TE RERE HAU EASTERN EXTENSION PROJECT

ASSESSMENT OF ECONOMIC EFFECTS

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1. INTRODUCTION

1. NZ Windfarms Ltd (NZWL) proposes to develop an extension to the Te Rere Hau wind farm on the south-eastern side of the Tararau Ranges in the Tararua District, which is part of the Manawatu-Wanganui region[1]. 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[2]. The TRHE will improve the utilisation of already established infrastructure and as such represents a cost effective opportunity to significantly increase renewable electricity production.

2. The wind farm will supply electricity to the national grid via the already established connection to the TWC2201 grid exit point (GXP). 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.

3. This assessment is to assist NZWL in preparing the Resource Consent Application for the project. The aim of this assessment is to identify the economic effects of the proposed TRHE project.

4. The next section of this report 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[3] Energy Strategy and Emissions Trading Scheme (ETS) and how the proposed extension project is consistent with likely Government policies affecting the electricity sector. Section 4 of the report briefly describes New Zealand's electricity market and projections for national electricity demand. The economic benefits of

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

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

3 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 is reviewing the Emissions Trading Scheme (ETS) and it aims to amend the Climate Change Response Act 2002 which covers the current New Zealand ETS by September 2009. The Government is likely to proceed with an ETS of some form, but details of any changes to the existing scheme remain uncertain.

the proposed wind farm extension are identified in Section 5, whilst Section 6 discusses potential economic costs. The report's conclusions are contained in Section 7.

2. ECONOMICS AND THE RMA

Community Economic Wellbeing

5. 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.

6. 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

7. 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[4]. 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"*[5].

8. 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.

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4 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.

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

Viewpoint

9. 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[6]. 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 Manawatu-Wanganui region and the wider national economic effects in terms of economic activity, electricity generation and transmission efficiency and the use of renewable resources.

Private Versus Public Costs and Benefits

10. An analysis of the costs and benefits of the proposed TRHE will be undertaken by NZWL in terms of the financial impacts of the scheme on the company. This will cover the expected revenues, capital costs and operating costs of the TRHE additional turbines from its private commercial perspective. This private sector or 'financial' cost benefit analysis will take account of alternative sites for wind turbines as well as alternative technologies for generating electricity.

11. If NZWL decides to proceed with the TRHE project, if consents are granted, then it can be assumed that these private or financial costs and benefits have been properly analysed and that from the viewpoint of those with money at risk, the expected financial benefits exceed the expected costs.

12. 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 arising from the TRHE are discussed later in this report.

3. GOVERNMENT ENERGY POLICY

13. 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.

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[6] 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.

14. 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.

15. 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.

16. 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, would have a positive impact on the New Zealand economy under the existing NZETS brought in by the previous Government.

17. As already noted, the change of Government in November 2008 has brought with it uncertainty as to what aspects of the current NZETS will be retained. However it is likely that an ETS in some form will be retained and to the extent that the wind 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 if these targets are revised by the incoming Government.

18. The previous Government also had a number of targets to enable it to monitor progress towards its low emissions and sustainability goals. In particular it announced a target of 90% of electricity generation being from renewable (hydro, geothermal and wind) sources by 2025. This target is likely to be reviewed by the incoming Government in the light of it lifting the previous Government's moratorium on new base-load fossil-fuel electricity generation. Another of the targets of the previous Government was for New Zealand to be one of the first countries in the world to widely deploy electric cars and this goal also had implications

for the need for new (renewable) electricity generation sources. This is against a backdrop of renewable sources accounting for more than 80% of total generation in 1990, falling to only around 65% in 2008[7], in the face of new electricity demand being largely met by new thermal generation over the period 1990 to 2008[8].

19. Therefore increased development of wind power, such as the proposed TRHE is consistent with the previous Government's energy policy and whilst the new Government may revise particular targets and strategies to achieve these revised targets, the proposed wind farm extension will be consistent with any revised energy policy objectives, targets and strategies.

4. NEW ZEALAND'S ELECTRICITY MARKET[9]

20. 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 (12%) and TrustPower (5%). The remaining 8% of generation is from on-site cogeneration and other independent generators.

21. In calendar year 2008, hydro accounted for 52.3% (22,091 GWhs), gas[10] 23.7% (10,010 GWhs), coal[11] 10.5% (4,446 GWhs), geothermal 9.4% (3,962 GWhs) , wind 2.5% (1,047 GWhs), oil 0.3% (123 GWhs) and others[12] 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.

22. In calendar year 2007, some 74% of hydro generation (i.e. around 41% of total generation) was from South Island generation schemes, principally located in South Canterbury and Otago.

