



GENESIS ENERGY LIMITED
CLIMATE STATEMENT
FOR THE REPORTING PERIOD
1 JULY 2023 TO 30 JUNE 2024
21 AUGUST 2024

Climate



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1. Message from the Chair and Chief Executive



Malcolm Johns
CHIEF EXECUTIVE

Barbara Chapman CNZM
CHAIR

To reach net zero 2050, New Zealand must deliver the 60 – 95 – 100 formula by 2050. At least 60% of New Zealand’s energy needs to come from electricity, at least 95% of that needs to be renewable and electricity needs to be available 100% of the time.

Genesis has a unique role to play in 60 – 95 – 100 to support the country’s transition to net zero 2050 and reduce our greenhouse gas emissions to help address climate change. This role is integral to our purpose: powering a sustainable and thriving Aotearoa.



Our Gen35 strategy, released in FY24, outlines how we will take action over the next 10 years to reduce emissions by growing renewables, supporting our customers to electrify, and managing increasing energy demand, while ensuring our customers have stable, reliable and cost-effective energy.

Climate change legislation set net zero 2050 as the destination for New Zealand’s transition. To achieve that, New Zealand homes and businesses need to commit to how they will reach at least 60% electrification by 2050.

Energy is a common factor in all prosperous and thriving societies. Access to a reliable and affordable supply of electricity is important in growing people’s confidence to continue to electrify more of their lives and businesses and to see renewable electricity as both an economic and social development platform.

Genesis Energy Limited (Genesis) plays a key role in New Zealand’s transition. We will continue to help our customers decarbonise to reach the electrification goal and we will deploy over \$1 billion of our capital to help deliver new renewable generation and grow our EBITDAF. As the renewable energy supply grows, we expect Huntly Power Station will evolve to become the Huntly Portfolio. It will play a unique and critical role in ensuring the uninterrupted availability of electricity and will increasingly be powered by biomass with grid scale battery backup.

In FY24, our emissions increased compared to FY23. With hydro levels dropping back from last year’s near historic levels, the unexpected outage of Unit 5 and gas supply constraints, meant we relied on more coal generation. Unfortunately right now less gas means more coal. We look ahead to winter 2024 with some caution. At the time of writing, national hydro storage is fluctuating, and gas supply is tight, and is likely to be so for the next few years. Our thermal assets may be relied upon again to support our customers and the wholesale market, highlighting again the importance of thermal generation to system security.

At the same time, we continue to decarbonise our portfolio with construction starting on our first solar farm through a joint venture with FRV Australia, and we have progressed sourcing a sustainable supply of biomass to displace coal. Our planned battery storage units at our Huntly site would also reduce the need for gas and coal generation during times of peak demand. While our emissions reductions may vary year to year, the importance lies in our direction of travel over time.

Given the scale of the challenge, it is clear we need to work together in genuine long-term partnerships with industry, government, and households to deliver the change the country has committed to. We will not always agree but where we can find consensus, we will seek to move forward together both across and beyond our own sector to ensure progress while providing Genesis shareholders returns as Genesis and New Zealand transition to a renewable future.

Transparency is important to our investors, lenders and other creditors. Genesis is pleased to release its inaugural Climate Statement prepared under the Financial Markets Conduct Act 2013.

Through collaboration and partnerships, we are tackling the next frontier of climate action to give ourselves the best chance of ensuring the benefits of a lower emissions future are shared. As a key enabler of New Zealand’s transition, with assets that provide security of supply at a period when generation becomes increasingly renewable and intermittent, we welcome the opportunity to share our analysis of our climate-related risks and opportunities, and how our strategy is responding accordingly.

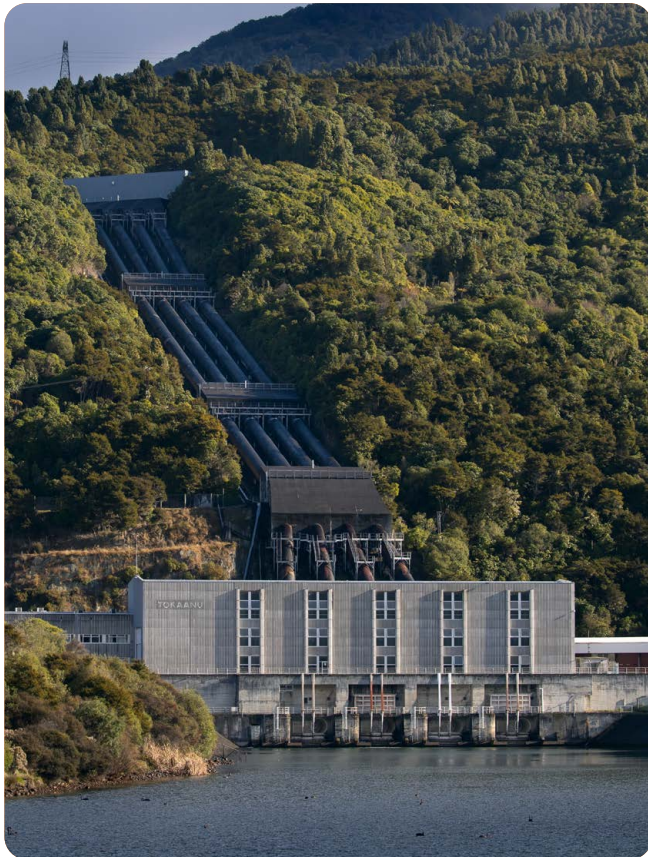

Barbara Chapman CNZM
CHAIR


Malcolm Johns
CHIEF EXECUTIVE

2. About this report

Reporting entity

Genesis is a Climate Reporting Entity (CRE) under the Financial Markets Conduct Act 2013 and as such is required to prepare a Group Climate Statement. This report includes climate-related disclosures for Genesis, its subsidiaries, controlled entities (together, 'Genesis' or the 'Group') and the Group's interests in associates and joint arrangements where relevant. The Group structure used in this report aligns with that used for Genesis's FY24 Consolidated Financial Statements.



Basis of preparation and statement of compliance

These climate-related disclosures comply with Aotearoa New Zealand Climate Standards (NZ CS) as issued by the External Reporting Board (XRB).

In preparing these climate-related disclosures, Genesis has elected to use adoption provision 2: Anticipated financial impacts contained within NZ CS 2. This adoption provision exempts Genesis from disclosing the anticipated financial impacts of climate-related risks and opportunities reasonably expected by Genesis, the time horizons over which they could reasonably be expected to occur and why quantitative information is unable to be provided.

This report was authorised for issue, for and on behalf of the Board on 21 August 2024.

Barbara Chapman
CHAIR OF THE BOARD

Catherine Drayton
CHAIR OF THE AUDIT AND RISK COMMITTEE

Reporting period and currency

This report covers the period from 1 July 2023 to 30 June 2024 (FY24). FY23 refers to the period from 1 July 2022 to 30 June 2023, similarly for any other financial year referenced in this report. Any reference to \$ in this report refers to New Zealand dollars.

Materiality

Information required by Aotearoa New Zealand Climate Standards must be disclosed if it is material; this requires us to apply our judgement when determining what to disclose. The Aotearoa New Zealand Climate Standard NZ CS 3 states that 'information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that primary users make on the basis of an entity's climate-related disclosures'. NZ CS 3 defines primary users of this report as our existing and potential investors, lenders, and other creditors.

To aid with making materiality judgements, we determine materiality by considering internal and external factors, such as whether the matter:

- Could plausibly have a material impact on Genesis in the short, medium, and/or long-term;
- Could reasonably be expected to influence an investment decision;
- Has been consistently raised by our primary users or is considered of high interest to them or is something they would expect to see being disclosed;
- Could have a significant impact on our reputation or our transition to a lower emission future; or
- Is relevant and needed to provide context.

When disclosing current impacts, we apply the same materiality as applied by our auditors for the Consolidated Financial Statements (refer to Deloitte's Audit Report in the [FY24 Integrated Report](#)).

The quantitative threshold used for our Consolidated Financial Statements is not considered appropriate when determining which climate-related risks and opportunities should be disclosed given: (i) we are considering the potential impact over multiple years out to 2050; (ii) the size of our balance sheet; and (iii) the complexity of our operations.

Disclaimer

This report contains forward-looking statements, such as potential impacts, climate scenarios, targets, forecasts and statements of our current intentions. Forward-looking statements are statements that are based on historical experience and various other factors that are reasonable under the circumstances. They are statements regarding our intent, belief or current expectations with regard to our business and operations and other climate and sustainability related commitments, targets, projections, scenarios, risk and opportunity assessments, pathways, forecasts, metrics and other proxy data.

Words such as ‘will’, ‘may’, ‘expect’, ‘intend’, ‘seek’, ‘would’, ‘continue’, ‘plan’, ‘estimate’, ‘potential’, ‘anticipate’, ‘believe’, ‘risk’, ‘aim’, ‘forecast’, ‘assumption’, ‘projection’, ‘target’, ‘goal’, ‘guidance’ or other similar words, are used to identify forward-looking statements. These statements reflect our current views on future events and are subject to change due to certain known and unknown risks, uncertainties, assumptions and other factors which are, in many instances, beyond our control, and have been made based on management’s expectations or beliefs concerning climate change and the potential impact on Genesis.

This report uses relatively lengthy time frames and plausible scenarios to assess potential impacts. Statements in this report use a greater number of assumptions and estimates than our Consolidated Financial Statements. These assumptions and estimates are subject to change over time, and, when coupled with the longer time frames used in these disclosures, make any assessment of materiality inherently uncertain. In addition, our climate-related risk and impact assessment capabilities and our strategic plan continue to evolve, and the data underlying these and market practice in relation to these disclosures also remain subject to evolution and change over time.

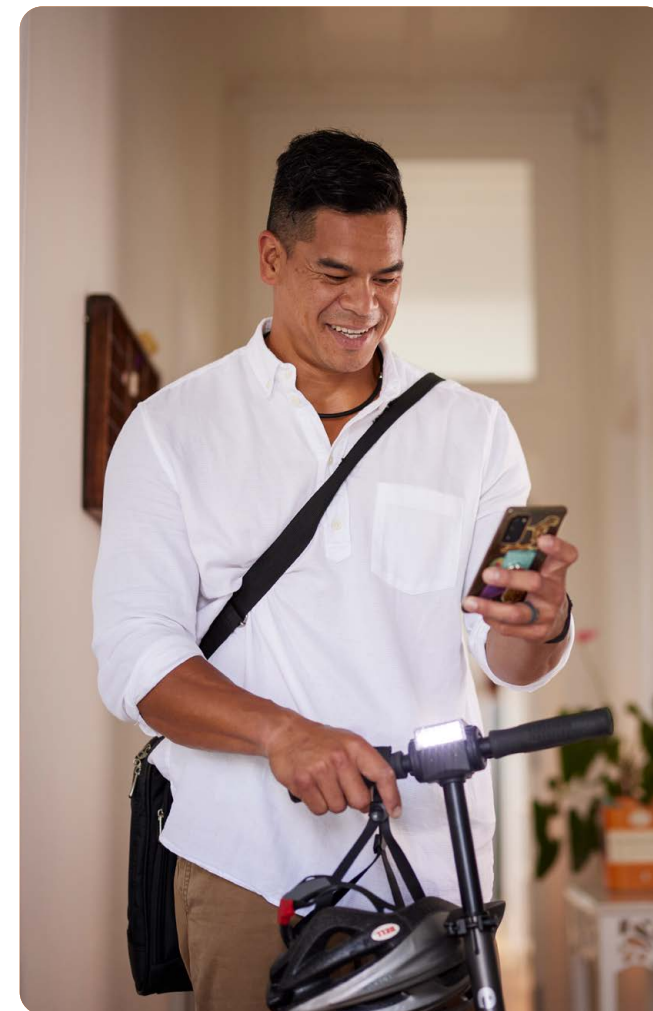
The information in this report includes non-financial metrics, estimates or other information that are subject to significant uncertainties, which may include the collection of data, and methodologies to analyse the data, which involves various estimates and assumptions, and/or underlying data that is obtained from third parties, some of which cannot be independently verified. As a result, we expect that certain disclosures made in this report may be amended, updated, recalculated, and restated in the future as the quality and completeness of our data and methodologies continue to improve. For clarity, Genesis makes no commitment to update the information in this report.

