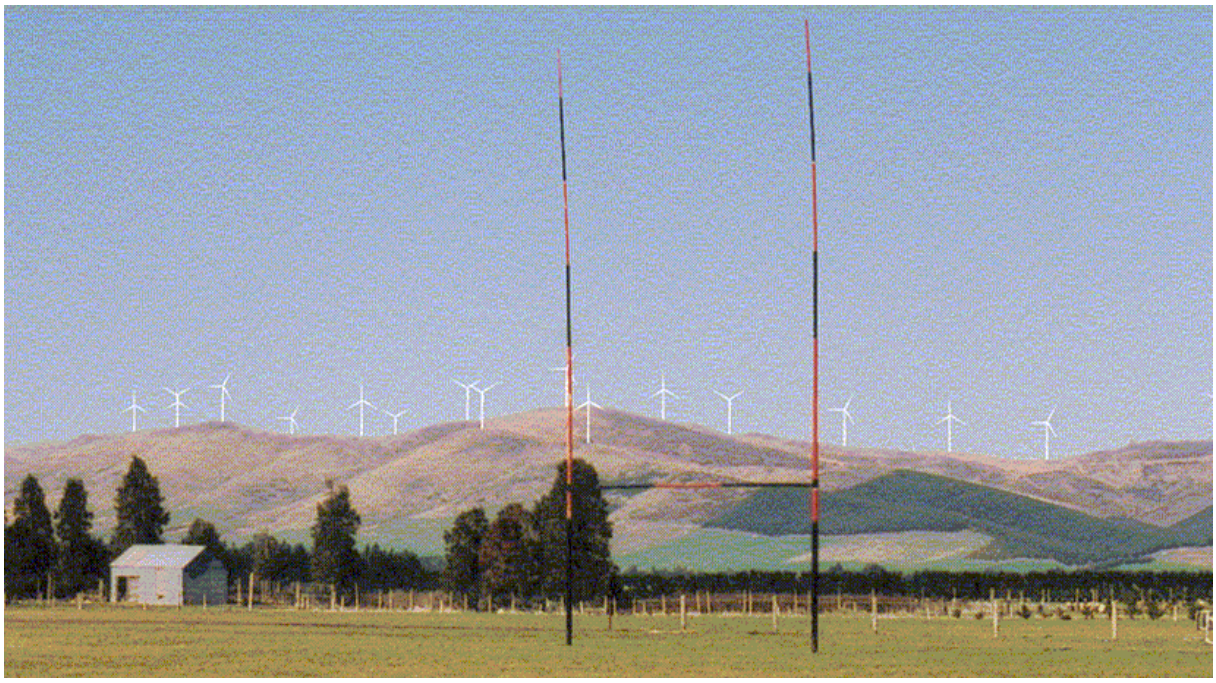
December 2005

Project Design Document
Project White Hill



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Front Cover: Photo representation of Project White Hill from the Mossburn Sports Ground

1. Project Characteristics

1.1. Project characteristics

Company name:	Meridian Energy Limited
Address:	Level 5, Presence House, 57-59 Courtenay Place, Wellington, New Zealand
Postal address:	PO Box 10-840, Wellington, New Zealand
Contact:	Ms Tracy Dyson
Job title:	Additional Revenues Manager
Telephone:	+64 21 289 6920
Fax:	+64 4 382 7439
Email:	tracy.dyson@meridianenergy.co.nz
Date of incorporation:	16 December 1998

1.2. Project abstract

Project title:	Project White Hill
Abstract:	Project White Hill will be a 58MW wind farm on a world class site in the South Island of New Zealand with an average wind speed of 9.25m/s at hub height. 29 x 2MW Vestas turbines will generate at least 208.8GWh and 130,500 tonnes CO_2e of emission reductions per annum, totalling 652,500 tCO_2e during 2008-2012. Electricity will be fed into the local grid and then into the national grid therefore offsetting thermal generation. Revenue will be derived from the sale of electricity into the national wholesale electricity market and the sale of emission reduction benefits including Emission Reduction Units awarded by the NZ Government in recognition of the project's additional nature.
Project location:	White Hill, 80km north of Invercargill, 14km west of Lumsden, South Island, New Zealand
Date of go/no-go decision:	November 2005
Anticipated construction start date:	February 2006
Construction finish date:	June 2007

1.3. Project description

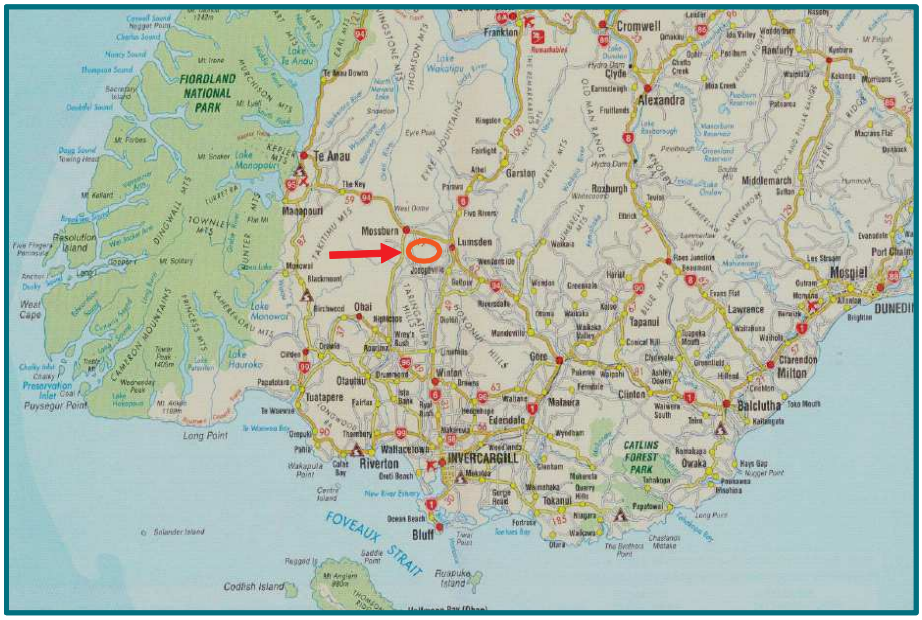
Project type

Project White Hill is a medium sized wind farm for the generation of electricity. Output from the wind farm will be fed in to the local electricity grid, and subsequently to the New Zealand national grid. Revenue will be derived by its sale into the national wholesale electricity market and through the sale of the emission reduction benefits of the project. See Appendix One for a brief overview of New Zealand and its electricity consumption.

In 2005 this project was assessed as being additional by the New Zealand Government.

Location

White Hill is located towards the southern end of the South Island. It is 80km north of Invercargill (population 49,800[1]) and 14km west of Lumsden (population 450). The area is rural low intensity farming.



The site has an average wind speed of 9.25 m/s at hub height. Local funnelling effects between the Takitimu Mountains to the west and the various mountain ranges (predominantly the Eyre Range) to the east, and the Waimea Plains, create a micro wind climate ideally situated to capture wind for electricity generation.

Proposed configuration

In January 2005 Meridian Energy gained a resource consent for the construction of up to 42 wind turbines. Subject to final design and equipment selection, this consent allows for a wind farm of up to 70MW generating up to 254 GWh of electricity per year. A 70 MW wind farm would produce enough electricity for approximately 30,000 homes, equivalent to all the houses in the Southland region.

[1] Statistics New Zealand, New Zealand Census of Population and Dwellings, 2001

Various local transmission constraints exist, and these become more complex the larger the wind farm becomes. The design that received Meridian Energy Board of Directors approval in November 2005 was a wind farm utilising 29 turbines with a maximum output of 58 MW, generating approximately 208.8 GWh per annum.

The proposed turbines will be made by Vestas of Denmark, the world's largest wind turbine manufacturing company. Each turbine will consist of:

- a tapered tubular steel tower;
- a nacelle which sits on top of the tower and houses the control gear, generator and the main rotor shaft that transmits the rotating energy from the turbine rotor to the main gearbox;
- the turbine rotor (3 bladed).

Vestas warranties that the availability of the turbines will be 97%.

