

**BEFORE THE HEARINGS COMMISSIONERS  
AT PALMERSTON NORTH**

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

**AND**

**IN THE MATTER** of an application by NZ Windfarms Limited for landuse, stormwater discharge and contaminants discharge consents required to establish the proposed Te Rere Hau Eastern Extension

**BETWEEN** **NZ Windfarms Limited**

**Applicant**

**AND** **Horizon Regional Council**

**AND** **Tararua District Council**

**Consent Authorities**

**AND** **Submitters on the application**

**Submitters**

---

**Statement of Evidence of Michael Campbell Copeland**

---

## 1. INTRODUCTION

### Qualifications and Experience

- 1.1 My full name is Michael Campbell Copeland.
- 1.2 I hold a Bachelor of Science degree in mathematics and a Master of Commerce degree in economics. I have over 35 years experience in the application of economics to various areas of business including resource management matters. A summary of my curriculum vitae is attached as **Appendix 1**.
- 1.3 I am a consulting economist and managing director of Brown, Copeland and Company Limited, a firm of consulting economists which has undertaken a wide range of studies for public and private sector clients in New Zealand and overseas. During the period 1990 to 1994, I was also a member of the Commerce Commission and during the period 2002 to 2008 I was a lay member of the High Court under the Commerce Act. Prior to establishing Brown, Copeland and Company Limited in 1982, I spent six years at the New Zealand Institute of Economic Research and three years at the Confederation of British Industry.
- 1.4 With respect to the Resource Management Act 1991 (**RMA**), I have prepared evidence for clients covering a number of projects and policies. A selection of these is listed at the end of my curriculum vitae in **Appendix 1**.
- 1.5 I have read the Code of Conduct for Expert Witnesses (Rule 330A, High Court Rules and Environment Court Practice Note). This evidence is within my area of expertise, except where I state I am relying on what I have been told by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

## Outline of Proposal

- 1.6 NZ Windfarms Ltd (**NZWL**) proposes to develop an extension to the Te Rere Hau wind farm on the south-eastern side of the Tararua Ranges in the Tararua District, which is part of the Manawatu-Wanganui (**Horizons**) region<sup>1</sup>. The project is known as the Te Rere Hau Eastern Extension (**TRHE**). The additional energy from the new turbines will provide renewable electricity for the benefit of consumers while reducing New Zealand's climate change liability. The proposal is for additional capacity of 28 MW from 56 turbines, which will be the same as those employed on the existing consented site (i.e. Windflow 500 turbines). The TRHE would produce around 95 gigawatt hours (**GWh**) of electricity per annum. This is enough electricity to supply around 12,000 average New Zealand homes<sup>2</sup>. The TRHE will improve the utilisation of already established infrastructure and as such represents a cost effective opportunity to significantly increase renewable electricity production.
- 1.7 The wind farm will supply electricity to the national grid via the already established connection to the TWC2201 grid exit point. Wind monitoring and modelling at the site undertaken for NZWL has identified the proposed site as one with excellent average wind speeds. Given the availability of this wind source, and the site's close proximity to the existing wind farm, the proposed extension enables the efficient utilisation of the wind energy and the existing infrastructure.

## Scope of Evidence

- 1.8 I have been asked by NZWL to identify and evaluate the economic effects of the proposed TRHE project.

---

<sup>1</sup> The Manawatu-Wanganui (or Horizons) region is made up of the Ruapehu, Rangitikei, Wanganui, Manawatu, Tararua and Horowhenua Districts and Palmerston North City.

<sup>2</sup> Based on an average annual household energy use of 8,000 MWh (from New Zealand Wind Energy Association's website.).

1.9 Following a summary of my key conclusions, my evidence discusses the relevance of economic matters under the Resource Management Act 1991 (**RMA**). This is followed by a brief description of key elements of the Government's existing<sup>3</sup> Energy Strategy and Emissions Trading Scheme (ETS) and how the proposed extension project is consistent with likely Government policies affecting the electricity sector. Section 5 of my evidence briefly describes New Zealand's electricity market and projections for national electricity demand. The economic benefits of the proposed wind farm extension are identified in Section 6, whilst Section 7 discusses potential economic costs. A number of issues related to economic effects and raised in support or opposition to the project in submissions on the resource consent application are examined in Section 8. Section 9 responds to the economic matters raised in the planners reports for the Manawatu-Wanganui (Horizons) Regional Council and the Tararua District Council. The conclusions of my evidence are contained in Section 10.

## 2. **SUMMARY OF KEY CONCLUSIONS**

2.1 The proposed TRHE will improve the economic wellbeing of the Manawatu region by:

- Increasing employment, incomes and expenditure in the local economy during the project's construction;
- Increasing turnover of local businesses supplying equipment and services to the project;
- Increasing (to a lesser extent) employment, incomes and expenditure during the wind farm extension's operation;

---

<sup>3</sup> The change of Government in November 2008 has created uncertainty with respect to possible changes to the Government's Energy Strategy and the Emissions Trading Scheme. In December 2008 the incoming Government removed the 10-year moratorium on new base-load fossil-fuel generation and a Special Select Committee has reviewed the Emissions Trading Scheme (ETS) and the Government aims to amend the Climate Change Response Act 2002 which covers the current New Zealand ETS by late 2009. The Government has indicated its intention to proceed with an ETS but with amendments to the existing regime relating to the timing for different sectors to come into the scheme, a cap on the price of carbon and a shifting of some of the costs of the scheme from industry (and consumers) to taxpayers with a longer phase out of Government support.

