

BEFORE THE BOARD OF INQUIRY

STATEMENT OF EVIDENCE OF DR RICHARD MICHAEL HAWKE

INTRODUCTION

1. My full name is Dr Richard Michael Hawke. I am the Manager of the Energy and the Environment Group, Energy and Communications Branch of the Ministry of Economic Development. I am responsible for leading sustainable energy policy across central government.
2. I have worked on energy and environmental policy in central government for the past three and a half years. I have been a manager with the Ministry for the past 2 years. I hold a BA (Hons), MBA and a PhD (geography). Prior to moving to central government, I was a senior lecturer at Victoria University of Wellington, teaching and researching in physical geography and environmental science.
3. The Minister for the Environment considered the Te Mihi geothermal power station to be of national significance and consequently called in the proposal. He considered Te Mihi to be of national significance as;
 - the proposal is relevant to New Zealand's international obligations to the global environment in terms of the Kyoto Protocol.
 - geothermal systems are a natural resource that is limited to a small area of New Zealand. This proposal will involve a significant use of this limited resource when viewed in the context of the totality of geothermal systems available for development; and,
 - the proposal will assist in achieving the target set out in the New Zealand Energy Strategy to 2050 (NZES) of 90% of electricity to be from renewable energy sources by 2025.
4. My evidence goes into more detail into these three factors. I will particularly focus on the contribution the proposed Te Mihi geothermal power station would make to achieving the Government's policies and objectives for the energy sector. My evidence does not comment on the environmental effects or implications of the application.
5. In my evidence, I will deal with the following matters:
 - New Zealand's Current Electricity Supply Composition (paragraph 8 to 9);
 - The New Zealand Energy Strategy (paragraph 10 to 19);
 - A Sustainable Energy System (paragraph 20 to 48);

- Government Policy Statement on Electricity Governance (paragraph 49 to 51);
 - The Resource Management Act 1991 (52 to 56)
6. To the extent that my evidence addresses matters of government policy, I have been authorised by the Minister of Energy to give this evidence on behalf of the Ministry of Economic Development.
 7. In writing my evidence, I have drawn from several publications. They include the New Zealand Energy Data File, the New Zealand Energy Strategy to 2050 and New Zealand Energy Greenhouse Gas Emissions 1990-2006. All of these documents are published by the Ministry.

NEW ZEALAND'S CURRENT ELECTRICITY SUPPLY COMPOSITION

8. New Zealand relies heavily on hydro power for its electricity. In the 2007 calendar year, 57% came from hydro. A further 12% came from other renewable and waste heat sources, mainly geothermal, with the rest made up from wind, biomass and biogas. The remainder came from fossil fuelled plants. New Zealand's electricity generation system can be described as a mixed hydro-thermal system, in which 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.
9. However, New Zealand's electricity source composition is undergoing significant change. The government wants New Zealand to have 90 percent of its electricity generated from renewable resources by 2025. This will require substantial amounts of new renewable capacity to be installed. I will speak about the renewable target later when I talk about the government's energy policy context.

NEW ZEALAND ENERGY STRATEGY TO 2050

10. New Zealand, like the rest of the world, faces two major energy challenges. The first is to respond to the risks of climate change by reducing the greenhouse gas emissions caused by the production and use of energy. The second is to deliver clean, secure, affordable energy while treating the environment responsibly.

