



meridian

# **Greenhouse Gas Emissions Inventory Report**

**Inventory Scope:** Meridian Group (all facilities)

**Inventory Period:** For the period 1 July 2014 to 30 June 2015


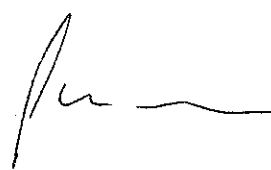
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The consolidation approach chosen for the greenhouse gas inventory should not be used to make decisions related to the application of employment or taxation law.

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# Contents

<b>GREENHOUSE GAS EMISSIONS INVENTORY SUMMARY.....</b>	<b>4</b>
<b>1 INTRODUCTION .....</b>	<b>7</b>
<b>2 STATEMENT OF INTENT .....</b>	<b>7</b>
<b>3 DESCRIPTION OF MERIDIAN.....</b>	<b>7</b>
<b>4 PERSONS RESPONSIBLE.....</b>	<b>9</b>
<b>5 REPORTING PERIOD COVERED.....</b>	<b>9</b>
<b>6 ORGANISATIONAL BOUNDARIES.....</b>	<b>9</b>
<b>7 OPERATIONAL BOUNDARIES AND INFORMATION MANAGEMENT PROCEDURES .....</b>	<b>11</b>
<b>8 SUMMARY OF EMISSION SOURCE INCLUSIONS .....</b>	<b>14</b>
<b>9 GHG EMISSIONS SOURCE EXCLUSIONS .....</b>	<b>20</b>
<b>10 DATA COLLECTION, QUANTIFICATION AND UNCERTAINTIES .....</b>	<b>23</b>
<b>11 IMPACT OF UNCERTAINTY .....</b>	<b>23</b>
<b>12 THE BASE YEAR SELECTED.....</b>	<b>23</b>
<b>13 CHANGES TO HISTORIC BASE YEAR.....</b>	<b>23</b>
<b>14 GHG EMISSIONS CALCULATIONS AND RESULTS.....</b>	<b>24</b>
<b>15 GHG REMOVALS AND REDUCTIONS .....</b>	<b>27</b>
<b>16 LIABILITIES – GHG STOCKS HELD .....</b>	<b>28</b>
<b>17 COMPLIANCE WITH ISO 14064-1 .....</b>	<b>28</b>
<b>18 AUDIT OF THE GHG INVENTORY.....</b>	<b>28</b>
<b>19 DESCRIPTION OF ADDITIONAL INDICATORS .....</b>	<b>28</b>
<b>20 ASSESSMENT OF PERFORMANCE AGAINST RELEVANT BENCHMARKS .....</b>	<b>28</b>
<b>REFERENCES:.....</b>	<b>29</b>
<b>APPENDIX 1 – MERIDIAN GROUP TREATMENT OF EMISSIONS.....</b>	<b>30</b>
<b>APPENDIX 2 – MERIDIAN ENERGY GROUP STRUCTURE.....</b>	<b>31</b>
<b>APPENDIX 3 – ISO 14064-1 REPORTING INDEX.....</b>	<b>32</b>

## Greenhouse Gas Emissions Inventory Summary

ISO 14064-1, 7.3.1 (e)

Table 1: Greenhouse gas emissions inventory summary for the Meridian Group

Scope	Category	Meridian Electricity	Damwatch	Meridian Australia	Powershop NZ	2014/15 tCO <sub>2</sub> e
Direct Emissions (Scope 1)	Stationary combustion	-	-	-	-	-
	Mobile combustion	908	5	118	1	1,032
	Fugitive emissions*	132	-	-	-	132
	<b>Subtotal</b>	<b>1,040</b>	<b>5</b>	<b>118</b>	<b>1</b>	<b>1,164</b>
Indirect Emissions (Scope 2)	Electricity consumption	1,611	6	89	30	1,736
	<b>Subtotal</b>	<b>1,611</b>	<b>6</b>	<b>89</b>	<b>30</b>	<b>1,736</b>
Indirect Emissions (Scope 3)	Capital goods	496	-	6	-	502
	Fuel & energy related activities	221	2	205,607	3	205,833
	Upstream transportation & distribution	696	-	62	-	758
	Waste generated in operations**	8	-	-	-	8
	Business travel	1,278	187	92	139	1,696
	Investments	-	-	-	-	-
	<b>Subtotal</b>	<b>2,699</b>	<b>189</b>	<b>205,767</b>	<b>142</b>	<b>208,797</b>
<b>Total Emissions (S1, 2 &amp; 3)</b>		<b>5,350</b>	<b>200</b>	<b>205,974</b>	<b>173</b>	<b>211,697</b>
<b>Total Carbon Credits Surrendered ***</b>		-	-	(179,538)	-	(179,538)
<b>Net Emissions</b>		<b>5,350</b>	<b>200</b>	<b>26,436</b>	<b>173</b>	<b>32,159</b>

\*Air-conditioning records unavailable at Damwatch

\*\*MEL office waste only

\*\*\* From 01 September 2014 Meridian Australia are formally offsetting their emissions from their full operations under the National Carbon Offset Standard (NCOS). NCOS and ISO 14064 require emissions offsets to be reported as a separate line item. Meridian Australia's retail electricity is also reported to illustrate the offsets required. In future years this will result in zero net emissions, however, this year the emissions from July and August 2014 that are not offset are included.



**Table 2: Total greenhouse gas emissions by business activity and facility**

Emissions Source	Meridian		Meridian		2014/15 tCO <sub>2</sub> e
	Electricity	Damwatch	Australia	Powershop NZ	
Air travel	1,253	186	61	137	1,637
Car travel	657	8	148	3	816
Boat travel	472	-	-	-	472
Electricity used in offices (incl. line losses)	334	6	84	33	457
HFCs	18	-	-	-	18
Office waste (parent company only)	8	nm	nm	nm	8
<b>Subtotal</b>	<b>2,742</b>	<b>200</b>	<b>293</b>	<b>173</b>	<b>3,408</b>
Fuel consumption for electricity generation	-	-	-	-	-
Freight of fuel to site	-	-	-	-	-
Electricity purchased and onsold to customers	-	-	205,598	-	205,598
Electricity used in facilities	1,302	-	15	-	1,317
Generation contractor fuel	86	-	46	-	132
SF6 leakage	113	-	-	-	113
HFCs	2	-	-	-	2
Retail maintenance and meter reading	447	-	-	-	447
<b>Subtotal</b>	<b>1,950</b>	<b>-</b>	<b>205,659</b>	<b>-</b>	<b>207,609</b>
Major materials used	496	-	6	-	502
Freight of major materials	71	-	-	-	71
Contractor fuel on site	91	-	16	-	107
Electricity consumption	-	-	-	-	-
<b>Subtotal</b>	<b>658</b>	<b>-</b>	<b>22</b>	<b>-</b>	<b>680</b>
<b>Total</b>	<b>5,350</b>	<b>200</b>	<b>205,974</b>	<b>173</b>	<b>211,697</b>
<b>Total Carbon Credits Surrendered *</b>	<b>-</b>	<b>-</b>	<b>(179,538)</b>	<b>-</b>	<b>(179,538)</b>
<b>Net Emissions</b>	<b>5,350</b>	<b>200</b>	<b>26,436</b>	<b>173</b>	<b>32,159</b>

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**Table 3: Total greenhouse gas emissions by greenhouse gas**

GHG Gas	Meridian Electricity	Damwatch	Meridian Australia	Powershop NZ	2014/15 tCO <sub>2</sub> e
CO <sub>2</sub>	900	5	117	1	1,023
CH <sub>4</sub>	-	-	-	-	-
N <sub>2</sub> O	7	-	1	-	8
HFCs	20	-	-	-	20
SF <sub>6</sub>	113	-	-	-	113
<b>Subtotal</b>	<b>1,040</b>	<b>5</b>	<b>118</b>	<b>1</b>	<b>1,164</b>
CO <sub>2</sub>	1,611	6	89	30	1,736
<b>Subtotal</b>	<b>1,611</b>	<b>6</b>	<b>89</b>	<b>30</b>	<b>1,736</b>
tCO <sub>2</sub> e	2,699	189	205,767	142	208,797
<b>Subtotal</b>	<b>2,699</b>	<b>189</b>	<b>205,767</b>	<b>142</b>	<b>208,797</b>
<b>Total</b>	<b>5,350</b>	<b>200</b>	<b>205,974</b>	<b>173</b>	<b>211,697</b>
<b>Total Carbon Credits Surrendered *</b>	-	-	(179,538)	-	(179,538)
<b>Net Emissions</b>	<b>5,350</b>	<b>200</b>	<b>26,436</b>	<b>173</b>	<b>32,159</b>

\*From 01 September 2014 Meridian Australia are formally offsetting their emissions from their full operations under the National Carbon Offset Standard (NCOS). NCOS and ISO 14064 require emissions offsets to be reported as a separate line item. Meridian Australia's retailed electricity is also reported to illustrate the offsets required. In future years this will result in zero net emissions, however, this year the emissions from July and August 2014 that are not offset are included.



