



NEWSLETTER N° 20

MARCH 2007

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Mission Statement

"To be a global leader in
wind turbine technology
innovation."



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The Better Mousetrap

There is a saying that "if you invent a better mousetrap, the world will beat a path to your door". It has become a rather tongue-in-cheek expression over the years, especially in my household, because life simply isn't like that, at least not when you invent something a little more complicated than a mousetrap. Hard work, a reasonable amount of good luck and effective communication are all required. Far from beating a path to your door, the world can take a long time to latch on to what the heck you're talking about!

So it is with the Windflow 500 and its patented torque-limiting gearbox system. As the turbines at Te Rere Hau (and the Gebbies Pass turbine) continue to operate excellently, the reputation of the Windflow 500 design is becoming cemented – as they say 'good things take time'. The media are very good at picking up stories which are new and exciting so we had a lot of coverage for a while. But stories of "Turbines Still Working" don't get printed so this newsletter seeks to redress that imbalance.

In this newsletter we will give an update on the excellent performance of the turbines at Te Rere Hau and our steady progress towards IEC certification, as well as introducing some new staff members. (Next newsletter we hope to be able to introduce three more, as we have recently advertised for more engineers for our design and production teams.)

In addition we are providing some thought-provoking images to contribute to the debate about the visual impact of wind farms – an issue which has received much media attention in several parts of the country. Unfortunately the debate has become polarised between the proponents of gigantic wind farms on one hand and New Zealand's vigorous conservation movement on the other. The Parliamentary Commissioner for the Environment advocates that "Investment in smaller-scale, distributed wind farms and turbines needs to be encouraged" (see their November 2006 report 'People, Power & Place' www.pce.govt.nz). We agree, and note that there seems to be little awareness of this alternative.

I was very concerned for example to learn, when I visited Dunedin a few months ago, how little some prominent city councillors know about the alternative Windflow can offer. They are quite concerned about the size of the wind turbines being proposed for Otago (see page 4), but were not aware of our existence, let alone the fact that some large and sophisticated components for our turbine are made in their fair city.

Smaller turbines, in smaller projects (tens not hundreds of megawatts), distributed widely around the country and feeding into local networks wherever possible have benefits for the wider community.

We have always maintained it is the most cost-effective way to proceed. It now seems it may be visually more acceptable as well.

Geoff Henderson
CEO and Director

Welcome New Staff

Excellent Turbine Performance

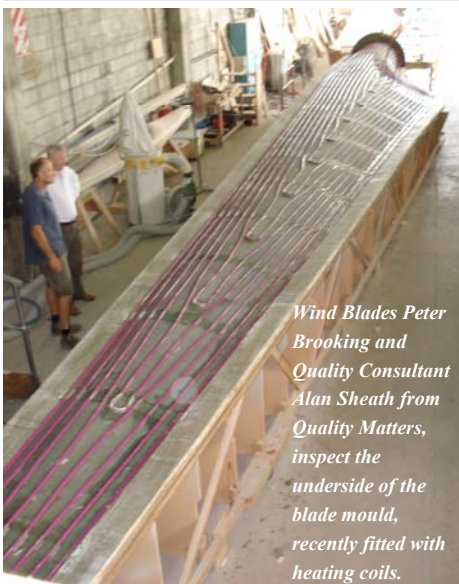
John Arimond – Sales Engineer



Our new Sales Engineer joins Windflow after 21 years with Rogers Corporation, a US manufacturer of engineered composite materials. At Rogers, John was responsible for designing and building new manufacturing lines, upgrading and modernizing older machinery, and overseeing automation systems engineering throughout the company's factories. A graduate of Harvard (Applied Mechanics) and M.I.T. (Mechanical Engineering), John immigrated to NZ in September 2006 with his wife, baby daughter and two dogs.

Sarah Kok – Office Assistant

Sarah Kok joined the team early this year as Office Assistant, assisting Office Manager Terry Moon. Sarah has extensive experience with accounting systems, stock management and administration through owning and operating two Nature Discoveries franchises. Before that she travelled and worked in Hawaii, Sydney and South France after finishing her B.Sc in Zoology.



Wind Blades Peter Brooking and Quality Consultant Alan Sheath from Quality Matters, inspect the underside of the blade mould, recently fitted with heating coils.

