

# Greenhouse Gas Emissions Inventory Report

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INVENTORY SCOPE: MERIDIAN GROUP (ALL FACILITIES)  
INVENTORY PERIOD: FOR THE PERIOD 1 JULY 2019 TO 30 JUNE 2020  
VERSION: FINAL  
AUDIT STATUS: VERIFIED



**Meridian.**

The Power to  
Make a Difference.

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**Disclaimer**

Every effort has been made to ensure that the report is accurate. Meridian Energy Limited will not be liable in contract, tort, equity or otherwise, for any reliance placed upon this report by any third party.

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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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## Greenhouse gas emissions inventory summary

### ISO 14064-1, 9.3.2 (f)

Table 1: Total greenhouse gas emissions for the Meridian Group by business activity and scope

Business activity	Scope	Emissions tCO <sub>2</sub> e	Offsets**	Remaining tCO <sub>2</sub> e
<b>Operational</b>				
	Scope 1	1,177	1,177	0
	Scope 2 (market based)	17	17	0
	Scope 3 operational	43,165	43,165	0
	<b>Subtotal</b>	<b>44,359</b>	<b>44,359</b>	<b>0</b>
<b>Energy purchased &amp; on-sold*</b>				
	New Zealand electricity	0	0	0
	Australia electricity and gas	813,054	813,054	0
		<b>813,054</b>	<b>813,054</b>	<b>0</b>
<b>One-time construction</b>				
	Scope 3 one-time construction	32	0	32
		<b>32</b>	<b>0</b>	<b>32</b>
<b>Total Group value chain emissions (S1, 2 &amp; 3)***</b>		<b>857,445</b>	<b>857,413</b>	<b>32</b>

\*Emissions of our retailed electricity using the market-based methodology. In New Zealand we use the annual netting off methodology (see [Section 11](#)). In Australia we use the National Carbon Offset Standard (NCOS) administered by the Australian government

\*\*Offsets include credits cancelled by suppliers against their own emissions, credits purchased to fulfil Australia's NCOS commitments, and Gold Standard Voluntary Emission Reductions (GS VERs) for the balance. For details on offsets see [Section 18](#).

\*\*\* Total emissions are calculated using the market-based methodology for Scope 2 emissions for the first time in FY20. [Section 11.1](#) explains this.

ISO 14064-1, 9.3.1 (j), 9.3.2 (e, f)

Table 2: Greenhouse gas emissions for the Meridian Group by facility

Scope	Category	Meridian NZ	Meridian Australia	Flux NZ	2019/20 tCO <sub>2</sub> e
<b>Direct emissions (Scope 1)</b>					
	Stationary combustion	29	55	nm	<b>84</b>
	Mobile combustion	765	108	0	<b>873</b>
	Fugitive emissions	105	115	nm	<b>220</b>
	<b>Subtotal</b>	<b>899</b>	<b>278</b>	<b>0</b>	<b>1,177</b>
<b>Indirect emissions (Scope 2)</b>					
	Electricity consumption (location based)*	1,612	852	4	<b>2,468</b>
	Electricity consumption (market based)**	13	0	4	<b>17</b>
	<b>Subtotal (market based)***</b>	<b>13</b>	<b>0</b>	<b>4</b>	<b>17</b>
<b>Indirect emissions (Scope 3)</b>					
	Purchased goods and services	10,230	2,180	287	<b>12,697</b>
	Capital goods	18	6	nm	<b>24</b>
	Fuel- and energy-related activities	199	813,090	0	<b>813,289</b>
	Upstream transportation and distribution	22,154	78	nm	<b>22,232</b>
	Waste generated in operations	74	82	1	<b>157</b>
	Business travel	924	147	215	<b>1,286</b>
	Employee commuting	563	43	34	<b>640</b>
	Downstream leased assets	5,926	n/a	n/a	<b>5,926</b>
	<b>Subtotal</b>	<b>40,088</b>	<b>815,626</b>	<b>537</b>	<b>856,251</b>
<b>Total emissions (S1, 2 &amp; 3) (market based)</b>		<b>41,000</b>	<b>815,904</b>	<b>541</b>	<b>857,445</b>

\*Location-based emissions are calculated using the average emissions intensity of the grids on which energy consumption occurs (using grid-average emission factor data). Market-based emissions are calculated using the low carbon attributes of mechanisms such as contractual instruments or certifications bundled with the consumed electricity. For example, Meridian Australia purchase their own NCOS certified carbon neutral retail electricity product for their own use, and Meridian NZ uses Meridian NZ's own 100% certified renewable energy.

\*\*Market-based emissions are calculated using the low carbon attributes of mechanisms such as contractual instruments or certifications bundled with

the consumed electricity. For example, Meridian Australia purchase their own NCOS certified carbon neutral retail electricity product for their own use, and Meridian NZ uses their own 100% certified renewable energy.

\*\*\*Total emissions are calculated using the market-based methodology for Scope 2 emissions for the first time in FY20. [Section 11.1](#) explains this.

nm : not measured  
n/a : not applicable

Table 3: Greenhouse gas emissions by business activity and scope

Business activity	Category	Meridian NZ	Meridian Australian	Flux NZ	2019/20 tCO <sub>2</sub> e
<b>Operational emissions direct emissions (Scope 1)</b>	Stationary combustion	29	55	nm	<b>84</b>
	Fuel used in electricity generation	0	0	n/a	<b>0</b>
	Backup generators	29	52	nm	<b>81</b>
	Gas consumption in offices	n/a	3	n/a	<b>3</b>
	Mobile combustion	765	108	0	<b>873</b>
	Boat travel	263	n/a	n/a	<b>263</b>
	Car travel	502	108	0	<b>610</b>
	Fugitive emissions	105	115	nm	<b>220</b>
	HFCs	0	1	nm	<b>1</b>
	SF6	105	114	n/a	<b>219</b>
<b>Subtotal Scope 1</b>		<b>899</b>	<b>278</b>	<b>0</b>	<b>1,177</b>
<b>Operational emissions indirect emissions (Scope 2)</b>	<i>Electricity consumption (location based)</i>	1,612	852	4	<b>2,468</b>
	<i>Facilities (location based)</i>	1,424	751	n/a	<b>2,175</b>
	<i>Offices (location based)</i>	184	101	4	<b>289</b>
	<i>Vehicles (location based)</i>	4	n/a	n/a	<b>4</b>
	<i>Electricity consumption (market based)</i>	13	0	4	<b>17</b>
	<b>Subtotal Scope 2 (market based)*</b>		<b>13</b>	<b>0</b>	<b>4</b>

Business activity	Category	Meridian NZ	Meridian Australian	Flux NZ	2019/20 tCO <sub>2</sub> e
<b>Operational indirect emissions (Scope 3)</b>	Purchased goods and services	10,230	2,180	287	<b>12,697</b>
	IT Services	829	79	64	<b>972</b>
	Maintenance Services	5,275	381	14	<b>5,670</b>
	Office Services	472	387	21	<b>880</b>
	Professional Services	3,654	1,334	187	<b>5,174</b>
	Fuel- and energy-related activities	199	36	0	<b>235</b>
	Production and distribution of fuel	182	26	0	<b>208</b>
	T&D losses from office electricity	17	10	0	<b>27</b>
	T&D losses from office gas	n/a	0	n/a	<b>0</b>
	Upstream transportation and distribution	22,146	78	nm	<b>22,224</b>
	Contractor fuel (meter reading)	77	nm	n/a	<b>77</b>
	Contractor fuel (maintenance)	318	78	n/a	<b>396</b>
	Couriers and postage	47	0	nm	<b>47</b>
	Lines operational	10,061	nm	n/a	<b>10,061</b>
	Transmission operational	11,643	nm	n/a	<b>11,643</b>
	Waste generated in operations	74	82	1	<b>157</b>
	Business travel	924	147	215	<b>1,286</b>
	Air travel	843	130	210	<b>1,183</b>
	Taxis and rideshare	25	5	1	<b>31</b>
	Hotel accommodation	56	12	4	<b>72</b>
Employee commuting	563	43	34	<b>640</b>	
Downstream leased assets (farms)	5,926	n/a	n/a	<b>5,926</b>	
<b>Subtotal Scope 3 operational</b>		<b>40,062</b>	<b>2,566</b>	<b>537</b>	<b>43,165</b>
<b>Total operational emissions (S1, 2 &amp; 3) (market based)</b>		<b>40,974</b>	<b>2,844</b>	<b>541</b>	<b>44,359</b>
<b>Energy purchased and on-sold* indirect emissions (Scope 3)</b>	Fuel- and energy-related activities	0	813,054	n/a	<b>813,054</b>
	Electricity purchased and onsold	0	730,383		<b>730,383</b>
	Gas purchased and onsold	n/a	82,671		<b>82,671</b>
<b>Subtotal Scope 3 energy on-sold</b>		<b>0</b>	<b>813,054</b>	<b>n/a</b>	<b>813,054</b>
<b>One-time construction indirect emissions (Scope 3)</b>	Capital goods	18	6	n/a	<b>24</b>
	Upstream transportation and distribution	8	0	n/a	<b>8</b>
	Contractor fuel	0	0		<b>0</b>
	Freight of major materials	8	0		<b>8</b>
<b>Subtotal Scope 3 one-time construction</b>		<b>26</b>	<b>6</b>	<b>n/a</b>	<b>32</b>
<b>Total emissions (S1, 2 &amp; 3) (market based)</b>		<b>41,000</b>	<b>815,904</b>	<b>541</b>	<b>857,445</b>