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## 1 Introduction

Responding to the global issue of climate change caused by escalating greenhouse gas (“GHG”) emissions presents opportunities for the Meridian Energy group of companies (“Meridian”) as a renewable energy organisation. There is world-wide momentum among governments and other agencies to adopt a range of measures including economic incentives for industries and for consumers to reduce such emissions.

This report is the annual greenhouse gas (GHG) emissions<sup>1</sup> inventory report for the Meridian Group of companies. The inventory is a complete and accurate quantification of the amount of GHG emissions that can be directly attributed to the organisation’s operations within the declared boundary and scope for the specified reporting period.

Our reporting processes and emissions classifications are consistent with international protocols and standards. This report has been written in accordance with Parts 7.3.1 of the requirements of International Standards Organisation ISO 14064-1<sup>2</sup>. Where applicable discretionary information has been disclosed consistent with section 7.3.2 of the Standard.

Meridian has calculated its own “carbon footprint” since 2001. From 2006 to 2010 the organisation certified its electricity product under the carboNZero<sup>Cert™</sup> programme and in FY12 and FY13 met the requirements for CEMARS<sup>®</sup> certification. Whilst Meridian continues to manage and report on GHG in a similar manner to previous years, no external certification is sought.

For the purposes of this report “Meridian” and “Meridian Energy Ltd” refer to the organisation with no accounting or legal inference. “Meridian Group” is used to refer to all four facilities. For definitions of these facilities, and more information on the organisational and reporting boundaries refer to Section 6.

## 2 Statement of Intent

Meridian is intent on demonstrating consistency with best practice accounting for greenhouse gas emissions.

This report:

- relates specifically to the emissions of the Meridian Group;
- has been prepared following the requirements outlined in ISO 14064-1;
- has been prepared as part of an ongoing commitment to measure and manage emissions on a regular basis; and
- excludes future targets.

## 3 Description of Meridian

### ISO 14064-1, 7.3.1 (a) and 7.3.2 (a)

Meridian is New Zealand's largest electricity generator. The Meridian Energy Group of companies is made up of:

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<sup>1</sup>Throughout this document “emissions” means “GHG emissions”.

<sup>2</sup>International Standards Organisation *Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*, Reference number ISO 14064-1:2006 (E).

- 
- Meridian Energy Limited (the “Parent”) and
  - our subsidiaries (together the “Group”) and
  - the Group’s interest in partnerships and joint ventures.

Meridian undertakes a variety of activities in the energy sector. Its primary activity is the renewable generation and retail of electricity. Other activities carried out by subsidiary or associate companies include:

- professional services relating to the upkeep of dams: and
- captive self insurance services.

For further information about the organisation please refer to the Meridian Energy Limited 2014/2015 Annual Report which is available at [www.meridianenergy.co.nz](http://www.meridianenergy.co.nz). For more information in regards to the facilities that comprise the Meridian Group see Section 6.

### **3.1 GHG and Sustainability Policies, Strategies and Programmes**

Meridian Energy’s Sustainability Framework sets an overarching goal to make “sound business decisions that recognise the interests of the environment, our communities and our customers”. The framework focuses on the six areas where Meridian’s core business activities have an impact on the external world and where we can influence the outcomes. These six areas are:

- Water Stewardship;
- Renewable Energy;
- Energy Services;
- Engaged Communities;
- Working Sustainably; and
- Financial Return

As part of ‘working sustainably’, a Greenhouse Gas Emissions Measurement and Management Guideline was approved by Meridian’s Management Team in June 2009 and revised in January 2013 and June 2015. This guideline outlines how Meridian will measure and manage its greenhouse gas emissions with the objective of understanding, transparently disclosing and reducing the emission intensity of its operations.

A focus on GHG measurement and management, of which this GHG Inventory Report is a part, enables us to improve our workplace sustainability, and gives us case studies we can share with our customers and communities. Specifically, GHG management advances the following objectives:

- Reducing the company’s overall environmental footprint by reducing, reusing and recycling resources;
- Encouraging our partners and suppliers to follow a sustainable development pathway and promoting leadership in this area.

Meridian also has a range of other policies supporting our sustainability policy.



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## 4 Persons Responsible

ISO 14064-1, 7.3.1 (b)

This GHG inventory is ultimately the responsibility of the Board of Directors.

The person responsible for this GHG inventory is Paul Chambers, Chief Financial Officer.

In addition the GHG accounting and reporting team have provided background and supporting information. These team members are:

- Elizabeth Liddell, Systems Accountant;
- Maree Willetts, Sustainability Specialist;
- Ewan Gestro, Commercial Insight Manager (electricity generation, purchases and power station electricity data);
- Nick Robilliard, Category Manager (business travel data);
- Claire Tucker, Performance & Remuneration Coordinator (HR data);
- Peter Harding, Management Accountant (office electricity consumption data);
- Numerous Markets & Production staff (one-time emissions sources, SF<sub>6</sub>);
- Rebekah Ford, Transfield (office waste and air conditioning);
- William Farley (Meridian Energy Australia Pty Ltd);
- Susan Whiteman, Office Administrator (Damwatch);
- Alpesh Soma, Office Manager (Powershop Limited).

## 5 Reporting Period Covered

ISO 14064-1, 7.3.1 (c)

This GHG inventory report covers the financial year 1 July 2014 to 30 June 2015.

## 6 Organisational Boundaries

ISO 14064-1, 7.3.1 (d)

The organisational boundary determines the parameters for GHG reporting in the Meridian Group GHG inventory. The boundaries were set with reference to the methodology described in the ISO14064-1 standard. The boundary encompasses the operations owned or controlled by Meridian, its subsidiaries, associate companies and joint ventures in the Meridian Group.

### 6.1 Consolidation approach

Meridian applies the operational control consolidation approach to the Meridian Group emissions inventory. This consolidation approach allows us to focus on those emissions sources over which we have control and can therefore implement management actions, consistent with Meridian's corporate responsibility objectives.

The table in Appendix 1 sets out how each entity in the Meridian Energy Group is treated. Appendix 2 contains a diagram of the Meridian Energy Group corporate structure as at 30 June 2015.

For further information about the organisation please refer to the Meridian Energy Limited 2014/2015 Annual Report which is available at [www.meridianenergy.co.nz](http://www.meridianenergy.co.nz).

