

**IN THE MATTER** of the Resource Management Act  
1991

**AND**

**IN THE MATTER** of the proposed Horizons One Plan

## **STATEMENT OF EVIDENCE OF ROBERT GRAHAM HUNTER**

### **1. INTRODUCTION**

#### **Qualifications and Experience**

- 1.1 My name is Robert Graham Hunter. I am the Manager – Environmental Strategy and Policy for Mighty River Power Limited (“Mighty River Power” or “the Company”) and have held that position since 2006, having been previously in the role of Generation Resources Manager since 2003. My responsibilities include the lead role in the policy and planning area of Mighty River Power, as well as understanding and development of strategy for Mighty River Power in the broad field of the Resource Management Act. This role also involves providing advice to aid the understanding and implications of central government policy on the company, and the developing international drivers for various initiatives impacting on operations.
- 1.2 I hold a Bachelors degree in Civil Engineering from the University of Auckland and a Post Graduate Diploma in Business Studies from the University of Waikato. I am a member of the Institute of Professional Engineers Inc, the New Zealand Water and Wastes Association and the Resource Management Law Association. I have also gained certification in the RMA: Making Good Decisions programme.
- 1.3 I have been involved in the energy industry for 5 years, with approximately 25 years experience in industry in New Zealand, the past 18 of these involved with environmental management and the Resource Management Act.

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## **Purpose and Scope of Evidence**

- 1.4 The purpose and scope of my evidence is to outline Mighty River Power's role and commercial and environmental objectives, and to comment on the significance of the existing and potential energy generation capacity of the Horizons Region to the New Zealand energy market.
- 1.5 Specifically, in my evidence I will:
- (a) Explain Mighty River Power's core business and corporate values;
  - (b) Outline the state of energy supply and demand in New Zealand;
  - (c) Discuss the influence of climate change policies on energy generation in New Zealand;
  - (d) Outline Mighty River Power's current and future energy generation interests in the Horizons Region; and
  - (e) Discuss the need for and benefits of energy generation activities in the Region.
- 1.6 I am authorised to give evidence on behalf of Mighty River Power.

## **2. MIGHTY RIVER POWER LIMITED**

- 2.1 Mighty River Power is a State Owned Enterprise (SOE) established under the State-Owned Enterprises Act 1986. Its principal operations are electricity generation and energy retail activities. The company has over 340,000 customers, mostly in the upper North Island. We employ 680 staff<sup>1</sup> throughout the North Island.
- 2.2 Mighty River Power was established following government reform of the electricity sector in 1998 and early 1999. This represented a significant milestone in a series of reforms undertaken by successive governments since the mid 1980s to foster economic efficiency in the New Zealand energy sector. Mighty River Power is the fourth largest electricity generator in New Zealand

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<sup>1</sup> Includes full time staff, part time staff and apprentices.

(based on electricity produced annually) and the third largest electricity retailer (based on customer numbers).

2.3 As an SOE, Mighty River Power's principal objective is to be a successful business, that is, an entity that is as profitable and efficient as comparable private companies. It is also required to be a good employer, an organisation that is economically focused, and has social responsibility to its communities.

2.4 Mighty River Power's business focus has five primary elements:

- (a) Continue to seek efficiency enhancements from current hydro, geothermal, natural gas and bio-energy generation systems as new technologies provide opportunities to gain additional output from existing plant without using more fuel resources.
- (b) Maintain and develop a portfolio of generation assets with fuel diversity including, hydro, geothermal, wind, natural gas and bio-energy.
- (c) Continue to encourage energy efficiency at the end user level, including providing direct financial and contractual incentives for customers to save energy when hydro resources are limited, and through promotion of good public policy.
- (d) Continue to monitor and review prospective renewable energy generation technologies such as solar, wave and hydrogen as well as end-use efficiency technologies to ensure that when these are considered commercially capable of making a material contribution to New Zealand's energy requirements, that we are part of that development.
- (e) Extend the breadth of its involvement across a full range of sustainable development activities, in particular providing leadership and direction in the energy field.

### **3. MIGHTY RIVER POWER – COMMUNITY FOCUS**

3.1 Mighty River Power is an organisation that has an informed sense of social responsibility. It seeks to enhance the communities in which it operates by supporting them when it is able to do so. By way of example, it is a founder and

ongoing supporter of the Maungatautari Ecological Island Trust which is establishing a mainland based "island" south of Cambridge through the construction of a pest proof fence around Maungatautari Mountain. The ultimate aim is the reintroduction of endangered native species such as Kiwi and Kaka with the expectation that the "island" will become a regionally significant tourism and educational centre.

- 3.2 The Company has committed to maximising the economic benefits of producing electricity while minimising negative environmental impacts and positively contributing to the wellbeing of its communities.

