

IN THE MATTER of the Resource
Management Act
1991

AND

IN THE MATTER of the submission by
**GENESIS POWER
LIMITED** on the
Horizons Regional
Plan One Plan

STATEMENT OF EVIDENCE OF ROBERT JOHN WEIR

(19 OCTOBER 2009)

1. INTRODUCTION

- 1.1 I am the General Manager, Production, at Genesis Power Limited (trading as “**Genesis Energy**”), a position I have held since July 2006. Previously, I held the position of Engineering Services Manager at the Huntly Power Station, a position I held since July 2004.
- 1.2 I have worked in the electricity generation industry in New Zealand and Australia for the last 24 years.
- 1.3 I hold the degree of Bachelor of Electrical Engineering from the University of Queensland. I am a member of the Institute of Engineers Australia, a Certified Professional Engineer in Australia and a member of the Institution of Professional Engineers New Zealand.
- 1.4 I am responsible for the management of Genesis Energy's generation assets including the Tongariro Power Scheme, the Waikaremoana Power Scheme, the Hau Nui Wind Farm, and the Huntly Power Station. I am also responsible for trading wholesale electricity and thermal fuel management.
- 1.5 In this position, I am required to ensure that the supply of electricity from all Genesis Energy's hydro, thermal, co-generation and wind-powered plants are available to meet the Company's trading requirements. This involves the management of generating facilities across the Company as a whole, and leading the strategic planning process for these assets and their deployment in the market.
- 1.6 I have previously presented evidence in relation to the Proposed One Plan. My previous statement of evidence (dated 1 July 2008)¹ was presented at the Overall Plan hearing.

¹ Statement of Evidence of Robert John Weir, One Plan Hearing, 1 July 2008.

Scope of Evidence

1.7 In this evidence, I will cover the following subjects:

- Background to Genesis Energy's business.
- The importance of electricity and the generation of electricity from renewable resources.
- The implications of the Proposed Horizons Regional One Plan for Genesis Energy and the supply of electricity to New Zealanders, and the importance of the Tongariro Power Scheme to New Zealand and Genesis Energy.
- Conclude my evidence.

2. GENESIS ENERGY

2.1 Genesis Energy is a State Owned Enterprise (“**SOE**”) that commenced full operation in April 1999 following the split of the Electricity Corporation of New Zealand Ltd (“**ECNZ**”).

2.2 Genesis Energy has generation assets with a combined nominal generation capacity of approximately 2,020 MW, valued at approximately \$2 billion. Genesis Energy’s generation assets currently comprise:

- Three hydro generation schemes, being the Tongariro Power Scheme (“**TPS**”), the Waikaremoana Power Scheme and the Kourarau Power Scheme.
- The Hau Nui Wind Farm in South Wairarapa.
- The Huntly Power Station site, which incorporates four coal fired units, an open cycle gas turbine and a combined cycle gas turbine unit.

- 2.3 Genesis Energy generates electricity for sale to the wholesale market and to meet the needs of the Retail Group customers. It is one of the largest energy retailers in New Zealand, and has a retail customer base comprising approximately 680,000 electricity and gas customers located primarily in the North Island. Genesis Energy is able to provide an integrated service for households and businesses covering gas, electricity, toll calls and internet services.
- 2.4 As a State Owned Enterprise, Genesis Energy is bound by the State Owned Enterprises Act 1986 that requires Genesis Energy, among other things, to operate its assets in the same manner as a commercial business and to act as a good corporate citizen. To achieve this, Genesis Energy seeks to make the best use of the resources available to it for the benefit of the shareholder and for New Zealand.
- 2.5 Genesis Energy is committed to providing a secure and reliable supply of energy to New Zealand now and in the future.

3. POSTION ON ONE PLAN

- 3.1 The proposed One Plan has a significant influence on resource access and use, particularly in relation to the allocation and use of water. This is of particular interest to Genesis Energy in relation to existing operations such as the TPS and with respect to potential future hydro proposals.
- 3.2 As will be discussed by subsequent witnesses, Genesis Energy generally supports the approach taken in the Proposed One Plan with respect to existing hydro generation activities, but seeks some changes to clarify the approach taken.
- 3.3 In addition, given the Manawatu-Wanganui region's extensive natural water resources, Genesis Energy seeks that sources of potential future electricity generation are not unnecessarily restricted.

