

Greenhouse Gas Emissions Inventory Report

INVENTORY SCOPE: MERIDIAN GROUP (ALL FACILITIES)
INVENTORY PERIOD: FOR THE PERIOD 1 JULY 2022 TO 30 JUNE 2023
VERSION: FINAL
AUDIT STATUS: ASSURED



Meridian.

The Power to
Make a Difference.

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Chief Financial Officer

This Greenhouse Gas Emissions Inventory Report is dated 28 August 2023 and is signed on behalf of the Board by:



Mark Verbiest
Director

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 ₂ e | Offsets** | Remaining tCO ₂ e |
|---|-------------------------------|------------------------------|---------------|------------------------------|
| Operational | | | | |
| | Scope 1 | 1,191 | 1,191 | 0 |
| | Scope 2 (market based) | 2 | 2 | 0 |
| | Scope 3 operational | 32,270 | 32,270 | 0 |
| | Subtotal | 33,463 | 33,463 | 0 |
| Energy purchased & on-sold* | | | | |
| | New Zealand electricity | 0 | 0 | 0 |
| | | 0 | 0 | 0 |
| One-time construction | | | | |
| | Scope 3 one-time construction | 14,295 | 14,295 | 0 |
| | | 14,295 | 14,295 | 0 |
| Total Group value chain emissions (S1, 2 & 3)*** | | 47,758 | 47,758 | 0 |

*Emissions of our retailed electricity using the market-based methodology. In New Zealand we use the annual netting off methodology (see [Section 11](#)).

**Offsets include credits cancelled by suppliers against their own emissions, 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. [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 ISO category and facility

| ISO category | Sub category | Meridian NZ | Flux NZ | 2022/23 tCO ₂ e |
|---|---|---------------|--------------|----------------------------|
| Direct emissions | | | | |
| | Stationary combustion | 45 | nm | 45 |
| | Mobile combustion | 661 | 0 | 661 |
| | Fugitive emissions | 485 | nm | 485 |
| Total direct emissions | | 1,191 | 0 | 1,191 |
| Indirect emissions from imported energy | | | | |
| | Electricity consumption (location based)* | 1,208 | 0 | 1,208 |
| | Electricity consumption (market based)** | 1 | 1 | 2 |
| Subtotal (market based)*** | | 1 | 1 | 2 |
| Indirect emissions from transportation | | | | |
| | Production and distribution of fuel | 160 | 0 | 160 |
| | Contractor fuel | 5,935 | n/a | 5,935 |
| | Freight | 272 | 0 | 272 |
| | Business travel inc contractors | 956 | 181 | 1,137 |
| | Employee commuting | 485 | 1 | 486 |
| Subtotal | | 7,808 | 182 | 7,990 |
| Indirect emissions from use of products and services purchased | | | | |
| | Purchased goods and services | 10,519 | 870 | 11,389 |
| | Capital goods | 8,463 | n/a | 8,463 |
| | Third party electricity & T&D losses | 20 | 0 | 20 |
| | Transmission and lines services | 15,588 | nm | 15,588 |
| | Waste | 128 | 0 | 128 |
| | Working from home | 24 | 1 | 25 |
| Subtotal | | 34,742 | 871 | 35,613 |
| Indirect emissions from use of products and services sold | | | | |
| | Electricity purchased and onsold | 0 | n/a | 0 |
| Subtotal | | 0 | 0 | 0 |
| Indirect emissions from other sources | | | | |
| | Downstream leased assets (farms) | 2,962 | n/a | 2,962 |
| Subtotal | | 2,962 | 0 | 2,962 |
| Total indirect emissions*** | | 45,513 | 1,054 | 46,567 |

*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 NZ uses its own 100% certified renewable energy.

***Total indirect emissions are calculated using the market-based methodology for Scope 2 emissions. [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 | Flux NZ | 2022/23 tCO ₂ e |
|---|---|---|--------------|----------------------------|
| Operational emissions direct emissions (Scope 1) | Stationary combustion | 45 | nm | 45 |
| | Fuel used in electricity generation | 0 | n/a | 0 |
| | Backup generators | 45 | nm | 45 |
| | Mobile combustion | 661 | 0 | 661 |
| | Boat travel | 217 | n/a | 217 |
| | Car travel | 444 | 0 | 444 |
| | Fugitive emissions | 485 | nm | 485 |
| | HFCs | 228 | nm | 228 |
| | SF ₆ | 257 | n/a | 257 |
| | | Subtotal Scope 1 | 1,191 | 0 |
| Operational emissions indirect emissions (Scope 2) | <i>Electricity consumption (location based)</i> | 1,208 | 0 | 1,208 |
| | <i>Facilities (location based)</i> | 1,111 | n/a | 1,111 |
| | <i>Offices (location based)</i> | 96 | 0 | 96 |
| | <i>Vehicles (location based)</i> | 1 | 0 | 1 |
| | Electricity consumption (market based) | 1 | 1 | 2 |
| | | Subtotal Scope 2 (market based)* | 1 | 1 |

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

| Business activity | Category | Meridian NZ | Flux NZ | 2022/23 tCO ₂ e |
|--|--|----------------|--------------|-------------------------------|
| Operational indirect emissions (Scope 3) | Purchased goods and services | 10,519 | 870 | 11,389 |
| | IT Services | 488 | 162 | 650 |
| | Maintenance Services | 5,703 | 26 | 5,729 |
| | Office Services | 1,533 | 130 | 1,663 |
| | Professional Services | 2,795 | 552 | 3,347 |
| | Fuel- and energy-related activities | 658 | 0 | 658 |
| | Production and distribution of fuel | 160 | 0 | 160 |
| | T&D losses from office electricity | 14 | 0 | 14 |
| | Contractor fuel (meter reading) | 185 | n/a | 185 |
| | Contractor fuel (maintenance) | 299 | n/a | 299 |
| | Upstream transportation and distribution | 15,620 | 0 | 15,620 |
| | Couriers and postage | 32 | 0 | 32 |
| | Lines operational | 11,878 | n/a | 11,878 |
| | Transmission operational | 3,710 | n/a | 3,710 |
| | Waste generated in operations | 35 | 0 | 35 |
| | Waste to landfill | 33 | 0 | 33 |
| | Waste sent to recycling | 2 | 0 | 2 |
| | Business travel | 914 | 181 | 1,095 |
| | Air travel | 839 | 176 | 1,015 |
| | Taxis and rideshare | 8 | 0 | 8 |
| | Hotel accommodation | 67 | 5 | 72 |
| | Employee commuting | 509 | 2 | 511 |
| | Employee commuting | 485 | 1 | 486 |
| Working from home | 24 | 1 | 25 | |
| Downstream leased assets (farms) | 2,962 | n/a | 2,962 | |
| Subtotal Scope 3 operational | | 31,217 | 1,053 | 32,270 |
| Total operational emissions (S1, 2 & 3) (market based) | | 32,409 | 1,054 | 33,463 |
| Energy purchased and on-sold** indirect emissions (Scope 3) | Fuel- and energy-related activities | 0 | n/a | 0 |
| | Electricity purchased and on-sold | 0 | n/a | 0 |
| | Subtotal Scope 3 energy on-sold | | 0 | n/a |
| One-time construction indirect emissions (Scope 3) | Capital goods | 8,463 | n/a | 8,463 |
| | Construction services | 5,832 | n/a | 5,832 |
| | Contractor fuel | 5,450 | n/a | 5,450 |
| | Contractor electricity use | 6 | n/a | 6 |
| | Contractor air travel | 42 | n/a | 42 |
| | Freight of major materials | 240 | n/a | 240 |
| | Waste to landfill | 91 | n/a | 91 |
| | Waste sent to recycling | 3 | n/a | 3 |
| Subtotal Scope 3 one-time construction | | 14,295 | n/a | 14,295 |
| Total emissions (S1, 2 & 3) (market based) | | 46,704 | 1,054 | 47,758 |
| <i>Total emissions (S1, 2 & 3) (location based)</i> | | <i>47,911</i> | <i>1,053</i> | <i>48,964</i> |

