Climate-related Disclosure

Meridian Energy Limited FY23

Prepared in accordance with the recommendations of the Taskforce on Climate-related Financial Disclosures, and in substantial early voluntary alignment with the Aotearoa New Zealand Climate Standards.

Meridian.

AUGUST 2023

How to read this report

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- Performance against metrics and targets in place to manage climate-related risks and opportunities.

Disclaimer

Quantifications in this report on the financial impacts of climate change (both risks and opportunities) are estimates only and are not intended to constitute earnings guidance. No representation is made as to their accuracy, completeness or reliability. These risks and opportunities may not eventuate and if they do the actual impacts may differ materially from these estimates.

A message from the Chief Executive

I am proud to mark the fifth consecutive year Meridian Energy has released a Climate-related Disclosure report, leading Aotearoa's corporate sector to be open and transparent about climate-related risks and opportunities.

As the myriad of extreme weather events through 2022 and 2023 shows, climate action has never carried more urgency than it does today. Businesses have a significant responsibility to understand how the changing climate impacts their operations and to proactively communicate these impacts to investors, stakeholders and the wider community.

We continue to see climate-related risks and opportunities for Meridian driven by two factors: physical impacts such as storms and floods and more gradual climatic changes, and the transitional effects as the world moves towards a lower-carbon future. While risks remain firmly on our radar, we also see great potential in transition opportunities such as greater electrification of transport, process heat, and catalysing the hydrogen opportunity.

Our reporting journey over the past five years has strengthened trust with our investors and stakeholders, and we acknowledge the growing number of other New Zealand businesses who have joined us in reporting their own climate-related disclosures. The more of us that take on the responsibility of assessing and taking action on these risks and opportunities, the more informed our collective decision-making will be to help address the challenges of climate change.

– Neal Barclay, Chief Executive

"Climate-related disclosures are no longer just a corporate obligation. By being transparent about our climate risks and opportunities, we empower ourselves, our investors and stakeholders to make informed decisions. It speaks to our commitment to responsible stewardship of the environment and to the resilience of all the communities we serve in Aotearoa."

– Mark Verbiest, Chair

Governance

Board oversight of climate-related risks and opportunities

Meridian is on a journey to build maturity in the way climate change is incorporated into strategic and operational decision making. As we build in capability, this disclosure will evolve.

Meridian's Board of Directors is responsible for the management of risks and opportunities for the organisation, including those related to climate change. Two Board committees support the Board in this function for climate change:

1. The Audit and Risk Committee has oversight of climate related risks and opportunities. It assists the Board in fulfilling its responsibilities in all matters related to identifying, assessing, monitoring, and managing risk (including climate risk).
2. The Safety and Sustainability Committee exists to support the Board in all matters related to safety and sustainability, including performing reviews of Meridian's primary sustainability impacts and performance, its **Climate Action Plan**, and its Sustainability Policy.

Both committees meet on a quarterly basis, where they review progress against goals and targets for addressing climate-related issues. For example, a standing Safety and Sustainability Committee agenda item is the 'Sustainability update', which contains a summary of the Group sustainability initiatives including progress and outcomes per initiative for the quarter to date (tracking against targets where relevant), and plans for the quarter ahead. The Audit and Risk committee monitors progress made to embed climate-related risk into business practices, and reviews key climate-related risks annually, or when statuses change. Both Committee proceedings are reported back to the Board. Additional Committee and Board disclosures occur for specific issues as required – for example, as climate-related policy changes.

The Board sets objectives and targets for climate-related issues annually and holds Management accountable for implementing these via:

- Policies – including annual reviews of Meridian's Risk Management Policy, Remuneration Policy, and Sustainability Policy.
- Strategic objectives and performance incentives that are set in the Executive Scorecard each financial year – objectives are set for both short and long-term.
- Oversight of key risks.

Board Skills & Competence

The Board ensures appropriate skills and capability are available to provide oversight of climate-related risks and opportunities through the maintenance of a director skills matrix. Meridian's FY23 **Corporate Governance Statement** shows the Director skills matrix and attendance at various Committee meetings.

When there are significant changes to climate-related risks, relevant regulation, or Board membership, the Board may hold a session to upskill members on latest requirements, good practice, and the implications for Meridian. The most recent of these sessions was held in May 2023.

The Board accesses climate-related expertise from within Meridian, and from external specialists when required. For example, Meridian seeks independent external climate scientific advice for the purposes of informing short, medium and long-term assumptions about the physical impacts of climate change on its operations, such as hydro inflows. A number of Meridian Board members are also actively involved in Chapter Zero New Zealand (chapterzero.nz) a global network of board directors committed to taking action on climate change and hosted in Aotearoa by the Institute of Directors.

Monitoring Progress

The Executive Scorecard is the mechanism used to monitor performance of strategic objectives and embed performance against climate-related goals into the remuneration of the Executive Team. The scorecard is set against the key initiatives in Meridian's business plan and defines the criteria for adequate, good, and excellent performance on each. The Executive Scorecard is built by the Chief Financial Officer and the Chief People Officer and is agreed by the People, Remuneration and Culture Committee on behalf of the Board. The initiatives that make up the scorecard are the key initiatives in the Business Plan for the financial year. They are defined through the business planning process by considering strategic goals and risks – including climate-related elements. The People, Remuneration and Culture Committee reviews progress on behalf of the Board twice a year. Details of the elements that make up the Executive Scorecard are provided in the Metrics and Targets section.

Management's role in assessing and managing climate-related risks and opportunities

The Board assigns climate-related responsibilities to management using mechanisms such as policy and the Executive Scorecard. Management reports to the Board Committees on a quarterly basis.

As an example of how Management tables climate-related issues with the Board, during FY23, Management tabled papers with the Safety and Sustainability Committee – such as the electrification of Meridian's Manapōuri Power Station staff boat – the Mararoa (as a part of the Half by 30 emissions reduction programme).

Meridian Executive Team members are responsible for ensuring the business is identifying, assessing and monitoring climate-related risks and opportunities. Meridian's annual climate-related disclosure process is facilitated by the Sustainability and Risk functions with a primary governance pathway via the Audit and Risk Committee to the Board. Furthermore, during FY23 sustainability-related guidance was added to the Investment Committee initiative card template regarding a range of criteria, including climate risk. This template is the basis for all initiatives that go to Meridian Investment Committee.

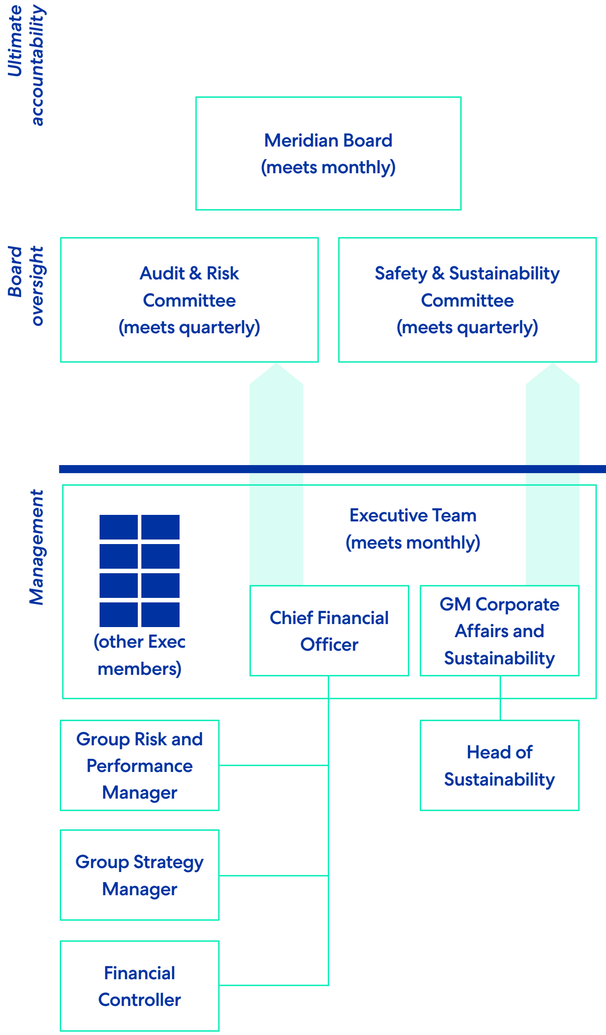
The Sustainability and Risk functions work with a cross-business management group to complete an annual update of climate-related risks and opportunities. This review considers significant context changes that could create new risks or opportunities, or change the materiality of existing ones.

Progress on management actions associated with climate-related risks and opportunities are reported to the Board, or one of the Committees, depending on the topic. For example, progress on the Renewable Development Pipeline is reported to the Board; action against the **Climate Action Plan** is reported to the Safety and Sustainability Committee and the Audit and Risk Committee receive updates on enterprise level risks and progress to embed climate risk and opportunity management into business processes.

An outline of key climate-related risk and opportunity responsibilities and processes at both Board and Management level is provided in Figure 1.

Governance continued

Figure 1. Governance and management of climate-related issues at Meridian Energy Limited.



Meridian Board

- Ensures Meridian has appropriate and effective risk and opportunity management practices in place, including for climate-related issues
- Ensures Board skills, size and composition are fit for purpose
- Assigns climate-related goals and targets to Management annually via the setting of an Executive Scorecard and agreed strategic objectives
- Approves the Executive Scorecard, Sustainability Policy, Risk Management Policy and the annual Greenhouse Gas Inventory

Audit & Risk Committee

- Ensures risks are managed in accordance with Meridian's Risk Management Policy. Reviews top risk reports twice a year, and new and escalating risk reports from Management quarterly, as well as the annual review of climate risks and opportunities
- Reviews and updates Meridian's Risk Management Policy (ISO 31000) annually

Safety & Sustainability Committee

- Ensures Meridian has an effective sustainability strategy and reporting and supporting processes, and monitors Management's execution of that strategy
- Reviews Meridian's annual Greenhouse Gas (GHG) Inventory, emissions reduction initiatives, and Meridian's **Climate Action Plan**
- Reviews Meridian's Sustainability Policy annually

Executive Team

- Responsible for ensuring Business Units are identifying, assessing and monitoring climate-related risks and opportunities in accordance with Meridian's Risk Management Policy, Sustainability Policy and other relevant targets set in the annual Executive Scorecard
- Implements appropriate risk-mitigation strategies as approved by the Audit and Risk Committee
- Implements sustainability initiatives aligned with performance targets and agreed strategic initiative

Chief Financial Officer

- Owns the implementation of the Risk Management Policy and associated processes
- Facilitates the business planning processes and ensures climate-related opportunities and risks are considered
- Ensures financial decisions are made giving appropriate consideration to climate resilience
- Co-accountability for Meridian's annual climate-related disclosure
- Reports to the Audit and Risk Committee on a quarterly basis
- Responsible for preparation of the annual Greenhouse Gas Inventory

GM of Corporate Affairs and Sustainability

- Owns the setting of the Sustainability Policy and ensuring resourcing and capability exists to effect it
- Co-accountability for Meridian's annual Climate-related disclosure
- Reports to the Safety & Sustainability Committee on a quarterly basis

Key Management roles reporting to Executive Management

- **Head of Sustainability** – responsible for Group climate-related issues processes and disclosure, and quarterly assurance reporting
- **Group Risk and Performance Manager** – responsible for the Group Risk Management Policy and oversight and alignment of climate-specific risk processes to the Group Risk Management Policy
- **Group Strategy Manager** – accountable for ensuring the Board is engaged on strategic planning and choices, including climate-related issues, and Group scenario analysis and modelling - via the Modelling Team
- **Financial Controller** – responsible for the organisation's budget setting process including ensuring that the right level of climate consideration is included. Responsible for processes relating to financial decision making
- Each operational Business Unit also has a Commercial Manager who will ensure the right consideration has been given to financial decisions, and a risk champion responsible for maintaining the Business Unit risk register and ensuing agreed actions are progressing

Risk Management

Identifying and assessing climate-related risks and opportunities – methodology

Meridian evolved its climate risk and opportunity assessment methodology this year, informed by methodologies outlined by the Intergovernmental Panel on Climate Change (IPCC) and Aotearoa New Zealand's National Climate Change Risk Assessment (NCCRA) method report. A change programme is also underway to further embed climate considerations into business processes and decision making.

