



NEWSLETTER N° 18

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## Mission Statement

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



## *Building An Industry*

Despite the gloomy weather over the past month, the outlook continues to be bright for Windflow Technology Ltd.

Nacelle assembly of the first batch of five turbines is well underway in Christchurch and we are on schedule to have turbines at the Te Rere Hau wind farm near Palmerston North during the third quarter of this year. We welcome our new windsmiths, Rick and André, to the Windflow team (see page 2) who are quickly learning the ropes and contributing greatly to the production system. Those who are interested in seeing the assembly plant first hand are welcome to attend an open day will be held on 20<sup>th</sup> June (see page 3 for details).

Road upgrades and foundation pads are underway at the Te Rere Hau wind farm site and our only concern is that the weather may delay progress.

'Neil', the test turbine at Gebbies Pass, continues to perform exceptionally well with continuous running and over 99% availability since early April. A full six monthly maintenance check has been performed recently and everything is working as it should. Many people have enjoyed visits to the turbine over the past months as interest in wind energy continues to grow both within NZ and internationally.

Part of this international interest has resulted in a South Australian wind farm reserving a space for a Windflow 500 turbine to be installed later next year, in order to observe its performance. The grid support and fault ride through capabilities are of particular interest in Australia, so it will be a good opportunity for us to demonstrate these.

With the increase in resource consent applications for wind farms, there has been media coverage of the various debates surrounding wind energy. Some comments have questioned the merits of different sized turbines, and we give our opinion on page 3.

Given the popularity of the webcast of the annual report last year, we have posted an eight minute video to our website ([www.windflow.co.nz](http://www.windflow.co.nz)) discussing highlights of the half year report to December 2005 (which Shareholders should have received by post in March). It also contains some good footage of progress with the production build and site works at Te Rere Hau so we hope you enjoy it. We welcome your feedback on this medium.

Thanks again for your continued support in helping to build a wind energy industry in New Zealand – we are well on our way!

Geoff Henderson  
**CEO and Director**



# Prototype Performs

The prototype turbine at Gebbies Pass continues to run well with an average of over 99% availability during April and May 2006. We are nearing 500,000 kWh produced since November 2005 which the Christchurch City Council has been purchasing to power their civic buildings.



*Summit Road Society visit. Photo Richard Moorham*

## EVENTS

### **Webcast of Half year report**

A video discussing the Half Year report including footage of production progress will be available at [www.windflow.co.nz](http://www.windflow.co.nz) from 1<sup>st</sup> June 2006.

### **Open Day – Batch 1 Nacelle Assembly facility, ASCO factory.**

**Tuesday 20th June, 4.30 – 6.30pm**

The factory is at the far left end of Canterbury St (the side street beside Mitre 10 Mega) off Main South Road, Hornby.

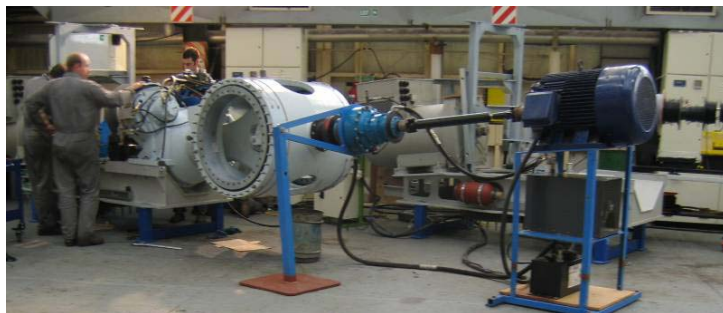
### **International Science Festival**

**1-9 July 2006, The Octagon, Dunedin**

Keep an eye out for a display of our 16 m long blade. More information at [www.scifest.org.nz](http://www.scifest.org.nz).

# Production Update

Nacelle assembly is well underway in our leased factory space at ASCO Carbon Dioxide in Christchurch. New Windsmiths, Rick Ward (mechanical) and André Holm (electrical) have set up the production line for the first batch of five nacelles and started assembly. The first nacelle is near completion with the gearbox and hub attached to the first pallet and the electric and hydraulic sub-assemblies installed and being connected. Each nacelle will undergo a full rotating test before being installed in its cladding, and transported to the Te Rere Hau wind farm site.



*Rotating test setup on nacelle 2, with nacelle 3 in background*

The five towers are also near completion in Wellington, with the fabrication work done and about half of the blast cleaning and painting completed.

Weather permitting, the five turbines will be installed and commissioned on the Te Rere Hau wind farm on time during the third quarter of the year (September 2006).

*For those who are interested in seeing the assembly facilities, we will be holding an open evening on Tuesday 20<sup>th</sup> June (details page 3).*

## WELCOME NEW STAFF MEMBERS

André and Rick are ‘Windsmiths’ who assemble the nacelles and assist with installation of the turbines at site, as well as performing the six monthly maintenance checks on the turbines.



**André Holm**

André is a qualified Refrigeration and Air Conditioning Engineer, who also has an Electrical Service Technician practising licence. Before joining Windflow he worked for York NZ Ltd in their Christchurch branch, as well as managing their Nelson branch on a 3 month temporary assignment.

**Rick Ward**

Rick is a qualified Aircraft Engineer and completed eight years service in the NZ Airforce. For the past 14 years he has worked in the aviation industry in Australia gaining a broad range of experience associated with aircraft maintenance.



# Does Size Matter?



The adage ‘bigger is better’ doesn’t always apply (remember ‘think big’) when it comes to wind turbines in New Zealand. We believe ‘**smaller and smarter**’ is the correct approach. Relative to 500 kW turbines, large 2-3 MW turbines would certainly be more cost-effective in the sea off the coast of Europe (which is what they were designed for). However we do not believe they are the best choice for onshore projects in NZ for reasons of cost and reliability.

