

**BOARD OF INQUIRY
TE MIHI GEOTHERMAL POWER STATION PROPOSAL**

In the Matter of the Resource Management Act 1991

And

In the matter of resource consent applications by Contact Energy Limited
in respect of the Te Mihi Geothermal Power Station Proposal

BRIEF OF EVIDENCE IN CHIEF OF DAVID THOMAS HUNT

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Introduction

1. My name is David Thomas Hunt. I am a director of Concept Consulting Group Ltd ('Concept').

Qualifications and Experience

2. I have the following qualifications and experience relevant to the evidence I shall give:
 - Bachelor of Arts degree in Statistics from Massey University awarded in 1984
 - Bachelor of Arts degree (First Class Honours) in Economics awarded by Massey University in 1985.
3. I have worked in the energy sector since 1994, in a range of public policy and senior executive roles.
4. Immediately before joining Concept Consulting Group, I was the Chief Executive of Contact Energy Limited, which at the time was the second largest company by market capitalisation on the New Zealand Stock Exchange.
5. In addition to my New Zealand experience, I have worked in the Australian energy market, and I am currently a non-executive director of Synergy Energy (Retail Electricity Corporation), the major electricity retailer in Western Australia, serving more than 800,000 customers.
6. My experience covers a wide range of issues including:
 - analysis and development of new generation projects
 - establishment of new energy retail operations
 - evaluation of merger and acquisition opportunities
 - analysis of regulatory issues.
7. Prior to my involvement with energy businesses, I held a number of senior roles with the New Zealand Government, including energy policy manager at the New Zealand Treasury, and economic adviser to the Minister of Finance.

Code of Conduct

8. I confirm that I have read the 'Code of Conduct for Expert Witnesses' contained in the Environment Court Consolidated Practice Note 2006. My evidence has been prepared in compliance with that Code. In particular, unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of Evidence

9. The purpose of my evidence is to outline the expected benefits from national and regional perspectives, if the Te Mihi geothermal power project goes ahead.
10. Concept prepared a report that assessed those benefits that was included with Contact's application documents when they were filed in July 2007. I was the Concept director with overall responsibility for preparation of the report.
11. I will therefore merely set out the conclusions I came to. The detailed reasoning that led me to those conclusions is set out in the Concept report, a copy of which is attached for convenience.
12. I will also identify areas where the Concept report has been overtaken by subsequent events and the conclusions reached need to be updated.
13. Finally, I will provide some comments on the practicability of a condition sought by Wind Farm Developments (Australia) Limited.

Summary of Conclusions

14. In the report the expected benefits of the Te Mihi project were compared to a base case of the Wairakei A and B stations operating until 2026, when they close because the existing consents expire and much of the plant will be almost 70 years old.
15. Compared to that base case, the Te Mihi project is expected to produce the following benefits:
 - **Significant additional electricity supply** - an average increase above the Wairakei A and B station output of 574 GWh/year in the period 2011-2026, based on data provided by Contact (see the evidence of

Mr Pummer). This increase is equivalent to the average production of the Karapiro hydro station, and would be sufficient to meet the energy requirements of approximately 70,000 households. For the period beyond 2026 when all of the Te Mihi project's output should be considered as providing additional supply, the station would add 1,650 GWh/year. This is more than the average combined output of the Karapiro, Atiamuri, Aratiatia and Waipapa hydro stations, and would be sufficient to meet the energy needs of approximately 200,000 households.

- **Avoids cost of alternative supply** - if the Te Mihi project does not proceed, other generation options will be required. Based on a review of publicly available estimates of the costs of new supply options, it appears likely that the alternative(s) would have a higher cost than Te Mihi. The cost increase could quite feasibly be in the order of 0.25 c/kWh. This would add \$60 million to electricity production costs over the first 25 years of the project.
- **Diversification benefits** - geothermal energy makes up a relatively small proportion of electricity generation. The Te Mihi project would therefore help to diversify New Zealand's electricity supply away from the existing major sources with their inherent exposure to weather and exploration risks (hydro, gas respectively).
- **Firm energy source** - the Te Mihi project is expected to generate continuously (aside from maintenance periods), unlike other renewable sources such as hydro or wind generation which are weather dependent.
- **Kyoto commitments** - the Te Mihi project is expected to displace other sources of generation with higher greenhouse gas emissions.
- **Reduced transmission losses** - electricity prices in the Wairakei region are typically a few percent higher than in the lower North Island, indicating that additional generation in the Taupo area is likely to reduce transmission losses. Estimates suggest the value of reduced losses to New Zealand could be approximately \$1 million per year.
- **Contribution to regional economy during construction phase** - construction of the Te Mihi power station would be a sizeable undertaking. It is estimated (see the evidence of Mr Pummer) that

during the 24 month construction phase, up to 400 people would be involved directly, and that the project would directly inject approximately \$50 million into the local economy. There are also likely to be indirect or flow-on benefits. For example, local contractors engaged for the project would have increased incomes, some of which is likely to be spent locally (e.g. on accommodation services). This spending would in turn raise incomes for other local providers (e.g. for accommodation), who in turn would spend some of their increased incomes. These effects are more difficult to quantify, but could raise the total regional impact to approximately \$90 million (based on the direct : indirect benefit ratio estimated in an independent study on the Marsden B power station repowering project).