**Emissions of our retailed electricity using the market-based methodology. In New Zealand we use the annual netting off methodology (see Section 11).

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 | GHG emissions in tonnes | | GHG emissions in tCO ₂ e | | |
|---------------------------------|-------------------------|---------|-------------------------------------|--------------|----------------------------|
| | Meridian NZ | Flux NZ | Meridian NZ | Flux NZ | 2022/23 tCO ₂ e |
| Scope 1 | | | | | |
| CO ₂ | 695 | 0 | 695 | 0 | 695 |
| CH ₄ | 0.06 | 0 | 2 | 0 | 2 |
| N ₂ O | 0.04 | 0 | 9 | 0 | 9 |
| HFCs | 0.12 | nm | 228 | nm | 228 |
| SF ₆ | 0.01 | n/a | 257 | n/a | 257 |
| Subtotal | | | 1,191 | - | 1,191 |
| Scope 2 (location based) | | | | | |
| CO ₂ | 1,173 | 0 | 1,173 | 0 | 1,173 |
| CH ₄ | 1.13 | 0 | 32 | 0 | 32 |
| N ₂ O | 0.01 | 0 | 3 | 0 | 3 |
| Subtotal | | | 1,208 | 0 | 1,208 |
| Scope 3 | | | | | |
| CO ₂ | 6,256 | 2 | 6,256 | 2 | 6,258 |
| CH ₄ | 0.79 | 0 | 22 | 0 | 22 |
| N ₂ O | 0.33 | 0 | 89 | 0 | 89 |
| tCO ₂ e* | 38,106 | 1,051 | 39,145 | 1,051 | 40,196 |
| Subtotal | | | 45,512 | 1,053 | 46,565 |
| Total (location based) | | | 47,911 | 1,053 | 48,964 |

*gas is reported as tCO₂e where no breakdown of the emission factor by gas is available

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) emissions¹ 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 14064-1². 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 “GHG emissions 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 two 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.

¹ Throughout this document “emissions” means “GHG emissions”.

² 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. Meridian sells electricity to our customers through two brands in New Zealand - Meridian and Powershop.

The Meridian Energy Group of companies is made up of:

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

The Meridian Group 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 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 2023 which is available at 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 **Clean energy for a fairer and healthier world**. We have identified the United Nations Sustainable Development Goals (SDGs) most relevant to our business in recognition of our impacts and business context – you can learn more about this in our [Sustainability Policy](#). We apply the objectives of these Goals and align our efforts to the underlying targets where we believe we can make the biggest difference.

In support of these goals, we have Greenhouse Gas Emissions Measurement and Reduction Guidelines, first approved by Meridian's Executive Team in June 2009 – last revised and approved in June 2022. 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.

“Half by 30” is a target within our business to reduce gross operational emissions by half by FY30 from a FY21 baseline excluding one-off emissions from the major maintenance and construction of renewable energy generation assets. In FY22 we restated our baseline to FY21 (Meridian Australia emissions excluded), from FY19, to ensure the most recent GHG inventory was used in support of seeking verification that our target is science-aligned, as preferred by Science Based Target initiative (SBTi). The baseline year restatement did not decrease the emissions abatement effort required.

We have a Half by 30 roadmap comprised of six areas of focus, all three scopes of activity and three horizons with targets that together form our plan to deliver on our Half by 30 commitment.

We seek to minimise one-off construction emissions associated with renewable energy generation assets by project specific KPIs, including for suppliers. For example, the Harapaki wind farm and Ruakākā Energy Park, both under construction include a range of KPIs addressing emissions reporting, emission reduction initiatives, the adoption of continuous improvement initiatives etc. This year we introduced guidance for sustainable construction across our business to capture and build on the lessons from Harapaki so they can be applied to future projects.

Our [Climate Action Plan](#) outlines the actions we're taking now and in the future to help reduce emissions across our three priority areas – Renewable generation, Customer decarbonisation and Managing our emissions and ensuring resilience. It is refreshed each year.

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:

- Tina Frew, Head of Sustainability;
- Judy Ryan, Carbon Accountant;
- Rob Gillespie, Commercial Carbon Accountant;
- Phillip Green, Commercial Support Manager;
- Criggy Haas, Sustainability Lead
- Claire Keeling, Sustainability Lead
- Jamie Bishop, APX Travel Management (air and rental car travel data Meridian NZ);
- Andrea Savage, Custom Fleet (fleet vehicle travel and fuel data Meridian NZ);
- Murray Smith & Blair Falconer (Contractor kms at sites)
- Kevin Klein, Market Ops and Transformation Lead (office electricity consumption data Meridian NZ and Powershop);
- Phil Edmonds, Electrical Engineer (Meridian NZ SF₆);
- Rebekah Peni, Niche FM (office waste and air conditioning Meridian NZ);
- Rachel Lagan, Office Manager (Powershop);
- Ryan Black, Reconciliations and Settlement Manager (Brooklyn wind turbine generation and consumption, lines company load)
- Blair Falconer, Hydro Maintenance Manager (boat fuel consumption)
- Lloyd Clark, Environment and Sustainability Manager (Harapaki construction emissions)
- Anahita Djamali, Environmental and Sustainability Specialist (Ruakaka BESS construction emissions)
- Damien Rillstone, Team Manager - Tech Support, (Meter Reading & Field Services Data Meridian NZ).

5 Reporting period covered

ISO 14064-1, 9.3.1 (c)

This GHG inventory report covers the financial year 1 July 2022 to 30 June 2023.

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 2023.

For further information about the organisation please refer to the [Meridian Energy Limited FY23 Integrated Report](#) which is available on our website.

