

Natural Resources. Innovative Solutions.



Strategy

➔ The availability of fossil fuels declines steadily while the demand for energy increases dramatically due to generalised economic as well as population growth. The competition for scarce energy resources is getting worse and the search for alternative energy sources has never been as intensive as it is nowadays. For this reason a growing number of governments tries to encourage renewable energy generation by using wind turbine generators (WTGs), either by offering direct government subsidies, tax exemptions, quota regulations, or feed-in-tariffs (e.g. USA, Canada, India, China, most European countries, a.o.) in order to secure their energy budget in the long run. As wind power is a relatively new line of business, the capacities of all established WTG-providers are nearly exhausted and delivery periods of up to 2 years are common. IWP wants to seize the opportunity of this market gap to firmly establish itself in the market.

The first step of the business plan was the development, production, and sales of a 1.25 MW wind turbine, the Falcon 1.25 MW. This WTG mainly aims at new or emerging markets or at specific niche segments within established markets. This WTG has a modular design which allows it to adapt to challenging infrastructural and climatic conditions. Thus it is so compact to be transported in standard-size containers.

It has furthermore been designed for utmost reliability: It features a sophisticated sensor technology and the best available remote monitoring and control systems, together with a large service opening and an integrated crane. This enables the WTG to compensate for market challenges and the often relatively scarce experience in wind technology of local engineers and technicians. The following technological step is to install the prototype of a larger WTG.

The production of IWP's wind turbine generator is not based on the principle of vertical integration but on the assembly-line principle which is much leaner and more flexible. The components are produced by external suppliers according to IWP's detailed specifications and certification and quality standards. The delivery is carried out on call. The assembly line is located in Bremerhaven from where the WTG is shipped in standard containers. Blades and towers are delivered straight to the project area, thus reducing the need for significant storage capacity on the assembly site.



Vision

➔ The world is running out of indigenous energy resources in the form of fossil fuels. Industrialisation and urban growth are causing an enormous increase in energy demand. Fossil fuel imports are putting economic stability at risk. A fossil fuel powered economy is furthermore unsustainable: with its heavy pollution load, it endangers our social and natural environment. Wind energy is currently the most promising renewable energy source, highly competitive both to other renewables and to fossil fuels.

On behalf of IWP, our vision is to reconcile ecological and social sustainability with the requirements of the economical development. Our tool is wind technology, the most mature renewable technology. We will continue to deliver economically viable and highly advanced alternatives to the unsustainable fossil fuel powered economy.

Mission

➔ Continuous innovation is the main strategy for enduring growth in the wind industry. The long time experience of IWP's engineers and management allows to combine the most innovative ideas in the industry: IWP's aim is to set new standards in technology. Benefits of such a strategy for developing cutting-edge technological solutions are to ensure faster growth, to deliver added value to the customer for the next 20 to 25 years of turbine lifetime.





History

➔ **Market Knowledge**, long time **Technical and Management Expertise**, and **Financial Strength** were the driving elements for the foundation of Innovative Windpower.

The management's intimate knowledge of the industry identified the enduring market gap as an opportunity for establishing a new manufacturer of WTGs. The demand for WTGs is currently so strong that established manufacturers can no longer meet it (market gap). Furthermore, this demand is going to last at least for the coming 8 to 10 years.

The management team with long-time experience in the wind energy business as consultant, technology and project developers were searching for ways to use this window of opportunity and to realize and secure their innovations. On the one side, developed projects or those from partners were to be equipped with wind turbines which should be more reliable than the standard and available in the near future. On the other side, own technical innovations and

the engineer's knowledge about the state-of-the-art were intended to be integrated within one single, newly designed WTG.

A financially strong investor, Innovative Energy Group, from Dubai who has successfully specialized in capital investment in the field of renewable energy technologies was searching for ways to invest in a German manufacturer of WTGs.

The combination of these three factors led to the foundation of Innovative Wind Power in Germany at the end of 2006. From then on, the Innovative Wind Power has been built up and expanded continuously: The Innovative Windpower AG with its headquarters in Bremerhaven is in charge of development, production and sales.

Service and maintenance of the installed WTGs is performed by a 100% daughter company, the Innovative Windpower Service GmbH in Bremerhaven.



