



# **Te Apiti Wind Farm**

## **2008 Annual Emission Reduction Report**

**Version 1**

**CONFIDENTIAL**

# Te Apiti Wind Farm 2008 Annual Emission Reduction Report

## 1 Background

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The report fulfils the reporting obligations set out in the 2003 Project Agreement between Meridian and the Crown.

## 2 The project

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The Te Apiti Wind Farm is Meridian's first New Zealand wind farm. The 90 MW wind farm is located on Saddle Road north of the Manawatu Gorge. It is situated across 1,150 ha of farmland owned by four separate land owners including Meridian. The 55 turbines each have a capacity of 1.65 MW – the first MW size machines to be used in New Zealand. The electricity generated from the site is sufficient to generate electricity for approximately 45,000 average homes. It is the first wind farm to supply into electricity directly into the national grid.



Key dates during the development and construction of Te Apiti Wind Farm	
Project announced and public consultation commenced	8 May 2003
Resource consent applications lodged	20 June 2003
Resource consents granted with no appeals	4 September 2003
Karakia and construction commencement ceremonies	7 November 2003
First turbine erected	27 May 2004
First power	July 2004
Full power	November 2004
Official opening by Prime Minister	9 December 2004

### 3 Emissions generated – 2008 calendar year

The emissions generated have been assessed using the methodology of Schedule 2 – Methodology for Determining Emission Reductions, of the PRE 2 Project Agreements.

Emissions generated on-site at Te Apiti Wind Farm in 2008 comprise 36.6914tCO<sub>2</sub>e from diesel and petrol used in vehicles for site operation and maintenance.

<b>Emissions generated – 2008 calendar year (operational emissions)</b>			
<b>Material</b>	<b>Quantity</b>	<b>Emission factor<sup>1</sup></b>	<b>Emissions generated</b>
Diesel	12,589 litres	0.00271 tCO <sub>2</sub> e/litre	34.1162 tCO <sub>2</sub> e
Petrol	1,110 litres	0.00232 tCO <sub>2</sub> e/litre	2.5752 tCO <sub>2</sub> e
Iron and steel imported	89 tonnes	0 tCO <sub>2</sub> e/tonne	0 tCO <sub>2</sub> e
Iron and steel produced in New Zealand	0 tonnes	2.01 tCO <sub>2</sub> e/tonne	0
Aluminium imported	0 tonnes	0 tCO <sub>2</sub> e/tonne	0
Aluminium produced in New Zealand	0 tonnes	1.62 tCO <sub>2</sub> e/tonne	0
Cement	0 tonnes	0.46 tCO <sub>2</sub> e/tonne	0
<b>Total operational emissions generated 2008</b>			<b>36.6914 tCO<sub>2</sub>e</b>

### 4 Electricity exported – 2008 calendar year

This table shows the total electricity exported by the Te Apiti wind farm in 2008 as recorded at the Grid Injection Point by the Marketplace Company (MCo).

<b>Revenue Meter</b>	<b>kWh</b>
<b>Total electricity exported 2008(kWh)</b>	<b>305,114,802</b>
<b>Total eligible generation<sup>2</sup> 2008 (kWh)</b>	305,114,802
<b>Total eligible generation to date over the commitment period<sup>3</sup> (kWh)</b>	305,114,802

<sup>1</sup> Emission factor as prescribed in Schedule 2

<sup>2</sup> As required in Section 7.1 b i of the Project Agreement.

<sup>3</sup> As required in Section 7.1 b i of the Project Agreement



Appendix 1 sets out the generation from each turbine and a combined generation total of 314,595,585kWh. The total electricity output of the Project as measured by the Revenue Meter is 9,480,783kWh less than this combined total because the revenue meter output incorporates generation losses. Generation losses include wind farm distribution losses (i.e. cables between turbines), transformer losses, transmission losses, and local service supply at the Te Apiti substation. This is within expected limits.

There is no other generation that is not part of the project that flows through the above meters.

Meridian expects to generate the full amount of Eligible Generation during the commitment period. Wind resource is variable from season to season and the 2008 year was a significantly low wind year across New Zealand.

## 5 Emission reductions generated – 2008 calendar year

The table below sets out the emission reductions generated by the project for the 2008 calendar year.