Schedule

The development plan for Project White Hill is summarised in the11 steps below:

Development Stage		Status
1.	Site identification and land agreements	Completed Aug 2004
2.	Site assessment and pre-feasibility studies	Completed Nov 2004
3.	Preliminary design	Completed Nov 2004
4.	Resource consents	Completed Jan 2005
5.	Feasibility design	Completed April 2005
6.	Commercial assessment – Board Approval	Completed May 2005
7.	Detailed design	Completed Oct 2005
8.	Final Board of Directors approval	Completed Nov 2005
9.	Construction	Due Feb 2006
10.	First turbine commissioning	Due Nov 2006
11.	Full Commercial operation	Due Jun 2007

These are the 11 major phases of the development programme and are based on experience gained in completing Project Te Apiti (Meridian Energy's first wind farm, completed in December 2004). These work streams are not always consecutive and are indicative only.

In May 2005 the New Zealand Government found Project White Hill to be additional and allocated Kyoto credits for some of the emission reductions achieved during 2008-2012.

Ownership

Project White Hill will be owned and operated by Meridian Energy. It will be constructed using national and international contractors, with Meridian Energy providing overall project management during construction and commissioning. Meridian Energy will finance Project White Hill entirely using its own financial resources, including corporate debt facilities and cash reserves.

Regulatory framework

The development of the White Hill wind farm supports several aspects of New Zealand Government policy:

- The Government's energy policy acknowledges the important role that renewable energy will play in ensuring New Zealand has access to a sustainable, reliable energy supply[2]. The importance of a diverse supply of renewable energy is also acknowledged. New Zealand must seek alternative means of generating power to ensure the security of our energy supply.
- The Government's climate change policy acknowledges wind specifically as a part of the solution to reduce the impact of energy use on New Zealand's increasing greenhouse gas emissions[3].
- Project White Hill will also contribute to the renewable energy target of the National Energy Efficiency and Conservation Strategy[4].
- The Government's sustainable development policy also highlights the importance of energy and specifically renewable energy if New Zealand is going to achieve its long-term sustainable development goals that ensure the needs of the present are met without compromising the needs of future generations[5].

Project description summary

Project White Hill will:

- increase the quantity of renewable energy that Meridian Energy is able to supply to the New Zealand market;
- reduce New Zealand's greenhouse gas emissions by approximately 130,500 tCO_2e per annum which is 652,500 tCO_2e during 2008-2012;
- diversify the sources from which Meridian Energy is able to supply renewable energy to the New Zealand market; and
- achieve a financially viable investment with the sale of emission units;
- provide a range of co-benefits to both the local region and New Zealand as a whole (see Section 6.1 for details).

[2] http://www.med.govt.nz/ers/electric/package2000/epf.html
[3] http://www.climatechange.govt.nz/resources/info-sheets/policy-in-brief.html
[4] National Energy and Conservation Strategy, EECA, 2001, page 4
[5] http://www.med.govt.nz/ers/environment/sustainable-energy/discussion/summary/summary.pdf, page 8

1.4. Meridian Energy's background

Meridian Energy is a limited liability company wholly owned by the New Zealand Government. It is one of three companies formed from the split of the Electricity Corporation of New Zealand (ECNZ) on 1 April 1999. Meridian Energy's core business is the generation, marketing, trading and retailing of energy, and includes the management of hydrological reservoirs and other related assets.

As a State Owned Enterprise, Meridian Energy's principal statutory objective is to operate as a successful business. It is a limited liability company with independent directors appointed by the shareholding Ministers who have the same duties and liabilities as directors of other new Zealand companies. Meridian Energy's objectives include maximising long-term shareholder value by pursuing its commitment to the environment and the sustainable management and development of the natural, physical and human resources utilised in its business. Meridian Energy undertakes to only generate electricity from renewable resources.

Meridian Energy is the single largest generator of electricity in New Zealand. In the financial year ending June 30th 2005 Meridian Energy had total revenue of NZD 1,656.1m. The company employs approximately 375 staff (excluding contractors) in 3 principle locations in New Zealand.

The company owns and operates the Waitaki and Manapouri hydro power schemes located in the lower South Island (total capacity 2,448 MW). In addition Meridian Energy owns and operates a 90 MW wind farm at Te Apiti (lower North Island). In July 2005 Meridian Energy applied for a further resource consent for Project West Wind. This proposal is for a 210 MW wind farm on the outskirts of Wellington, the capital of New Zealand located at the southern end of the North Island.

Meridian has also invested significantly in renewable energy efficiency and improvement projects associated with its current assets since its inception. These include New Zealand's largest energy efficiency project to date, the completion of the Second Tailrace Tunnel in May 2002 for the Manapouri Power Station (approximately NZD 250m).

This year Meridian Energy announced its plans to focus solely on the development of renewable energy opportunities. At the same time the New Zealand Energy Efficiency and Conservation Authority ("EECA") announced the results of a survey EECA commissioned from UMR research, of attitudes towards electricity generation options. Under the heading "New Zealanders favour renewable energy growth" ECCA reported that: "an EECA study released today shows that New Zealanders overwhelmingly support wind energy and hydro electricity".

Meridian Energy is an active member of the local communities where generation plants are located, and supports a wide range of activities through its Community Sponsorship Programme. The company also sponsors a wide range of national and regional arts, cultural and sporting activities.

1.5. Additionality

New Zealand, straddling the 'roaring 40's' in the South Pacific, has a very good wind resource by international standards. Capacity factors (annual generation at a site as a percent of what that site could generate if the turbines were operating continuously throughout the year) in many existing or proposed New Zealand wind sites vary between 30% and 50%. This compares to an international average of 23%.[6] Project White Hill has a forecast capacity factor of 43%.

Project White Hill may be a high utilisation wind site by international measures, but the economics of the project are still marginal. New Zealand has historically enjoyed low electricity prices due to the mix of hydro and gas resources[7]. Wholesale electricity prices during 2002/03 were in the order of NZD 0.066/kWh[8] (approx US$ 0.045) and the currently accepted approximation of the development cost for a good wind site is NZD 0.067/kWh[9] (approx US$ 0.047). At such prices alternative generation options within New Zealand become feasible, for example indigenous coal reserves in the South Island, or even imported coal, are proposed. Such thermal options are positioned as more reliable, albeit less environmentally friendly, generation alternatives to wind. Such a thermal plant is currently seeking resource consent at Marsden Point in the north of the North Island.

New Zealand also does not have any existing domestic subsidies for wind energy projects. Development costs must therefore be kept to a minimum, and additional revenue from sources such as the sale of emission units are required to enable Project White Hill to proceed.

The current Net Present Value (NPV) evaluation of Project White Hill is marginally positive at a planning level estimate of 80% confidence level[10]. At levels higher than this, the project has a negative NPV. Any increase in revenue from the sale of emission units will improve the project NPV, and hence provide greater certainty to Meridian Energy to proceed with this project.

The New Zealand Government has assessed Project White Hill and found it to be additional and requiring additional revenue from the sale of emission reduction benefits from the project in order for the development to proceed. By allocating revenue generating Emission Reduction Units (ERUs) for some of the emission reductions generated by the project during 2008-2012, the Government and potential buyers of all emission reduction units will have assisted with the project.

[6] BTM Consulting, 2002.
[7] New Zealand Energy Data File, Ministry of Economic Development, 2003, page 145.
[8] New Zealand Energy Data File, Ministry of Economic Development, 2004, page 119. (Energy cost of total retail sales/Consumption of total retail sales = $2,295,690 million/34,888,509MWh = $65.8/MWh = 6.6c/kWh).
[9] New Zealand Energy Outlook to 2020, Ministry of Commerce (now Ministry of Economic Development), 2000, page 11.
[10] A range of construction costs are used in the evaluation of the project economics, with a probability of occurrence attached to each. This is part of Meridian Energy's risk management process for dealing with construction uncertainty

2. Application of Baseline Methodology

2.1. Construction of the baseline scenario

The carbon qualification detailed below is in alignment with the New Zealand Government's required approach under its Projects to Reduce Emissions process. This is a core part of the Government's climate change policy.

The New Zealand Climate Change Office (NZCCO), part of the Ministry of the Environment[11], engaged Concept Consulting Group to carry out an analysis of the impact of grid connected electricity projects on the electricity generation sector through the first commitment period of the Kyoto Protocol (2008-2012), and to advise on the appropriate standardised emission factors throughout this period[12].

Method

The nominal supply and demand scenario has been modelled in detail over the period 2007 to 2012 using Concept's electricity market model (EMOS). The assumed supply and demand scenario was assessed over a representative range of hydro inflow events using 1971 to 2001 hydro inflow sequences. Thermal generation offers were tuned to reflect the likely relativity between fuel costs and efficiencies at each station taking into account expected relative fuel contract flexibility and the impact of a carbon charge on generator short run costs.