The forward-looking statements made in this report are not guarantees or predictions of future performance and there is a risk that estimates, judgements, assumptions, views, scenarios or projections may turn out to be incorrect and that these risks may cause actual outcomes to differ materially from those expressed or implied in this report. In particular, there is inherent uncertainty around future climate-related policy and legislation, current scientific understanding of climate change and its impacts.

Accordingly, Genesis gives no representation, warranty or assurance (including as to the quality, accuracy or completeness of any forward-looking statements set out in this report), that the occurrence of the events expressed or implied in any forward-looking statement made in this report will occur.

Enquiries

For any questions or comments regarding this report, please contact investor.relations@genesisenergy.co.nz.



3. Results at a glance

Launched

Gen35

Focused on electrification, flexibility and growing renewable generation

Electrification

8,325

Customers on EV plan

FY23: 4,153

Flexibility

Biomass

Good progress with suppliers to develop a long-term supply of biomass to displace coal

Grow renewables

Targeting up to

~500 MW

of solar development

Hydro generation decreased by

1,005 GWh

compared to FY23, driven by below average inflows, particularly in the South Island in FY24 compared to exceptionally high inflows in FY23

FY23: 936 GWh higher than FY22

Coal generation increased by

1,261 GWh

compared to FY23, driven by below average hydro inflows, gas supply constraints and the unplanned Unit 5 outage requiring higher use of Rankines on coal

FY23: 883 GWh lower than FY22

Flexibility

Battery

Plan to develop up to 400MW / 800 MWh of battery capacity. Financial investment decision for first 100 MW / 200MWh reached in August 2024

Final investment decision reached on

Lauriston solar farm

construction started in FY24, estimated to generate approximately 100,000 MWh annually

Carbon emissions increased by

1,205 kt CO₂e

59% increase in scope 1, 2 and 3 emissions compared to FY23, driven by increase in coal generation

FY23: 1,625 kt CO₂e lower than FY22

2025 Science Based Target

9%

reduction in scope 1 & 2 emissions for FY24 compared to FY20 base year

Target = 36% annual reduction from FY20 base year by FY25

2025 Science Based Target

60%

reduction in scope 3 emissions from use of sold products¹ for FY24 compared to FY20 base year

Target = 21% annual reduction from FY20 base year by FY25

Sustainable finance

48%²

of drawn debt at 30 June 24 was green debt

FY23: 32%

1. Category 11 under the GHG Protocol.

2. The calculation is based on drawn debt at year end excluding lease liabilities. It excludes fair value interest rate risk adjustments, capitalised issue costs and accrued interest.

4. About Genesis

4.1 Our purpose and vision

Powering a sustainable and thriving Aotearoa

Genesis generates electricity from a diverse portfolio of assets in New Zealand, including hydropower, wind and thermal generation, and sells gas and electricity to commercial and retail customers.

Our purpose is ‘powering a sustainable and thriving Aotearoa’. We’re striving to bring this to life through all parts of our business, from the way we generate and supply electricity, to the way we interact with mana whenua and iwi, customers, our people, and wider communities, while at the same time caring for the environment in which we operate and delivering returns to our shareholders.



Addressing climate-related risks and opportunities is central to our organisational strategy

Climate change will drive New Zealand’s and global decisions on how we live and work in the years to come. The scale of change will be significant, and Genesis has a role to play as a key enabler in achieving a successful transition to a lower emission future in New Zealand. We recognise the impact of climate change and support meaningful, economy-wide planning to reduce emissions and transition New Zealand to a lower emissions future.

Our Gen35 strategy outlines how we are taking action over the next 10 years to reduce our emissions by growing renewables, supporting our customers to electrify, and managing increasing energy demand, while ensuring our customers have reliable and cost-effective energy.

With our diverse portfolio of generation assets and our purpose of powering a sustainable and thriving Aotearoa, we understand the importance of New Zealand’s transition to net zero 2050.

Decarbonising our activities and helping our customers do the same will contribute to a successful transition to a lower emissions future. Transitioning to a lower emissions business, while supporting New Zealand’s transition will support ongoing earnings and returns to Genesis shareholders.

Embedding climate considerations into how we do business

Genesis has committed to setting a net zero emission reduction target in line with the Science Based Target initiative (SBTi) *Corporate Net Zero* guidance which provides companies with a clearly-defined pathway to reducing greenhouse gas emissions in line with limiting global warming to 1.5°C temperature rise. For Genesis, a net zero target under the SBTi guidance is a commitment to reduce greenhouse gas emissions by more than 90 percent from a FY20 base year by 2040 (here in referred to as net zero 2040). We are on track to submit our target for validation with the SBTi in Q1 of FY25. The target will ensure we measure our progress and hold ourselves accountable to reduce our carbon footprint.

As New Zealand moves to a lower emissions economy, we’re mindful of working with communities connected to our assets, employees whose jobs may be impacted and customers in vulnerable circumstances to ensure that the transition will be as smooth as possible.

Through our [Sustainable Finance Framework](#) we have embedded further accountability and transparency. The [Sustainable Finance Framework](#) includes targets for reducing our emissions, increasing our renewable generation capability, and creating education and employment opportunities for young people living in the communities that surround our generation sites.

4.1 Our purpose and vision (continued)

Gen35

OUR PURPOSE

POWERING A SUSTAINABLE & THRIVING AOTEAROA

OUR IMPACT



PEOPLE

Manaakitanga, caring and nurturing our communities, customers, team



PROFIT

How we invest in the future and reward our shareholders



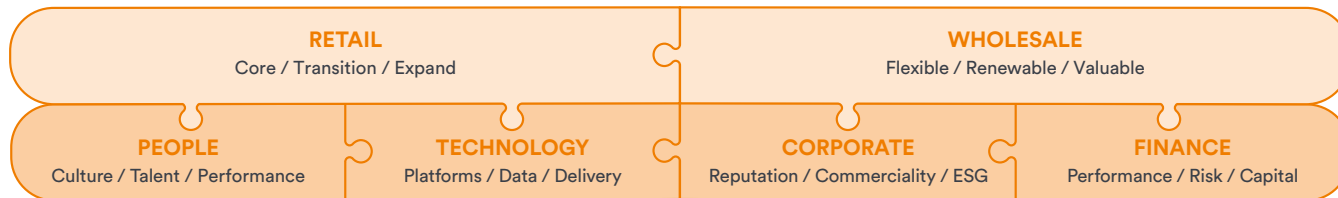
PLANET

Tiaki taiao, protecting the environment for us and those who come after us

OUR MISSION



HOW WE DELIVER



OUR VALUES

**KIA MANAAKI
WE CARE**

We care deeply about our customers, communities, the environment and each other.

**KIA MĀIA
WE'RE COURAGEOUS**

We use our courage, expertise and determination to make bold choices, create solutions and get things done.

**KIA KOTAHI
WE'RE CONNECTED**

We're many parts but one team, and we respect our connection to our communities and the land.

FUTURE STATE

ACCELERATED
TRANSITION

FUTURE FIT

4.2 Our business model

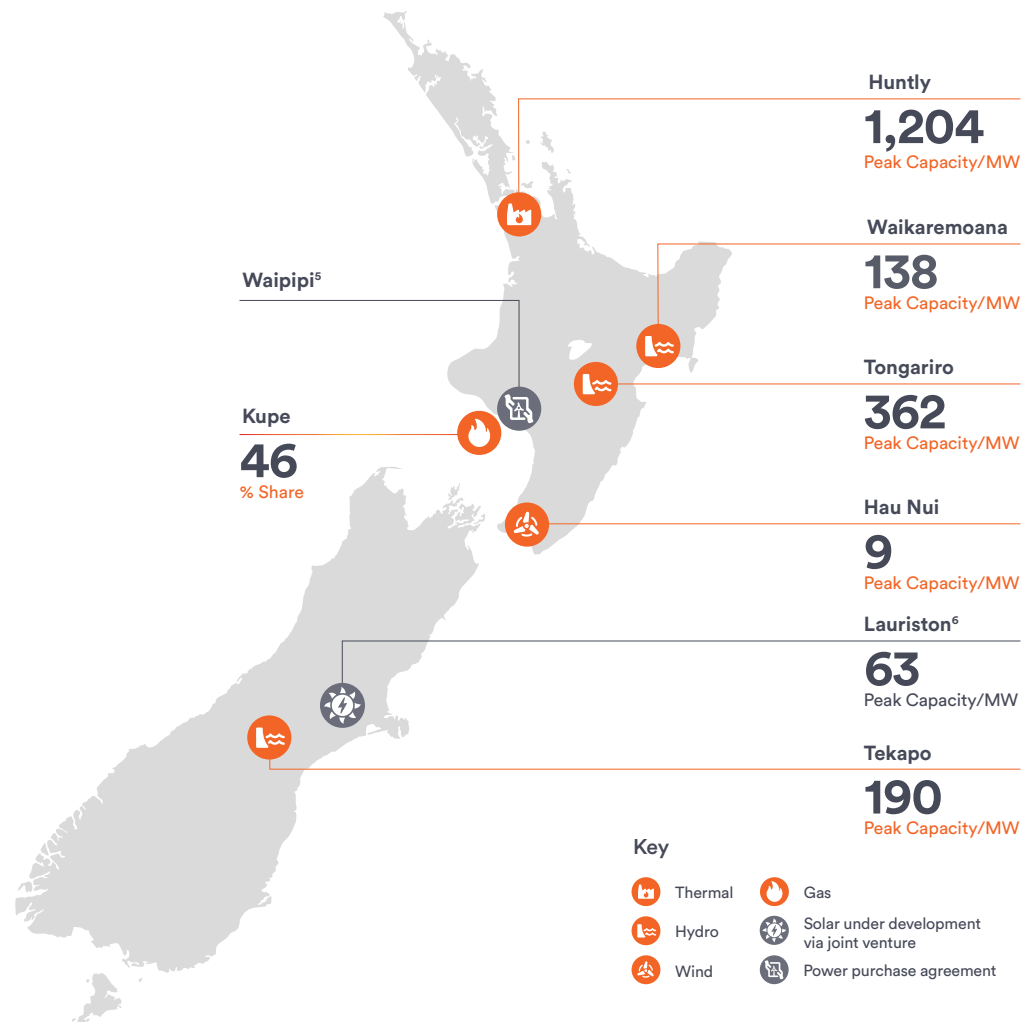
Genesis is a vertically integrated energy business. Our operations include generation and wholesale procurement of energy through to the sale of energy to residential, business and wholesale customers. We supply electricity, LPG and natural gas to more than 496,000 customers in New Zealand through two retail brands (Genesis and Frank*Energy) and we own a 70% share of electricity retailer Ecotricity and a 46% share of the Kupe Joint Venture (JV), which owns the Kupe gas field³.

We operate a range of renewable and thermal generation sites across the country⁴. The geographic spread and diversity of our generation assets provides vital support to the country's electricity sector. Genesis sits at the intersection of supply and demand for several energy sources as well as providing some back-up generation for New Zealand's electricity supply when renewable sources are unable to meet demand. The Huntly Power Station sits at the centre of New Zealand largest population centres and is critical to ensuring security of supply to the country's highly renewable electricity system.

Our vertically integrated gas portfolio provides flexibility and security for our customers. The Kupe gas field is also a vital part of New Zealand's energy system.

We remain focussed on evolving our business model to integrate new grid technologies like solar generation and utility scale batteries alongside customer-side technologies including electricity plans and offerings for EV owners, other distributed resources, and electrification opportunities, with the aim to continue delivering cost effective and convenient energy to New Zealanders in lower emission ways.

Genesis is a mixed ownership model company, listed on the New Zealand Stock Exchange and the Australian Securities Exchange and is majority owned by the Crown (51%). For further information about Genesis, refer to our [FY24 Integrated Report](#).



