



## **Freen-20 – a small vertical wind turbine with 20 kW capacity.**

In the forefront of the renewable energy industry, FREEN is reshaping the landscape with innovative small wind turbines that epitomize efficiency and sustainability. Our unwavering commitment to innovation and quality establishes us as a pivotal entity in the worldwide transition towards more eco-friendly energy solutions.

### About FREEN

As a pioneering force in wind energy technology, FREEN specializes in the design and manufacture of compact, high-efficiency wind turbines. Our holistic approach merges avant-garde design with practicality, yielding renewable energy solutions that are both potent and accessible. Operating from our EU-based manufacturing facility, we have the capacity to produce over 4,000 units annually, all the while adhering to the utmost standards of quality and environmental care.



### **FREEN OÜ**

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## Introducing the FREEN-20: A Beacon of Innovation

At the vanguard of our product suite, the FREEN-20 is a testament to our dedication to superior quality and innovation. Celebrated for its remarkable efficiency, robustness, and versatility, this Darrieus-type turbine is perfectly suited for a wide array of energy requirements. The FREEN-20 encapsulates our vision for a cleaner, sustainable future, offering a solution that is not only groundbreaking but also pragmatic and dependable.

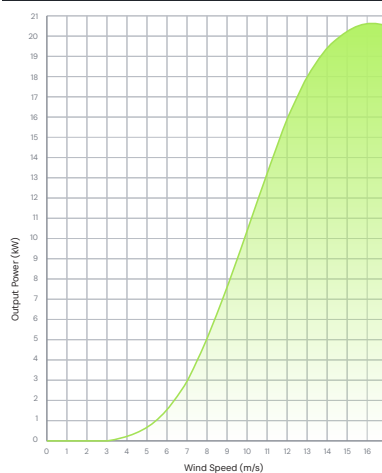
# FREEN-20

### Technical specifications

|                                     |  |
|-------------------------------------|--|
| Rated power, (kW)                   | 20                                     |
| Cut-in wind speed, (m/s)            | 3.5                                    |
| Cut-out wind speed, (m/s)           | 17                                     |
| Wind class                          | IEC III, IV                            |
| Swept area, (m <sup>2</sup> )       | 52                                     |
| Noise level at 100 m distance, (dB) | 45                                     |
| Height, (m)                         | 24.7                                   |
| Weight, (kg)                        | 5000                                   |
| Footprint area, (m <sup>2</sup> )   | 35                                     |
| Lifetime, (years)                   | 20                                     |
| Standard                            | IEC 61400-2:2013 - Small wind turbines |
| Operating temperatures, (C°)        | -25 to +40                             |
| Survival wind speed, (m/s)          | 36                                     |
| Remote monitoring                   | FREEN SCADA                            |
| Installation time                   | 1-2 days                               |

### 20 kW Wind Turbine

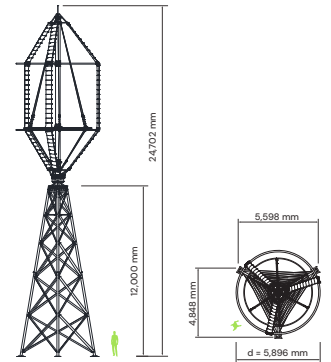
### Power output



### AEP

| Wind speed (m/s) | AEP (MWh) | Wind speed (m/s) | AEP (MWh) |
|------------------|-----------|------------------|-----------|
| 4                | 7.9       | 11               | 69.6      |
| 5                | 17.6      | 12               | 69.6      |
| 6                | 30.2      | 13               | 68.1      |
| 7                | 43.2      | 14               | 65.7      |
| 8                | 54.5      | 15               | 62.7      |
| 9                | 62.6      | 16               | 59.5      |
| 10               | 67.5      | 17               | 56.2      |

AEP is based on a Rayleigh wind speed distribution, K=2, t=15°C, P=1013 mbar, ρ=1.225 kg/m<sup>3</sup>



### Equipment set

- Wind Turbine with off-grid wiring\*
- Inverter
- Controller
- FREEN SCADA
- Installation
- Tower
- Foundation\*\*
- Shipping

\*Basic wiring connection directly to premises. We also offer on-grid wiring to sell excess energy to network

\*\*We offer non-buried prefabricated foundations designed for installation on a flat prepared surface (soil, asphalt, concrete, crushed stone). Customers may set up their own foundations with specified parameters

**i** The product specifications are provisional and subject to change at any time due to improvements or other reasons.



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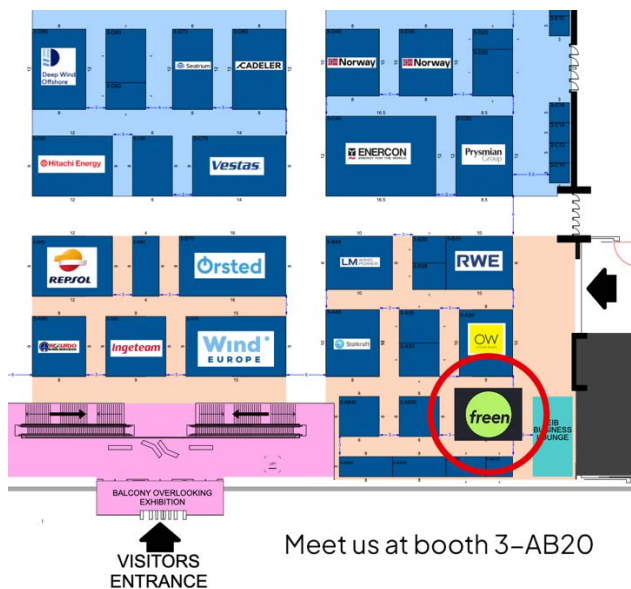


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## Meet Us at the WindEurope Annual Event 2024 in Bilbao

We are thrilled to participate in the WindEurope Annual Event 2024, an illustrious convergence of industry magnates, pioneers, and stakeholders within the wind energy domain. Scheduled for Bilbao from March 20 to 22, this event serves as an ideal backdrop for FREEN to unveil our latest innovations, including the esteemed FREEN-20.



**We cordially invite you to engage with us at booth 3-AB20**, where we will be showcasing our revolutionary wind turbines, pivotal in steering the renewable energy paradigm. Anticipate a firsthand look at how our products, spearheaded by the FREEN-20, are contributing to the advancement of renewable energy globally.

For additional details about FREEN and our dedication to sustainable energy solutions, please visit [www.freen.com](http://www.freen.com)

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