The market simulation was repeated with a tranche of new supply (50MW base-load) added. The differences in production at each thermal power station were then analysed and converted into net CO_2 emissions per GWh of additional supply.

In any one year, the emission factor ranges between 400 and 900 tonnes per GWh depending on hydrological variability. Over the full five years, the annual variability is attenuated significantly although there is still substantial variation driven by year-to-year changes in hydrology.

Sensitivity analysis

Analysis has also been undertaken to check the sensitivity of the emission factor to a number of parameters including increased coal flexibility, increased gas flexibility/availability and altering the new supply assumptions. Overall, sensitivity analysis has tended to indicate that most realistic variations on the nominal scenario assumptions would tend to push the factor up rather than down.

[11] A New Zealand Government body
[12] Concept Consulting Group, Electricity Emission Factor Review, August 2004

Results

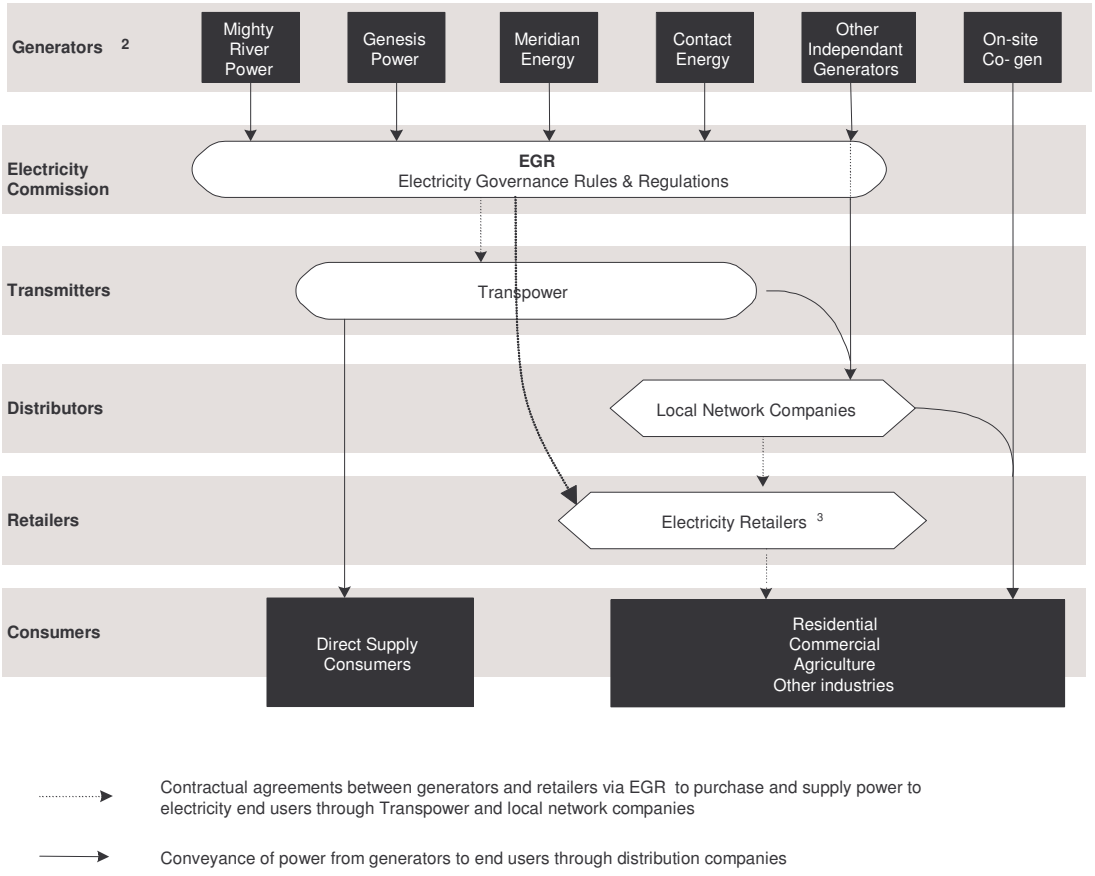
Based on the above analysis undertaken by Concept Consulting, and taking into account sensitivity analysis, a standardised emission factor of 600 to 650 tonnes of CO_2 per GWh was deemed to be appropriate. A mid point of 625 tCO_2e per GWh[13] for the 2004-2012 period has been adopted by the New Zealand Government.

Meridian Energy has adopted 625 tCO_2e per GWh as a proxy to estimate emissions for the first 20 years of Project White Hill, as it is the most authoritative independent estimate available for this extended period of time.

2.2. Project boundaries

The following chart provides an overview of the current structure of the New Zealand electricity system which does not include Project White Hill.

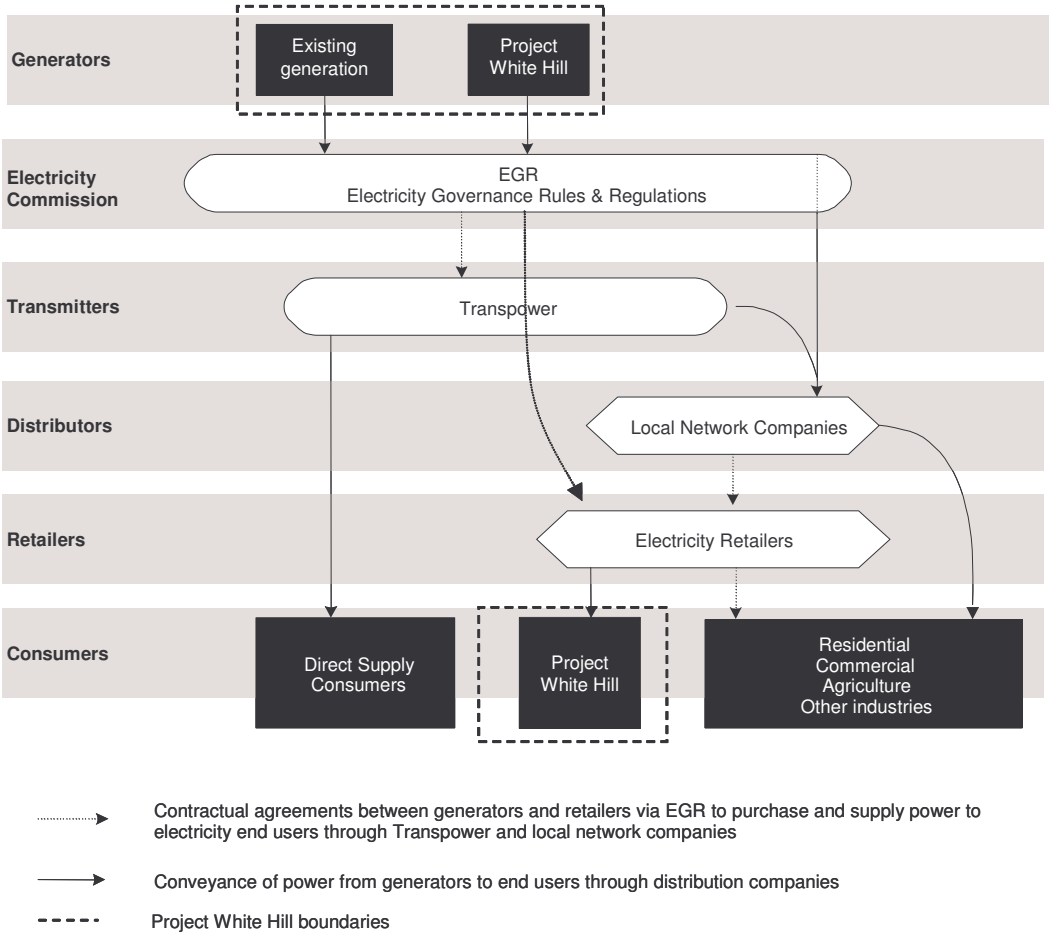
Figure: Overview of New Zealand electricity system



[13] New Zealand Climate Change Office, August 2004, Projects to Reduce Emissions Programme, page 11

The following flowchart shows components which are introduced by the project and how they fit in to New Zealand electricity structure. The dotted lines show the project boundary for Project White Hill.

Figure: Electricity system including Project White Hill



2.3. Greenhouse gas emission sources

The project is a green field wind farm generating electricity which is delivered into the local electricity transmission system.

The project will have the effect that power production of existing generators, attached to the grid, will be reduced when the wind speed is high enough for the turbines to generate. When the wind is low, the turbines may draw some electricity from the grid prior to shut down, however, this will be negligible.