RETAIL

2 Brands
Genesis and Frank*Energy

490k Customers spread across NZ

3 Fuels
Electricity, gas, LPG

27 LPG depots and delivery agents delivering from Northland to Southland

WHOLESALE

5 Diverse generation options
Hydro, gas, coal, diesel, wind

4 Wholesale markets we operate in
Electricity, gas, carbon, and LPG

5 Power schemes
3 hydro, 1 wind and 1 thermal

1 Solar farm in development
Plan to develop up to 500MW of solar

KUPE

46%

Share in Kupe joint venture providing access to fuel to support the transition

3. Refer to [Appendix IV](#) for a description of Kupe Joint Venture's physical assets and contractual arrangement.

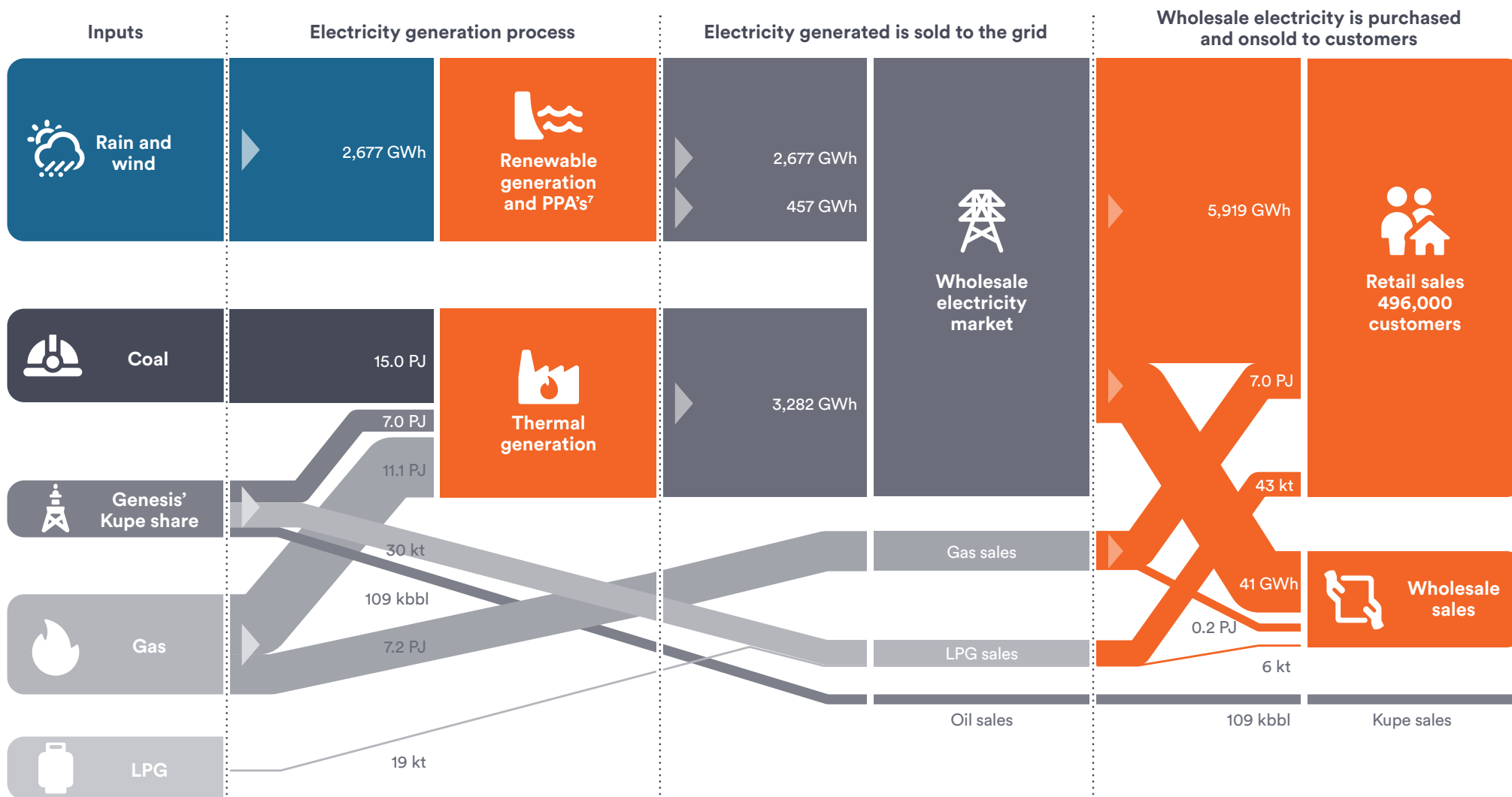
4. Huntly Power Station, Tongariro, Waikaremoana and Tekapo Power Schemes and Hau Nui Windfarm. Refer to [Appendix IV](#) for a description of our physical assets and refer to our website for further information on our generation sites.

5. Genesis has a Power Purchase Agreement (PPA) linked to the electricity generated from Waipipi.

6. Expected to be operational in the second quarter of FY25.

4.3 Key inputs and outputs for FY24

The diagram below provides an overview of the physical inputs and outputs of our business. The inputs are shown on the left-hand side, the process and markets we operate in are shown in the middle and the outputs and customer segments on the right-hand side. Refer to [Appendix IV](#) for a description of our physical assets.



7. Power purchase agreements.

4.3 Key inputs and outputs for FY24 (continued)

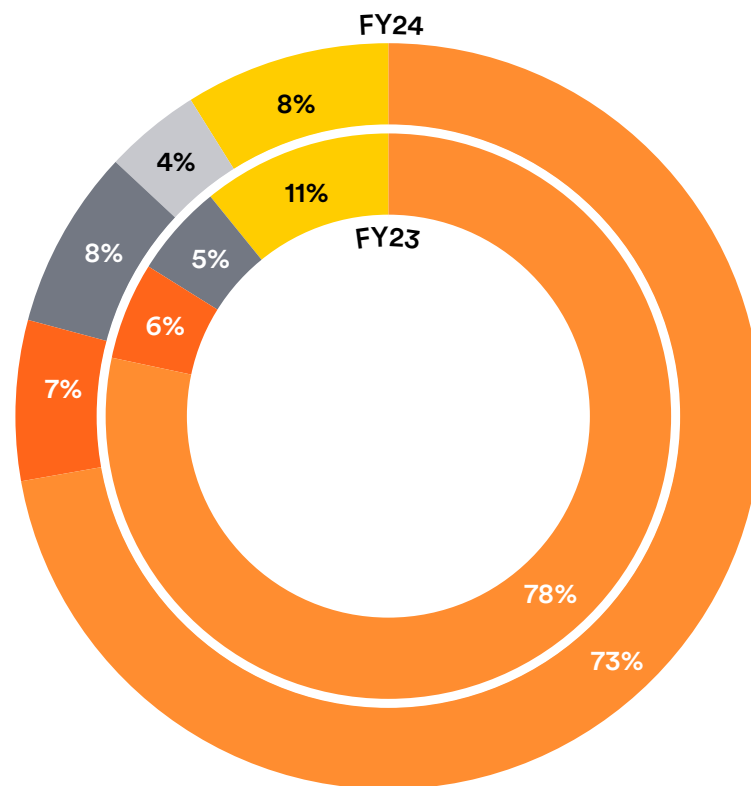
Seventy three percent of our gross margin came from the sale of electricity in FY24 (FY23: 78%). Due to the nature of the New Zealand market, we generate electricity using our thermal, hydro and wind generation assets and sell it to the National Grid. This is recorded as revenue by our wholesale segment who then buys electricity from the National Grid and sells it to our retail segment. Our retail segment sells the electricity purchased to our customers. This is recorded as revenue by our retail segment. The electricity gross margin combines the performance of our wholesale and retail segments (essentially eliminating these intersegment transactions).

Fifty five percent of electricity generated in FY24 came from thermal⁸ (FY23: 37%) and 45% came from hydros (FY23: 63%). Hydro generation in FY24 decreased compared to FY23 mainly due to below average flows in FY24 compared with near record inflows in FY23. Hydro inflows are significantly impacted by acute weather events and seasonal variations.

Thirty nine percent of our customer base in FY24 used at least one fossil fuel (FY23: 39%) and the majority of these customers use a combination of fossil fuels and electricity (FY24: 79%, FY23: 76%). Retail gas and LPG sale volumes have remained relatively consistent year on year.

Refer to [section 8](#) for more information on key metrics used to measure and monitor our material climate-related risks and opportunities.

Gross margin by product



Gross margin	FY24 \$m	FY23 \$m
Electricity	560	670
Gas	54	47
LPG	60	46
Other	31	-
Kupe	65	91
Total gross margin	770	854
Employee benefits	(152)	(136)
Other operating expenses	(211)	(194)
EBITDAF	407	524

8. Based on GWh.

5. Governance

5.1 The role of the Board

The Board of Directors (Board) is responsible for the governance, direction and control of the activities of Genesis and our subsidiaries, including responsibility for the oversight of material climate-related risks and opportunities.

Many of our material climate-related risks and opportunities are intrinsic to our operations and strategic direction. Accordingly, oversight of these risks and opportunities is embedded within our established governance structures and operating rhythm (including through our enterprise Risk Management Framework and our strategic governance processes).

The members of the Board are outlined on page 57 of the [FY24 Integrated Report](#).

The diagram to the right defines the key responsibilities for each body in relation to oversight, assessment and management of material climate-related risks and opportunities.



KEY – Meeting frequency

M Monthly ⁹	B Bi-Monthly
Q Quarterly	W Weekly

Board

Responsible for overseeing and approving:

- The strategic direction and business strategy and scorecards of the Group;
- Climate-related risks, opportunities, metrics and targets and approval of the annual Climate Statement;
- The risk management strategy, policies, and risk appetite which includes climate-related risks.

Audit and Risk Committee (ARC)

Responsible for assisting the Board in the oversight of climate-related matters by reporting its findings and recommendations from its review of :

- The Risk Management Framework, policies, risk appetite, risk limits, internal controls and risk reporting (including climate-related metrics);
- Climate-related risks and opportunities, climate scenarios, the approach to and results from scenario analysis and the annual Climate Statement.

Chief Executive (CE)

Responsible for implementing the strategic objectives approved by the Board, fostering a proactive risk management culture in line with the risk management policy and risk appetite and embedding risk management into strategic and operational planning and reporting.

Executive Leadership Team (ELT)

Responsible for identifying, understanding, monitoring and managing climate-related risks and opportunities and reporting progress against strategic initiatives.

Chief Financial Officer (CFO)

Leads the financial operating planning process and development of investment strategies.

Accountable for maintaining, reviewing and monitoring compliance with the Risk Management Policy and reporting to the ELT and ARC on risk and compliance matters.

Accountable for the preparation and publication of the annual Climate Statement.

Key management roles supporting climate-related matters

<p>Group Manager Strategy</p> <p>Manages the strategic planning process (including reporting to the ELT and Board).</p> <p>Co-ordinates the integration of the strategy into the operating plan with the Group Manager Planning and Performance.</p> <p>Manages the scenario analysis required for our climate reporting obligations.</p> <p>Group Manager Planning and Performance</p> <p>Manages the operating planning process including financial modelling of strategic initiatives.</p>	<p>Commercial finance teams</p> <p>Provides financial advice and support to risk/opportunity owners and supports the development of, and financial reporting of strategic initiatives.</p> <p>Group Treasurer and Risk</p> <p>Responsible for identifying, managing and monitoring risks in accordance with the risk management policy and reporting to the ELT and the ARC.</p>	<p>General Manager Financial Control and Assurance</p> <p>Responsible for the oversight of internal controls and managing compliance with climate reporting obligations.</p> <p>General Manager Sustainability</p> <p>Works with the business to support development of strategies, policies and reporting related to environmental and social sustainability, including those related to emissions reductions (science-based targets, net zero 2040) and a fair transition.</p>
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9. With the exception of July 23 and November 23.

5.1 The role of the Board (continued)

Governance processes and frequency

The Board and Audit and Risk Committee (ARC) are engaged through a combination of formal reporting, face to face meetings, educational sessions, and sessions with the Chief Executive and members of the Executive Leadership Team (ELT). The Chief Executive and other members of the ELT connect with the Board and ARC each time the Board and ARC meet.

Oversight of material climate-related risks and opportunities

Our material climate-related risks and opportunities are subsets of our principal risks¹⁰ to our business. The ARC, a sub-committee of the Board, oversee Management's assessment of principal risks on a half-yearly basis¹¹. Refer to [section 6.1](#) for more information.

In FY24 we worked to develop a climate-related risk and opportunity dashboard. This dashboard enables us to monitor our material climate-related risks and opportunities and was incorporated into the quarterly risk reporting and presented to the ARC for the first time in June 2024. The value of the dashboard will continue to grow each year it is used, we will continue to refine it in FY25 and beyond.

The ARC is also responsible for overseeing our climate reporting obligations, while the Board is responsible for approval of the annual Climate Statement. A climate specific risk and opportunity review is completed and reported to the ARC annually, along with the approach taken with respect to climate scenarios and scenario analysis. The ARC also reviews the results of scenario analysis when it is undertaken.