11. In October 2007, the Government released its New Zealand Energy Strategy to 2050 and the New Zealand Energy Efficiency and Conservation Strategy. The Energy Strategy sets out the government's vision of a reliable and resilient system delivering sustainable, low emission energy services, and describes the actions that will be taken to make this a reality. It specifically responds to the challenges of providing enough energy to meet the needs of a growing economy, maintaining security of supply and reducing greenhouse gas emissions.
12. The 2007 New Zealand Energy Efficiency and Conservation Strategy replaces the National Energy Efficiency and Conservation Strategy 2001. It is the government's detailed action plan to maximise energy efficiency and renewable energy. It is a requirement of the Energy Efficiency and Conservation Act 2000.
13. The Energy Strategy has set a target of 90% of electricity to be generated from renewable sources by 2025. The government believes that increasing the proportion of renewable electricity is an affordable option for New Zealand, using current technology and our indigenous resources, and that it is the best choice for a sustainable economy and environment.
14. Modelling done by the Ministry of Economic Development as part of developing the Energy Strategy shows that there are sufficient quantities of renewable energy sources available to meet the government's target.
15. However, there are limited opportunities for new hydro power developments, particularly on the scale of those built in the past because many of the best sites have already been developed and resource consent issues exist for the remainder. Bio-energy, using wood or methane collected from landfills, is likely to continue playing a small role. Solar energy is not yet extensively used in New Zealand, mainly because of its cost. Ocean power, including wave, current and tidal energy, may be a potential future source of renewable energy for New Zealand if robust and cost-effective technologies can be developed.
16. The two most likely sources of energy to supply our future needs are geothermal and wind. New Zealand has an abundant supply of geothermal resources and there is significant potential to develop this energy source.

17. While New Zealand has significant geothermal resources, the high temperature geothermal systems that can generate electricity are limited to a small part of New Zealand: the Taupo volcanic zone in the Waikato and Bay of Plenty. There is another high temperature resource zone in Northland. The proposed Te Mihi project will involve a significant use of this limited resource when viewed in the context of the totality of geothermal systems available for development.
18. One of the key advantages of electricity generated from geothermal sources is that it is not subject to variations in rainfall or in wind and hence it can be used as baseload generation. Geothermal electricity generation typically operates 95% of the time.
19. The government expects geothermal energy to contribute a substantial amount of our future electricity needs, as well as wind and some run of the river hydro schemes. The exact mix will be determined by the commercial decisions generators make when investing in new generation.

A SUSTAINABLE ENERGY SYSTEM

Security of Electricity Supply

20. Ensuring security of supply is a critical issue for all New Zealanders and the government. Supply interruptions cause social stress and hardship. Ensuring that supply is reliable and resilient is achieved by securing energy supplies, using energy efficiently and avoiding waste. Reliable energy comes at a cost, and absolute reliability is unachievable.
21. There are two components to security of supply: meeting demand for electricity and promoting resilience in the electricity system.

Demand for electricity

22. Demand for electricity is growing, and new generation needs to be commissioned to meet it. New Zealand currently has around 6,100 MW of renewable generation capacity and 2,700 MW of fossil fuel generation, providing around 40,000 gigawatt hours of electricity per year.

23. Under current forecasts, electricity demand is expected to grow by around 24% by 2025, which would require approximately 3,500 MW of additional generation capacity to maintain security of supply.
24. 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.
25. The government has made it clear that it prefers all new generation to be renewable, except to the extent needed for security of supply. Through the Climate Change (Emissions Trading and Renewable Preference) Bill, the government intends to amend the Electricity Act 1992 to restrict new baseload fossil-fuelled generation. This makes it doubly important that proposals such as Te Mihi are granted consent.
26. Te Mihi is intended to replace the existing Wairakei Power Station, which is nearing the end of its life. Wairakei currently has a generation capacity of 157 MW. I understand that it is due to be decommissioned in 2026.
27. Te Mihi will generate sufficient electricity to replace Wairakei, with an additional capacity of 60 MW. In total, Te Mihi will have a generation capacity of 220 MW.
28. As a geothermal power station, Te Mihi will not be subject to variations in rainfall or in wind and hence will be able to be used as baseload generation.
29. Te Mihi would make a significant contribution to the increased generation capacity required to satisfy demand, while at the same time reducing New Zealand's dependence on non-renewable energy sources.