#### **4. MIGHTY RIVER POWER'S CORE BUSINESS**

- 4.1 The business fundamentals of Mighty River Power involve the investment of significant amounts of capital in assets with lives of 30 to 100 plus years that are generally dependent upon the management of natural resources and their associated effects.
- 4.2 The sustainability of the Company's business is dependent on an ongoing ability to utilise and manage natural resources, and on regional and territorial planning frameworks providing a regulatory environment that recognises the necessity of electricity generation.
- 4.3 The heart of Mighty River Power's business activities is the generation of electricity. On average, the generation stations we own or operate generate a total of around 5,500 gigawatt hours (GWh) annually. This represents approximately 14% of New Zealand's current electricity requirements. Mighty River Power's generation assets encompass hydro, geothermal, thermal (gas) and bio-energy (recovered methane) power stations.
- 4.4 The Waikato hydro system provides the majority of the Company's electricity generation, averaging 4,200 GWh per year. The actual amount of energy generated by the Waikato hydro system varies from season to season and year to year depending on how much rainfall there is in the various catchments, as it does for all of New Zealand's hydro systems. The range of variation in the Waikato system has been between 3,200 GWh and 5,800 GWh over the past 20 years.

- 4.5 Mighty River Power has a significant and growing portfolio of geothermal assets. At present the Company's assets include a 25% shareholding in the Tuaropaki Power Company's 113MW geothermal power station at Mokai near Taupo, which Mighty River Power operates and manages on behalf of Mighty River Power and its co-shareholder - the Tuaropaki Trust - and a 33MW geothermal power station at Rotokawa near Taupo which the company owns and operates in partnership with Tauhara North No. 2 Trust. Mighty River Power is undertaking the largest geothermal exploration and expansion programme in New Zealand in the past 20 years. This programme involves the investment of more than \$1 billion to develop some 400MW of new geothermal generation capacity over the next five years. As part of this programme the Company has recently obtained consent to develop the Nga Awa Purua power station alongside its Rotokawa plant which will roughly quadruple its output, and a 90MW geothermal power station at Kawerau is currently under construction and is due for completion and commissioning over the next couple of months.
- 4.6 The company owns and operates bio-energy power stations that recover methane gas from landfills at Rosedale and Greenmount in Auckland, and at Silverstream near Wellington. The total capacity of these three stations is 11MW, which makes Mighty River Power New Zealand's largest generator of electricity using landfill derived methane gas. Our landfill electricity generation activities have significant environmental benefits in that they recover methane gas which would otherwise be emitted to the atmosphere. Methane is a significantly more potent greenhouse gas than carbon dioxide, which is subsequently discharged from the plant.
- 4.7 In terms of thermal power generation, Mighty River Power owns the 170MW Southdown gas fired co-generation plant near Auckland, which produces steam for an industrial heat customer in addition to electricity. In addition, the recent addition of a separate boiler at Southdown has reduced the level of carbon dioxide emitted from that power station by allowing the process steam required by our customer to be supplied under certain circumstances without operating the power station. This also enables more efficient use of New Zealand's diminishing supply of natural gas.

- 4.8 Over 85% of Mighty River Power's electricity production is from renewable hydro and geothermal resources. This is closely representative of New Zealand's total electricity supply characteristics.
- 4.9 It has been announced this week that Mighty River Power is to buy a stake in New Zealand wind turbine developer and supplier, Windflow Technologies Limited. This is a further indicator of Mighty River Power's intentions for ongoing development of renewable electricity generation in New Zealand.

## **5. ELECTRICITY SUPPLY AND DEMAND**

- 5.1 Electricity is an essential commodity in a modern economy, often with no alternatives. New Zealand's economic and social wellbeing are inextricably dependent on a secure and cost effective electricity supply system. Large scale disruptions and the public outcry caused by electricity supply shortages in the Auckland CBD in 1998 and national emergency conservation campaigns in 1992, 2001, 2003 and this year bear testimony to the critical importance of electricity to the country's economic and social wellbeing.
- 5.2 New Zealand's remote geographic situation means that it is important that the New Zealand electricity system is self reliant and that the means of electricity production must be diverse and stable.
- 5.3 The Electricity Commission's May 2007 National Demand Forecast predicts that New Zealand's demand for electricity will continue to grow for the foreseeable future. The demand for electricity in New Zealand has grown on average by around 2.3% per annum since 1980 to its current level of around 40,000 GWh. In some years, demand growth has exceeded 3% to 4% and current forecasts range from 1.3% through to 2.5% per annum over the next 25 years.
- 5.4 The attached Figure 1 shows the historical and forecast demand growth. This figure also provides an insight into the concerns being expressed in relation to the provision of sufficient generation capacity to meet this demand. The ongoing increases in generation capacity have clearly been able to meet historical demand in a way which has meant that under most scenarios there was not a shortfall caused by low inflows. This is evidenced by the demand line being generally within the band of "Hydro Dry" generation. It should be noted

that during the period of 2003 through to 2006 the demand was only able to be met by inflows being at least normal and as already noted there were years within that period when shortages were experienced as a result of lower than required inflows.