Production

➔ IWP positions itself as a technological innovator who will produce «The Next Generation Wind Turbine». IWP has established a turbine with both proven-and-tested and state-of-the-art features. The main reason for this is that the IWP turbine is a WTG designed on the basis of the challenges and problems to which established manufacturers are confronted: The Falcon 1.25 MW and its follower models are designed to solve the existing problems especially in the supply chain and the quality control of its products.

Production Facilities are located in Bremerhaven, Germany:

- ➔ Sufficient industrial area
- ➔ Direct connection to quayside
- ➔ Investment subsidies from the Government of Bremerhaven
- ➔ Test site and Certification Centre

The Manufacturing plant of IWP wind turbines as the complete company is in the process of certification depending on DIN EN ISO 9001:2000. Certificate Nr.: QS-436 HH.

Effective Supply Chain Management :

- ➔ Networking with reliable and experienced partners enables production capacity of 500 gearboxes / year.





Research & Development

➔ The concept of IWP's wind turbines are, not only a highly engineered product, but also brought to perfection for the wind farm owner, who has to live with it for the next 20 years: The customer and wind farm operator therefore gets a turbine whose operations and maintenance is done with easy, fast, and cost-efficient procedures.



IWP's technological innovations are secured through the Intellectual Property Department.

Until now the following submissions were made:

- ➔ 26 invention disclosures in total
- ➔ 12 patent applications filed to the German Patent Office
- ➔ 3 trademark applications approved
- ➔ 1 trademark application in progress

Early Phase Activity of the Innovative Windpower Service GmbH

- ➔ Training of local on-site service teams in Bremerhaven
- ➔ Training on Prototype
- ➔ Establishment of high experienced Special Service Team
- ➔ Interface™ Virtual Documentation and Training
- ➔ 24/7 Turbine Surveillance from Bremerhaven
- ➔ RFID-based Automatic Field Service System
- ➔ Support by Phone/Internet



