

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

To: Waikato District Council

Name: Ministry of Economic Development

Address: P.O. Box 1473, Wellington.

1. The Ministry of Economic Development (MED) supports the application of WEL Networks Limited for land use consent to construct and operate a wind energy development referred to as the Te Uku wind farm in the Waikato district, insofar 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:

MED considers that the Te Uku Wind Farm offers national benefits, by making use of a viable and renewable energy source, helping ensure security of supply through diversification in electricity production methods, and by generating electricity in an environmentally responsible manner that avoids greenhouse gas emissions.

This submission seeks to ensure that the contribution Te Uku would make to achieving the government's energy objectives is taken into account in the consent decision.

Te Uku's contribution to government policies and objectives

The government is committed to a sustainable energy system. New Zealand needs to respond to climate change and reduce carbon emissions from our energy production and use. We also need to ensure our energy systems can deliver secure, clean energy at affordable prices to support economic development.

In the past six years, the government has introduced a number of specific energy and energy-related policies and strategies that contribute to a more sustainable energy system. They include:

- the Sustainable Development Programme of Action in 2003, which sets out principles for sustainable development policy and decision-making. Energy is one of four action areas identified in the programme;
- the Government Policy Statement on Electricity Governance¹, which outlines the overall objective for the electricity industry of ensuring that electricity is produced and delivered to all classes of consumer in an efficient, fair, reliable and environmentally sustainable manner and promoting and facilitating the efficient end use of electricity;

¹ Prepared under the Commerce Act 1986.

- the National Energy Efficiency and Conservation Strategy (NEECS)² in 2001 (addressed in more detail below);
- amendments to section 7 of the RMA, addressed in more detail below;
- the establishment of the Electricity Commission in 2003; and
- the commissioning of a 155 MW generation plant in Hawke's Bay to provide some of the necessary reserve energy.

More recently, the government released its draft New Zealand Energy Strategy, and a replacement to the NEECS: the New Zealand Energy Efficiency and Conservation Strategy. These two documents set out the government's objectives and policies for moving towards a sustainable energy future.

New Zealand Energy Strategy

In December 2006, the Government released the draft New Zealand Energy Strategy to 2050. The final Strategy is expected to be released in October 2007. The draft Strategy sets out the Government's vision of a sustainable energy system and describes the actions that will be taken to make this vision a reality.

The draft vision is for "a reliable and resilient system delivering New Zealand sustainable, low emissions energy". This vision will be supported by action in six thematic areas.

Te Uku would contribute to three of these areas, and through them, support the government's vision. Te Uku would help:

- maintain high levels of security and reliability at competitive prices
- maximise the proportion of energy that comes from our abundant renewable energy resources
- reduce our greenhouse gas emissions.

How it would contribute is set out in more detail below.

Security and reliability at a competitive prices

Ensuring security of electricity supply is a critical issue for all New Zealanders and the government, and is a key component of the draft New Zealand Energy Strategy. Supply interruptions and steeply rising prices cause social stress and hardship. Ensuring supply is reliable and resilient is achieved by securing energy supplies, using energy efficiency and avoiding waste.

There are two aspects to security of supply. First, it is important to minimise the impact of dry years by diversifying energy sources. Second, New Zealand needs enough capacity to meet the projected growth in energy demand.

Minimising the impact of dry years

New Zealand's heavy reliance on hydro-generated electricity leaves it vulnerable to the effects of dry years. Dry years were experienced in 2001 and 2003.

One of the considerable advantages of electricity generated by wind is that it can help complement hydro-generation. Typically, there is still wind available in dry years or expected periods of low rainfall, allowing water to be conserved, and reducing reliance on fossil-fuelled generation.

² Prepared under the Energy Efficiency and Conservation Act 2000.

Meeting growth in energy demand

Demand for electricity is growing. Electricity demand is predicted to increase by an average of 1 to 1.5 percent per annum over the period to 2030³. There is some evidence to suggest that in the shorter term, increases in demand may be higher than these figures. Data from 1999 to 2005 indicates that electricity demand is increasing in the range of 2 to 2.5 percent per annum on average.

Energy efficiency and conservation measures, along with technologies such as solar water heating, are vital and necessary parts of New Zealand's future energy mix. However, these measures and technologies will not be enough to offset the need for new generation in the short to medium term. There is a pressing need to build new generation capacity to meet this growth in demand.

MED estimates that between 100 and 150 MW of new thermal-equivalent electricity generation is needed each year to meet the growth in electricity demand. For wind, which has approximately half the capacity factor of thermal generation, this would translate to approximately 200 to 300 MW each year.

Te Uku, at a maximum of 84 MW, would contribute to the increased generation capacity required to satisfy demand, while reducing New Zealand's dependence on non-renewable energy sources.

Promoting reliability

Although electricity supply can never be completely reliable, resilience in the energy system helps maintain the ability to deliver electricity. Resilience is the capacity of the energy system to absorb and recover from shocks and to respond to gradual changes. A key source of resilience is increasing the diversity of energy sources, such as wind energy.