6.2 Defining Meridian “facilities”

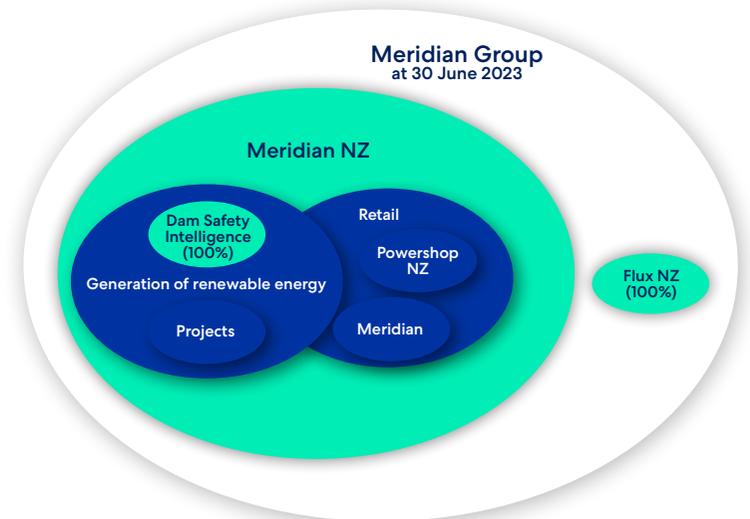
Meridian's diverse activities and resulting emissions are categorised into “facilities” in line with Annex A of ISO 14064-1 which requires that the data should be retained in its disaggregated form to aid transparency and to provide maximum flexibility in meeting a range of reporting requirements.

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”³

For the year ended 30 June 2023 these facilities are: Meridian NZ and Flux NZ, as illustrated in the following diagram.

Figure 1: Facilities comprising the Meridian Group



³ 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 |
|--------------------|---|
| Meridian NZ | <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 13,903 GWh of electricity, supplied around 246,280 customer connections at 30 June 2023. Powershop conducts energy retailing activities within Powershop New Zealand Limited under the Powershop brand and supplied around 117,000 customer connections at 30 June 2023. 921 people were employed by Meridian New Zealand at 30 June 2023.</p> <p>It includes the following legal entities:</p> <ul style="list-style-type: none">• Meridian Energy Limited• Dam Safety Intelligence Limited• Meridian Energy Captive Insurance Limited (non-trading)• Meridian Limited (non-trading)• Meridian Energy International Limited (non-trading)• Meridian LTI Trustee Limited (non-trading)• Powershop New Zealand Ltd (non-trading) <p>Further information about Meridian can be found at www.meridianenergy.co.nz and Powershop can be found at www.powershop.co.nz.</p> |
| Flux NZ | <p>Flux provides electricity retailing software to Meridian NZ, along with external customers. It licences the Powershop brand and operating model. Flux employed 126 people at 30 June 2023. It includes the following legal entities:</p> <ul style="list-style-type: none">• Flux Federation Ltd• Flux UK Ltd <p>Further information about Flux can be found at www.fluxfederation.com.</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 June 2022. This documents 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 ESP CSR software database and reviewed by the GHG accounting team;

- Emissions factors and conversion factors in ESP CSR are maintained by Meridian Energy and ESP CSR;
- The GHG inventory is compiled using activity data and emission factors;
- The report is independently audited by Deloitte Limited;
- The report is internally reviewed to identify opportunities to reduce emissions and improve the information management process; and
- Senior management are informed of emissions reduction progress.

8 Operational boundaries

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 Corporate and Scope 3 Standards and, ISO 14064-1, and classified into categories.

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 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)), and construction services (this includes contractor fuel and electricity use (category 3), freight (category 4), waste (category 5) and travel (category 6))
- 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 3.

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 | Methodology, data quality, uncertainty (qualitative) |
|---------|--|--|---|--|---|
| Scope 1 | Stationary combustion | Fuel used for electricity generation | Meridian NZ | No fuel consumed | There were no emissions from the 13,903 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 | Fuel deliveries to sites from McKeown (Waitaki) and RD Petroleum | Assumed fuel deliveries are equivalent to consumption each year. |
| | Mobile combustion | Car travel (owned, leased, rented) | All facilities | GPS generated odometer readings, fuelcard purchase data, rental provider activity reports, and taxi expenditure data | Start/end odometer data (rental vehicles) for distance travelled x average fuel efficiency of vehicle fuel type. 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 | Accurate records of litres used from operator. |
| | | Fugitive emissions | Fugitive emissions from SF ₆ | Meridian NZ | Maintenance records |
| | Fugitive emissions from air-conditioning systems | | All facilities | Maintenance records | Records from service providers who maintain and top up units. |

| Scope | Category | GHG emissions source | Facilities included | Data source | Methodology, data quality, uncertainty (qualitative) |
|---------|-------------|------------------------------------|---------------------|---|---|
| Scope 2 | Electricity | Electricity consumed in offices | Meridian NZ | Records from billing system | Accurate records from the billing system. |
| | | | Flux NZ | Billing system & landlord invoices | Accurate records from the billing system. |
| | | Electricity consumed by vehicles | All facilities | GPS generated odometer readings | Vehicles are calculated from kWh of electricity purchased on fuelcards. |
| | | Electricity consumed in facilities | Meridian NZ | The electricity market reconciled consumption files | Accurate records of electricity consumed by Meridian NZ facilities. |

| Scope | Category | GHG emissions source | Facilities included | Data source | Data from supplier engagement | 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. | 47% | 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 and commercial office rental. Where no supplier information available, \$ spend by service type x emission factor sourced from Market Economics. |
| Scope 3 operational | Fuel related emissions (not Scope 1 or 2) (category 3) | Production & distribution of fuel | All facilities | Fuel invoices | 100% | Calculated from amount of fuel purchased (and consumed) using emission factors sourced from DESNZ. |
| | | | Meridian NZ | Records from billing system | 0% | Accurate records from the billing system. Start and end of year are partially estimated. |
| | | Flux NZ | | Billing system & landlord invoices | 0% | Accurate records from the billing system. Start and end of year are partially estimated. Calculated from the invoices. |
| | | | Contractor fuel (operational maintenance and construction) | All facilities with relevant activity in reporting period | Contractor records | 90% |
| Contractor fuel for retail meter reading and maintenance | Meridian NZ | Supplier estimates of distances Samples of jobs Samples of vehicle types used | 85% | 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 DESNZ. One contractor provides fuel used information. | | |

| Scope | Category | GHG emissions source | Facilities included | Data source | Data from supplier engagement | Methodology, data quality, uncertainty (qualitative) |
|---------------------|---|---|---------------------|---|-------------------------------|---|
| Scope 3 operational | Upstream transportation and distribution (category 4) | Lines company operational emissions | Meridian NZ | Emissions information provided by suppliers where available. | 64% | 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). Company reporting periods may not match Meridian's reporting period, no adjustments are made to account for this. Where no supplier information available, volume x emission factor used as proxy. |
| | | Transmission company operational emissions | Meridian NZ | Emissions information provided by supplier | 100% | 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). |
| | | Couriers and postage | All facilities | Emissions information provided by suppliers where available. Where not available \$ spend used. | 95% | Calculated by collating quantity of each service used then carbon emission value assigned for that service. Where no supplier information available, \$ spend x emission factor sourced from Market Economics. |
| Scope 3 operational | Waste (category 5) | Waste to landfill and recycling from offices and facilities | All facilities | Actual weight of waste bins. Supplier records | 100% | Waste bins weighed on a monthly basis from some site suppliers. If weight unavailable, full bins are assumed each time they are emptied. Estimation for Flux NZ and sites where Meridian does not control the waste disposal based on Meridian NZ data. |