- Increasing the utilisation of infrastructure already established in the region and therefore increasing economic efficiency; and
- Making more competitive wholesale prices for electricity supplied at Transpower's grid exit points in the Manawatu-Wanganui region.

2.2 At the national level the TRHE will improve resource use efficiency by:

- Increasing employment, incomes and expenditure in the national economy as a consequence of over 90% of the project's construction costs being spent in New Zealand at a time of rising unemployment;
- Lowering the costs of generating additional quantities of electricity;
- Reducing transmission line losses; and
- Reducing New Zealand's climate change liabilities.

### 3. ECONOMICS AND THE RMA

#### Community Economic Wellbeing

3.1 Economic considerations are intertwined with the concept of the sustainable management of natural and physical resources, which is embodied in the RMA. In particular, Part II section 5(2) refers to enabling "*people and communities to provide for their ... economic ... well being*" as part of the meaning of "*sustainable management*", the promotion of which is the purpose of the RMA.

3.2 As well as indicating the relevance of economic effects in considerations under the RMA, this section also refers to "*people and communities*" (emphasis added), which highlights that in assessing the impacts of a proposal it is the impacts on the community and not just the applicant or particular individuals or organizations, that must be taken into account. This is underpinned by the definition of "*environment*" which also extends to include people and communities.

#### Economic Efficiency

3.3 Part II section 7(b) of the RMA notes that in achieving the purpose of the Act, all persons "*shall have particular regard to ... the efficient use and development of natural and physical resources*" which include the

economic concept of efficiency<sup>4</sup>. Economic efficiency can be defined as:

*“the effectiveness of resource allocation in the economy as a whole such that outputs of goods and services fully reflect consumer preferences for these goods and services as well as individual goods and services being produced at minimum cost through appropriate mixes of factor inputs”<sup>5</sup>.*

3.4 More generally economic efficiency can be considered in terms of:

- Maximising the value of outputs divided by the cost of inputs;
- Maximising the value of outputs for a given cost of inputs;
- Minimising the cost of inputs for a given value of outputs;
- Improving the utilisation of existing assets; and
- Minimising waste.

### **Viewpoint**

3.5 An essential first step in carrying out an evaluation of the positive and negative economic effects of a development project is to define the appropriate viewpoint that is to be adopted. This helps to define which economic effects are relevant to the analysis. Typically a district or wider regional viewpoint is adopted and sometimes even a nationwide viewpoint might be considered appropriate<sup>6</sup>. For the TRHE it is appropriate to consider regional and national economic impacts given the project’s impacts on the residents and businesses of the Horizons region and the wider national economic effects in terms of economic activity, electricity generation and transmission efficiency and the use of renewable resources.

---

<sup>4</sup> See, for example, in *Marlborough Ridge Ltd v Marlborough District Council* [1998] NZRMA 73, the Court noted that all aspects of efficiency are “economic” by definition because economics is about the use of resources generally.

<sup>5</sup> Pass, Christopher and Lowes, Bryan, 1993, *Collins Dictionary of Economics* (2<sup>nd</sup> edition), Harper Collins, page 148.

<sup>6</sup> For example, there was an inference that the consideration of “Project Aqua” and other Waitaki River water allocation cases by a central government appointed body was to broaden the viewpoint from a local district or regional level to a wider national level.

- 3.6 There are also private or financial costs and benefits associated with this proposal. If consents are granted, and NZWL gives effect to those consents then it can be assumed that these private or financial costs and benefits have been responsibly and properly analysed and that from the viewpoint of those with money at risk, the expected financial benefits exceed the expected costs. Accountability for accuracy of the analysis clearly rests with NZWL.
- 3.7 However, not covered in any private sector cost benefit analysis are the so-called externalities – i.e. those side effects of the production process, which affect third parties, other than the buyer and seller. A range of economic externalities (both positive and negative) arising from the TRHE are discussed later in my evidence.
- 3.8 This evidence does not cover the production costs associated with providing the TRHE, with back up generation or the comparative costs of wind, coal and gas thermal generation. These are matters which NZWF as a participant in the electricity market is best placed to determine. In my view such matters are not relevant considerations for the Hearing Panel, given New Zealand does not centrally plan its power generation.

#### **4. GOVERNMENT ENERGY POLICY**

- 4.1 The New Zealand Emissions Trading Scheme (**NZETS**) as introduced by the previous Labour led Government was proposed to be progressively introduced over the period 2009 to 2013 with the stationary energy sector (that which is relevant to electricity generation) being brought into the scheme in 2010. The NZETS was designed to reduce New Zealand's net emissions below a 'business as usual' level and to comply with New Zealand's international obligations, including the Kyoto Protocol obligations.
- 4.2 The basic concept behind the scheme is a requirement for generators of emissions to hold emission units (**NZUs**) to match the emission levels for which they are responsible. The Government was to initially gift units to particular industry participants based upon the extent to which it was perceived that a sector was disadvantaged as compared

to those able to pass any cost impact on to customers. Other than gifted units, firms were to be required to purchase units either in New Zealand or overseas via auctions and normal trading of emission units.