## Cost

For onshore projects, the age-old European three-bladed 500 kW turbines may be more expensive per MW than their large 2 or 3 MW counterparts, but it is certainly not true of the modern 500 kW Windflow turbine which has been designed for reliable operation in turbulent, high-wind sites, with lower weight, lower cost and better grid integration at no extra cost.

We have recently sent letters to editors of papers to correct misinformation:

“Your article... was factually incorrect when it stated that "A two- or three- megawatt turbine [imported] now cost (sic) about \$2 million". That should have read "\$2 million per megawatt installed, ie about \$4 or 6 million per turbine". By contrast, the NZ manufactured Windflow 500 costs \$1.6 million per megawatt. That’s cheaper!”

The following table provides specific factual comparisons of two wind farm projects in the Manawatu which give a compelling argument in favour of the Windflow 500 kW sized turbine compared with a larger turbine. See also figure at top right.

Manawatu Wind Farms	Te Rere Hau	Te Apiti
<b>Main Descriptors:</b>		
<i>Turbine manufacturer</i>	Windflow Technology, from New Zealand	NEG Micon/Vestas, from Denmark
<i>Wind farm rating</i>	48.5 MW	91 MW
<i>Number/size of turbines</i>	97 x 0.5 MW	55 x 1.65 MW
<b>Financial Factors:</b>		
<i>Stated cost of energy</i>	6.0 c/kWh	7-8 c/kWh
<i>Percent of capital cost spent in NZ</i>	>90%	~30%
<i>Reactive power capability and cost</i>	53 MVAR (110 per unit) @ zero cost	27 MVAR (28 per unit) @ \$millions
<b>Visual Impact Factors:</b>		
<i>Rotor diameter</i>	33 m	72 m
<i>Height to tip</i>	47 m	106 m
<b>Land Use:</b>		
<i>Project land area</i>	243 ha	1150 ha
<i>Land area per MW</i>	5 ha/MW	12 ha/MW
<b>Construction Cost Factors:</b>		
<i>Access road width</i>	4 m	10 m
<i>Earthworks for 5 MW</i>	10,000 cubic metres	70,000 cubic metres
<i>Crane size</i>	80 tonne	400 tonne
<i>Blade transport rate</i>	1 MW per standard truck	0.55 MW per 40 m truck
<i>Material above foundation for 5 MW</i>	276 tonnes	654 tonnes
<i>Concrete in foundation for 5 MW</i>	640 cubic metres	1200 cubic metres

## Ridgetop sites - Land Use and Visual Impact

The table shows that Te Rere Hau will use **half the land per MW** compared to the Te Apiti project. This is because small turbines can be installed on ridgetop sites with limited accessibility where larger turbines are physically unable to get to, due to the smaller roads, trucks and cranes required. On flat open land, the land used per MW is independent of turbine size, and it is only in densely populated areas, like the plains of northern Europe, that the large turbines start to have a land use advantage.

On ridgetop sites in New Zealand, questions of scale relative to existing landforms become important for visual impact. Shorter turbines on a hill or ridge have a smaller visual catchment as they are less likely to be visible above the skyline.

Looking at these comparisons, we believe it simply beggars belief that the large imported turbines could be truly, sustainably competitive. They show that we are “onto” something vitally important for New Zealand’s electricity future. They also explain how we have maintained the resolve and persistence for which we are well-known. As our design continues to build a track record of reliability and is proven in cost-effective projects, we believe the ‘**smaller and smarter**’ approach will become more widely accepted in New Zealand.

## Are large turbines proven?

We would not ordinarily comment on other turbine manufacturers but our shareholders need to be aware of important developments in the international wind industry. Vestas have publicly acknowledged recently "lack of reliability in several of Vestas' products," including expensive gearbox problems because of “how far we have come in the last decade”. In other words they have increased turbine size too quickly. See for example: <http://vestas.ipaper.dk/GB503/> and Windpower Monthly, April 2006.

So size doesn’t count in any positive sense here in New Zealand. As the saying goes - it’s what you can do with it *and* at what cost that truly counts.





# Te Rere Hau project update

## Site works

Preparation of the Te Rere Hau wind farm site has come along well over the past few months and, despite the wet weather, progress has been made on the external roading and roads to the individual turbines, foundation pads, and trenching for cables.

The North Range Road has been widened at several points to approximately four metres to accommodate cranes, concrete trucks and the standard sized trucks that will be carrying the towers, blades, and nacelles to the site.

The internal roads leading to each foundation pad have been completed and five foundations pads have been dug with the first layer of site concrete laid to prevent sediment run-off.

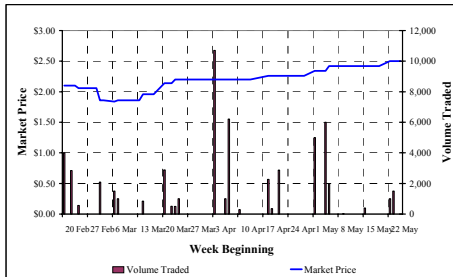
Next steps include finishing the foundations and upgrading the electrical connection for the first five turbines.



*Internal road and grading of foundation pad site*

## 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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*Foundation excavation at Te Rere Hau*

More photos and videos showing the construction progress at Te Rere Hau are available on the NZ Windfarms website.

[www.nzwindfarms.co.nz](http://www.nzwindfarms.co.nz)

## ONLINE TRADING OF WINDFLOW TECHNOLOGY SHARES

Please note that when you register for online trading with broking houses and major banks, the shares are taken out of your name and off the share registry database. Your details are then removed from our database which means you will no longer receive shareholder newsletters or updates.

If you are thinking of changing or have already registered for online trading and wish to remain on our mailing lists, please contact us!