\*Total emissions are calculated using the market-based methodology for Scope 2 emissions for the first time in FY20. [Section 11.1](#) explains this.

nm not measured  
n/a not applicable

ISO 14064-1, 9.3.1 (f)

Table 4: Total greenhouse gas emissions by greenhouse gas

Greenhouse gas	Meridian NZ	Meridian Australia	Flux NZ	2019/20 tCO <sub>2</sub> e
<b>Scope 1</b>				
CO <sub>2</sub>	785	161	0	<b>946</b>
CH <sub>4</sub>	0	0	0	<b>0</b>
N <sub>2</sub> O	9	2	0	<b>11</b>
HFCs	-	1	-	<b>1</b>
SF <sub>6</sub>	105	114	n/a	<b>219</b>
<b>Subtotal</b>	<b>899</b>	<b>278</b>	<b>0</b>	<b>1,177</b>
<b>Scope 2 (location based)</b>				
CO <sub>2</sub>	1,538	852	4	<b>2,394</b>
CH <sub>4</sub>	73	-	0	<b>73</b>
N <sub>2</sub> O	1	-	0	<b>1</b>
<b>Subtotal</b>	<b>1,612</b>	<b>852</b>	<b>4</b>	<b>2,468</b>
<b>Scope 3</b>				
tCO <sub>2</sub> e	40,088	815,626	537	<b>856,251</b>
<b>Subtotal</b>	<b>40,088</b>	<b>815,626</b>	<b>537</b>	<b>856,251</b>
<b>Total (location based)</b>	<b>42,599</b>	<b>816,756</b>	<b>541</b>	<b>859,896</b>



## 1 Introduction

The authenticity of the sustainability positioning of the Meridian Energy Group of companies is dependent on credible climate action, including measuring and managing our emissions and reducing the greenhouse gas emissions of our operations.

Our emission measurement and reduction guidelines support the Sustainability Policy, and our desire to take “Climate Action” in line with the 13th UN Sustainable Development Goal.

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 Part 9.3.1 of the requirements of International Standards Organisation ISO 14064-1<sup>2</sup>. Where applicable discretionary information has been disclosed consistent with section 9.3.2 of the

Standard. The inventory has also been prepared in accordance with the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) (the GHG Protocol) and the Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011) (the Scope 3 Standard).

Meridian has calculated its own “carbon footprint” since 2001.

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 the Meridian Group of companies which is broken into three 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, the GHG Protocol and the Scope 3 Standard;
- has been prepared as part of an ongoing commitment to measure and reduce emissions on a regular basis.

<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 14064-1:2018(E).

### 3 Description of Meridian

#### ISO 14064-1, 9.3.1 (a) and 9.3.2 (a)

Meridian is New Zealand's largest electricity generator through our five wind farms, seven hydro power stations, and commercial solar arrays. In Australia, we own two wind farms and three hydro power stations. The Group sells electricity to our customers through three brands – Meridian and Powershop in New Zealand, and Powershop in Australia. The Meridian Energy Group of companies is made up of:

- Meridian Energy Limited (the “Parent”) and
- our subsidiaries (together the “Group”).

Meridian undertakes a variety of activities in the energy sector. Its primary activity is the renewable generation and retail of electricity. Other activities include:

- professional services relating to the upkeep of dams;
- development of software used by electricity retailers;
- licencing of electricity retailing software and the Powershop brand to overseas companies; and
- captive self-insurance services.

For further information about the organisation please refer to the Meridian Energy Limited Integrated Report for the year ended 30 June 2020 which is available at [www.meridianenergy.co.nz](http://www.meridianenergy.co.nz). For more information about the facilities that comprise the Meridian Group see [Section 6](#).

#### 3.1 GHG and sustainability policies, strategies and programmes

Meridian Energy's purpose is to provide “clean energy for a fairer and healthier world”. Our key contributions (aligned to the United Nation's seventh and thirteenth Sustainable Development Goals) are reliable and affordable electricity, renewable energy, and a reduction in NZ's carbon footprint.

In support of these goals, we have Greenhouse Gas Emissions Measurement and Reduction Guidelines, first approved by Meridian's Executive Team in June 2009 and revised and approved in August 2019. These guidelines outline how Meridian will measure and reduce our greenhouse gas emissions with the objective of understanding, transparently disclosing and reducing the emission intensity of our operations.

In August 2019 we set an absolute target of across the Group of halving our operational greenhouse gas emissions by 2030.

A focus on GHG measurement and reduction, 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, this 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.

## 4 Persons responsible

### ISO 14064-1, 9.3.1 (b)

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

The person responsible for this GHG inventory is Mike Roan, Chief Financial Officer.

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

- Alison Howard, Head of Sustainability;
- Judy Ryan, Carbon Accountant;
- Rob Gillespie, Management Accountant;
- Anna Mills, Commercial Support Manager;
- Ewan Gestro, Commercial Insight Manager (electricity generation, purchases and power station electricity data);
- Jamie Bishop, APX Travel Management (air and rental car travel data);
- Custom Fleet staff (fleet vehicle travel and fuel data);
- Nick Robilliard, Procurement & Property Manager (business travel and all vehicle data inputs);
- Daniel Williamson, HR Analyst (HR data);
- Peter Harding, Management Accountant (office electricity consumption data);
- Numerous Generation and Natural Resources staff (one-time emissions sources, SF<sub>6</sub>);
- Sandy Iti, Broadspectrum (office waste and air conditioning);
- Rebekah Peni, Niche FM (office waste and air conditioning);
- Victoria Kladouhos (Meridian Energy Australia Pty Ltd);
- Rachel Lagan, Office Manager (Powershop Limited);
- Katrina Cooper, Office Manager (Flux Limited (NZ));
- Hannah Porter, Meter Reading & Field Services Data.

## 5 Reporting period covered

### ISO 14064-1, 9.3.1 (c)

This GHG inventory report covers the financial year 1 July 2019 to 30 June 2020.

## 6 Organisational boundaries

### ISO 14064-1, 9.3.1 (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 GHG Protocol and ISO14064-1 standards. 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 2020.

For further information about the organisation please refer to the [Meridian Energy Limited FY20 Integrated Report](#) which is available on our website.

#### 6.2 Defining Meridian "facilities"

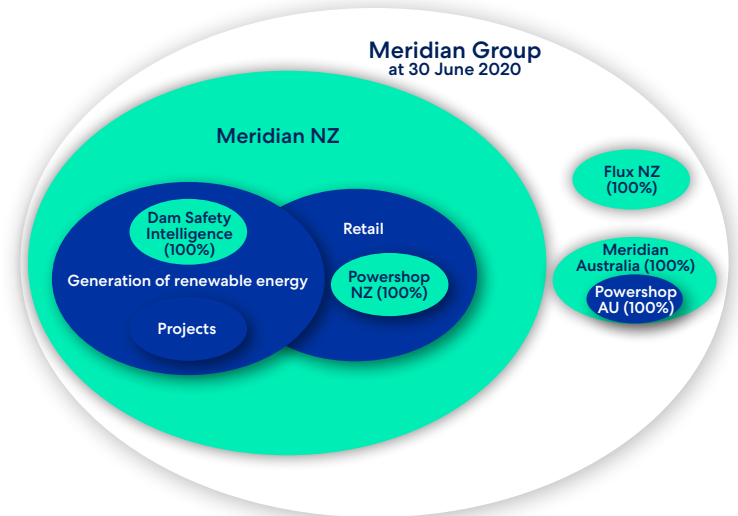
Meridian's diverse activities and resulting emissions are categorised into "facilities" in line with Annex A of ISO 14064-1 which requires that the data should be retained in its disaggregated form to aid transparency and to provide maximum flexibility in meeting a range of reporting requirements.

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 2020 these facilities are: Meridian NZ, Flux NZ, and Meridian Australia as illustrated in the following diagram. Powershop NZ has been incorporated into the Meridian NZ this year as its operations are increasingly shared with the parent company. There are no other significant changes.

