



07/03

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

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

**1. The Ministry of Economic Development (MED) supports the application of Contact Energy Limited for land use consent to construct and operate a geothermal energy development referred to as Te Mihi, north of Lake Taupo. MED supports the application 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 Mihi geothermal power station 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 Mihi would make to achieving the government's energy objectives is taken into account in the consent decision.

*Te Mihi'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 New Zealand Energy Strategy to 2050 (October 2007), which sets out a path to a sustainable low emissions energy system (addressed in more detail below);
- the New Zealand Energy Efficiency and Conservation Strategy<sup>1</sup> (October 2007)
- the introduction of an Emissions Trading Scheme (ETS) to address climate change. This is to be implemented progressively from 2008 to include all sectors of the economy by January 2013.
- 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;

<sup>1</sup> Prepared under the Energy Efficiency and Conservation Act 2000.

- the Government Policy Statement on Electricity Governance<sup>2</sup>, 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;
- amendments to section 7 of the RMA (addressed in more detail below);
- the preparation of a National Policy Statement on Renewable Energy; and
- the establishment of the Electricity Commission in 2003.

### *New Zealand Energy Strategy*

In October 2007, the Government released the New Zealand Energy Strategy to 2050 (NZES). The NZES sets out the Government's vision of "a reliable and resilient system delivering New Zealand sustainable, low emissions energy services, through:

- Providing clear direction for the future of New Zealand's energy system;
- Utilising markets and focused regulation to securely deliver energy services at competitive prices;
- Reducing greenhouse gas emissions, including through an emissions trading scheme;
- Maximising the contribution of cost-effective energy efficiency and conservation;
- Maximising the contribution of cost-effective renewable energy resources while safeguarding our environment;
- Promoting early adoption of environmentally sustainable energy technologies;
- Supporting consumers through the transition".

As part of the Strategy, the government has set a target that 90 percent of our electricity be generated from renewable sources by 2025.

Te Mihi would make a significant contribution to the government's renewable electricity target. It would help New Zealand move towards a sustainable energy system by:

- securely delivering energy services at competitive prices;
- maximising the contribution of cost-effective renewable energy resources while safeguarding our environment; and
- reducing New Zealand's greenhouse gas emissions.

This is discussed in more detail below.

### ***Security and reliability at a competitive prices***

Maintaining security of energy supply at competitive prices is essential for a modern economy. Supply interruptions and steeply rising prices cause social stress and hardship.

Long-term security of supply requires:

- Building enough generation capacity to meet peak demands;
- Ensuring there is enough fuel (taking into account the uncertainty of hydro inflows and wind flows) to generate sufficient electricity at all times;

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<sup>2</sup> Prepared under the Electricity Act 1992.

- Building and maintaining a transmission system to convey power from generation plants to consumers, particularly at peak times; and
- Making the most of cost-effective energy efficiency opportunities.

Te Mihi would contribute to security of supply by increasing capacity to meet peak demand and ensuring there is enough fuel to generate electricity at all times.

### **Building enough generation capacity to meet peak demand**

Demand for electricity is growing. Electricity demand is projected to grow at around 1.3 percent per annum over the period to 2030<sup>3</sup>.

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.

New Zealand currently has around 6100 MW of renewable generation capacity, and 2700 MW of fossil fuel generation, providing around 40,000 gigawatt hours of electricity. Under current forecasts, electricity demand is expected to grow by around 24% by 2025, which would require approximately 3500 MW of additional generation capacity to maintain security of supply.

Te Mihi is intended to replace the Wairakei Power Station, which is nearing the end of its life. Wairakei was sited close to the Waikato River because of it needed to discharge cooling water into the river. Te Mihi does not have this requirement and as a modern plant sited on the steamfield, will be more efficient than Wairakei.

Wairakei currently generates approximately 157 MW of electricity. When it is decommissioned in 2026, and if Te Mihi does not go ahead, this generation shortfall would need to be made up elsewhere.