As detailed in Section 3 the wind farm project does not have any net GHG emission sources or sinks. The emission and reductions one step upstream and one step downstream from the construction site have also been quantified.

- An example of one step upstream is the emissions from the construction of the wind farm including emissions from building civil structures on site and related transport fuels. Section 3 quantifies these emissions as 3,997.2 tCO_2e.

- An example of one step down-stream is the emission reductions due to the replacement of thermal electricity generated on another site. This will be the major positive impact of this project and is quantified in section 3.3 as being130,500.0 tCO_2e per annum, with a total of 652.5 $ktCO_2e$ during the period 2008-2012.

Only CO_2 emissions will be considered during the operation of the project as the other gases are immaterial when considering greenhouse gas emissions resulting from the combustion of fossil fuels.

There are no significant GHG emissions once the project is operational. However, there are emissions resulting from the construction of the project that will be offset prior to the Kyoto commitment period. Further details of commissioning emissions are discussed later in this document, to ensure a conservative approach all GHG gases will be considered during commissioning.

2.4. Key factors analysis

External key factors

The major points covering the key external on and off-site factors are summarised below[14]:

- Demand is assumed to grow at 2% pa over the period to 2012 from a figure of 42,024 GWh for the 2004 calendar year. The 2004 figure represents 2% growth over the 2003 calendar year nominal gross demand assumption;
- New supply capacity assumptions to 2012 are summarised in Table 1. The table shows the additional supply capacity assumed to come on line between now and 2008 and then for each calendar year thereafter based on fuel type. 1,163 MW of new capacity are expected to 2008, with an additional 307 MW expected prior to 2012;

MW Capacity	to 2008	2009	2010	2011	2012
Gas	405	-	-	-	-
Geothermal	252	10	10	10	10
Hydro	66	-	-	71	16
Wind	343	20	20	20	20
Other	97	-	-	-	-
Coal				100	
Total	1,163	30	30	201	46

Table 1 – New MW Supply Capacity Assumptions

- Fuel supply issues require company specific discussions. Genesis has an 8 year coal supply contract with Solid Energy leading to the delivery of 1.7 m tonnes of coal per annum to Huntly power station during 2008-2012. Additional supply options also exist for Genesis. The baseline scenario assumes that Contact Energy and Genesis will have sufficient gas to operate their combined cycle gas turbine plants to 2012 but with limited flexibility due to

[14] Concept Consulting Group, August 2004, Electricity Emission Factor Review

less overall gas supply however more may potentially be available at a higher cost. Lower overall gas supply and the loss of Project Aqua means a greater reliance on coal than considered in the past.

Project-specific factors

Risks that could result in the emission reductions attributable to the project being lower than forecast are outlined below.

- restrictive RMA consent conditions. The likelihood of this risk eventuating is considered low. Meridian's thorough assessment of effects and full community consultation before lodging an application for consent should ensure that consent conditions are not unduly restrictive although the impact of the conditions imposed has yet to be fully evaluated.
- wind resource less than predicted. The likelihood of this risk eventuating is considered low. Meridian will have over two years of wind data from the site before the final decision to proceed with the project is made. The data will also be correlated with other local long term data records. Meridian has processes in place to ensure there is sufficient quality assurance on both wind data recording equipment and the analysis which follows.
- turbine performance and/or availability is less than predicted. The likelihood of this risk eventuating is considered low. Meridian has a wind turbine supply agreement with Vestas who are the world's largest turbine manufacturing company. The turbine technology being assessed is all proven technology. The agreement with Vestas provides performance guarantees as to turbine performance and Meridian will purchase an extended warranty on equipment (5 years) to ensure any design faults are rectified.
- constraints in distribution or transmission system prevent full project output from being delivered. The likelihood of this risk eventuating is considered low to medium. Meridian Energy is currently undertaking a detailed evaluation of the transmission and distribution system capability in cooperation with the local grid operator (Powernet) and the national grid operator (Transpower).
- Meridian Energy unable to deliver project. The likelihood of this risk eventuating is considered low. Meridian Energy is committed to continue building capability in wind generation with the aim of developing a number of large-scale wind farms both in New Zealand and Australia. Meridian currently operates the Wellington wind turbine and the 90MW Te Apiti wind farm. The Te Apiti wind farm was completed in December 2004 as projected. In the unlikely event that Project White Hill is not implemented in the timeframe or the scale currently planned, Meridian Energy can offset the risk of not having the quantity of emission reductions contracted for by substitution with other wind projects in the Meridian Energy portfolio.

3. Estimation of Greenhouse Gas Emissions

The NZCCO has also prepared embodied emissions factors to be used in assessing the Projects to Reduce Emissions 2004 tender process in New Zealand. The methodology states that only emissions in New Zealand should be taken into account. The indices and factors provided by them are included in Appendix Three.

The total direct on-site and off-site emissions of 3,997.2 tCO_2e up to 2012 represents approximately 6.40 GWh[15] of generation by the wind farm. This is approximately 12 days of normal wind farm operations. During full production years the net emission reductions generated by Project White Hill are 130,500 tCO_2e per annum or 652,500tCO_2e during 2008-2012.

Detailed calculations underlying this summary are shown in Sections 3.1 to 3.4.

	2006	2007	2008	2009	2010	2011	2012	Total to 2012
Direct on-site	166.1	136..3	0	0	0	0	0	302.4
Direct off-site	1,079.3	2,615.5	0	0	0	0	0	3694.8
Indirect on-site	0	0	0	0	0	0	0	0
Indirect off-site	neg.	neg.	neg.	neg.	neg.	neg.	neg.	neg.
Total	1,245.4	2,751.8	0	0	0	0	0	3,997.2
Emission reductions	11,750.0	130,500.0	130,500.0	130,500.0	130,500.0	130,500.0	130,500.0	794,750.0
Net emissions	10,504.6	127,748.2	130,500.0	130,500.0	130,500.0	130,500.0	130,500.0	790,752.8

3.1. Direct emissions

Direct on-site emissions

Direct on-site emissions will arise during the construction process and during on-going operations.

[15] Converted at 625tCO_2e per GWh

(i) Construction.
Direct on-site emissions during construction will arise from the use of diesel and petrol fuel for construction equipment. For a 58 MW wind farm these are calculated at 302.4 tCO_2-e. as follows:

	Emission factor[16]	2006 (litres)	2006 (tCO_2e)	2007 (litres)	2007 (tCO_2e)	Total (litres)	Total (tCO_2e)
Diesel used	0.00271	57,000	154.5	46,000	124.7	103,000	279.2
Petrol used	0.00232	5,000	11.6	5,000	11.6	10,000	23.2
Total			166.1		136.3		302.4

(ii) Operations
Diesel or petrol emissions during on-going operations are extremely small, and arise only from the use of petrol or diesel engine vehicles for on-site movement of maintenance crews. These emissions are insignificant within the total emissions balance of the project.

There will be a small amount of electricity used on site when the wind turbines are not operational, however, this is taken into account as the electricity generation figures used are net figures after all losses and all onsite use has been taken into account. The total annual electricity figure represents the amount of additional electricity that the wind farm puts into the local network.

In summary, there are no material operational direct on-site emissions.

Direct off-site emissions

Direct off-site emissions will arise during the construction of the project due to manufacturing of material and equipment, and transport to site. For a 58 MW wind farm, and using the emission factors in Appendix Three, the total direct off-site emissions during construction are calculated at 3,694.8 tCO_2-e as follows:

	Emission factor[17]	2006 (tonnes)	2006 (tCO_2e)	2007 (tonnes)	2007 (tCO_2e)	Total (tonnes)	Total (tCO_2e)
Cement	0.46	1,350	621	3,150	1,449	4,500	2,070
Iron and steel – imported[18]	0	-	0	5,400	0	5,400	0
Iron and steel – New Zealand produced	2.01	228	458.3	532	1,069.3	760	1,527.6
Aluminium	1.62	-	0	60	97.2	60	97.2
Total			1,079.3		2,615.5		3,694.8

[16] Projects to Reduce Emissions Programme Tender Instructions, Ministry for the Environment, page 11, 2004. See Appendix Three .
[17] Projects to Reduce Emissions Programme Tender Instructions, Ministry for the Environment, page 11, 2004
[18] Only emission in NZ are considered in line with the methodology in Projects to Reduce Emission Programme Tender Instructions, Ministry for the Environment

3.2. Indirect emission effects (leakage)

Indirect on-site emissions

The indirect on-site emissions are expected to be the power augmentation required during fluctuating wind conditions. The quantum of power required and whether it is needed at all is a function of the technology used. It will be negligible, and the amount of electricity generated is net of this amount. The project will not lead to a significant change in demand for services on-site, therefore there are no material indirect on-site emissions that need to be considered.

