



NEWSLETTER N° 12

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Mission Statement

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



Summer

UPS AND DOWNS BUT MOVING FORWARD!

Welcome to the start of what promises to be an eventful new year after the ups and downs of the prototyping program in 2004.

During the eighteen month testing program, there have been only three significant changes to the original design. The most time consuming was the redesign of the gearbox to meet sound level requirements, which resulted in a very quiet gearbox which we intend to patent. Testing resumed when the council gave the go ahead in October.

The next change was in November to strengthen the pitch tube which had proved to be inadequate for its design loads. With the correctly redesigned piece in place we had our windiest day yet at Gebbies Pass (just after the AGM) with the windmill running in gusts of over 130 km/hr, which Windflow believes is a New Zealand (and possibly world) first.

Before Christmas, the smallest bearing in the gearbox failed. This was almost certainly due to insufficient lubrication to a particularly inaccessible part of the gearbox. A new system has been developed which provides ample lubrication, and this is currently being tested rigorously on the full-load test rig in Auckland. We have also changed to less viscous oil as the gearbox is running cooler than expected. The windmill will be running again by the end of January and testing of the prototype will continue as we gather the information needed to gain IEC certification.

Directors are working on plans for capital raising for both Windflow Technology and NZ Windfarms Ltd (NZWL) this year and details will be released when finalised. Our recently announced agreement with the Bank of New York will allow investors in the US to invest in Windflow through American Depositary Receipts (ADR's) and improve the liquidity and international profile of our shares.

NZWL made significant progress last quarter, filing for resource consent for the 52 MW Te Rere Hau windfarm near Palmerston North. The hearing took place from December 15-17 with a decision expected in February.

As discussed at the AGM, our main focus for the future is track record, track record, track record through both the Gebbies prototype and first stage of the Te Rere Hau wind farm. Our vision of a robust, cost-effective, NZ manufactured wind turbine is exciting and realisable and this makes us determined to get it right.

We thank you again for your continued support and wish you all the best for a happy and prosperous 2005!

Geoff Henderson, **CEO and Director**

AGM Report

Approximately 100 people attended the AGM which took place in Christchurch on Tuesday 30 November.

Windflow Chairman, Barrie Leay, welcomed everyone and introduced fellow board members and Derek Walker the newly appointed Chairman of NZ Windfarms Ltd.

The meeting went smoothly with apologies and proxies given, no matters arising from the 2003 AGM minutes, and brief presentations given on the annual report.

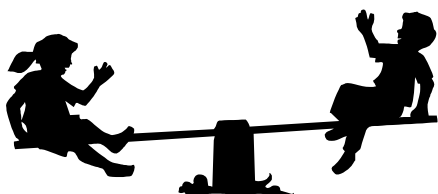
Shareholders were brought up to date on progress with Te Rere Hau, Windflow's progress over the past year, and future plans.

Hugh Kelly retired by rotation and was re-elected to the board, and the motion regarding directors' remuneration was passed.

TECHNICAL TRANSLATIONS

"Moment" is an engineering term for the quantity that can break a beam when it is bent. The moment on any point in a beam is the sum of all applied forces times the distance each force is offset from the point.

"Fatigue" is the process by which many cycles of loading can weaken a structure. Wind turbines must withstand 300-1000 million cycles of loading in their design lives.



A simple explanation of **teetering** can be found in a child's seesaw. Consider two children of 25 kg each 2 metres from the pivot point of a seesaw. The maximum bending moment on the seesaw is at the pivot point and equals 25 kg times 2 metres equals 50 kg-metres (kg-m). The fact that the seesaw can pivot ensures that this bending moment is steady except when it bumps on the ground (little or no fatigue).

Now imagine a seesaw that cannot pivot, but is fixed in a horizontal position and imagine the two children jumping up and down on either end of the seesaw to get their fun instead. The bending moments would fluctuate due to impulsive effects (jarring) so they would be probably 50 kg-m plus and minus 100 kg-m for many cycles. Thus either the fatigue life (the period until the seesaw will fail from fatigue) would be greatly reduced, or the seesaw would need to be built more heavily to withstand the jarring.