## 6.2 Defining Meridian “facilities”

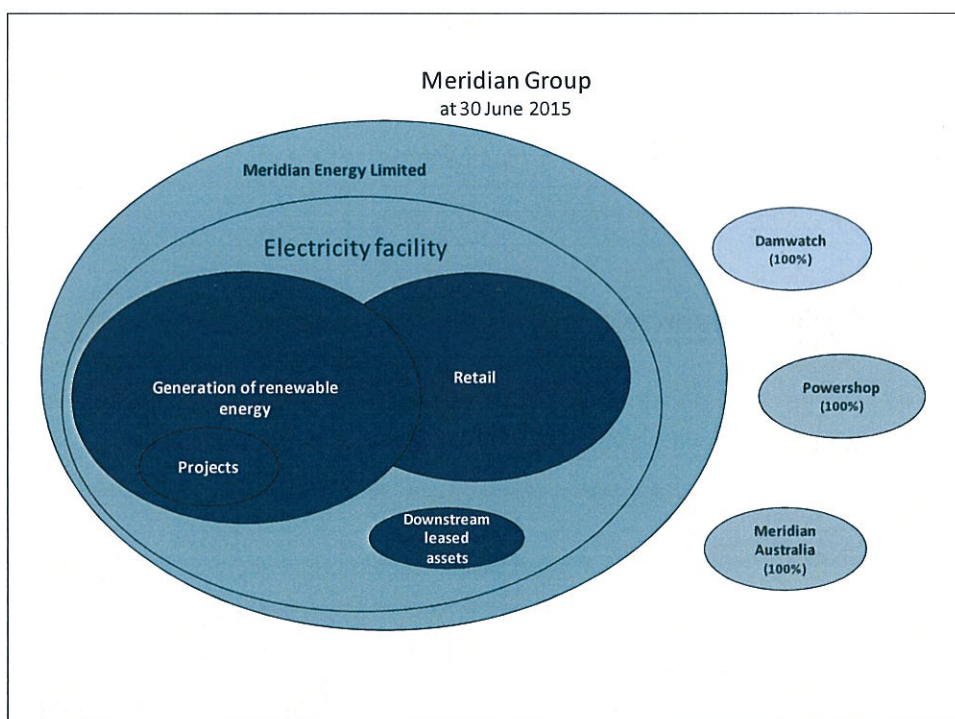
Meridian’s diverse activities and resulting emissions are categorised into “facilities” in line with Annex A of ISO 14064-1 which requires that the data should be retained in its disaggregated form to aid transparency and to provide maximum flexibility in meeting a range of reporting requirements.

A facility is an operation which, by the nature of its processes or geography, can be separately accounted for. ISO 14064-1 defines a *Facility* as:

*“a single installation, set of installations or production processes (stationary or mobile), which can be defined within a single geographical boundary, organizational unit or production process”<sup>3</sup>*

For the year ended 30 June 2015 these facilities are: Meridian Electricity, Damwatch, Powershop, and Meridian Australia as illustrated in the following diagram. Arc Innovations was sold in the current year and has been excluded as a facility.

**Figure 1: Facilities comprising the Meridian Group**



## 6.3 Defining the Individual Facilities

A brief description of each of the facilities (including which legal entities are included within them) follows. See Appendix 2 for an organisational chart.

<sup>3</sup> ISO 14064-1, section 2.21 pg 3



Facility	Description
Meridian Electricity	<p>This includes emissions arising from Meridian's core activities associated with the generation and retail of electricity from renewable resources. Meridian Electricity supplies 224,436 customer connections as of 30 June 2015 and employed 578 FTEs on average during 2014/15.</p> <p>It includes the following legal entities:</p> <ul style="list-style-type: none"> <li>• Meridian Energy Limited</li> <li>• Meridian Energy Captive Insurance Limited</li> <li>• Meridian Limited (non-trading)</li> <li>• Meridian Energy International Limited (non-trading)</li> <li>• Meridian LTI Trustee Limited</li> </ul>
Damwatch	<p>Damwatch is a niche consultancy specialising in dam engineering, safety and surveillance. The Damwatch facility is responsible for emissions arising from consultancy services relating to dam safety and surveillance that take place in Damwatch Engineering Ltd. The facility also includes Damwatch Pty Limited (incorporated in Australia) because it is 100% owned by Damwatch Engineering Limited and performs the same type of activities. This facility has non-incorporated joint venture with GNS via Damwatch Projects Limited. Damwatch employed 33 FTEs on average during 2014/15. Further information about Damwatch can be found at <a href="http://www.damwatch.co.nz">www.damwatch.co.nz</a>.</p>
Powershop NZ	<p>Powershop conducts energy retailing activities within Powershop New Zealand Limited under the Powershop brand. Powershop employed 119 FTEs on average during 2014/15 and supplies 56,010 customers as at June 2015. Further information about Powershop can be found at <a href="http://www.powershop.co.nz">www.powershop.co.nz</a>.</p>
Meridian Australia	<p>Meridian carries out generation development activities in Australia. Meridian Australia employed 41 FTEs on average during 2014/15 and supplies 48,208 customers as at June 2015. There are four companies trading in this group:</p> <ul style="list-style-type: none"> <li>• Meridian Energy Australia Pty Ltd</li> <li>• Mt Mercer Windfarm Pty Ltd</li> <li>• Mt Millar Wind Farm Pty Ltd</li> <li>• Powershop Australia Pty Ltd</li> </ul> <p>This facility also includes several non-trading legal entities. Further information about Meridian Australia can be found at <a href="http://www.meridianenergy.com.au">www.meridianenergy.com.au</a>.</p>

## 7 Operational Boundaries and Information Management Procedures

### ISO 14064-1, 7.3.2 (k) and 4.2

GHG emissions sources were identified with reference to the methodology described in the ISO 14064-1 standards and confirmed through personal communication with Meridian staff. Emission sources identified were reviewed against expenditure records for this reporting period in order to identify the activities that may create emissions.

As adapted from the ISO (Annex), these emissions were classified into the following categories:

- Direct GHG emissions (Scope 1): GHG emissions that are operationally controlled by the company;



- Indirect GHG emissions (Scope 2): GHG emissions from the generation of purchased electricity, heat or steam consumed by the company;
- Indirect GHG emissions (Scope 3): GHG emissions that occur as a consequence of the activities of the company but from sources that are not owned or controlled by the company;
- Indirect GHG one-time emissions (Scope 3 one-time): GHG emissions that occur as a consequence of major construction activities undertaken by contractors on behalf of Meridian.

Meridian prepared its FY12 and FY13 GHG inventories in accordance with the *Corporate Value Chain (Scope 3) Accounting and Reporting Standard* (2011). Scope 3 emissions were identified using the fifteen categories outlined in the Corporate Value Chain Standard, and relevant emission sources were identified using criteria consistent with the guidance of that Standard and in alignment with Meridian's wider sustainable development objectives. In FY14, Meridian reassessed the Scope 3 emissions measurement and returned to the previous methodology. Purchased goods and services made up a large proportion of the Scope 3 emissions. However, as the methodology for calculating emissions was based on dollars spent the only effective way to reduce these emissions was to reduce the purchase of goods and services necessary to the business. As a result, Meridian prepared the FY14 and this inventory under ISO 14064-1.

Under ISO 14064-1, reporting of Scope 3 emissions is optional. Meridian has elected to report some relevant Scope 3 emissions, particularly those from major project emissions.

Meridian has determined which emissions sources are relevant using criteria that have been developed to provide consistency and alignment with Meridian's wider sustainable development objectives. These criteria are that an emissions source is considered relevant if it is:

- relevant to Meridian's operations;
- large in relation to Meridian's Scope 1 and Scope 2 emissions;
- critical to key stakeholders; or
- able to potentially deliver significant emissions reductions that could be undertaken or influenced by Meridian.

Meridian has included in its Scope 3 emissions any:

- Significant contractor emissions and major project emissions;
- Emissions associated with contractors co-located in Meridian office buildings (including IT and Telecommunications support staff, and casual employees), which are reported in power consumption and waste figures in the Meridian Electricity inventory; and
- Emissions associated with field services activities for Meridian Electricity.

Meridian seeks to work with its other suppliers, contractors, and other value-chain partners to identify opportunities to measure, manage and report additional significant emissions sources. This process is driven in part by Meridian's procurement process. Where these additional significant emissions sources can be measured reliably, and where Meridian can influence the emissions through working with its value-chain partners, they will be included in future emissions reporting.

## 7.1 Information Management and Monitoring Procedures

GHG Measurement and Management Guidelines were developed and approved 30 June 2009 and revised in January 2013 and June 2015. These documented measurement and reporting requirements for individual facilities and the group with the objective of understanding, transparently disclosing and reducing the emission intensity of operations.

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Meridian has, for each facility, developed and maintained GHG information management procedures that ensure conformance with the principles of ISO 14064-1, ensure consistency with the intended use of the GHG inventory, provide routine and consistent checks to ensure completeness and accuracy, identify and address errors and omissions and manage and store documentation in a safe and accessible manner.

The key GHG information management procedures are as follows:

- Source data is collected directly from third party suppliers or from the Meridian financial system;
- The data is stored in the SoFi software database and reviewed by the GHG accounting team;
- Emissions factors and conversion factors in SoFi are maintained by thinkstep (formerly PE Australasia);
- The GHG inventory is compiled using activity data and emission factors;
- The report is independently audited by Deloitte;
- The report is reviewed to identify opportunities to reduce emissions and improve the information management process; and
- Senior management are informed of emissions management progress.

