

**Submission to an application for resource consent under section  
96 of the Resource Management Act 1991**

To: Environment Waikato  
Name: Ministry of Economic Development  
Address: P.O. Box 1473, Wellington.

**1. The Ministry of Economic Development (MED) supports the application of Unison Networks Limited for land use consent to construct and operate a wind energy development referred to as the Te Waka wind farm in the Hastings district, in so far as it contributes to national energy objectives, and as long as environmental impacts are appropriately avoided, remedied or mitigated.**

**2. The particular parts of the application MED supports are:**

The whole of the application.

**3. The reasons for making this submission are:**

The Te Waka wind farm is well aligned with the government's objectives, particularly the energy objectives to deliver security of supply with an increasing focus on renewable energy sources.

The Ministry considers that wind power is a viable alternative energy source, that its development will help ensure security of supply through "diversification" in electricity production methods, and that it is an environmentally responsible alternative to using fossil fuels for generation.

### **Wind Energy in New Zealand**

New Zealand is ideally situated to generate electricity from wind. Located directly across the path of prevailing westerly winds, many regions of New Zealand have a wind resource that is among the best in the world, with annual average wind speeds of approximately 10 m/s.

In 2005 the Ministry commissioned a study, *Availability and Costs of Renewable Sources of Energy for Generating Electricity and Heat*, which identifies that wind energy has the potential to contribute significantly to meeting New Zealand's energy needs. The table below identifies the contribution wind power could make to consumer energy, compared with hydro-generation, at less than 16 cents per kilowatt-hour (c/kWh).

## Total Resource Available (Consumer Energy) at less than 16c/kWh

(GWh/y)

Resource	2015			2025		
	High confidence	Medium confidence	Low confidence	High confidence	Medium confidence	Low confidence
Wind	6740	12630	16840	7166	13440	17915
Hydro	5050	8870	15575	5050	8870	15575

NB. High confidence resources are those that are well proven and readily able to be permitted and developed. Achievable development rate has been taken into account. High confidence resources represent an 80-90% confidence that the uptake will occur. Medium confidence estimates represent a median estimate of uptake. Generally these are associated with a more liberal consenting environment. Low confidence estimates represent resources that can be developed but difficulties are expected in terms of permitting and access. They represent a 10-20% confidence that the uptake will occur. Confidence levels are cumulative e.g. the medium confidence resource available will include both the high and medium confidence bands.

The study identifies that the technology associated with wind power continues to mature, which in turn continues to reduce the unit cost of generation. By 2015, generation in the 4-6c/kWh band will be possible, with the largest resource available in the 6-8c/kWh band. By 2025, considerably more of the resource could be available for generation in the 4-6c/kWh band.<sup>1</sup> Technological advancement, when combined with New Zealand's wind resource, provides a potentially major opportunity to utilise this renewable resource for electricity generation.

In 2005, the Ministry of Economic Development and the Energy Efficiency and Conservation Authority commissioned Energy Link Limited and MWH NZ Limited to develop a methodology that can be used to quantify the potential for the integration of wind generated electricity into the New Zealand electricity system and to undertake an initial application of this methodology<sup>2</sup>. Wind energy integration is defined as the ability of wind farms to connect to, and operate within, the New Zealand electricity supply network in a manner which is compatible with the day-to-day operation and short term security of the electricity supply system as a whole<sup>3</sup>.

Wind energy is currently in its infancy in New Zealand with penetration, a measure of installed wind capacity as a percentage of peak load, having reached only 2.5 percent by the start of 2005. The wind energy integration study finds that wind energy could potentially reach 35 percent penetration and have market share of 20 percent of total electricity generated. The initial analysis therefore indicates that there is potential for much higher levels of wind integration than we currently have.

Wind energy, as with other renewable energy sources, is an environmentally responsible alternative to energy derived from fossil fuels because generation does not produce carbon dioxide. Carbon dioxide emissions could be significantly reduced if the potential of wind energy was fully exploited. By contributing to the reduction of

<sup>1</sup> A similar study by the Energy Efficiency and Conservation Authority (EECA) in 2001, *Review of New Zealand's Wind Energy Potential to 2015*, identified that wind energy provided approximately 0.5% (150 GWh/y) of New Zealand's electricity and could potentially provide 23% (7,900 GWh/y) of 2001 electricity needs at costs of up to 10 c/kWh within 10-15 years.