Meridian management adopted a new approach to the annual exercise of identifying and assessing climate-related risks and opportunities this financial year. The process applies its newly adopted climate scenarios, and aligns with Meridian's updated Risk Management Policy and Risk Management Framework. The new process has three steps:

1. **First Pass:** In this step a team including a scenario subject matter expert (SME), sustainability SMEs and risk SME reviewed a matrix of physical and transition climate hazards against Meridian elements that could be impacted (e.g. assets or business activities). A list of risks and opportunities was generated and these were consolidated and cross referenced with existing company risks to generate a first pass list. The list of risks was validated in a workshop with owners and functional SMEs[1] from across the business to determine which risks would progress to the next stage of assessment. This workshop was also used to share relevant changes to context (including regulatory considerations), and scenario detail.
2. **Detailed Assessment:** This step involved workshops with the risk/opportunity owners and functional SMEs. In these sessions the impacts of the risks were captured, and physical risks were assessed for vulnerability and exposure. Transition risks were assessed using likelihood and consequence scales consistent with other risk assessments at Meridian. If these sessions identified that further analysis was required, then the third step is completed in a different session once all relevant data is available.
3. **Action Planning:** The final step confirms what management action is required.

Once the annual review is completed, the risks and opportunities are transferred to the Business Units for actioning and monitoring. If a risk aligns with a key corporate risk, or becomes one in its own right, the corporate risk register is updated for tracking in accordance with the Risk Management Policy.

All value chain stages were included in the scope of the assessment outlined above, and Meridian identified items that are customer/demand driven through to potential supply chain impacts (focused on tier 1 suppliers, with some extension to tier 2[2]). While all value chain stages are in scope, Meridian acknowledges that many of our suppliers are early in their maturity journey and, as a result, data and information is limited in some areas. Meridian's procurement process includes undertaking due diligence on a range of areas, including sustainability. Meridian plans to extend this to include greater climate-specific content to promote action and increase access to climate-related information to those Meridian works with.

Outside the annual review process of climate-related risks and opportunities, management actively responds to emerging issues, including regulatory issues. For example, any climate-driven policy announcements or consultations (such as consultation on New Zealand's second Emissions Reduction Plan), prompt a review of impacts and implications for Meridian, which is escalated to the Board if required. Individual and material risks and opportunities also have more frequent management action(s) and reporting requirements beyond the annual process, including to the Board. This includes the advancement of Meridian's Southern Green Hydrogen project and new assets from the Renewable Development Pipeline.

1 SMEs included representatives from across the business such as: Generation (engineering and strategy), Retail (new energy solutions), Renewable development and Wholesale (financial trading, and portfolio strategy).
2 Tier 1 suppliers refer to those who directly supply Meridian with goods or services. Tier 2 suppliers refer to those who supply Meridian's tier 1 suppliers. Furthermore, Meridian considers direct suppliers to be those providing goods and services that input directly to electricity generation, and indirect suppliers those who provide goods and services not directly related to the production of electricity. Meridian has defined its assessment supplier scope based on a 'tier' categorisation basis.

Risk Management continued

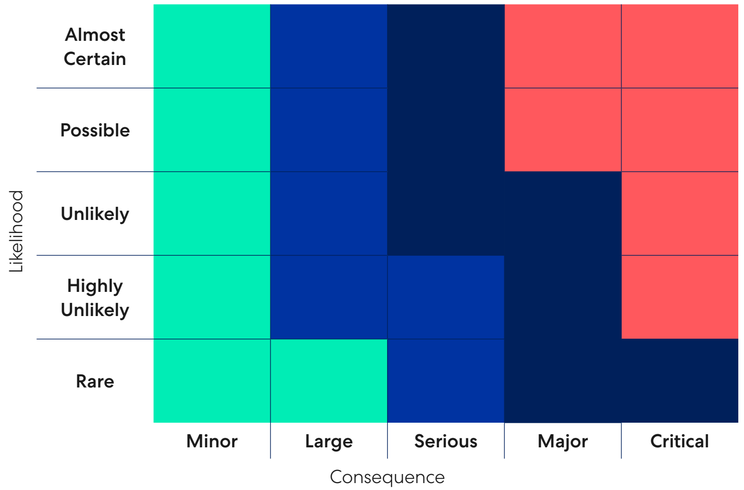
Time horizons and risk scoring

Meridian's climate-related disclosure process considers scenarios across three time horizons. This year Meridian has adopted longer time horizons that align with the climate-related scenarios, and can take into account the useful life of assets (beyond a typical business case horizon). These horizons will continue to be reviewed based on emerging and relevant context, including climate science. The time horizons are as follows:

- Short term:
  from today through 2030
- Medium term:
  from 2030 to 2050
- Long term:
  from 2050 to 2100

Transition risks are assessed using the same likelihood/consequence framework used to assess other risks within the business (see Figure 2). These risks tend to consider a short-to-medium time horizon as extremely high uncertainty exists on transition impacts beyond a mid century time horizon.

Figure 2. Climate-related risk/opportunity heat map.

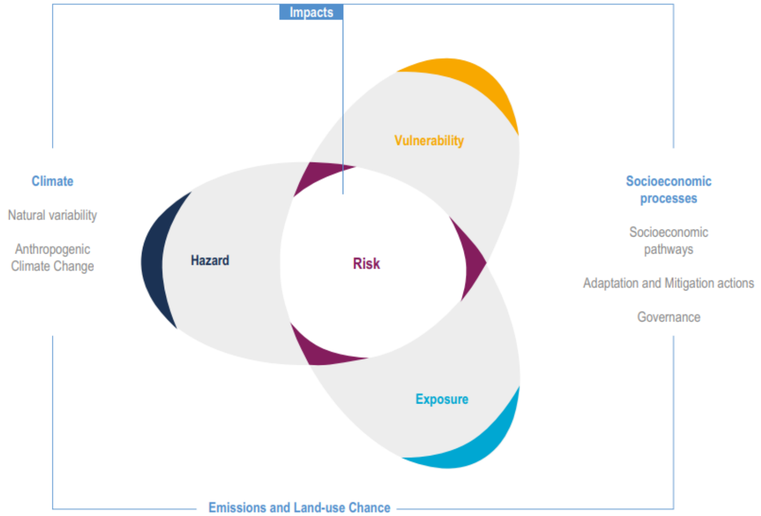


Note: Extreme = Red , High = Dark Blue, Medium = Blue, Low = Green.

In Meridian's case, physical risks need to be considered using a longer time horizon as its core business relies on assets that have useful lives over that period.

Under Meridian's new climate risk assessment process for physical risks, the exposure/vulnerability assessment was used for the first time this year (informed by IPCC AR5 – refer Figure 3), its application is expected to evolve as maturity develops.

Figure 3. IPCC AR5 risk graphic – reproduced here from IPCC AR6 Working Group II report.



Risk Management continued

Table 1. High level risk assessment criteria for physical risks.

Low	Medium	High	Extreme
Local interest or moderate regional interest. Can be handled via Business as usual.	Moderate interest nationally or significant regional interest. Moderate impact on the way Meridian will operate.	Substantial reduction to the value of Meridian or ability to achieve Meridian's strategic objectives. High interest nationally due to prolonged or significant disruption to people, environment or communities.	Impacts so significant they would impact Meridian's viability as a business or be of significant interest nationally due to permanent disruption to multiple groups.

The overall risk rating assessment is defined by the risk owner by considering all of the information gathered through the process including an assessment of the urgency of action. The assessment uses the Low, Medium, High, Extreme scale to be consistent with other Meridian risks. The high level definitions for each risk rating level are shown in Table 1. A check for consistency is applied after all risks have been assessed.

Managing climate-related risks and opportunities

The impacts of risks are quantified as part of Meridian's annual climate-related disclosure process (completed via initial group workshops and further risk/opportunity-specific meetings). This process also includes the assessment and recording of any management actions completed and/or required to manage these risks.

The use of the Low-Medium-High-Extreme rating scale to indicate the relative significance of climate-related risks and opportunities is primarily driven by their potential/actual impacts on enterprise value.

Meridian has adopted a conservative approach for climate-related disclosures, disclosing some risks and opportunities that are well below what would be considered material by New Zealand Stock Exchange requirements. For climate-related disclosure purposes, inclusion is based on guidance from the NZ Climate Standards and considers whether the matter would be of interest to Meridian's current and potential stakeholders or investors. It involves answering a key question – would this impact a decision to invest in or do business with Meridian? Some of the guidance considerations to answer this question include:

- Risks and opportunities should be considered individually and in combination.
- A well-managed risk or a lack of a process may count as relevant.
- Is there information from a sector perspective that readers would want to compare across organisations?
- If in doubt, disclose it.

An overview of the most material physical and transitional financial impacts are outlined in the Strategy section of this disclosure.

To determine whether the risk should be incorporated into Meridian's enterprise risk register, the thresholds described in Meridian's Risk Management Framework are applied. Those risks assessed as "High" or "Extreme" will feature in the enterprise risk register which is regularly reviewed at Board level. Decisions to mitigate, transfer, accept or control are made on a risk-specific basis and are informed by:

- Viable mitigation and/or control options.
- Views on the most appropriate entity and/or individual to take mitigation action(s).
- Materiality and likelihood.

Decisions regarding the public disclosure of a risk or opportunity, having taken into account Meridian's materiality threshold guidance, require consultation with the risk or process owners. The Risk and Sustainability teams recommend disclosure content to the Chief Financial Officer and GM of Corporate Affairs and Sustainability. Audit and Risk Committee has final approval on behalf of the Board.

Construction at of Meridian's sixth wind farm, Harapaki, in the Hawke's Bay.

Risk Management continued

Climate-related risks and integration with Group risk management approach

Meridian's Risk Management Policy provides the overarching framework for assessing, monitoring and managing risks, including climate-related risks. The policy meets ISO 31000:2018 Risk management – Guidelines (Second edition).

An overview of the policy, which is available on Meridian's website[1], outlines the categories of risk considered, such as people, financial, environmental, reputational and strategic risks.

At an operational level, Meridian's Executive Team assesses and monitors climate-related risks and opportunities in accordance with the levels of risk assigned through the Risk Management Policy (risk response categorisations are shown in Table 2).

Meridian's climate-related risks are assessed with the same Low, Medium, High, Extreme categories as the Group Risk Management approach. Climate-related risk that form part of other High or Extreme company risks are embedded in those risks, and those that are stand-alone risks are added to the company register to be monitored through governance levels as described by the Risk Management Policy.

Table 2. Level of risk categorisation and response as determined by Meridian's Risk Management Policy.

Risk rating	Low	Medium	High	Extreme
Ownership	Manager or subject-matter expert	General Manager together with their direct report	General Manager	Chief Executive
Resourcing	Staff and resources applied based on risk/reward assessment	General Manager together with their direct report	Priority focus of staff and resources reducing risk and building mitigation in response	High-priority focus with significant organisational effort directed at moving risk out of the Extreme rating
Reporting	Business units oversee and review actions	Risk-review process with GM and their direct reports to ensure adequate assessments of risk and treatments are in place	Biannual formal reporting to Audit and Risk Committee meeting	Monthly reporting to the Board
Monitoring	Business units monitor improvement initiatives via quarterly reviews.	Monitoring undertaken by peers or self-monitoring as appropriate	Risk owner (GM) to select most appropriate monitoring (peer or external) to ensure the steps Meridian is taking are necessary and sufficient	Risk owner (CE) needs to consider whether Meridian needs independent advice to provide assurance that the steps being taken are necessary and sufficient

1 meridianenergy.co.nz/about-us/investors/governance/risk-management

Strategy

Meridian's business model and strategy

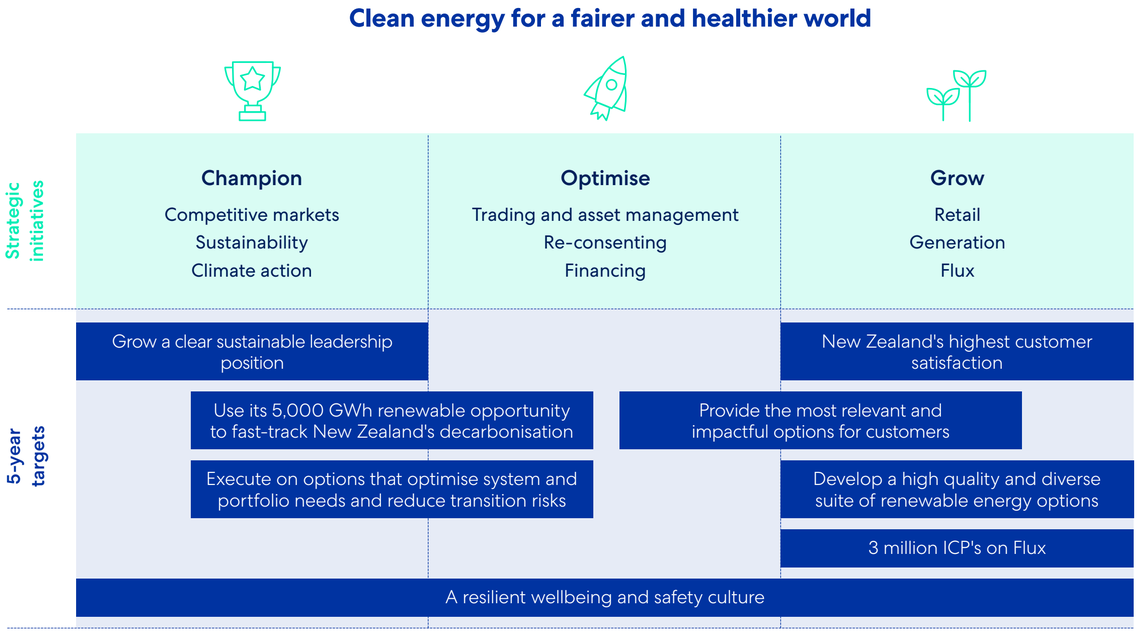
Meridian's purpose, Clean Energy for a Fairer and Healthier World, inherently means it is in its DNA to contribute meaningfully to the transition to a net-zero and climate-resilient future. Meridian's business model is anchored in creating short, medium and long-term value by generating electricity from renewable energy sources (wind, water and sun) and retailing electricity to customers. Meridian has started to build on its electricity generation heritage with further generation investment, and provide targeted decarbonisation offers in sectors such as transport and process heat.