4. IMPORTANCE OF ELECTRICITY

- 4.1 New Zealand currently uses approximately 42,000 gigawatt-hours² (“GWh”) of electricity per year across the country which is used for a variety of activities. The New Zealand economy and the welfare of the population are dependent on a secure electricity supply, both now and for the years to come.
- 4.2 For many people and businesses, access to a secure energy supply has largely been taken for granted. Many require and expect electricity to be readily available and to be able to increase or decrease consumption at will, and recognise how important it is when supply cannot be guaranteed. Some every day examples of electricity use include municipal uses such as lighting, traffic lights; water supply; water treatment; sewage treatment and pumping; the operation of hospitals; the function of dairy sheds for example milking, cooling and processing; radio and TV broadcasting, office use for example computers; entertainment, our general living environment and domestic uses (cooking, hot water, lighting, heating and cooling), as well as keeping local and export industries operating.
- 4.3 As an indication of the importance of electricity to society, I note that reinstatement of electricity supplies is a high priority for electricity lines companies when inclement weather (such as recent snow falls on the Napier – Taupo road) results in the loss of supply to consumers. The reinstatement work will often be undertaken during adverse weather conditions and may involve linesmen working extended hours in order to re-establish the service.
- 4.4 In recognition of the important role that electricity plays in New Zealand society, Genesis Energy actively participates in Civil Defence emergencies as a Lifelines Utility. Lifeline utilities are entities that provide infrastructure services to the community such as water, wastewater, transport, energy and telecommunications in a way which enables the continuation of these services in emergency situations.

² Ministry of Economic Development, Quarterly Statistics, July 2009.

5. ELECTRICITY DEMAND / RENEWABLE ENERGY

- 5.1 In the year ending June 2009, approximately 70%³ of New Zealand's electricity generation came from renewable sources. Of this, approximately 79%⁴ was from hydro generation. In comparison to other systems around the world, New Zealand's hydro storage capacity is relatively small with typically only approximately six weeks of storage available to supply New Zealand's electricity needs. This can lead to power supply constraints, especially in winter due to low hydro storage, as has been evidenced regularly in past winters in New Zealand.
- 5.2 Even allowing for a considerable uptake of electricity efficiency gains, electricity demand is projected to grow at around 1.5% per annum⁵. There will also be periods of much higher local growth rates in areas of higher economic activity. A significant amount of new generation capacity will still be needed to meet this growth.
- 5.3 The New Zealand Energy Strategy ("**NZES**") anticipates that approximately 4,000 MW of new capacity will be required to meet demand growth between 2005 and 2030⁶ (assuming the status quo situation remains in respect of existing electricity supplies); otherwise New Zealand will require more energy than can be generated. The Energy Outlook anticipates that approximately 4,000 MW of new baseload capacity from geothermal, wind and hydro plant (with an additional 1,000MW of new gas and diesel peaking plant to support the new renewable generation) will be required. This projected generation requirement takes into account advances in energy use efficiencies and increased savings as more efficient electricity utilisation is commissioned.
- 5.4 The Genesis Energy response to increasing electricity demand has been to investigate and implement, as appropriate, a range of new generation facilities, enhancements to existing generation facilities, and measures to improve the efficiency of electricity use (demand side management). However, an important

³ Ministry for Economic Development, Quarterly Statistics, July 2009.

⁴ Ministry for Economic Development, Quarterly Statistics, July 2009.

⁵ New Zealand's Energy Outlook 2009, Reference Scenario, pg 6. A publication of the Ministry of Economic Development - www.med.govt.nz/energyoutlook ("**Energy Outlook**").

⁶ New Zealand Energy Strategy, October 2007, pg 72. This information has been recently updated in the Energy Outlook.

aspect to achieving New Zealand's electricity demand is to ensure that access to existing generation sources is maintained and protected. This is particularly important for existing renewable generation such as the TPS.