<sup>2</sup> Energy Link and MWH NZ, *Wind Energy Integration in New Zealand*, May 2005

<sup>3</sup> Wind energy integration is quantified by its penetration and its market share. Penetration is defined as the ratio of installed wind capacity in MW to peak generation in MW, expressed as a percentage value (expressed relative to the peak demand of the country as a whole). Market share is the proportion of total annual generation (GWh) that is generated from wind (expressed relative to the total annual generation of the country as a whole).

greenhouse gases, the Te Waka wind farm would assist New Zealand in meeting its commitments under the Kyoto Protocol.

## **Contribution to Government's Policies and Objectives**

As stated above, the proposed Te Waka wind farm development contributes to the government's stated objectives for the energy sector (energy efficiency and security of supply with an increasing focus on renewables) and is consistent with the principles for sustainable development.

### *Security of Supply*

Ensuring security of electricity supply is a critical issue for all New Zealanders and for the government. There are two aspects to security of supply. Firstly, it is imperative to minimise the risk associated with dry years and secondly to ensure that New Zealand has the generation capacity over the long term to meet the projected growth in energy demand.

### Dry Year Risk

Heavy reliance on hydro-generated electricity leaves New Zealand vulnerable to the effects of dry years. 2001 was very dry in the South Island hydro catchments and 2003 was similarly severe, necessitating public electricity conservation campaigns. Dry years highlight the dependence of both consumers and industry on energy as a key element of infrastructure and, consequently, how essential security of supply is.

One of the considerable advantages of electricity generated by wind is that supply is not dependent on rainfall. The Te Waka wind farm could help ensure continued electricity supply for both New Zealand consumers and industry during dry periods.

### Growth in Energy Demand

A further aspect of security of supply is ensuring that New Zealand has the generation capacity to meet the forecasted growth in energy demand. The most recent *Energy Outlook* provided by the Ministry of Economic Development projects that the composition of New Zealand's energy supply and demand will change as the demand for energy increases, the Maui gas field declines and new technologies for the production, delivery and use of energy become more economically viable. It should be noted that several developments since 2003 mean that some of the Outlook's predictions, particularly for the supply side, are dated. In particular, the Outlook included Project Aqua, which would have delayed the need for more generation. Since the Outlook's publication, Meridian Energy Limited has announced that Project Aqua will not proceed.

The Energy Outlook considers a range of scenarios, all of which predict increased electricity demand, ranging from an average of 1.2 percent per annum to 1.8 percent per annum over the period to 2025<sup>4</sup>. There is some evidence to suggest that in the

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<sup>4</sup> Ministry of Economic Development, *Energy Outlook to 2025*, October 2003.

### Assumptions of the Energy Outlook's Reference Scenario:

- 2.5% p.a. GDP growth from 2007
- Oil prices rising from US\$20/bbl in 2004 to US\$25/bbl by 2020 and constant thereafter
- Constant exchange rate of NZ\$1.00 = US\$0.50 out to 2025

shorter term, increases in demand may be higher than these figures. Analysis of Grid Exit point data from 1999 indicates that electricity demand is currently increasing in the range of 2 to 2.5 percent on average per annum.

It is important that, as the means become available, New Zealand undertakes the transition to renewable energy sources to ensure that we have the capacity to accommodate the growth in demand and to compensate for the likely decline in the availability of indigenous gas. The Te Waka wind farm would contribute to the increased generation capacity required to satisfy demand while at the same time reducing New Zealand's dependence on non-renewable energy sources.

### *Sustainable Development Programme of Action for Energy*

The Sustainable Development Programme of Action is one of the Government's major overarching documents designed to guide and underpin policy development. Energy has been identified as one of the target areas for sustainable development because of its correlation to economic growth, potential environmental impact, and because both consumers and businesses are heavily reliant on its supply.

The major objective of the programme of action for energy is to ensure continued delivery of energy services to New Zealanders. It acknowledges that renewable energy sources, such as wind power, will become increasingly important in providing security of supply and in mitigating harmful effects that energy use can have on the environment.

A sustainable energy discussion document, which establishes a policy framework within which energy choices can be considered going forward, was released on the 27<sup>th</sup> of October 2004. The document states that sustainable energy must be:

- a) reliable and resilient;
- b) environmentally responsible; and
- c) efficiently and fairly priced.