Figure 1: Facilities comprising the Meridian Group



<sup>3</sup>ISO 14064-1:2018(E) section 3.4.1

### 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.

Facility	Description
<b>Meridian NZ</b>	<p>This includes emissions arising from Meridian's core activities associated with the generation and retail of electricity from renewable resources. Meridian New Zealand generated 14,224 GWh of electricity, supplied around 235,109 customer connections at 30 June 2020 and employed 713 people at 30 June 2020. Powershop conducts energy retailing activities within Powershop New Zealand Limited under the Powershop brand. Powershop employed 154 people and supplied around 89,144 customer connections at 30 June 2020.</p> <p>It includes the following legal entities:</p> <ul style="list-style-type: none"><li>• Meridian Energy Limited</li><li>• Dam Safety Intelligence Limited</li><li>• Meridian Energy Captive Insurance Limited (non-trading)</li><li>• Meridian Limited (non-trading)</li><li>• Meridian Energy International Limited (non-trading)</li><li>• Meridian LTI Trustee Limited (non-trading)</li><li>• Powershop New Zealand Ltd</li></ul> <p>Further information about Meridian can be found at <a href="http://www.meridianenergy.co.nz">www.meridianenergy.co.nz</a> and Powershop can be found at <a href="http://www.powershop.co.nz">www.powershop.co.nz</a>.</p>
<b>Meridian Australia</b>	<p>Meridian carries out generation and retailing of electricity and gas activities in Australia. Meridian Australia generated 641 GWh of electricity, employed 84 people and supplied around 136,202 electricity and around 37,878 gas customer connections through the Powershop brand at 30 June 2020. It includes the following legal entities:</p> <ul style="list-style-type: none"><li>• Meridian Energy Australia Pty Ltd</li><li>• Three River Holdings (No 1) Limited (holding company)</li><li>• Three River Holdings (No 2) Limited (holding company)</li><li>• Meridian Energy Markets Pty Ltd (holding company)</li><li>• Meridian Finco Pty Ltd (non-trading)</li><li>• GSP Energy Pty Ltd</li><li>• Rangoon Energy Park Pty Ltd</li><li>• Wandsworth Wind Farm Pty Ltd</li><li>• Meridian Wind Monaro Range Holdings Pty Ltd (holding company)</li><li>• Meridian Wind Monaro Range Pty Ltd (non-trading)</li><li>• Mt Millar Wind Farm Pty Ltd</li><li>• Meridian Australia Holdings Pty Ltd (holding company)</li><li>• Meridian Wind Australia Holdings Pty Ltd (holding company)</li><li>• Mt Mercer Windfarm Pty Ltd</li><li>• Powershop Australia Pty Ltd</li></ul> <p>Further information about Meridian Australia can be found at <a href="http://www.meridianenergy.com.au">www.meridianenergy.com.au</a></p>
<b>Flux NZ</b>	<p>Flux provides electricity retailing software to Powershop New Zealand, Powershop Australia, Meridian NZ and nPower in the U.K. It licences the Powershop brand and operating model. Flux employed 162 people at 30 June 2020. It includes the following legal entities:</p> <ul style="list-style-type: none"><li>• Flux Federation Ltd</li><li>• Flux UK Ltd</li></ul> <p>Further information about Flux can be found at <a href="http://www.fluxfederation.com">www.fluxfederation.com</a>.</p>

## 7 Information management procedures

### ISO 14064-1, 9.3.2 (i)

GHG Measurement and Reduction Guidelines were developed and approved 30 June 2009 and last revised and approved in August 2019. These document measurement and reporting requirements for individual facilities and the group with the objective of understanding, transparently disclosing and reducing the emission intensity of operations.

Meridian has, for each facility, developed and maintained GHG information management processes that: ensure conformance with the principles of ISO 14064-1 and the GHG Protocol; 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;
- 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 reduction progress.

ISO 14064-1, 9.3.1 (e)

GHG emissions sources from the Meridian Group value chain were identified with reference to the methodology described in the GHG Protocol, ISO 14064-1, and Scope 3 standards, and classified into categories. Under the standards, reporting of Scope 3 emissions is optional.

The following categories are used:

- Direct GHG emissions (Scope 1): GHG emissions that are operationally controlled by the company;
- Indirect GHG emissions from imported energy (Scope 2): GHG emissions from the generation of purchased electricity, heat or steam consumed by the company;
  - Reported by both location- and market-based emissions factors
  - Total annual emissions are reported using the market based approach
- Other indirect GHG emissions (Scope 3): all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. These have been further categorised using the Scope 3 Standard categories:
  - Purchased goods and services (category 1)
  - Capital goods (category 2)
  - Fuel- and energy-related activities not included in Scope 1 or 2 (category 3)
  - Upstream transportation and distribution (category 4)
  - Waste generated in operations (category 5)
  - Business travel (category 6)
  - Employee commuting (category 7)
  - Downstream leased assets (category 13)

For clarity these emissions sources are also reported in the following groups:

- Operational emissions - subject to our reduction and offsetting targets
  - Scope 1, 2, and 3 emissions relating to the day-to-day operation of our businesses
- Construction emissions – from major projects
  - Scope 3 emissions including major materials (Capital goods (category 2)), freight of major materials to site and fuel consumed by contractors (both Upstream transportation and distribution (category 4))
- Emissions from energy purchased and on-sold to customers
  - Scope 3 emissions from Fuel- and energy-related activities (category 3)

Additional Scope 3 standard categories are not reported because they are not relevant to our business, with the exception of category 11 which is captured in our reporting of energy purchased and on-sold under category 4.

9 Summary of emission source inclusions

ISO 14064-1, 9.3.1 (g, m)

This table provides details on the emissions sources included in the GHG inventory.

Scope	Category	GHG emissions source	Facilities included	Data source	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 1	Stationary combustion	Fuel used for electricity generation	Meridian NZ and Meridian Australia	No fuel consumed	n/a	There were no emissions from the 14,865 GWh of electricity generated in the reporting period, as the fuel used to generate this electricity was water and wind.
		Testing of back-up generators	Meridian NZ, Meridian Australia	Estimated hourly usage multiplied by time of test.	Hydro Asset Management Team	Consumption estimated based on regular testing regime.
		Gas consumption in offices	All facilities	Finance system and invoices from supplier	Meridian Australia finance team	Accurate records from the billing system. Start and end of year are partially estimated.
	Mobile combustion	Car travel (owned, leased, rented)	All facilities	GPS generated odometer readings, fuelcard (2) purchase data, rental provider activity reports, and taxi expenditure data	Vehicle operators Customfleet – fuelcards Rental suppliers Freedom Expense Management	Start/end odometer data (rental vehicles) for distance travelled x average fuel efficiency of vehicle class (small, medium or large). Owned vehicles are calculated from litres of fuel purchased on fuelcards. Driver behaviour and individual engine performance are not taken into account for rental vehicles.
		Boat travel (Tug and staff transport boat at Lake Manapōuri)	Meridian NZ	Fuel storage readings	Real Journeys	Accurate records of litres used.
	Fugitive emissions	Fugitive emissions from SF <sub>6</sub>	Meridian NZ, Meridian Australia	Maintenance records	Maintenance staff	Accurate records of storage cylinder weights. Records of 'top-ups'.
		Fugitive emissions from air-conditioning systems	All facilities	Maintenance records	Broadspectrum to 31 March, Niche from 1 Apr, maintenance contractors	Accurate record of 'top-ups' from those facilities that Broadspectrum/Niche is managing. No data from in-house maintenance.



Scope	Category	GHG emissions source	Facilities included	Data source	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 2	Electricity	Electricity consumed in offices	Meridian Australia and Meridian NZ	Records from billing system	Meridian Australia and Meridian NZ finance teams	Accurate records from the billing system.
			Flux NZ	Billing system & landlord invoices	Flux finance team	Accurate records from the billing system.
		Electricity consumed by vehicles	All facilities	GPS generated odometer readings	Smart Track GPS	Kilometres travelled from fleet management system. There could be some level of double counting if vehicles are charged on a Meridian site.
		Electricity consumed in facilities	Meridian NZ and Meridian Australia	The electricity market reconciled consumption files	Meridian NZ finance team and GNR	Accurate records of electricity consumed by Meridian NZ facilities. Meridian Australia facilities derived from energy generated less energy exported.

Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 3 operational	Purchased goods and services (category 1)	Goods and services provided not otherwise included in categories below	All facilities	Emissions information provided by suppliers where available. Where not available \$ spend used.	4% Meridian NZ 3% Meridian Australia 0% Flux	Meridian key purchasers and sustainability team	All major suppliers (spend >\$250k in year) contacted for information on portion of their footprint attributable to activity performed on behalf of Meridian. Generally fuel use, electricity in office and travel. Service types: IT services, professional services, maintenance services, office services. Where no supplier information available, \$ spend by service type x emission factor sourced from Motu.
Scope 3 operational	Fuel related emissions (not Scope 1 or 2) (category 3)	Production & distribution of fuel	All facilities	Fuel invoices	0%	Finance teams	Calculated from amount of fuel purchased (and consumed) using emissions factors derived from LCA studies.
		Transmission and distribution losses from electricity consumed in offices	Meridian Australia and Meridian NZ	Records from billing system	0%	Meridian Australia and Meridian NZ finance team	Accurate records from the billing system. Start and end of year are partially estimated.
			Flux NZ	Billing system & landlord invoices	0%	Flux finance team	Accurate records from the billing system. Start and end of year are partially estimated. Calculated from the invoices.

Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 3 operational	Upstream transportation and distribution (category 4)	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.
		Lines company operational emissions	Meridian NZ	Emissions information provided by suppliers where available.	20%	Meridian key purchaser and Sustainability team	Companies contacted for information on portion of their footprint attributable to activity performed on behalf of Meridian (scope 1, 2 but excluding T&D losses, and scope 3 field services). Where no supplier information available, volume x emission factor used as proxy.
		Transmission company operational emissions	Meridian NZ	Emissions information provided by supplier	100%	Sustainability team	Company contacted for information on portion of their footprint attributable to activity performed on behalf of Meridian (scope 1, 2 excluding T&D losses, and scope 3 maintenance).
		Contractor fuel for retail meter reading and maintenance	Meridian NZ	Supplier estimates of distances Samples of jobs Samples of vehicle types used	100%	Retail  Delta Vector AMS Wells ARC Metrix/Intellihub	Calculated using a formula of estimated distance x estimated emissions factor. Contractors estimate distance and the average type of vehicle used. The emissions factor is a weighted average of the vehicle types, calculated from emission factors provided by Defra. One contractor provides fuel used information.
		Couriers and postage	Meridian NZ	Supplier records	100%	NZ Post	Calculated by collating quantity of each NZ Post service used by Meridian then carbon emission value assigned for that service.
Scope 3 operational	Waste (category 5)	Waste to landfill from offices and facilities	All facilities	Actual weight of waste bins. Supplier records	50%	Broadspectrum and Niche. Finance teams	Waste bins weighed on a monthly basis by maintenance provider or size of bin and collections from invoices by finance teams. Estimation for Flux NZ based on Meridian NZ data.

Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 3 operational	Business travel (category 6)	Air travel (domestic and international)	All facilities	Purchase records (supplier data, internal purchasing systems)	100%	Meridian NZ Procurement team Travel providers Finance teams	Supplier records of flights ticketed (and not cancelled but excludes 'no shows') calculated by our suppliers integrated financial data warehouse and mid-office travel management systems. Outputs are calculated using the distances travelled by sector split into domestic, shorthaul and longhaul and longhaul split by class of travel. Distances are calculated using Great Circle Mapper <sup>4</sup> .
		Car travel (taxi and rideshare)	All facilities	Purchase records (supplier data, internal expense management system – Fraedom)	30%	Meridian NZ Procurement team. Uber Mevo	Records of expenditure for taxis. For rideshare except Mevo this is estimated based on distance travelled x average fuel efficiency of vehicle class (assumed to be hybrid Toyota Prius). Mevo provides exact emissions for travel in their vehicles. These emissions are offset 120% by Mevo. 100% are shown as offsets in inventory.
		Hotel accommodation	All facilities	Purchase records (supplier data, internal purchasing systems)	100%	Meridian New Zealand Procurement team Travel providers Finance teams	Hotel nights provided by travel provider, by NZ, Australia and rest of world. Accommodation booked through purchasing card is excluded as it would be difficult and time consuming to calculate. This method of purchase is actively discouraged.
Scope 3 operational	Employee commuting (category 7)	Travel to and from work (in private vehicles and public transport)	All facilities	Employee commuter survey	100%	Sustainability team	Staff were surveyed in FY19 and asked to estimate own emissions from commuting. Emissions from multiple forms of transport estimated using Map My Emissions <sup>5</sup> . Given the disruption caused by COVID-19 this year an estimation of 83% of the previous year data was used.

<sup>4</sup> www.gcmap.com

<sup>5</sup> https://mapmyemissions.com/home

Scope	Category	GHG emissions source	Facilities included	Data source	Data from supplier engagement	Data collection unit	Methodology, data quality, uncertainty (qualitative)
Scope 3 operational	Downstream leased assets (category 13)	Farming activities	Meridian NZ	Leaseholder	100%	Compliance and Property Relationship Manager Land and Property Advisor	For farms: Leaseholder provided estimates of key information on stock and other activities. Farming calculator used to estimate total emissions for each farm. For salmon farms: leaseholder provided key information. Emission factor applied to live weight of salmon.
	Capital goods (category 2)	Major construction and plant upgrade materials	All facilities with relevant activity in reporting period	Project records from manufacturer or design specifications	100%	Project Managers in GNR	Records of weights or volumes of major materials used in construction projects.
Scope 3 one-time construction	Upstream transportation and distribution (category 4)	Contractor fuel used during construction and significant upgrades	All facilities with relevant activity in reporting period	Contractor records	50%	Project Managers in GNR	Estimates of the amount of fuel used. Some information is provided by suppliers.
		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.
Scope 3 energy purchased and on-sold	Fuel related emissions (not Scope 1 or 2) (category 3)	Electricity purchased and on-sold	Meridian NZ	From internal records	0%	Meridian NZ GNR and Powershop finance team	Emissions calculated using the annual netting off methodology (see <a href="#">Section 11</a> ).
		Electricity purchased and on-sold	Meridian Australia	From internal records	0%	Meridian Australia finance team	Emissions calculated using the National Carbon Offset Standard administered by the Australian government.
		Gas purchased and on-sold	Meridian Australia	From internal records	0%	Meridian Australia finance team	Emissions calculated using the National Carbon Offset Standard administered by the Australian government.

### 9.1 Other emissions - PFCs & NF<sub>3</sub>

No operations within the Meridian Group use perfluorocarbons (PFCs) or Nitrogen Trifluoride (NF<sub>3</sub>) therefore no holdings of PFCs are reported and no emissions from these sources are included in this inventory.

### 9.2 Other emissions - CO<sub>2</sub> Emissions from the combustion of biomass

There was no combustion of biomass in the operations of the Meridian Group during the reporting period.

## 10 GHG emissions source exclusions

### ISO 14064-1, 9.3.1 (i)

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	Estimated size of exclusion tCO <sub>2</sub> e	% of total Scope 1 & 2 FY20 inventory
Scope 1	Stationary combustion	Testing of back-up generators	Flux NZ	Emissions from the testing of back-up generators from these facilities is estimated to be de minimis. Recalculated in FY19 based on FY11 data.	5	0.37%
	Stationary combustion	Back-up generators when used in emergency situations	All facilities with relevant activity in reporting period	Additional emissions from use in emergency situations is estimated to be de minimis. Recalculated in FY19 based on FY11 data.	8	0.57%
	Fugitive emissions	Fugitive emissions from fridges and vehicle AC systems	All facilities	Difficult to obtain the data, estimated to be de minimis. Based on FY11 data.	17	1.26%
<b>Total</b>					<b>30</b>	<b>2.20%</b>

Scope	Category	GHG emissions source	Facilities	Reason for exclusion
Scope 3	Purchased goods and services	Contracts for Differences for electricity	Meridian New Zealand	These contracts are financial instruments for managing Meridian's financial position and are not for physical generation. Therefore no emissions are created for these contracts.
Scope 3	Upstream transportation and distribution	Lines company and gas transmission company operational emissions	Meridian Australia	Difficult to obtain the data.
		Freight - courier packages and minor materials	Meridian Australia and Flux NZ.	Difficult to obtain the data, estimated to be de minimis.
		Contractor fuel for retail meter reading and maintenance	Meridian Australia	Difficult to obtain the data, estimated to be de minimis.

## 11 Data collection, quantification and uncertainties

### ISO 14064-1, 9.3.1 (m, n, o, t)

Section 9 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 6.14.9 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)<sup>6</sup> or Department of Environment, Food and Rural Affairs (Defra, United Kingdom)<sup>7</sup>. All calculations in this report are expressed in total tonnes of carbon dioxide equivalent as this is how most emissions factors are presented.

- Location based emission factors applied to electricity consumption in New Zealand have been calculated from Ministry of Business, Innovation and Employment (MBIE)<sup>8</sup> data.
- Emissions factors for electricity consumption in Australia have been sourced from NGA released by the Australian Government (Department of the Environment and Energy), August 2019<sup>9</sup>
- The emissions factors for purchased goods and services have been sourced from Motu<sup>10</sup>
- The emissions factor for International Long Haul is a weighted average of the differing classes of travel taken, calculated by Meridian from emission factors provided by MfE and include radiative forcing.

<sup>6</sup> Ministry for the Environment. Measuring emissions: A guide for organisations – 2019 detailed guide: Using Data and Methods from the 2016 Calendar Year. Wellington <https://www.mfe.govt.nz/publications/climate-change/measuring-emissions-guide-organisations-2019-detailed-guide>.