The ARC reports its findings and recommendations to the Board for consideration and approval throughout the year.

The Board considers material climate-related risks and opportunities as part of the annual strategic and operating planning processes. For example, considerations in the strategy development process include key driving forces of climate-related risks and opportunities such government priorities and regulatory change, change in consumer demand and preferences, new technology advances and competitor analysis.

Throughout the year the Board also receive updates on various matters including strategic initiatives which often address climate-related risks and opportunities, progress on our Sustainability Framework goals, consideration of long-term decarbonisation commitments and climate-related legal matters.

Board skills and competencies

Directors are elected to the Board by shareholders. The Nominations Committee, a subcommittee of the Board, is responsible for identifying and recommending suitably qualified and experienced prospective candidates to the Board for shareholder approval. These nominations are presented based on candidates meeting the agreed skills matrix. The Nominations Committee holds the authority to review and recommend changes to the Director skills matrix should any be required. These accountabilities are set out in the Nominations Committee Charter. Refer to the 'Corporate governance' section of the [FY24 Integrated Report](#) for an assessment of the Directors experience against the current skills matrix.

The Board continues to expand its climate-related knowledge through education sessions and use of industry experts. For example, during FY24 the Board, ELT, subject matter experts and the Climate Working Group (CWG) attended an in-house one-day climate transition workshop to further build competency on climate science, consider Genesis' climate-related risks and opportunities in the context of our Gen35 strategy, and reflect on key elements of a fair transition. The session included presentations, question and answer sessions with leading external experts and a workshop analysing our climate-related risks and opportunities.

10. 'Principal risks' are the most important enterprise-wide risks, as determined by the Board or ELT even if they do not meet 'materiality' thresholds.

11. Only one assessment was completed in FY24 due to a refresh of the Risk Management Framework.

5.1 The role of the Board (continued)

Integration with strategy

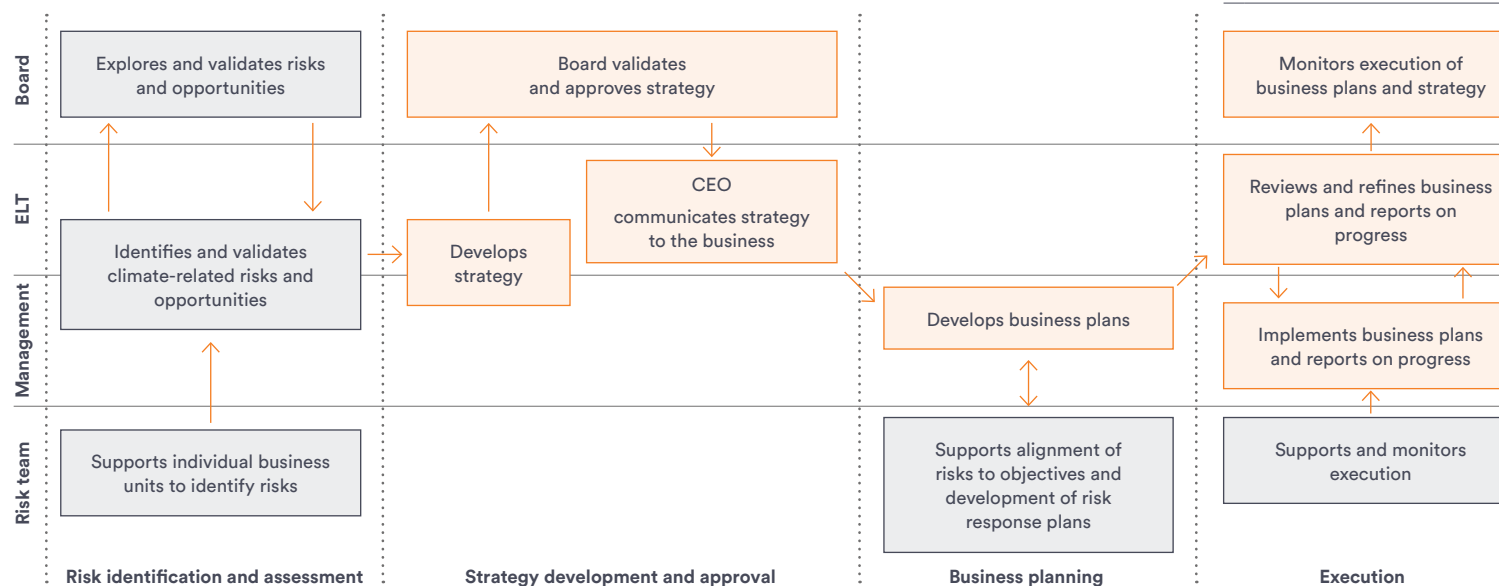
This year we have been getting ‘future fit’ by reviewing our Risk Management Framework, strategy and business model. Our refreshed strategy, Gen35, establishes our strategic direction for the next 10 years and was released to the market on 30 November 2023¹².

When setting strategy, incorporating the impact of material risks and opportunities is integral to the process. The diagram to the right shows how material risks and opportunities are integrated into the strategy setting process. The risks and opportunities considered include climate-related matters, such as decarbonisation, emissions reduction, electrification of current fuel uses, growing demand for renewable electricity, and the growing need for flexible electricity generation.

The strategy team are key members of the Climate Working Group, which ensures material climate-related risks and opportunities are well considered as part of the strategic planning process. In addition, subject matter experts from within the business participate in strategy setting workshops.

The Board reviews the Company strategy annually, and more frequently if required, to accommodate adjustments as needed acknowledging the changing landscape of both internal, and external influences.

Integration of climate-related risk and opportunities into strategy development



Monitoring progress against metrics and targets

Gen35 includes goals to be achieved for FY28 and FY35, which we monitor and report against internally and we report against the FY28 goals externally on a half yearly basis. Refer to [section 9](#) for progress against our goals.

Achievement of these goals have been assigned to individual ELT members and strategic initiative owners who, since the launch of the Gen35 strategy, have established metrics to monitor performance. The metrics were reviewed and approved by the ELT as part of the operating plan process in May 2024 and will be reported to the ELT and Board on a quarterly basis from July 2024.

In addition, as noted in the Board oversight section on page 11, during the year we established metrics to monitor material climate-related risks and opportunities. These metrics were incorporated into the quarterly risk reporting and presented to the ARC in June 2024.

Incentivisation and remuneration

The Human Resources and Remuneration Committee, a subcommittee of the Board, oversees the ELT remuneration, which include incentives based on achievement of decarbonisation related goals.

In FY24:

- Between 32% and 37% of the ELT’s (and Senior Leaders who qualify) short-term incentive was based on achievement of decarbonisation related goals. The ‘Executive remuneration’ section of the [FY24 Integrated Report](#) provides a summary of these goals.
- 20% of the ELT’s long-term incentive was based on the achievement of two greenhouse gas emission goals in FY26. The FY26 goals are an extension to the FY25 targets approved by the SBTi. Both goals must be met in FY26 for the hurdle to be met.

12. Refer to our 2023 Investor Day Presentation, [2023_genesis_energy_investor_day_presentation.pdf](#)

5.2 The role of Management

Executive Leadership Team

Accountability for delivery of strategy and operations lies with the ELT. Members of the ELT are outlined on page 58 of the [FY24 Integrated Report](#).

The ELT has overall accountability for actions and commitments to embed material climate-related risks and opportunities into risk management, and the strategic and operating planning (budgeting) process. This includes:

- Working jointly with the Board on strategy development (which incorporates managing climate-related risks and maximising climate-related opportunities);
- Successful execution and implementation of the approved strategy including considering and managing actual and emerging risks that may impact achievement of the strategy;
- Supporting and embedding the Risk Management Framework and processes including the three lines operating model;
- Adhering to risk management processes, including half yearly risk reviews, monitoring the external and internal contexts for new risks (including climate-related risks), ensuring owners are identified for risks and that the owners have appropriate knowledge, authority and resources to manage risks effectively;
- Ensuring that risks, including climate-related risks and opportunities, in their business units are promptly identified, understood, managed, monitored and escalated appropriately;
- Reviewing climate-related risk and opportunity metrics;

- Reviewing information provided by the Climate Working Group on climate-related risks and opportunities, scenarios, scenario analysis and the Climate Statement; and

- Reviewing updates on progress against sustainability goals (which include science-based targets) on a half-yearly basis.

During FY24, we clarified which ELT member was accountable for each climate-related risk and opportunity and which individual within the business was responsible for managing the risk/opportunity at an operational level and reporting back to the accountable ELT member.

Many of the climate-related risks and opportunities have been incorporated into Gen35 strategic initiatives (refer to [section 7.4](#)). Management forums, with ELT sponsors, have been established to govern the execution and implementation of Gen35 strategic initiatives. A Gen35 scorecard as well as business unit scorecards have been established to monitor performance against Gen35.

The ELT is informed about, makes decisions on and monitors climate-related risks and opportunities at multiple levels within Genesis, depending on how the risk or opportunity is being managed. For example, the ELT is informed about and makes decisions on climate-related risks and opportunities through the strategic and operating planning process and monitors risks through quarterly risk reporting (refer to [section 6.1](#) for more information). The table to the right summarises how this works in practice.

Process / forum / report	Reported to	Frequency	Inform	Make decisions	Monitors
Strategic planning	ELT Board	A	✓	✓	
Operating planning	ELT Board	A	✓	✓	
Strategic initiatives via Management Forums and ELT individuals	ELT	M	✓	✓	✓
Gen35 scorecard ¹³	ELT Board	Q			✓
Business unit scorecards ¹³	CE	M			✓
Principal risk assessment	ELT ARC	Q H	✓	✓	✓
Climate specific risk assessment	CWG ELT ARC Board	A	✓	✓	
Risk metric reporting	ELT ARC	Q			✓
Climate reporting obligations	ELT ARC Board	As appropriate	✓	✓	✓

KEY – Reporting frequency

- A Annually
- Q Quarterly
- H Half yearly
- M Monthly

13. The scorecards were developed in FY24 and reporting commenced in July 2024.

5.2 The role of Management (continued)

Climate Working Group

The Climate Working Group meets weekly and is responsible for:

- Ensuring a cohesive and unified approach by supporting the business to identify, assess, manage, monitor and report on climate-related risks and opportunities using established internal business processes;
- Overseeing the company-wide monitoring and review of climate-related risks and opportunities, scenarios and the approach to and results from scenario analysis;
- Keeping abreast of changing national and international developments in relation to climate science, the climate transition, and climate reporting;
- Developing and delivering climate-related training for employees and the Board, as required;
- Preparing and publishing this document (the Climate Statement in accordance with Aotearoa New Zealand Climate Standards) annually and ensuring appropriate records are maintained to support the disclosures; and
- Reporting and informing the climate-related information outlined above to the ELT, ARC and Board at least annually.

The Climate Working Group consists of the Group Treasurer and Risk, the Group Manager Strategy, the General Manager Financial Control and Assurance, the General Manager Sustainability, the ESG Reporting Manager and other members of the risk, strategy, and financial control teams.

Sustainability Committee

The Sustainability Committee is responsible for developing and overseeing implementation of the Sustainability Framework. This includes climate-related goals such as achieving 1.5°C aligned science-based targets by reducing annual emissions and empowering our customers to reduce their carbon footprint, setting relevant targets, and identifying and executing initiatives to improve integration, engagement, and education on sustainability related matters.

Risk team

The risk team's responsibilities include maintaining the Risk Management Framework, which includes:

- Designing and implementing processes, tools and methodologies to manage risk across the organisation (refer to [section 6.1](#) for more information);
- Monitoring internal and external contexts for emerging risks;
- Managing enterprise risk registers;
- Quarterly reporting on principal risks (into which climate-related risks and opportunities are integrated); and
- Quarterly reporting on risk metrics for financial, operational, market and material climate-related risks¹⁴.

Strategy team

The strategy team is responsible for ensuring the strategy reduces exposure to climate-related risks and maximises value from climate-related opportunities, and that the scenario analysis results are considered in the strategic and operating plan process. Strategic assumptions, including those related to climate-related risks and opportunities, are reviewed annually as part of the business planning process.

Individual business units

The identification and management of climate-related risks is dispersed throughout our business. Individual business units are responsible for ensuring that risks are identified, understood, managed, monitored and escalated appropriately to the risk team.