| Scope | Category | GHG emissions source | Facilities included | Data source | Data from supplier engagement | 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% | 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. |
| | | Car travel (taxi and rideshare) | All facilities | Purchase records (supplier data, internal expense management system – Fraedom) | 30% | Records of expenditure for taxis and rideshare except Uber. For Uber rideshare this is estimated based on distance travelled x average fuel efficiency of vehicle class (assumed to be hybrid vehicle). Mevo emissions are quantified by multiplying spend by the appropriate emission factor. These emissions are offset 120% by Mevo. 100% are shown as offsets in this inventory. |
| | | Hotel accommodation | All facilities | Purchase records (supplier data, internal purchasing systems) | 55% | Hotel nights provided by travel provider, by NZ, Australia and rest of world. Data is extrapolated to find an average room night cost, and then multiplied against total hotel spend from PCard system to determine total room nights, for bookings made outside of travel provider. |
| Scope 3 operational | Employee commuting (category 7) | Travel to and from work (in private vehicles and public transport) | All facilities | Employee commuter survey | 100% | Staff for surveyed in Q4 of FY23. They recorded typical commuting journeys with vehicle type and distance. A third party calculated the annual emissions from this activity. |
| | | Working from home | All facilities | Employee commuter survey | 100% | Staff were surveyed in Q4 of FY23. This survey noted their typical work from home routine. |

| Scope | Category | GHG emissions source | Facilities included | Data source | Data from supplier engagement | Methodology, data quality, uncertainty (qualitative) |
|--------------------------------------|--|---|---|--|-------------------------------|---|
| Scope 3 operational | Downstream leased assets (category 13) | Farming activities | Meridian NZ | Leaseholder | 100% | 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 on energy use on site. |
| | 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% | Records of weights or volumes of major materials used in construction projects provided by project managers. |
| 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 | 100% | Estimates of the amount of fuel used provided by project managers. Some information is provided by suppliers. |
| | | Freight of major materials | All facilities with relevant activity in reporting period | Project records | 100% | Estimates of major materials used calculated from weight of materials x distance travelled provided by project managers. 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% | Emissions calculated using the annual netting off methodology (see Section 11). |

9.1 Other emissions - PFCs & NF₃

No operations within the Meridian Group use perfluorocarbons (PFCs) or Nitrogen Trifluoride (NF₃) therefore no holdings of PFCs are reported and no emissions from these sources are included in this inventory.

9.2 Other emissions - CO₂ 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 ₂ e | % of total Scope 1 & 2 FY23 inventory |
|--------------|--------------------|--|----------------|---|--|---------------------------------------|
| Scope 1 | 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. | 14 | 1.19% |
| Total | | | | | 14 | 1.19% |

| Scope | Category | GHG emissions source | Facilities | Reason for exclusion |
|---------|--|--|-------------|--|
| Scope 3 | Purchased goods and services | Contracts for Differences for electricity | Meridian NZ | Meridian enters into a large number of financial derivative products annually, primarily for the purposes of mitigating exposure to electricity spot pricing. These do not require the physical supply of energy and therefore have no associated emissions. |
| Scope 3 | Upstream transportation and distribution | Freight - courier packages and minor materials | Flux NZ | Difficult to obtain the data, estimated to be de minimis. |

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 methodologies used. Collection of information was centralised in the finance teams of each facility. Much of the information is sourced from the finance team, project teams, suppliers and relevant individuals throughout the business.

All emissions data was calculated using ESP CSR. 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)⁴ or Department for Energy Security and Net Zero (DESNZ, United Kingdom)⁵. All calculations in this report are expressed in tonnes of carbon dioxide equivalent.

- The emissions factors for purchased goods and services have been sourced from Market Economics⁶, these are adjusted for inflation since publication.
- Air travel emission factors include radiative forcing⁷.
- Where possible, construction emission factors are sourced from BRANZ CO₂NSTRCT⁸.
- 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 its 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 System⁹.

Quantities of each greenhouse gas are converted to tonnes CO₂e using the global warming potential from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report. The time horizon is 100 years.

11.1 Changes to approaches used previously

There have been no material changes to the approaches used in FY21.

⁴ Ministry for the Environment. 2023. Measuring emissions: A guide for organisations: 2023 summary of emission factors. Wellington: Ministry for the Environment. https://environment.govt.nz/assets/publications/Measuring-Emissions-Guidance_EmissionFactors_Summary_2023_ME1781.pdf

⁵ Department for Energy Security and Net Zero. Greenhouse gas reporting: conversion factors 2023 v1.1. <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023>

⁶ Market Economics Limited, 2023. Consumption Emissions Modelling, report prepared for Auckland Council. March 2023 <https://www.knowledgeauckland.org.nz/publications/consumption-emissions-modelling/>

⁷ Radiative forcing is associated with emissions at higher altitudes and results in a higher global warming potential. MfE apply a multiplier of 1.9%.

⁸ CO₂NSTRCT v3 (<https://www.branz.co.nz/environment-zero-carbon-research/framework/branz-co2nstruct/>)

⁹ <https://www.certifiedenergy.co.nz/residual-supply>

12 Impact of uncertainty

ISO 14064-1, 9.3.1 (p, q)

Uncertainties associated with GHG inventories can be broadly categorised into scientific uncertainty and estimation uncertainty. Scientific uncertainty arises when the science of the actual emission process is not sufficiently understood.

Estimation uncertainty arises any time GHG emissions are quantified. To minimise this uncertainty source data has been selected from a verifiable source and any further uncertainty is detailed under [Sections 9](#) and [11](#).

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

A quantitative analysis for the top 20 sources of GHG emissions using the GHG protocol tool indicates that the aggregated uncertainty ranking is good and the cumulated uncertainty is +/- 6%. These sources account for around 99% of Meridian's emissions.

13 Base year selected

ISO 14064-1, 9.3.1 (k)

The base year is 1 July 2020 to 30 June 2021. 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 restated Group operational emissions in the base year were 30,591 tCO₂e.

Base year emissions were recalculated this year as a new source of spend-based emission factors for purchased goods and services and couriers was applied. This resulted in an increase to the base year inventory of 1,084 tCO₂e.

These same emission factors were applied to the FY22 inventory, increasing operational emissions by 1,927 tCO₂e

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.

The base year was updated from FY19 to FY21 in FY22 to account for the sale of the Australian business and to ensure that the most recent inventory was used in the commitment to set near and long term emission reduction targets. All historic figures in this report exclude emissions from the Australian business.

15 GHG emissions calculations and results

15.1 Total operational emissions by scope

Total operational GHG emissions for Meridian Group in FY23 were 33,463 tCO₂e shown by scope in the following graph.