- 5.5 Over the past 5 or so years it has become evident that New Zealand has been relying on wet year rainfall to fuel hydro generation in order to maintain the electricity supply reliability we have all come to take for granted. This has left the nation, both socially and economically, at the mercy of the weather and forced to accept the long term risk on the stable provision of electricity to meet increasing demand.
- 5.6 The concerns in terms of ability to supply demand are as a result of the future expected reduction in thermal electricity supply as a result of run down of domestic gas resulting in years that will rely on high hydro inflows as a result of wetter than normal conditions to meet demand. Based on this data this might be expected to occur around 2012, subject to ongoing changes in the assessment of reserves. As we look into the future this shortfall is likely to get worse unless moves are made to provide for additional, probably renewable, generation capacity to be installed. Opportunities such as the process we are currently engaged in cannot be overlooked in order to make the appropriate provisions.
- 5.7 At the same time as New Zealand has been facing increasing demands for the provision of electricity supply the expectations have significantly increased in terms of the stability of the electricity supplied in terms of frequency and voltage. This expectation has occurred as a result of the dramatic increases in the use of digital technology in all facets of our lives and economy and the requirements this places on supply in order to avoid upsets. Maintenance of this stability is made much more possible in situations where the supply system is not working at maximum capacity as is the case in New Zealand at the current time.
- 5.8 Historically New Zealand has relied heavily on hydro electricity and since the 1980's Maui gas fired generation. However, with the depletion of the Maui gas fields and an increasing demand for energy, New Zealand has become increasingly reliant on what are varying rainfalls to sustain hydro generation. It

is difficult to envisage future large scale hydro projects being developed in New Zealand given difficulties in gaining public acceptance and expected costs.

- 5.9 The Government has placed a moratorium on new thermal base-load generation (unless required for security of supply) for the next 10 years. This means that New Zealand will have to look to develop its hydro, geothermal, biomass, wind, solar, wave and tidal energy resources. Opportunities for such development need to be maximised in the national interest.
- 5.10 Against the backdrop of increasing demand and diminishing supply, it is critical that existing energy infrastructure is maximised and opportunities to increase and diversify New Zealand's generation capacity, and in particular renewable generation capacity, are fostered.
- 5.11 Along with provision of generation in amounts to satisfy the demand requirements of consumers in terms of availability, stability and security it is key that provision is made for sufficient transmission infrastructure to be put on place to allow the electricity supply system to work as required. A strong transmission system is key to a renewables future. We are seeing ongoing issues develop with transmission from provision of infrastructure, maintenance and upgrading of the existing infrastructure, constraints developing in the transmission network and issues of reverse sensitivity. The development of the One Plan provides a timely opportunity to allow for this transmission infrastructure in the region in order to provide for the current needs of the industry and also to meet the future requirements of transmission as the demand for electricity continues to increase. Without making such provisions transmission infrastructure, which is essential to electricity supply, will continue to be an unnecessary point of tension in the community.
- 5.12 The security of supply issue also has a regional dimension. The Horizons Region is a net importer of electricity, with a demand for 1584 GWh and a supply of 766 GWh in 2007. Generation activities within the Region have the opportunity to provide more secure energy options for regional needs, and so should be encouraged.



## 6. CLIMATE CHANGE POLICY

- 6.1 New Zealand has made an international commitment<sup>2</sup> to reduce greenhouse gas emissions to 1990 levels during the initial Kyoto Protocol commitment period (2008 to 2012). This has significant implications for New Zealand, noting that on current predictions, New Zealand faces adverse economic impacts during the first commitment period of approximately \$0.5 to \$1.2 billion<sup>3</sup>.
- 6.2 To comply with its obligations under the Kyoto Protocol, New Zealand must look to reduce its emissions of greenhouse gases in all sectors of the economy including the current reliance on thermal generation by developing its renewable energy resources.
- 6.3 The New Zealand Energy Strategy sets a target of 90% of the country's energy being supplied by renewable energy generation by 2025. Government policy is that it is *"in New Zealand's longer-term economic and environmental interests to meet increases in [electricity] demand through an economic mix of renewable energy sources..."*. The Government expects to achieve this outcome through:<sup>4</sup>

*"Maximising the contribution of cost-effective renewable energy resources while safeguarding our environment."*

*"Aggressively pursuing existing and new renewable-based electricity generation."*

- 6.4 As has become evident during the current hydro fuel (water) shortage the provision of sufficient thermal generation in order to maintain the security of supply is key to success in the plans to generate a higher proportion of New Zealand's electricity from renewable sources. This means that in abnormal years such as this demand can be met from thermal generation which is not normally needed to make up the shortfall.