<sup>7</sup> Department for Business, Energy & Industrial Strategy. UK Government Greenhouse gas reporting: conversion factors 2019. London <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019>

<sup>8</sup> Ministry of Business, Innovation & Employment. a) Quarterly electricity and liquid fuel emissions data. b) Emission factors electricity. Wellington.  
a) [https://www.mbie.govt.nz/assets/Data-Files/Energy/energy-quarterly-statistics/q1-march-2019/f21f15a7f3/Quarterly\\_electricity\\_liquid\\_fuel\\_emissions\\_data.xlsx](https://www.mbie.govt.nz/assets/Data-Files/Energy/energy-quarterly-statistics/q1-march-2019/f21f15a7f3/Quarterly_electricity_liquid_fuel_emissions_data.xlsx)  
b) <https://www.mbie.govt.nz/assets/Data-Files/Energy/7042baaf2c/emission-factors-electricity.csv>

- The annual netting off methodology is applied to electricity purchased and on-sold for the Meridian NZ facility. Under this methodology the difference between electricity generated by Meridian and the electricity supplied to its retail customers is calculated on an annual basis. This calculation includes an allowance for transmission losses in the national grid and is based on the amount purchased at the entry point for local network distribution thereby taking into account losses due to distribution. If, on an annual basis, the amount purchased is more than the amount supplied, Meridian reports the net difference as a source of scope 3 emissions. The emission factor applied is calculated after removing Meridian generation from the mix.
- The market based emission factor for electricity consumption in the Meridian NZ offices and facilities is based on the purchase of Meridian NZ's certified renewable energy product for their own use.
- The market based emission factor for Meridian Australia is based on the purchase of Powershop Australia's NCOS certified carbon neutral retail electricity product for their own use. Any electricity use which was not covered by this product has been disclosed at a residual factor provided by New Zealand Energy Certificate System. This year, this figure is the New Zealand grid-average emission factor<sup>11</sup>.

Quantities of each greenhouse gas are converted to tonnes CO<sub>2</sub>e using the global warming potential from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4)<sup>12</sup>. The time horizon is 100 years.

<sup>8</sup> Department of the Environment and Energy, 2019: National Greenhouse Accounting Factors – August 2019. Canberra <https://publications.industry.gov.au/publications/climate-change/system/files/resources/cf1/national-greenhouse-accounts-factors-august-2019.pdf>

<sup>10</sup> Romanos, Carl, Suzi Kerr and Campbell Will. 2014. "Greenhouse Gas Emissions in New Zealand: A Preliminary Consumption-Based Analysis." Motu Working Paper 14-05, Motu Economic and Public Policy Research. Wellington. <https://motu.nz/our-work/environment-and-resources/emission-mitigation/emissions-trading/greenhouse-gas-emissions-in-new-zealand-a-preliminary-consumption-based-analysis/>

<sup>11</sup> <https://www.certifiedenergy.co.nz/how-it-works>

<sup>12</sup> [https://www.ipcc.ch/site/assets/uploads/2018/05/ar4\\_wg1\\_full\\_report-1.pdf](https://www.ipcc.ch/site/assets/uploads/2018/05/ar4_wg1_full_report-1.pdf)

### 11.1 Changes to approaches used previously

Total emissions have been calculated using the market-based methodology for Scope 2 emissions for the first time in FY20. Prior to this the location-based methodology for Scope 2 emissions was used to calculate total emissions.

The market-based methodology will be used going forward.

In FY19 Meridian reported Scope 2 emissions of 2,318 tCO<sub>2</sub>e using the location-based methodology and 1,605 tCO<sub>2</sub>e using the market-based methodology. The total operational emissions for FY19 reported using the location-based methodology were 36,983. Using the market-based methodology the total operational emissions were 36,270 tCO<sub>2</sub>e.

## 12 Impact of uncertainty

### ISO 14064-1, 9.3.1 (p, q)

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 9, 10](#) and [11](#). Where

uncertainty exists in the data, a conservative estimation approach has been taken leading to over, rather than understating of emissions.

## 13 Base year selected

### ISO 14064-1, 9.3.1 (k)

The base year is 1 July 2018 to 30 June 2019. This provides the most recent benchmark against which our absolute target of halving our operational greenhouse gas emissions across the Group by 2030 can be measured.

The total Group operational emissions in the base year were 36,270 tCO<sub>2</sub>e (using market based emissions for electricity consumed in our Australian operations).

We have restated this figure to include transmission operational emissions in our Scope 3 value chain. These were included for the first time in FY20 and have a material impact.

The restated total Group operational emissions in the base year were 47,279 tCO<sub>2</sub>e. The reported and restated baselines are shown in [Section 16.3](#).

Prior to FY19 the base year was FY12. For reporting purposes some comparisons will be made to FY12 where they are relevant.

## 14 Changes to historic base year

### ISO 14064-1, 9.3.1 (l)

We recalculate our base year if any of the following applied:

- if emission factors changed substantially and were relevant to prior years (for example if the science behind a factor changed);
- if we bought or sold a business; or
- if we significantly changed the scope of what we were measuring in the value chain.

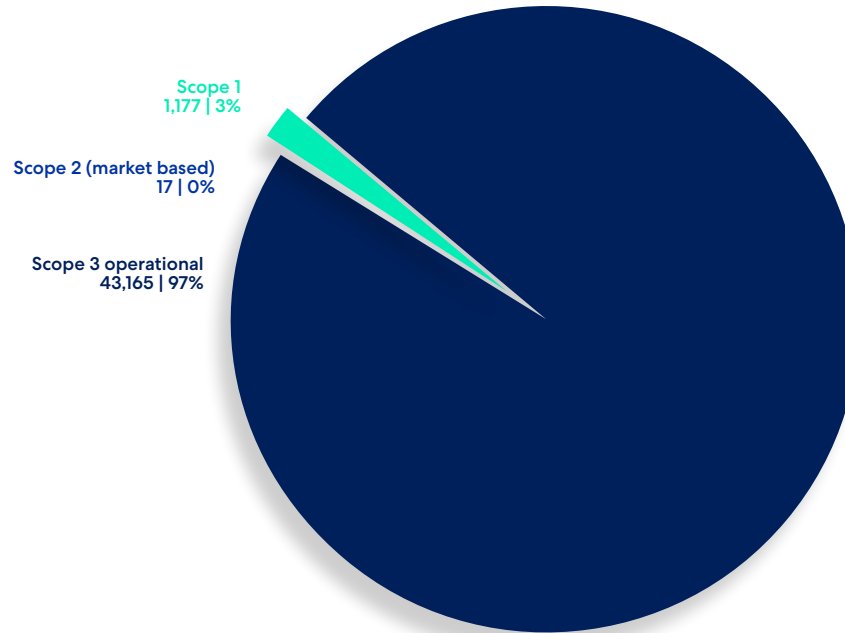
In FY19 we significantly changed the scope of what we were measuring in the value chain, committed to a significant reduction target and adopted a new base year. Total emissions from FY19 were restated in FY20 as a new Scope 3 inclusion had a material impact.

## 15 GHG emissions calculations and results

### 15.1 Total operational emissions by scope

Total operational GHG emissions for Meridian Group were 44,359 tCO<sub>2</sub>e for the reporting period, shown by scope in the following graph.

Figure 2: Total operational greenhouse gas emissions by scope (tCO<sub>2</sub>e)



While the generation of electricity is Meridian New Zealand's core business, there are no Scope 1 emissions from the generation of electricity as fuel sources are wind and water. Upstream transportation and distribution makes up 51% of the Scope 3 operational emissions. The next highest category of Scope 3 operational emissions is purchased goods and services (29%) followed by downstream leased assets (14%).

Note: operational emissions exclude one-time emissions and emissions from energy purchased and on-sold.