- 4.3 In the case of the stationary energy sector, it was proposed no NZUs would be gifted and the consequent impact was to raise the cost of thermal generation (i.e. coal, gas and to a lesser extent geothermal fired generation) relative to that utilising renewables such as hydro and wind generation. This was to occur as a consequence of coal and gas producers and importers being required to hold NZUs corresponding to emission levels of their respective fuels. In the case of geothermal energy, those using it (including electricity generators) were to be required to hold units.
- 4.4 The macroeconomic impact of the proposed NZETS has been modelled and at least in the short-term was estimated to reduce growth in gross domestic product (**GDP**) by around 0.1% per annum, versus expected average annual growth of around 2% per annum. In the longer term the macroeconomic impact of the existing scheme would depend on the stringency of international agreements. However from a national economic perspective the fewer emission units, which needed to be purchased the more competitive the New Zealand economy would be under the existing scheme and the lower would be the impact of meeting New Zealand's greenhouse gas emission obligations. Thus the TRHE, to the extent that it displaces alternative thermal generation, is likely to have a positive impact on the New Zealand economy under any ETS.
- 4.5 As already noted, the change of Government in November 2008 has brought with it uncertainty as to the precise aspects of the current NZETS will be retained. However the Government has announced its intention that an ETS will be retained<sup>7</sup> and to the extent that the wind

---

<sup>7</sup> On 31 August 2009 the Government released the Special Select Committee report on the New Zealand Emissions Trading Scheme legislation and climate change. Among the recommendations of the Select Committee (majority) is a preference for the

farm extension displaces alternative thermal generation, the TRHE will have positive impacts on the New Zealand economy through reducing the costs for the New Zealand economy of meeting its greenhouse gas emission targets, even though these targets have been revised by the incoming Government.

- 4.6 On 9 August 2009, the Government announced a target range for greenhouse gas emission reductions of between 10% and 20% below 1990 levels by 2020, if there is a comprehensive global agreement. So far as the electricity generation sector is concerned, this is against a backdrop of renewable electricity sources accounting for more than 80% of total generation in 1990, falling to only around 65% in 2008<sup>8</sup>, in the face of new electricity demand being largely met by new thermal generation over the period 1990 to 2008<sup>9</sup>.
- 4.7 Increased development of wind power, such as the proposed TRHE is clearly consistent with the Government's energy policy, adding a new component of renewable energy to an existing facility.

## 5. NEW ZEALAND'S ELECTRICITY MARKET<sup>10</sup>

### Overview of the Market

- 5.1 There are five main generating companies in New Zealand accounting for 92% of generation in calendar year 2007 – Meridian Energy (30%), Contact Energy (27%), Genesis Power (18%), Mighty River Power

---

retention of an emissions trading scheme. It now appears that an ETS will be retained but with changes in dates when sectors of the economy enter the scheme, a greater burden of the costs of the scheme being carried by taxpayers as compared to industry (and consumers) with a longer phase out of Government support and a cap being placed on the price of carbon. The Government has estimated that the proposed changes to the ETS will halve the price impact on households for electricity from 2 cents per kWh to 1 cent per kWh. (See Minister for the Environment press release: Revised ETS Balances NZ's Environment & Economy; 14 September 2009.) Of which hydro accounted for around 52%.

<sup>8</sup> Wind generation increased from 119 GWhs to 1,047 GWhs over the period 2000 to 2008, i.e. an increase of 780%, but this accounts for only a small proportion of New Zealand's total generation of 42,246 GWhs in 2008 (Source: Ministry of Economic Development website, April 2009).

<sup>10</sup> Data in this section from *The New Zealand Energy Data File; June 2009*. Ministry of Economic Development; July 2009 and Ministry of Economic Development website, April 2009.

(12%) and TrustPower (5%). The remaining 8% of generation is from on-site cogeneration and other independent generators.

- 5.2 In calendar year 2008, hydro accounted for 52.3% (22,091 GWhs), gas<sup>11</sup> 23.7% (10,010 GWhs), coal<sup>12</sup> 10.5% (4,446 GWhs), geothermal 9.4% (3,962 GWhs), wind 2.5% (1,047 GWhs), oil 0.3% (123 GWhs) and others<sup>13</sup> 1.3% (567 GWhs). However hydro's contribution in percentage terms has fallen sharply over the last 27 years – i.e. since 1980, when hydro generation contributed 85% of total generation, due to the rapid depletion of the Maui gas field resulting from the economic pressure applied by the 'take or pay' gas contracts which dominated this period.
- 5.3 In calendar year 2008, some 69% of hydro generation (i.e. around 36% of total generation) was from South Island generation schemes, principally located in South Canterbury and Otago.
- 5.4 In terms of installed generating capacity hydro makes up 57.3% (5,375.6 MWs), gas 19.3% (1,805.6 MWs), coal 10.8% (1,805.6 MWs), geothermal 6.2% (585.3 MWs), wind 3.4% (321.6 MWs), oil 1.7% (155.4 MWs) and others 1.4% (127.5 MWs). Also much of the thermal generating capacity is nearing the end of its life and will need to be replaced over the coming decade.
- 5.5 Transpower owns and operates the national transmission network which enables electricity to be transported from regions having electricity surpluses to those with electricity deficits. Areas of deficit and surplus change by time of day and time of year according to supply characteristics (in the case of wind and hydro supply) and demand characteristics. For example the underwater cable joining points of supply and demand in the North and South Islands is generally for carriage of electricity northwards. However at certain times of the year, depending upon climatic conditions it may also be

---

<sup>11</sup> Includes co-generation from gas.