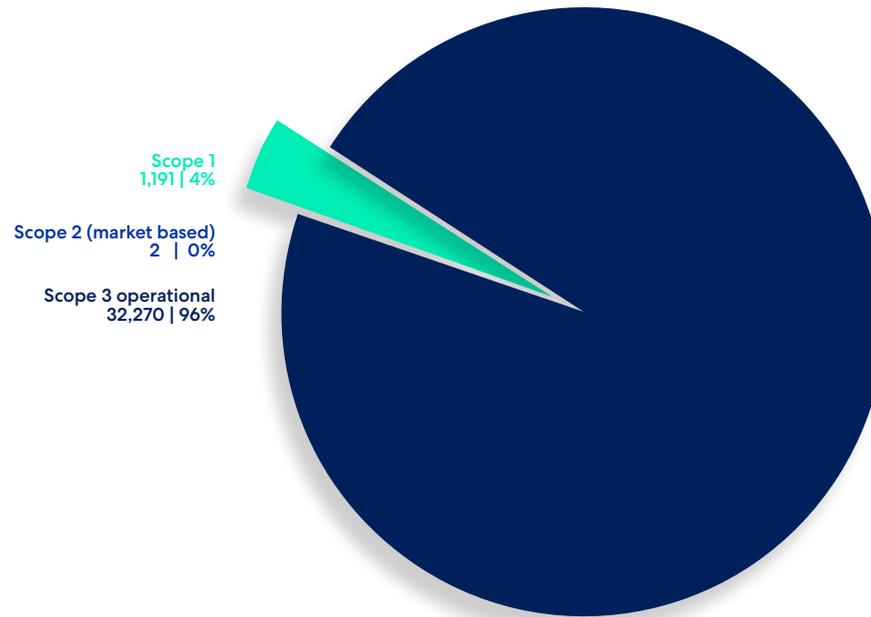


Figure 2: Total operational greenhouse gas emissions by scope (tCO₂e)

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 makes up 48% of Scope 3 operational emissions. The next highest category is purchased goods and services (35%) followed by downstream leased assets (9%).

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

15.2 Total emissions by scope over time Meridian NZ and Flux

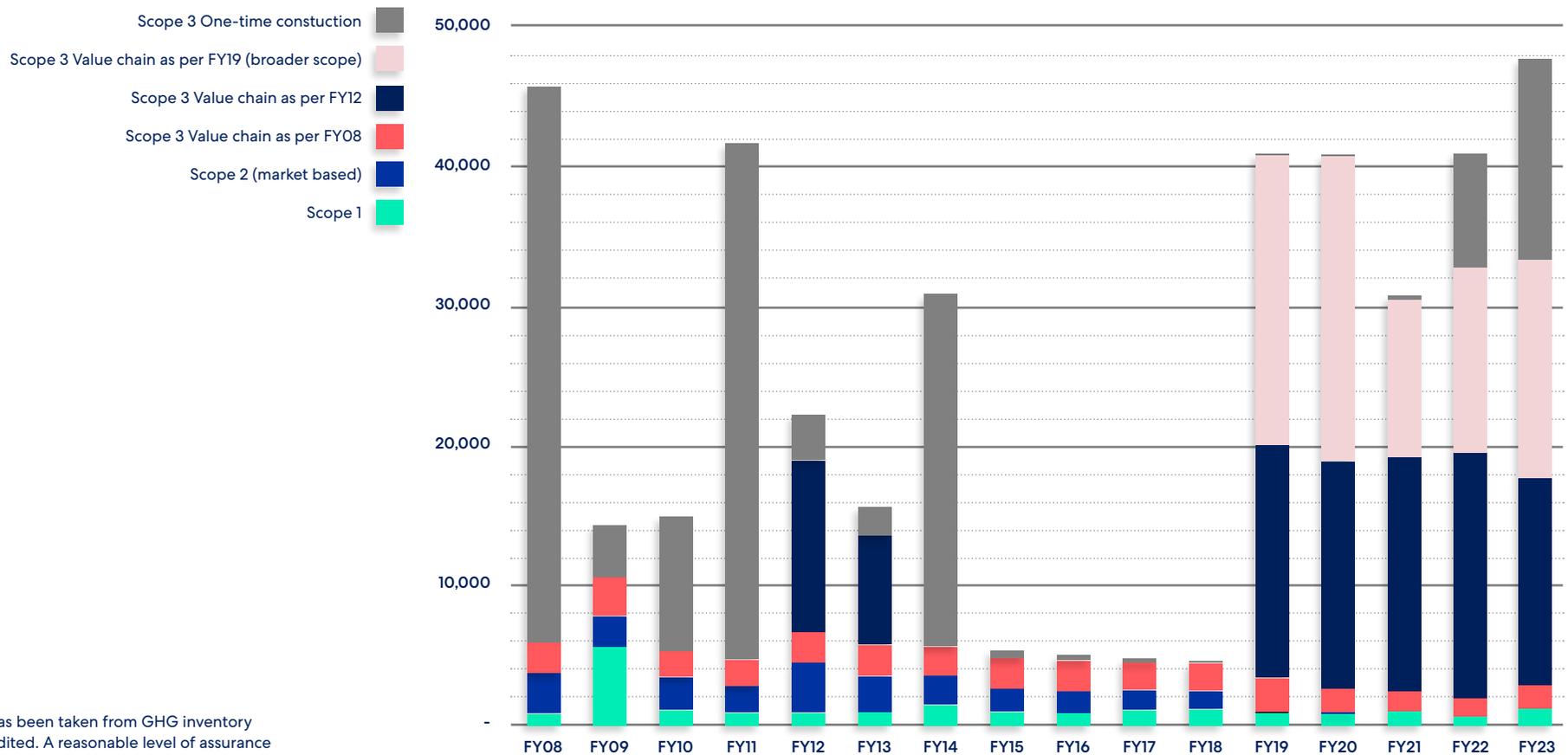
This graph shows the total emissions for Meridian NZ and Flux over time. It is broken into the following categories: Scope 1; Scope 2; Scope 3 Operational Core (as defined in FY08); Scope 3 value chain as defined in FY12; Scope 3 value chain as defined in FY19 and One-time construction. It illustrates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

Overall operational core emissions (Scopes 1, 2 and 3 Value chain as per FY08) are 51% lower in FY23 than they were in FY08.

One-time construction emissions in FY23 relate primarily to the construction of the Harapaki wind farm.

FY21 and FY22 scope 3 value chain emissions were restated in FY23. The results are reflected in this graph. The restatement is described in [section 13](#).