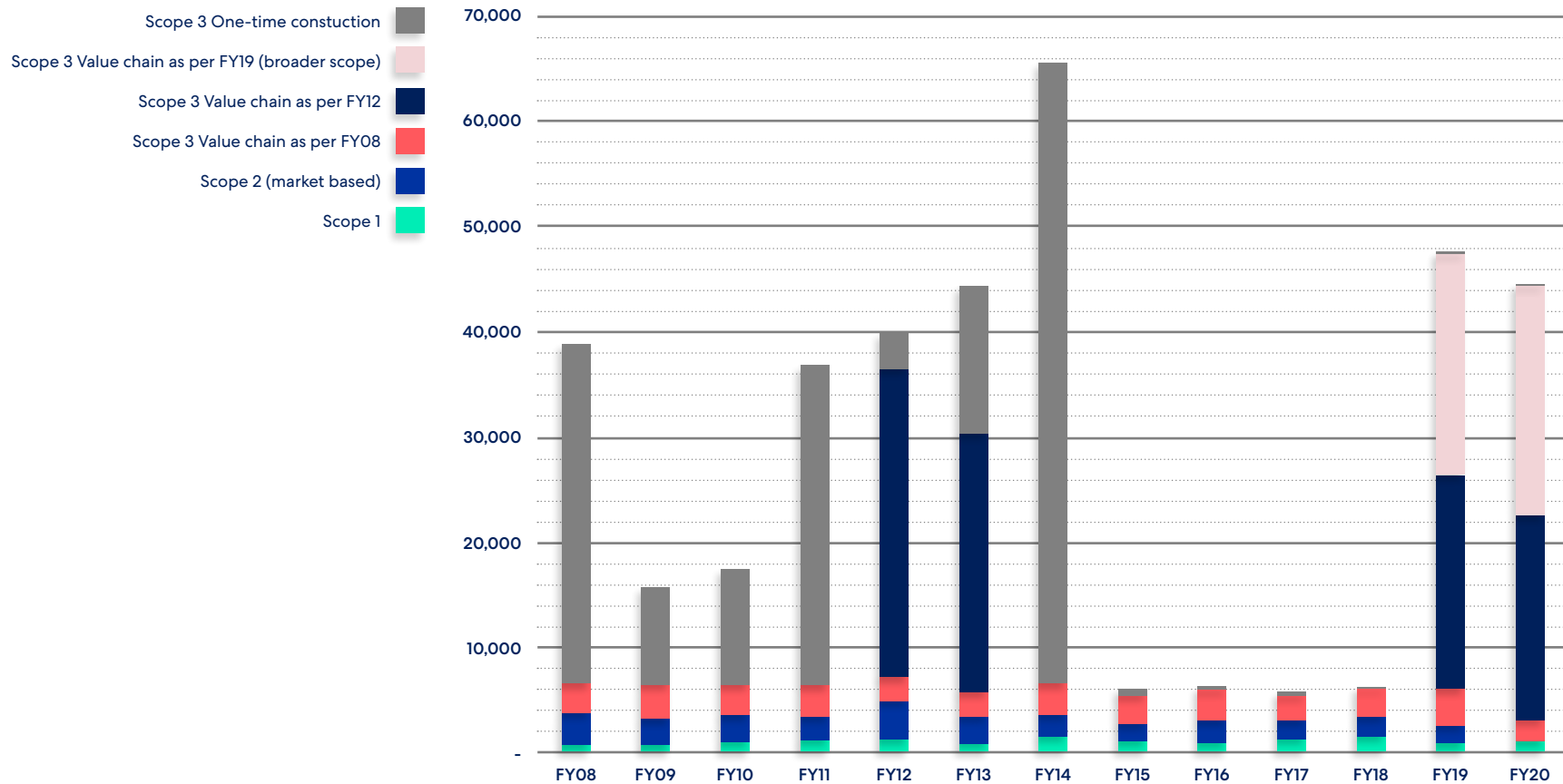
### 15.2 Total emissions by scope over time

This graph shows the total emissions by the group over time. It is broken into the following categories: Scope 1; Scope 2; Scope 3 Operational Core (as defined in FY08); Scope 3 value chain as defined in FY12; Scope 3 value chain as defined in FY19 and One-time construction. It illustrates the fluctuating nature of emissions from major construction

projects. Emissions from energy purchased and on-sold (relevant to Meridian Australia) are excluded.

Overall operational core emissions (Scopes 1, 2 and 3 Value chain as per FY08) are 50% lower in FY20 than they were in FY08, and are 56% lower than they were in FY12 when operational core emissions were at their highest.

Figure 3: Total greenhouse gas emissions by scope - annual comparison\*



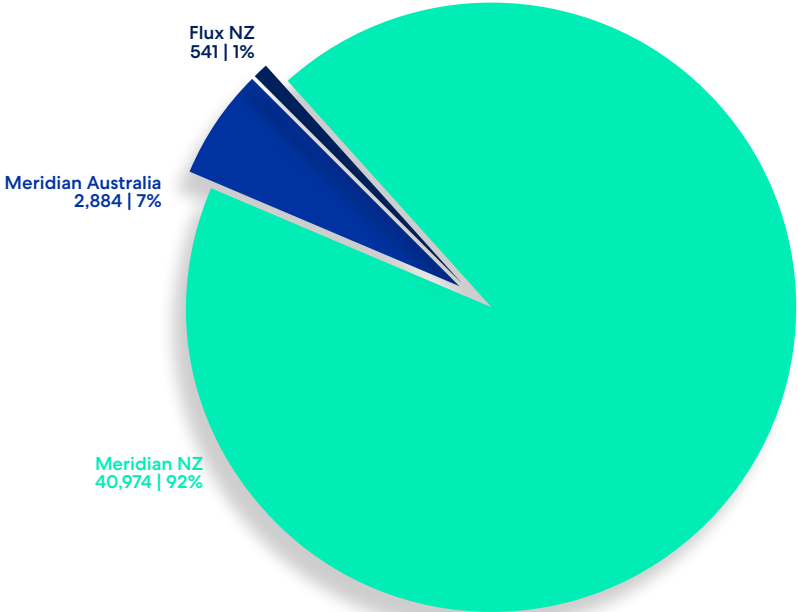
\*excludes energy purchased and on-sold, due to the scale of this emissions source.

**15.3 Total operational emissions by facility**

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

The majority of operational emissions are from the Meridian NZ facility and are emissions from upstream transportation and distribution. Emissions from this source are 50% of the total group operational emissions. Emissions from purchased goods and services in the Meridian NZ facility make up 23% of the total group operational emissions.

**Figure 4: Total operational greenhouse gas emissions by facility (tCO<sub>2</sub>e)**



**16.1 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.

Meridian has started a project to plant 1.5million trees across 1,500 hectares of land. We’ve started on home soil, with our hydro stations and wind farms welcoming their first seedlings late in 2019. And we’re now planning for land to house the rest.

The trees will be a mix of natives and exotics. Mixed planting is the best way to go, because the exotics are the carbon 'engine' - pulling carbon down from the atmosphere in a hurry. They then create a canopy to protect the natives in their early days so they can flourish later in life. In the long term, the natives will take over, leaving a lasting legacy for future generations. In a few years, we expect that they'll remove the same amount of carbon as the Meridian Group emits.

**16.2 Emission reduction initiatives**

We have an absolute target of halving our operational greenhouse gas emissions across the Group by 2030 when compared to our FY19 baseline.

The following emissions reductions initiatives were planned this year. Deployment of some of these initiatives was delayed due to the impact of the COVID-19 pandemic.

Initiative	Part of business	Status
Supply chain scope 3 emission reductions	Group	Commenced FY20
Reduction in farm emissions	Meridian NZ	Deferred to FY21
Air travel reduction – at least 50% reduction in carbon from FY20 to FY21	Meridian NZ	Commenced FY20
Energy efficiency project for wind and hydro assets	Meridian NZ	Commenced FY20
Electrification of vehicle fleet	Meridian NZ	Ongoing
Electrification of Meridian boat	Meridian NZ	Commenced Y20
Reduction in air travel emissions per FTE	Meridian Australia	Ongoing
New waste management procedures for head office	Meridian Australia	Completed. During implementation 5 tonnes of paper and cardboard and 1 tonne of food waste were diverted from landfill.

### 16.3 Emission reductions / increases

The total Group operational emissions in the base year were 36,270 tCO<sub>2</sub>e (using market-based emissions for electricity consumed in our Australian operations). This figure was restated due to a material inclusion in Scope 3 for transmission operational emissions.

The restated total Group operational emissions in the base year were 47,279 tCO<sub>2</sub>e.

This year total Group operating emissions are 44,359 tCO<sub>2</sub>e, a 6.2% decrease on the restated base year FY19 and a reduction of 2,920 tCO<sub>2</sub>e.

**Table 5: Emissions data for all years between base year and FY20**

Total operational emissions by facility	2018/19 tCO <sub>2</sub> e (as reported FY19)	Base Year 2018/19 tCO <sub>2</sub> e (restated FY20)	2019/20 tCO <sub>2</sub> e	% change as reported	% change restated base year	tCO <sub>2</sub> e change restated base year
Meridian NZ (inc Powershop NZ)	31,312	42,321	40,974	30.9%	-3.2%	-1,347
Meridian Australia	4,200	4,200	2,844	-32.3%	-32.3%	-1,356
Flux	758	758	541	-28.6%	-28.6%	-217
<b>Group</b>	<b>36,270</b>	<b>47,279</b>	<b>44,359</b>	<b>22.3%</b>	<b>-6.2%</b>	<b>-2,920</b>

**17 Assessment of performance against relevant benchmarks**

**ISO 14064-1, 9.3.2 (h)**

We have investigated the application of Science Based Targets, however, as a 100% renewable energy generator with no direct emissions from generating electricity, this methodology was not relevant to our operations.

We have instead chosen to take a bold approach to carbon reduction and have set an absolute target across the group of halving our operational greenhouse gas emissions by 2030 against our FY19 baseline.

Total Group operational emissions in FY20 are 771 tCO<sub>2</sub>e or 2% lower than the straight-line reduction target.

**Figure 5: Total Group operational greenhouse gas emissions (tCO<sub>2</sub>e)**



## ISO 14064-1, 9.3.3

There have been, or will be, offsets applied to this inventory. The types of offsets applied are outlined below.

The Meridian Group has a policy to offset Group operational emissions. These include all Scope 1, Scope 2 (market based) and Scope 3 operational emissions where they are not offset by vendors or as part of another programme. The Meridian Group does not offset emissions from one-time construction activities.