Promoting resilient energy systems

30. Although energy supply can never be completely reliable, resilience in the system helps maintain the supply of electricity. Resilience is the ability to absorb and recover from shocks, and to learn, innovate and respond successfully to gradual changes and trends. A key source of resilience is through diversifying sources of energy.

31. Our heavy reliance on hydro-generated electricity leaves us vulnerable to the effects of dry years. For example, 2001 and 2003 were very dry in the South Island hydro catchments, resulting in public electricity conservation campaigns to avoid supply interruptions. Indeed this year, 2008, New Zealand is also experiencing below average rainfall in our hydro catchments.
32. Te Mihi, if consented, would help diversify New Zealand's energy sources, thereby increasing the electricity system's resilience to dry years and shocks.

Maximising Electricity from Renewable Resources

33. The other two aspects of a sustainable energy system are maximising the electricity we generate from renewable resources and reducing New Zealand's greenhouse gas emissions. The two are clearly interlinked as renewable electricity has low or no emissions.

Greenhouse gas emissions

34. Over the past decade, climate change has emerged as the major global environmental impact of energy use. Burning fossil fuels for energy produces gases, particularly carbon dioxide. These accumulate in the Earth's atmosphere enhancing the natural 'greenhouse effect.' Over time, this changes the earth's climate.
35. Climate change is real, and it is happening. The government considers that finding effective and long-term solutions to climate change is one of the most important tasks facing New Zealand and the world today. How we respond now will determine New Zealand's future: our economy, our environment and our community.
36. International commitment to reducing greenhouse gas emissions has grown over recent years, particularly with the development and ratification of international agreements such as the Kyoto Protocol.
37. New Zealand ratified the Kyoto Protocol in December 2002, with a target of reducing emissions to 1990 levels. This means that New Zealand is liable for any emissions above 1990 levels for the period 2008 to 2012. The Kyoto Protocol came into force on 16 February 2005.

38. New Zealand is committed to meeting its Kyoto Protocol obligations by returning emissions to (on average) 1990 levels over the first commitment period (2008 to 2012). Long term, the challenge for New Zealand is to reduce its 1990 levels even further by achieving a low-carbon economy and ultimately carbon neutrality.
39. Until recently it was thought that New Zealand was well situated to meet its Kyoto obligations. However stronger than expected growth in the economy, as well as analytical adjustments in carbon accounting, have meant that New Zealand faces a greater than anticipated challenge in meeting this target. We have gone from a situation that identified benefits for New Zealand to a situation where we will have to pay the international price for emissions that occur during the 2008-2012 period that are in excess of 1990 levels.
40. One of the steps New Zealand can take to reduce our greenhouse gas emissions is to improve the sustainability of our energy system through maximising electricity from renewable resources. As I have mentioned, the government aims to have 90 percent of electricity produced from renewable sources percent by 2025.
41. Geothermal is a low emission energy option. While it produces greenhouse gas emissions, the levels produced are lower than gas or coal-fired generation. The application states that Te Mihi would release approximately 83,000 tonnes CO₂ equivalent per annum once it is fully commissioned.
42. If Te Mihi does not go ahead and the total capacity came instead from a coal-fuelled generator, approximately 1.6 Million tonnes of CO₂ equivalent would be released per annum. If a gas-fired generator was the alternative approximately 700,000 tonnes of CO₂ equivalent would be released per annum.
43. Te Mihi would help reduce climate change impacts from electricity production, as it would avoid emissions from fossil-fuelled alternatives. The proposed Te Mihi geothermal power station would help New Zealand meet its international climate change obligations, and avoid the economic consequences of not doing so.

