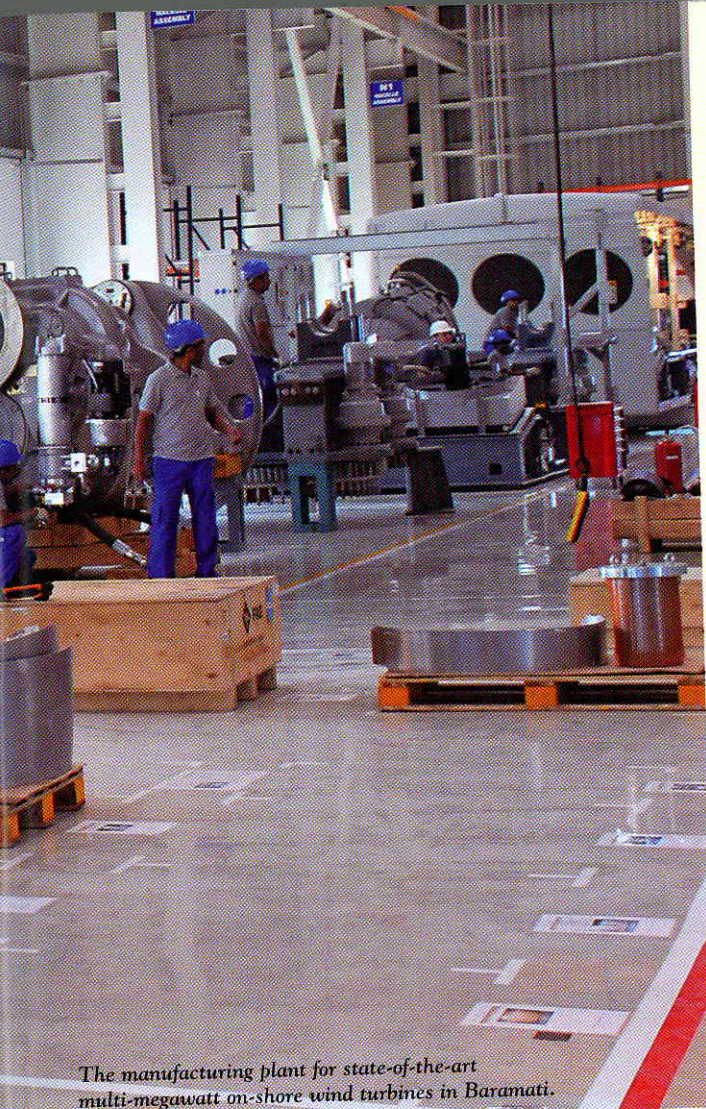


About Kenersys

Kenersys is a worldwide operating manufacturer of wind turbine generators. Founded in 2003, the company has become part of the Kalyani Group since 2007. In April 2008 First Reserve Corporation, a US-based private equity firm, with over \$12.5 billion funds under its belt and \$1.2 billion invested and committed to alternate and renewable energy companies, invested in the company. The company has developed two onshore turbines, the K82 2.0MW turbine with 82 m rotor diameter and the K100 2.5 MW turbine with 100 m rotor diameter for Class II sites. They are equipped with patented internal supply unit and full conversion system, which enables the turbines to fulfill all stringent grid codes.

“Banks are showing interest in funding projects”

This is due to the increasing awareness about the benefits of wind power and the growing government thrust on the sector, **Kailash Tarachandani, CEO, Kenersys India**, informs **R Srinivasan**.



The manufacturing plant for state-of-the-art multi-megawatt on-shore wind turbines in Baramati.

The wind turbine manufacturer had recently launched its new K100 2.5 MW wind turbine, which will be manufactured at the production facility at Baramati, near Pune. The K100 2.5MW with 100 meter rotor diameter, 2.5 MW rated power and a tower height of 85 and 100 metres, is one of the largest turbines in India. Kailash Tarachandani spoke to us about the USP of the turbine, materials used in its manufacture and where their components are sourced from. Excerpts:

What are the critical issues and challenges related to attaining 50 GW by 2020? What would you suggest to overcome them?