5.5 In this regard, and by way of an example and as I observed in my earlier evidence presented at the "General" One Plan hearing in July 2008⁷, when the TPS was initially commissioned it was able to generate up to approximately 1,800⁸ GW/h per annum (excluding any additional contribution made through the Waikato Hydro System) utilising the water naturally flowing in the relevant TPS river catchments. Following various agreements regarding flow regimes, the setting of minimum flows, and the establishment of new resource consent conditions (particularly during the 1990s and early 2000s) in order to address various environmental matters, the maximum output of the TPS is now limited to approximately 1,435⁹ GW/h per annum, a reduction of more than 20%. Any further increases in minimum flow requirements or allocations to other users that would constrain the operations of the TPS would result in further constraints to the supply of electricity from the TPS. As I will discuss further below, constraints on the TPS also impact the Waikato Hydro System.

5.6 The Manawatu – Wanganui region is important in that it contains extensive natural water which may potentially be able to be harnessed economically for renewable energy generation. In addition, these resources are reasonably close to the northern load centres and the national transmission grid. These matters are of such significance that further consideration should be given to identifying the benefits derived from hydro electricity proposals and certainly should not be restricted. This would further support current government policy regarding electricity generation.

⁷ Statement of Evidence of Robert John Weir, One Plan Hearing, 1 July 2008.

⁸ This is assuming no constraints.

⁹ This is taking into account constraints across both the Manawatu-Wanganui and Waikato regions.

6. GENESIS ENERGY'S INTEREST IN THE WATER ASPECTS OF THE HORIZONS REGIONAL ONE PLAN

The Tongariro Power Scheme

- 6.1 The TPS is located on the central volcanic plateau south of Lake Taupo, which will be discussed in further detail by Mr Bowler.
- 6.2 The TPS provides water to the Tokaanu (240 MW) and Rangipo (120 MW) power stations and uses a series of lakes, canals and tunnels to do so. Tokaanu Power Station is located on the slopes of Mount Tihia, near the township of Turangi, south of Taupo. Rangipo Power Station is situated underground in the Kaimanawa Forest Park, on the eastern side of the TPS.
- 6.3 The water from the TPS currently contributes approximately 1,800 GWh per annum¹⁰ (including Waikato River generation) to New Zealand's electricity supply – which is approximately 4% of the country's total electricity generation. The Tokaanu power station is also used as a frequency control station (controls the power system frequency) when required.
- 6.4 The TPS is unique in New Zealand in that water from the Horizons region diverted through the scheme is used in not only the TPS stations – in which Tokaanu uses water from the Whanganui catchment and from the Whangaehu and Moawhango catchments; and Rangipo, which uses water from the Whangaehu and Moawhango catchments – but enables Mighty River Power to generate an additional approximately 430 GWh¹¹ of electricity per year from the Waikato Hydro System. The water from the TPS also supports the generation of electricity at the Huntly Power Station by contributing to the cooling water taken from the Waikato River for the station. Any loss in water supplied to TPS is therefore lost to generation throughout the Waikato Hydro System and constrains generation at Huntly.

¹⁰ Based on typical Genesis Energy TPS generation and estimated Mighty River Power generation.

¹¹ Estimated Mighty River Power generation in evidence to TPS resource consent hearings.

6.5 The national importance of the TPS has been specifically noted by the Environment Court and it is a physical resource of significant importance to the nation. For example, the Environment Court stated:¹²

“[401] We have found that the TPD makes a significant contribution to the hydro electric production of New Zealand. It’s infrastructure, with its “sunk-costs” and existing capacity to produce 360MW - not to mention the re-use of the water down the Waikato River - reflects its contribution to the New Zealand economy...

[402] Clearly, it is in the national interests for the TPD structure to be as fully utilised as possible. The water and the waterways, utilised by the TPD, can in an average year and in the absence of providing any flows for environmental reasons, produce 1,801 GWh/yr of electricity. The potential generation has been reduced as a result of environmental constraints to a potential annual generation of 1,437 GWh/yr...” [Emphasis added]

6.6 When you include the contributions to the Waikato River system, the TPS can generate over 1,800 GWh. In this regard, the Environment Court stated:¹³

“[339]... In addition the water diverted into Lake Taupo, supplementing nine hydro power stations and eight dams on the Waikato River ... This gives a total 1,850 GWh/yr or about 8% of national renewable energy ... this equates to sufficient energy to supply some 237,180 households, which represents a population approximately half the size of Auckland, five times the size of Hamilton or ten times the size of Rotorua, based on Statistics NZ 2001 Census.”