<sup>12</sup> Includes co-generation from coal.

<sup>13</sup> Includes generation from biogas, waste heat and wood.

used to carry electricity from north to south. The transmission network (sometimes referred to as the national grid) connects to electricity lines companies or distribution network companies, of which there were 29 in September 2009<sup>14</sup>. In turn the electricity lines companies distribute power to individual residential and commercial customers within their region. Transpower also transports electricity directly to customers, but only to major customers such as New Zealand Aluminium Smelters at Bluff.

- 5.6 The Manawatu-Wanganui region is served by the distribution network owned and operated by PowerCo. The region's electricity supply is made up of own supply from the Te Apiti, Tararua and Te Rere Hau wind farms and the Mangahao hydro station and imported electricity via Transpower's transmission system.
- 5.7 Most electricity prices for consumers in New Zealand are set in the first instance via the wholesale market. Generators bid in supply quantities over half hour periods for supply at grid exit points and the wholesale price is set by the clearing price – i.e. the highest priced quantity of supply which makes aggregate supply equal to aggregate demand. Because there are a number of competing retailers, certain cost savings will be passed on over time to retail customers. Consequently areas (including the Horizons region) with generation assets on average experience lower wholesale prices than those regions which do not have generation.
- 5.8 New Zealand has, in comparison to other developed nations, enjoyed comparatively low electricity prices. This has been an important contributor to New Zealanders' standard of living and economic well being– both directly, in terms of lower household electricity costs and lower priced goods and services reliant on an electricity input; and indirectly by contributing to New Zealand industry's ability to maintain its comparative advantage and compete in domestic and overseas markets. A proposal which increases the supply of electricity, such as

---

<sup>14</sup> Source: Electricity Networks Association.

the TRHE proposal, plays a part in helping to keep electricity prices low and economic well being high.

### **Growth in Electricity Demand**

5.9 Historically, demand for electricity has been closely linked to economic growth. New Zealand's electricity consumption has grown at 2.7 percent per annum over the period 1974 to 2007<sup>15</sup>. The latest Ministry of Economic Development (**MED**) Energy Outlook document contains a "Base Case" expectation of considerably reduced growth in electricity demand, to average only 1.3 percent per annum over the period 2005 to 2030<sup>16</sup>. This significantly reduced rate of growth is despite the Base Case scenario's assumed GDP growth of 2.5 percent, 3.3 percent, 3.1 percent, and 2.8 percent respectively for the calendar years 2006 to 2009 and then a linear<sup>17</sup> decline from 2.6% to 2.0% per annum over the period 2010-2020, a linear decline from 2.0% to 1.5% per annum over the period 2020-2027 and 1.5% per annum over the period 2028-2030. Accordingly, MED's assumed rate of growth in electricity demand will, between the present and 2030, be far less than the estimated GDP growth. MED's predicted reduced rate in the growth of electricity demand relies heavily on assumed energy efficiency improvements and uptake as well as an increase in electricity prices in real terms assisting the incentive to increase efficiency. On the basis of the historic relationship between growth in electricity consumption and economic growth, the expected 1.3 percent per annum growth in electricity demand is low and is reliant on a high level of energy efficiency uptake. Also it does not take into account the retirement of old thermal plant and the expected increase in electricity use in transport.

5.10 The MED's base case scenario predicts a need for significant amounts of new electricity generation capacity. However, if any of the following occur, or occur in combination, the required increase in

---

<sup>15</sup> Source: MED; *Energy Data File, June 2008*; July, 2008.

<sup>16</sup> See *New Zealand Energy Outlook to 2030*; Energy Information & Modelling, Ministry of Economic Development; 2006. This same forecast rate of growth is used in the NZES.

<sup>17</sup> In other words, the growth rate falls by an equal amount each year over this period.

generation capacity will be much more significant than the MED base case scenario suggests:

- Increase in the rate of predicted GDP growth;
- Non-achievement of assumed energy efficiency improvements;
- Delay in operation of, or decisions not to develop expected new generation capacity.

5.11 It is quite possible that the MED electricity demand forecasts are much too low and that actual future electricity demand will rise significantly faster than the MED has assumed - in other words at a rate closer to the historical growth rate of between 2 and 3 percent per annum, approximately in line with the rate of economic growth.

5.12 However, even the MED's conservative Base Case scenario results in the domestic electricity energy market's growth by a significant 39% between 2005 and 2030, requiring 3,166 MW of additional electricity generation capacity in New Zealand over the period 2005 to 2030. In the NZES released in October 2007, the forecast is revised upwards to an additional 3,900 MW of electricity generation capacity. If the Government's climate change policy target of a 10% to 20% reduction in greenhouse gases is to be met then much if not all of this new electricity generation capacity will need to be from non-thermal sources.

5.13 Given the proposed TRHE will introduce an additional 28 MW of installed electricity generation capacity to the New Zealand generation market, it will play a part in meeting the new renewable generation capacity required at the national level. Also by its nature, wind power complements New Zealand's existing hydro generation given its higher reliability on an annual basis and supports hydro's daily reliability, with the net effect being the enhanced security of the electricity system as a whole.

**6. ECONOMIC BENEFITS OF TE RERE HAU EASTERN EXTENSION  
Increased Economic Activity from Wind Farm Construction and  
Operation<sup>18</sup>**

6.1 The construction and operation of the TRHE will create increases in economic activity for the local economy and national economy. These economic impacts are discussed in the next sections of my evidence.