With recent advances in wind power technology, investors can now look at increased capacity utilisation and hence better energy capture from wind power. Plus the government has outlined ambitious capacity expansion and investment plans for the sector. Measures like access for investors to accelerated depreciation, providing the facility to offset taxes on income from other sources, have given a great impetus to the growth of the wind energy sector. Also, the recent introduction

of the Generation-Based Incentive (GBI) scheme has attracted independent power producers to the industry and this is crucial to the future growth of the industry. With the increasing awareness about the benefits of wind power and growing government thrust on the sector, banks and lending institutions are showing interest in funding these projects. Proposed policy guidance and regulations are also coming into place to further strengthen this rate of growth.

Key challenges affecting the growth of this sector are to set up a long-term and sustainable policy and regulatory framework to facilitate purchase of renewable energy from outside the host state, expansion of the grid infrastructure, delays in acquiring land and obtaining statutory clearances.

In terms of wind power forecasting, design, testing and certification of wind turbines, what needs to be done in India?

A wind turbine manufacturer has to be registered on the Centre for Wind Energy Technology (C-WET) list of accredited turbines to be allowed to erect and install a wind turbine in India. That means that your turbine has the type certificate, which includes three subordinated certificates.

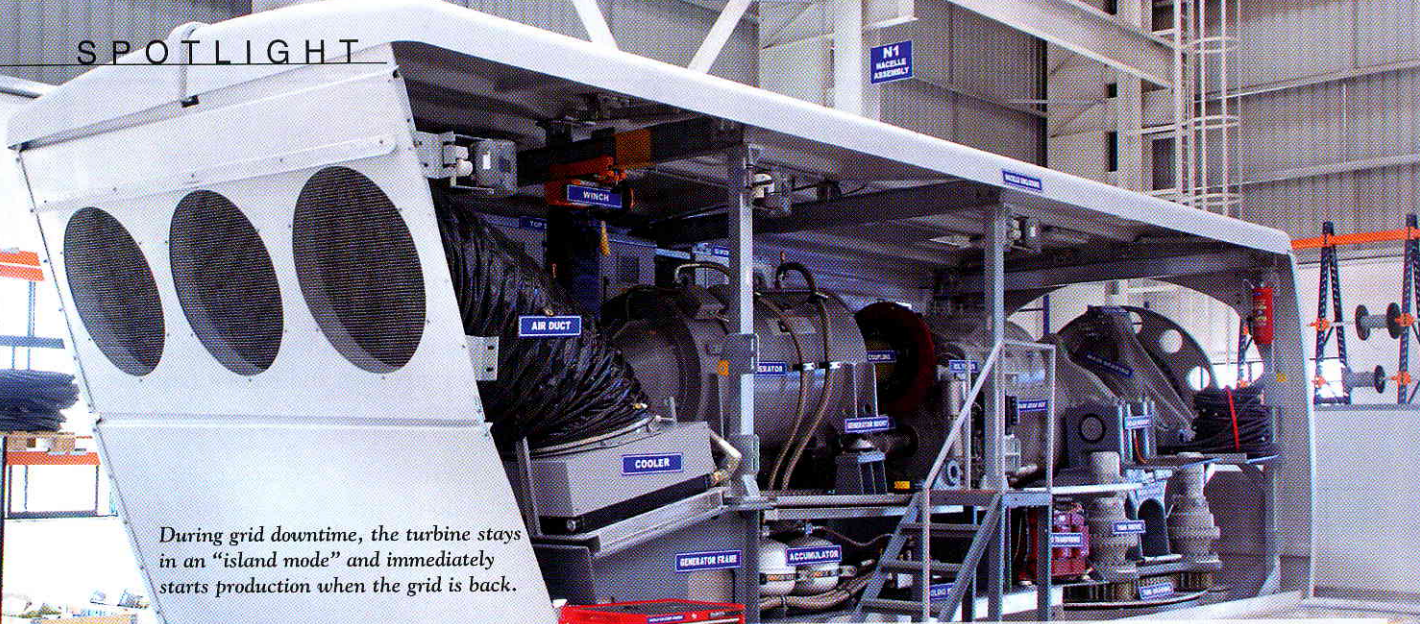
1. The turbine certificate which contains a turbine report, a rotor report, a bear report etc.,
2. The metrological validation and
3. The manufacturing evaluation.