The Meridian Group undertakes the following activities:

- **Meridian New Zealand** – 7 large hydro power stations and 5 large wind farms contributing 30% of national electricity generation, sitting alongside a retail business with two brands (Meridian Energy and Powershop) that sell electricity to 15% of residential customers in NZ (excluding New Zealand's Aluminium Smelter [NZAS])
- **Flux** – a subsidiary that offers highly configurable energy software, operating in three countries (New Zealand, Australia and the United Kingdom)
- **Dam Safety Intelligence** – a subsidiary company that offers dam-management expertise to dam owners in New Zealand and internationally.

Meridian's strategy delivers value by integrating the activities above. It presents this strategy internally using the framework shown in Figure 4.

Figure 4. Meridian Energy strategy – summary.



Strategy continued

Meridian's modelling work

Meridian has utilised two central models that explore the strategic and operational implications of climate change for its business focussing on hydrological implications – Evolution and Revolution.

Meridian's modelling uses historical weekly hydro inflow sequences – this historic data represents a distribution of possible hydro inflow profiles for a given year. These hydro inflow distributions are then applied to future years, but with adjustments applied for climate change effects (intensifying seasonality and volatility). The scenarios each use an average hydro inflow profile from the distribution of future climate-change-adjusted hydro inflow sequences. Extreme future climate-change-adjusted hydro inflow sequences may be used for targeted analysis if needed.

Meridian is awaiting the first update on global temperature and rainfall projections since 2014, with Coupled Model Intercomparison Project 6 results, to be released. NIWA is working on these outputs, and the first downscaled temperature and rainfall projections for New Zealand since 2014 are due to be released imminently. River-flow projections will follow this, and will be used in Meridian's modelling to explore out to 2060.

The resilience of Meridian's strategy and business model to climate scenarios

The Meridian Board and Management hold an annual strategy review that includes outside-in and forward-looking strategic planning, taking into consideration any changes to climate scenarios. Meridian's climate scenarios describe plausible and distinct futures with different assumptions of the potential climate-related impacts, as outlined earlier. The annual strategy review informs choices for Meridian's existing strategic initiatives and targets, and the adoption of any shifts from here. Core to the review is ensuring that the strategy is resilient to plausible futures, including different climate-related impacts.

Overall, Meridian is in a unique position to benefit from the transitional impacts of climate change – its strategy, business model and capability is anchored around a focus on climate action. The products and services Meridian offers can be enablers for businesses and individuals across Aotearoa to decarbonise, with potential for us to enable decarbonisation abroad through the hydrogen opportunity.

Meridian has implemented a number of changes to the organisation's structure over the last two years which have been driven by the need to support New Zealand's decarbonisation goals.

The physical impacts of climate change present notable opportunity as hydro-generation potential better aligns with the seasonal electricity demands unique to New Zealand. Meridian must ensure its assets, and those of its local and international partners, are resilient, particularly to acute weather events. Meridian has not yet identified a climate-related physical issue that materially affects its business model and strategy today, but Meridian notes that it will become increasingly affected by the physical impacts of climate change over the longer term.

Based on the assessment of climate-related actual and potential impacts at both the individual risk and opportunity level outlined further below, Meridian has assessed its business model and strategy to be resilient to the climate scenarios assessed. Mitigating actions at the individual risk/opportunity level are outlined in Tables 3–6.

The management actions Meridian is taking to maximise resilience of its strategy and business model to the climate-related risks and opportunities identified are also outlined.

Risk and opportunity summary

Meridian has categorised climate-related risks and opportunities as being driven by either:

- **physical impacts** arising from climate impacts such as floods and other climate system changes. Physical impacts can be acute (extreme weather event) or chronic (sea-level rise and other gradual changes); or
- **transition impacts** that arise as the economy and people transition to a lower-carbon future, such as changes to policy and customer demand that are primarily motivated by climate interests.

There are several climate-related risks and opportunities that in combination may make it easier or harder to support New Zealand's decarbonisation, or represent different types of challenges in how we adapt to the impacts of climate change.

Meridian's identified physical risks are dominated by impacts on water / hydroelectricity generation, asset damage from extreme weather events, and/or impacts on the goods and services procured through its global supply chain. Identified physical opportunities also exist for potential water seasonality changes and also electricity demand increases from its customers for applications such as irrigation or summer cooling.

Meridian's identified transition risks feature in the shorter term due to the combined effect of significant renewable energy generation build underway (bringing new capacity over time), alongside growing electricity demand, with a likely increasing carbon price impacting thermal generation in the New Zealand electricity system. The net effect expected is some impact on power system flexibility due to more scarce flexible energy products in the shorter term and until new builds and flexible demand products become available at increased scale. Transition opportunities are very significant for Meridian, driving growth and investment to support the electrification of transport and process heat at scale and catalysing the hydrogen opportunity.

A summary of our climate-related risks and opportunities, including assessment outcome, financial quantification where feasible, and management actions in place, is provided in Tables 3–6.

Refer to the Metrics and Targets section to identify which climate-related risks and opportunities Meridian's metrics and targets connect to.

Strategy continued

Meridian's planning horizons

Meridian's climate-related scenarios, risks and opportunities consider three time horizons: short term (up to 2030), medium term (2030 to 2050) and long term (2050 to 2100). Each climate-related risk and opportunity disclosed here is aligned with the time horizon that has the actual or potential greatest financial impact on Meridian.

Meridian's business planning and capital allocation timeframes are currently defined as: short 1–5 years; medium 5–10 years; and long term 10–30 years. Transitional climate impacts strongly influence short term business planning and capital allocation decisions (such as investment in a renewable energy generation pipeline). Meridian's climate-related scenarios inform physical climate risks and opportunities which increase in impact (and uncertainty) over longer time horizons. We use this information to inform business planning and capital allocation decisions today such as land purchases and design of new assets.

Climate-related impacts and influence on financial planning

Meridian undertakes financial planning annually, taking into consideration Meridian's five-yearly strategic targets, 10-year Wholesale Market Outlook (WMO) model and climate scenarios that extend to a 2100 time horizon. Major investment decisions have typically been made on a 30 year time horizon, but we are starting to consider this longer time frame.

Climate-related risks and opportunities are factored into financial planning and capital allocation by accounting for climate-related transitional impacts in Meridian's WMO and longer-term climate scenarios. For example, factoring in plausible demand increases over time for electricity driven by policy impacts and customer demand for transport electrification. These demand pathways then inform things like the scope of Meridian's renewable energy generation pipeline and its assumptions for the planned allocation of capital over time for future investments. Climate-related risks and opportunities are also factored into funding decisions on a project-by-project basis.

For example, as a part of embedding its evolved climate risk assessment methodology during FY23, Meridian started to consider potential impacts from combined climate hazards for site evaluations for Renewable Development pipeline projects under different climate scenarios.

Meridian also has an established Green Finance Framework[1] which is aligned with Market Standards: International Capital Markets Association Green Bond Principles (GBP), Climate Bonds Standard version 3.0 (CBS), and the Asia Pacific Loan Market Association Green Loan Principles (GLP). The Framework sets out the process, criteria and guidelines under which Meridian intends to issue and/or manage existing and future bonds and loans under the Programme which contribute towards achieving Meridian's sustainable objectives. The Framework enables Meridian to connect company strategy and vision to financing requirements and provide investors who want an investment that aligns with the Market Standards with a mechanism to make that investment.

Tekapo A, with snow-capped Southern Alps behind, at the start of the Waitaki Hydro Scheme.

1 www.meridianenergy.co.nz/about-us/investors/reports/green-finance

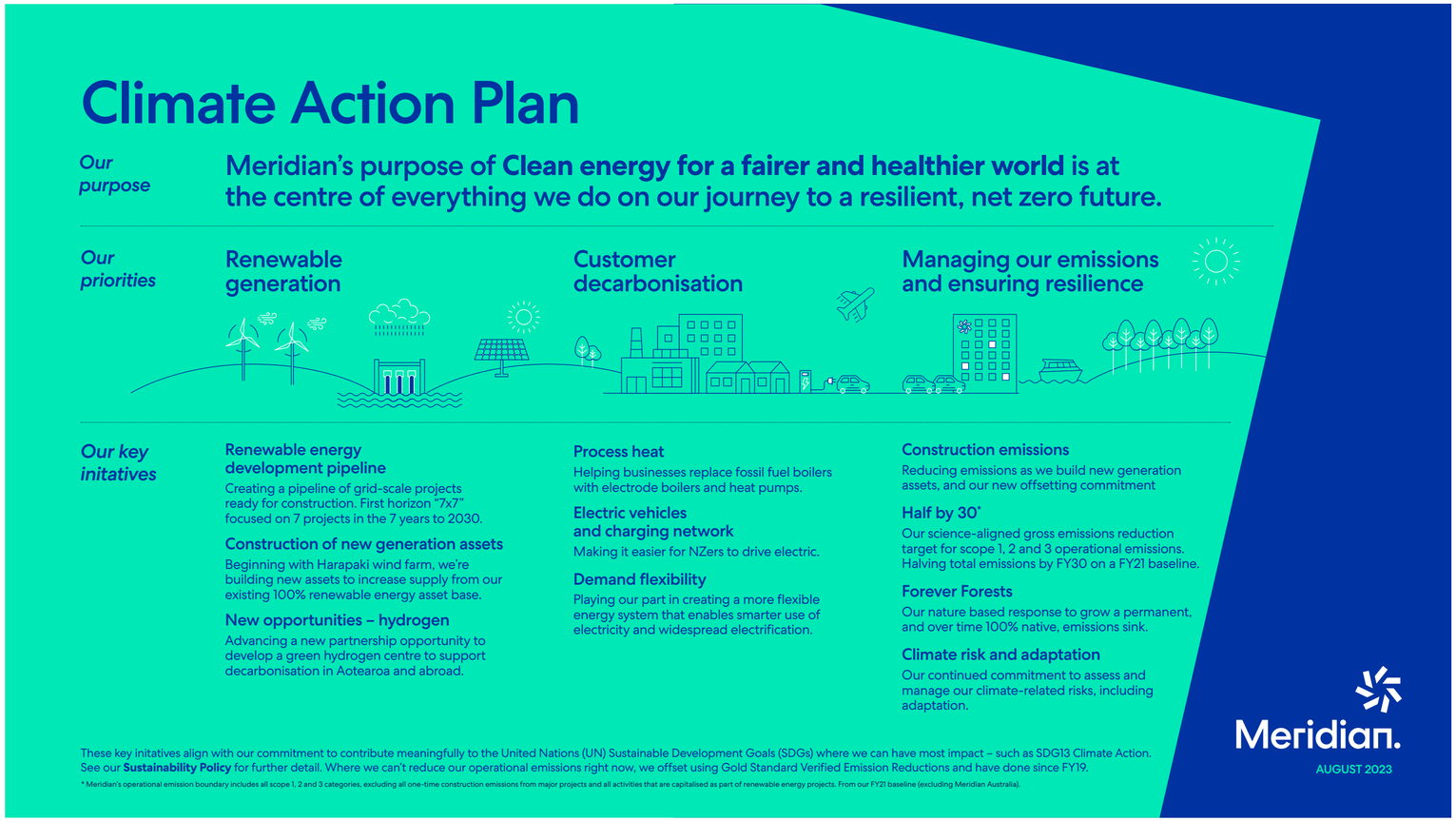
Transition and adaptation in Meridian's strategy

Meridian's contribution to the transition to a net-zero emissions future is outlined in its Climate Action Plan (CAP) which details three climate priorities, and the key initiatives underpinning each – summarised in Figure 5 opposite.