Finance team

In addition to the risk and strategy teams, which are part of the Finance function, other members of the Finance team have responsibilities related to climate-related risks and opportunities and climate reporting. Specifically, the planning and performance team manage the operating planning process, working closely with the strategy team and the commercial finance teams for retail and wholesale business units to oversee financial modelling of strategic initiatives (many of which address climate-related risks and opportunities).

The commercial finance teams provide tailored financial advice and support to climate risk and opportunity owners, including the development and production of reporting on strategic initiatives.

The financial control function manages compliance with climate reporting obligations, oversees the internal financial control environment (including in relation to climate-reporting) and manages the internal audit function.

¹⁴. Material climate-related risk metrics were included from May 2024.

6. Risk Management

6.1 Processes and frequency for identifying and assessing climate-related risks

Our approach to climate risk

Climate change presents risks and opportunities for Genesis. We are focused on integrating climate-related risks into our internal processes.

Our Risk Management Framework which is based on internationally recognised standards and practices¹⁵, outlines how we manage risks, including climate-related risks.

Our key activities in relation to the identification, assessment, management, and integration of climate-related risks is provided below.

Risk identification

We use a range of tools and methods to identify climate-related risks including:

1. Trend analysis
2. Internal stakeholder engagement
3. Exposure analysis
4. Scenario analysis

1. Trend analysis

Trend analysis is the process of analysing the past to predict how the external environment might impact the future. It was undertaken during the year to monitor our risk landscape and to identify current and emerging risks within the industry, the wider economy, and across international markets.

We utilised STEEP, a specific type of trend analysis, focused on Social, Technological, Economical, Environmental and Political factors. STEEP analysis was undertaken as part of our strategic planning process and our climate scenario analysis. The output was a list of driving forces and critical uncertainties.

Trend analysis is used to identify risks in the short- and medium-term time horizons. It is completed each time we refresh our climate-related scenarios (refer to section '[Climate-related scenario analysis](#)' on page 20 for more information) and annually for strategic planning purposes.

2. Internal stakeholder engagement

During the year we refreshed our approach to risk management. We use a 'top-down' and 'bottom-up' approach to identify and assess risks to our business.

The ELT completed the first 'top-down' review in March 2024. The review included consideration of emerging issues¹⁶ and risks to achieving Gen35 and a refresh of principal risks. Individual business units complete the 'bottom-up' assessment six monthly, most recently in April 2024.

The Risk team consolidated the outcomes of both approaches to provide a comprehensive organisational view of Genesis' risk profile. This fed into the ELT's second quarterly risk review which was completed in May 2024, the results of which were reported to the ARC in June 2024.

In addition to the 'top-down' review and 'bottom-up' assessment, a series of climate-related workshops were run with subject matter experts across the business during the year to identify and assess climate specific risks and opportunities across our value chain. The results of this work were reported to the ELT and ARC in February 2024.

Internal stakeholder engagement is used to identify risks in the short-, medium- and long-term time horizons. Engagement specifically focused on climate-related risks is completed annually.

3. Exposure analysis

We conduct regular exposure analysis of dam and reservoir infrastructure assets to explore health, performance, capacity, and resilience of our assets.

Dam safety and asset management plans were reviewed and refreshed during the year (refer to the risk '[More frequent intense rain events and flooding impacting hydro generation](#)', in [section 7.3](#) for more information on asset management) and portfolio scenario stress testing was completed quarterly.

In addition to this, in FY23 we engaged an external consultant to undertake an initial exposure analysis to identify potential physical risks associated with our generation assets. The results were received and analysed in FY24. The analysis used multiple scenarios and time horizons which were consistent with our scenarios discussed in [section 7.2](#).

This tool is used to identify risks in the short-, medium- and long-term time horizons.

Exposure analysis is completed at various frequencies depending on the nature of the analysis being undertaken. Dam safety and asset management plans are reviewed annually, portfolio stress testing is completed quarterly and analysis using international climate models is updated when there is a material change in climate science.

15. The International Standard ISO 31000:2018 *Risk management - Principles and Guidelines*, The Committee of Sponsoring Organizations of the Treadway Commission (COSO):2017 *Enterprise Risk Management - Integrating with Strategy and Performance*, and World Business Council for Sustainable Development (WBCSD) and COSO: *Applying Enterprise Risk Management to Environmental, Social and Governance-Related Risks*.

16. Risk Leadership Network horizon Scanning Tool and World Economic Forum 2024.

6.1 Processes and frequency for identifying and assessing climate-related risks (continued)

4. Climate-related scenario analysis

Scenario analysis is a tool used to explore the impact of plausible future states, associated outcomes and actions under uncertainty.

Through engagement with internal and external experts we refreshed our climate scenarios in FY23 to enable us to identify material climate-related risks, support strategic planning and decision-making and test the resilience of our strategy to climate change.

During FY24 we:

- Developed a policy to guide when we should update our climate scenarios and scenario analysis. Key considerations include but are not limited to material developments or changes in our strategy, operating model, organisational structure, climate science¹⁷ or any other new information that suggests that revisiting the scenarios would identify new material risks or opportunities.
- Reviewed the FY23 scenarios and confirmed they were relevant for use in FY24. Refer to [section 7.2](#) for further detail on the process undertaken in FY24 and the intended approach for FY25.

Climate-related scenario analysis is used to identify and assess risks in the short-, medium- and long-term time horizons.

The insights gained from these tools and methods were used to support the assessment, management, monitoring and reporting of risks, inform strategic and operating planning, as well as inform the review of climate-related risks and scenarios.

Risk assessment

Climate-related risks are assessed and prioritised using our enterprise risk matrix and documented within our climate risk register. The enterprise risk matrix used for climate risks is the same matrix used to assess other risks at Genesis.

The enterprise risk matrix considers the likelihood of occurrence and the severity of the consequence (size of potential impact), which allows us to determine the appropriate corresponding level of impact and response for each risk. The enterprise risk matrix considers not only the potential financial impact but also the potential impact on operations, reputation, compliance, the environment, and the safety of our people.

One key difference between climate-related risk and other risks is the 'likelihood' aspect which is difficult to accurately quantify over long-term periods associated with some climate-related risks. Accordingly, greater weighting is placed on the 'consequence' aspect of the risk matrix in comparison to 'likelihood'.

We assess the significance of climate-related risks based on inherent risk, which ensures an appropriate level of emphasis is placed on mitigating the risks ahead of time.

Climate-related risks are updated and presented to the ELT and ARC for review, and to the Board for approval on an annual basis.

How we prioritise climate-related risks relative to other types of risk

Climate-related risks are prioritised using the enterprise risk matrix as outlined in the previous section.

In addition to the standard risk assessment process, climate-related risks are also evaluated using a materiality assessment process. This is due to the fact it is possible that certain matters that are considered 'highly material' through the materiality assessment could have been understated through the standard risk assessment (because of the pre-defined likelihood and consequence criteria). Consequently, the materiality assessment helps reprioritise risks for consideration.

Proportionality is also considered when deciding whether to prioritise climate-related risks. The higher the likelihood and potential impact of a climate-related risk relative to other risks and the greater its potential impact on other risks, the higher priority it receives. As part of the risk rating process, Management also considers vulnerability. If an asset is considered highly vulnerable to the risk, the impact rating is increased.

17. This includes consideration of changes in nationally and internationally recognised climate models used in the construction of our scenarios (refer to [section 7.2](#) for a summary of these).

6.1 Processes and frequency for identifying and assessing climate-related risks (continued)

How we manage our climate-related risks

Details on how we manage each of our material climate-related risks is contained in [section 7.3](#).

Time horizons and how these link to strategic planning horizons and capital deployment plans

The impact of climate-related risks is considered across short-, medium- and long-term time horizons. The table below outlines the duration of each of these time horizons and how they link to our strategic planning process.

Term	Period	Rationale
Short	1-5 years (2029)	Aligns with the time horizon used for Genesis' operating plan.
Medium	6-15 years (2039)	Closely aligns with the time horizon used for Genesis' corporate strategy (Gen35) which looks out to 2035 and our commitment to net zero 2040 science-based target.
Long	16-26 years (2050)	Aligns with the Intergovernmental Panel on Climate Change (IPCC) findings that to limit the temperature increase to 1.5°C above pre-industrial levels, emissions would have to peak now and reduce by around half by 2030, and globally net zero emissions need to be attained by 2050. The only exception to this was the length of time considered for physical risks to our generation assets which was considered through to 2100 to align with their useful lives.

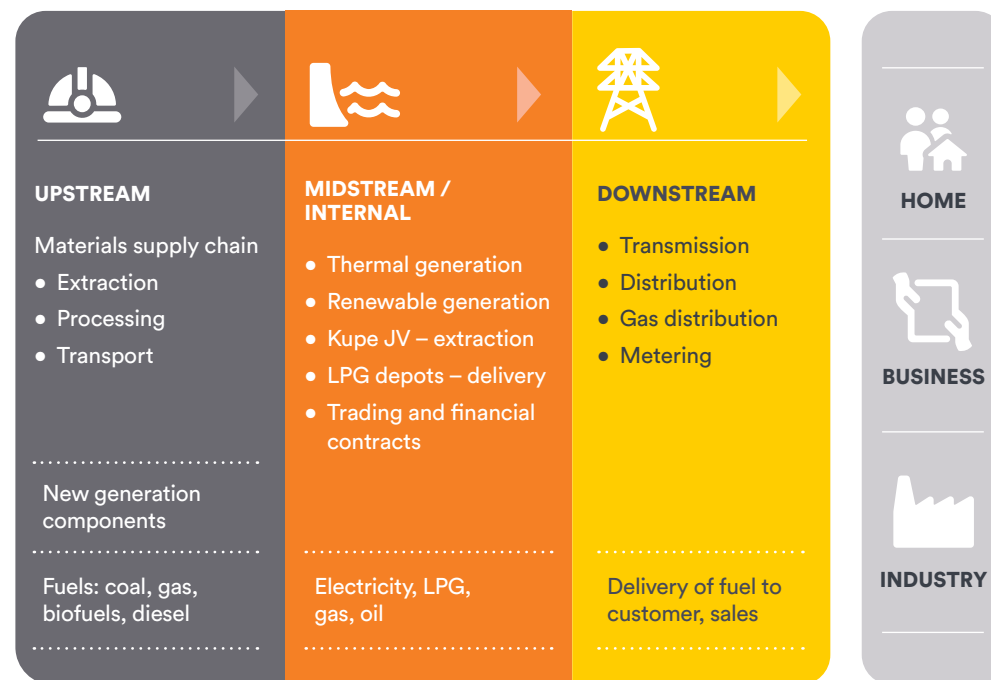
Capital deployment plans can be short, medium, or long-term depending on the nature of the project, the expected return on investment period and the expected useful life of any assets that are created. Some capital deployment plans such as our investment in solar generation assets use slightly longer time periods (35 years rather than 26 years). In addition, the expected useful lives of our hydro generation assets have much longer time horizons than used above. While this is the case, the physical impact of climate change on these assets has been considered out to 2100 using the three Representative Concentration Pathways used in our scenarios (refer to [section 7.2](#)).

Value chain exclusions

The risk tools we use consider potential risks across our value chain. Risks identified which may directly impact us include areas such as supply chains, distribution and transmission networks and customer demand as well as risks to our core business.

No parts of the value chain were specifically excluded from the process. As we enhance our risk identification processes over time, it is expected that our consideration of our value chain will continue to evolve and extend.

Our value chain



6.2 Integration of climate-related risks into risk management

Climate-related risks are managed throughout the business in accordance with our Risk Management Policy and Risk Management Framework. The Risk Management Framework guides the integration of Genesis' various risk requirements into a cohesive whole, which is particularly necessary for a cross-cutting risk such as climate change. The specific ways in which climate-related risk is integrated are outlined in this section.

Alignment and planning

Our Risk Management Framework recommends that risk management practices should be tailored to the requirements and level of risk being managed, where materially significant risks (such as climate-related risks) warrant more rigorous risk management practices.

The Risk Taxonomy explicitly identifies climate-related risks (the separate aspects of 'transition' and 'physical' risks).

The Risk Management Framework emphasises the importance of materiality when considering climate-related risks. When determining whether a risk is considered material we go beyond the standard likelihood and consequence risk rating criteria and consider the views of existing and potential investors, lenders, and other creditors.