This is what 3-bladed windmills have to put up with, kids jumping up and down on a locked seesaw, whereas the Windflow rotor just seesaws (teeters) back and forth, and only occasionally bumps on the ground (i.e. on the teeter dampers in the hub).

A Question of the Best Technology

We are often questioned as to why the Windflow 500 is different from other turbines. The trend is for bigger, three-bladed turbines with an increasing number installed offshore. Why has Windflow developed a 500 kW, two-bladed turbine designed for onshore windfarms?

Let's look at the most obvious and most visual difference – 'Why does ours only have two blades while the others have three'?

The answer is simple – cost, weight and durability. Naturally, two blades have less material, therefore less cost and weight and many other benefits. But the main reason is that a two-bladed rotor that teeters on the low speed shaft (like the Windflow 500's) applies much smaller fatigue bending moments to the shaft than a three-bladed rotor (see insert).



Two blades in one easy lift

The two-bladed design also has a higher rotor speed, which means less torque therefore a smaller, more cost effective gearbox. The two-bladed rotor can be parked horizontally, which has benefits for hurricane survivability and lightning protection.

The tradeoffs are a slight increase in blade noise (from faster speed) and a slight decrease in energy capture (around 2%). Note that neither of these is significant enough to offset the proven advantages of the Windflow design. **The Windflow 500's sound power of 100.7 dBA puts it among the quietest wind turbines in the world (and considerably quieter than the larger 3-bladers presently being installed in New Zealand, which typically emit 104 dBA).** And the 2% energy capture is more than offset by the reduced turbine weight-related costs.

Although the market is dominated by three-bladed designs, the benefit of two-bladed teetering has long been recognized by wind turbine designers. Only two companies have been able to overcome a fundamental teeter stability problem, WEG in England and Windflow Technology Ltd. The WEG 2-bladed turbines have been running successfully in the UK since 1993, but the company was bought out in 1998, so Windflow has a unique opportunity to carry on the know-how around teetering and teeter stability.

For the unsubsidised New Zealand market and gusty wind conditions, a two bladed design was the logical option. With the Windflow 500's bundle of technological advantages and cost-effectiveness, we believe that the merits of two blades will gradually become more accepted.

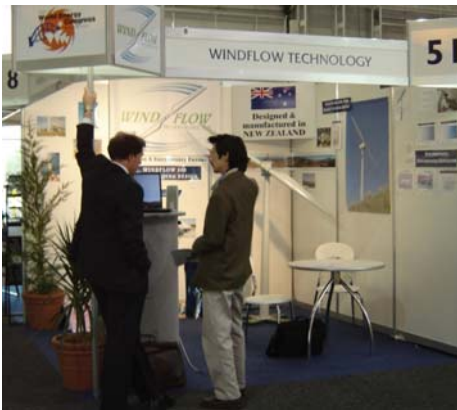
*More 'Questions of the Best Technology' in the next newsletter.
If you have any burning questions, please send them in.*

Events Update

We are busy spreading the news about Windflow and our technology. Here are some highlights of events of the past quarter.

World Energy Congress – September 5-9, Sydney, Australia

Hosted by the World Energy Council, this event attracted 3,000 delegates. This year's theme was "Delivering Sustainability: Opportunities and Challenges for the Energy Industry". There was a reasonable amount of interest in the Windflow 500 and we made many interesting contacts from energy companies, government agencies and consultants from around the world.



Climate Change and Business – November 3-5, Auckland

Windflow presented on "Wind projects and building local manufacturing capacity in NZ" at this joint NZ/Australia conference and trade expo.

Sustainable Energy Futures – Think BIG or Think Smart – November 19-20, Wellington

Windflow had a display and presented on Thinking Smart with Wind Energy, updating attendees on progress and potential for wind energy in New Zealand. The main presentation was from MED, MfE and EECA seeking feedback on the Sustainable Energy discussion paper (<http://www.med.govt.nz/ers/environment/sustainable-energy>). The Hon Marian Hobbs, Minister for the Environment launched the new wind energy planning book by Mark Ashby from Connell Wagner.

Who's Investing in Wind Energy?

Investment in wind energy is increasing globally with numerous countries offering incentives for wind power and setting targets for renewable energy generation. Russia has ratified the Kyoto Protocol, strengthening the demand for investment in clean energy projects in order to acquire carbon credits.