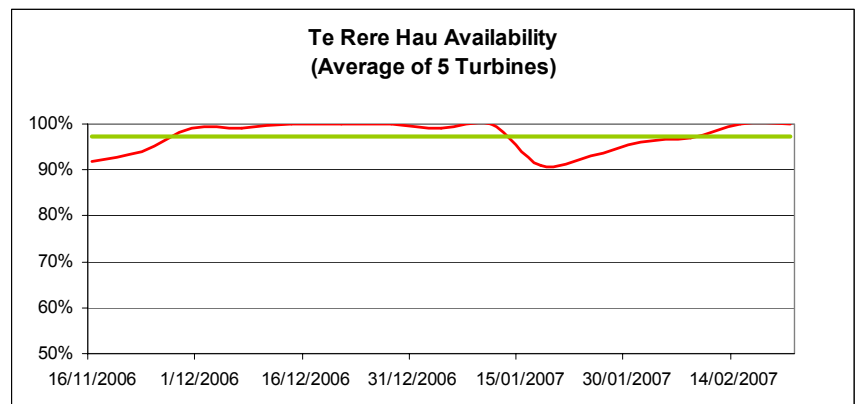


The five Windflow turbines operating at Te Rere Hau

We are thrilled to report that the first five production turbines installed at the Te Rere Hau wind farm are performing extremely well and have achieved over 97% availability since mid November 2006.

The graph below shows the 97% level as the straight line. After initial commissioning issues were shaken out, the availability was close to 100% during December. Then in mid-January some scheduled post-commissioning work caused a short-term dip before the turbines went back to more or less 100% availability. They just keep turning!

The five have already produced over 2 million kWh between them, enough to power over 650 homes for the same period.



This excellent performance meant that in December, the Te Rere Hau Joint Venture (consisting of NZ Windfarms Ltd and NP Babcock & Brown) ordered the next batch of 14 out of the 97 turbines scheduled in the Sale and Purchase Agreement.

Components are being ordered for these 14 turbines which are expected to be built later this year. They will be installed and commissioned as soon as the Te Rere Hau electrical connection is finished.

Wind Blades in Auckland has built a new set of blade moulds with a new heating system which will decrease curing times and allow them to build blades more quickly (see photo at left).

It is an exciting time for Windflow as we prepare to scale up our production from five turbines in 2006 to an estimated 60 turbines in 2008.

Upcoming Events

Design and Certification

NZ Wind Energy Conference 2007

13-14 March, Wellington

www.windenergy.co.nz

Windflow will have a display to promote the Windflow 500 to an expected 300 attendees. Emma Patrick, Mechanical Engineer, will be making a presentation entitled "Quality turbines for NZ - the IEC Certification Process".

There is also a site tour to the Te Rere Hau and Tararua wind farms for conference attendees on 12 March. The Te Rere Hau leg of the tour will be hosted by staff from Windflow and NZ Windfarms.



American Wind Energy Conference 2007

3-6 June, Los Angeles, California

www.awea.org

Geoff will have a poster presentation entitled "Should The Wind Industry Switch To Synchronous Generation?"

Visit to Blade Testing facility IRL

Hear about the IEC certification process and see the 16 metre long turbine blade being tested. **5:30 – 7:30 pm**

Tuesday 27 March 2007

IRL

24 Balfour Rd, Parnell, Auckland

RSVP to Sarah (sarah@windflow.co.nz) or ph 03 365 8960 by Friday 23 March

We are making progress towards fulfilling the various components required in order to gain certification of our Windflow 500 turbine to International Electrotechnical Commission (IEC) standards. It is the first time that a wind turbine has been through this process in New Zealand, so it has been a steep but interesting learning curve for all involved.

The stringent testing that is being performed as part of the IEC certification process is showing that our turbine is very robust and we expect it to perform extremely well over its twenty year life. We note with concern that imported turbines are not faring so well in New Zealand's strong wind conditions.

Here is an update on some of the activities that are underway.

- The company has been documenting and implementing ISO 9001 procedures and made changes recommended by the Lloyds Register Quality Assurance assessor.
- Type Testing of the Gebbies Pass turbine lasted for two weeks in January but was suspended after the meteorological mast was destroyed by vandals. It should recommence in the week beginning 12th March and is expected to take approximately three months to gather all the data required in a specific range of wind conditions. Set up of the procedures and equipment took longer than expected but it is important to get it right to ensure that Lloyds Register has the correct data.
- As part of this type testing, a blade is currently undergoing three month fatigue testing at Industrial Research Ltd in Auckland. The natural frequency of the blade is being measured and will help verify the blade's strength and life. See the box at left for details about a visit to view this testing.