Furthermore, the Risk Management Framework provides a specific process to integrate strategy and risk; ensuring climate-related risks are considered prior to strategy formulation as well as in business planning. The need for 'outside-in' and 'inside-out' thinking is encouraged to ensure we have a more fulsome view of climate-related risks.

Climate change is considered a cross-cutting risk because it impacts multiple risk categories (such as reputational, environmental, financial, and operational). Our risk appetite framework and statement indicates where risk responses need to be risk seeking versus risk averse. As climate-related risks are cross-cutting risks our risk appetite varies depending on the nature of the risk. We have established a risk appetite for each of our principal risks (which encompass many of our climate-related risks).

Application and tools

Genesis uses a range of practices to address the bespoke needs of climate-related risk assessment and broader risk integration, such as:

- Scenario analysis (for different climate scenarios) – which integrates with strategy development; and
- A bespoke risk register (for different time horizons and climate related opportunities) – which is integrated into the 'top-down' review and 'bottom-up' assessment.

Application also extends to adjacent risk and resilience practices such as incident management, business continuity, and insurance.

Monitor, review and assurance

The Risk Management Framework requires monitoring, review, and assurance activities to align to the specific needs of the risks involved. It also caters for the cadence of specific governance review and assurance requirements to ensure the Board and ARC are kept informed of the status of all principal risks including climate-related risks.

The management response applied to each risk is influenced by the characteristics and impact of such risk. Management may choose to either maintain the existing response approach to each risk or choose to avoid, mitigate, transfer, or tolerate the risk.

Risk metrics for financial, operational, market and climate-related risks are monitored and reported quarterly to the ELT and the ARC. Principal risks (which include climate-related risks) are reviewed and reported quarterly to the ELT and half-yearly to the ARC.

7. Strategy

7.1 Current impacts

Our operations and financial performance in FY24 were materially impacted by three events:

1. The unplanned outage of Unit 5
2. Gas supply constraints (transition impact) and
3. Below average hydro inflows (physical impact)

The unplanned outage of Unit 5 was not climate-related, the gas supply constraints and below average hydro inflows are discussed in more detail in this section and [section 7.3](#).

Gas supply constraints

The previous Government's policy to ban new gas exploration to support the transition to a low carbon future, and onerous rehabilitation provisions, have contributed to a lack of investment in the oil and gas sector. This in turn has contributed to the gas supply constraints currently being experienced.

Gas supply constraints have impacted fuel costs, which has had a knock-on impact on wholesale electricity prices, thereby increasing both wholesale electricity generation revenue and wholesale electricity purchases.

The impact of the gas supply constraints on EBITDAF in FY24 and on the valuation of our thermal generation assets as at 30 June 2024 is outlined on [page 38](#).

Gas supply constraints is expected to increase gas prices in the short-term. This has had a positive impact on the calculation of the recoverable amount and subsequent impairment of Kupe cash generating unit (refer to note B2 of our Consolidated Financial Statements for more information on the sensitivity of the impairment calculation to changes in gas prices).

Increased wholesale electricity prices have also had a significant impact on the carrying value of our hydro generation assets and electricity swaps and options and PPAs, which are carried at fair value on our balance sheet. The fair value of hydro generation assets increased by \$473.3 million and electricity swaps and options and PPAs increased by \$135.8 million

(refer to note B1 and F1 in our Consolidated Financial Statements for more information). The increase in hydro generation assets was recognised in the 'Change in asset revaluation reserve' line in the Consolidated Statement of Changes in Equity. The majority of the increase in electricity swaps and options and PPAs (\$132.8 million) was recognised in the 'Change in fair value of financial instruments' line in the Consolidated Comprehensive Income Statement and \$3.0 million was recognised in 'Change in cash flow hedge reserve' line in the Consolidated Statement of Changes in Equity.

It is not possible to isolate the impact of gas supply constraints on the forecasted wholesale price path and, as a result, we are unable to quantify the financial impact of the gas supply constraints separately from other changes in fair value for these assets.

There was no material impact on our retail business in FY24.

Below average hydro inflows

Hydro inflows into our catchments were below average in FY24, following near-record levels in FY23. There were periods in FY24 when hydro generation could only run on minimum flows. As hydro inflows are significantly impacted by acute weather events and seasonal variations, it is difficult to determine if below average inflows in FY24 were due to climate change or seasonal factors. The impact of low hydro inflows on

FY24 financial performance is outlined on [page 33](#).

Other current impacts not considered material

We have also provided analysis of the current impact for each of our climate-related risks and opportunities in [section 7.3](#).

The only other impact identified in FY24, but which is not included in [section 7.3](#) relates to the increase in gas transmission and distribution costs. Pricing for gas transmission and distribution businesses is regulated by the Commerce Commission which approves a default price path for these entities to follow every four years, with the last price path set for the period from 1 October 2022 to 30 September 2026. When the last price path was established in FY22, the Commerce Commission allowed gas transmission and distribution businesses to reduce the asset lives from the physical life of their assets to their economic life to mitigate the risk that these businesses end up with stranded assets as a result of the transition to a lower carbon future. This increased transmission and distribution costs by between 2.2% – 6.2% per annum in real terms from 1 October 2022 to 30 September 2026. This increase has been passed onto our retail customers as end users and has not had a material impact on EBITDAF in FY24.

7.2 Scenario analysis

Scenario analysis is a method of exploring the impact of different plausible future states and associated outcomes and actions under uncertainty. During FY23 we undertook scenario analysis to help identify material climate-related risks and opportunities, support strategic planning and decision-making and test the resilience of our strategy to climate change.

Using the process outlined in this section we developed three plausible but distinctly different future scenarios (Green tape, Energy transformation and Hot house as described on pages [22-24](#)) to test the resilience of our business model and strategy (refer to [Appendix I](#) for a list of source data used to construct each scenario).

We engaged PwC and West Nine Consulting Limited to guide and support the development of the scenarios and the scenario analysis. The scenarios were reviewed by these experts and business stakeholders to ensure coherency, plausibility and that they were sufficiently challenging enough to test the business model and strategy under difficult circumstances. The scenarios and the results of the scenario analysis were reviewed by the ELT, ARC and the Board.

The scenario analysis was completed through the development of risks and opportunities, risk mapping and qualitative analysis. No quantitative modelling was undertaken.

The scenario analysis process was completed as a standalone process. Management is working to integrate this work into the strategic planning process going forward.

The scenarios and scenario analysis developed in FY23 were reviewed during the current reporting period in accordance with our Climate-related Scenario and Scenario Analysis Policy. The review confirmed the scenarios and scenario analysis were still relevant for the current reporting period. We intend to refresh our scenarios and scenario analysis in FY25 to incorporate the latest climate science information expected to be released by Niwa by the end of 2024, the energy sector scenarios published in June 2024 and the latest Climate Change Commission modelling released in April 2024.

Scenario analysis process

- 1

Identified and prioritised

Key internal stakeholders identified and prioritised climate-related risks and opportunities.

- 2

Developed focal question

We asked ourselves how climate change could plausibly affect our business, what should we do and when?

- 3

Identified driving forces

We identified driving forces using the STEEP framework and we prioritised them according to their influence and uncertainty.

- 4

Developed scenarios

We considered the implications of different social and economic pathways with different global warming outcomes and used this information to create three scenarios.

- 5

Determined impact

We considered the impact our material climate-related risks and opportunities could have on our business over the short, medium and long term (refer to [section 6.1](#) for how these periods were defined) and we qualitatively assessed the materiality of the impacts across each of the three scenarios.




- 6

Assessed effectiveness of strategy

We qualitatively assessed how resilient each of our key revenue pools were under each scenario, we considered how effective the company strategy was to manage the risk/opportunity and we identified considerations for the future.

7.2 Scenario analysis (continued)

Overview of our three scenarios

	 Green tape	 Energy transformation	 Hot house
Key assumption	Transformation driven by government legislation and more sustainable choices by consumers	Transformation driven by private sector innovation and consumer pressure. Government responds but lags	Greenhouse gas emissions continue to increase. Government response based on adaptation, not mitigation
Policy ambition	1.5°C	2.0°C	>3.0°C
Pathways	RCP ¹⁸ 2.6 SSP ¹⁹ 1 Orderly (Net Zero 2050)	RCP 4.5 SSP 2 Disorderly (Delayed transition)	RCP 8.5 SSP 5 Hot house (Current policies)
Policy reaction	Immediate and smooth	Delayed to 2030's	None
Access to financial services (eg. some forms of capital and insurance)	Easily accessible for those with sustainability credentials, no access for others	Available for most at a higher cost	Still available to those that exploit natural resources
Demand change	Fast	Moderate	Slow/Moderate
Technology change	Fast - mid 2020's	Moderate - early 2030's	Slow - not focused on climate
Customer preference change	Fast	Moderate - early 2030's	Slow - not front of mind
Physical risk severity	Moderate	Moderate	Extreme
Transition risk severity	Moderate	High	Low

18. Representative Concentration Pathway.

19. Shared Socio-economic Pathway.

Green tape

A series of extreme environmental events raises climate risk awareness and spurs global agreement on climate action, limiting temperature rise to 1.5°C (Paris Agreement). This requires stringent government legislation as well as more sustainable choices by consumers.

Swift and stringent mitigation has restricted carbon emissions and ensured a minimal temperature increase. Adaptation is carried out strategically to achieve long term goals, improve resilience, and prosperity. By 2050, New Zealand has reached net zero emissions and is using 90% renewable energy. Energy is accessible, affordable and has supported an equitable transition to a low carbon economy. Energy supply is secure, reliable, resilient and includes distributed alternative generation.

Consumers prefer sustainable options, supported by government incentives. This includes greater uptake of public transport, cycling and electric scootering, leading to less private car ownership.

From the mid-2020's, the focus shifts towards technology that reduces emissions, mandated by government restrictions, which results in acceleration of industry electrification. As a result, the total demand for electricity increases rapidly (to 60,000 GWh by 2050) and new generation and transmission must be built.

Strong investment in innovation and energy storage drive technology improvements that reduce costs and increase efficiency, resulting in increased demand for skilled employees. Fossil fuels are almost phased out and renewables dominate, but stranded assets are minimised through careful government policy.

New Zealand meets much of its own energy needs, with a good uptake of low emission fuels, such as biofuels and green hydrogen. By 2050, biomass makes up 15% of the country's total primary energy.

Severe weather events including rainfall increase but less than in other scenarios. Most severe impacts are mitigated. The South Island experiences higher levels of rainfall, particularly on the West Coast. The North Island experiences less precipitation, but more severe weather around the North and East coasts. Snowfall declines, but at a slower rate than globally. Communities are impacted, leaving some cut-off in severe storms. Increased reliance on battery power storage and higher network resilience is expected.

New Zealand meets much of its own energy needs, with a good uptake of low emission fuels, such as biofuels and green hydrogen. By 2050, biomass makes up 15% of the country's total primary energy.



⚡ Energy transformation

Increasingly severe weather events and a lack of government action lead to a loss of faith in political leaders. Private sector-driven technology advances and consumer choices succeed in keeping climate change within the 2.0°C goal of the Paris Agreement (with overshoot). Innovation takes off in the 2030’s including: electric vehicle adoption, distributed solar and batteries, and demand response. Commercial propositions and business models enable new choices for consumers and paths to energy sector decarbonisation. There is less government mandated or subsidised action taken to restrict carbon emissions.

Around 2030, weather events cause significant property damage and fatalities across New Zealand, resulting in political tension and a loss of faith in government to take effective action on climate change. Behavioural change, while slow up until this point, is spurred by international action and expectations. A delayed transition means consumers help to drive rapid change. The private sector responds to consumer wants and needs and leads the transition through innovative technology uptake. The government responds with supportive policy post-2030, but it is not the driver of the transition. Delays in effective policy implementation result in a more inequitable and expensive transition.

Up to the 2030’s, recent historical global trends continue, followed by rapid technology and behaviour change, spurred by worsening climate change impacting communities. The cost-of-living increases, putting economic and social pressure on people for a time, due to operational costs increasing from uptake of new technology.

Post 2030 there is high uptake of public transport, cycling and electric scootering, leading to reduced private car ownership.

High rates of innovation in the energy sector include electrification of end-use sectors; electric vehicle adoption; distributed solar and batteries; utilisation and storage of CO₂; use of low carbon gases such as hydrogen and demand response. Global coal demand falls rapidly during the 2030’s and halves between 2018-2040 for the Asia-Pacific region.

New commercial propositions enable new choices for consumers and new paths to decarbonise the energy sector.