Element	Annual Production	Factor	t CO <sub>2</sub> -e
Total electricity generation (GWh)	305.11 GWh	440 tCO <sub>2</sub> /GWh <sup>4</sup>	134,250.51
		Less operational emissions	36.6914
Less other generation not part of the project, recorded by the meters (GWh)	0 GWh		-
		<b>Net emission reductions generated for the 2008 calendar year</b>	<b>134.213</b>

Appendix 2 shows the emission reductions that will be reported to the Dutch Government based on the emission reduction calculation methodologies of the ERUPT 3 Contract.

## 6 Emission Units claimed

Meridian claimed 120,000 ERUs for the 2008 calendar year in January 2008 as set out in clause 6.1 of the Project Agreement. These have been transferred to Meridian Energy via the New Zealand Emission Unit Register.

Meridian claims 120,000 ERUs for the 2009 calendar year as set out in clause 6.1 of the Project Agreement.

<sup>4</sup> Crown's risk weighted emission factor



## 7 How the generation is measured

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The total electricity generated is recorded at the Grid Injection Point by the Marketplace Company (MCo).

Appendix 3 contains “a report which verifies the total electricity generated from the Project and injected into the national transmission system in that Year by the person responsible for the reconciliation of electricity injected into and taken from electricity networks in New Zealand or any other person authorised to administer and certify the reconciliation of such data by that person”.

Appendix 4 contains evidence that the metering and recording equipment has been certified as compliant by a reputable, independent quality assurance service provider.

## 8 Purchasers of Emission Reduction Units (ERUs)

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As required in the Project Agreement<sup>5</sup>, a summary of all sales contracts for Kyoto Compliant Emission Units and the rights to any additional emissions abatements that Meridian has entered into since the Effective Date and up to the end of 2008 relating to the emissions abatement brought about by the Te Apiti wind farm during the commitment period follows.

Summary of sales contracts			
Vintage Year	Purchaser	Type and number of units	Delivery schedule
2008 - 2012	SenterNovem through ERUPT3 (delivery address TBA)	530,000 ERUs	5 equal tranches of 106,000 units from 2009-2013

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<sup>5</sup> Project Agreement Section 7.1 b vi



## 9 Statements

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As at 31 December 2008, nothing has, or has the potential, to be an impediment to achieving the agreed emission reductions during the first commitment period.

This report:

- Has been prepared in accordance with the Project Agreement dated 17 December 2003.
- Has been prepared using the methodology of Schedule 2 – Measurement of Emission Reductions (except where detailed in this report) of the Projects to Reduce Emissions Project Agreements.

Signature:

Name: Anna Broadhurst

Position: Manager – Climate Change

Date: 28 January 2009



## 10 Unit Transfer Details

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1	Project name:	Te Apiti Wind Farm
2	Name of the project developer:	Meridian Energy Limited
3	Project ID:	NZ- 1000001
4	Calendar year for which units are being transferred:	2009
5	Participant's account identifier:	NZ-1024
6	Quantity of units:	120,000
7	Type of units:	ERUs



## Appendix 1

Generation for each turbine – 2008  
 (This data is generated by the Vestas Windman database)

Park unit	Actual Output (WTG counter) kWh	Park unit	Actual Output (WTG counter) kWh
TAP01	5.814,372	TAP31	6.055,077
TAP02	6.095,349	TAP32	6.374,023
TAP03	5.662,666	TAP33	5.999,634
TAP04	4.920,634	TAP34	6.197,719
TAP05	5.535,548	TAP35	7.024,761
TAP06	6.167,379	TAP36	6.680,745
TAP07	6.097,858	TAP37	7.045,653
TAP08	4.999,321	TAP38	5.570,612
TAP09	5.705,578	TAP39	5.300,704
TAP10	5.583,176	TAP40	4.894,953
TAP11	6.437,025	TAP41	4.588,047
TAP12	6.340,490	TAP42	5.064,486
TAP13	6.240,459	TAP43	5.860,575
TAP14	6.220,100	TAP44	4.973,808
TAP15	6.145,807	TAP45	5.705,918
TAP16	5.740,210	TAP46	5.713,094
TAP17	6.146,553	TAP47	5.441,250
TAP18	6.087,147	TAP48	5.869,818
TAP19	7.005,398	TAP49	5.959,225
TAP20	6.832,025	TAP50	5.682,083
TAP21	5.388,374	TAP51	5.553,007
TAP22	4.870,063	TAP52	5.309,689
TAP23	4.883,242	TAP53	4.926,140
TAP24	4.603,906	TAP54	4.940,645
TAP25	5.432,449	TAP55	5.308,922
TAP26	5.461,142	Total	<b>314.595,585</b>
TAP27	5.208,384		
TAP28	6.098,138		
TAP29	5.550,847		
TAP30	5.281,357		





## Appendix 2

Emission Reduction Calculations for ERUPT.