Based on an “average” household use of 8000 kWh per year, 1,800 GWh per year would provide sufficient generation for approximately 225,000 households. According to the 2006 Census data, there are 85,194 households in total in the Manawatu-Wanganui Region and 140,982 households in total in the Waikato Region (a total of 226,176 households across both regions). On this basis, the TPS generates enough power to provide the equivalent of that consumed by almost all of the dwellings in both regions.

6.7 The provisions in the proposed One Plan have a major influence on the operation of the TPS. Genesis Energy therefore seeks that the provisions of

¹² *Ngati Rangi Trust v Manawatu-Wanganui Regional Council* (A67/04) at [402], and endorsed by the High Court in *Genesis Power*.

¹³ *Ngati Rangi Trust v Manawatu-Wanganui Regional Council* (A67/04) at [339].

the One Plan recognise the importance of the TPS, and protects this existing, significant piece of infrastructure supplying renewable electricity generation to the National Grid.

- 6.8 Genesis Energy has been involved in a lengthy process seeking resource consents for the operation of the TPS. This has involved wide consultation and detailed analysis of the catchments affected by the TPS, and assessment of appropriate minimum flows for these catchments. The resource consents granted for the operation of the TPS allocate water for the scheme and implement minimum flow requirements for the various catchments affected by the scheme. While the resource consents relating to the TPS activities within the Horizons region are still under appeal in relation to the duration of the consents granted, Genesis Energy has implemented the minimum flow requirements as if the consents were operative.
- 6.9 The establishment of the minimum flows for these rivers and the granting of resource consents for the TPS have involved processes that have taken almost 25 years, including the initial minimum flow hearings for the Whanganui River and subsequent resource consent processes for the TPS. This has meant that there has been considerable uncertainty over the authorisation status for the TPS for many years now, and there is the potential for the One Plan provisions to extend that period still further. Genesis Energy is very keen to see that uncertainty resolved as soon as possible, and to ensure that the effort that has been made over the last 25 years to establish appropriate flow regimes is not superseded by the Proposed One Plan.
- 6.10 I understand that the intention in preparing the Proposed One Plan is that the allocations made to existing hydro electricity generation schemes is maintained, and that the flow regimes established through the consent conditions and minimum flow provisions would be retained. Genesis Energy is fully supportive of that approach and requests that this be made explicitly clear in the One Plan provisions.
- 6.11 The resource consent conditions under which the TPS currently operates require that abstraction of water from the Whanganui River and its tributaries for the scheme ceases during periods of low flows in order to maintain the minimum flows prescribed for the Whanganui River. They can mean that

abstraction ceases for considerable periods of time (usually weeks but often months) during summer periods. This is further addressed in Mr Bowler's evidence. Any further suspension of taking during low periods would be detrimental to the operation of the TPS and would reduce further the generation of electricity from renewable sources. Genesis Energy therefore requests that no further suspension of taking occur in relation to the TPS during low flow periods other than what is already provided for in its resource consents.

- 6.12 Mr Bowler will discuss the TPS in more detail and will discuss the present minimum flow provisions applying to the scheme, and the resource consents granted on the basis of present Horizons Regional Council policies.

7. CONCLUSION

- 7.1 Genesis Energy currently owns and operates a diverse range of assets essential for maintaining an effective generation business. The assets include co-generation, wind generation, hydro generation and thermal generation power stations as well as a significant retail customer base and investment in gas resources.
- 7.2 New Zealand depends on the utilisation of natural and physical resources (water, land, air and structures) for the generation of hydro, thermal, and wind powered electricity.
- 7.3 Genesis Energy believes that the use of hydro electricity generation and the benefits that accrue from it should be specifically and explicitly recognised in the relevant chapters and Schedules of the One Plan and that the policy direction within the One Plan needs to reflect that, in some instances, the development and use of renewable energy resources of the region needs to occur to provide for the economic well being of New Zealand.
- 7.4 Genesis Energy seeks that existing hydro generation operations are recognised and that the development of new hydro electricity generation is supported throughout the One Plan, this being consistent with central government policy (both statutory and non-statutory) regarding electricity generation.