In New Zealand Meridian applies an annual 'netting off' approach whereby the amount of electricity reported in Scope 3 is calculated by deducting electricity retailed by Meridian from electricity generated by Meridian. This approach takes into account that all Meridian's electricity is generated from renewable resources and that Meridian sells its electricity generated into the national wholesale market and purchases electricity retailed from the wholesale market. This approach conforms to green energy programme precedents in the US (Green-e), Australia (Greenpower), and Europe (Eugene). Transmission losses are accounted for by using the entry point for local network distribution to calculate the amount purchased thereby taking into account losses due to distribution. In FY14 we applied this netting off approach to the electricity retailed and generated in Australia. From 1 September 2014 Meridian Australia has formally offset their emissions from their full operations under the National Carbon Offset Standard (NCOS). This inventory reports the offsets (carbon credits surrendered) as a separate line item in keeping with NCOS and ISO 14064 requirements. Retailed electricity is also reported. In future years this offsetting will result in zero net emissions, however, this year the emissions from July and August 2014 that are not offset are included and therefore net emissions are reported.

## 8 Summary of Emission Source Inclusions

ISO 14064-1, 7.3.1 (I)

The emissions sources included in the GHG emissions inventory, and details in regards to data sources and uncertainties can be found in the following table.

Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 1 (& Biomass)	Stationary combustion	Fuel used for electricity generation	Meridian Electricity and Meridian Australia	No fuel consumed		n/a	There were no emissions from the 13,870GWh of electricity generated in the reporting period, as the fuel used to generate this electricity was water and wind
	Mobile combustion	Boat travel (Tug and staff transport boat at Lake Manapouri)	Meridian Electricity	Fuel storage readings		Real Journeys	Accurate records of litres used
		Car travel (owned, leased, rented)	All facilities	Odometer readings, rental records		Vehicle operators Customfleet Rental suppliers	Estimated from accurate records of distance travelled x average fuel efficiency of vehicle class (small, medium or large). Owned vehicles are calculated from litres of fuel consumed. Driver behaviour and individual engine performance are not taken into account
	Fugitive emissions	Fugitive emissions from SF <sub>6</sub>	Meridian Electricity, Meridian Australia	Maintenance records		Maintenance staff	Accurate records of storage cylinder weights <sup>4</sup> Records of 'top-ups'

<sup>4</sup> The emission factor has been sourced from the IPCC Second Assessment Report IPCC (2007) AR4 WG1 Chapter2 Table 2.14 [http://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch2s2-10-2.html](http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html)

Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
		Fugitive emissions from air-conditioning systems	All facilities excluding Damwatch	Maintenance records		Transfield, maintenance contractors	Accurate record of 'top-ups'
Scope 2	Electricity	Electricity consumed in offices	Meridian Australia	Landlord invoices		Meridian Australia finance team	Calculated from the invoices
			Powershop	Landlord invoices		Powershop finance team	Calculated from the invoices
			Damwatch	Records from billing system		Damwatch finance team	Accurate records from the billing system Start and end of year are partially estimated
			All other facilities	Records from billing system		Meridian Electricity finance team	Accurate records from the billing system Start and end of year are partially estimated
		Electricity consumed in facilities <sup>5</sup>	Meridian Electricity	The electricity market reconciled consumption files		Meridian Electricity finance team	Accurate records of electricity consumed
Scope 3	Capital goods	Major construction and plant	All facilities with relevant activity in	Project records from manufacturer or design specifications	100%	Project Managers	Records of weights or volumes of major materials used in construction projects

<sup>5</sup> Excludes Manapouri Power Station – see exclusions table



Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
		upgrade materials <sup>6</sup>	reporting period				
Scope 3	Fuel related emissions (not Scope 1 or 2)	Electricity purchased and on-sold to end users <sup>7</sup>	Meridian Energy	The electricity market reconciled consumption files	100%	Meridian Electricity finance team	Accurate records of sales and purchase information using Annual Netting Off methodology <sup>8</sup> In this reporting period Meridian generated more electricity than was required to meet its customer's demand (including lines losses)
			Meridian Australia	The electricity market reconciled consumption files	100%	Meridian Australia finance team	Accurate records of sales and purchase information using Annual Netting Off methodology. In this reporting period Meridian Australia generated more electricity than was required to meet its customer's demand (including lines losses)
			Powershop		100%	Powershop finance team	Accurate records of sale and purchase information
		Production & distribution of fuel	All facilities	Fuel invoices	0%	Finance teams	Calculated from amount of fuel consumed using emissions factors derived from LCA studies

<sup>6</sup> This includes projects from Meridian Electricity and Meridian Australia.

<sup>7</sup> Financial instruments such as contracts for difference do not involve the physical supply of electricity. Agency relationships such as that between Meridian and its grid-connected customers with Market Services Agreements are retail activities within the boundaries of the Electricity facility but the electricity consumed by these customers is not sold by Meridian under these arrangements and is not reported. Meridian entered a contract for difference arrangement with NZ Aluminium Smelters (NZAS) in January 2013.

<sup>8</sup> While Meridian Electricity has a contract for difference with NZAS we will generate in excess of retail volumes in New Zealand

Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 3	Upstream transportation and distribution	Freight of major materials	All facilities with relevant activity in reporting period	Project records	30%	Meridian project managers	Estimates of major materials used Calculated from weight of materials x distance travelled Some information is provided by suppliers
		Contractor fuel (operational maintenance and construction)	All facilities with relevant activity in reporting period	Contractor records	50%	Project managers	Estimates of the amount of fuel used Some information is provided by suppliers
		Contractor fuel for retail meter reading and maintenance	Meridian Electricity	Supplier estimates of distances Samples of jobs Samples of vehicle types used	100%	Retail Delta Datacol Group Arc Innovations	Calculated using a formula of estimated distance x estimated emissions factor <ul style="list-style-type: none"> <li>Contractors estimate distance and the average type of vehicle used</li> <li>The emissions factor is a weighted average of the vehicle types, calculated from emission factors provided by Defra.</li> </ul>
Scope 3	Waste	Office waste to landfill	Meridian Electricity	Actual weight of waste bins	100%	Transfield Services	Waste bins weighed on a monthly basis

Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 3	Business Travel	Air travel (domestic and international)	All facilities	Purchase records (supplier data, internal purchasing systems)	100%	Meridian Electricity Procurement team Travel providers Finance teams	Supplier records of flights taken, manually processed by finance teams and Procurement Team Calculated using the distances travelled by sector Distances are calculated using Great Circle Mapper <sup>9</sup>
		Car travel (taxis)	All facilities	Purchase records (internal purchasing systems)	0%	Meridian Electricity Procurement team Finance teams	Records of expenditure
		Car travel (private vehicles)	All facilities with relevant activity in the reporting period	Odometer readings	100%	Vehicle operators	Estimated from accurate records of distance travelled x average fuel efficiency of vehicle class (small, medium or large)

<sup>9</sup> [www.gcmap.com](http://www.gcmap.com)



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## 8.1 Other emissions - PFCs

No operations within the Meridian Energy Group use perfluorocarbons (PFCs) therefore no holdings of PFCs are reported and no emissions from these sources are included in this inventory

## 8.2 Other emissions - CO<sub>2</sub> Emissions from the Combustion of Biomass

**ISO 14064-1, 7.3.1 (f) and 7.3.2 (b)**

There was no combustion of biomass in the operations of the Meridian Electricity, Damwatch, Meridian Australia, and Powershop facilities during the reporting period.

## 9 GHG Emissions Source Exclusions

ISO 14064-1, 7.3.1 (h)

The emissions sources below have been identified and excluded from this GHG emissions inventory. These emissions sources are considered not material to stakeholders, not material in the context of the inventory, and/or not technically feasible nor cost effective to be quantified at the present time.