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



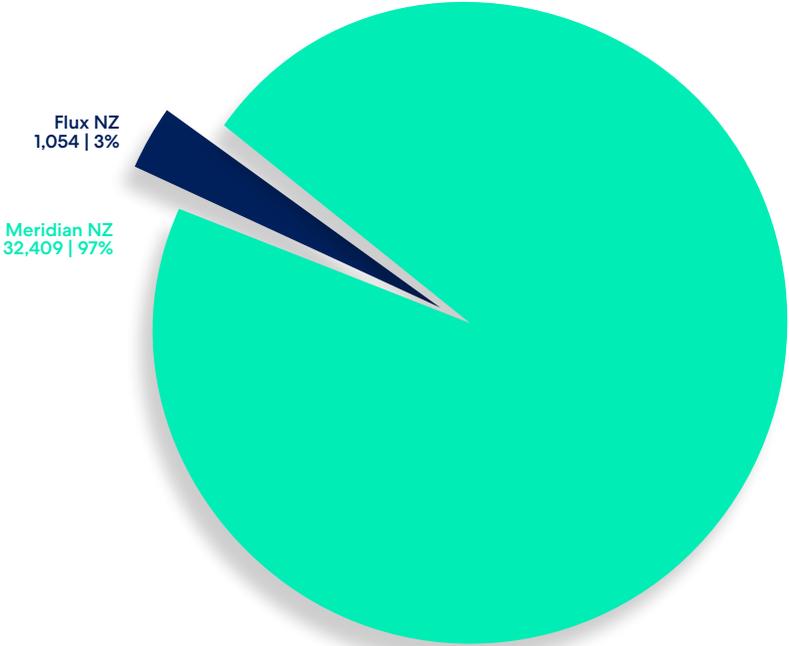
All data in this graph has been taken from GHG inventory reports which were audited. A reasonable level of assurance was given over the assertions and quantifications given in each of those reports.

15.3 Total operational emissions by facility

The following graph shows the total operational GHG emissions (tCO₂e) by facility in the reporting period for the Meridian Group.

The majority of operational emissions are from the Meridian NZ facility and are emissions from upstream transportation and distribution and purchased goods and services. Scope 3 operational emissions from Meridian NZ are 93% of the total group operational emissions. Emissions from purchased goods and services in the Meridian NZ facility make up 31% of the total group operational emissions while emissions from upstream transportation and distribution in the Meridian NZ facility make up 47% of the total group operational emissions.

Figure 4: Total operational greenhouse gas emissions by facility (tCO₂e)



16.1 Removals

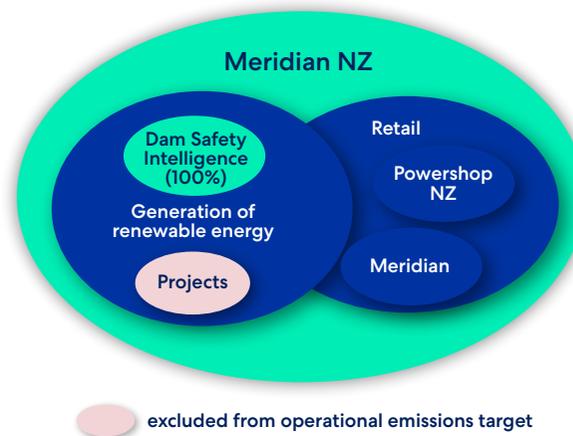
A greenhouse gas removal is defined by ISO 14064-1 as the “total mass of a greenhouse gas removed from the atmosphere over a specified period of time”. There are no removals quantified for this reporting period.

Meridian is progressing with its project to plant around 1,200 hectares of land in forest. We have secured 100% of the land we need for the programme across 14 projects, with 5 of these now registered in the ETS with MPI.

Trees will be a mix of natives and exotics. In a climate crisis, mixed planting is our chosen pathway because the exotics are a 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. Long-term forest-management plans ensure that the natives 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.

In FY23 we were proud to adopt an expanded commitment to offset 100% of our business emissions, now including one-off construction emissions from renewable energy generation projects. This includes also backdating the commitment to our first major development project, offsetting our one-off construction emissions from our FY22 Harapaki wind farm project.

Figure 5: Meridian's boundary for half by 30 target



16.2 Emission reduction initiatives

Half by 30 is Meridian's ambitious commitment to half our FY21 baseline emissions by FY30. Our operational emissions boundary (our Half by 30 boundary) excludes Meridian Australia (sold in January 2022) and all one-time construction emissions from major projects, including activities that are capitalised as part of renewable energy projects.

In FY22 Meridian Group reset its baseline to FY21 to account for the sale of the Australian business and to ensure that our most recent GHG inventory was used in our commitment to set near and long-term company-wide emission reductions in line with science-based net-zero with the Science Based Target initiative (SBTi). The reset of the baseline has not decreased the abatement effort required of Meridian.

We know we can achieve significant reductions through our construction activities, and how important it is to decouple the growth of our development pipeline with growth in associated emissions – both during construction as well as during the operational life of our assets. We embed emissions reductions KPIs and actions into our sustainability management plans for construction projects. This year we released a Sustainable Infrastructure Framework to capture and build on the lessons from Harapaki so they can be applied to future projects.

As part of Harapaki design and construction a number of initiatives have been implemented to reduce the overall emissions of the project. These include use of on-site concrete batching, on-site aggregates and water sourcing, lower intensity foundations and smarter on-site roading design to reduce earthworks. Through these initiatives we estimate we have reduced the overall emissions to date by between 15,000 and 20,000 tCO₂e.

| Initiative | Progress FY23 |
|---|---|
| Half by 2030 | |
| Refresh offer to help staff to reduce commuting emissions. | ✓ Commuting staff offer refresh approved by Meridian Executive. Offer will be implemented in FY24. |
| Electrify salmon farms in our canal away from diesel. | ✓ Supported two salmon farms to connect to electricity supply. We estimate abatement to be between 200 and 250 tCO ₂ e p.a |
| Air travel budget set | ✓ Air travel budget of 800t CO ₂ e p.a set. End of year air travel emissions 1,011tCO ₂ e. |
| Establish Half by 30 fund to support company decarbonisation efforts (internal decarbonation fund). | ✓ Inaugural funding round held. New electric mower purchased for our hydro assets. |
| Construction emissions | |
| Design and on-site emissions actions at Harapaki wind farm. | ✓ To date, overall emissions reductions estimated to be between 15,000 and 20,000 tCO ₂ e. |

Our [Climate Action Plan](#) outlines the actions we're taking now and in the future to help reduce emissions across our three priority areas – Renewable generation, Customer decarbonisation and our emissions and ensuring resilience. It is a living document and is refreshed each year – communicating new initiatives, milestones and progress against targets. The Plan includes:

- Our Half by 30 roadmap, comprised of six focus areas over three time horizons. The focus areas include land transport, farms, fugitive emissions, air travel, ferry & barge and waste. In FY23 our Half by 30 focus was on initiatives where we have the most influence and within our direct control – such as commuting emissions, electrification of salmon farms located in our canals away from diesel – and developing strategies for harder to abate scope 3 emissions sources.
- Actions to reduce our one-off construction emissions, including through project specific KPIs. For example, at Ruakākā Energy Park, our most recent construction project, we have set the following sustainability KPIs and meet quarterly to ensure continuous improvement:
 - Monthly and annual carbon impact reports;
 - Waste diversion target of >80% on site;
 - On-site carbon emissions target for plant and heavy machinery;
 - Contractor air travel budgets

Tackling the challenge of Half by 2030 will require deliberate effort across the Group and in particular includes a sharp focus on our supply chain, which is where over 95% of our operational emissions lie. Achieving this will see us engaging and collaborating with our suppliers and a Group commitment to the Half by 30 Climate Action Plan.

More detail on these and other initiatives can be found in our Climate Action Plan.

