

RENEWABLE ENERGY

Manufacturing Milestone

SA wind turbine maker completes first prototype blade

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Local wind turbine manufacturer Isivunguvungu Wind Energy Converter (I-WEC) has completed its first prototype 50 m wind turbine rotor blade.

The prototype was initially expected to take one month to manufacture but the process turned out to be more challenging than initially thought, ultimately taking about two months to complete.

Facilities and planning engineer **Simon Graaff** told *Engineering News* that the team wanted to produce “the perfect blade”, rather than rush the process. “It has taken longer but we are pretty confident this one is 100%,” he said.

The rotor blade has been manufactured using about 300 layers of four main materials, these being balsa wood, glass fibre, PVC and epoxy resin.

The I-WEC team manufactured the prototype under the supervision of advisers from Aerodyne, which is the German engineering company specialising in the design of large-scale wind turbines, from which I-WEC obtained the turbine design under licence.

The prototype blade would undergo static load testing, as well as a resin frequency test in April. Graaff explained that the static load testing would involve flexing the blade up to 8 m and would be carried out in Cape Town harbour where there would be sufficient space.

As the prototype rotor blade had been completed, manufacture of components for the first production blade had already been started, said Graaff. He said that the next blade should take in the order of two weeks to manufacture, with the ultimate target being that a single rotor blade should take less than a week to manufacture under standard production conditions.

It was expected that the first 2.5 MW turbine, which required three 50 m rotor blades, would be completed by the end of May. Graaff said that the bulk of the parts required for the turbine generator had already been received and assembly on the generator would begin shortly and would be completed in a timeframe of about two months, testing included.



PERFECT BLADE

The blade has been manufactured using about 300 layers of four main materials, including balsa wood, glass fibre, PVC and epoxy resin

The first completed turbine would be erected at ArcelorMittal South Africa’s (Mittal’s) Saldanha steel plant and would be fully financed by I-WEC, which would be selling the power generated from the turbine to the steel plant.

This turbine would also act as a demonstration model for the company, financial director **Thomas Schaal**, told *Engineering News*. “We are currently negotiating with [Mittal] the extension of the wind farm by an additional five turbines and supply of the energy to them most likely in the second and third quarter of 2013.”

He said the cost of the turbines being produced by I-WEC would be R12-million to R17-million per megawatt, which he believed was competitively priced, compared with imported wind turbines.

Schaal added that increased interest was being shown in I-WEC, especially as the third renewable-energy independent power producer bid round approached, as the company would be able to assist in meeting local content requirements. “That is one aspect, but we are also providing a state-of-the-art product . . . we have acquired from Aerodyne the best technology you can get,” he stated.