Wind is an intermittent resource, and this intermittency will need to be carefully factored into electricity systems operations. However, Te Uku will also promote a reliable electricity supply through its geographical location. Most of New Zealand's existing wind farms are located in the Manuwatu⁴. Spreading wind farms across New Zealand reduces the risk of disruptions to the electricity supply if the wind is not blowing at a particular location.

While wind can be highly variable over short periods, it is relatively reliable over timeframes greater than a month. The inter-annual wind electricity variation is typically 10 percent, compared with a rainfall variation of approximately 20 percent.

Fair and efficient pricing

Fair and efficient pricing of energy should reflect the relative scarcity or abundance of energy resources, and the costs of production, distribution and use. The availability of historically low cost energy has been a key component of economic growth and development, and for maintaining a high standard of living for New Zealanders. It is

³ Ministry of Economic Development, *Energy Outlook to 2030, September 2006, p.24-25* (<http://www.med.govt.nz/energy/eo/>)

⁴ The Wairarapa and Southland have existing wind farms. Other areas with consented (but not yet built) wind farms are in the Waikato, Hawkes Bay, Wellington and Auckland regions (although the Awhitu farm in Auckland is unlikely to be built). There are sites in South Taranaki, North Canterbury and Central Otago that are either seeking a consent or intend to apply.

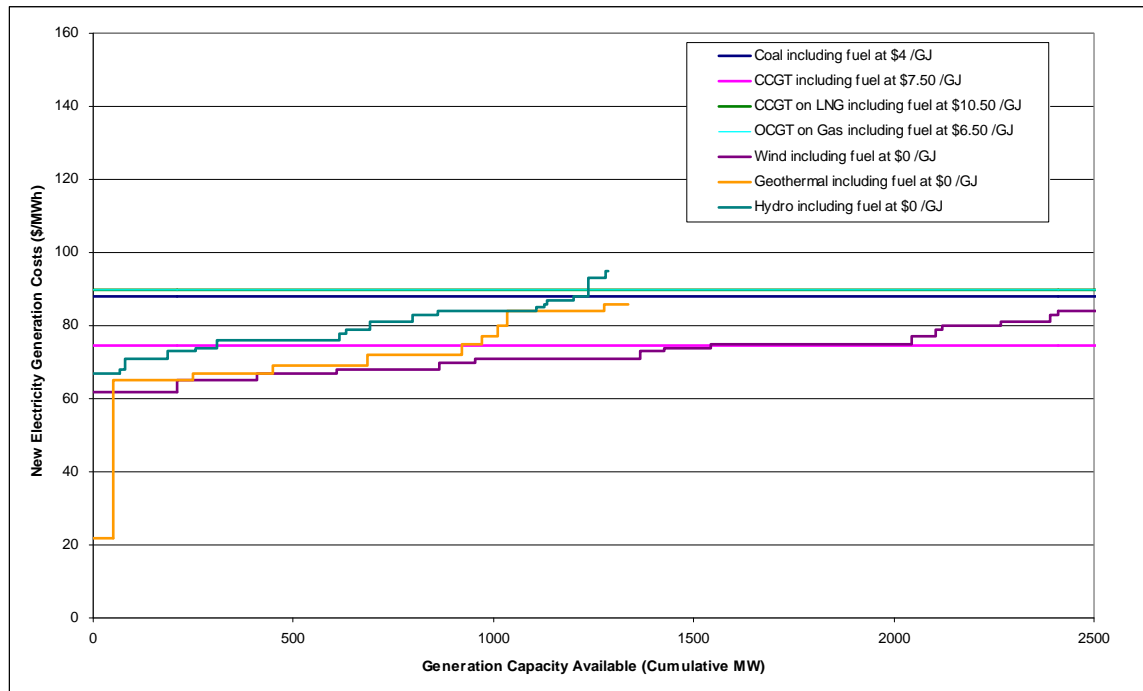
government policy that energy prices should, in principle, reflect the full costs of supply, including environmental costs.

Part of fair and efficient pricing is ensuring that cost-competitive forms of generation are brought into use in a timely fashion. If lowest cost options are not used, using more expensive sources will place upwards pressure on prices.

Figure 1 below shows the estimated costs of fossil fuel and renewable electricity generation for new capacity. The graph shows there are substantial quantities of renewable capacity that are likely to be less than or near the cost of fossil-fuel based generation, without allowing for the cost of greenhouse gas emissions. Wind is a lower-cost option than most other energy sources.

Increases to electricity costs can also be minimised by having a diverse array of energy sources. Fossil fuels can be subject to price shocks or supply disruptions, which can sharply increase thermal generation costs. As mentioned above, hydro-electricity is vulnerable to the effect of periods of lower than expected rainfall.

Figure 1: Typical costs for new electricity generation⁵



Maximising energy that comes from renewable resources

New Zealand relies heavily on hydro power for our electricity, with 55 percent of our electricity coming from hydro in 2006. A further 10 percent came from other renewable and waste heat sources⁶, and the remainder (34 percent) from fossil fuelled plants.⁷ New Zealand's electricity generation system can be described as a mixed hydro-thermal system, where hydro energy is used as much as possible, depending on lake levels, and thermal power stations run as necessary to make up the rest of the required supply.

