

Concepts for the price war

The cost pressure in the wind energy sector is forcing turbine manufacturers to bring ever more efficient and larger wind turbines onto the market. Engineers react with technical innovations and cost-optimised designs.

Due to the changeover to the tendering system and the resulting price competition, manufacturers of wind turbines are coming under increasing pressure. All previous concepts and costs are put to the test. This is the only way to keep wind turbines competitive at auctions. This is primarily a matter of reducing electricity production costs. The turbines must generate higher yields at lower costs. The manufacturers are relying on efficiency here: With larger rotors, higher towers, and greater rated capacity, the turbines can achieve an optimum energy yield even at locations with very little wind, and they can significantly increase yields at good locations. The trend has been towards ever larger turbines for quite some time.



Enercon E-160 EP5.
Photo: Enercon

According to an analysis by the Onshore Wind Energy Agency, 42 percent of the turbines newly installed in Germany in 2018 have a capacity of 3-4 megawatts. Fifteen percent of new installations even have more than 4 MW. A total of 35 different types of turbines were installed in 2018, the most popular being – as in the previous two years – Enercon’s 3 MW model E-115 with 191 commissionings. Second place went to the Vestas V126 model, of which 84 turbines with rated outputs of 3.3 to 3.6 MW were installed. Enercon was the market leader in Germany again in 2018, 398 of the 762 new turbines were set up by the Aurich-based company. Vestas was able to notch up 184 new installations. They are followed by: Nordex (72), Senvion (49), Siemens Gamesa (38), Eno Energy (12), and GE (6).

Manufacturers rely on modularisation and standardisation

The constantly growing pressure in terms of cost and competition as well as the weakening market in Germany pose enormous challenges to manufacturers of wind turbines. The companies are continuously working on new, even more powerful and efficient turbines. Modularisation and standardisation are critical concepts. At **Enercon**, the E-147 EP5 (rated output 5 MW) and the E-160 EP5 (4.6 MW) are new turbines in the +4 MW class for medium and low-wind locations. “Both new developments are based on the EP5 platform, which like the new EP3 platform builds on a compact and cost-optimized design”, writes the company. For the EP3 series, Enercon relies on the fact that key components such as the nacelle and rotor hub are finally assembled at the factory in order to save time on the construction site.



Enercon’s E-115 was the most popular turbine in 2018.
Photo: Jan Oelker



Vestas V150. Photo: Vestas/Frank Boutrup Schmidt



GE's Haliade-X with a 12 MW direct drive generator. Photo: GE

Senvion also relies on modularisation. According to the company, all new onshore and offshore platforms are based on existing models. This means “less risk, faster certification, and a shorter time to market”. **Vestas** plans to start series production of the new V150-5.6 MW and V162-5.6 MW models, which are also based on a modular design, by mid-2020.



Nordex N149. Photo: Nordex

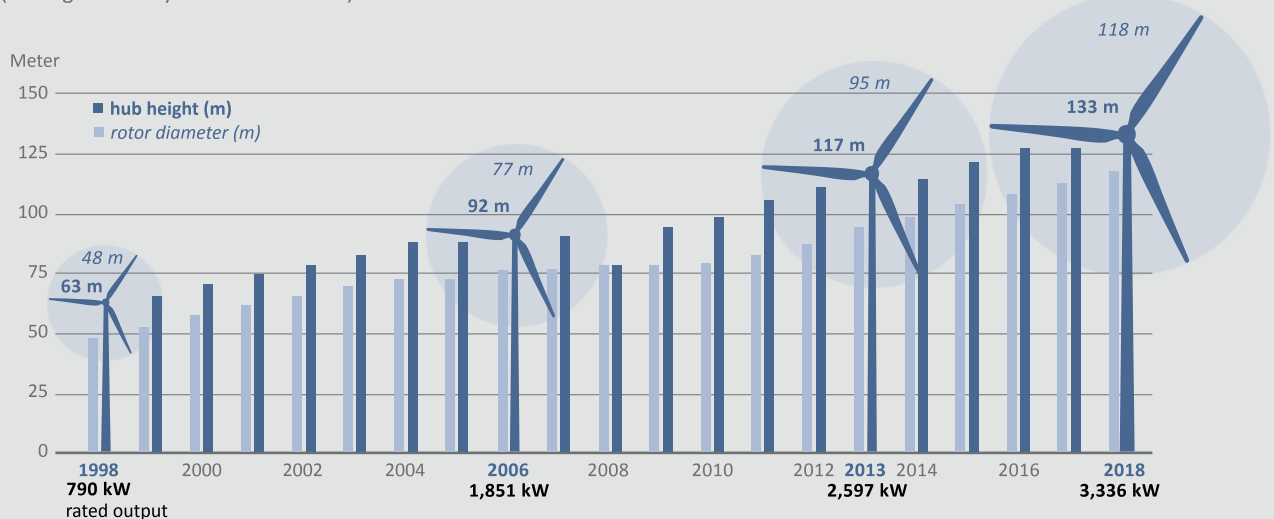
Nordex is currently trying to win favour with customers with the N149/4.0-4.5 wind turbine, a further development of the Delta generation. The first turbine was erected in August 2018.

With the “Cypress platform” with a rated output of up to 5.3 megawatts and a rotor diameter of 158 metres, **GE** currently has the largest onshore turbine in its portfolio according to its own information, and a first prototype has already been installed. Offshore, the dimensions are even greater: the company plans to install the prototype of the 12-megawatt Haliade-X turbine before the end of this year. This construction will also use the longest rotor blade in the world spanning 107 metres.

ONSHORE WIND ENERGY

Development of turbine dimensions

(Average of newly installed turbines)



Source: Fraunhofer IWES