<b>Electricity and emission reduction units generated based on Electricity Emission Factor as per validated PDD</b>	
<b>2008 calendar year</b>	
Total electricity generation	305.11 GWh
2008 Electricity Emission Factor as per the validated PDD	591 tCO <sub>2</sub> /GWh
Gross emission reductions generated	180,322.85 tCO <sub>2</sub>
Less total emissions	36.6914 tCO <sub>2</sub>
<b>Total emission reductions generated</b>	<b>180,286 tCO<sub>2</sub></b>
Emission reduction units claimed from New Zealand Government for 2008 calendar year	120,000 ERUs



## **Appendix 3**

Report from The Marketplace Company confirming net generation from Te Apiti wind farm.



23 January 2008

Toni Nevin  
Meridian Energy Limited  
P O Box 2128  
Christchurch

Dear Toni

**Te Apiti windfarm generation for the 2008 calendar year**

The reconciliation manager wishes to advise Meridian Energy Limited, that the total generation recorded for the calendar year of 2008 for Te Apiti was 305,114,802 kWhs. The volume reported is net generation, i.e. injection quantities less any load at Te Apiti as supplied by Meridian Energy to the reconciliation manager.

If you have any questions regarding this letter please call me on 04 498 0044.

Yours sincerely

Zane Doran  
For and on behalf of  
The reconciliation manager

we make marketplaces work

The Marketplace Company Limited  
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Telephone +64-4-473 5240 Facsimile +64-4-473 5247  
Home Page <http://www.m-co.co.nz> Email [info@m-co.co.nz](mailto:info@m-co.co.nz)



# Appendix 4

Metering equipment certification



Meter Test House



## CERTIFICATE OF COMPLIANCE

Certificate Number: **TSL 100064**

Reference Number: 14971

Installation Name: **Te Apiti Wind Farm**  
Meridian's Te Apiti Wind Farm  
Palmerston North

Equipment Certified: Metering Installation

### Component Information:

<u>Component</u>	<u>Serial No.</u>	<u>Certification No.</u>
METER	FL-0402A137-01	14971M
CT	709960, 1, 2.	14971C
VT	404520, 21, 22.	14971V

Conditions of Issue: Refer to Meter Test House Database - Installation Record "comments" section.

Installation Category: 6

*This certifies that the above metering equipment has been calibrated in accordance with the Electricity Governance Rules.*

Issue Date: 04/04/2007

Signatory:

Expires: 20/07/2010

Malcolm Hoare  
for TSL E&T Meter Test House

Electronically Created by: Godfrey Dube on  
19/02/2008



**TRANSFIELD  
SERVICES**  
Meter Test House



## ***CERTIFICATE OF COMPLIANCE***

*(Component Only)*

**Certificate Number: 14971M**

**Installation Name:** Te Apiti Wind Farm  
Meridian's Te Apiti Wind Farm  
Palmerston North

**Equipment Certified:** METER: Ion; 7600

**Serial Number(s):** PL-0402A137-01

**Calibration Report No.:** CMR11722

**Conditions of Issue:** Nil

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*This certifies that the above metering equipment has been calibrated in accordance with the Electricity Governance Rules.*

**Issue Date:** 20/07/2007

**Signatory:**

**Expires:** 20/07/2010

*Malcolm Hoare  
for TSL E&J Meter Test House*

Electronically Created by: Godfrey Dube on 26/09/2007



**TRANSFIELD  
SERVICES**  
Meter Test House



## ***CERTIFICATE OF COMPLIANCE***

*(Component Only)*

**Certificate Number: 14971C**

*Installation Name:* **Te Apiti Wind Farm**  
Meridian's Te Apiti Wind Farm  
Palmerston North

*Equipment Certified:* CT: ESITAS

*Serial Number(s):* 709960; 1; 2.

*Calibration Report No.:* CMR11638

*Conditions of Issue:* Nil

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*This certifies that the above metering equipment has been calibrated in accordance with the Electricity Governance Rules.*

*Issue Date:* 04/04/2007

*Signatory:*

*Expires:* 04/04/2017

*Malcolm Hoare  
for TSL E&J Meter Test House*

Electronically Created by: Godfrey Dube on 16/04/2007