There are a number of specific energy and energy and energy-related policies and strategies that contribute to sustainable energy objectives, including the National Energy Efficiency and Conservation Strategy, the climate change initiatives and the Government Policy Statement on Electricity Governance. The Te Waka wind farm proposal is consistent with the actions outlined in these documents<sup>5</sup>.

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- Pohokura gas available from 2007 and Kupe from 2008
  - New gas available from discoveries averaging 35 PJ p.a. for 2011-2013 and 60 PJ p.a. from 2014 onwards
  - North Island delivered coal prices at \$3.59/GJ in 2004 and at \$4.00/GJ from 2013 onwards and South Island delivered coal prices about \$3.00/GJ
  - As a result of the National Energy and Efficiency and Conservation Strategy, additional energy efficiency uptake above the normal rate of 0.5% p.a. for 2002-2005, 1.0% p.a. for 2006-2015 and 0.5% p.a. for 2016-2025
  - Forest industry growth, with the harvest rate increasing from 19 Mm<sup>3</sup> in 2001 to 33 Mm<sup>3</sup> in 2025 and the total amount processes increasing from 13 Mm<sup>3</sup> in 2001 to 19 Mm<sup>3</sup> in 2025.

<sup>5</sup> While the Te Waka wind farm would contribute to the outcomes identified in the Sustainable Development Programme of Action, we acknowledge that the load factor for a wind turbine means that wind power is not a predictable energy source over short time periods, such as a

### *National Energy Efficiency and Conservation Strategy*

The National Energy Efficiency and Conservation Strategy (NEECS) is the government's primary means to achieve outcomes sought in the sustainable development programme of action. The purpose of the NEECS is to facilitate the move towards a sustainable energy future for New Zealand by promoting energy efficiency, conservation, and a transition to the use of renewable energy sources.

The NEECS identifies two key policy directions that support New Zealand's movement towards a sustainable energy economy.

a) Ongoing improvement in our energy efficiency

Target: By 2012, energy efficiency throughout the economy will improve by at least 20 percent. This target is equivalent to a continual improvement rate of two percent per annum to 2012.

b) Progressive transition to renewable sources of energy

Target: By 2012, renewable energy sources will generate an additional 30PJ of energy above 2000 levels. In 2000, renewable energy sources provided 133.5PJ, or 29% of consumer energy. The target means that by 2012, renewable sources should generate a minimum of 163.5PJ of consumer energy, which would equate to approximately a 30-35% market share.

It is estimated that a wind farm development, like the Te Waka wind farm, could provide up to 405 million kilowatt hours of electricity a year, or 1.5 petajoules, which is approximately 5% of the renewable target.

### *Government Policy Statement on Electricity Governance*

The Government's overall objective for the electricity industry is to ensure that electricity is delivered in an efficient, fair, reliable and environmentally sustainable manner to all classes of consumer.

The government has identified a number of desired outcomes consistent with the above objective. The Te Waka wind farm would particularly contribute to achieving the following outcomes:

a) the electricity sector contributes to achieving the government's climate change objectives by minimising hydro spill, efficiently managing transmission losses and constraints, promoting demand-side participation and energy efficiency and removing barriers to investment in new generation technologies, renewables and distributed generation; and

b) risks relating to security of supply are properly managed.

### *Resource Management (Energy and Climate Change) Amendment Act 2004*

The Resource Management (Energy and Climate Change) Amendment Act 2004 has recently been passed by Parliament. It seeks greater alignment between local

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specific day or hour. However, New Zealand's considerable wind resource, relative to most other countries, means wind energy will be more reliable here than overseas.

government plans and national energy objectives outlined in the NEECS and climate change policies, and aims to ensure that councils consider the contribution their regions can make to meeting New Zealand's commitments under the Kyoto Protocol.

Specifically the Act has amended section 7 (other matters) of the RMA to require decision-makers to have particular regard to the efficient use of energy, the effects of climate change, and the benefits associated with the use and development of renewable sources of energy.

**4. The Ministry of Economic Development requests that the consent authority make the following decision:**

Approve the application for land use consent.

**5. The Ministry of Economic Development may wish to be heard in support of its submission, if any clarification of its position is required.**

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Attention: Stuart Calman