Scope	Category	GHG emissions source	Facilities	Reason for exclusion	Size of exclusion (based on FY11 data, tCO <sub>2</sub> e)	% of total estimated inventory
Scope 1	Stationary combustion	Back-up generators	All facilities with relevant activity in reporting period	Estimated to be <i>de minimis</i>	94	0.29%
	Fugitive Emissions	Fugitive emissions from air-conditioning systems	Damwatch	Difficult to get data on leakage and holdings from office landlords	37	0.17%
		Fugitive emissions from fridges and vehicle AC systems	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	17	
Scope 2	Electricity	Electricity consumed at Manapouri power station	Meridian Electricity	Not metered - consumption is netted off the generation produced by the station before it is exported, estimated to be <i>de minimis</i>	163	.51%
		Electricity consumed at Mt Millar and Mt Mercer wind farms	Meridian Australia	Estimated to be <i>de minimis</i>	0 <sup>10</sup>	

<sup>10</sup> The electricity used on site by the wind farm is used prior to export to the market and therefore does not pass through the wholesale market and gain emissions.

Scope	Category	GHG emissions source	Facilities	Reason for exclusion	Size of exclusion (based on FY11 data, tCO <sub>2</sub> e)	% of total estimated inventory
Scope 3	Upstream transportation and distribution	Freight - courier packages and minor materials	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	231	0.72%
Scope 3	Waste	Office waste to landfill	All facilities other than Meridian Electricity	Difficult to obtain the data, estimated to be <i>de minimis</i>	6	0.38%
		All other sources of waste	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	115	
Scope 3	Purchased goods & services	Professional services, IT services, maintenance services	All facilities with relevant activity in reporting period	Difficult to obtain the data other than based on dollars spent.	10,814	33.63%
		Water	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	3	0.01%
		Stationery and print	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	323	1.00%
		Furniture	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	76	0.24%
		IT Hardware	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	51	0.16%
		Employee commuting	All facilities	Not a focus of measurement and reduction.	1,015	3.16%
Scope 3	Downstream leased assets	Leased land - farms	Meridian Electricity	Not a focus of measurement and reduction.	10,391	32.31%



Scope	Category	GHG emissions source	Facilities	Reason for exclusion	Size of exclusion (based on FY11 data, tCO <sub>2</sub> e)	% of total estimated inventory
Scope 3	Business travel	Hotel accommodation	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	44	0.14%
Scope 3	Upstream leased assets	Upstream leased assets	All facilities	Consolidation approach is operational control, so all upstream leased assets are included in Scope 1 and 2		n/a
Scope 3	Downstream transportation and distribution	Downstream transportation and distribution	All facilities	No physical products sold		n/a
Scope 3	Processing of sold products	Processing of sold products	All facilities	No physical products sold		n/a
Scope 3	Use of sold products	Use of sold products	All facilities	No physical products sold		n/a
Scope 3	End of life treatment of sold products	Disposal of bills and newsletters	All facilities	Difficult to obtain the data, estimated to be <i>de minimis</i>	27	0.08%
Scope 3	Franchises	Franchises	All facilities	No franchises		n/a
<b>Total Net Emissions</b>					<b>23,407</b>	<b>72.79%</b>

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## 10 Data collection, quantification and uncertainties

ISO 14064-1, 7.3.1 (m,n)

Section 8 provides an overview of how data was collected for each GHG emissions source, the source of the data, and any uncertainties or assumptions made. Collection of information was centralised in the finance teams of each facility, however much of the information is sourced from the procurement team, project teams, suppliers and relevant individuals throughout the business.

All data was calculated using SoFi 5.8.1. This software uses a calculation methodology for quantifying the GHG emissions inventory using emissions source activity data multiplied by GHG emissions factors.

Except as stated, emission factors used were sourced from Ministry for the Environment (MfE, New Zealand) or Department of Environment, Food and Rural Affairs (Defra, United Kingdom). These are expressed in terms of total tonnes of carbon dioxide equivalent. As such, all calculations in this report are expressed in total tonnes of carbon dioxide equivalent.

- The emission factors applied to electricity consumption are calculated by the Ministry of Business, Innovation and Employment (MBIE). The Scope 2 electricity emission factor is a quarterly factor. The emission factors applied to electricity consumption activity data (Electricity, and Electricity – distributed T&D losses; Scope 2 and Scope 3 respectively) are based on data published by MBIE and have a quarterly and annual update frequency respectively.
- Emission factors are from life cycle analysis (LCA) studies - The analysis is based on using LCA methodology so consequently includes all upstream as well as in-use emissions.
- The emission factor applied to SF<sub>6</sub> leakage is sourced from the IPCC AR4.

## 11 Impact of Uncertainty

ISO 14064-1, 7.3.1 (o) and 7.3.2 (h)

There is some level of uncertainty associated with preparing a GHG inventory. To minimise this uncertainty source data has been selected from a verifiable source and any further uncertainty is detailed under sections 8, 9 & 10 and above. Where uncertainty exists in the data, a conservative estimation approach has been taken leading to over, rather than understating of emissions.

## 12 The Base Year Selected

ISO 14064-1, 7.3.1 (j)

The base year is 1 July 2011 to 30 June 2012.

## 13 Changes to Historic Base Year

ISO 14064-1, 7.3.1 (k)

No change has occurred to the base year selected this year.

In FY15 Meridian sold Arc Innovations Limited and its dairy farms. There is no reporting on Arc Innovations Limited or the dairy farms in this inventory. Any comparative statements in this report to previous inventory reporting periods have been recalculated to exclude Arc Innovations Limited and the dairy farms, or are in discussion of specific emissions sources that have not changed in their calculation methodology.

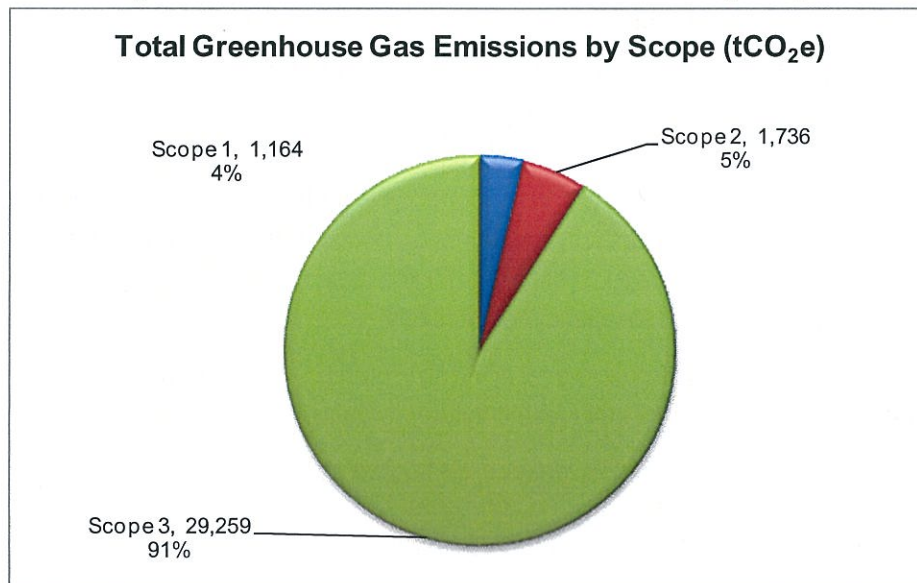
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## 14 GHG Emissions Calculations and Results

### 14.1 Total emissions by scope

Net GHG emissions for Meridian Group were 32,159 tCO<sub>2</sub>e for the reporting period, shown by scope in the following graph.

