



NEWSLETTER N° 10

APRIL 2004

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Mission Statement

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



Autumn

Autumn already!

At the time of writing the last newsletter, we were coming to grips with the frustrating news that our noise problem was still unresolved. We are pleased to report that excellent progress has been made since then towards understanding the science of the problem, and we are now about to test the science with our new test rig. See page 2 for more details.

And there have been dramatic developments in favour of wind power for New Zealand. Three months ago Project Aqua was facing stiff opposition but few would have predicted that Meridian would pull the plug on it. How things change!

With the uncertainty which surrounded Aqua gone, New Zealand is now free to plan just how we will keep the lights on over the next decade. The options put forward are many and varied but it is rapidly becoming a mainstream opinion that wind power will play a significant and ever increasing role in New Zealand's electricity supply chain.

Autumn has also seen Windflow starting to move into the international arena. I have attended conferences in Adelaide and Chicago and in both cases was buoyed up by the huge attention which is now being paid to the issue of electrical integration. The issue is a "problem of success" for the wind industry. It is arising because wind power is becoming such a big player in parts of Australia and the US, as well as Europe. This is something I foresaw 15 years ago when I came up with the Torque Limiting Gearbox system. The TLG system is unique in the wind industry in enabling a synchronous generator directly on line. As such it solves many of these major electrical integration problems, cheaply and reliably. I presented a paper to the Global Windpower conference in Chicago on this subject. It generated a lot of interest.

Work on the Te Rere Hau wind farm near Palmerston North is also progressing and we are working towards a summer build program, which will see the first 6 Windflow 500's installed and commissioned on one of the world's best wind farming sites.

Geoff Henderson
CEO and Director

Aqua's Message

Aqua is gone. For so long it has been a part of New Zealand's future energy planning that its abandonment came as a surprise to all.

The demise of Aqua is significant for many reasons; it shows that 'think big' no longer has a place in New Zealand's energy industry. Instead we must 'think smart' - there is no one answer, no one project that will fix our electricity problems.

Instead we need to apply appropriate technology in appropriate locations in order to match the supply / demand balance. Wind power is definitely going to have a significant part to play in this future. 20-30% of our electricity could be coming from wind energy a decade or two from now, displacing our present fossil fuel consumption and meeting demand growth as well.

The real difference between the energy systems of last century and today will be their scale, little and often will be the catch cry. For example a couple of energy efficient lamps in every house, office and factory is the equivalent of Tekapo B (160 MW), and that's just a couple of lights.

Imagine what would happen if we had solar hot water heaters on every roof, double glazing in every window and a Windflow 500 for every 200 households spinning quietly on the hills above. Now that's a future I want to be a part of.

So thank you, Aqua - by stepping aside you have created room for wind power and other renewable technologies to play their part in NZ's energy future, a challenge which we look forward to meeting.

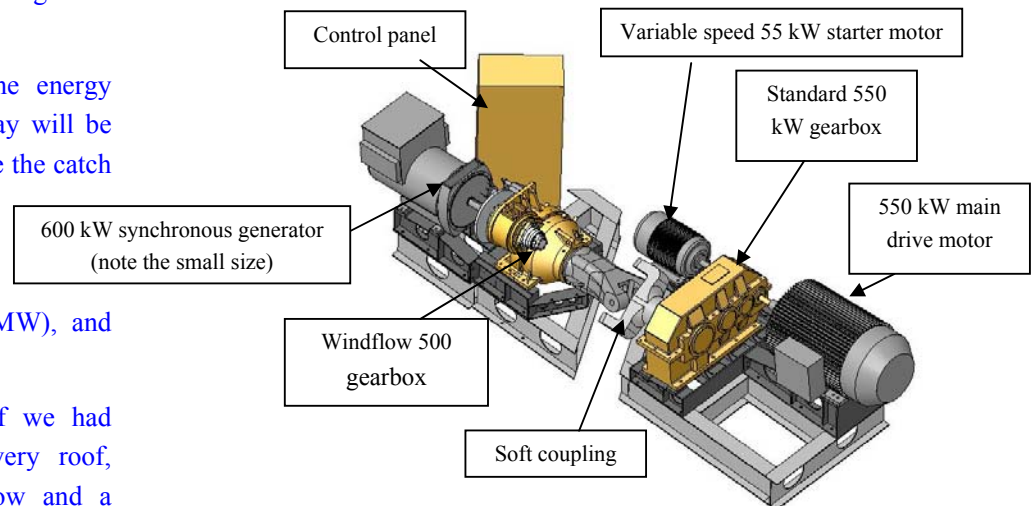
Sound Progress

We are making excellent progress in the work to reduce the sound emissions from the prototype gearbox. Last week commissioning was completed on the mechanical test rig. Early results confirm that we are now - for the first time - able to reproduce the problem frequency in the factory.

The test rig will speed up work on the gearbox tremendously, by allowing testing work that has taken months in the past to be completed in little over a week, allowing more time to be spent on engineering a long term solution to the problem.

At this point we have two main approaches to solving the problem with the final solution likely to be some combination of the two.

The easiest way to think about the problem is to consider a music system metaphor, where the Stage 2 gear mesh is the CD player, a resonance in the low speed shaft is the amplifier, and the blades are acting as speakers. The "music" that comes out very efficiently is a very boring single note, E flat above middle C (311 Hz). The test rig is speeding up the work on turning off the CD and amp, while another work stream is attempting to stuff a large sock into the speakers.