Key initiatives such as the construction of the Harapaki wind farm and process heat and transport electrification offers, are all opportunities that provide value for Meridian and support its customers and others to decarbonise. Meridian has developed a roadmap to halve our FY21 operational business emissions by FY30, and has completed a range of practical initiatives to reduce one-off construction emissions. More detail on progress against these key initiatives is provided in the Metrics and Targets section. Meridian's Safety and Sustainability Committee gets quarterly progress updates on the advancement of all of these initiatives and our financial plans capture the impacts of our committed and likely transition activities.

Meridian's approach to adaptation is to ensure that its assets and services remain resilient to the physical impacts of climate change. Meridian does this by assessing risks in its current operations and putting in place mitigations (refer to the 'More intense extreme rainfall events in hydro catchments' risk in Table 3, for example), and completing due diligence on business growth activities where relevant. Meridian's financial plans, and any project-specific requirements, allow for associated assessment and mitigation costs.

*Figure 5. Meridian **Climate Action Plan**.*



Strategy continued

Meridian's climate scenarios, methodology and assumptions

During FY23, Meridian developed three scenarios to help identify potential climate risks and opportunities and inform its strategic planning more broadly. Two of these built on Meridian's prior long-standing Evolution and Revolution models. The purpose of this scenario refresh is to incorporate broader considerations (such as additional international context), extend the time horizon to better consider Meridian's longer-life assets, and aid comparability of its in-house scenarios with recognised international and local scenarios.

Meridian recognises that many plausible futures exist with differences in global temperature pathways, and changes in climate motivated regulations, or changing consumer preferences. It is also plausible that climate action in New Zealand occurs at a different pace to that elsewhere in the world, potentially creating unique transition impacts for us.

Meridian's chosen three scenarios are not forecasts but aim to provide sufficiently distinct and plausible futures to help Meridian test the resilience of its business model and strategy, and identify and assess climate-related risks and opportunities. The scenarios were developed by Meridian with expert, independent peer review and advice from a climate scientist. Meridian's Executive team and Board, both reviewed and endorsed these scenarios.

Meridian began by identifying the list of transitional and physical variables captured in the context of its unique business – for example, changes in the frequency/intensity of storm events, precipitation, carbon pricing and policy intervention levels in New Zealand and abroad. Meridian also developed scoring criteria to benchmark international and local scenarios against. As a result of this review, Meridian concluded it could best access the necessary variables by sourcing data and information from a combination of: the Network for Greening the Financial System (NGFS), Intergovernmental Panel on Climate Change (IPCC) Shared Socioeconomic Pathways, New Zealand – Climate Change Commission (CCC) and New Zealand – National Institute of Water and Atmospheric research (NIWA) Representative Concentration Pathway scenarios. Meridian is able to complement this more widely accessible work with additional bespoke work it had already completed, to help understand possible hydro catchment specific impacts from climate change.

Of note, Meridian's prior Revolution and Evolution models extended to 2050 and were anchored on respective 1.5°C-2°C and 4°C pathways - they assumed the same level of temperature increase between now and 2050. This was due to similar physical impacts of climate change occurring over that time period (including the availability of water and wind energy) regardless of the temperature-increase scenario chosen from the Intergovernmental Panel on Climate Change, that is, the 1.5°C–4°C warmer worlds are not significantly different.

However, Meridian noted a 4°C warmer world in 2100 would present significant challenges, in terms of both its potential physical impacts on Meridian's dam structures and the uncertainty about how society would function in those circumstances and what an electricity business would look like as a result. Transition impact assumptions had been the primary drivers of distinction between these scenarios (models) in the past. Meridian has chosen to align its existing Revolution and Evolution scenarios with its new overarching scenarios that extend out to 2100, based on the transition impacts they represented up to the 2050 time horizon. This means that Meridian's Evolution scenario has served as an input to its Adaptive Evolution scenario below, which assumes a 2.6°C temperature rise outcome this century.

A summary is provided over the page.

West Wind Farm at dusk, Te Whanganui-a-tara Wellington

Strategy continued

Meridian's climate scenarios

Net Zero Revolution

The world reaches net-zero by 2050 but with higher costs due to divergent policies introduced across sectors and a quicker phase out of fossil fuels.

Globally, some countries achieve net-zero targets faster and easier than others, gross emissions are lower but remain a problem addressed by offsets, and nationally, some sectors face higher burdens to cut emissions than others, while other sectors are protected from policy pressures.

However, accelerated uptake of consumer electrification and industrial decarbonisation is rapid, broad, and well-supported. New investment in renewable energy generation is required with a phase-out of fossil fuels occurring rapidly.

Emissions are in line with a climate goal limiting global warming to 1.5°C by the end of the century, with low overshoots (<0.1°C) of 1.5°C in earlier years. This leads to high transition risks, but lower physical climate risks. Hydro inflows favourable in the medium term.

Key scenario assumptions include:

Global response

Policy ambition	Policy reaction	Technology change	CO_2 removal approaches	Regional policy variation
1.4°C (SSP/RCP2.6)	Immediate but divergent	Fast change	Low-medium use	Medium variation

NZ Response & Physical Risk

Risks to assets	Risks to generation	Ease of development	Government intervention	Market response
Small increase	Small increase	Easier	Medium	High demand; High competition

Data sources:
- Global – to 2050 – NGFS Divergent Net Zero
- Global – to 2100 – IPCC Shared Socioeconomic Pathway SSP1-2.6
- New Zealand – to 2050 – CCC Headwinds
- New Zealand – to 2100 – NIWA Representative Concentration Pathway RCP2.6
- Meridian Revolution model

Adaptive Evolution

A lack of international coordination of the climate response occurs and each region operates independently. Globally, existing climate policies are delayed or postponed and new climate policies are not introduced until 2030. The level of action differs across countries and regions based on currently implemented policies, leading to a "fossil-fueled recovery" out of the economic crises of the early 2020s as countries rely on coal, oil, and gas developments to underpin energy security and drive economic growth at the expense of climate goals.

In New Zealand, subsidies in place today are wound back, slowing the rate of electrification and decarbonisation. While these processes do still occur, financial and reputational incentives are lower.

Globally, annual emissions do not begin to decrease until after 2030. Stronger policies are then needed to limit warming but take time to be implemented. Emissions decline but lead nonetheless to 2.6°C of warming associated with moderate to severe physical risks. Hydro inflows favourable in the medium term are impacted by drought. Transition risks are relatively low.

Key scenario assumptions include:

Global response

Policy ambition	Policy reaction	Technology change	CO_2 removal approaches	Regional policy variation
2.5°C (SSP/RCP4.5)	NDCs	Slow change	Low-medium use	Medium variation

NZ Response & Physical Risk

Risks to assets	Risks to generation	Ease of development	Government intervention	Market response
Moderate increase	Moderate increase	Same	Low-medium	Medium demand; High competition

Data sources:
- Global – to 2050 – NGFS Nationally Determined Contributions (NDCs)
- Global – to 2100 – IPCC SSP2-4.5
- NZ – to 2050 – CCC Current Policies
- NZ – to 2100 – NIWA RCP4.5
- Meridian Evolution model

Hot House

Globally, only currently implemented policies are preserved, leading to high physical climate risks.

The economic costs of climate change impacts are strong, making finance for new investments more expensive, which in turn limits new renewable investment. Demand growth is muted but still occurs. The national and global economy is battered by increasing physical risks.

Emissions grow until 2080 leading to about 3°C of warming and severe physical risks. This includes irreversible changes like higher sea level rise. Significant drought impacts hydro generation.

Key scenario assumptions include:

Global response

Policy ambition	Policy reaction	Technology change	CO_2 removal approaches	Regional policy variation
3°C+ (SSP/RCP8.5)	No change	Slow change	Low use	Low variation

NZ Response & Physical Risk

Risks to assets	Risks to generation	Ease of development	Government intervention	Market response
Large increase	Large increase	Harder	Low	Low demand; High competition

Data sources:
- Global – to 2050 – NGFS Current Policies
- Global – to 2100 – IPCC SSP3-7.0
- NZ – to 2050 – CCC Current Policies
- NZ – to 2100 – NIWA RCP8.5*

* When available, NIWA RCP7.0 will be used – expected in 2024.

Climate considerations in asset management

An overview of Meridian's assets and a summary of regional climate change impacts is provided in Figure 6. The ranges represent the variation across the three scenarios.

Meridian's hydroelectric generation assets have in place comprehensive dam safety assurance plans which include a Probable Maximum Flood (PMF) load case which sets the basis to ensure infrastructure is resilient to an inflow event up to this level. The PMF values are highly conservative and were last updated in 2016 for the Waitaki catchment and 2017 for the Waiau catchment – these are reviewed every 10 years. Meridian looks forward to advancing the committed Dam Safety Hydrology Group collaboration to have the Probable Maximum Precipitation (PMP) methodology updated to increase robustness in the context of climate change. PMP is a key input to PMF load case estimate to inform extreme flood hazards for Meridian reservoirs and dams. The resulting tool from this work will enable us to better assess future climate hazard projections considering a number of different climate scenarios.

Meridian's existing wind assets, and soon also grid scale solar and battery assets, have a typical design life of 30 years. Meridian also has assets on these sites with longer lifespans, such as sub stations. When making new investments in land/renewable generation infrastructure, Meridian has started to consider longer time horizons for these assets as a part of its updated risk assessment methodology (outlined in the Risk Management section). This includes consideration from factors such as sea level rise, land stability or more severe storm events. This process is helping us to understand the choices available to us to maximise resilience against potential future climate hazards.

Figure 6. Meridian generation assets and potential climate change impacts.

Climate impacts to existing assets, all scenarios with a long-term view to 2100.

Waikato

Storm events will become more likely, we can expect 5-50 more hot days per year and 0–15% increase in average precipitation.

Hawke's Bay

Storm events will become more likely, we can expect 5–25 more hot days per year.

Lower North Island

There may be a 0-15% increase in average precipitation and the risk of storm events will increase.

Waitaki catchment

We expect an increase in winter precipitation of 5–20% and a decrease in summer precipitation of 0–10%. There would be a greater risk of drought or prolonged dry periods as well as a risk of more frequent flood events.

Southland and Manapōuri catchment

There may be an increase in winter precipitation of 5–20% and decrease in summer precipitation of 0–10%. There would be a greater risk of drought or prolonged dry periods as well as a risk of more frequent flood events.

Impact to Meridian assets

Hydro

Periodic review of probable maximum inflows to Meridian catchments will inform its dam safety processes and procedures ensuring physical climate resilience of the assets.

Wind

A 30-year design life for equipment means more frequent upgrades to the latest technology. At these points Meridian tests continued viability of the site and ensures that the new equipment will be resilient to likely changes over their lifetime.

Strategy continued

Table 3. Physical risks.