Renewables make economic sense

44. Building renewable projects like Te Mihi makes economic sense in an emissions trading scheme environment where emissions are priced.
45. The government believes pursuing renewable generation is not only environmentally preferable, but is likely to keep electricity prices lower than if we rely on more fossil fuel based generation that will need to bear the cost of its greenhouse gas emissions. Over time, a high renewable generation mix means that New Zealand's electricity prices will be less affected by emissions pricing than other countries that are more reliant on fossil fuel generation.
46. This analysis is supported by modelling done by the Ministry of Economic Development as part of the New Zealand Energy Strategy, provided economic renewable projects gain consent and are built.
47. Part of having fair and efficient electricity pricing is ensuring that cost-competitive forms of generation are brought into use in a timely fashion. If lowest cost options are not used, the use of more expensive sources will place pressure on prices.
48. As stated by the Applicant, Te Mihi is ideally located because of its close proximity to an expanding geothermal production zone, and its ready access to the electricity transmission grid. Consenting economic sites such as Te Mihi will help reduce upward pressure on electricity prices.

GOVERNMENT POLICY STATEMENT ON ELECTRICITY GOVERNANCE

49. The Government Policy Statement on Electricity Governance is prepared under section 172ZK of the Electricity Act 1992. It sets out the objectives and outcomes the Government wants the Electricity Commission to give effect to, including matters relating to renewables and transmission.
50. The GPS was reviewed earlier this year to ensure it reflected recent policy developments, notably the direction set out in the NZES. The GPS was released by the Minister of Energy in May 2008.
51. In relation to renewable electricity energy in the GPS, the government's objectives are that:
 - "Undue barriers to investment in renewables should be reduced or removed
 - The efficient uptake of renewable generation should be promoted

- The national transmission grid should be planned and made available so as to facilitate the potential contribution of renewables to the electricity system
- The specification of the grid planning processes and approval criteria should allow grid upgrade plans to facilitate the efficient and timely development of renewable generation resources, taking into account any difference in lead times for transmission and generation investment.”

THE RESOURCE MANAGEMENT ACT 1991

52. The government's desire to see more renewable energy generation projects granted consent under the RMA is reflected by the 2004 amendments to that Act that introduced sections 7(ba), (i) and (j) and provide that the benefits from the development and use of renewable energy are to be considered in consent processes.

53. Prior to the Resource Management (Energy and Climate Change) Amendment Act 2004 and the inclusion of sections 7(ba), (i) and (j), officials considered the lack of explicit mention of energy matters in the RMA to be problematic. There was a lack of guidance to consent authorities. After considering a paper in December 2002, the Cabinet Policy Committee agreed:

[...] that it is desirable to provide national direction [on renewable energy matters inter alia] and that an explicit reference to renewable energy in the Resource Management Act will assist in this regard

[...] to amend the Resource Management Act to require all persons exercising functions and powers under the Act to give greater weighting to the value of renewable energy.”

54. As a result, the Resource Management (Energy and Climate Change) Amendment Act 2004 seeks greater alignment between local authorities' plans and the government's energy and climate change policies. The Resource Management (Energy and Climate Change) Amendment Act 2004 aims to ensure that local authorities and consent authorities consider the contribution that 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.

55. As part of the Energy Strategy, the government agreed to prepare a national policy statement, or NPS, on renewable electricity generation, under section 45 of the RMA. This NPS is intended to ensure that the national benefits of

renewable electricity are fully considered and reflected in RMA plans, policy statements and consent decisions.

56. The government intends to refer the NPS to a Board of Inquiry to consider in August 2008.

CONCLUSIONS

57. In conclusion, the application of Contact Energy Ltd for resource consent to establish, operate and maintain a renewable energy development referred to as Te Mihi geothermal power station would make a positive contribution to achieving the government's vision of a sustainable, low emissions energy system.

58. In particular, it would:

- Contribute to achieving New Zealand's 90% renewable electricity target, a key target outlined in the New Zealand Energy Strategy;
- Improve New Zealand's security of supply, particularly during dry years;
- Promote resilience of the electricity system through diversifying energy sources; and
- Help New Zealand meet its climate change obligations by avoiding the need for electricity to be generated from fossil fuels.

59. The Ministry of Economic Development accordingly supports this proposal.