Indirect off-site emissions

There are no indirect off-site emissions.

3.3. Emission reductions

The first full year of production is forecast to be 2007. From this time forward the project will result in the reduction of emissions of 130,500.0 tCO_2 per annum.

	2006	2007	2008 - 2025
Electricity Generated (GWh)[19]	18.8	208.8	208.8 p.a.
Emission Reduction (tCO_2e)[20]	11,750.0	130,500.0	130,500.0 p.a.

3.4. Net emissions

During 2006 it is estimated that Project White Hill will have a net reduction in emissions of 10,504.6 tCO_2e, and a net reduction in emissions of 127,742.8 tCO_2e during 2007. Emissions caused by the construction will be offset by the staged commissioning of the wind turbines during the construction period.

	2006	2007	2008 - 2025
Emission Reduction (tCO_2e)[21]	11,750.0	130,500.0	130,500.0 p.a.
Less Construction Emissions (tCO_2e)[22]	1,245.4	2,751.8	0
Net Emission Reduction (tCO_2e)	10,504.6	127,748.2	130,500.0 p.a.

[19] Electricity produced by the project, consumed outside the project
[20] Electricity produced by the project, multiplied by the electricity emission factor of 625 tCO_2-e per GWh
[21] Electricity produced by the project, multiplied by the electricity emission factor of 625 tCO_2-e per GWh
[22] Due to construction of the windfarm, as shown in Section 5.2

4. Monitoring and Verification Plan

The monitoring, verification and reporting plan outlined below has met the requirements of the New Zealand Government's Project to Reduce Emissions programme.

The emission reductions from this project will be measured by measuring the GWh produced annually by the wind farm using Meridian Energy's generation meters and multiplying this by the emission factor calculated above. A report will be prepared and this will be used as the basis for the verification process that is likely to be carried out by DNV. DNV has achieved UNFCCC accreditation for CDM projects and for several other international emission trading systems.

4.1. Metering and data management quality control

All Meridian Energy's generation meters meet the electrical metering installation standards in New Zealand. These are required to be in compliance with the Electricity Governance Regulations 2003 and rules (EGRs). The EGRs allow generators to compete for the right to generate and enable electricity wholesalers and retailers to compete for customers. The EGRs also cover all aspects of physical data recording, handling and settlement , the metering and reconciliation process, particularly the matching of data provided by retailers and generators, and include accuracy standards for metering systems, Codes of Practice governing installation and certification of meters, as well as handling of data and allocation of volumes to participants in the reconciliation process through to financial settlement.

The Electricity Commission, an industry specific regulator, is responsible for overseeing the governance, operation and development of New Zealand's wholesale and retail electricity markets. The Electricity Commission develops or amends the EGRs as well as assessing compliance with the rules. Further information on the Electricity Commission and the Electricity Governance Regulations 2003 and rules can be found at www.electricitycommission.govt.nz.

A business unit of Transpower performs the role of Reconciliation Manager (RM). The RM is responsible for reconciling metering data against a register of contracts and passing the data to industry participants.

More specifically, responsibility for installation, measurement and monitoring is as follows. Meters must comply with an internationally recognised standard, such as IEC 60521 and IEC61036, and have passed laboratory tests to prove compliance with the requirements of the EGRs and the relevant Codes of Practice.

Installations must be installed and maintained and site certified by an ISO and EGR compliant Test House. Test Houses are subject to audit, and certification will be withdrawn for Test Houses that do not meet the requirements of the EGRs and Codes of Practice.

Data Administrator's are ISO and EGR certified companies that can handle information from EGR compliant metering systems, and only certified Data Administrator's may pass this information into the reconciliation process. Again, they are subject to audit and recertification, and certification will be withdrawn for Data Administrators that do not meet the requirements of the EGRs and Codes of Practice.

Issues of monitoring metering systems and data for integrity, validation of information, and estimation of missing data is contained within the EGRs and Codes of Practice. In additional metering errors must be notified to the Reconciliation Manager and are open for audit.

Generation information from the wind farm will be measured and recorded half hourly. This information is collected and validated daily by a proprietary computer package in compliance with Meridian's ISO and EGR certification. This data is used within the reconciliation process to obtain payments for volumes generated and will also be the GWh information used for calculating VERs.

4.2. Monitoring and reporting plan

Based on the above methodologies generation of GWh will be monitored half hourly. Emission reductions will be generated at the same time at a rate of 625tCO_2/GWh. On an annual basis third party GWh generation data will be utilised to calculate the total VERs generated in the year. Meridian will generate a report which will be utilised by DNV as part of their process to verify the emission reductions. A verification statement will be issued by DNV which will be provided with Meridian Energy's VER report.

Emission reductions will be generated from the project before it is fully commissioned as electricity begins to be generated from the time the first turbine is erected and connected to the grid

Meridian Energy will commit to providing the reports. Additional reporting will be possible by negotiation.

Report	Topic	Expected date
1.	Emission reduction report for 2006 from Meridian Energy With Verification Report from DNV (or equivalent independent body)	1st March 2007
2.	Commissioning report – when the project is fully operational	June 2007
3.	Emission reduction report for 2007 from Meridian Energy With Verification Report from DNV (or equivalent independent body)	1st March 2008
4.	Emission reduction report for 2013 from Meridian Energy With Verification Report from DNV (or equivalent independent body)	1st March 2014

Note: Meridian Energy also reports on an annual basis to the New Zealand Government the sale of all emission reduction units from the project.

5. Stakeholder Comments

As part of the resource consent process for Project White Hill Meridian undertook community consultation. Meridian has prepared the following summary of the consultation undertaken for Project White Hill. A more detailed description of the consultation may be found on the Project White Hill website.[23]

Consultation was meaningful and comprehensive. The consultation efforts were 'fronted' predominantly by Meridian staff, and supported by technical specialists or consultants as required. This section outlines Meridian's consultation philosophy, how it was implemented for White Hill, and attempts to capture the winder community's feedback and reaction to the project.

5.1. Meridian's consultation philosophy

Meridian has a proven track record in stakeholder relationships and environmental performance. The approach and methodology for planning and managing consent processes have proven to be highly successful (for example with the Second Manapouri Tailrace Tunnel project in Fiordland, and the Te Apiti Windfarm project in the Manawatu). This success is underpinned by a commitment to a genuine process of consultation, which is early, open and honest. This philosophy is the cornerstone of Project White Hill consultation.

5.2. Meridian's consultation objectives

The team involved with Project White Hill had the following objectives with respect to consultation:

- To support the resource consent process for Project White Hill;
- To fulfil resource consent requirements under the Resource Management Act;
- To build rapport with existing and new stakeholders and deliver key project messages:
- To provide sufficient information to the community so that it can make an informed decision;
- To receive stakeholder feedback and incorporate where possible;
- To counter or dispel misinformation about wind energy ie, myths and legends;
- To maintain the commercial integrity of the project;
- To increase awareness and understanding of the benefits of the wind farm; and
- To enhance Meridian's company profile in the area.

5.3. Key stakeholders and project shaping

Definitions

Key stakeholders is a term used by Meridian to mean those organisations or individuals who may have a direct effect of the *shaping* of the proposed White Hill windfarm. *Shaping* is a term

[23] http://www.meridianenergy.co.nz/WindProjects/whitehill/resource+consent+application.htm, Resource Consent Application, pages 56-64

that Meridian uses to describe the process of developing a robust project prior to engaging the wider public. In general terms, it is the development of a preferred option for a proposed wind farm layout, before fully engaging the wider public.

Key stakeholders

Since late 2003 Meridian has been in discussions with some key stakeholders regarding options for a potential windfarm on White Hill. The key stakeholders include, but are not limited to:

- Meridian staff and consultants;
- Some landowners near White Hill
- Southland District Council (key staff);
- Department of Conservation (key staff);
- Environment Southland (key staff);
- Venture Southland;
- Te Ao Marama and key local Runanga representatives;
- Mossburn Community Development Area Committee (Mossburn CDA);
- Lumsden Community Board
- Dipton Community Development Area Committee (Dipton CDA)
- Some local residents;
- Immediately neighbouring property owners (those that share a site boundary);
- Transit New Zealand;
- Civil Aviation Authority;
- Interest groups eg, gliding club(s), Southland Tramping Club;
- Forest and Bird;
- The local branch of NZ Fish and Game;
- Southland Chamber of Commerce

Project shaping

The shaping process takes place with all key stakeholders, often involving much iteration, until Meridian is satisfied that the project is robust enough to be considered by the public ie, the most obvious issues have been considered and addressed.