**Effects During Construction Period**

6.1 Construction of the TRHE will use New Zealand made turbines and local expertise thus ensuring over 90% of the project's budget will be spent in New Zealand, not only creating jobs, but also helping to consolidate New Zealand's indigenous wind industry. Specifically the project is expected to result in the direct employment of a construction workforce of around 40 staff, most of whom, would likely live permanently within the Manawatu-Wanganui region during the two-year construction period.

6.2 Wages and salaries paid to these staff are estimated at \$2.3 million per annum<sup>19</sup>.

6.3 In addition to the direct economic impacts, there are indirect impacts arising from:

- The effects on suppliers of goods and services provided to the site from within the region (i.e. the "forward and backward linkage" effects)<sup>20</sup>; the Manawatu-Wanganui regional economy (and principally Palmerston North City) will benefit from additional purchases of goods and services bought from local supplies for the project over the two-year construction and commissioning period, where

---

<sup>18</sup> Data in this section provided by NZWL.

<sup>19</sup> Based on \$25 per hour, 10 hours per day and 230 days per annum.

<sup>20</sup> For example, whilst 40 jobs will be provided at the site, there will be additional jobs created off-site such as at quarries, as a consequence of the additional demand for aggregate.

such suppliers are available and suitable. Those who are likely to benefit will include local providers of security services, accommodation, rock, aggregate, concrete and steel, crane hire firms, earthmoving and cartage contractors, electrical contractors and building contractors. Many of these types of locally based suppliers are currently engaged on the construction of the Te Rere Hau wind farm;

- The supply of goods and services to employees at the site and to those engaged in supplying goods and services to the site (i.e. the “induced” effects). For example, there will be additional jobs and incomes for employees of supermarkets, restaurants and bars as a consequence of the additional expenditure by employees directly involved in the TRHE construction at the site.

6.4 Regional multipliers can be estimated to gauge the size of these indirect effects. The size of the multipliers is a function of the extent to which a regional economy is self-sufficient in the provision of a full range of goods and services and the region’s proximity to alternative sources of supply. Regional multipliers typically fall in the range of 1.5 to 2.0 and taking the midpoint of 1.75 implies total impacts (i.e. direct plus indirect impacts) during the construction period of:

- 70 additional jobs; and
- \$4.0 million per annum in additional wages and salaries.

### **Effects Once Operational**

6.5 Once the TRHE is operational there will be around 3-4 fulltime staff to undertake regular servicing of the additional turbines. There will also be additional expenditure within the Manawatu-Wanganui economy on other goods and services purchased locally.

6.6 In addition NZWL has approximately 2,500 shareholders within the Manawatu-Wanganui region and who will benefit directly from the receipt of dividends.

6.7 Once again, there will be both direct and indirect economic impacts associated with these additional jobs, incomes and expenditure.

## National Effects

- 6.8 NZWL estimate that over 90% of the total cost of the TRHE will be spent in New Zealand as a consequence of using New Zealand made Windflow 500 turbines. Therefore at the national level there are significant direct and indirect (or multiplier) impacts from the project's construction phase. The direct plus indirect (or multiplier) impacts at the national level are greater than those at the regional level<sup>21</sup> because they include the additional employment, income and expenditure effects for the suppliers of goods and services from the rest of New Zealand in addition to those for locally based suppliers.

## Contribution to Economic Wellbeing

- 6.9 As indicators of levels of economic activity, economic impacts (in terms of expenditure, incomes and employment) are not in themselves measures of improvements in economic welfare or economic wellbeing. However, there are economic welfare enhancing benefits associated with increased levels of economic activity. These relate to one or more of:

- Increased economies of scale: Businesses and public sector agencies are able to provide increased amounts of outputs with lower unit costs, hence increasing profitability or lowering prices;
- Increased competition: Increases in the demand for goods and services allows a greater number of providers of goods and services to enter markets and there are efficiency benefits from increased levels of competition;
- Reduced unemployment and underemployment<sup>22</sup> of resources: To the extent resources (including labour)

---

<sup>21</sup> For example, a study (Manufacturing Scenarios and Multipliers, for the Industry Capability Network, Business and Economic Research Limited, June 2006) estimates national multipliers of 2.27, 2.77 and 2.90 for expenditure, value added and employment respectively for the New Zealand machinery and equipment manufacturing industry group.

<sup>22</sup> Underemployment differs from unemployment in that resources are employed but not at their maximum worth; e.g. in the case of labour, it can be employed at a higher skill and/or productivity level, reflected in higher wage rates.

would be otherwise unemployed or underemployed, increases in economic activity can bring efficiency benefits when there is a reduction in unemployment and underemployment. The extent of such gains is of course a function of the extent of underutilized resources within the local economy at the time and the match of resource requirements of a project and those resources unemployed or underemployed within the local economy; and

- Increased quality of central government provided services: Sometimes the quality of services provided by central government such as education and health care are a function of population levels and the quality of such services in a community can be increased if increased economic activity maintains or enhances population levels.

6.10 It is reasonable to presume that any increases in economic activity (i.e. expenditures, incomes and employment) as a consequence of the TRHE construction (and operation) will give rise to one or more of these four welfare enhancing economic benefits. For example, at the present time there are particular benefits in creating additional employment opportunities, or maintaining existing employment, at the regional and national level. The alternatives of greater unemployment and/or Government subsidisation of employment are much less desirable from the perspective of national economic efficiency.