23. In terms of installed generating capacity hydro makes up 58.8% (5,366.2 MWs), gas 22.2% (2,029.13 MWs), coal 7.3% (670.59 MWs), geothermal 4.9% (449.80 MWs), wind 3.5% (321.71 MWs), oil 1.7% (155.66 MWs) and others 1.5% (139.70 MWs). Also much of the

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7 Of which hydro accounted for around 52%.

8 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).

9 Data in this section from *The New Zealand Energy Data File; June 2008.* Ministry of Economic Development; July 2008 and Ministry of Economic Development website, April 2009.

10 Includes cogeneration from gas.

11 Includes cogeneration from coal.

12 Includes generation from biogas, waste heat and wood.

thermal generating capacity is nearing the end of its life and will need to be replaced over the coming decade.

24. 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 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 28 in March 2007. 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.

25. 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, Taraua and Te Rere Hau wind farms and the Mangahao hydro station and imported electricity via Transpower's transmission system.

26. 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 in time to retail customers. Consequently areas with generation assets on average experience lower wholesale prices than those regions which do not have generation.

27. 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 – 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. The ability for New Zealand to prosper during such conditions of comparatively low electricity prices shows such low electricity costs contribute positively to "economic wellbeing".

28. 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[13]. 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[14]. 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[15] 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 that 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.

29. 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 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.

30. 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. This higher rate of electricity demand is even more likely in the light of the Electricity Commission's '*Initial Statement of Opportunities'* where growth is expected to be 2% per year between 2005 and 2025.

31. 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

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13 Source: MED; *Energy Data File, June 2008*; July, 2008.

14 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.

15 I.e. the growth rate falls by an equal amount each year over this period.

the NZES released in October 2007, the forecast is revised upwards to an additional 3,900 MW of electricity generation capacity. If the previous Government's climate change policy target of 90% of electricity generation coming from renewables by 2025 is to be met, at least this amount of new renewable capacity will need to be installed, since at the present time (for calendar year 2008) only 65% was supplied by renewable sources. In other words this amount of new capacity plus the displacement of some existing non-renewable capacity will need to be provided.

32. 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.

5. ECONOMIC BENEFITS OF TE RERE HAU EASTERN EXTENSION

Increased Economic Activity from Wind Farm Construction and Operation[16]

33. 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 this period.

34. Wages and salaries paid to these staff are estimated at $2.3 million per annum[17].

35. In addition, the Manawatu-Wanganui regional economy will benefit from additional purchases of goods and services bought from local suppliers for the project over the two-year construction and commissioning period, where 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, retail trade outlets, cafes, bars and restaurants, crane hire firms, earthmoving and cartage contractors, electrical contractors and building contractors.

36. So 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

[16] Data in this section provided by NZWL.

[17] Based on $25 per hour, 10 hours per day and 230 days per annum.

region (i.e. the "forward and backward linkage" effects)[18]; and

- 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)[19].

37. 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.

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

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

40. 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[20] 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.

41. 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

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[18] 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.

[19] 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.

[20] 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.

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[21] of resources. To the extent resources (including labour) 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.

42. 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

43. 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 is shared with the wind being harvested above the continued farming operation below. Note, 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.

[21] 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.

44. 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 spends 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

45. 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 via the national grid.

46. 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[22]; 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 wholesale electricity market and the cost savings can then be passed on to consumers by the retailers.

47. 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

48. 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

[22] The annual operating and maintenance costs relate to periodic maintenance and do not vary with output.

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

49. 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^2e) greenhouse gases will be avoided. This is about 1% of New Zealand's emissions from electricity generation in 2007. If coal-fired generation is displaced 92,100 tonnes of CO^2e greenhouse gases will be avoided. This is about 2% of New Zealand's emissions from electricity generation in 2007. On the basis of the Government's $15 to $25 per tonne range for emissions[23] 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.

50. Also relevant in terms of the environmental impacts of the TRHE is its "reversibility" at the end of its economic life. By comparison other forms of electricity generation (e.g. hydro) may effectively be irreversible.

Other Local Benefits

51. With the addition of improvements to the land the Tararua District Council and the Manawatu-Wanganui (Horizons) Regional Council will have an increase in their rating base and this will effectively lower the rate demands for all other ratepayers in the District and region.

6. ECONOMIC COSTS OF THE TE RERE HAU EASTERN EXTENSION

Lost Agricultural Production

52. 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.

53. 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

54. 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.

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[23] Contained in *The Framework for New Zealand's Emissions Trading Scheme;* Ministry for the Environment and The Treasury; September 2007.

7. CONCLUSIONS

55. 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;
- 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.

56. 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.

57. The TRHE will provide net positive economic benefits at both a local and national level.