**Figure 2: Total Net Greenhouse Gas Emissions by Scope**

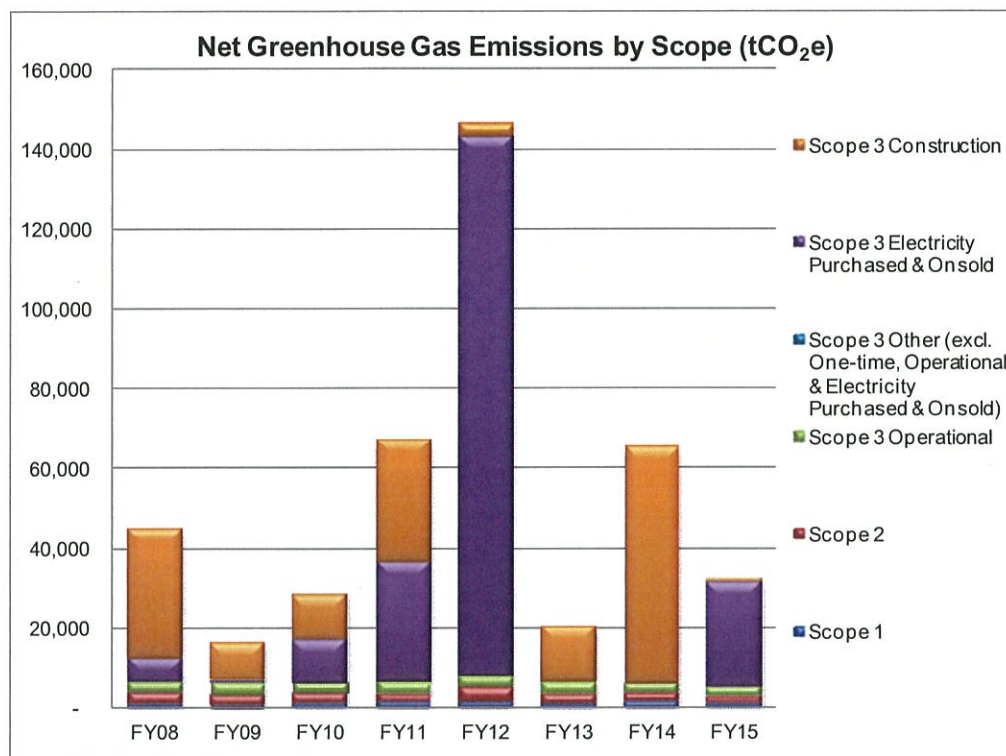


While the generation of electricity is Meridian Electricity's core business, there are no Scope 1 emissions from the generation of electricity as fuel sources are wind and water.

Without major construction projects this year, the majority of Scope 3 emissions are from electricity purchased and onsold in Australia in July and August 2014. Business travel and maintenance projects in New Zealand are the next most significant contributor.



**Figure 3: Net Greenhouse Gas Emissions by Scope - Annual Comparison**

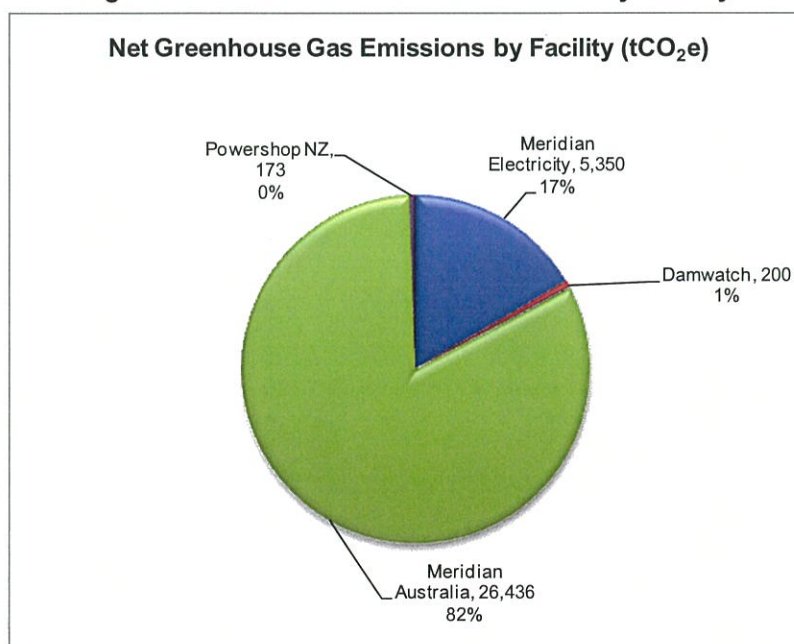


## 14.2 Net emissions by facility

The following graphs show the total GHG emissions (tCO<sub>2</sub>e) by facility in the reporting period.

The majority of emissions are from the Meridian Australia electricity purchased and onsold in July and August 2014. The Meridian Electricity facility emissions are related to corporate activity.

**Figure 4 Net Greenhouse Gas Emissions by Facility**

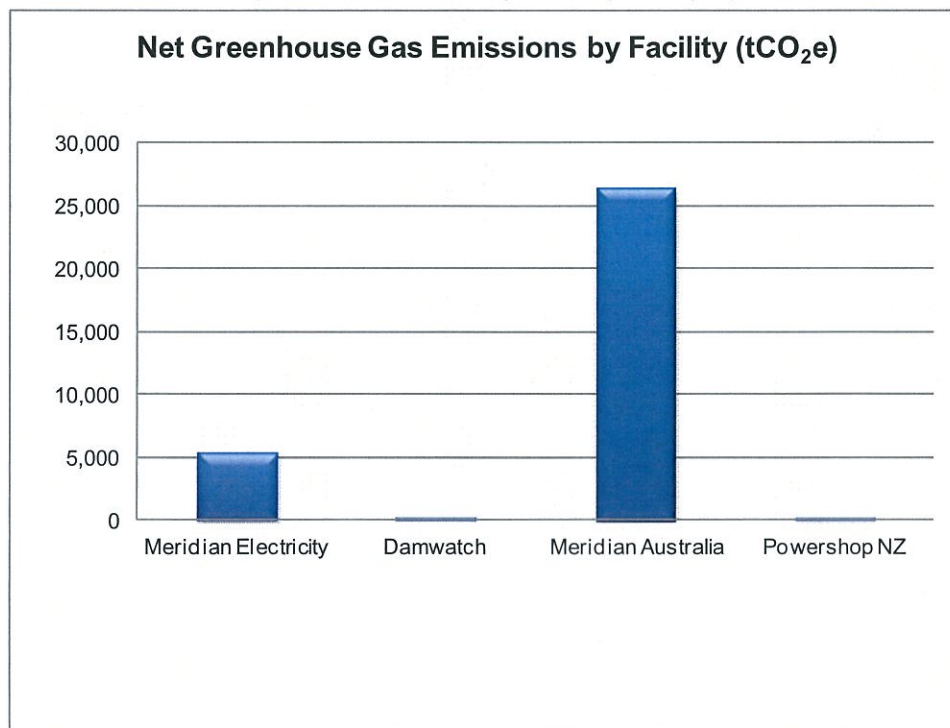




### 14.3 Net emissions by business activity category

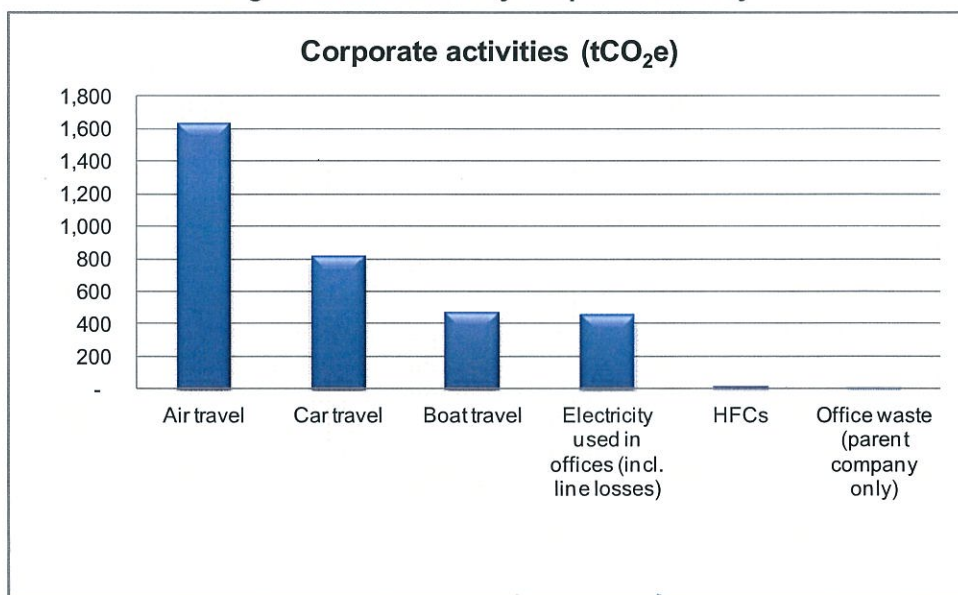
The majority of emissions this year result from Meridian Australia electricity purchased and onsold in July and August 2014. Business travel was Meridian Electricity's major emission source in New Zealand where the majority of the Group's staff are based.