Risk	Assessment summary	Current impacts (FY23)	Future impacts	Management actions
PR1 – More intense, extreme rainfall events in hydro catchments Risk of increased costs or reduced generation capacity from the current probable maximum flood (PMF) increasing, or damage to assets or dam failure if the current estimate of PMF is incorrect and exceeded.	New Zealand dam safety guidelines specify estimation of PMF using a conservative assessment of probable maximum precipitation (PMP) that Meridian plans for. Climate change means the estimates of PMP and PMF need to be kept up to date with the latest climate science. **Type:** Physical risk assets and to operations **Time horizon:** Medium term (2030–2050) **Risk Rating** • Hazard: Extreme rainfall (inflow event) • Exposure[1]: Low (% revenue) • Vulnerability[2]: Medium • Overall risk rating: Medium **Materiality:** Following commitment to Dam Safety Hydrology Group (DSHG) revision of PMP process, and establishing a process to incorporate climate change impacts, this risk is downgraded at an enterprise level and is no longer a key enterprise risk. Risk disclosed here to demonstrate the risk is being actively managed, and for comparability to prior year disclosures.	Meridian has had no events where inflow rainfall has exceeded the PMP for a catchment. To improve Meridian's confidence that the PMP is set accurately in the context of potential future climate impacts, Meridian is contributing to work by the DSHG. This work will provide a new tool to better update the PMP and PMF inflow estimates for Meridian's catchments, and will allow estimates of climate change impacts to be included in the estimates forecasts to set of PMP used levels. **Actual financial:** nil	Projected increases in intensity of extreme rainfall events may result in larger estimates of extreme inflow events to Meridian's reservoirs. As there is little margin in the available flood storage or spill capacity for Meridian's catchments, this would most easily be mitigated by reducing the maximum storage level in its main storage reservoir (Pukaki), and changes to the flood management operating rules. Or, in the longer term, by making physical modifications to the dam structures to increase flood storage capacity, and/or to increase spill outlet capacity. The first option would reduce the net water storage capacity of the Waitaki Scheme, reducing the amount of energy the system can produce annually. The second option would require investment of hundreds of millions and take many years to implement. Thus, if PMP updates indicate an increase in PMP and PMF this would most likely be managed through changes to the operating range in the main storage reservoir (Pukaki), and flood management operating rules. If managed as above, there is unlikely to be any change to the risk of actual damage to dam structures causing business interruption (restriction on generating) from passing extreme floods. Significant increases to PMP/PMF in a longer term horizon may require the business to consider structural changes to its dams and spill outlets to mitigate, but regular (10 yearly) review of PMP to consider climate change forecasts with a 20-30 year time horizon will allow this to be added to Asset Management and Business plans. **Potential financial:** $10-$15 NZ million per annum annualised over the medium term period. This represents exposure less than 1.5% of average forecast generation revenue.[3] **Quantification methodology:** Estimated potential financial impact is an annualised figure over a 20-year time horizon of estimated civil construction costs and negative revenue impacts. Damage to dam structures and the cost of business interruption from an extreme event of sufficient scale is not included in the quantification as it is not practical to assess the additional risk of damage to the dams and spillways from passing extreme spill events made larger by climate change.	Contribute to industry DSHG work to update PMP methodology and ensure it can incorporate projections of climate change impacts to ensure PMP can be assessed based on contemporary climate change projections. This will inform the ongoing 10-year reviews. Implement ongoing programme of 10 yearly PMP/PMF reviews, incorporating current projections of climate change impact. Last reviews: • 2016 for Waitaki Valley catchments • 2017 for Waiau catchments. Meridian's current Waitaki Valley flood rules are being updated to reflect the updated PMF estimate. Also, as part of Meridian's Resource Consent Renewal submission it is proposed that Flood Management is made a management process rather than specified as consent conditions. This will allow changes to PMP estimates and make any necessary changes to reservoir operations and flood rules simpler to implement. Insurance is in place for both physical damage and business interruption after 30 days, resulting from damage to generation assets.

1 Risk rating exposure refers to how much of the asset, business activity or other element is exposed to the hazard when it occurs.
2 Vulnerability assesses how much damage could happen to the elements exposed to the hazard – it considers sensitivity and adaptive capacity.
3 Forecast total generation revenue - annual average over 20-year outlook, as stated in FY23 valuation report.

Strategy continued

Table 3. Physical risks continued.

Risk	Assessment summary	Current impacts (FY23)	Future impacts	Management actions
PR2 – Increased hydro inflow volatility due to changing seasonal weather patterns (rain and drought) Risk to electricity generation and wholesale prices from unpredictable weather and greater likelihood of drought.	Whilst Meridian expects average annual and seasonal hydro inflow profiles to cause improved generation and demand alignment (see opportunity table 3), Meridian also expects increased volatility in the weather such as prolonged dry periods and larger inflow events when they occur. This will make it harder to manage lake levels to balance reducing the need to spill when it is wet, and retaining enough water to last a dry season. **Type:** Physical risk to operations **Time horizon:** Long (2050-2100) **Risk rating** · Hazard: Drought and rain · Exposure: Low (% revenue) · Vulnerability: High · Overall risk rating: High **Materiality:** This risk is not a key risk to Meridian in the short term, but does connect to existing Enterprise Risk Adverse hydrological conditions. The potential impacts of climate change will be managed for this long term risk via annual review, to ensure any additional mitigation actions needed in the short term are adopted, also informing the assessment of the existing Enterprise Risk.	Meridian is experiencing increased weather volatility. However, it is challenging to isolate the impact of climate change from other seasonal variation (e.g. El Niño, and La Niña) and so the short term financial impacts have not been calculated. Meridian has not incurred direct material costs or investments in FY23 as a result this risk, but investment in the construction of new renewable generation assets, over time, will result in an increased generation capacity and peak time flexibility. **Actual financial:** Not feasible to quantify as there are a considerable number of non-linear interactions in the current market between inflows and prices. It is also difficult to assess the current climatic influence on inflow volatility within the same year.	Meridian expects increasing weather volatility over time, the degree of which is dependent on the climate scenario. Our Hot House scenario presents the most weather volatility. It is becoming more difficult to accurately predict patterns therefore harder to determine the ideal lake level. If the level is too high, Meridian increases the risk of needing to spill, while if too much water is used during the wet season, Meridian risks not having enough to get through a prolonged dry season. Meridian is investing in increasing capacity and peak time flexibility to be able to better manage this. The potential financial impact to Meridian is on average neutral, with some notable range. The reputational and strategic risk is more significant as it could impact its ability to deliver Meridian's strategy of supporting New Zealand's decarbonisation. **Potential financial:** Not yet quantified due to significant uncertainty associated with the basis for any potential financial quantification. Meridian sees potential for both a negative, and positive financial impacts.	Management actions which contribute to mitigating this risk include: · Increasing generation capacity through new wind and solar · Grid level battery storage to help balance peak capacity · Virtual power plant which also helps peak capacity by allowing EV/battery users to sell back to the grid when demand is high · Negotiating flexibility into the contract with Tiwai Point aluminium smelter (NZAS) · Incorporating flexibility into future projects like Southern Green Hydrogen As noted in the Transition opportunities table, many of the above actions, are actually opportunities for Meridian, which also have the benefit of mitigating this risk.

Strategy continued

Table 3. Physical risks continued.

Risk	Assessment summary	Current impacts (FY23)	Future impacts	Management actions
PR3 – Damage to assets from extreme weather Risk to assets from extreme weather events (extreme rainfall impact on hydro operations treated separately).	Meridian's climate scenarios highlight the potential range of impacts across its asset base. Meridian expects climate change to bring more frequent and intense storms for example (refer Figure 6). There is a risk that one or a number of such events strikes one of Meridian's assets, potentially doing damage to some wind turbines, solar farms and batteries, including access infrastructure (e.g. slips prevent road access to site). Cyclone Gabrielle demonstrated that while Meridian's assets themselves might have adaptive capacity during extreme weather events, damage to the surrounding land and infrastructure can also significantly disrupt its operations. **Type:** Physical risk to operations **Time horizon:** Long (2050-2100) **Risk rating** · Hazard: Storms · Exposure: Extreme · Vulnerability: High · Overall: Medium **Materiality:** The risk of natural disaster is a key risk being actively monitored at Meridian Board level. Meridian notes impacts on a third party's infrastructure which it depends on/has less control over, could increase the overall risk rating.	During cyclone Gabrielle, Meridian's Harapaki wind farm site in Hawke's Bay suffered damage to access roads and associated infrastructure, and to a lesser extent a number of erosion channels. Overall the project site held up reasonably well, in part due to the limestone road construction methodology. Impacts to Meridian included a minor project delay (one quarter) and remediation costs from damage. **Actual financial impact:** Damage $5-$10 NZ million - will largely be covered by contract works insurance. **Quantification methodology**: Actual costs incurred from site repair and recovery.	Extreme weather events will become more frequent over time. Meridian's hydro assets have comprehensive dam safety plans that apply very conservative thresholds, which mean short term risks are low (refer to risk 'extreme rainfall in hydro catchments'). Meridian's existing wind assets, and soon also grid scale solar and battery assets, have a typical design life of 30 years. Meridian also has assets on these sites with longer lifespans such as sub stations. NIWA is expected to deliver updated national climate projections for Aotearoa New Zealand in 2024. Meridian plans to use these outputs when available to assess the impact on all of its assets. **Potential financial impact:** not yet quantified – to be considered as a part of the asset climate impact assessment. Potential impacts will vary by asset type and location.	Meridian is awaiting the NIWA data update to reassess the likely impact on assets. Meridian continues to work with local government and the National Emergency Management Agency on hazard analysis and applying lessons learned. The risk of a natural disaster continues to be a material risk reviewed on a regular basis by the Executive and the Board. Mitigation includes insurance cover of $1.2bn for asset damage and business interruption. The climate related factor is small compared to the earthquake risk. The chance of a flood or storm event impacting all assets is low. When making new investments in land/ renewable generation infrastructure, Meridian has started to consider longer time horizons for these assets as a part of its updated risk assessment methodology (outlined in the Risk Management section). This includes consideration of factors such as sea level rise, land stability or more severe storm events. This process helps Meridian to understand choices available to maximise resilience against potential future climate hazards.

Strategy continued

Table 3. Physical risks continued.

Risk	Assessment summary	Current impacts (FY23)	Future impacts	Management actions
PR4 – Physical supply chain risks – reliable access to global supply chain goods and services Risk to Meridian's supply chain due to global climate changes.	Climate change will impact the operations of Meridian's suppliers globally and potentially impact their ability to supply materials. Meridian needs a better understanding of where its suppliers source key materials to confidently know how exposed and vulnerable Meridian is to climate change in its supply chain. Meridian has completed an initial mapping exercise to identify where some of its critical components are sourced from, and has an understanding of alternative suppliers/source locations if needed. **Type:** Physical risks to supply chain **Time horizon:** Long (2050-2100) **Risk rating** · Hazard: Multiple potential climate hazards · Exposure: Extreme · Vulnerability: Medium · Overall: High **Materiality:** This climate-specific risk is not currently identified as a key risk to Meridian. This risk has been included to demonstrate to the audience of this disclosure that Meridian has information gaps relating to its supply chain vulnerability that Meridian wishes to address.	Meridian is not aware of any material supply chain challenges this FY related to its suppliers as a result of physical impacts from climate change. Meridian has a complex range of suppliers who in turn source key materials from across the globe. **Actual financial impact:** Nil material. *Note: Meridian has a separate Transition supply chain risk.*	Meridian expects its current and future suppliers to be exposed and vulnerable to physical impacts from climate change. As climate change becomes a greater focus for companies around the world, Meridian expects greater visibility of these risks and its suppliers are able to provide more transparency. **Potential financial impact:** Not yet quantified. Requires increased visibility of Meridian's global supply chain to form a stronger basis for reasonable quantification.	Meridian has started a project to implement new technology over the next 2-3 years that will allow more centralisation and improvement of data collection regarding its supply chain. Furthermore, Meridian will be implementing an enterprise Supplier Relationship management (SRM) framework which broadly sets in place the governance, roles, category management plans and connection to the contracted reporting and disclosures between the parties. This will drive the expectation that the 'owners' of the relationship are working to lift either one or both of supplier capability and disclosures of their supply chain to manage this risk. Investigation planned to secure long-term agreement with wind turbine supplier to further mitigate supply chain risks (including geopolitical, pandemic, climate-related).

Strategy continued

Table 4. Transition risks.

Risk	Assessment summary	Current impacts (FY23)	Potential future impacts	Management actions
TR1 – Power system flexibility There is a risk to earnings due to increasingly scarce flexible energy products, and increased volatility of wholesale electricity prices (from intermittent generation).	Thermal generation in New Zealand currently plays a significant role in responding to periods of reduced renewable supply, such as dry periods in the hydro catchments. It is likely that much (or all) of this thermal plant will be replaced by renewable energy options over time. In the short-to-medium term, whilst new renewable generation build is underway, and thermal energy is limited and with alternate flexible products at scale on the way, it is likely that this will lead to: higher levels of electricity spot price volatility, and increasing demands on flexible elements within the existing power system, such as hydro. This risk has significantly influenced Meridian's strategy and decision making to ensure Meridian is contributing to a resilient, efficient and flexible energy supply for New Zealand. **Type:** Transition risk to earnings **Time Horizon:** Short term (now to 2030) **Risk rating** · Hazard: Other (multiple drivers) · Likelihood: Almost certain · Consequence: Large · Overall: Medium **Materiality:** This risk is not a key risk to Meridian, but is linked to the company risk – market supply. This risk has been included to demonstrate that the risk is being actively managed.	Improved 'outage' or scheduled works on the Ōhau hydro chain maintenance, minimises outage time. Introduction of flexible outages that will go ahead based on market situation (e.g. wind / NZ demand). Swaption portfolio change – new swaption arrangement provides greater flexibility and a stronger fit to Meridian's generation asset profile. Negotiated peak demand flexibility with the Tiwai Aluminium Smelter Demand flex contracts for large Retail customers. **Actual financial**: $20 NZ million **Quantification methodology:** approximate current annual spend for availability of flexibility products.	This risk will reduce over time. The short to medium term impacts relate to the advancement of identified management actions (right), and continued security of flexible options to manage supply. Ruakākā battery operational mid decade. **Potential financial:** $20–$80 NZ million annualised over the short term. Represents exposure of less than 7% of average forecast generation revenue.[1] **Quantification methodology:** High-level estimate of annual costs, and informed by the actual costs of current risk instruments and internal views on the magnitude of potential changes to electricity spot price volatility and investments that may be required to provide flexibility.	Mature commodity risk framework in place (Electricity Hedging Policy) that includes specific limits on allowable exposure to spot electricity price risk. Within that framework the cost of mitigation is traded off against the impacts of accepting the risk. Continue to invest in assets and strategies that increase flexibility including outage planning, battery and virtual power plan solutions. Asset management and outage planning to deconflict with any source constraints i.e., plan some outages whilst windy so wind generation provides outage generation cover. Actively investigating new options to provide flexibility in place of that provided by thermal, such as hydrogen and large-scale batteries. Virtual Power Plant (VPP) initiative will enable greater access to demand flexible products such as industrial heat processes, solar, batteries, hot water cylinders etc. See Metrics and targets section for performance against relevant actions above.