Rain increases by up to 30% over a year but falls on fewer days with heavier rain and less snow (snow days per year reduce by 30 days). These heavier intense rainfall days are frequent in winter. This increases the likelihood of rivers flooding and flash flooding. Although precipitation increases, there are more dry days.

Increases in mean temperature and longer summers (higher temperatures and lower rainfall over a longer period) means increased water demand. Droughts intensify and become more frequent over time. The number of hot days doubles by the end of the century. River flows are lower in summer and higher in winter. Lower river flows in summer raises water temperatures and aggravates water quality problems.

Post 2030 there is high uptake of public transport, cycling and electric scootering, leading to reduced private car ownership.



Hot house

Economic and social development is paired with the continued exploitation of fossil fuel resources and the continuation of resource and energy intensive lifestyles around the world. Restricting carbon emissions becomes a lower priority for both the government and public leading to severe physical climate change impacts and a global temperature rise of >3°C by 2100.

Global climate policy ambition dwindles during the mid-2020's. Fossil fuel use and resource exploitation continues, with weak, reactive and localised adaptation to avoid near-term costs. By 2050 the economy has experienced strong growth but with increasing emissions and worsening physical climate impacts.

Scaled action on climate change is traded for robust economic growth, driven by reliance on fossil fuels. Sustainability is still valued by consumers, however, this is not always reflected in purchasing decisions or consumption patterns. Population wellbeing decreases.

Technology continues to evolve but is not focused on climate solutions. Countries and sectors fail to coordinate in this scenario, leading to a lack of reduction in emissions and geopolitical tension. Despite electrification of some areas, and further uptake of electric vehicles, reliance on fossil fuels continues. Coal demand for energy generation remains flat. For the Asia-Pacific region, coal demand increases from 2018-2040 by 10%.

Extreme events occur (precipitation of up to one metre of rainfall in 48 hours localised to one area in the country). The largest changes in precipitation occur on the West Coast in the winter season, with an average increase up to 40% by 2090. Snow days per year reduce by 30 days or more by 2090. Flooding occurs in many areas across the country, creating landslides and disrupting transportation and communications.

Average (monthly) wind speeds increase to 22–27 knots. Most significant increases occur in the southern half of the North Island, and throughout the South Island. 'Extreme' wind events present the capability to damage/disrupt infrastructure. Tropical cyclones become more frequent, intense, and push south, often causing flooding in the North Island. The South Island has a notable increase in stormy weather.

Technology continues to evolve but is not focused on climate solutions. Countries and sectors fail to coordinate in this scenario, leading to a lack of reduction in emissions and geopolitical tension.



7.2 Scenario analysis (continued)

Why these scenarios?

The Green tape (1.5°C) and the Hot house (>3°C) scenarios were chosen as they align with the requirements of the Aotearoa New Zealand Climate Standards. The Energy transformation (2.0°C) scenario is considered the most challenging and plausible scenario for our business because it has high transition risks and moderate physical risks. In comparison Green tape focuses on transitional risks and Hot house focuses on physical risks. The Energy transformation scenario is considered relevant, as it aligns with International Energy Agency (IEA) reference scenarios.

By utilising these three scenarios, we tested the resilience of our business strategy with a broad range of climate-related risks and opportunities.

Green tape



POLICY AMBITION

1.5°C

Energy transformation



POLICY AMBITION

2.0°C

Hot house



POLICY AMBITION

>3°C

7.3 Material climate-related risks and opportunities

The table below outlines the most significant climate-related transition and physical risks, and opportunities that could impact our business over the short, medium and long term. These climate-related risks and opportunities have been identified and assessed using the processes discussed in [section 6.1](#) and [section 7.2](#). The classification represents our current assessment of the risk landscape. The risks and opportunities are discussed in more detail on pages [27-43](#). Given the future is unknown, actual results may differ from those noted on pages [27-43](#).

KEY

- Transition risk
- Physical risk
- Opportunity

Theme	Type	Description	Reference	Category	Time horizon		
					Short	Med	Long
Electrification	●	Shift in customer preferences away from fossil fuels	page 27	Products and services	✔	✔	
	●	Speed of LPG and gas sales decline ²⁰	page 28		✔	✔	
	●	Increased electricity demand through electrification	page 28		✔	✔	
	●	Technological developments enable existing and new customers to decarbonise ²¹	page 29		✔	✔	
	●	Decarbonisation products and services offered by competitors ²²	page 30		✔	✔	
Renewables	●	Development of new renewable generation ²³	page 31	Adaption and mitigation	✔	✔	
	●	Ability to execute and deliver new renewable generation projects ²⁴	page 32		✔	✔	
	●	Warmer temperatures and longer dry spells impacting hydro generation	page 33	Operations			✔
	●	Improved alignment of hydro inflows and electricity demand	page 34				✔
	●	More frequent intense rain events and flooding impacting hydro generation	page 35				✔
Flexibility and security of supply	●	Government intervention caused by supply disruption (blackouts) ²⁵	page 36	Operations	✔	✔	
	●	Development of flexible portfolio	page 37		✔	✔	
	●	Speed of fossil fuel generation phase down ²⁶	page 38	Adaption and mitigation	✔	✔	
	●	Weather events impacting gas supply	page 39	Supply/value chain		✔	✔
Other transition risks	●	Changes to the NZ Emissions Trading Scheme (ETS)	page 40	Supply/value chain	✔	✔	
	●	Climate litigation	page 41	Reputation		✔	
	●	Ability to access some forms of capital	page 42	Access to capital		✔	
	●	Ability to access insurance	page 43	Supply/value chain		✔	

20. Previously called 'Restricted ability to sell LPG and gas'

21. Previously called 'Technological developments create new customer propositions'

22. Previously called 'Retail's transition to a low carbon future'

23. Previously called 'Development of solar generation' and 'Development of onshore wind generation'

24. Previously called 'Speed of wholesale transition to a low carbon future'

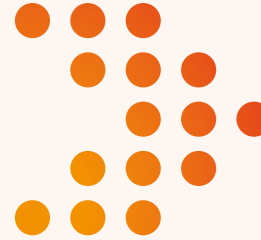
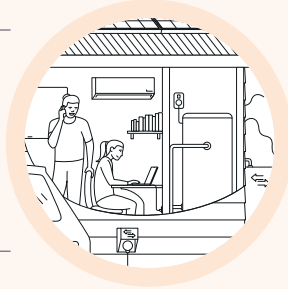
25. Previously called 'Blackouts and/or supply resilience risk'

26. Previously called 'Speed of wholesale transition to a low carbon future'

Electrification

● TRANSITION RISK

Shift in customer preferences away from fossil fuels



Anticipated impact

Increased consumer awareness of climate change and the impact carbon emissions have on the environment, results in a shift in customer preferences away from the use of fossil fuels and/or businesses who use or sell fossil fuels, thereby increasing the risk that customers migrate to other retailers.

Anticipated business unit / asset impacted

Retail business unit – reduced customer numbers, impacting earnings.

Current impact²⁷

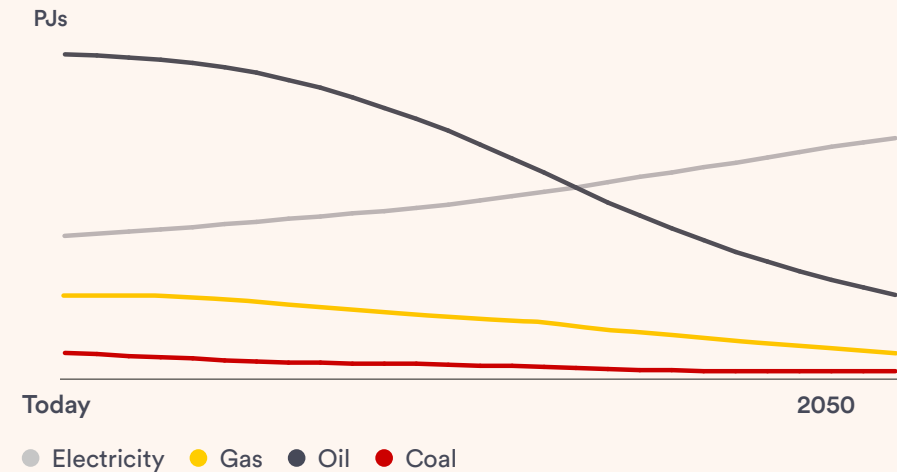
There has been no material financial impact in the current year. New gas connections across the country were higher than disconnections in FY24 and national gas and LPG consumption remains relatively consistent with FY23.

While our retail gas and LPG sale volumes are slightly lower than FY23, the total number of customers using fossil fuels is slightly higher this year. Refer to [section 8.2](#) and [8.4](#) for further analysis.

Strategy to manage risk

This risk is managed through Gen35, adoption of Science Based Targets (SBT), product offerings (including renewable energy certificates) and brand diversification (Ecotricity).

Customers energy consumption is expected to change over time

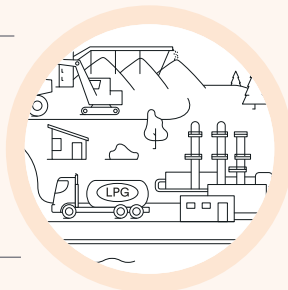


27. Current impact refers to the impact, including the financial impact identified in the current reporting period (1 July 2023 to 30 June 2024).

Electrification (continued)

● TRANSITION RISK

Speed of LPG and gas sales decline



Anticipated impact

There is an expectation that LPG and gas usage will need to decline through the coming decades for New Zealand to meet its commitments under the Paris Agreement. Changes to government policy, access to technology at affordable prices that enables customers to decarbonise, and availability of domestic gas and LPG, will impact how the market transitions.

If LPG and gas sales decline faster than anticipated, it could have a negative impact on earnings.

If LPG and gas sales decline slower than anticipated, it could impact our ability to meet our net zero 2040 target and increase the likelihood that other transition risks eventuate (such as access to some forms of capital and changes in customer preferences).

Anticipated business unit / asset impacted

Retail business unit – reduced customer numbers and earnings / carrying value of LPG assets (fixed and intangible assets).

Kupe business unit – reduced earnings / carrying value of Kupe assets (oil and gas assets and intangible assets associated with customer contracts and relationships). This is considered less likely, given the current gas market and natural decline in field reserves as it reaches end of life in the 2030's.

Current impact

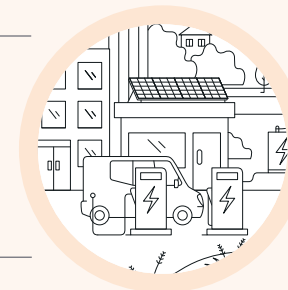
There has been no material financial impact in the current year. While our retail gas and LPG sale volumes are slightly lower than FY23, the number of customers using fossil fuels is slightly higher this year (both nationally and for Genesis). New Zealand gas and LPG consumption in FY24 also remains relatively consistent with FY23. Refer to [section 8.2](#) and [8.4](#) for further analysis.

Strategy to manage risk

This risk is managed through development of products and services focused on supporting customers to decarbonise.

● OPPORTUNITY

Increased electricity demand through electrification



Anticipated impact

There is an expectation that electrification of industry, transport and heating will increase electricity demand over the coming decades as consumer preferences change and decarbonisation becomes more affordable. This creates an opportunity to provide new services to customers and increases demand and load on the National Grid, leading to increased retail and wholesale revenue. This also provides the opportunity to develop new renewable generation assets, which is discussed in the [‘Renewables’](#) section on [page 31](#).

Anticipated business unit / asset impacted

Retail and wholesale business units – increased earnings / carrying value of generation assets²⁸.

Current impact

There has been no material financial impact in the current year. Electricity consumption data for the last quarter of FY24 has yet to be published by the Ministry of Business, Innovation and Employment (MBIE) however based on data published by the Electricity Authority, national electricity demand in FY24 was 2.3% higher than FY23. Electricity consumption for New Zealand has yet to return to pre Covid levels. Retail electricity sales volumes for both our brands combined increased by 4.5% in FY24. Refer to [section 8.4](#) for further analysis.

Strategy to manage opportunity

This opportunity is managed through dedicated teams focused on identifying emerging customer and market needs, developing the technology and partnerships required to deploy future products and services to market and development of strategic initiatives focused on decarbonisation.

28. Generation assets are recorded at fair value in the balance sheet. The valuation is based on a discounted cash flow model. Refer to note B1 of the Consolidated Financial Statements for more information.

