



Summer

NEWSLETTER N° 9

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Mission Statement

"To become the leading supplier
of wind turbines for
wind power projects in
New Zealand and Australia."

Welcome to another Exciting Year!

Last year, we met the exciting challenge of commissioning the first New Zealand designed and built windmill, and then we raised \$5 million to begin Stage 2 of the Company's development plan. This year we aim to progress Stage 2 with the public float of New Zealand Windfarms Ltd. NZWL will buy our first six production machines to establish the Te Rere Hau Windfarm near Palmerston North.

There is a healthy interest in our machines from individuals and corporations, and the Board and staff are determined to position our company and machine to take advantage of the strong world-wide demand for wind energy.

The advantages of building our first windmill as a full-scale prototype and siting it near Christchurch have been well demonstrated over the past year. The machine's power output exceeded our expectations over its operating range and it operates at lower wind speeds than we had expected. The main load-reducing technologies, which underpin our competitive edge, are working well.

Our staff are spending much of their time running tests and 'fine-tuning' the controls, so its proximity to our office is a real advantage.

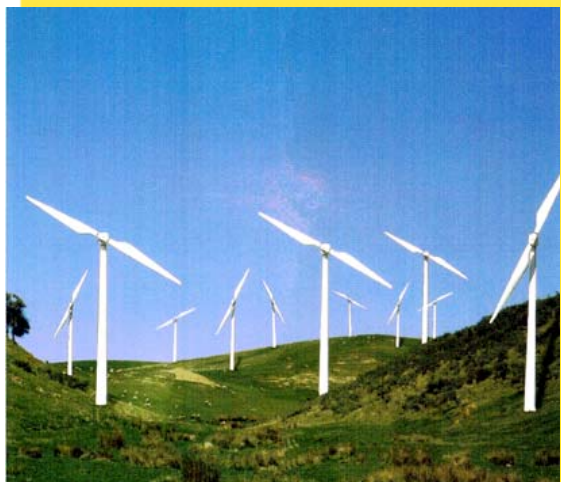
All this is tempered by the sound emission problem, which remains unresolved. In November, we reported at the AGM and to the media that we had made a significant discovery with regard to the sound levels coming from the gearbox. We expected that by correcting a manufacturing error we would solve the problem.

The error has been corrected and the gearbox re-installed. But sound emissions have not reduced sufficiently to meet our obligations under the Resource Consent. So we have reverted to the line of research that we were pursuing until November. More information on the problem and our research to solve it is given on the next page.

Also in this issue, we report on events relating to Stage 2 - winning Kyoto emission reduction units (carbon credits) and our investment in Wind Blades Ltd – and we report on the AGM and on our success at the Sustainable Business Awards.

Internationally it would appear that the wind industry is starting to consolidate, as the growth of the European market dropped to just 23% in 2003. This is the equivalent of installing 14,000 Windflow 500's!

Geoff Henderson
CEO and Director





Jake Roberts, of ASCO NZ Ltd, is a "regular" member of the Windflow team. Here he is removing the lightning rod and anemometer before reassembly of the gearbox and rotor.

A Sound Solution

Noise has always been an issue with windmills, and our knowledge bank has been extended significantly by our research on the prototype.

The timeline of events (below left) summarises the history of our problem and what we have done.

First, I want to put the sound emissions into perspective. The Council's normal night-time requirement is 40 dBA, but in the Resource Consent process we recognised the special nature of neighbouring McQueens Valley and offered a limit of 30 dBA when measured at the boundary of Julie Riley's property.

Our initial sound measurements identified a level of up to 32 dBA at Julie's boundary. This compares with a popular range of domestic refrigerators that emits about 43 dBA! Of course refrigerators are usually sited inside a house while our measurements are taken outside.

New Zealand standards require that we add a 'tonal penalty' of 5 dBA to our measured sound levels. This compensates for a peak in our tonal curve at the 311 Hz frequency. So we are required to report a measured sound emission of 32 dBA as 37 dBA.

Currently, we are homing in on the most likely theory that gearbox tooth meshing forces are exciting a structural resonance in the gearbox/pallet system. This will amplify vibration and thus cause increased sound energy to be propagated from all surfaces. If we can kill the resonance we should be able to significantly reduce the sound levels and achieve the required 30 dBA.

First, we need to establish exactly what mode of vibration is being excited, and we have engaged IRL to assist us with the detailed vibration analysis in the field.

Also we are examining if stiffening the gearbox/pallet structure would eliminate the resonance, or if not, whether the addition of mass in the right place (eg 500 kg of steel which is about a 400 mm cube) could eliminate the resonance. Other options include damping the resonance (eg with rubber or something more sophisticated) and other approaches such as tuned mass absorbers.

We are putting all our efforts into this research at the moment. Once we have killed the noise we will then feed the lessons learned back into the Stage 2 design-build programme. For us it is not simply a matter of meeting certain very low sound levels in McQueens Valley, it is also a matter of marketing the windmill in other locations where, experience shows, noise will almost always be an issue. While it has taken a long time to sort this out, we are confident that we will be able to resolve it now in a matter of weeks rather than months.

The Noise Issue – a Timeline of Events

July

Official opening of WF500 prototype, 7 weeks after installation in late May.

August

Advise neighbours, shareholders and media of unacceptable sound emission levels.

August to November

Identify and eliminate various sound emissions, especially from the tower. Start to research gearbox/pallet resonances.

October

Complaint against TVNZ coverage of issue upheld. (TVNZ had inaccurately reported the sound levels in a way which exaggerated them.)

November

3 month grace period under resource consent expires and windmill shut down except for test purposes. Later that month endoscopic examination of gearbox showed thrust collars rubbing on gear teeth.

