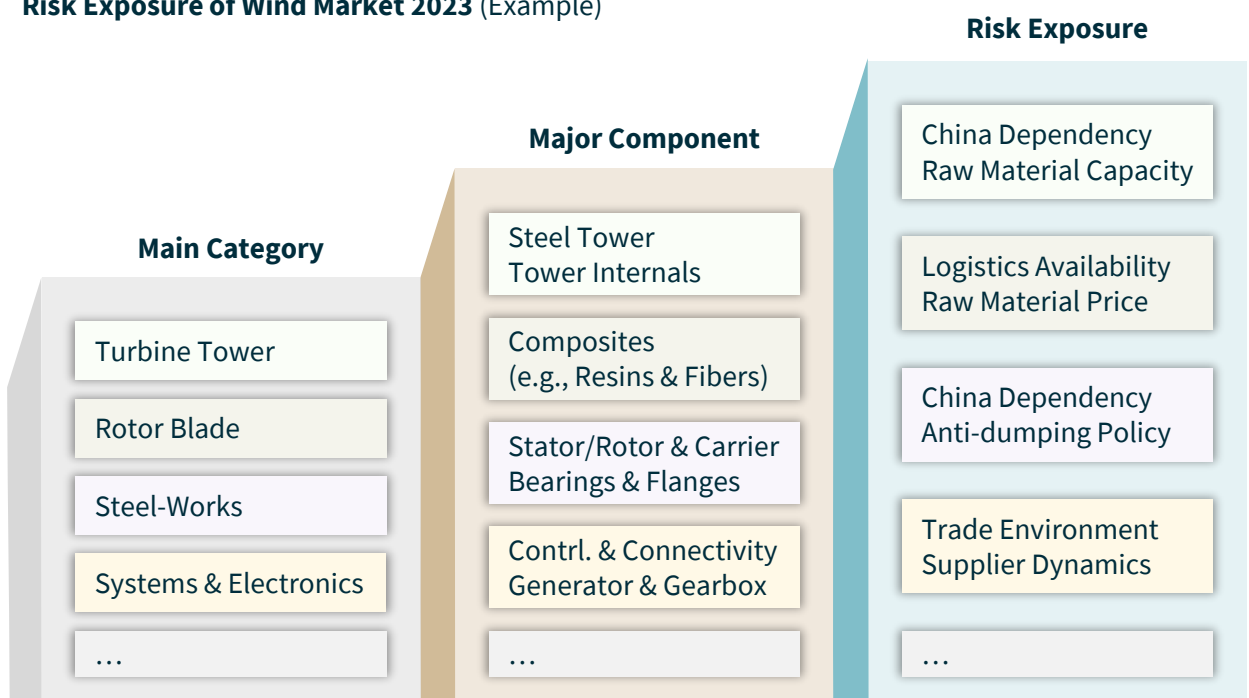
### For wind companies, EAC monitors risk clusters in global supply chains

A comprehensive risk assessment mechanism developed by EAC is an integrated solution for wind companies to improve their supply chain resilience. Corresponding risk exposure assessments are suggested:

- **Impact of geopolitical events, esp. black swan disruptions, continue exacerbating turbulence:**
  - Intensifying international relations, e.g., Taiwan conflict, Russia-Ukraine war, etc.
  - Indeterminacy of international trading environment, e.g., trade disputes and tariffs
  - ‘Unchallenged’ China dependency in global wind supply chain and ecosystem
- **Imbalanced development of wind manufacturing capacities:**
  - Lack of sufficient local manufacturing infrastructure in regions such as Europe, USA, SEA & Latin America
- **Uncertainties in wind sector get severe due to changeful market environment:**
  - Supply availability concerns, delays and more interactions with suppliers
  - Concerns of raw material price & availability plus lack of logistics capacity
  - Resource competition from other industries e.g., E-Vehicles, automation, robotics
- **A green and sustainable supply chain is needed for environmental requirements:**
  - The recyclability of materials is increasingly demanded, especially for blades, electronics, etc.

Figure 1

Risk Exposure of Wind Market 2023 (Example)





## Improve Performance and Manage Uncertainties

### Comprehensive approach to speed up future growth



#### Supply Chain Digital Transformation

### Global Risk Monitoring Tool

A real-time based risk monitoring platform

- Utilize various data sources & **artificial intelligence** to model global supply chain risks down to a single incident
- Enable supply chain experts to **analyze procurement data**, global market changes & share insights
- Benefit enterprises by easy-to-review **visualizations** & up-to-date information

#### Our Offerings

##### Supply Chain & Sourcing

- Supply Chain Stress Test
- Spend Opportunity Assessment
- Supplier Identification & Expediting

##### De-risking & Resilience Concepts

- Corporate Foresight & Scenario Planning
- Resilience Framework Development
- Operational & Financial Risk Mitigation

##### Market Growth Advisory

- Validation of Market & Customer Opportunities
- Go-to-Market & Growth Strategy Formulation
- Execution Support & Government Affairs

##### Location & Footprint Advisory

- Location Search & Assessment Tool
- Footprint Advisory & Relocation Strategies
- Shared Service Center Conceptualization



**Uwe Haizmann**  
EAC Munich



**Tom Chen**  
EAC Shanghai



**Anup Barapatre**  
EAC Mumbai



**Karl Godderis**  
EAC KL



**Yangyang Liu**  
EAC Shanghai



Partner Dietmar Kusch / Daniela Bartscher-Herold / Daniel Berger / Uwe Haizmann / Ashish Kumar / Anna Ahlborn / John Deng / Eric Luo / Ketan Jadhav / Karl Godderis

#### EAC MUNICH

**EAC - Euro Asia Consulting PartG**  
Widenmayerstraße 29  
80538 München  
T +49 89 92 29 93-0  
eac-muc@eac-consulting.de

[www.eac-consulting.de](http://www.eac-consulting.de)

#### EAC Kuala Lumpur

**EAC - Euro Asia Consulting**  
GBC Menara Hap Seng 2  
Plaza Hap Seng, No. 1 Jalan P. Ramlee  
50250 Kuala Lumpur  
T +60 43 9235 1800  
eac-sea@eac-consulting.de

#### EAC MUMBAI

**EAC - Euro Asia Consulting Pvt. Ltd.**  
306-310 Peninsula Plaza  
A/16, Veera Industrial Estate  
Andheri (West), 400053 Mumbai / India  
T +91 22 26 74 24 91  
eac-mum@eac-consulting.de

#### EAC SHANGHAI

**EAC - Euro Asia Consulting**  
Sunyoung Centre, Rm. 801  
398 Jiangsu Road  
200050 Shanghai / China  
T +86 21 63 50 81 50  
eac-sha@eac-consulting.de