1 Forecast total generation revenue - annual average over 20-year outlook, as stated in FY23 valuation report.

Strategy continued

Table 4. Transition risks continued.

Risk	Assessment summary	Current impacts (FY23)	Potential future impacts	Management actions
TR2 – Carbon price uncertainty Risk to earnings due to higher wholesale market prices caused by carbon price rise during a period when Meridian is supply constrained (key drivers being dry winter period and where shorter term capacity constraints exist).	This risk is directly correlated to Power system flexibility due to carbon price benchmarking in some financial derivative product arrangements, associated with meeting our commodity risk framework requirements. This represents Meridian's most significant exposure to carbon price escalation. Meridian is also exposed through price offers of thermal generators particularly through winter. This year has seen peaky prices due to a combination of plenty of hydro capacity meaning thermal generators have been needed to cover peaks but setting prices high through peaks and low offpeak in order to be dispatched. **Type:** Transition risk to earnings **Time Horizon:** Short term (now to 2030) **Risk rating** · Hazard: Carbon pricing · Likelihood: Possible · Consequence: Large · Overall: Medium **Materiality:** This risk is not a key risk to Meridian, but is linked to Power system flexibility. This risk has been included to demonstrate this disclosure that carbon price risk is considered and managed.	Negligible impacts during FY23 with minimal calling on financial derivative products. More widely, the price for NZ ETS collapsed from late 2022 as the NZ Government did not adopt the Climate Change Commissions (CCC) recommendations. In late July 2023 following a legal challenge, the Government has changed approach and affirmed the CCC's recommendations. This has seen prices recover and set expectations for higher prices. Meridian recently submitted on discussion documents for a review of the NZ Emissions Trading Scheme (ETS), and a redesigned NZ ETS Permanent Forest Category. The potential for changing Government policy settings are likely to continue. The potential for changing Government policy settings are likely to continue to remain a risk for long-term pricing and investment.	This risk will reduce over time, consistent with the Power system flexibility risk. **Potential financial:** Meridian has not yet quantified the carbon price component of the risk through exposure in the security of financial derivative products, this is likely to be a small part of the Power System Flexibility potential financial impact, based on ensuring the availability of financial derivative products over the next 5-10 years.	Management actions outlined under Power system flexibility apply here, which ultimately reduce dependency on flexible products priced from a carbon price benchmark. See Metrics and targets section for performance against relevant actions above.
TR3 – Transition supply chain risks –affordable and timely access to global supply chain goods and services There is a risk of renewable energy asset development/maintenance costs increasing, and timely access to goods being impacted, due to increased global demand for associated goods and services because of international policy and market demand for low carbon products.	As the world is decarbonising there will be global competition for the same products and materials. Meridian is a small purchaser on a global scale so it has to be strategic in how it secures the goods and services required. Meridian has completed an initial mapping exercise to identify where some of its critical components are sourced from, and have an understanding of alternative suppliers / source locations if needed. At the same time, Meridian is committed to ethical sourcing and recognises that its suppliers having growing businesses in a range of countries with differing employment standards. There is opportunity to increase Meridian's visibility of its global supply chain, and increase its assessment quality for this risk. **Type:** Transition risk to supply chain **Horizon:** Short term (to 2030) **Risk rating** · Hazard: Supply chain · Likelihood: Almost certain · Consequence: Large · Overall: Medium **Materiality:** This climate-specific risk is not a key risk to Meridian, but it does have a related Enterprise risk Economic climate, driven by a range of factors such as COVID-19, the Russian-Ukraine conflict and growing global demand for renewables. This risk has been included to demonstrate that the risk is being actively managed.	Meridian has been experiencing increasing lead times and increasing prices, however, the impact of increased competition from climate-motivated demand is negligible compared to the impact of geo-political factors, inflation, and COVID-19 related supply chain disruptions. **Actual financial impact:** Nil material or specifically attributable to this risk (other factors dominated) *Note: Meridian has a separate Physical supply chain risk.*	Over time Meridian expects the installed capital cost of wind and solar generating technology to fall, however, in the short term, global demand may mean these savings are not realised. Furthermore, this demand surge introduces possible environmental and social standard risks requiring investments in supply-chain transparency, and possible cost premiums from sole sourcing where required to mitigate the risks. **Potential financial impact:** Not yet quantified due to significant uncertainty associated with the basis for any potential financial quantification. Supply chain impacts influenced by multiple factors beyond climate-specific.	Meridian ensures all development contracts are negotiated at the beginning of a project and are incorporated into the financial investment decision. Meridian is building supply chain capability including technology that allows more centralisation and functionality to support increased visibility of its supply chain. Today Meridian completes Modern Slavery due diligence across its high risk procurement categories, and targeted additional due diligence for major developments, to aid in its ethical sourcing commitment. This includes seeking visibility of mineral re-purposing, recycling and recovery initiatives. Investigation planned to secure long-term agreement with wind turbine supplier to further mitigate supply chain risks (including geopolitical, pandemic, climate-related).

Strategy continued

Table 5. Physical opportunities.

Opportunity	Assessment summary	Current impacts (FY23)	Potential future impacts	Management actions
PO1 – Annual and seasonal hydro inflow profiles improving generation and demand alignment	Projected changes to Meridian's inflow profiles in the Waiau and Waitaki catchment areas are likely to better match anticipated changes in New Zealand's electricity demand profile. **Time horizon:** Long term (2050-2100) **Alignment to TCFD:** Energy source, Resilience **Opportunity rating** · Exposure: Medium · Benefits: Large · Overall rating: Medium **Materiality:** This is not a key opportunity for Meridian but is a noteworthy benefit of potential interest to its stakeholders. This opportunity has been included for visibility that Meridian has identified and assessed the potential future impact.	Meridian is not yet seeing an increase it can attribute to climate change. El Niño and La Niña weather patterns tend to have a more immediate impact which may mask long term climate patterns. **Actual financial impact:** nil	Meridian expects to see margin uplift as a result of price-participation improvement. This would be a result of Meridian's electricity supply and demand better aligning during wholesale market trading – largely hydroelectricity assets would be expected to achieve higher returns as a result of the changes to the hydro inflow profile from climate change. **Potential financial impact:** $10–$60 NZ million annualised. Represents exposure of less than 5% of average forecast generation revenue.[1] **Quantification methodology:** Estimated potential financial impact is an annualised figure modelled over a 30-year time horizon. This is calculated using an assumed increase in price participation of 2%–10% by 2050 for Meridian generation assets and the relative margin uplift under Revolution and Evolution modelling demand outlooks (representative of Net Zero Revolution and Adaptative Evolution scenarios). There is significant uncertainty in this calculation.	Wholesale market team manages the changing inflow profile using a market optimisation approach informed by weekly inflow forecasts and analyses of short- to medium-term weather patterns.
PO2 – Increased electricity demand from agriculture irrigation and summer cooling load	Changing weather patterns mean Meridian's customer base may increase electricity consumption as a result of physical climate change impacts, mainly for agricultural irrigation or for summer cooling. **Time horizon:** Long (2050-2100) **Alignment to TCFD model:** Resilience, Markets **Opportunity rating** · Exposure: Low · Benefits: Large · Overall rating: Medium **Materiality:** This is not a key opportunity for Meridian but has been included for visibility that it has identified and assessed the potential future impact of electricity use changes customers may experience as a result of changing weather patterns due to global warming.	Meridian is not yet seeing a material increase in electricity demand it can directly attribute to the physical impacts of climate change (i.e., irrigation / summer cooling needs). **Actual financial impact:** nil	As the number and intensity of hot days and periods of drought increases, Meridian would expect demand from agriculture, residential and commercial cooling to increase. The scale of demand increase is highly dependent on our climate future. For example, between Meridian's Adaptive Evolution and Hot House scenarios, hot days per year could increase by 5–50 in some regions. Hydro assets could be used more to manage peaking capacity. Planned increase in solar generation capacity will align well with potential electricity demand increase from physical climate impacts. **Potential financial impact:** $5–$10 NZ million per annum. Represents exposure of less than 1% of average forecast generation revenue.[1] **Quantification methodology:** Annualised financial impact range over the long term based on potential electricity demand difference between an Adaptive Evolution and Hot house scenario future.	To respond to the potential requirement for new renewable generation Meridian maintains a pipeline of development options. See Metrics and targets section for performance against relevant actions above.

1 Forecast total generation revenue - annual average over 20-year outlook, as stated in FY23 valuation report.

Strategy continued

Table 6. Transition opportunities.

Opportunity	Assessment summary	Current impacts (FY23)	Potential future impacts	Management actions
TO1 – Electrification of transport and process heat, and virtual power plant	Increased electricity demand through transport and process heat electrification is an opportunity for business growth. These use case applications also create additional potential benefit through demand flexibility – offering a new market opportunity through a Virtual Power Plant (VPP). By working smartly with EV chargers, industrial heat processes, solar, batteries, hot water cylinders and Meridian customers, a VPP will make things simple for customers to maximise uptake. **Time horizon:** Medium (10-30 years) **Alignment to TCFD:** Resource efficiency, resilience, markets, products/services. **Opportunity rating** • Likelihood: Possible • Benefit: Significant • Overall rating: High **Materiality:** This opportunity is a central part of Meridian's Retail Strategy with progress reporting and governance oversight at Board level. The opportunity is a feature in the shared Executive Scorecard.	During FY23 Meridian's efforts have focused on the continued roll out of its Zero charging network, additional commitments from customers secured for process heat electrification with demand response provisions included, and the piloting of a Virtual Power Plant. **Actual financial:** $1 NZ million **Quantification methodology:** Accounts for costs and revenue associated with Zero charging network roll out, process heat electrification work during FY23 and minor early VPP pilot costs.	Revenue upside most significant over the medium term. Potential effects of transport and process heat electrification, and VPP uptake based on Evolution and Revolution modelling (linked to Meridian's Net Zero Revolution and Adaptive Evolution scenarios). **Potential financial impact:** $10-$40 NZ million. Represents exposure of less than 3.5% of average forecast generation revenue.[1] **Quantification methodology:** Estimated potential financial impact is an annualised figure modelled over a 30-year time horizon. This is calculated using assumed new electricity demand profiles for these use cases under Evolution and Revolution models and applying a possible margin range. There is significant uncertainty to this calculation.	Meridian is pursuing alternative forms of electricity demand across workstreams focused on the electrification of industrial heat and transport, and the scaling of a Virtual Power Plant. Initiatives include: • Certified Renewable Energy (CRE) offer and decarbonisation fund • Process heat electrification offer • Zero EV charging network • EV pricing plan offer • Virtual power plant • Meridian's development pipeline to underpin generation capacity growth for multi-sector decarbonisation See Metrics and targets section for performance against relevant actions above.
TO2 – Sustainability leadership and ESG performance	Meridian has an established focus on sustainability and ESG performance. As this has become a key criteria for investors (among other stakeholders), Meridian could maintain an advantage over organisations not relatively as mature. **Time horizon:** Short term (now to 2030) **Alignment to TCFD:** Markets **Opportunity rating** • Likelihood: Possible • Benefit: Major • Overall rating: High **Materiality:** This opportunity is potentially material to Meridian with performance reporting and improvement plans having oversight up to Board level, via the Safety and Sustainability Committee, and measures in the shared Executive Scorecard.	**Potential financial:** major **Quantification methodology:** with significant uncertainty associated with any quantification method, Meridian has opted not to disclose a specific indicative figure.	Attractive investment proposition through sustainability leadership. **Potential financial:** Major. **Quantification methodology:** with significant uncertainty associated with any quantification method, Meridian has opted not to disclose a specific indicative figure.	Develop and deliver new climate-focused initiatives such as the renewable development pipeline and the new Harapaki wind farm currently under construction. Deliver and disclose progress against business emission reductions – Half by 30. Maintain wider ESG performance to retain inclusion in the S&P Asia Pacific Dow Jones Sustainability Index. See Metrics and targets section for performance against actions outlined above.

