By **Nick Lerner**

Rotor blade shape optimised with CATIA

quietrevolution
The answer is blowing in the wind

Ultra-advanced product lifecycle management software is allowing wind energy companies to reap the harvest of an industry set for global expansion. UK-based quietrevolution deploys CATIA to lead the way towards sustainable wind energy turbine manufacture.

The Wind Energy Industry brings together skills, technologies and science that have not been previously combined on a single system. Dassault Systèmes PLM technology that is used by thousands of enterprises throughout the world to develop and bring leading products to market has proven an ideal match for the needs of this emerging industry. For example, light weight, very robust, able to deal with severe climate, intricate mechanisms and advanced power handling are common requirements to both the aerospace and wind energy industry allowing an ideal technology and knowledge transfer to the wind energy sector.

The first modern wind turbines were developed in the 1980's. Despite the age of the industry wind turbine manufacture and use, represents only a tiny fraction of the energy generation scene. However it is an increasingly important one.

IN THE VANGUARD

The companies leading the field in wind generation are using the most advanced design and production techniques in their work. Aerodynamicists teamed with geophysicists are working with composites engineers and production specialists to conceive, design build and operate wind turbines that represent some of the most advanced products ever devised, that use an elemental source of power as old as time.

> CATIA is the industry standard among our supply chain.

The prize for humanity is that an estimated 70 terawatts of power could be harnessed from the wind compared to a current total global consumption amounting to 20% of that figure. Arguments over the actual amount that can be harnessed vary and reference to Betz law must be made (this estimates a total yield of under 60%) although figures of 30% have also been offered. Regardless of these figures there is a race to develop ever more efficient wind turbines. Leading the field in UK-based wind energy is quietrevolution which has deployed Dassault Systèmes CATIA based PLM solutions to enhance design and manufacture of its wind energy generators.

MATH + WIND = €

Having calculated a mathematically correct shape for its aerodynamically optimized vertical axis rotor blades, quietrevolution use CATIA to design, engineer and manufacture wind energy turbines. CATIA helps quietrevolution to capitalize on the growing demand for wind energy systems by providing an efficient design, development and production technology platform that allows the company to make the most of its resources.

quietrevolution turbines generating wind energy

> CATIA has significantly improved our ability to efficiently complete the design-to-manufacture processes of advanced structures.

quietrevolution Design Manager Richard Kingsley said, "Product development is at the heart of our work. In the short time that we have been using CATIA virtual design solution, it has significantly improved our ability to efficiently complete the design-to-manufacture processes of advanced structures." Mr. Kingsley, who has experienced PLM at Lotus Cars, Proton, Ascari and Aston Martin, added: "Dassault Systèmes PLM solution allows us to digitally design, sign off, investigate tooling feasibility, build products, and communicate 3D designs. CATIA is the industry standard among our supply chain and it allows us to exchange native files with partner companies leading to more efficient production processes."

The advantage of the quietrevolution design is that the 120-degree blade twist means that the rotor is always working; this makes the design especially suitable for populated areas where wind direction is often variable. Using CATIA allows the company to not only develop a more efficient and very elegant design, but also to communicate through internal and external supply chains using native CATIA files or data formats that suit the needs of suppliers and sub-contractors. Richard Kingsley added: "Working efficiently with suppliers is crucial. The Dassault Systèmes data environment ensures that this level of communication is smooth and error free with absolute control over versions iterations and release procedures."

CYCLE TIME

Mike Crow, Director, Dassault Systèmes said: "We are glad that quietrevolution is utilizing CATIA leading-edge virtual design solutions to be at the forefront of the wind energy industry. Using best practices developed in conjunction with leading manufacturers from other industries for design and production, wind turbine manufacturers can avoid costly trial and error in the real world and significantly reduce development cycle time while manufacturing stronger products with higher energy outputs by integrating design, testing, and manufacturability analysis in a single environment."

Darren Cairns of Intrinsys, the Dassault Systèmes Value Added Reseller that implemented and supports the solution said, "quietrevolution is an example of a cutting-edge company using advanced 3D PLM technology to lead the world in this sector of the wind energy industry. We are proud to make our CATIA expertise available to help quietrevolution develop new energy solutions by providing advanced production software and the services that optimize its rewards" •)

For more information:
www.quietrevolution.co.uk
www.intrinsys.co.uk

Ground mounted wind turbine installation