CAD drawing of Gearbox Test Rig

As with all the things we build, our new test rig is an imposing piece of equipment. It measures 6.5 m x 2.2 m and weighs in at 8 tonnes. There are two drive motors, a 55 kW motor to get everything started before the 3 tonne 550 kW main drive motor takes over. The really clever bit is the way that the output from the synchronous generator is fed back into the test rig's main drive motor. This allows almost 90% of the energy to be recycled, which means we can operate the test rig for extended periods on full load while only consuming a fraction of the energy passing through the gearbox being tested.

EMEX

An idea whose time has come?

From aeronautical engineering to food production, from internet-controlled compressed air equipment to product design and development software... Virtually every manufacturing sector will be represented at EMEX 2004, exhibiting an exciting array of products coming from **future thinking** around the globe, and Windflow will be there.

From May 11th to 13th at the Auckland Show Grounds our new \$200,000 test rig, Windflow 500 gearbox and a full size blade will be on display. We will be sharing the site with AH Gears who are regulars at the EMEX events.

EMEX is a "trade only" event but we are able to invite guests. So if you are in the Auckland region and would like to come along please send Terry an email at terry@windflow.co.nz with EMEX in the subject, and we will send you information on how to register. Entry to the event is free but the parking costs \$5.

Twenty years ago a young man arrived in California to chase his dream of wind power. He'd had the dream since 1976 when he decided to study engineering on his father's advice, "If you want to actually do something about renewable energy, you'll have to be an engineer."

Well to cut a long story short, Geoff worked in the Californian wind farms and in the wind R&D hotbed of Britain, learning all about windmills. Twenty years on he has not only built a windmill, but a company dedicated to the design and manufacture of windmills.

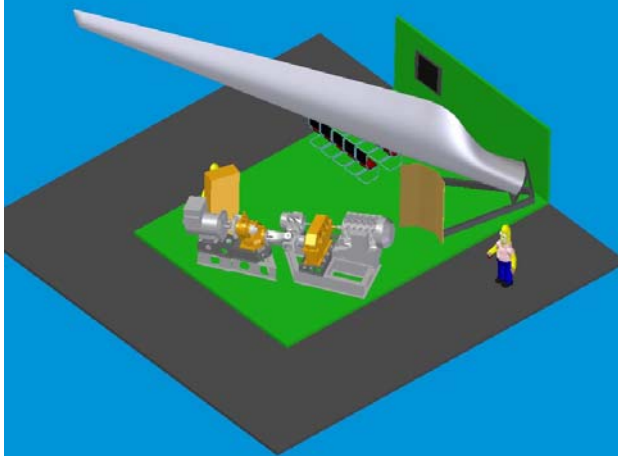
And it is the Windflow 500 which he designed that has the wind industry talking. At the recent Global Windpower Conference in Chicago, attended by more than 3,600 delegates Geoff gave a poster presentation on the unique Torque Limiting Gearbox System.

The underlying issues at this conference (as with others in



Windflow 500, the only windmill in the world to have a synchronous generator directly on line.

Computer Drawing of our EMEX 2004 site



which Windflow has participated in both Australia and New Zealand), is that the wind industry is desperately searching for a solution to the issues of gearbox reliability and grid integration. These are the very issues that the TLG system resolves. Currently many grid operators around the world are demanding that wind turbines provide the fault ride-through and other capacities which are inherently provided by having a synchronous generator, and the Windflow 500 is the only windmill able to drive a synchronous generator directly "on line" with the 50 Hz national grid.

This achievement alone should assure Windflow's future based on licensing the patented TLG system, though of course it will take further successful demonstration and professional marketing before licensees are "beating a path" to our door.

New Zealand Windfarms Ltd



Work on the Te Rere Hau wind farm near Palmerston North is progressing with the consent, electrical connection, wind monitoring and capital raising aspects of the project all under way. Development of the New Zealand Windfarms Ltd (NZWL) business model is continuing. We are working towards a share issue in NZWL later this year. In addition to preliminary work on this capital raising (whereby NZWL will own turbines and manage the wind farm), we are also designing commercial arrangements will allow investors to purchase their own Windflow 500 within the wind farm.

NZ Windfarm Ltd's new Director

We are pleased to announce that Derek Walker joined the board of New Zealand Windfarms Ltd at the end of February.

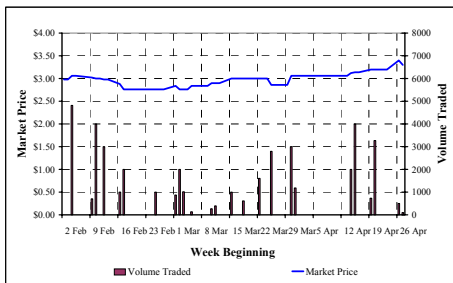


Derek Walker

Derek is a professional electrical engineer and a member of the Institute of Directors and the Institute of Management. His association with wind farms began in 1998 with the building of the Tararua Wind Farm when he was the CEO of CentralPower who funded and built the farm (it has since been sold to Trustpower). Derek's governance experience includes Palmerston North Airport Limited, Palmerston North City Holdings, The Bio Commerce Centre, and the Central Energy Trust

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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