Te Mihi, by generating sufficient electricity to replace Wairakei, and by providing an additional capacity of 60 MW, would contribute to the increased generation capacity required to satisfy demand, while reducing New Zealand's dependence on non-renewable energy sources.

### **Ensuring there is enough fuel to generate at all times**

Diversification of generation types and location is also important for ensuring there is enough fuel to generate electricity.

Around 60 percent of New Zealand's electricity is generally from hydro generation. 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 advantages of electricity generated from geothermal sources is that it is not subject to variations in rainfall or in wind; hence it can be used as baseload generation.

### **Competitive 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

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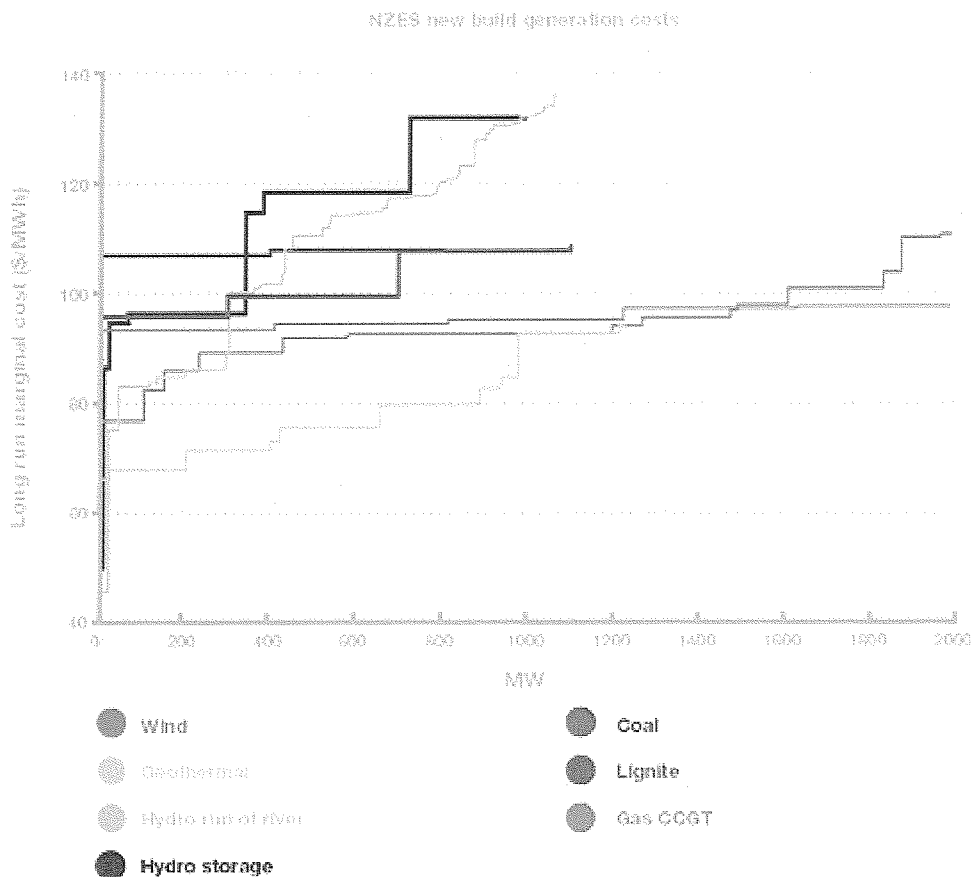
<sup>3</sup> Ministry of Economic Development, *New Zealand Energy Strategy to 2050*, October 2007, p 72.

maintaining a high standard of living for New Zealanders. It is 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.

The government is intending to introduce an emissions trading scheme (ETS), which will put a price on greenhouse gas emissions from thermal electricity generation. Under an ETS, the electricity sector will face the costs of greenhouse gas emissions from 2010. Electricity generated from fossil fuels will cost more to produce. Figure 1 below shows the estimated costs of fossil fuel and renewable electricity generation for new capacity (assuming medium term emissions price of \$25/tonne of CO<sub>2</sub>-e and a \$9/GJ gas price). The graph shows that new geothermal, wind and combined-cycle gas turbine (CCGT) are all available at around the same price. With increasing emissions and gas prices, the economic viability of New Zealand's geothermal resources becomes even more compelling.