2004 has been an especially significant year for wind energy in NZ and the investment is likely to continue. 126 MW of wind power was installed, being the only new generation commissioned in NZ (other than reserve generation).

- **Meridian Energy** commissioned its 90 MW Te Apiti wind farm near Palmerston North and in December received resource consent for a proposed 70 MW project near Mossburn, Southland.
- **Trustpower** commissioned its 36 MW extension to the Tararua Wind Farm, and announced plans for another 120 MW there and 90 MW in Marlborough.
- **Genesis Energy** applied for resource consent for the Awhitu wind farm (20 - 25 MW) south of Auckland (currently under appeal after its application was turned down) and is extending Hau Nui wind farm.
- **NZWL** applied for resource consent for Te Rere Hau wind farm (52 MW) near Palmerston North.
- Several other proposed wind farm projects have received carbon credits through the Projects to Reduce Emissions (PRE) program.
- Increased activity in monitoring wind resources and developing educational materials is bringing wind energy further into the public arena. (New fact sheets available from www.windenergy.org.nz).

The time is ideal for Windflow to commence a period of significant growth. In the near future, we intend to make another Windflow rights issue to ensure we are well-positioned to take advantage of these growth prospects. And later this year, as we've signalled in the past, we intend to launch NZWL as a separate company to fund Te Rere Hau and other wind farm projects over the next few years. Existing shareholders will have every opportunity to participate in these issues.

At the same time, Windflow is using an investor relations firm 'Spring Start' to promote Windflow Technology Ltd to United States investors who will be able to trade our shares through American Depositary Receipts (ADR's). This is a way for Windflow to access the US capital market, increase shareholder value by improving liquidity, and help raise Windflow's profile in the US for future business development opportunities.

What is an American Depositary Receipt (ADR)?

ADR's are basically securities of companies located outside of the US that are traded on US securities markets, therefore offering US investors a user-friendly currency in their own country. Due to complexities of buying shares in foreign markets, U.S. banks (in this case the Bank of New York) simply purchase a bulk lot of shares from the company, bundle the shares into groups, and reissue them.

There are different levels of ADR issues and Windflow will be level 1, the most basic type of ADR found on the Over-the-Counter (OTC) market rather than the larger exchanges. Level 1 issues are an easy way to gauge interest for our securities in North America. Thanks to a generous offer from the Bank of New York, it is also an inexpensive opportunity for Windflow.



NZ Windfarms Ltd

It has been a busy few months for NZ Windfarms Ltd (NZWL). In September we filed for resource consent for the Te Rere Hau wind farm near Palmerston North. The council received 71 submissions with 28 in support, an unusually high level of support for a resource consent, and 43 opposed.

The Airways Corporation registered an opposing submission; it considered that one turbine might interfere with the nearby air traffic control radar (most other proposed turbines would be well below the level of the radar station). Windflow and the Airways Corporation ran some joint tests in November using cranes and chicken-mesh to simulate turbine towers. The tests involved placing a simulated tower directly between the radar dome and an aircraft transponder while the signals were monitored by airways in Christchurch. A second 'tower' was moved to various locations nearby during the test to check any reflected interference. Although the testing allayed most concerns, Airways and NZWL will continue to address this issue to ensure aircraft safety.

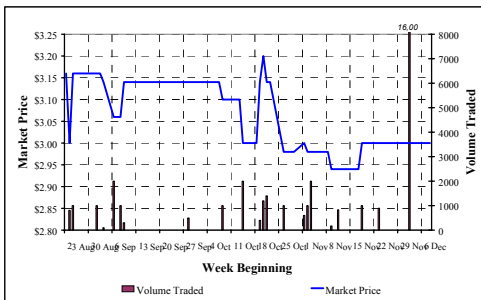
NZWL has also been working with a number of other submitters to address concerns and appreciates the efforts of all involved. The hearing was held on December 15-17 with a decision expected in February.

Other potential wind farm sites around the country are continuing to be investigated.

Derek Walker, a current Board member of NZWL, has been appointed Chairman.

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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Factory Visits March 2005 -Auckland-



Join us on a visit to Wind Blades and AH Gears to experience the technology first hand.

Invitations will be sent in the near future with further details.