Figure 5: Emissions by Activity Category



Corporate emissions are primarily from business travel.

Figure 6: Emissions by Corporate Activity



## 15 GHG Removals and Reductions

ISO 14064-1, 7.3.1 (g) and 7.3.2 (c & d)

### 15.1 Removals

A greenhouse gas removal is defined by ISO 14064-1 as the “total mass of a greenhouse gas removed from the atmosphere over a specified period of time”. There are no removals quantified for this reporting period.

### 15.2 Avoided Emissions

Meridian's Te Āpiti and White Hill Wind farms were allocated Kyoto compliant carbon credits under the Government's Projects to Reduce Emissions Scheme until FY13 when the first commitment period of the Kyoto Protocol ended.

### 15.3 Emission Reductions

This year net Group emissions are 32,159 tCO<sub>2</sub>e, a 79% decrease on base year and a 51% decrease on FY14. The dry hydrological year in the base year included electricity purchased and onsold for Meridian and Powershop retailed electricity, substantially increasing emissions. Reasonable hydrological conditions in FY13, FY14 and FY15 allowed Meridian and Powershop retailed electricity in New Zealand to be offset by Meridian's NZ generation. The contract for difference entered into with New Zealand Aluminium Smelters in January 2013 means New Zealand generation will exceed retailed electricity while this contract is in place. This year's decrease across the Group is attributable to a reduction in construction and one time emissions. The majority of FY15 emissions are from the Meridian Australia electricity purchased and onsold in July and August 2014. The following tables and graphs show a high level comparison of total emissions for each facility for the FY12, FY13, FY14 and FY15 years.

Net emissions by facility	2011/12 tCO <sub>2</sub> e	2013/14 tCO <sub>2</sub> e	2014/15 tCO <sub>2</sub> e	% change base year	% change last year	tCO <sub>2</sub> e change base year	Variance Analysis
Meridian Electricity	45,493	30,749	5,350	-88%	-83%	-40,143	FY12 was a dry hydrological year resulting in inclusion of Electricity Purchased & Onsold. FY14 has increased one-time emissions from wind farm builds. FY15 had no outstanding activity or emission sources.
Damwatch	206	225	200	-3%	-11%	-6	Decrease in travel activity during FY14
Meridian Australia	5,136	34,471	26,436	415%	-23%	21,300	FY14 had one-time emissions from building the Mt Mercer wind farm. FY15 has 2 months of electricity purchased and onsold that has not been offset
Powershop NZ	100,314	100	173	-100%	72%	-100,141	Base year included electricity purchased and onsold in dry year. FY15 had substantial increase in business travel.
<b>Group</b>	<b>151,149</b>	<b>65,545</b>	<b>32,159</b>	<b>-79%</b>	<b>-51%</b>	<b>-118,990</b>	FY14 included construction projects in NZ and AU. FY15 includes Meridian Australia electricity purchased and onsold not offset.



## 16 Liabilities – GHG Stocks Held

GHG holdings	Meridian Electricity	Damwatch	Meridian Australia	Powershop	2014/15 kg	2014/15 tCO <sub>2</sub> e
HFC gas holdings [kg]	695 kg	nm	23 kg	82 kg	800	1,544
SF <sub>6</sub> holdings [kg]	1,670 kg	n/a	320 kg	0 kg	1,990	45,371

Meridian's Electricity facility has a holding of sulphur hexafluoride (SF<sub>6</sub>) gas. The bulk of the gas is held in 220kV circuit breakers and current transformers with small amounts being held in 110kV, 33kV and 22kV switchgear. No SF<sub>6</sub> is known to be held in fire extinguishing systems. Meridian's current management practices in relation to SF<sub>6</sub> are well aligned with best practice as defined by the Cigré and IEC publications<sup>11</sup>. SF<sub>6</sub> is also present in switchgear in Meridian Australia. No top ups were required in FY15.

It has not been possible to obtain data on HFC holdings in air conditioning systems from Damwatch. For all other facilities liabilities from HFCs from refrigerators have been estimated to be well below the *de minimus* threshold of 1% and their liabilities are not reported here.

## 17 Compliance with ISO 14064-1

### ISO 14064-1, 7.3.1 (p)

This GHG inventory report for the year ending 30 June 2015 has been prepared in accordance with ISO 14064-1. A reporting index is provided in Appendix Three.

## 18 Audit of the GHG Inventory

### ISO 14064-1, 7.3.1 (q)

This GHG inventory report has been audited by Deloitte, a third party independent assurance provider. A reasonable level of assurance has been given over the assertions and quantification included in this report. Deloitte is also the financial auditor of Meridian Energy Limited on behalf of the Office of the Auditor General.

## 19 Description of Additional Indicators

### ISO 14064-1, 7.3.2 (i)

No additional indicators have been presented in this GHG inventory.

## 20 Assessment of Performance against Relevant Benchmarks

### ISO 14064-1, 7.3.2 (j)

No assessment of performance against relevant benchmarks is presented in this GHG inventory.

<sup>11</sup> *SF<sub>6</sub> Recycling Guide Re-Use of SF<sub>6</sub> Gas in Electrical Power Equipment and Final Disposal* Cigré Task Force 23.10.01 G Mauthe et al, August 1997  
IEC 1634 Technical Report Type 2 'High-Voltage Switchgear and Controlgear – Use and Handling of SF<sub>6</sub> in High Voltage Switchgear and Control Gear', 1995  
IEC 480 'Guide to the Checking of Sulphur Hexafluoride (SF<sub>6</sub>) Taken from Electrical Equipment', 1976

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## References:

Cigré Task Force, SF<sub>6</sub> Recycling Guide Re-Use of SF<sub>6</sub> Gas in Electrical Power Equipment and Final Disposal' 23.10.01 G Mauthe et al, August 1997

IEC 1634 Technical Report Type 2 'High-Voltage Switchgear and Controlgear – Use and Handling of SF<sub>6</sub> in High Voltage Switchgear and Control Gear', 1995

IEC 480 'Guide to the Checking of Sulphur Hexafluoride (SF<sub>6</sub>) Taken from Electrical Equipment', 1976

International Standards Organisation, *ISO 14064-1:2006 (E)*

Ministry for the Environment, Guidance for Voluntary, Corporate Greenhouse Gas Reporting. Data and methods for the 2007 calendar year, September 2008.





## Appendix 1 – Meridian Group treatment of emissions

Meridian Energy treatment of emissions from subsidiaries, associates, joint ventures and investments as at 30 June 2015.