16.3 Emission reductions / increases for Meridian NZ and Flux

The operational emissions in the base year for Meridian NZ and Flux were 30,591 tCO₂e. These were restated in FY23. This is described in [section 13](#).

This year operational emissions for Meridian NZ and Flux are 33,463 tCO₂e, a 9% increase on the base year FY21 and an increase of 2,871 tCO₂e.

Table 5: Emission Reductions / Increases

| Business activity | Category | Base Year 2020/21 tCO ₂ e | 2021/22 tCO ₂ e | 2022/23 tCO ₂ e | % change from 2021/22 | tCO ₂ e change from 2021/22 | % change from 2020/21 base year | tCO ₂ e change from 2020/21 base year |
|---|--|--|-------------------------------|-------------------------------|-----------------------------|---|--|--|
| Operational emissions direct emissions (Scope 1) | Stationary combustion | 29 | 28 | 45 | 61% | 17 | 55% | 16 |
| | Mobile combustion | 704 | 613 | 661 | 8% | 48 | -6% | -43 |
| | Fugitive emissions | 287 | 2 | 485 | 23,846% | 483 | 69% | 198 |
| | Subtotal | 1,020 | 643 | 1,191 | 85% | 548 | 17% | 171 |
| Operational emissions indirect emissions (Scope 2) | Electricity consumption (market based) | 14 | 2 | 2 | 15% | 0 | -86% | -12 |
| | Subtotal (market based) | 14 | 2 | 2 | 0% | 0 | -86% | -12 |
| Operational emissions indirect emissions (Scope 3) | Purchased goods and services | 10,894 | 12,642 | 11,389 | -10% | -1,253 | 5% | 495 |
| | Fuel & energy related activities | 549 | 718 | 658 | -8% | -60 | 20% | 109 |
| | Upstream transportation & distribution | 11,209 | 13,223 | 15,620 | 18% | 2,397 | 39% | 4,411 |
| | Waste generated in operations | 225 | 103 | 35 | -66% | -68 | -84% | -190 |
| | Business travel | 704 | 565 | 1,095 | 94% | 530 | 56% | 391 |
| | Employee commuting | 538 | 235 | 511 | 118% | 277 | -5% | -27 |
| | Downstream leased assets | 5,438 | 4,740 | 2,962 | -38% | -1,778 | -46% | -2,476 |
| | Subtotal | 29,557 | 32,225 | 32,270 | 0% | 45 | 9% | 2,713 |
| Total Operational Emissions (S1, 2 & 3) | | 30,591 | 32,870 | 33,463 | 2% | 593 | 9% | 2,871 |

17 Assessment of performance against relevant benchmarks

ISO 14064-1, 9.3.2 (h)

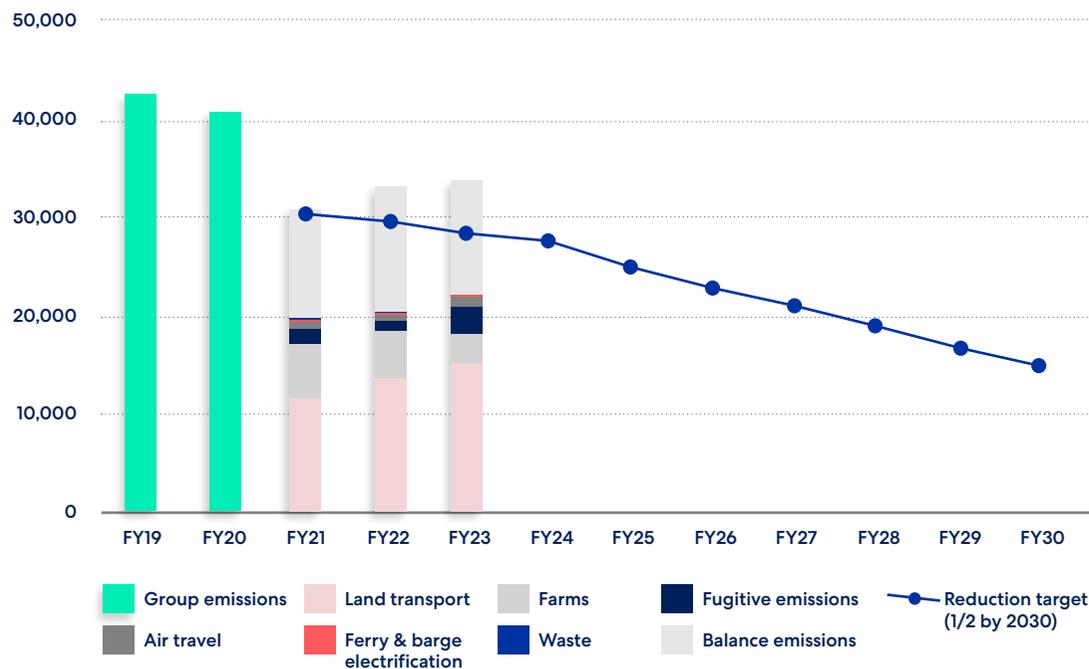
Half by 30 is Meridian's ambitious commitment to half our FY21 baseline emissions by FY30. In line with this commitment, the Science-Based Targets initiative (SBTi) has approved Meridian Energy's near-term science-based emissions reduction target to reduce absolute scope 1 and 2 GHG emissions 50% by FY30 from a FY21 base year and to reduce absolute scope 3 GHG emissions 50% within the same time frame (excluding all one-time construction emissions from major projects and all activities that are capitalised as part of renewable energy projects).

Our scope 1 and 2 target has been classified as 1.5 aligned by the SBTi** and we have committed to set long-term emissions reduction targets with the SBTi in line with reaching net-zero by 2050.

As a 100% renewable energy generator with no fossil fuel combustion for electricity generation, we recognise that our biggest impact will come from the continued investment in further renewable energy generation to enable further decarbonisation, and having an operational GHG target that is focused on our supply chain (scope 3).

Total Group operational emissions in FY23 are 5,332 or 19% higher than the target for FY23. The greatest absolute increase was in upstream transportation and distribution which increased by 2,397 tCO₂e or 18%. These emissions are recorded in land transport in the graph below. The greatest percentage increases were in fugitive emissions, employee commuting (which is in the balance emissions) and business travel.

Figure 5: Total Group operational greenhouse gas emissions (tCO₂e)



Note: This graph reflects the restated FY21 and FY22 emissions.

**A methodology to classify scope 3 targets is under development by the SBTi.

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 increased its offsetting commitment to cover total business emissions (beyond Group operational emissions). It now includes emissions from one-off construction activities for renewable energy generation assets. 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.

Table 6: Offsets applied to this inventory

| Total offsets by facility (tCO ₂ e) | Vendor cancelled | Gold Standard VERs | Total offsets | Not offset |
|--|------------------|--------------------|---------------|------------|
| Meridian NZ | 112 | 46,592 | 46,704 | 0 |
| Flux | 0 | 1,054 | 1,054 | 0 |
| Group | 112 | 47,646 | 47,758 | 0 |

18.1 Vendor cancelled

18.1.1 EKOS approved credits

Less than 1 tCO₂e was offset by Mevo on behalf of Meridian NZ for all travel using Mevo vehicles in FY23. 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 VERs

Russel McVeigh are carboNZero certified. They provided just over 4 tCO₂e of services in FY22. Russel McVeigh offsets meet the requirements of the carboNZero programme and were cancelled on the appropriate registries.