**Table 6: Offsets applied to this inventory**

Total offsets by facility (tCO <sub>2</sub> e)	Vendor cancelled	Calendar year offsets	Gold Standard VERs	Total offsets	Not offset
Meridian NZ	11	0	40,963	40,974	32
Meridian Australia	67	813,663	2,168	815,899	0
Flux	0	0	541	541	0
<b>Group</b>	<b>78</b>	<b>813,663</b>	<b>43,672</b>	<b>857,413</b>	<b>32</b>

### 18.1 Vendor cancelled

#### 18.1.1 EKOS approved credits

4.42 tCO<sub>2</sub>e was offset by Mevo on behalf of Meridian NZ for all travel using Mevo vehicles in FY20. Mevo sources its offsets through Ekos. All Ekos carbon credits are sourced from their own indigenous forest carbon and conservation projects. These offsets are certified to international carbon standards. All credits sold by Ekos are cancelled on the New Zealand Emissions Trading Register (NZ) or Markit Environmental Registry (NY/London).

#### 18.1.2 NCOS approved credits

Services provided by PwC Australia are recorded in our inventory at 26.83 tCO<sub>2</sub>e. PwC is certified carbon neutral under the National Carbon Offset Standard. Eligible Verified Emission Reduction and Emission Reduction Fund carbon offsets were purchased and cancelled by PwC.

Services provided by Gilbert + Tobin Australia are recorded in our inventory at 42.56 tCO<sub>2</sub>e. Gilbert + Tobin is certified as carbon neutral organisation & service under the Climate Active Carbon Neutral Standard. Eligible offsets were purchased and cancelled by Gilbert + Tobin.

#### 18.1.3 ClimateCare offsets

5.57 tCO<sub>2</sub>e was offset by Deloitte NZ on behalf of Meridian NZ for services provided to Meridian NZ in FY20. These credits were sourced through the FlyNeutral programme run by ClimateCare. The programme states that credits are cancelled on the appropriate registry.

### 18.2 Calendar year (NCOS approved credits)

Meridian Australia is certified carbon neutral against the National Carbon Offset Standard for the emissions associated with the running of its corporate business, servicing of its windfarms, Powershop's retail electricity Australia-wide, and its Victorian retail gas supply.

The CERs that are purchased are accredited under the UNFCCC Clean Development Mechanism. CERs can be from projects such as energy efficiency projects, those that involve the destruction of industrial pollutants or agricultural by-products and projects involving the destruction of landfill methane. In addition to purchasing these CERs, voluntary credits from Australian carbon offsetting projects are also purchased. No credits that are associated with palm oil production are purchased.

Reporting and surrender of credits for NCOS is by calendar year, therefore emissions reported in this inventory which occur in 2020 will be offset in the 2020 return. Those reported in this inventory which occurred in 2019 have been offset in the 2019 return. The total of these emissions as reported in this inventory is 888,005 tCO<sub>2</sub>e for FY20.

### 18.3 Gold Standard VERs

Meridian will surrender Gold Standard VERs for its group operational emissions for the FY20 year excluding any offsets which have been, or will be, surrendered as identified above. The 43,672 tCO<sub>2</sub>e remaining will be offset. These credits will be from a wind farm and a solar farm in India.

Meridian purchased and retired 36,080 tCO<sub>2</sub>e of credits to offset its FY19 inventory. With the restatement of the FY19 inventory the total required to be offset is now 47,153 tCO<sub>2</sub>e. Meridian will purchase and retire an additional 11,073 tCO<sub>2</sub>e of credits in FY20 to cover this.

## 18.4 NZ ETS

Meridian reports and surrenders credits for the New Zealand Emissions Trading Scheme (NZ ETS) for SF<sub>6</sub> emissions on a calendar year basis. These credits are not recorded as offsets in the calculation above as the

Government could choose to use these units to meet New Zealand's national emissions reduction target which would result in double counting.

## 19 Description of additional indicators

### ISO 14064-1, 9.3.2 (g)

There were no scope 1 emissions from the 14,865 GWh of electricity generated in the reporting period, as the fuel used to generate this electricity was water and wind.

Table 7: Emissions from electricity generation

Additional indicators	FY19	FY20
Electricity generation (GWh)	13,559	14,865
Emissions from electricity generation (tCO <sub>2</sub> e)	0	0

## 20 Liabilities – GHG stocks held

Table 8: Greenhouse gas holdings

GHG holdings	Meridian NZ	Meridian Australia	Flux NZ	2019/20kg	2019/20 tCO <sub>2</sub> e
HFC gas holdings [kg]	913	58	nm	971	2,028
SF <sub>6</sub> holdings [kg]	2,747	263	n/a	3,010	68,630

nm not measured  
n/a not applicable

The Meridian NZ facility has holdings 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>13</sup>. SF<sub>6</sub> is also present in switchgear in Meridian Australia.

For the Flux facility the liability from HFCs from refrigerators has been estimated to be well below the de minimis threshold of 1% and the liability is not reported here.

<sup>13</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

**21 Compliance with ISO 14064-1**

**ISO 14064-1, 9.3.1 (r)**

This GHG inventory report for the year ending 30 June 2020 has been prepared in accordance with ISO 14064-1. A reporting index is provided in Appendix Three.

**22 Audit of the GHG inventory**

**ISO 14064-1, 9.3.1 (s)**

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 also provides assurance of the Meridian Group Integrated Report against the GRI Standards, and is the financial auditor of Meridian Energy Limited on behalf of the Office of the Auditor General.



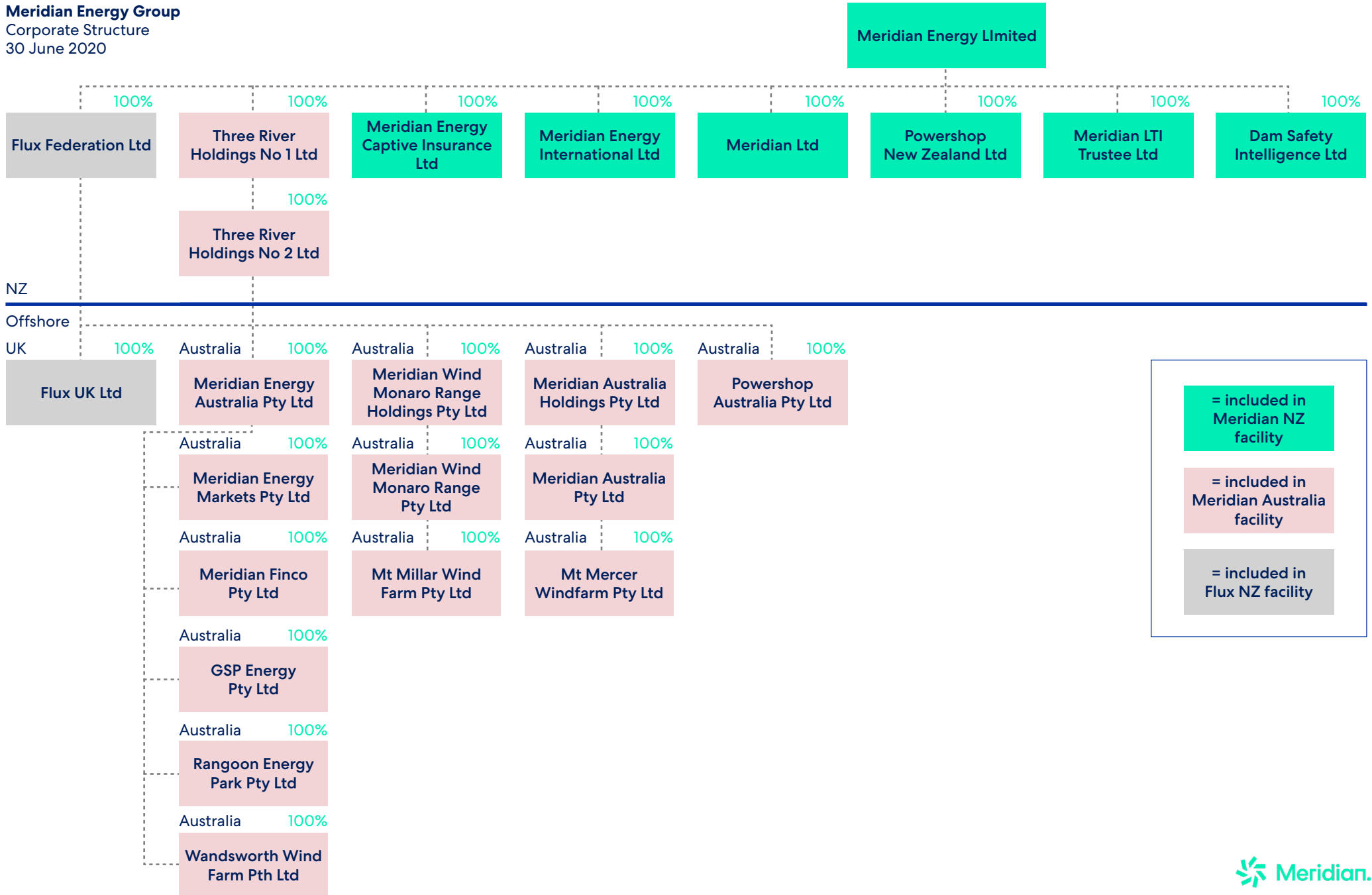
## Appendix 1 – Meridian Group treatment of emissions

Meridian Energy treatment of emissions from subsidiaries, associates, joint ventures and investments as at 30 June 2020.