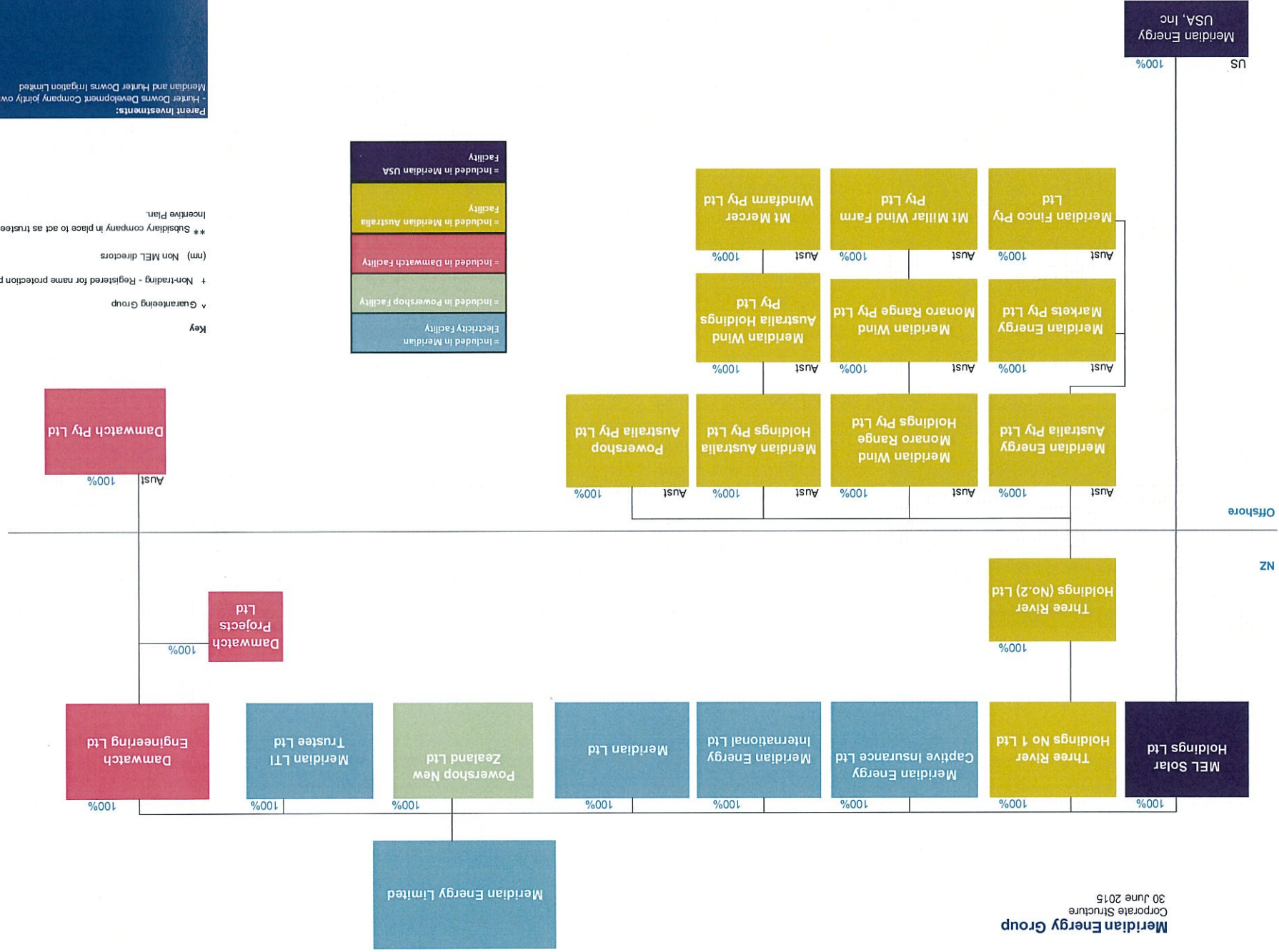
Company Name	Emissions source?	Legal structure and partners	Economic interest held by MEL		Country	Operational control	Comment
Meridian Energy Limited (MEL)	Yes	Parent company	100%		NZ	Yes	Included in Meridian Electricity facility.
Tonga solar plant	Yes	Finance lease	0%		NZ	No	Excluded from the Meridian Electricity facility
Mill Creek Transmission Line	Yes	Finance lease	0%		NZ	Yes	Excluded from the Meridian Electricity facility
Meridian Energy Captive Insurance Limited	No (non-trading entity)	Group companies / subsidiaries	100%		NZ	Yes	No activity, therefore no emissions.
Meridian LTI Trustee Limited	No (non-trading entity)	Group companies / subsidiaries	100%		NZ	Yes	No activity, therefore no emissions.
Meridian Energy International Limited	No (non-trading entity)	Group companies / subsidiaries	100%		NZ	Yes	No activity, therefore no emissions.
Meridian Limited	No (non-trading entity)	Group companies / subsidiaries	100%		NZ	No	No activity, therefore no emissions.
Hunter Downs Joint Venture	Yes	Non-incorporated joint venture	50%		NZ	No	Included from the Meridian Electricity facility
Damwatch Services Limited	Yes	Group companies / subsidiaries	100%		NZ	Yes	Included in Damwatch facility (NZ operations)
Damwatch Projects Ltd	No (holding company)	Group companies / subsidiaries	100%	via Damwatch Services Ltd	NZ	Yes	No activity, therefore no emissions.
GNS Joint Venture	Yes	Non-incorporated joint venture	33%	via Damwatch Projects Ltd	NZ	No	Included in Damwatch facility (NZ operations)
Damwatch Pty Limited	Yes	Group companies / subsidiaries	100%	via Damwatch Services Ltd	AUS	Yes	Included in Damwatch facility (AUS operations)
Three River Holdings (No 1) Limited	No (holding company)	Group companies / subsidiaries	100%		NZ	Yes	No activity, therefore no emissions.
Three River Holdings (No 2) Limited	No (holding company)	Group companies / subsidiaries	100%	via Three River Holdings (No 1) Ltd	NZ	Yes	No activity, therefore no emissions.
Meridian Energy Australia Pty Ltd	Yes	Group companies / subsidiaries	100%	via Three River Holdings (No 2) Ltd	AUS	Yes	Included in Meridian Australia facility.
Meridian Finco Pty Ltd	No (non-trading entity)	Group companies / subsidiaries	100%	via MEL Meridian Australia Partnership	AUS	Yes	No activity, therefore no emissions.
Meridian Australia Holdings Pty Limited	No (holding company)	Group companies / subsidiaries	100%	via Three River Holdings (No 2) Ltd	AUS	Yes	No activity, therefore no emissions.
Meridian Wind Australia Holdings Pty Ltd	No (holding company)	Group companies / subsidiaries	100%	via Meridian Australia Holdings Pty Ltd	AUS	Yes	No activity, therefore no emissions.
Meridian Energy Markets Pty Ltd	No (holding company)	Group companies / subsidiaries	100%	via Meridian Wind Australia Holdings Pty Ltd	AUS	Yes	No activity, therefore no emissions (holds our trading licences)
Mt Mercer Windfarm Pty Limited	Yes	Group companies / subsidiaries	100%	via Meridian Energy Markets Pty Ltd	AUS	Yes	Included in Meridian Australia facility (Mt Mercer wind farm)
Meridian Wind Monaro Range Holdings Pty Limited	No (holding company)	Group companies / subsidiaries	100%	via Three River Holdings (No 2) Ltd	AUS	Yes	No activity, therefore no emissions.
Meridian Wind Monaro Range Pty Limited	No (non-trading entity)	Group companies / subsidiaries	100%	via Meridian Wind Monaro Range Holdings Pty Limited	AUS	Yes	No activity, therefore no emissions.
Mt Millar Wind Farm Pty Ltd	Yes	Group companies / subsidiaries	100%	via Meridian Wind Monaro Range Pty Limited	AUS	Yes	Included in Meridian Australia facility
Mt Mercer Transmission Line	Yes	Finance lease	0%		AUS	Yes	Excluded from the Meridian Australia facility
Powershop Australia Pty Ltd	Yes	Group companies / subsidiaries	100%	via Three River Holdings (No 2) Ltd	AUS	Yes	Included in Meridian Australia facility
MEL Solar Holdings Limited	No (holding company)	Group companies / subsidiaries	100%		NZ	Yes	No activity, therefore no emissions.
Meridian Energy USA, Inc	No (holding company)	Group companies / subsidiaries	100%	via MEL Solar Holdings Ltd	USA	Yes	No activity, therefore no emissions.
Powershop New Zealand Limited	Yes	Group companies / subsidiaries	100%		NZ	Yes	Included in Powershop facility.



Appendix 2 – Meridian Energy Group Structure



Meridian Energy Group  
Corporate Structure  
30 June 2015





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## Appendix 3 – ISO 14064-1 Reporting Index

### ISO 14064-1 Reporting Index

ISO Reporting	Section in this report	ISO Reporting	Section in this report
7.3.1 (a)	Section 3	7.3.1 (j)	Section 12
7.3.1 (b)	Section 4	7.3.1 (k)	Section 13
7.3.1 (c)	Section 5	7.3.1 (l)	Section 8
7.3.1 (d)	Section 6	7.3.1 (m)	Section 10
7.3.1 (e)	Table 4	7.3.1 (n)	Section 10
7.3.1 (f)	Section 8	7.3.1 (o)	Section 11
7.3.1 (g)	Section 15	7.3.1 (p)	Section 17
7.3.1 (h)	Section 9	7.3.1 (q)	Section 18
7.3.1 (i)	Table 1		
7.3.2 (a)	Section 3	7.3.2 (h)	Section 11
7.3.2 (b)	Section 8	7.3.2 (i)	Section 19
7.3.2 (c)	Section 15	7.3.2 (j)	Section 20
7.3.2 (d)	Section 15	7.3.2 (k)	Section 7
7.3.2 (e)	not applicable		
7.3.2 (g)	Table 1		
4.2	Section 7		

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