

South Africa sets wind power first for Africa

Local wind turbine manufacturer Isivunguvungu Wind Energy Converter (I-WEC) has completed its first prototype 50 metre 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 approximately two months to complete.

Facilities and planning engineer Simon Graaff told Engineering News Online that the team rather wanted to produce "the perfect blade", 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 approximately 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 whom 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 the 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 anticipated that the first 2.5 MW turbine, which required three 50 metre 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



I-WEC's 50 metre long wind turbine rotor blade is exposed as the mould it was made in is opened and it is lifted out for the first time

received and assembly on the generator would begin shortly and be completed in a time frame of approximately two months, testing included.

The first completed turbine would be erected at the 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" said financial director Thomas Schaal. "We are currently negotiating with them [Mittal] for the extension of the wind farm to an additional five turbines and to supply the energy most likely to them in the second and third quarter of 2013."

He said the cost of the turbines being produced by I-WEC would be in the order of R12 million to R17 million per megawatt, which he believed was competitively priced against 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 the local content requirements.

I-WEC was founded by two Germans, Thomas Schaal and Dr Michael Kast, who have both been living in SA for a long time, but employs 30 South Africans and will be employing hundreds more in the next four years.

I-WEC is the first company in Africa to build multi-megawatt on-shore wind turbines, the biggest turbines the continent has ever seen, with its partner, heavy engineering group DCD. These turbines are 2.5MW and will measure about 130m from top (tip of top blade)



The blade was manufactured at I-WEC's Table Bay Harbour workshop in Duncan Road in Cape Town harbour