#### **Additional Income from Land Rentals**

6.11 A particular feature of wind power generation schemes compared to other types of generation such as hydroelectric and thermal power stations is that the land on which they operate can be shared with the wind being harvested above the continued farming operation below. NZWL have indicated that the stocking rates on the land used for the TRHE will be unchanged by the project. In addition the farmers involved will benefit from improved road access and improved weed and pest management.

6.12 Notwithstanding this the TRHE owner will pay annual rentals to the landowners. Although these rental payments are only “community” economic benefits to the extent that the landowners spend the additional income within the local economy, the greater productivity of

the land is consistent with an improvement in the efficient use of natural and physical resources.

### **Lower Cost Electricity Generation and Supply**

6.13 There will be cost savings to the extent that the costs of generation from the TRHE are less than the generation and transmission costs of alternative new generation capacity elsewhere in New Zealand, which is displaced or delayed. These cost savings reflect:

- Lower or at least comparable average generation costs per kWh compared to alternative new generation options to meet growth in electricity demand in New Zealand. Alternatively, if new capacity does not keep pace with growth in demand, there will be increased costs for electricity consumers and for the economy generally;
- The TRHE being able to utilise existing infrastructure with no need for new transmission lines as is likely for other new potential wind, geothermal and hydro generation; and
- Meeting a greater proportion of the central and lower North Island's electricity requirements from a source of supply within the Manawatu-Wanganui region will reduce the amount of electricity that must be supplied from more distant generation sources (e.g. South Island hydro stations) via the national grid.<sup>23</sup>

6.14 Via the operation of the wholesale electricity market, NZWL will bid into the market the additional electricity, which will displace higher cost electricity. The electricity generated from the TRHE will effectively have zero marginal costs of supply<sup>24</sup>; that is the variable costs of production are zero. For this electricity NZWL will effectively be a price taker, bidding in the available electricity from the wind farm extension at zero cost to ensure the electricity is dispatched into the

---

<sup>23</sup> Alternatively if some of the electricity generated from the TRHE displaces South Island hydro power required in the Auckland region then there will still be significant transmission cost savings.

<sup>24</sup> The annual operating and maintenance costs relate to periodic maintenance and do not vary with output.

wholesale electricity market and the cost savings can then be passed on to consumers by the retailers.

- 6.15 Economic efficiency can be considered in terms of minimising the cost of inputs for a given value of output. The proposed TRHE requires fewer resources to obtain the same quantity of electricity output than alternative 'green field' projects, which again improves economic efficiency and makes more efficient use of natural resources.

#### **Increased Security of Supply**

- 6.16 The proposed TRHE will add to dry-year security of supply because wind helps to diversify supply away from the predominant reliance on the large South Island hydro schemes. Also central and lower North Island areas will be less reliant on the more distant parts of the transmission network and therefore less affected by transmission system constraints.

#### **Environmental Benefits**

- 6.17 Using the New Zealand Wind Energy Association website calculator if the TRHE displaces gas-fired generation, the emission of 36,700 tonnes of carbon dioxide equivalent (**CO<sub>2</sub>e**) greenhouse gases will be avoided. This is about 0.4% of New Zealand's emissions from electricity generation in 2008<sup>25</sup>. If coal-fired generation is displaced 92,100 tonnes of CO<sub>2</sub>e greenhouse gases will be avoided. This is about 1.1% of New Zealand's emissions from electricity generation in 2008. On the basis of the Government's \$15 to \$25 per tonne range for emissions<sup>26</sup> this equates to an annual benefit of \$0.6 million to \$2.3 million in terms of reduced emission units which would need to be purchased offshore by New Zealand industry.
- 6.18 Also relevant in terms of the environmental impacts of the TRHE is that it is mostly "reversible" (ie all but the foundations can be

---

<sup>25</sup> 8,247,000 tonnes (from New Zealand Energy Quarterly; Ministry of Economic Development; March 2009).

<sup>26</sup> Contained in *The Framework for New Zealand's Emissions Trading Scheme*; Ministry for the Environment and The Treasury; September 2007.

removed) at the end of its economic life. By comparison other forms of electricity generation (e.g. hydro) may effectively be irreversible.

## **7. ECONOMIC COSTS OF THE TE RERE HAU EASTERN EXTENSION**

### **Lost Agricultural Production**

- 7.1 Lost agricultural production is not an external cost of the wind farm extension project. The productive value of the land in alternative uses will be internalised into the cost structure of the development – in other words NZWL in meeting land rental costs will cover any reductions in the productive value of the land and such costs are not costs to be borne by the wider community.
- 7.2 In any case the land will continue to be used for pastoral farming at the same level of intensity once construction of the wind farm is complete.

### **Loss of Amenity**

- 7.3 The proposed TRHE will be on a site adjacent to an existing wind farm development. Therefore it seems unlikely that any additional loss of amenity associated with the extension will have economic impacts in terms of, for example, reductions in tourist visits and associated expenditure.

## **8. ECONOMICS RELATED ISSUES RAISED IN SUBMISSIONS**

- 8.1 I have read a number of the submissions on the TRHE resource consent application and respond here to a number of issues related to economics raised in opposition to the proposed wind farm extension.