It is critical to stress that Meridian does not presume to have identified all issues during the project shaping process. The intention is to provide the public with sufficient project detail so that the project can be reasonably scrutinised and an informed opinion can be made. The opinion may be to support the project, oppose it, or to request further information on any particular aspect of the project.

5.4. Presentations to key stakeholders

A significant part of Meridian's consultation efforts are presentations to stakeholders and interest groups. These presentations typically give background to Meridian Energy, wind energy and the proposed project.

Meridian staff presented to the following groups regarding the proposed White Hill windfarm:

- Venture Southland;
- Venture Southland Board;
- Mossburn and Lumsden Community Boards;
- Southland District Council staff;
- Environment Southland staff;
- Department of Conservation;
- Southland Chamber of Commerce.

In general, the presentations were well received by all audiences. Most expressed appreciation of the early consultation, the information provided and the openness of the consultation approach.

5.5. Public announcement

Project White Hill was officially launched at the Mossburn Community Centre on Friday 17 September 2004. Invited to attend were representatives of Southland District Council (mayor, councillors and staff); Environment Southland (councillors and staff); Mossburn, Lumsden and Dipton Community Boards (or CDAs); PowerNet; local landowners; the media; and Clutha MP Bill English.

General reaction to the public launch from attendees was positive with television and press coverage also presenting an optimistic outlook for the project.

5.6. Mailout to northern Southland residents

Almost 900 copies of a letter were sent out to northern Southland residents. A total of 899 houses received the letter which outlined the proposal for the wind farm, provided key project details and advised of project open days.

5.7. Project open days

Meridian hosted a total of 5 open days in the communities of Mossburn, Lumsden and Dipton prior to lodging a resource consent application. These are essentially a temporary local information centre which is staffed by Meridian Project White Hill personnel. The intention is that anyone can 'drop in' at any convenient time during the day to view the video, see simulations, collect printed material or ask questions of staff.

Based on attendance figures, the interest in the proposed White Hill windfarm was very high. Staff at the open days report that, during general conversation with attendees, there was overwhelming (majority) support for the project. However, of the 239 attendees, 6 individuals made their objections to the project clear to Meridian Energy representatives. As a general indication, the objections related primarily to the visual effects and/or comments received like "it should be somewhere else".

5.8. Free phone number and website

A free phone number was established for Project White Hill. Up to the date on which the resource consent application was lodged, seven phone calls had been received. The majority of these were requests for a video or DVD, or registrations of interest for potential construction work.

An email address was also established to receive internet queries. Up to the date on which the resource consent application was lodged, only two emails had been received. One was a query for a high school project, the other a registration of interest for potential construction work.

5.9. Summary

The consultation for the proposed White Hill windfarm, which culminated in the resource consent application, was meaningful and comprehensive. This consultation does not end with the lodging of the resource consent and will continue through the project. Feedback received from presentations, meetings and open day attendances, suggest widespread approval of Meridian's approach to consenting and consultation.

To date, the wider Southland community appear highly supportive of the proposed White Hill windfarm. Meridian staff involved in presentations, meetings, and the open days generally report a very high level of positive community feedback. A total of 269 visitors went to one of the open days. Only 6 individuals made some objection to an aspect of the project clear to Meridian's representatives (most commonly related to visual effects).

A total of 58 questionnaires were completed during the open days (approximately 22% of attendees). Of these, 55 (95%) showed support for the project and 3 (5%) were neutral or undecided.

General public opinion to date, appears to be one of satisfaction with the level and quality of the information provided at this early stage. Strong interest remains for updates as the project progresses, which is a matter Meridian is committed to meeting on an on-going basis.

6. Environmental Impact

Significant benefits both nationally and locally will result from the proposed White Hill wind farm. The development and operation of the wind farm can be achieved in a way that avoids, remedies or mitigates adverse effects. Achieving positive, sustainable outcomes, while addressing any adverse effects is consistent with the purpose of the Resource Management Act. Meridian gained approval to proceed with Project White Hill under this act in January 2005 following granting of its application for a resource consent.

6.1. Co-benefits

Regional tourism

New generation wind farms that utilise turbines above 1.5MW are relatively new in New Zealand, and their impact in the landscape has received generally very supportive comments. It has been reported that the Te Apiti wind farm has had a positive impact on the Manawatu Region. It has been incorporated into tourism products, is included in regional brochures and attracts visitors, both locally and from outside the region. This is an example of a windfarm enhancing the recreational values of an area that previously had low levels of recreational use. Meridian energy expects a similar reaction to Project White Hill.

Local income

Project White Hill will provide approximately US$ 0.3m per annum to the local community or region due to its ongoing operations. This comprises annual maintenance services (exclusive of capital items), annual land rentals, and annual community sponsorships and grants. In a part of new Zealand with a low population density, this income will have a proportionally greater impact than the same amount in more populous areas.

Leverage for further wind farm developments

The completion of this project will increase the likelihood of further wind farms in New Zealand. It will increase the publics knowledge about how modern wind turbines can co-exist successfully in the right environment, thereby dispelling old misconceptions on noise and wildlife impacts. It will also demonstrate to other New Zealand electricity generators that while marginal, wind farms can be commercially viable in the right settings and with the right financing structures. Finally, it will support the continuing wind development programme within Meridian Energy by increasing our corporate knowledge on how to develop this technology. This 'learning curve' effect is difficult to quantify and describe, but it is seen as being critical in leveraging our development programme into larger scale wind farms. One tangible example related to this effect is the ability to increase our purchasing power over turbine suppliers due to economies of scale within our development programme.

Other emission reductions

Project White Hill, and other wind farms within New Zealand, will not only reduce carbon dioxide emissions but also other emissions associated with non-renewable generation alternatives. Coal in particular is seen as a viable alternative to wind farm developments. The avoidance of a thermal station, with its emissions of heavy metals in water cooling systems and a range of other gaseous emissions associated with the combustion process, is a major environmental benefit.

6.2. Environmental impact assessment

The requirements of the Resource Management Act mean that Meridian has had to undertake a full assessment of environmental effects (AEE) as part of its application for a resource consent.

The development of projects in New Zealand which impact on the natural and physical resources of the country are subject to the Resource Management Act 1991. This Act requires a full assessment of the effects of any development. If any adverse effects resulting from the proposed development can be avoided, remedied or mitigated then a resource consent may be issued. This resource consent provides the developer with the regulatory approval to carry out the development.

The project team worked together on the design of the White Hill windfarm to ensure that the proposal will have minimal effects on the surrounding area. An assessment of environmental effects has been undertaken, examining in detail issues such as the effects on the landscape, traffic, noise, ecology, archaeology, electro-magnetic interference, air traffic, issues of significance to tangata whenua, and socio-economic effects. The potential effects of the construction process have also been assessed.

The main findings of the assessments include:

- Overall, the proposed wind farm is unlikely to have adverse landscape or visual effects that are more than minor;
- More than minor visual effects are limited to an area where there are relatively few affected residential properties;
- Appropriate design and siting of turbines and earthworks will minimise ecological effects;
- At all houses, noise emissions from the proposed wind farm will comply with the performance standard contained in the New Zealand Standard for noise from wind farms;
- There will be no impacts on sites of significance to tangata whenua;
- Overall, it is considered that the effect on archaeological sites will be minor;
- The geological value of the site will not be adversely affected;
- The windfarm will not constitute a hazard to aircraft;
- With the mitigation proposed, the effects of any electrical interference on electrical equipment in the surrounding area will be negligible;
- Traffic related effects are predominantly confined to the construction period and are readily able to be handled and accommodated within the established road network;
- Turbine foundations are unlikely to be affected by slope instability and seismic risk is low;
- The impact from erosion, sediment run-off and dust emission is likely to be minor with the adoption of best practice environmental control measures;
- Once construction is complete, there will be no long-term effect on the surrounding neighbours other than the change to any outlook they may have of White Hill itself.

Full copies of each of the assessment of effects studies are available on the Meridian Energy Project White Hill website[24].