## 7. MIGHTY RIVER POWER IN THE HORIZONS REGION

- 7.1 Mighty River Power's Waikato hydro system relies, to some extent, on water that is diverted from the Horizons Region as part of the Tongariro Power

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<sup>2</sup> In 1997, New Zealand signed the Kyoto Protocol on greenhouse gas emissions. The Protocol has now been ratified

<sup>3</sup> <http://www.climatechange.govt.nz/about/kyoto-provision.html>

<sup>4</sup> New Zealand Energy Strategy, pages 15, 36.

Scheme. Mighty River Power wishes to ensure that the importance of this diversion is recognised and provided for in relevant planning instruments.

- 7.2 There may also be other hydro generation opportunities within or connected to the Region that can be developed in the future. For these reasons the Company has an interest in ensuring that renewable energy issues and water allocation questions within the Region are addressed in a way that preserves existing hydro generation potential and does not unduly restrict new development.
- 7.3 The Horizons Region also contains other energy resources with significant potential to benefit New Zealand's energy supply. The quality of the wind resource in the Tararua Ranges is virtually unparalleled both in New Zealand and internationally.
- 7.4 Mighty River Power has entered into commercial arrangements with the Palmerston North City Council to develop a wind farm on the Tararua Ranges in the Turitea Reserve, and is currently monitoring the wind resource on the site. If the project goes ahead it will not only have benefits in terms of electricity generation and security, but revenue generated will assist the Council to implement its own environmental aspirations for the Turitea Reserve.
- 7.5 The Company is exploring further wind energy developments in the Region. Wind energy generation can only be undertaken efficiently in locations where the wind is strong and reliable. There are only a limited number of viable wind generation sites in New Zealand, a great many of which are in the Horizons Region. The development of wind energy resources helps decrease New Zealand's dependence on hydro generation, and the vagaries of rainfalls and lake levels.
- 7.6 EECA's Renewable Energy Assessment for the Manawatu-Wanganui region dated 20 July 2006 states:

*"If carefully planned, approximately 200-400 MW of additional wind capacity could be installed over a number of years with environmental impacts that were broadly acceptable to local communities. This excludes the existing 160 MW and the 140 MW under construction. The technically available potential is much larger."*

- 7.7 Estimates made since this EECA report was published now range up to a potential of an additional 1000MW of wind power which could be installed in the region.
- 7.8 EECA's Renewable Energy Assessment for the Manawatu-Wanganui Region identifies a wide range of other renewable energy technologies that are or may become feasible power generation options, including: solar energy collection; hydro; biomass using a variety of fuels; geothermal; and a range of emerging marine generation methods utilising wave, tide and current energy. As market conditions change or technologies improve a wider range of these options may be worthwhile pursuing within the Region.
- 7.9 Energy generation activities within the Horizons Region benefit not just New Zealand generally, but the Region in particular. Economic benefits flow from the construction, maintenance and employment associated with the energy industry, as well as the resulting increase in regional generation and reduction in imported electricity. This has benefits in the efficiency of transmission of electricity as well as improved security of supply for the region.
- 7.10 Mighty River Power views the Horizons Region as one of the more important Regions in the country in terms of the significant potential and opportunity for the development of renewable energy projects. In coming to this view recognition has been given to the issue of transmission of electricity, which I will now discuss.

## **8. TRANSMISSION EFFICIENCY**

- 8.1 The larger 'load centres' in New Zealand exist in the upper North Island, especially in the Auckland region. Electricity supply in New Zealand generally flows from south to north, because in the South Island, hydro electricity supply typically exceeds demand.<sup>5</sup> Greater transmission distances result in greater energy losses. The renewable energy resources in the Manawatu-Wanganui region have an advantage in that they are reasonably proximate to the northern load centres, and to the national transmission grid.

- 8.2 Therefore, electricity generation in the Horizons Region, closer to demand, would reduce transmission losses that occur when electricity generation is transported from generation locations that are more remote from demand, saving supply that would otherwise be wasted. A proportion of this would be renewable hydro supply from the South Island, especially at times of peak demand when incremental losses can be particularly high.

## **9. CONCLUSIONS**

- 9.1 Mighty River Power is a significant contributor within New Zealand's electricity generation sector. The Company is interested in ensuring that the Region's planning framework preserves existing electricity generation-related activities in the region, and provides for further suitable development.
- 9.2 Mighty River Power believes that the Horizon's Region contains significant resources that are critically important to New Zealand's energy future. The nation's ability to achieve its energy and climate change goals are to an extent dependant on this Region's planning and regulatory framework.
- 9.3 Mighty River Power seeks to ensure that the importance of electricity supply and energy generation and diversification are appropriately recognised at a regional level in the Horizons One Plan.

**Figure 1: Electricity Demand and Supply**