Company name	Emissions source?	Legal structure & partners	Economic interest held by MEL		Country	Operational control	Comment
Meridian Energy Limited (MEL)	Yes	Parent company	100%		NZ	Yes	Included in Meridian NZ 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
Powershop New Zealand Limited	Yes	Group companies / subsidiaries	100%		NZ	Yes	Included in Meridian NZ facility
Meridian Limited	No (non-trading entity)	Group companies / subsidiaries	100%		NZ	No	No activity, therefore no emissions
Dam Safety Intelligence Limited	Yes	Group companies / subsidiaries	100%		NZ	Yes	Included in Meridian NZ facility
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 Energy Markets Pty Ltd	No (holding company)	Group companies / subsidiaries	100%	via Meridian Energy Australia Pty Ltd	AUS	Yes	No activity, therefore no emissions (holds our trading licences)
Meridian Finco Pty Ltd	No (non-trading entity)	Group companies / subsidiaries	100%	via Meridian Energy Australia Pty Ltd	AUS	Yes	No activity, therefore no emissions
GSP Energy Pty Ltd	Yes	Group companies / subsidiaries	100%	via Meridian Energy Australia Pty Ltd	AUS	Yes	Included in Meridian Australia facility
Rangoon Energy Park Pty Ltd	Yes	Group companies / subsidiaries	100%	via Meridian Energy Australia Pty Ltd	AUS	Yes	Included in Meridian Australia facility
Wandsworth Wind Farm Pty Ltd	Yes	Group companies / subsidiaries	100%	via Meridian Energy Australia Pty Ltd	AUS	Yes	Included in Meridian Australia facility
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
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
Mt Mercer Windfarm Pty Limited	Yes	Group companies / subsidiaries	100%	via Meridian Wind Australia Holdings Pty Ltd	AUS	Yes	Included in Meridian Australia facility (Mt Mercer wind farm)
Powershop Australia Pty Ltd	Yes	Group companies / subsidiaries	100%	via Three River Holdings (No 2) Ltd	AUS	Yes	Included in Meridian Australia facility
Flux Federation Limited	Yes	Group companies / subsidiaries	100%		NZ	Yes	Included in Flux NZ facility
Flux UK Limited	No	Group companies / subsidiaries	100%	via Flux Federation Ltd	UK	Yes	No activity, therefore no emissions

## Appendix 2 – Meridian Energy Group Structure

**Meridian Energy Group**  
Corporate Structure  
30 June 2020



## Appendix 3 ISO 14064-1 reporting index

ISO Reporting	Section in this report
9.3.1 (a)	<a href="#">Section 3</a>
9.3.1 (b)	<a href="#">Section 4</a>
9.3.1 (c)	<a href="#">Section 5</a>
9.3.1 (d)	<a href="#">Section 6</a>
9.3.1 (e)	<a href="#">Section 8</a>
9.3.1 (f)	<a href="#">Table 4</a>
9.3.1 (g)	<a href="#">Section 9</a>
9.3.1 (h)	<a href="#">Section 16</a>
9.3.1 (i)	<a href="#">Section 10</a>
9.3.1 (j)	<a href="#">Table 2</a>
9.3.1 (k)	<a href="#">Section 13</a>
9.3.1 (l)	<a href="#">Section 14</a>
9.3.1 (m)	<a href="#">Section 9</a> <a href="#">Section 11</a>
9.3.1 (n)	<a href="#">Section 11</a>
9.3.1 (o)	<a href="#">Section 11</a>
9.3.1 (p)	<a href="#">Section 12</a>
9.3.1 (q)	<a href="#">Section 12</a>
9.3.1 (r)	<a href="#">Section 21</a>
9.3.1 (s)	<a href="#">Section 22</a>
9.3.1 (t)	<a href="#">Section 11</a>
9.3.2 (a)	<a href="#">Section 3</a>
9.3.2 (b)	<a href="#">Section 16</a>
9.3.2 (c)	<a href="#">Section 16</a>
9.3.2 (d)	not applicable
9.3.2 (e)	<a href="#">Table 2</a>
9.3.2 (f)	<a href="#">Table 1</a> <a href="#">Table 2</a>
9.3.2 (g)	<a href="#">Section 19</a>
9.3.2 (h)	<a href="#">Section 17</a>
9.3.2 (i)	<a href="#">Section 7</a>
9.3.2 (j)	<a href="#">Section 16</a>
9.3.2 (k)	<a href="#">Section 16</a>
9.3.3	<a href="#">Section 18</a>

## **Report on Greenhouse Gas Emissions Inventory Report**

We have undertaken a reasonable assurance engagement relating to the Greenhouse Gas Emissions Inventory Report (the 'Inventory Report') of Meridian Energy Limited and its subsidiaries (the 'Meridian Energy Group') for the year ended 30 June 2020, comprising the Emissions Inventory and the explanatory notes set out on pages 1 to 35.

The Inventory Report provides information about the greenhouse gas emissions of the Meridian Energy Group for the year ended 30 June 2020 and is based on historical information. This information is stated in accordance with the requirements of International Standard ISO 14064-1 Greenhouse gases – Part 1: **Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals** ('ISO 14064-1:2018'), the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) ('the GHG Protocol') and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011) ('the Corporate Value Chain Standard').

### **Board of Directors' Responsibility**

The Board of Directors are responsible for the preparation of the Inventory Report, in accordance with ISO 14064-1:2018, the GHG Protocol and the Corporate Value Chain Standard. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation of an Inventory Report that is free from material misstatement, whether due to fraud or error.

### **Our Responsibility**

Our responsibility is to express an opinion on the Inventory Report based on the evidence we have obtained. We conducted our reasonable assurance engagement in accordance with International Standard on Assurance Engagements (New Zealand) 3410: **Assurance Engagements on Greenhouse Gas Statements** ('ISAE (NZ) 3410'), issued by the New Zealand Auditing and Assurance Standards

Board. That standard requires that we plan and perform this engagement to obtain reasonable assurance about whether the Inventory Report is free from material misstatement.

We did not evaluate the security and controls over the electronic publication of the Inventory Report.

A reasonable assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves performing procedures to obtain evidence about the quantification of emissions and related information in the Inventory Report. The nature, timing and extent of procedures selected depend on the assurance practitioner's judgement, including the assessment of the risks of material misstatement, whether due to fraud or error, in the Inventory Report. In making those risk assessments, we considered internal control relevant to the Company's preparation of the Inventory Report. A reasonable assurance engagement also includes:

- Assessing the suitability in the circumstances of the Meridian Energy Group's use of ISO 14064-1:2018, GHG Protocol and the Corporate Value Chain Standard as the basis for preparing the Inventory Report;
- Evaluating the appropriateness of quantification methods and reporting policies used, and the reasonableness of estimates made by the Meridian Energy Group; and
- Evaluating the overall presentation of the Inventory Report.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

## Inherent Limitations

Non-financial information, such as that included in Meridian Energy Group's Inventory Report, is subject to more inherent limitations than financial information, given both its nature and the methods used and assumptions applied in determining, calculating and sampling or estimating such information. Specifically, GHG quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

## Our Independence and Quality Control

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 International Code of Ethics for Assurance Practitioners (including International Independence Standards) (New Zealand) issued by the New Zealand Auditing and Assurance Standards Board, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

Other than this engagement and our role as auditor of the statutory financial statements on behalf of the Auditor-General, our firm carries out other assignments for the Meridian Energy Group in the areas of limited assurance of the sustainability content in the integrated report, review of the interim financial statements, audit of the securities registers, vesting of the executive long-term incentive plan, the solvency return of Meridian Captive Insurance Limited and supervisory reporting, which are compatible with those independence requirements.

In addition, principals and employees of our firm deal with the Meridian Energy Group on arm's length terms within the ordinary course of trading activities of the Meridian Energy Group. These services have not impaired our independence for the purposes of this engagement. Other than these engagements and arm's length transactions, we have no relationship with, or interests in, the Meridian Energy Group.

The firm applies Professional and Ethical Standard 3 (Amended): **Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements** issued by the New Zealand Auditing and Assurance Standards Board, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

## Use of Report

Our assurance report is made solely to the directors of Meridian Energy Limited in accordance with the terms of our engagement. Our work has been undertaken so that we might state to the directors those matters we have been engaged to state in this assurance report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the directors of Meridian Energy Limited for our work, for this assurance report, or for the conclusions we have reached.

## Opinion

In our opinion, the Inventory Report of the Meridian Energy Group for the year ended 30 June 2020 has been prepared, in all material respects, in accordance with the requirements of ISO 14064-1:2018, the GHG Protocol and the Corporate Value Chain Standard.

*Deloitte Limited*

**Auckland, New Zealand  
25 August 2020**

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Christchurch Central,  
Christchurch 8013

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**Meridian.**

The Power to  
Make a Difference.