⁵ Ministry of Economic Development. *Powering Our Future: Draft New Zealand Energy Strategy to 2050*, December 2006, page 52, updated for additional information provided for geothermal and from specific industry input. These cost curves are likely to be updated in the final NZES.

⁶ Predominately geothermal, with the rest made up of wind and biomass.

⁷ Ministry of Economic Development, *New Zealand Energy Data File*, June 2007.

However, New Zealand's energy composition is about to undergo change. With gas production from the Maui field declining in recent years and limited known alternative sources of indigenous gas, other forms of energy will be needed to fill the gap.

While New Zealand has a wealth of renewable energy resources, economic and consentable sites are limited. Many of the best hydro sites have already been developed, and resource consent issues exist for the remainder. Geothermal is limited to certain parts of New Zealand and is subject to resource sustainability constraints. Bio-energy, using wood or methane collected from landfills, is likely to continue playing a small role. Solar energy is not extensively used because of its cost. Harnessing marine energy may be a potential future source of energy, if robust and cost-effective technologies can be developed.

Wind energy is the most likely renewable energy source that could be used to meet growing demand for electricity. 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.

There are, however, a finite number of sites that have prime wind resources and are feasible for wind energy development. It is important to maximise our use of these quality resources by consenting projects such as Te Uku.

Reducing greenhouse gas emissions

The energy system has global and local environmental effects. The key global environmental concern is climate change. Without more effective international action to reduce greenhouse gas emissions, the likely effects of climate change in New Zealand include rising average temperatures, rising sea levels, more frequent extreme weather events and a change in rainfall patterns. Globally, the major greenhouse gas generated by human activity is carbon dioxide from energy use.

Greater use of renewable energy resources that have low emissions of greenhouse gases is one option for reducing the emissions of greenhouse gases, and ultimately the climate change impacts, of energy use.

Te Uku is an environmentally responsible alternative to fossil-fuelled electricity generation. It will not produce greenhouse gas emissions such as carbon dioxide or air pollutants such as sulphur dioxide during its operation. By commissioning new renewable electricity generators, there is the potential to prevent or reduce greenhouse gas emissions from new or existing fossil-fuelled plants.

If Te Uku does not go ahead and the electricity came from a gas-fired generator, approximately 92,000 tonnes of carbon dioxide would be released each year. If the electricity came instead from a coal-fired generator, approximately 240,000 tonnes would be released each year. Te Uku has clear national benefits, as it would help New Zealand meet its international climate change obligations and avoid the economic consequences of not doing so.

National Energy Efficiency and Conservation Strategy

The National Energy Efficiency and Conservation Strategy (NEECS) is a statutory requirement under the Energy Efficiency and Conservation Act 2000. The purpose of this Act is to promote energy efficiency, energy conservation and the use of renewable sources of energy.

The NEECS was intended 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. One of its two goals is for a progressive transition to renewable sources of energy. Its target was to generate an extra 30 petajoules (PJ) of energy above 2000 levels by 2012.

Te Uku could provide up to 256 gigawatt hours each year, or almost 1 PJ of energy. This is approximately three percent of the renewable target.

A draft replacement New Zealand Energy Efficiency and Conservation Strategy (NZECS) was released in December 2006 for consultation with the draft New Zealand Energy Strategy and climate change policy options. It is a subset of the NZES and contains sector-based action plans that would support the Energy Strategy's energy efficiency and renewable energy objectives. They are:

1. Maximising how efficiently we use our energy to safeguard affordability, economic productivity and our environment; and
2. Maximising the proportion of energy that comes from our abundant renewable energy sources.

In particular, the draft NZECS sets the objective for clean electricity and heat – more energy from renewable energy sources for the electricity sector. The draft does not set specific targets, but indicates that targets for the electricity sector are under consideration. These will not be finalised until the final strategy is released alongside the New Zealand Energy Strategy.

Resource Management (Energy and Climate Change) Amendment Act 2004

In 2002, the Government decided to provide a stronger mandate to councils to encourage energy efficiency and renewable energy generation (CAB Min (02) 27/3A). The result was the passing of the Resource Management (Energy and Climate Change) Amendment Act in 2004 and the inclusion of sections 7(ba), (i) and (j).

The amendment seeks greater alignment between local authorities' plans and national energy objectives outlined in the New Zealand Energy Efficiency and Conservation Strategy and climate change policies. The amendment aims to ensure that local authorities and consent authorities consider the contribution their regions and districts can make to meeting New Zealand's commitments under the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

The amendment to section 7 requires 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. The Ministry considers all of these matters in section 7 to be met by the Te Uku proposal.

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.**

David Smol
Deputy Secretary
Resources and Networks Branch
Ministry of Economic Development

Address for Service: P.O. Box 1473
Wellington

Attention: Stuart Calman