### **Insufficient National and Local Benefits**

- 8.2 A number of submissions (e.g. Submission 10 from Tararua-Aokautere Guardians Inc (**TAG**)) have argued that the proposed development fails to offer national or local benefits that would offset the adverse effects of the proposed development. I am not in a position to assess the significance of any adverse environmental effects as a consequence of the TRHE. This is done in the evidence of other witnesses for NZWL. However in my evidence above I have listed a number of economic benefits which are a consequence of the

proposed TRHE and which will accrue at the national and local level. These economic benefits are referred to in a number of submissions in support of the application – see in particular Submission 50 by the Energy Efficiency and Conservation Authority and Submission 76 by the New Zealand Wind Energy Association.

### **Inappropriate Timing in the Light of the Current International Financial Crisis and the Slowdown in Economic Activity**

- 8.3 The TAG submission has argued that the TRHE project is inappropriate at this time because of the current international financial crisis and the consequent slowdown in economic activity. Certainly I would expect the slowing and recent negative growth rates for the New Zealand economy to lead to a slowing or levelling off in the growth in demand for electricity. However despite the severity of the current international crisis and its impacts on the New Zealand economy its effects are likely to be short lived – i.e. negative or zero economic growth for at most 1 to 2 years.<sup>27</sup> Over the medium to longer term it is likely the New Zealand economy will return to positive rates of economic growth and consequently ongoing increases in the demand for electricity. For example I am unaware of any downward revisions to the MED and Electricity Commission's long-term forecasts for additional electricity generation capacity out to 2030 as a result of the current international financial crisis. The TRHE's additional 28MW of capacity is a relatively modest contribution towards the 3,900 MW of additional generating capacity estimated to be required by 2030 in the October 2007 NZES document and is unlikely to be affected if the estimate is revised downwards.

### **Adverse and Distorted Effects on the Future Growth of Residential and Lifestyle Block Development**

- 8.4 The TAG submission states that the TRHE development will create adverse and distorted effects upon the future growth of residential and

---

<sup>27</sup> On 23 September, Statistics New Zealand released a figure of +0.1% for growth in New Zealand's GDP for the quarter ending 30 June 2009, following five quarters of negative GDP growth (See Gross Domestic Product: June 2009 Quarter – Media release; Statistics New Zealand; 23 September 2009.)

lifestyle block development within Palmerston North City. Should any such effects occur it seems more likely that would only impact on development within a part of Tararua District. The demand for residential and lifestyle block development within Palmerston North City, Tararua District as a whole and the broader Horizons region is in my opinion unlikely to be a function of whether or not the TRHE development proceeds. Therefore even if there is some localized reduction in residential or lifestyle block development within close proximity of the TRHE, I would expect increased demand for such development elsewhere within the Tararua District and Horizons region. In other words I would not expect any net reduction in economic activity associated with residential and lifestyle block development from a wider district or regional community perspective.

### **Negative Impacts on Property Values**

- 8.5 A number of submissions (including Submission 14 from R.B. and M.E. Stewart and Submission 72 from C. and N. Wallace) argue that the TRHE will reduce amenity values for the neighbouring and nearby properties and as a consequence reduce these properties' values and/or result in a longer period of time being required to sell any property so affected. I am not qualified to comment on whether such reductions in amenity values will occur<sup>28</sup>, the significance of any such reductions in amenity values or the significance of any reductions in property values (or extensions in property selling time) as a consequence of any amenity value reductions. However I wish to make two points in relation to property value effects.
- 8.6 Firstly, any such effect on property values is only a reflection of the amenity value effects. It is not an additional effect and to avoid double counting either the loss of amenity **or** the reduction in land values should be included in the analysis of project effects, but not both. A property owner who sells his/her property and suffers a loss in value will not continue to suffer any amenity loss effects. The new

---

<sup>28</sup> This is being addressed by other witnesses for NZWL.

purchaser, who will suffer any amenity loss effects, will have purchased the property at a lower price because of the lower amenity.

- 8.7 Secondly, the TRHE will not by itself alter the demand for land within the Tararua District or Horizons region. To the extent that there is any consequent reduction in the values of properties adjacent to or nearby the wind farm extension, it is reasonable to expect that there would be increased demand and therefore values for similar properties elsewhere within the district and region.

## **9. PLANNERS REPORTS**

- 9.1 The Section 42A Planners Report prepared for the Horizons Regional Council does not analyse economic effects of the TRHE but concentrates on environmental and cultural effects. However the Section 42A Planners Report prepared for the Tararua District Council does consider economic effects. The report identifies a number of positive economic benefits and reaches the conclusion that the Section 5 sustainable management purpose of the RMA is best served by granting consent to the application (paragraph 215). From the report I note in particular:

- The list of potential benefits of the TRHE under the headings of renewable energy; reduction in carbon dioxide emissions; national economic benefits; and regional and local economic benefits (paragraphs 74-78).
- That since direct effects (principally actual and potential noise and landscape/visual effects as identified by submitters) are to be considered and determined it follows that indirect, property value effects need not be given any weight in consideration and determination of the application (paragraph 133).
- That the TRHE is consistent with both the National Policy Statement for Renewable Electricity Generation and the New Zealand Energy Strategy (paragraphs 141-149).
- That the TRHE is consistent with the Operative Regional Policy Statement in that it will generate renewable energy whilst allowing pastoral activities to continue (paragraph 151).