Blade being set up for fatigue testing at IRL

- A large part of the design evaluation work is underway using a sophisticated wind turbine design software called 'Bladed' purchased from Garrad Hassan. It will be validated using early data from the type testing. Our design team will use information from *Bladed* to revise our existing calculations for design evaluation by the certification body Lloyds Register. This overall process has identified significant areas in the turbine which are overly-conservative in their design and thus point the way to possible economies to be achieved in the future.
- We are working on the Manufacturing Plan which will specify our processes and requirements on our suppliers. The last part of the certification process will be a final quality check on manufacturing processes which will occur during production of the next batch of turbines.

Overall, the team is busy working through new quality procedures for design and production and ensuring that we will be ready to build and install more and more quality turbines over the next few years.

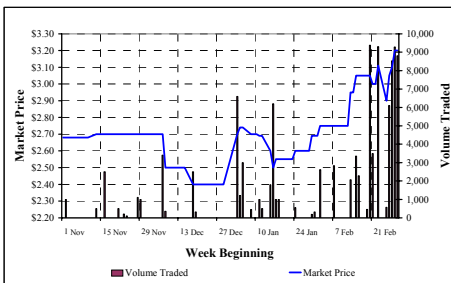


Top image: Simulation of 3 x 2 MW turbines

Lower image: Simulation of 9 x WF500 turbines

NZAX – Share Trading History

The line graph shows the market price while the columns show the volume of shares being traded.



To view this graph daily go to:

<http://www.nzx.com/nzxmarket/nzax>

and search for stock code WTL

(There is also a link on our website.)

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Small is beautiful

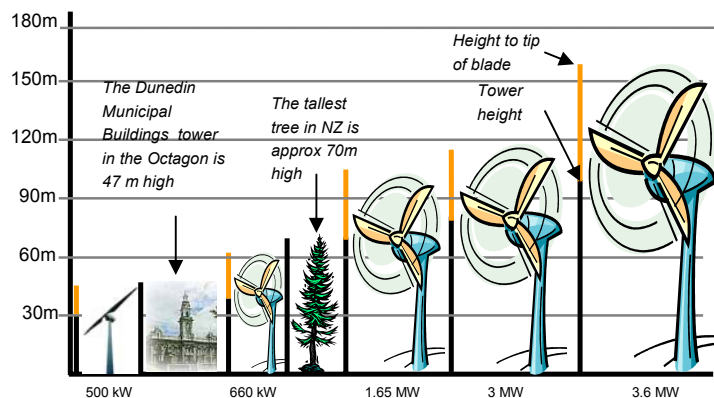
There has been a lot of comment on the visual impact of wind farms in the media over the past few months. The Rational Energy Debate's (RED) provocative images of large 160 metre high turbines (100 m tower and each blade approximately 60 m high) placed in the Dunedin Octagon certainly helped give an idea of scale. Of course, turbines would never be placed in such inappropriate sites, but it does allow people to visualise turbine sizes against a scale of things that they are familiar with (e.g. buildings). In order to contrast the size difference, we have replaced the large turbines with our 45 m (blade tip-height) Windflow 500 turbines.

We believe that smaller turbines such as the Windflow 500 are less visually obtrusive than larger turbines, particularly when sited on a ridge top. Smaller turbines can be similar in scale to familiar landscape features such as trees and do not dwarf the ridge they sit on.

The 'visual influence zone', a way of measuring the size of area where turbines can be seen, of shorter turbines is generally considerably less than it is for taller turbines. People have observed how difficult it is to see the five Windflow turbines at Te Rere Hau compared to the neighbouring turbines, until you get closer to the hill. This is highlighted in the above simulations where it is much harder to see the five Windflow turbines across Otago harbour (~2.7 km away) compared to the two 160 m high turbines.

We have always argued that (in New Zealand's unsubsidised environment and for land-based wind farms) "sub-megawatt" turbines like ours are more economic than multi-megawatt units. And there are additional economic arguments for New Zealand manufacturing, which of course we are passionate about. Given all of this, we think it is timely to stand up and make sure the general public understand our point of difference.

What's your 'view'?



Size of existing and proposed turbines in NZ



Simulation of 160 m high turbines –Courtesy of RED



Simulation of 45 m high Windflow turbines