6.3. Cultural effects

Meridian has consulted extensively with Te Ao Marama to determine whether or not there are sites or matters of interest to tangata whenua arising from the development. Te Ao Marama has indicated that they have reviewed the relevant archives and records and that these do not indicate that there are any sites or other matters of interest to iwi in the proposed development area.

In order to verify this, Te Ao Marama recommended that Ngai Tahu Development Corporation's archaeologist undertake an aerial survey of the site. Meridian accepted this recommendation, and the site was aerial surveyed, by helicopter in September 2004. Immediately following the flight, Meridian received a verbal report which indicated that there were "no surprises" ie, no 'new' sites or potential sites were identified. However, it was reported to Meridian that the Ngai Tahu Development Corporation archaeologist would look at the trig stations more closely by re-examining the archaeologists report. At the time or writing this had not been completed.

Irrespective, Meridian will continue to consult with Te Ao Marama throughout the construction process, and agreed to a White Hill specific Accidental Discovery Protocol. An example of this protocol can be provided on request.

[24] http://www.meridianenergy.co.nz/WindProjects/whitehill/resource+consent+application.htm, Appendices B-J

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8. Appendix One – New Zealand Country Overview[25]

Geography

New Zealand lies in the South West Pacific ocean, approximately 1,500km east of Australia and 7,500km south of Hawaii. The country consists of two main islands - North Island and South Island - and a number of much smaller outlying islands. New Zealand has a combined surface area of approximately 270,000km2, similar in size to the British Isles or Japan.

Mountains and hill country dominate the New Zealand landscape, with large ranges running through both the North and South Islands. New Zealand has a long coastline relative to its area, and offers varied scenery including fiords, glaciers, lakes, volcanic regions and spectacular beaches, harbours and coastal areas.

Climate

Seasons in New Zealand are opposite to those in the northern hemisphere, with January and February being the hottest months and July the coldest. New Zealand's climate varies from sub-tropical in the north, to extremely cold in central alpine areas. However, most areas enjoy a temperate climate, with moist summers and winters and without extremes of temperature. Mean annual temperatures range from 15 degrees Celsius in Northland and Auckland to 13 degrees Celsius in Wellington and 10 degrees Celsius in Southland.

Population

New Zealand's estimated population at 30 June 2004 is 4.06 million of whom 76% live in the North Island and 24% in the South Island. The populations of the largest urban areas estimated at 30 June 2003 are:

Auckland	1,199,300
Wellington	363,400
Christchurch	358,000
Hamilton	179,000
Dunedin	113,600
Napier/Hastings	118,400

(Source: Estimated Resident Population of Urban Areas, at 30 June 2003, Statistics New Zealand)

New Zealand has a diverse and multicultural society. The racial breakdown of New Zealand is:

European	71%
Maori ((indigenous people of New Zealand)	13.9%
Pacific Island	6.5%
Asian	8.5%

There is no state religion and no restrictions on the practice of religion in New Zealand. The population is predominantly Christian, with the major denominations being Anglican, Presbyterian, Roman Catholic and Methodist. English is spoken throughout the country and is one of the official languages, along with Maori.

[25] http://www.chapmantripp.co.nz/resource_library/DoingBusinessInNZ/overview.asp Sections 1 to 7

Government

As a member of the British Commonwealth of Nations, New Zealand is a monarchy with a democratically-elected and fully independent parliamentary government. By constitutional convention, the Governor-General (the Queen's representative in New Zealand) is obliged to follow the advice of government ministers, although this advice may be rejected in extraordinary circumstances.

New Zealanders voted in a referendum in 1992 to adopt a mixed member system of proportional representation (MMP), similar to that in place in Germany. This system was introduced in the 1996 general election. Under MMP voters have a party vote and an electorate vote. The party vote enables the voter to choose what party they would like represented in Parliament. The electorate vote is for choosing a Member of Parliament to represent the voter's electorate.

Parliament is the governing body of the nation, consisting of a 120 member House of Representatives. Sixty two members represent the 62 general electorates, 7 members represent the seven Maori electorates and the remaining 51 members are list members. Members are elected nationally every three years. All persons over the age of 18 may vote in elections.

Legal system

New Zealand has a common law system, similar to that in England and many other western countries.

A hierarchical structure of courts exist to rule on the interpretation of legislation passed by Parliament. Most criminal and civil matters are dealt with by the District Court, with large civil matters and the most serious crimes handled by the High Court. A right of appeal exists from the High Court to the Court of Appeal and, with leave to the Supreme Court.

New Zealand has a single legal profession in which most members hold a practising certificate as barrister and solicitor. Judges are appointed by the Crown and there is a strong tradition of independence for judges with various mechanisms to protect that independence.

Infrastructure

New Zealand has well-established national and international transport and communication systems. One domestic airline provides air links between all major towns and cities and over 20 international airlines offer services to New Zealand.

Four container and 12 conventional ports provide access to a comprehensive network of shipping services.

A modern and sophisticated telecommunications network services the country with over 51 access lines and 30 mobile phones per 100 people. New Zealand has one of the highest interconnect rates in the world on a per capita basis. (Table 25: Census per household, Household Economic Survey 2001, Statistics New Zealand).

Living in New Zealand

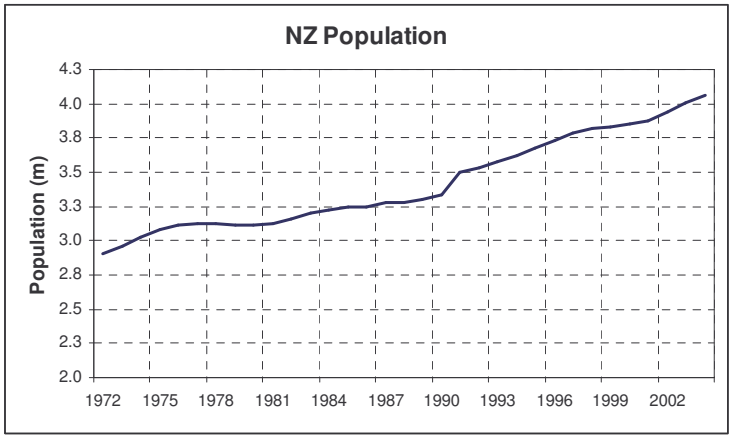
New Zealanders enjoy a high standard of living with excellent housing, education and health systems, combined with a solid transportation and communications infrastructure.

There is a wide range of leisure and sporting activities available, taking advantage of New Zealand's unique natural landscape and environment. Arts, music and cultural pursuits have

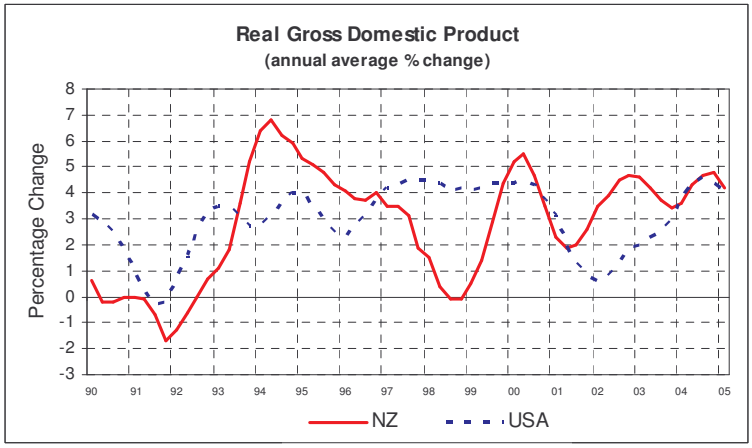
also flourished in recent times with the establishment of national and regional orchestras, theatre groups, opera and dance companies.

Electricity demand

Current annual electricity demand in New Zealand is about 40,000 GigaWatt Hours (GWh) and is forecast to grow between 1.8% and 2.4% per annum[26]. This increase is driven by economic and population growth. The population of New Zealand has increased on average by 1 percent per annum between the years 1972 and 2004.



In addition the New Zealand economy has enjoyed annual average growth of 2.8% since 1990[27].



- New Zealand's population continues to grow and now exceeds 4 million;
- Electricity plays a key role in living standards and technological progress that enhances productivity and hence GDP;
- Large industrial processes consume 44% of New Zealand's electricity. Increases in wood processing and dairying expansion continue to require more electricity;
- Energy intensity will improve over the long term with investment in more efficient technologies.