Anderson Lloyd are carboNZero certified. These were recorded in the inventory as 108 tCO₂e. Anderson Lloyd offsets meet the requirements of the carboNZero programme and were cancelled on the appropriate registries.

18.2 Gold Standard VERs

Meridian has retired Gold Standard VERs for its group emissions for the FY23 year excluding any offsets which have been, or will be, surrendered as identified above. The 47,646 tCO₂e remaining have been offset. These credits are from two wind farm projects in India. Details on the [Gold Standard Registry](#). Meridian retired 8,526 VERs for construction emissions reported in FY21 and FY22 (284 tCO₂e and 8,242 tCO₂e respectively) and 3,011 VERs to cover the increase in emissions due to restatements (FY21: 1,084 tCO₂e, FY22:1,927 tCO₂e).

18.3 NZ ETS

Meridian reports and surrenders credits for the New Zealand Emissions Trading Scheme (NZ ETS) for SF₆ emissions on a calendar year basis. Surrendering units as part of a legal requirement under the NZ ETS is not voluntary climate change mitigation.

19 Description of additional indicators

ISO 14064-1, 9.3.2 (g)

Table 7: Additional indicators

| Additional indicators | FY19 | FY20 | FY21 | FY22 | FY23 |
|---|--------|--------|--------|--------|--------|
| Electricity generation (GWh) Meridian NZ | 13,570 | 14,224 | 12,692 | 13,557 | 13,903 |
| Emissions from fuel used to generate electricity (tCO ₂ e) | 0 | 0 | 0 | 0 | 0 |
| Generation emissions intensity (tCO ₂ e/GWh of total generation) | 0 | 0 | 0 | 0 | 0 |

We have calculated our generation emissions intensity using an industry accepted metric. The GHG emissions included are those from fuel used in generation. As Meridian uses only renewable energy to generate electricity this is 0%.

20 Liabilities – GHG stocks held

Table 8: Greenhouse gas holdings at 30 June 2023

| GHG holdings | Meridian NZ | Flux NZ | 2022/23 kg | 2022/23 tCO ₂ e |
|-------------------------------|-------------|---------|------------|----------------------------|
| HFC gas holdings [kg] | 1,546 | n/a | 1,546 | 2,370 |
| SF ₆ holdings [kg] | 2,992 | n/a | 2,922 | 70,312 |

nm not measured
n/a not applicable

The Meridian NZ facility has holdings of sulphur hexafluoride (SF₆) gas. The bulk of the gas is held in 220kV circuit breakers and transformers with small amounts being held in 110kV, 33KV and 22kV switchgear. No SF₆ is known to be held in fire extinguishing systems.

Meridian's current management practices in relation to SF₆ are well aligned with best practice as defined by the Cigré and IEC publications¹⁰.

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.

¹⁰ SF6 Recycling Guide Re-Use of SF6 Gas in Electrical Power Equipment and Final Disposal' Cigré Task Force 23.10.01 G Mauthe et al, August 1997

IEC 622271-4:2013 High-voltage switchgear and controlgear - Part 4: Handling procedures for sulphur hexafluoride (SF6) and its mixtures, August 2013

IEC 60480:2019 Specifications for the re-use of sulphur hexafluoride (SF6) and its mixtures in electrical equipment, April 2019

nm : not measured
n/a : not applicable

21 Compliance with ISO 14064-1

ISO 14064-1, 9.3.1 (r)

This GHG inventory report for the year ending 30 June 2023 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 Limited, a third party independent assurance provider. A reasonable level of assurance has been given over the assertions and quantification included in this report. Deloitte Limited 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 3 ISO 14064-1 reporting index

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

INDEPENDENT ASSURANCE REPORT ON MERIDIAN ENERGY LIMITED'S GREENHOUSE GAS EMISSIONS INVENTORY REPORT

TO THE BOARD OF DIRECTORS OF MERIDIAN ENERGY LIMITED

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 Group') for the year ended 30 June 2023, comprising the Emissions Inventory and the explanatory notes set out on pages 3 to 35.

The inventory report provides information about the greenhouse gas emissions of the Group for the year ended 30 June 2023 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.

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 Group's preparation of the inventory report. A reasonable assurance engagement also includes:

- Assessing the suitability in the circumstances of the 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 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 the 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)* ('PES 1') 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.

We note that during the period our systems identified that a non-audit partner in the same office as the engagement partner inadvertently held an interest in the entity for part of the period, which was rectified prior to the issuance of this opinion. The matter does not have an impact on the GHG Inventory Report and has not compromised our objectivity as an assurance provider. 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 Group in the areas of limited assurance of the sustainability content in the integrated report prepared in accordance with the Global Reporting Initiative Sustainability Reporting Standards, review of the interim financial statements, audit of the securities registers, audit of the fixed rate bond registers reasonable assurance engagement for the vesting of the executive long-term incentive plan, reasonable assurance of the solvency return of Meridian Captive Insurance Limited, gap analysis in regards to climate related disclosures readiness programme, and limited assurance of climate related disclosures readiness programme, and limited assurance of supervisor reporting. We also carried out non-assurance assignments for the Group relating to the Corporate Taxpayers Group Programme, which are compatible with those independence requirements.

In addition, principals, and employees of our firm deal with the Group on arm's length terms within the ordinary course of trading activities of the 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 Group.

The firm applies Professional and Ethical Standard 3: *Quality Management for Firms that Perform Audits or Reviews of Financial Statements, or Other Assurance or Related Services Engagements*, which requires the firm to design, implement and operate a system of quality management including 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 the Group 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. We accept or assume no duty, responsibility or liability to any other party in connection with the report or this engagement, including without limitation, liability for negligence in relation to the opinion expressed in this report.

Opinion

In our opinion, the inventory report of Meridian Energy Limited for the year ended 30 June 2023 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

Chartered Accountants
28 August 2023
Auckland, New Zealand

This reasonable assurance report relates to the Greenhouse Gas Emissions Inventory Report of Meridian Energy Limited for the year ended 30 June 2023 included on Meridian Energy Limited's website. Meridian Energy Limited is responsible for the maintenance and integrity of the Meridian Energy Limited's website. We have not been engaged to report on the integrity of the Meridian Energy Limited's website. We accept no responsibility for any changes that may have occurred to the Greenhouse Gas Emissions Inventory Report since they were initially presented on the website. The reasonable assurance report refers only to the Greenhouse Gas Emissions Inventory Report named above. It does not provide an opinion on any other information which may have been hyperlinked to/from the Greenhouse Gas Emissions Inventory Report. If readers of this report are concerned with the inherent risks arising from electronic data communication they should refer to the published hard copy of the Greenhouse Gas Emissions Inventory Report and related reasonable assurance report to confirm the information included in the Greenhouse Gas Emissions Inventory Report presented on this website.

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Meridian.

The Power to
Make a Difference.