**Figure 1: Typical costs for new electricity generation<sup>4</sup>**



Increases to electricity costs can also be mitigated 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.

<sup>4</sup> Ministry of Economic Development, *New Zealand Energy Strategy to 2050*, October 2007, p.38

## ***Maximising energy from renewable resources***

As mentioned above, New Zealand relies heavily on hydro power for our electricity, with approximately 60 percent generated from hydro. A further ten percent comes from other renewable and waste heat sources<sup>5</sup>, and the remainder from fossil fuelled plants<sup>6</sup>. 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.

However, New Zealand's energy composition is about to undergo change. The government has set a target of 90 percent electricity to come from renewable sources by 2025. This will require substantial increases in renewable electricity generation.

The Government believes there is no need for new baseload fossil fuel generation in the short to medium term. The government has introduced to the House the Climate Change (Emissions Trading and Renewable Preference) Bill that will restrict the construction of new baseload fossil-fuelled electricity generation for the next ten years, except to the extent necessary to ensure the security of New Zealand's electricity supply. This makes it especially important that consents for new renewable generation are approved.

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. There is considerable interest in wind energy, but good, consentable sites are also limited and the intermittency of wind needs to be carefully managed. Bio-energy, using wood or methane collected from landfills, is likely to continue playing a small role. Solar energy is not yet extensively used because of its cost. Harnessing marine energy is a potential future source of energy, assuming robust and cost-effective technologies are developed.

Geothermal energy also faces constraints. It is limited to certain parts of New Zealand, and can be subject to resource sustainability issues. As mentioned above, one of the considerable advantages of electricity generated from geothermal sources is that it is not subject to variations in rainfall or in wind, and can be used as baseload generation. It is therefore important to maximise our use of quality resources by consenting projects such as Te Mihi.

## ***Reducing greenhouse gas emissions***

The energy system has global and local environmental effects. A 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. A number of actions are being undertaken both internationally and nationally to combat climate change, including the emission abatement targets set by the Kyoto Protocol and development of an emission trading scheme.

Greater use of renewable energy resources with lower emissions of greenhouse gases will reduce greenhouse gas emissions, and ultimately the climate change impacts, of New Zealand's energy use.

Te Mihi is an environmentally responsible alternative to fossil-fuelled electricity generation. While it will produce greenhouse gas emissions, the levels produced are lower than for either

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<sup>5</sup> Predominately geothermal, with the rest made up of wind and biomass.

<sup>6</sup> Ministry of Economic Development, *New Zealand Energy Data File*, June 2007.

gas or coal-fired generation. The application states that Te Mihi would release approximately 83,000 tonnes CO<sub>2</sub>-e per annum.

Until Wairakei retires in 2026, if Te Mihi does not go ahead, and the additional capacity (60 MW) came from a coal fuelled generator approximately 550, 000 tonnes of CO<sub>2</sub>-e would be released per annum. If gas-fired generation was the alternative, approximately 234,000 tonnes would be released.

Once Wairakei is decommissioned in 2026, if Te Mihi does not go ahead and the total capacity (220 MW) came instead from a coal-fuelled generator, approximately 1.6 Million tonnes of CO<sub>2</sub>-e would be released per annum. If a gas-fired generator was the alternative approximately 680,000 tonnes of would be released per annum.

Te Mihi has clear national benefits in helping New Zealand meet its international climate change obligations and avoid the economic consequences of not doing so.

### ***Resource Management***

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 sought 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 aimed 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 Mihi proposal.

As one of the actions under the New Zealand Energy Strategy, the government is preparing a national policy statement on renewable energy under the RMA to provide further guidance to consent authorities on the national benefits of renewable energy. This policy statement is expected to be notified in 2008. While it is under development, it signifies the importance to the government of renewable energy projects.

**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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