The work of C-WET is crucial for the future development of the Indian wind industry to become more and more professional and efficient.

What is the USP of the company's K82 2.0MW turbine (82 m rotor diameter) and K100 2.5 MW turbine (100m rotor diameter)?

The company has introduced a complete range of state-of-the-art multi-megawatt turbines – simultaneously in Europe and India. Our turbines comprise of the new and spearheading Synerdrive technology ensuring maximum efficiency and power output. It is a unique synergy of an absolutely robust, optimised mechanical drive train and our spearheading electrical concept that ensures superior reliability, availability and grid integration. These three factors will be crucial for market success in future.

We have a unique synchronous generator system with the Gridshaper full conversion system that provides a smooth and stable power output and a perfect decoupling from the grid. With our coolride system we provide a higher efficiency by cooling with ambient air and water cooling for gearbox oil, generator (oil-to-water heat exchanger) and rectifier unit. We are the only manufacturer



During grid downtime, the turbine stays in an "island mode" and immediately starts production when the grid is back.

to have the internal supply unit (ISU) that supplies the nacelle and power electronics continually with constant voltage and frequency even when the grid has dripped. This means that during grid downtime the turbine stays in an "island mode" and immediately starts production when the grid is back.

What materials (steel, composites) does the company prefer while manufacturing turbines?

We have the same production method like the automotive industry - we co-develop components in co-operation with international renowned component suppliers. The components are produced at the suppliers' side and are assembled by us. This makes it flexible and guarantees maximum innovation and quality.

Give us details of the patented internal supply unit and full conversion system which enables turbines to fulfill all stringent grid codes?

The internal supply unit (ISU) protects the turbines against grid-based over- and under-voltages and provides constant voltage and frequency to all turbine electrical components – designed for a quick restart after a production stop.

- The nacelle and the internals are continually supplied with constant voltage and frequency making it independent from the grid.
- Capability to produce energy even below the cut-in wind speed (below 3.5 m/s). Between 1.5 to 3.5 m/s there will be no export of active kWh but it generates sufficient power to keep the turbine online.
- It also reduces the fatigue load on the turbine and increases its efficiency and lifecycle.

The Gridshaper full conversion system and improved electrical architecture makes the turbine suitable also for weaker grids as well as for tougher

grid codes.

The turbine's grid compliance system provides a vast active and reactive power regulation to maintain grid stability.

- Conversion of mechanical energy by an electrically excited synchronous generator combined with the full conversion system Gridshaper. The converter is modular in design so that the system operates with improved efficiency in partial load.
- Electrically excited generator needs less power electronics at the generator side
- Additionally, its compact design enables better O&M and optimised controls.
- AC-DC-AC conversion through rectifier and convertor allows the transport of energy between nacelle and tower bottom via the DC-bus with significantly higher voltage levels and reduces the internal transmission losses.

Does the turbine have any features to overcome avian and bat deaths?

In general, large, multi-megawatt turbines turn slower, so the risk of bat or avian death is even lower. In combination with environmental studies, this risk can be significantly reduced.

From which countries are major components, used in the company's turbines, sourced from?

In production, we have a clear dual shore strategy: Our production plant in Wismar, Germany, is our master production plant. The production facility in Baramati is a 1:1 copy of the Wismar unit and we adhere to stringent quality measures to keep the standards high. Since quality depends on the material of our component suppliers, we source spare parts from renowned international suppliers having subsidiaries in India or Indian suppliers who deliver quality products.