- That the TRHE is consistent with the Operative and proposed District Plan since it is consistent with the efficient use of resources (paragraph 172).
- That the TRHE is consistent with Part II, Section 7 (b) of the RMA since it is consistent with the efficient use and development of resources (paragraph 196).
- That the TRHE is consistent with Section 5 (2) of the RMA in that the TRHE's additional generating capacity has the potential to directly contribute to enabling people (nationally, regionally and locally) to provide for their social and economic wellbeing (paragraphs 210-211).

## **10. CONCLUSIONS**

- 10.1 The proposed TRHE will help to enable the people and community of the Manawatu-Wanganui region to provide for their economic well being. It will also be consistent with the efficient use and development of natural and physical resources.

**Michael Copeland**

October, 2009

## APPENDIX 1

### CURRICULUM VITAE OF MICHAEL CAMPBELL COPELAND

**DATE OF BIRTH** 3 October 1950

**NATIONALITY** New Zealand

**EDUCATIONAL** Bachelor of Science (Mathematics) 1971

**QUALIFICATIONS** Master of Commerce (Economics) 1972

#### PRESENT POSITIONS

(Since 1982) Economic Consultant, Brown, Copeland & Co Ltd

(Since 2003) Director, Wellington Rugby Union

#### PREVIOUS EXPERIENCE

1978-82 NZ Institute of Economic Research

Contracts Manager/Senior Economist

1975-78 Confederation of British Industry

Industrial Economist

1972-75 NZ Institute of Economic Research

Research Economist

1990-94 Member, Commerce Commission

2001-06 West Coast Regional Council Trustee, West Coast  
Development Trust

2002-08

Lay Member of the High Court under the Commerce Act  
1986

## **GEOGRAPHICAL EXPERIENCE**

New Zealand

Australia

Asia (India, Indonesia, Kazakhstan, Malaysia, Nepal, Pakistan, People's Republic of China, Philippines, Tajikistan, Sri Lanka, Uzbekistan)

South Pacific (Cook Islands, Fiji, Tokelau, Tonga, Vanuatu, Western Samoa)

United Kingdom

## **AREAS OF PRIMARY EXPERTISE**

Agriculture and Resource Use Economics (including Resource Management Act)

Commercial Law and Economics (including Commerce Act)

Development Programme Management

Energy Economics

Industry Economics

Transport Economics

## **SECTORAL COVERAGE**

Agriculture	Aluminium	Airports	Aviation
Electricity	Fertiliser	Flood Control	Forestry
Natural Gas	Pharmaceuticals	Public Transport	Rail

## **RESOURCE MANAGEMENT ACT SPECIFIC PROJECTS**

- A new supermarket in Dunedin;
- A power station development on the Rangitaiki River;
- Port storage facilities at Westport;
- The proposed Clifford Bay ferry terminal;
- The proposed pipeline and related facilities to utilise water from the Waikato River for metropolitan Auckland;
- A container terminal expansion by the Ports of Auckland;
- The designation of the Transmission Gully motorway route;
- The proposed Variation No. 8 to the Wellington City District Plan covering height and other controls on development of the airspace above the Wellington railway yards;
- A proposed Town Centre Zone within the Kapiti Coast District;
- Wellington City Council's heritage preservation policy;
- Solid Energy's proposed West Coast Coal Terminal at Granity;
- The proposed Waimakariri Employment Park;
- The designation of land for a proposed motorway extension in the Hawke's Bay;
- The Hastings District Council's Ocean Outfall;
- A proposed new shopping and entertainment centre in Upper Hutt;
- New regional correctional facilities in Northland, South Auckland, Waikato and Otago;
- Proposed controls on wake generation by vessels travelling within the waterways of the Marlborough Sounds;

- Southern Capital's proposed new township at Pegasus Bay, north of Christchurch;
- Renewal of water resource consents for the Tongariro Power Development Scheme;
- The imposition of land use restrictions within noise contours surrounding Christchurch International Airport;
- The expansion of the Whangaripo Quarry in Rodney District;
- A proposed five star hotel development for Wanaka;
- Holcim's proposed new cement plant near Weston in the Waitaki District;
- TrustPower's proposed new wind farm at Mahinerangi in Central Otago;
- TrustPower's proposed new Arnold hydroelectric power scheme on the West Coast;
- McCallum Bros and Sea Tow Limited's appeal before the Environment Court regarding extraction of sand from the Mangawhai-Pakiri embayment north of Auckland;
- The development of the Symonds Hill pit at Winstones' Hunua Quarry;
- The rezoning of land for residential development at Peninsula Bay, Wanaka;
- The rezoning of land for more intensive residential development at Peka Peka on the Kapiti Coast;
- A gondola development for the Treble Cone ski field;
- A gondola development for the Snow Farm and Snow Park skiing and snowboarding facilities;
- The extraction of gravel from the bed of the Shotover River;

- The proposed Hilton hotel development on Wellington's Queen's Wharf;
- Land use restrictions in relation to the Runway Extension Protection Areas for Christchurch International Airport;
- A new residential and commercial development by Apple Fields at Belfast on the outskirts of Christchurch;
- A proposed business park development on land at Paraparaumu Airport;
- The proposed redevelopment of Wellington's Overseas Passenger Terminal;
- The proposed Central Plains irrigation scheme in Canterbury; and
- The staging of residential and business development at Silverdale North in the Rodney District.