Advise shareholders, neighbours and media.

December

Remove blades and gearbox, send gearbox to Auckland.

January

Re-install blades and gearbox.

February

Sound measurements show little change.

NZWL is coming

Success with Kyoto Tender

New Zealand Windfarms Ltd (NZWL) is currently a wholly owned subsidiary of Windflow Technology Ltd (WTL), and, as reported at right, has already been awarded ERUs for the Te Rere Hau wind farm.

The board of directors of NZWL has been meeting since September. Initially, the board consisted of the five existing WTL directors and we are pleased to announce that Juliet McKee joined the board in January.

Many decisions about the company's structure and operation have yet to be made, but NZWL is aiming to seek public investment in the middle of this year. Subject only to statutory requirements, the directors will ensure WTL shareholders are given preference in some way.



Juliet McKee, suitably attired for her first climb to the top of the Gebbies Pass windmill.

Juliet McKee

Juliet is an economist and company director whose board appointments include Warren and Mahoney, NZ Book Council, Marsden School, and the Centre for Corporate and Institutional Governance at Massey University. Previous assignments have been diverse – as a reporter for the BBC in Tunisia, a financial analyst for Shell in Gabon, and 3 year stints with the UN in Geneva and the Commonwealth Secretariat in London, among others. She was awarded the Commonwealth Medal in 1990 and the QSO for public services in 1996. She is also Chairman of the Wellington Branch of the Institute of Directors.

An exciting development over the last quarter has been our success in the first tender round for Kyoto Emission Reduction Units (carbon credits) by New Zealand Windfarms Ltd, a subsidiary of Windflow Technology Ltd. The plan is to construct a 50 megawatt wind farm (named Te Rere Hau, Maori for 'Windflow') over the next four years on the Manawatu saddle. The farm will have an annual output of 180 million kilowatt-hours (kWh), enough to power 15,000 households.

The wind farm will be built in stages, with the first six turbines being erected this year. The wind farm is expected to start generating electricity by the end of 2004. By replacing electricity generated from fossil fuels, the Te Rere Hau wind farm will reduce emissions of greenhouse gases equal to 519,000 tonnes of carbon dioxide between 2008 and 2012, the first commitment period of the Kyoto Protocol.

Te Rere Hau is one of 15 successful projects (out of 46 tenders) that were awarded Emission Reduction Units (ERUs), which are expected to be internationally tradeable when the Kyoto Protocol comes into force.

At that point, many countries covered by the Protocol will

need to buy extra ERUs to meet their agreed emission targets. Businesses will be able to sell their ERUs as they wish. The Government will issue the ERUs annually as the agreed reductions in greenhouse gas emissions are achieved.

For example if by 2008-2012 the ERUs have a value in the range \$10 each, the contract we have been awarded will be worth \$5 million, so all that remains is to make it happen.

Work on the first batch of production machines (which include some design changes resulting from the lessons learnt at Gebbies Pass) has already begun, and it is expected that the first of these will be completed in the third quarter of this year.



Geoff Henderson and Hon. Pete Hodgson, Minister for Energy, sign the ERU contract.



Wind Blades Ltd

Another exciting development was the metamorphosis of Wind Blades Ltd into a joint venture company 50/50 owned by Windflow and the original owners of Wind Blades Ltd, Peter Brooking and Bruce Tait.

Peter and Bruce have already started production with the first blade expected out of the mould this month. It is an exacting job with the different layers of foam, timber and fibreglass being carefully laid in so that the pair of 950kg blades is perfectly balanced.

The WBL factory has moved to a new, larger factory in Pakuranga, Auckland. The factory is big enough to handle our manufacturing requirements for at least the next two years.

Windflow AGM

Windflow's second AGM was attended by more than 80 shareholders.

Much of the meeting centred on the reasons for the turbine's shut-down in November, what we had learned about the acoustics of the machine as a whole and the corrective actions identified.

Geoff also took the opportunity to explain about Windflow being part of the launch of the NZAX. Some excellent photo opportunities arose out of this; for example Geoff led the "1st XV" companies of the NZAX onto the park at the official launch and a 'team' photo has been on display in Wellington Airport over the Christmas period.

He also introduced the other members of staff and ensured they each had a moment in the spotlight (thanks Geoff).

One of the main orders of business was the special resolution to change the constitution in order to bring them in line with the NZAX listing rules, this resolution was passed and as a result Windflow has been trading on the NZAX since November. (See also the trading history opposite.)

Sustainable Business

Back in November Windflow took part in the Sustainable Business Network's (SBN) annual conference and expo, which was held in the Aotea Centre in Auckland. The theme of the conference was 'knowledge, information, wisdom.'

Geoff's presentation on 'The future of wind power in NZ' was well received with many people interested to find out more about this sustainable and cost effective form of electricity generation.

The conference was also the venue for the presentation of the 'National Sustainable Business Awards' these are split into three categories: Small, Medium and Large. At this time Windflow is still a small company so we were entered in the Puka award section.

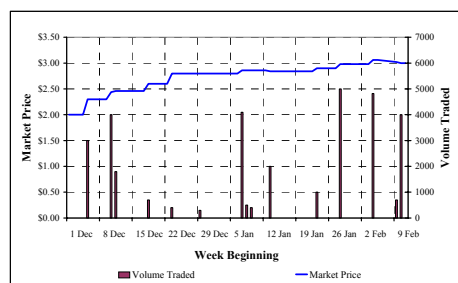
It was a black tie event, which was presided over by a very entertaining "coach"!

Can I have the envelope please (drum roll) and the winner is...

Well we can't be the winner every time, we did however receive a 'Judges Commendation' which stated amongst other things that we are the 'ultimate sustainable business', not too bad for a company that has only just turned two!

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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