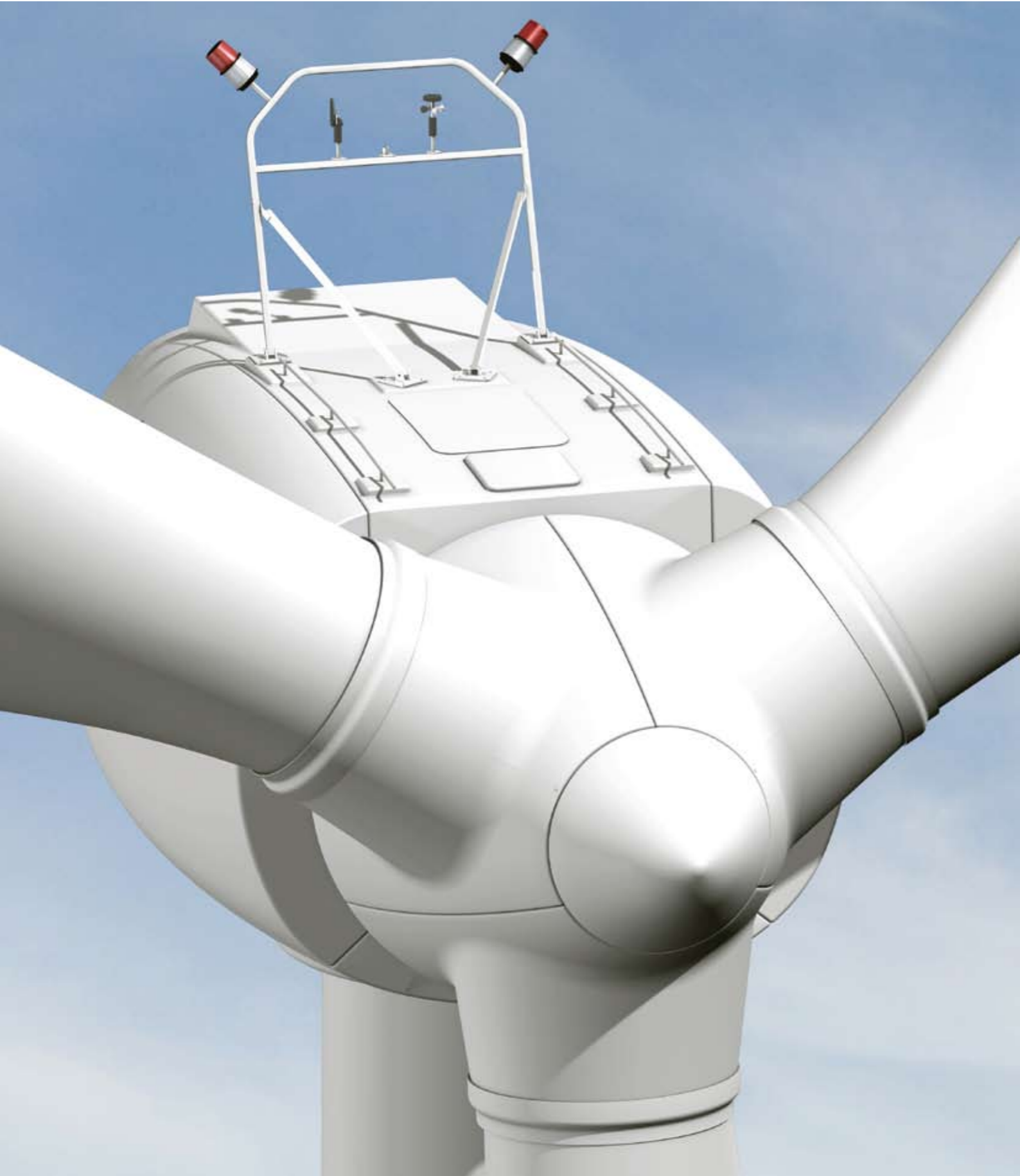
Products

➔ The first question to answer at this stage is why a medium sized wind turbine whilst established manufacturers are engaged in a race to up-scaling? In fact, nowadays manufacturers make efforts to provide the market with multi-MW turbines. For example, the average turbine size delivered in 2006 was 1,419 MW (more than 100 kW above that of 2005).

While taking into account the challenges of the supply chain, IWP decided to cautiously follow this trend

by developing a range of WTGs starting with the 1.25 MW, and continuing through upsized types in the next years, while focusing primarily on the performance of the Falcon 1.25 MW and benefiting from the experience gained in the meantime by in the multi-MW class as well as off-shore wind technology.





The Next Generation Wind Turbine - Falcon 1.25 MW

➔ The Falcon 1.25 MW has a modular design which allows to adapt it to challenging infrastructural and climatic conditions. Thus it is so compact to be transported in standard-size containers. It has furthermore been designed for utmost reliability: It features a sophisticated sensor technology and the best available remote monitoring and control systems, together with a large service opening and an internal crane. The core idea for the design of such a wind turbine was that it ought to be a turbine for the owner and operator rather than for the engineer. This means that O&M is fast, efficient, and cost effective for the whole lifetime of the wind turbine. In this way, the Falcon 1.25 MW compensates all market challenges and reaches a high serviceability.

The Falcon 1.25 MW wind turbine is a three-bladed, horizontal axis 1.25MW upwind wind turbine which is developed for maximum energy yield. The Falcon 1.25 MW reaches its rated output at a wind speed of 12.5m/s, 13.0m/s and 13.5m/s, depending on the rotor diameter, and can be operated up to 25.0 m/s (62m, 64m rotor diameter) and 20m/s (70m rotor diameter) with a optimized power output.

The construction of the wind turbine is dimensioned for wind classes TC IA, TC IIA and TC IIIA.

The Export mid-sized wind turbine has a design that fits the markets requirements. Also the concept of the Falcon 1.25 MW considers specific local requirements of our target markets regarding optimum points between cost of energy, logistic and service lifetime costs. We have developed a full service program with a 24/7 control system out of Germany and an "Automated Field Service System" (AFS) for the interface between the maintenance team and the turbine components.

The maximal tip height of the wind turbine is 132m with hub heights from 60m up to 100m for the standard rotor of 64m. Alternatively the rotor has a blade diameter of 62m, and 70m. The Falcon 1.25 MW is furnished with a full span blade pitch control based on an electromechanical pitch system for operation at optimum aerodynamic efficiency and to reduce load above rated wind speeds.



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