1 Forecast total generation revenue – annual average over 20-year outlook, as stated in FY23 valuation report.

Strategy continued

Table 6. Transition opportunities continued.

Opportunity	Assessment summary	Current impacts (FY23)	Potential future impacts	Management actions
TO3 – New markets – green hydrogen/ammonia (Southern Green Hydrogen)	Meridian is pursuing an opportunity to produce green hydrogen/ammonia at scale to meet growing international demand, and potential domestic use for hard to abate use cases. It is anticipated the green hydrogen/ammonia plant will be designed to ramp down to support the NZ electricity sector during years of low inflows or high demand. **Alignment to TCFD:** Markets, products/services, resilience. **Time horizon:** Medium term (2030-2050) **Opportunity rating** • Likelihood: Possible • Benefit: Major • Overall rating: High **Materiality:** This opportunity is potentially material to Meridian with performance reporting and improvement plans having oversight up to Board level.	Meridian completed an RFP during FY23 to confirm development partners Woodsite and Mitsui & Co., Ltd., to advance the Southern Green Hydrogen opportunity. Murihiku Regeneration, representing Ngāi Tahu and local rūnanga of Murihiku, are working closely with the project team to ensure alignment with their local vision for the region. Work this year has continued with a focus on establishing a Joint Venture, and finalising the workstreams required, to advance toward a Final Investment Decision (FID) by 2026. **Actual financial:** $3 NZ million **Quantification methodology:** Meridian SGH project expenses for FY23	Meridian FTEs will continue to advance specific workstreams up to FID in 2026. Progress beyond this point would include construction efforts and transition to an operating facility and supply to ammonia market(s). **Potential financial:** Not quantified. **Quantification methodology:** At this stage of the Project there remains significant underlying uncertainties that mean the potential future financial impacts remain unquantifiable. The uncertainties include: tenure of existing large demand, MW size of SGH plant, ammonia offtake price and terms, capex for plant and underlying project opex. The pre-FID development period aims to confirm these underlying uncertainties in an effort to build a compelling business case.	Complete the establishment of a SGH Joint Venture and begin work on workstreams Meridian is responsible for. Final Investment Decision planned for 2026. See Metrics and targets section for performance against relevant actions above.

Metrics and Targets

Greenhouse gas emissions

- Meridian prepares an annual GHG Inventory, including scope 1, 2 and 3 emissions. Its FY23 GHG Inventory is available on the Meridian website, and a summary of these emissions are reproduced from its GHG Inventory in Table 7, of note:
- Emissions for the base year (FY21) were restated, as a result of a change in emission factor methodology impacting base year emissions, greater than our significance threshold of 5%. New spend-based emission factors were published in FY23, and have been applied.
- The largest absolute increase compared to FY22 for operational emissions was in upstream transportation and distribution (2,397 tCO2e) due to increase in scope 3 distribution emissions.
- One-time construction emissions have increased associated with the construction of a wind farm (see action taken to avoid)
- 100% of business emissions (including one-time construction) are now offset.

Meridian's GHG Inventory is stated in accordance with the requirements of International Standard ISO 14064-1:2018: Greenhouse gases – Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals, the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011).

Meridian applies the operational control and consolidation approach to its emissions and its GHG Inventory outlines how it has derived its facilities and operations within the boundary. This consolidation approach allows Meridian to focus on those emission sources over which it has control and for which it can therefore implement management actions, consistent with Meridian's corporate responsibility objectives. Facilities included in Meridian's GHG Inventory boundary include:

- **Meridian NZ:** comprised of legal entities: Meridian Energy Limited, Dam Safety Intelligence Limited
- **Flux NZ:** comprised of legal entities: Flux Federation Ltd, Flux UK Ltd

Emission factors used in the preparation of Meridian's GHG Inventory are outlined in section 11, page 22 of its GHG Inventory. In summary, emission factors used were sourced from Ministry for the Environment (MfE, New Zealand)[3] or Department for Business, Energy & Industrial Strategy (DBEIS, United Kingdom)[4].

Meridian's GHG Inventory is subject to independent reasonable assurance by Deloitte Ltd 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.

Table 7. FY23 GHG emissions.

Business activity	Scope	FY23 Total Emissions tCO_2e	Offsets**	FY21 tCO_2e (base year)	FY22 tCO_2e	FY23 remaining tCO_2e
Operational	Scope 1	1,191	1,191	1,020	643	0
	Scope 2 (market based)	2	2	14	2	0
	Scope 3 operational	32,270	32,270	29,557	32,225	0
	Subtotal	33,463	33,463	30,591	32,870	0
Energy purchased and on-sold*	New Zealand electricity	0	0	0	0	0
One-time construction	Scope 3 one-time construction	14,295	14,295	284	8,242	0
		14,295	14,295	284	8,242	0
Total Group value chain emissions (S1, 2 & 3 (market based))* **		47,758	47,758	30,875	41,112	0

Additional indicators	FY21	FY22	FY23
Electricity generation (kWh) Meridian NZ	12,692	13,557	13,903
Emissions from fuel used to generate electricity (tCO2e)	0	0	0
Generation emissions intensity (tCO2e.GWh of generation)****	0	0	0

* Emissions of Meridian's retailed electricity using the market-based methodology. In New Zealand we use the annual netting off methodology.

** Offsets include credits cancelled by suppliers against their own emissions, and Gold Standard Voluntary Emission Reductions for the balance.

*** Total emissions are calculated using the market-based methodology for Scope 2 emissions. All emissions exclude historical Meridian Australia emissions (business sold end January 2022).

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

3 Ministry for the Environment. 2022. Measuring emissions: A guide for organisations: 2023 detailed guide. Wellington: Ministry for the Environment. environment.govt.nz/publications/measuring-emissions-a-guide-for-organisations-2023-detailed-guide/

4 UK Government GHG Conversion Factors for Company Reporting: 2023 full set v1.1 www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023

Metrics and Targets continued

Meridian has a GHG reduction target of halving FY21 operational emissions by FY30 – which includes a 50% scope 1 and 2 reduction, and a 50% scope 3 reduction (excluding all one-time construction emissions from major projects and all activities that are capitalised as part of renewable energy projects).

Meridian has had approval from the Science Based Targets initiative (SBTi) that its commitment to reduce absolute scope 1 and 2 GHG emissions by 50% by FY30 from a FY21 base year is in line with a 1.5°C trajectory, with its further commitment noted to also reduce absolute scope 3 GHG emissions by 50% within the same timeframe[5].

Meridian has also committed to set long-term emission-reduction targets with the SBTi in line with reaching net zero by 2050, and it's excited to be part of the Business Ambition for 1.5°C campaign. Meridian publicly discloses on its Half by 30 initiatives, and progress towards this commitment annually. Meridian's **Climate Action Plan**, which includes its Half by 30 roadmap (and interim targets to FY30), is publicly available on the Meridian website.

Meridian's Half by 30 target is also included in the summary Metrics and targets table below.

Meridian's **Climate Action Plan** also outlines one of its top priorities – renewable energy generation – which includes the construction of new assets to increase capacity in New Zealand. Meridian is pleased to have begun construction at two sites – Harapaki wind farm and Ruakākā Energy Park. How Meridian builds matters. Meridian can bring significant reductions to the emissions from its construction activities and it is important to Meridian to decouple the growth of its development pipeline with growth in associated emissions – both during construction and the operational life of its assets. Refer to Table 10 for detail on associated one-off construction project targets.

Key risks that may affect Meridian's ability to reduce business emissions include:

- decoupling business growth from emissions growth. As Meridian looks to invest in and build further renewable generation facilities, it must continue to proactively minimise one-off construction emissions and 'design out' future operational emissions. Meridian sets Sustainability Management Plans for all new renewable generation projects, with KPIs including emissions reporting and reduction requirements. Meridian will continue to report on the actions taken to minimise these emissions, and demonstrate its commitment to continuous improvement over time.
- addressing the large proportion of operational emissions (>95%) in its supply chain. Meridian is committed to addressing these emissions, and is approaching this in a targeted way where its efforts will create impacts that would not yet otherwise occur. There is an inherent risk in addressing supply-chain emissions based on the independent organisations in Meridian's supply chain, and the number and size of the organisations involved.
- some emission sources are in the 'hard to abate' sectors, such as those involving air travel and heavy vehicles and machinery. Meridian does not track a GHG emission-intensity metric. As a generator of 100% renewable energy, the fuel source for the electricity generated has no emissions. Therefore, GHG emission intensity is not the most relevant metric for Meridian to adopt to track emission reductions.

Ika Rere electric ferry, Days Bay, Te Whanganui-a-tara Wellington

5 Excluding Meridian Australia FY21 emissions from the baseline after its sale in January 2022.

Metrics and Targets continued

Remuneration

Meridian's annual report provides a detailed description of its approach to remuneration. Pay for Executives includes a 30% Short term incentive (STI) component and 50% for the Chief Executive. Up to 40% of the STI is based on performance against a Board-approved scorecard. Table 8 describes alignment to climate-related issues within each performance area.

Table 8. Executive Scorecard Summary FY23.

Performance Area	Description	Climate change alignment	Weighting
Decarbonisation Led Growth	Develop a high quality diverse suite of renewable energy options	Focus is on leveraging opportunities to support New Zealand and international decarbonisation efforts	20%
Customer	Customer satisfaction and growth	Includes adding power system flexibility which directly addresses one of the transition risks	20%
Optimise Business performance	Execute options and optimise portfolio needs while reducing risk	Includes operational changes that support NZ's move to 100% renewable energy	20%
NZ Aluminium Smelter (NZAS) Closure Mitigation	Find new sources of demand in the South Island to mitigate the impact of potential NZAS closure	N/a	20%
Sustainability	Grow a clear sustainability leadership position through purposeful action	Strong ESG performance including emissions reduction goals	10%
Investment Stability	Regulatory, legal and government relations accelerate and improve NZ's decarbonisation transition	Includes industry and other external influence to support NZ's decarbonisation	10%

The sum of the above may also be varied based on workplace safety culture, overall workplace engagement, and individual performance.

As described in the Governance section, when annually setting and assessing performance against the Executive Scorecard, the Board considers key initiatives that are designed to address material risks, opportunities and to execute Meridian's strategy.

Exposure to Risks and Opportunities

Physical Risks

100% of Meridian's generation assets are exposed to the physical risks of climate change to a degree – impacts vary by asset type, location, and time horizon (as summarised in the Strategy section). Meridian's hydro assets have lower relative vulnerability and any potential negative financial impact from extreme inflow events (physical risk) is mitigated by improving average annual alignment (physical opportunity) between New Zealand electricity demand and the outlook for wetter winters and drier summers. Meridian is implementing mechanisms to factor 30 year forecasts into hydro generation asset planning that will inform any investments required to further mitigate risks. For example, Meridian is working with Dam Safety Hydrology Group on revised precipitation forecasts to accommodate climate change more accurately.

The vulnerability of wind, solar, and battery is influenced by geographic location and potential impacts to land and surrounding infrastructure.

The lifecycles of the assets are 30 years, after which time Meridian typically plans for these to be replaced with new, more efficient, technology. Cyclone Gabrielle demonstrated that damage to roading and transmission outside of our control can slow projects, impact its ability to generate, and slow maintenance. The financial impacts for events such as this are largely mitigated by insurance.

Specific physical risks to our assets from exposure to potential climate-related impacts include those in the Strategy section: PR1, PR2 and PR3.

Transition Risks

As presented in the Strategy section, Meridian uses hedging to manage the power system flexibility risk that is created by a reduction in thermal generation. Meridian's investment of $20m equates to 2% of forecast generational revenue.[6] Supply chain impacts are difficult to estimate but the impact of delays to its renewable pipeline could be significant to the timeframe or revenue of a delayed project.

Climate-related opportunities

Meridian's strategy has been anchored on climate action and supporting New Zealand's decarbonisation. Meridian's current renewable generation capacity is 2.8GW and it has a pipeline to start projects that will increase by 786MW (or 30% of current capacity) by 2030 and a deep pipeline of 4.7GW (or 170% of current capacity) of advanced prospects that might start by 2050. This does not include grid scale battery projects which would provide 200MW.

6 Forecast total generation revenue – annual average over 20-year outlook, as stated in FY23 valuation report.

Metrics and Targets continued

Capital Deployment

Most asset maintenance that builds resilience to climate change will be drawn from operational budgets. Table 9 describes the capital expenditure and investment towards climate-related risks and opportunities.

Table 9. FY23 climate-related Capital deployment.