- **Ongoing contribution to the regional economy** - the Te Mihi project is expected to have an ongoing positive regional impact, especially beyond 2026 when the existing Wairakei power station is likely to have ceased operation. This would take the form of employment of local staff and contractors for plant maintenance and development activities.
- **Cascade users** - the Wairakei Tourist Resort, New Zealand Education and Tourism Corporation (Netcor) and the Huka Prawn Park currently utilise some of the geothermal fluid created as a by-product of Contact's power generation within their own operations. Contact's ability to supply residual geothermal energy/fluid to these users is dependent on the continued operation of a generation facility drawing on the Wairakei steamfield. Without this, it would be more costly for the cascade users to meet the cost of tapping the geothermal resource. Developing the Te Mihi project should therefore provide a basis for continuing supply of geothermal fluid/energy to these cascade users.

Developments since Concept Report was prepared

16. After the Concept report was finalised, Central Government announced policy initiatives which, if followed through, are likely to affect some of the expected benefits from the Te Mihi project.
17. The policy initiatives were:
 - the progressive introduction of an economy-wide greenhouse gas emissions trading scheme (ETS) - with the power generation sector to be covered from 1 January 2010.

- a ten year moratorium on the construction of new fossil-fuelled electricity generation plant (unless the plant falls within specified exemption categories).
18. The key design elements for both initiatives are set out in the Emissions Trading Scheme and Renewables Preference Bill, which is currently before Parliament.
19. The main consequence of these initiatives (subject to any substantive legislative changes) is that development of new baseload thermal generation will effectively be ruled out during the moratorium period.
20. In the context of the Te Mihi project assessment, this has two main implications:
- the cost of not allowing the Te Mihi project to proceed is likely to be higher (because any new baseload thermal options that are cost effective will not proceed in the moratorium period); and
 - the greenhouse gas emissions saving from allowing the Te Mihi project to proceed is likely to be lower (because displacement of fossil-fuelled generation is likely to be limited to the effect on existing thermal plant).
21. Whilst the expected direction of change for each benefit is clear, it is not possible to quantify the differences at this point. In particular, it will be heavily influenced by the detail of the moratorium exemption provisions, and this information is not available at the time of preparing this evidence.
22. It is also worth noting that the Government has announced a target of meeting 90 percent of New Zealand's electricity needs from renewable sources by 2025.
23. To achieve this target will require a substantial rate of new renewable development. If annual demand growth averages around 0.6% per annum as assumed in the New Zealand Energy Strategy (which compares to historic rates of over 2%), this would imply the need for over 10,000 GWh of new renewable generation by 2025, or an increase of approximately 600 GWh every year. The Te Mihi project would be able to make a sizeable contribution to meeting this target.

Condition sought by Wind Developments (Australia) Limited

24. I have been provided with a copy of the submission of Wind Farm Developments (Australia) Limited and asked to discuss the practicability of the condition sought that “the project shall not result in the loss of generation from any existing or approved renewable generation projects as at the 7/03/08”.
25. My view is that the proposed condition is not workable under the current Electricity Governance Rules. The main reasons for this view are as follows:
- as explained in Section 6.5 of the Concept report, the system operator decides which generators will run during each half hour by selecting the combination of stations that yields the lowest expected overall cost. It uses the price/quantity offers submitted by generators to make this selection;
 - to meet the condition sought, Te Mihi generation would always need to be priced higher in the ‘offer stack’ than all “existing or approved renewable generation projects”;
 - for Contact to achieve this, it would need prior knowledge of the relevant generators’ half hourly offer prices, so it could ensure these offers are not undercut by Te Mihi during times when demand is insufficient for all relevant plant to run. It is hard to see how Contact could obtain this information from competitors without breaching the price fixing provisions of the Commerce Act;
 - an exception where Contact might have price information is wind generation, which must adhere to special provisions for intermittent generation in the market rules. Most generation, including schemes like Te Mihi, must offer a firm quantity and has discretion with respect to offer price. However, the market rules recognise that wind generation is intermittent (varying continuously with wind conditions) and provide for it to submit a non-firm ‘forecast’ of wind generation but only at \$0.01/MWh. In principle, Contact could be required to offer Te Mihi at a price above \$0.01/MWh to enable wind generation to be dispatched before it. However, this would affect Te Mihi’s competitive position relative to all wind generation, not just “existing and approved” projects. Such a condition might also be regarded as anti-competitive.

Furthermore, it would not address the position with respect to other forms of renewable generation;

- the overall situation would become even more difficult when, inevitably, additional new generation is approved and developed. For example, projects that gain approval subsequent to Te Mihi, whether renewable or not, could displace “existing or approved renewable generation projects”. To meet the proposed condition, Te Mihi offers would somehow need to take account of that too - requiring knowledge of the offers of the additional generators.

26. In short, there is no straightforward approach that Contact could adopt to meet the condition.
27. The only alternative would be for Contact to offer Te Mihi at a high price, and hold it back during any periods when it might conceivably compete with “existing or approved renewable generation projects”. In doing so, it would need to second guess how the market would clear and conservatively offer Te Mihi’s production so that it could be dispatched within its technical envelope. This would be incompatible with the intended role of Te Mihi as a baseload plant, and would be expected to have a material impact on project economics and resource efficiency. Such an approach could also have implications for market efficiency with other generation having to compensate for conservatism in Te Mihi offers.

D T Hunt