[26] http://www.med.govt.nz/ers/environment/sustainable-energy/discussion/summary/summary.pdf, page 4
[27] Reserve Bank of New Zealand. http://www.rbnz.govt.nz/keygraphs/Fig2.html

9. Appendix Two – White Hill 20 Year Financial Plan

Notes to financial statements

The statements are presented in thousands of New Zealand dollars. The statements have been produced from a real model of project cash flows (that is, revenues and costs are in constant dollars where inflation will impact all cash flows equally). The result is that the statements are expressed in 2005 dollars.

Part One – Years 2006 to 2015

Calendar year ($NZ '000)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Years	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
PROFIT AND LOSS										
Energy Sales	922	11,107	13,068	13,783	14,161	15,539	15,765	16,575	16,575	16,575
GROSS REVENUE	922	11,107	13,068	13,783	14,161	15,539	15,765	16,575	16,575	16,575
Less Costs	707	2,816	3,284	4,554	4,494	4,208	2,433	2,340	2,402	3,215
EBITDA	215	8,292	9,784	9,229	9,667	11,331	13,332	14,235	14,173	13,359
Less Depreciation	3,410	19,402	16,686	13,145	10,391	8,248	6,575	5,268	4,244	3,439
Less Overdraft Interest	-	6,889	8,279	7,932	7,476	7,224	6,769	6,395	5,834	5,415
Plus Investment Interest	-	-	-	-	-	-	-	-	-	-
EBT	(3,195)	(18,000)	(15,181)	(11,848)	(8,201)	(4,141)	(13)	2,572	4,095	4,505
Tax Payable	(1,054)	(5,940)	(5,010)	(3,910)	(2,706)	(1,366)	(4)	849	1,351	1,487
NPAT	(2,140)	(12,060)	(10,171)	(7,938)	(5,494)	(2,774)	(9)	1,723	2,744	3,018
BALANCE SHEET										
Current Assets	86	1,041	1,225	1,292	1,328	1,457	1,478	1,554	1,554	1,554
Fixed Assets	95,225	103,949	87,263	74,118	63,727	55,479	48,904	43,636	39,392	35,952
TOTAL ASSETS	95,311	104,990	88,488	75,410	65,054	56,936	50,382	45,190	40,946	37,506
Current Liabilities	(963)	924	(453)	923	(339)	808	(389)	709	(293)	693
Term Liabilities	98,415	118,266	113,313	106,797	103,197	96,706	91,358	83,344	77,358	69,915
TOTAL LIABILITIES	97,452	119,191	112,859	107,720	102,858	97,514	90,969	84,053	77,066	70,608
TOTAL PROJECT EQUITY	(2,140)	(14,200)	(24,371)	(32,309)	(37,804)	(40,578)	(40,587)	(38,864)	(36,120)	(33,102)
STATEMENT OF CASHFLOWS										
Net Cash - Operating	12,549	11,791	4,954	6,516	3,599	6,492	5,348	8,014	5,986	7,444
Net Cash - Investing	(110,964)	(31,642)	-	-	-	-	-	-	-	-
Net Increase/Decrease	(98,415)	(19,852)	4,954	6,516	3,599	6,492	5,348	8,014	5,986	7,444
Opening Balance	-	(98,415)	(118,266)	(113,313)	(106,797)	(103,197)	(96,706)	(91,358)	(83,344)	(77,358)
CLOSING BALANCE	(98,415)	(118,266)	(113,313)	(106,797)	(103,197)	(96,706)	(91,358)	(83,344)	(77,358)	(69,915)

(continued)

Part Two – Years 2016 to 2025

Calendar year ($NZ '000)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Years	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
PROFIT AND LOSS										
Energy Sales	16,575	16,575	16,575	16,575	16,575	16,575	16,575	16,575	16,575	16,575
GROSS REVENUE	16,575	16,575	16,575	16,575	16,575	16,575	16,575	16,575	16,575	16,575
Less Costs	4,344	3,782	2,591	2,362	2,424	2,293	1,899	1,957	1,957	1,910
EBITDA	12,231	12,793	13,983	14,212	14,150	14,282	14,676	14,618	14,618	14,665
Less Depreciation	2,805	2,304	1,906	1,588	1,334	1,129	963	827	716	624
Less Overdraft Interest	4,894	4,542	4,053	3,595	3,014	2,503	1,887	1,301	624	-
Plus Investment Interest	-	-	-	-	-	-	-	-	-	-
EBT	4,532	5,947	8,025	9,029	9,803	10,651	11,827	12,490	13,279	14,041
Tax Payable	1,495	1,963	2,648	2,980	3,235	3,515	3,903	4,122	4,382	4,634
NPAT	3,036	3,985	5,377	6,050	6,568	7,136	7,924	8,368	8,897	9,408
BALANCE SHEET										
Current Assets	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,554	1,812	12,247
Fixed Assets	33,147	30,843	28,937	27,349	26,015	24,887	23,924	23,097	22,381	21,757
TOTAL ASSETS	34,701	32,397	30,491	28,903	27,569	26,440	25,478	24,651	24,193	34,004
Current Liabilities	(116)	579	(158)	499	(98)	438	(86)	399	(46)	358
Term Liabilities	64,883	57,899	51,353	43,059	35,754	26,953	18,591	8,910	-	-
TOTAL LIABILITIES	64,766	58,478	51,196	43,558	35,656	27,391	18,505	9,309	(46)	358
TOTAL PROJECT EQUITY	(30,066)	(26,081)	(20,704)	(14,655)	(8,087)	(951)	6,973	15,341	24,238	33,646
STATEMENT OF CASHFLOWS										
Net Cash - Operating	6,984	6,546	8,294	7,305	8,801	8,363	9,680	9,168	10,435	9,680
Net Cash - Investing	-	-	-	-	-	-	-	-	-	13
Net Increase/Decrease	6,984	6,546	8,294	7,305	8,801	8,363	9,680	9,168	10,435	9,693
Opening Balance	(64,883)	(57,899)	(51,353)	(43,059)	(35,754)	(26,953)	(18,591)	(8,910)	258	10,693
CLOSING BALANCE	(57,899)	(51,353)	(43,059)	(35,754)	(26,953)	(18,591)	(8,910)	258	10,693	20,385

10. Appendix Three – Indicies and Factors

Global Warming Potential Index (GWP)

Greenhouse Gas		*Chemical Formula*	*GWP*
Carbon dioxide		CO_2	1
Methane		CH_4	21
Nitrous oxide		N_20	310
Sulphur hexafluoride		SF_6	23,900
Hydrofluorocarbons (HFCs)	HFC-23	CHF_3	11,700
	HFC-32	CH_2F_2	650
	HFC-125	C_2HF_5	2,800
	HFC-134	CHF_2CHF_2	1,000
	HFC-134a	CH_2FCF_3	1,300
	HFC-143	CHF_2CH_2F	300
	HFC-143a	CF_3CH_3	3,800
	HFC-152a	CH_3CHF_2	140
	HFC-227ea	C_3HF_7	2,900
	HFC-236fa	$C_3H_2F_6$	6,300
	HFC-245ca	$C_3H_3F_5$	560
	HFC-41	CH_3F	150
	HFC-43-10mee	$C_5H_2F_{10}$	1,300
Perfluorocarbons (PFCs)	Perfluoromethane	CF_4	6,500
	Perfluoroethane	C_2F_6	9,200
	Perfluoropropane	C_3F_8	7,000
	Perfluorocyclobutane	$C\text{-}C_4F_8$	8,700
	Perfluorobutane	C_4F_{10}	7,000
	Perfluoropentane	C_5F_{12}	7,500
	Perfluorohexane	C_6F_{14}	7,400

Emission factors

Electricity	625 tonnes CO_2-e per GWH
Gas	0.0524 tonnes CO_2-e per GJ
Diesel	0.00271 tonnes CO_2-e per litre
Petrol	0.00232 tonnes CO_2-e per litre
LPG	0.00162 tonnes CO_2-e per litre
Fuel oil	0.00292 tonnes CO_2-e per litre
Coal	2.064 tonnes CO_2-e per tonne

Embodied emission factors

Cement	0.46 tonnes CO_2 -e per tonne
Iron and steel – imported	0 tonnes CO_2 -e per tonne
Iron and steel – produced in New Zealand	2.01 tonnes CO_2 -e per tonne
Aluminium – imported	0 tonnes CO_2 -e per tonne
Aluminium – produced in New Zealand	1.62 tonnes CO_2 -e per tonne

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[28] Projects to Reduce Emissions Programme, Second Tender Round Offering Six Million Kyoto Protocol Emission Units, Tender Instructions 30 August 2004, page 11