Item	FY23 Spend	Method/assumptions
New renewable development (supports climate-related risks and opportunities: PR2, TR1, TR2, PO2, TO1, TO2)	$259m	Includes costs relating to Harapaki project and Ruakākā battery. We have a further approx. $2.5–3.5bn estimated over 7 years to the end of FY30 which covers 7 projects.
Investment in energy solutions projects (supports climate-related risks and opportunities: PR2, TR1, TR2, TO1, TO2)	$4.8m of capital expense recognised on the balance sheet Approximately $2m of operating expenditure incurred	The amount reflects spend on various energy solution initiatives undertaken by the Retail business unit. These initiatives range from offering rooftop solar to both residential and commercial customers, building out EV charging network across New Zealand, supporting commercial customers transition to electric fleet and enabling industrial customers to convert from fossil fuel-based boilers to fully electric. The amount budgeted for FY24/FY25 initiatives is around $7m.
Certified Renewable Energy (supports climate-related opportunities: TO1, TO2)	$0.5m	Meridian markets Renewable Energy Certificates (RECs) that enable Customers to report their business' market-based scope 2 emissions, the ones linked to their electricity usage, as zero. These certificates enable customers to demonstrate their commitment to sustainability, applies market influence on generators to increase renewable generation and provides tangible evidence that they are supporting renewable energy generation. These are tradable securities and Meridian ring fences profits generated from the creation and issuance of these certificates for charitable purposes with KidsCan being the main recipient in FY23.
Southern Green Hydrogen (supports climate-related risks and opportunities: PR2, TR1, TR2, TO2, TO3)	Commercially sensitive	Work this year has focussed on identifying partners and establishing a joint venture and the workstreams required to advance towards an investment decision by 2026.

Selected metrics – with no targets

Meridian applies carbon-pricing assumptions in its climate-related models, which are informed by current New Zealand emissions unit (NZU) pricing and policy assumptions. In FY22, the carbon pricing assumptions applied ranged from $70/tonne CO2eq in the short term up to $250/tonne CO2eq in the longer term. Meridian committed to establishing in FY23 an internal emissions price focused on catalysing delivery against its Half by 30 target – its current approach uses NZ Emissions Trading Scheme (ETS) pricing as a proxy for specific projects, also factoring in avoided offsetting costs if material and relevant. Meridian is assessing the adoption of a higher internal carbon price, to drive decarbonisation pace and reflect the social cost of carbon – its **Climate Action Plan** will continue to be updated as Meridian advances this work.

Selected metrics – with targets

Meridian's priority metrics and targets to manage its climate-related risks and opportunities, and performance against them, are outlined in Table 10. As an overarching approach, Meridian adopts bespoke metrics and targets for material climate-related risks and opportunities, including enabling project-specific metrics and targets.

Meridian has implemented some structural changes to help better leverage climate-related opportunities. This included setting up a new team focussed on Energy Innovation in its Retail business unit. This has led to a change in focus and at the time of this disclosure, a long term approach to targets and metrics is still in development. Meridian looks forward to sharing targets and metrics in the 2024 disclosure that exhibits its progress in helping its customers lower their emissions, and how Meridian creates more flexibility in the New Zealand power system.

Metrics and Targets continued

Table 10. Climate-related metrics and targets summary.

	Target	Baseline and History	Performance	Method/assumptions
GHG gross operational emissions	Half by 30: 50% reduction in operational emissions by FY30, from an FY21 baseline. Comprised of SBTi verified targets: • reduce absolute scope 1 and 2 GHG emissions by 50% by FY30 from a FY21 base year, in line with a 1.5°C trajectory. • further commitment noted to also reduce absolute scope 3 GHG emissions by 50% within the same timeframe. Note more detailed targets for Meridian's Half by 30 goal are disclosed in its **Climate Action Plan**.	**FY21 (baseline):** 30,591 t CO2eq (scope 1 + 2 = 1,034 t CO2eq of total, scope 3 = 29,557 tCO2eq). **FY22:** 7.4% increase to 32,870 t CO2eq (scope 1 + 2 = 645 t CO2eq of total, scope 3 = 32,225 t CO2eq).	**FY23**: 33,463 t CO2eq (scope 1+2 = 1,193 t COeq of total, scope 3 = 32,270 tCO2eq), a 9% increase on FY21 baseline. Refer to Meridian's **Climate Action Plan** and GHG Inventory for full detail on underlying emissions sources and outcomes of planned emission reduction initiatives during FY23.	Meridian's **Climate Action Plan** details the assumptions in the plan to halve operational emissions. Method of calculation: Meridian's emissions are prepared using the operational consolidation approach and stated in accordance with the requirements of International Standard ISO 14064- 1:2018: Greenhouse gases – Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals, the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011). Target supports Strategy section climate related opportunity: TO2.
Reduction of emissions for one off renewable energy projects	**FY23 Harapaki project:** • emissions /100km travelled <25kg CO2/100km (excludes site plant and machinery). • >1 continuous improvement per quarter that leads to tangible sustainability benefits. **FY23 Ruakākā project:** • Emissions target for plant & machinery of 2lm3 (2 litres of diesel per cubic metre of material moved). equates to 2l / 5.39kgCO2e/m3. • >5 continuous improvements per quarter that leads to tangible sustainability benefits. • 100% of monthly GHG data provided.	**FY22:** 8243 t CO2eq (Harapaki emissions). **FY21:** 285 t CO2eq (Harapaki emissions). Targets were established in FY23 (base year) following the establishment of processes to capture full emissions.	**FY23 Harapaki:** • 20kgCO2e CO2/100km (target achieved). • 1 per month (target achieved). **FY23 Ruakākā:** • Emissions plant and machinery target 1.8l / 5.39kgCO2e/m3. • Ruakākā project has been in the construction phase a minority of FY23, performance on other targets not yet available. Refer to Meridian's **Climate Action Plan** for full detail on its focus and impacts to reduce one-off construction emissions.	Sources of Uncertainty: Historical data (FY22 and earlier) excluded some emissions elements (for example construction of pond used for onsite water). Method of calculation: The Ruakākā project has only been operating since March 23 so there is no historical data to provide. Target supports Strategy section climate-related opportunity: TO2.
Forever Forests emission removals A permanent carbon sink – transitioning to 100% natives over time.	Create a supply of high quality emission removals equivalent to Meridian's expected residual operational emissions by FY30 (circa 15,000 tCO2eq), optimising other benefits also such as biodiversity and social outcomes. 700,000 trees in the ground by the end of FY24. We track metrics on land acquired, stems planted and NZUs received for this project to ensure we are on track. We have acquired 100% of the land needed. Disclosed here annual progress on stems planted and credits received. The target this programme is designed around is to secure at least a 15,000 t CO2eq annually supply of credits from FY30. The target was last base-lined to FY21, consistent with Meridian's Half by 30 base year target.	**FY21 (baseline):** no credits received, on track for FY30 credit target. **FY22:** no credits received, on track for FY30 credit target. In FY23 we secured 100% of the required land. We started receiving the first tranche of credits from 2020 plannings with further planting registered with the Ministry for Primary Industries (MPI).	**FY23:** 2364 credits received based on FY22, this equates to 2364 tCO2eq (on target). We have now secured 100% of the land required.	Sources of uncertainty include: • potential change in Government policy to exclude exotics from the permanent category of the ETS (relevant to Meridian's initial mixed model approach of exotics/ natives, transitioning to 100% natives over time). • survival rate of plants. • any significant delays in delivery of seedlings. Method of calculation: Based on credits in the current year for the previous year's position. Target supports Strategy section climate-related opportunity: TO2.

Metrics and Targets continued

Table 10. Climate-related metrics and targets summary continued.

	Target	Baseline and History	Performance	Method/assumptions
Renewable generation pipeline	7 projects underway by 2030. 3 buildable options by 2024.	**FY22 (baseline):** One confirmed financial investment decision. On track. In 2022 we had the Harapaki project underway, commitment to invest in a 100MW battery and 120MW solar farm, and plans to consent a 60MW wind farm (Mt Munro). The full pipeline represents 2.3GW, with 1.1GW secured and 1.2GW under advanced prospecting. Baseline capacity is 2.8GW.	**FY23:** Two confirmed financial decisions. On track to meet targets. **Underway:** Ruakākā grid scale battery project, and Harapaki wind farm. **Announced:** The solar farm (120MW) at the same site is on track for a financial decision in December 2023. Mt Munro (60MW) resource consent application was lodged in May 2023. We have a deep pipeline of 4.7GW (to 2050), with 1.5GW secured, and 3.2GW in advanced prospects.	Sources of uncertainty: • Cost and time to build (materials, shipping, civil works). • Regulatory changes (environmental consents and cost). • Ability to connect to transmission network in a timely manner. Method of calculation: Based on projects and progress on confirming projects in the Development pipeline. A project is confirmed following the Financial Investment Decision. Target supports Strategy section climate-related risks and opportunities: PR2, TR1, TR2, PO2, TO1, TO2.
New renewable generation and storage delivery	176MW capacity from end FY24.	**FY21 (baseline):** The Harapaki wind farm (176MW) was announced FY21 (February 21) and on site works were under way August 21.	Cyclone Gabrielle delayed the Harapaki project (176MW) by 1 quarter and it will start generating from October 2023. Progress this year has included: • 95% of cabling installed. • 95% of earthworks and roading complete. • Switchyard components installed. • Services building has been blessed and is certified for commercial use. Ruakākā battery project started March 23 and completion is expected Sept 24.	Sources of uncertainty: • Weather affecting remainder of civil works (site is at 730–1,100m elevation). • Increases in allowed inflation escalators within contracts. • Freight and materials – costs and lead times are very high. • The extent of any future COVID-19 or geo-political impacts. • Access to experienced staff. Method of calculation: Installed capacity quantified at asset commissioning. Target supports Strategy section climate-related risks and opportunities: PR2, TR1, TR2, PO2, TO1, TO2.
Southern Green Hydrogen	Take Southern Green Hydrogen to a positive Final Investment Decision by 2026.	In FY22 a feasibility study was completed and the selection of developers was under way. Target baseline FY23.	FY23: The project has managed to attract two very large and capable international partners.	Sources of uncertainty: • Offtake customer yet to be finalised and subject to further negotiation. • International subsidy regimes yet to be clarified. • Tenure of existing large demand in Southland will impact timelines. • Cost and time uncertainties (supply chain constraints, inflationary pressures). Target supports Strategy section climate-related risks and opportunities: PR2, TR1, TR2, TO3.

Metrics and Targets continued

Table 10. Climate-related metrics and targets summary continued.

	Target	Baseline and History	Performance	Method/assumptions
Transport electrification	250 AC EV chargers (500 charging points) implemented by FY23. This was set as an ambitious stretch target. Targets for this will be superseded by customer decarbonisation targets in the next disclosure.	**FY21 (baseline):** nil. **FY22:** 61 chargers (122 charging points) installed.	**FY23:** 237 charge points operational (202 AC, 25 DC) Over the course of this project Meridian's proposition evolved to place more focus across home, business and public charging, extended from AC only into DC charging as well. Meridian won EECA co-funding to deliver journey chargers in remote South Island locations including a battery backed charging solution using 2nd hand EV batteries. This project will help to complete the government's original target of a DC public charger every 75km on NZ's state highways. Meridian is also partnering with Wellington and Hutt City Councils to deliver close to 100 mainly DC destination charge points in the region.	Sources of uncertainty: • Connecting to electricity networks – complexity, cost and timing relating to EV charging electrical connection, especially for public charging is a challenge facing Charge Point Operators (CPOs). • Timely procurement of EV chargers. Method of calculation: count of installed chargers and charging points. Target supports Strategy section climate-related risks and opportunities: PR2, TR1, TR2, TO1, TO2.
Commercial-scale solar delivered	FY23 targets are commercially confidential, but include a kWp installation target for commercial-scale solar. Targets for this will be superseded by customer decarbonisation targets in the next disclosure.	**FY22 (baseline):** nil. In FY22 customer commitment was announced and others made but not yet announced with further build planning underway.	**FY23:** Targets met.	No significant sources of uncertainty to note. Target supports Strategy section climate-related opportunity: TO2.
Process heat electrification	600GWh agreed by FY23. This was set as an ambitious stretch target. Targets for this will be superseded by customer decarbonisation targets in the next disclosure.	**FY21 (baseline):** nil. **FY22:** 300GWh agreed.	**FY23:** 472GWh agreed This is a strong result against a target that was set as an ambitious stretch goal. Meridian also developed and contracted demand flexibility which makes these projects more effective and financially viable.	Government Investment in Decarbonising Industry Fund expanded to support further decarbonisation projects over the next four years. This commitment will enable Meridian and others to continue delivering industry emissions abatement. Connecting to electricity networks and unlocking government co-funding are challenges facing businesses electrifying process heat. These challenges are likely to impact on the speed of project delivered. Method of calculation: Sum of the GWh of agreed projects. Target supports Strategy section climate-related opportunities: TO1, TO2.

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