Electrification (continued)

● OPPORTUNITY

Technological developments enable existing and new customers to decarbonise



Anticipated impact

Technology advancements, products and services create new opportunities for customers to decarbonise their homes, business and transport and enables customers to integrate into the electricity system. These include distributed solar and batteries²⁹, virtual power plants³⁰ and orchestration, electric vehicles, appliances, and equipment. Combining data platforms, AI and smart devices enable new customer propositions that ‘extend beyond the meter’, which have the potential to increase retail revenue.

Anticipated business unit / asset impacted

Retail business unit – increased earnings.

Current impact

In FY24 we:

- Launched two initiatives to incentivise our business customers to decarbonise. We partnered with:
 - RCR Infrastructure to provide discounts on EV chargers for our customers on Business Energy Plans; and
 - Auckland Fork Truck Hire to provide a 20% discount when our customers on Business Energy Plans buy or rent a UN electric forklift.

- Successfully completed a decarbonisation-as-a-service pilot, which helped Van Lier Nursery replace their gas fired boiler (used to heat their greenhouses) with a state-of-the-art 1 MW low emission heat pump. Experience and learnings from the pilot will be incorporated into future offerings for our business customers.
- Grew our mass market EV Plan base from 4,153 customers in FY23 to 8,325 customers in FY24 with ~50% of those customers subscribed to EEverywhere, allowing them to charge on the go through our partner ChargeNet at cheaper rates.

Refer to pages 50-51 of our [FY24 Integrated Report](#) for more information on how we are helping our customers to decarbonise. These initiatives did not have a material impact on our financial performance in FY24.

Strategy to manage opportunity

For existing customers, this opportunity is managed through our product, sales and partnership capabilities. For future propositions, this opportunity is managed through a dedicated team focused on identifying emerging customer and market needs, developing the technology and partnerships required to deploy future products and services to market and development of strategic initiatives focused on decarbonisation.

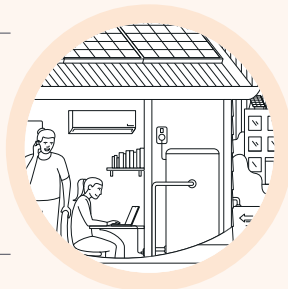
29. Solar electricity produced by households using rooftop systems and stored in batteries which are connected to the electricity grid.

30. Virtual power plants are a network of assets connected to the electricity grid that you can control to provide support to the grid when demand is high and supply is low.

Electrification (continued)

● TRANSITION RISK

Decarbonisation products and services offered by competitors



Anticipated impact

Increasingly competitive market, new technology and emerging products and services to support customers to decarbonise and transition to a low carbon economy could either increase or decrease market share and earnings. If our retail strategy is not executed successfully, it could result in reduction of customer relevance resulting in higher customer churn and loss of earnings.

Anticipated business unit / asset impacted

Retail business unit – higher churn / reduced customer numbers, impacting earnings.

Current impact

While competitors have launched or outlined intent to launch new products and services related to decarbonisation, these strategies did not have a material impact on our financial performance in FY24. We have yet to see a decline in the number of our customers with a gas connection. While Genesis brand churn was slightly up compared to FY23, we do not believe the increase is related to this risk. Refer to [section 8.2](#) and [8.4](#) for analysis of customer numbers, customer churn and sales volumes.

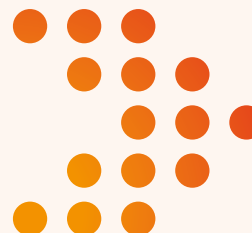
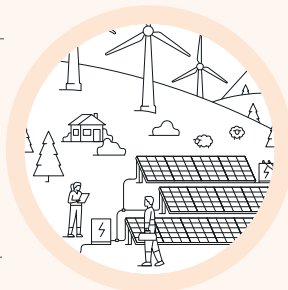
Strategy to manage risk

This risk is managed through a dedicated team focused on identifying emerging customer and market needs, developing the technology and partnerships required to deploy future products and services to market and development of strategic initiatives focused on decarbonisation.

Renewables

● OPPORTUNITY

Development of new renewable generation



Anticipated impact

Increased demand from electrification and technology advancements decreasing the cost of renewable technologies, will make it more viable to invest in renewable generation such as solar and wind. Generation from new renewable assets will meet increasing demand and/or replace baseload fossil fuel generation and reduce operating costs.

Anticipated business unit / asset impacted

Wholesale business unit – increased capital outlay from investment in new renewable generation and increased borrowing which will create pressure on debt metrics in the short-term / increased earnings and reduced operating costs once the assets are operational.

Current impact

In FY24 we:

- Established Lauriston Solar Project (2023) Limited Partnership with FRV Australia and commenced construction of a 63 MWp solar farm at Lauriston, the first solar development project under the solar JV arrangement. The project is expected to be operational in the second quarter of FY25 and is estimated to generate approximately 100,000 MWh annually. Genesis has committed \$13.1 million of capital towards the project, of which \$2.9 million was paid during FY24³¹. Genesis has also entered into a Power Purchase Agreement (PPA) to notionally purchase all the electricity generated from the project for the first 10 years of its operations. This agreement is recorded as a derivative in our Consolidated Financial Statements. The carrying value of the contract has not been disclosed for commercial reasons.

- Continued to assess several North Island development sites as well as a range of solar development acquisition opportunities as part of a growing pipeline of development options.
- Established additional in-house capacity and capability in the renewable and asset development and delivery team, including international wind and battery experience.

We have spent approximately \$4.1 million in FY24 on investigation and development of opportunities. This includes capital contributions to solar partnerships, our share of net profit/loss from the solar JV, internal labour and third-party costs.

Strategy to manage opportunity

This opportunity is managed through our Gen35 strategy, which aims to secure 2,650 GWh of new renewable electricity generation by FY28 growing to 5,500 GWh by FY35³².

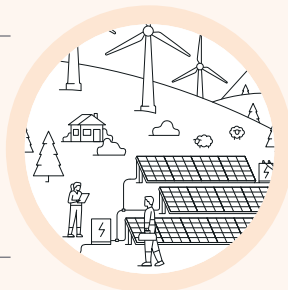
31. Refer to note D3 Investments in associates and joint ventures in our FY24 Consolidated Financial Statements for information on how this entity is accounted for.

32. Against our FY20 baseline.

Renewables (continued)

● TRANSITION RISK

Ability to execute and deliver new renewable generation projects



Anticipated impact

The ability to execute and deliver new renewable generation projects is impacted by:

- High grid connection costs and interest rates (as well as delays and uncertainty on timing for gaining connection agreements).
- Supply chain constraints, as a result of increased demand for key minerals used to manufacture renewable technologies, which is exacerbated by these minerals and technologies often attracting modern slavery risks.
- Availability of land that is economic to build new renewables on.
- Uncertainty in relation to the process for applying for resource consents and risk in relation to the granting of consents.
- Competitors and new market entrants adopting new technologies and developing new generation earlier than us.
- Uncertainty and changes associated with the Government's energy related policies.

If the market is unable to execute and deliver new renewable generation projects in line with the forecasted increase in electricity demand, it could result in increased reliance on thermal generation from fossil fuels impacting our ability to decarbonise and meet our Science-Based Targets or it could result in supply disruptions (blackouts).

If Genesis is unable to execute and deliver its planned new renewable generation projects, it could reduce earnings and increase exposure to wholesale electricity prices.

Anticipated business unit / asset impacted

Wholesale business unit – reduced earnings from long volume / increased exposure to wholesale electricity prices. Exposure to wholesale electricity prices could be managed through optimisation of our retail book, which could impact the financial performance of both the retail and wholesale business units.

Current impact

Delays in consenting and gaining grid connections continues to be a barrier to developing new renewables at pace across the sector. We continue to liaise with energy sector participants and the Government on addressing these issues, including feeding into the fast-track consent process and Transpower review of new connection management processes.

We continue to experience competition for renewable energy developments, including access to suitable sites, connection capacity both at the national grid and distribution level, and resources (including engineers, project developers and consultants).

In response, our approach to new renewables is a mix of greenfield development projects and acquisition of late-stage developments. The latter de-risks the development process by enabling us to acquire projects that have already secured land, consents and connection. This, combined with our ability to develop projects on our own, through joint ventures or to secure power purchase agreements, allows us access to a wide range of developments.

High interest costs and inflation continue to place pressure on project costs, these are largely offset by decreases in equipment costs and elevated wholesale electricity market prices.

Strategy to manage risk

We are pursuing a range of pathways to secure new renewable generation, which are outlined in detail in [section 7.4](#). Possible pathways include:

1. PPAs with other renewable energy developers.
2. Co-developing new solar projects through our JV with FRV Australia.
3. Exploring options to develop our own renewable generation and/or partnering with other developers.
4. Maintaining a watching brief on emerging technologies.

To manage supply constraints, we have partnered with FRV Australia, a leading utility-scale solar farm developer who has established supply chain networks and we continue to develop a pipeline of development options in different locations.

Renewables (continued)

● PHYSICAL RISK

Warmer temperatures and longer dry spells impacting hydro generation



Anticipated impact

As weather patterns shift, warmer temperatures and longer dry spells may become more frequent. This could:

- Alter catchment inflows (i.e. less snowpack and more irregular and intense rainfall) creating more volatile hydrology. This is a risk as well as an opportunity as hydro flows may better align with electricity demand.
- Create water restrictions and, therefore, impact water flowing into our catchments (water may be required for other uses such as agricultural irrigation). This would reduce hydro generation and therefore wholesale revenue.
- Elevated weed (including new species) proliferation or new pests (such as Golden Clams), which would increase maintenance costs and reduce, or constrain, generation output if not well managed.

Anticipated business unit / asset impacted

Wholesale business unit – earnings and the carrying value of hydro generation assets could either increase or decrease depending on the outcome and we could see an increase in operating costs.

Current impact

Inflows into our catchments were below average in FY24, following near-record levels in FY23. There were periods where hydro generation could only run on minimum flows. As hydro inflows are significantly impacted by acute weather events and seasonal variations, it is difficult to determine what impact, if any, changes in temperature have on hydro inflows.

We estimate that EBITDAF would have been between \$30 million and \$35 million higher had inflows been in line with historical averages. This estimate is based on comparing our operating plan model, which is based on average hydrology³³ against actual results.

Strategy to manage risk

Our strategy is to maintain a diverse and flexible portfolio of renewable generation through our Gen35 strategy. We continue to track and forecast the impacts of climate change on our generation assets and, where necessary, make generation decisions based on these impacts.

33. Average hydrology is calculated based on 90 years of historical hydro inflow data.

Renewables (continued)

● OPPORTUNITY

Improved alignment of hydro inflows and electricity demand



Anticipated impact

As weather patterns shift, warmer temperatures and longer dry spells become more likely. This is expected to alter catchment inflows (i.e. less snowpack and more irregular and intense rainfall) creating more volatile hydrology. This is a risk as well as an opportunity as hydro flows may better align with electricity demand, which could help manage price volatility and increase generation revenue.

Anticipated business unit / asset impacted

Wholesale business unit – increased earnings and carrying value of hydro generation assets.

Current impact

As hydro inflows are significantly impacted by acute weather events and seasonal variations they can vary significantly from month to month and year to year. To date national electricity demand has not fluctuated in the same way as hydro inflows. Accordingly, based on current data, we do not believe this opportunity has had a material impact on our financial performance in FY24.

Strategy to manage opportunity

Our strategy is to maintain a diverse and flexible portfolio of renewable generation through our Gen35 strategy. We continue to track and forecast the impacts of climate change on our generation assets and, where necessary, make generation decisions based on these impacts.

Renewables (continued)

● PHYSICAL RISK

More frequent intense rain events and flooding impacting hydro generation



Anticipated impact

More frequent intense rain events and flooding have the potential to:

- Cause loss of civil integrity of generation and ancillary infrastructure (e.g. dams, spillways, storage ponds) resulting in loss of generation revenue.
- Increase sediment load in rivers and storage lakes, and sediment removal activities, thereby increasing operating costs.
- Damage electricity transmission lines, communication networks or road access, which could impact generation revenue and increase operating and capital expenditure costs.
- Impact our right to operate if intense rain and flooding causes lake levels to rise or increase spilling, which causes physical damage to areas surrounding our dam assets.

Anticipated business unit / asset impacted

Wholesale business unit – reduced earnings because of increased operating or capital expenditure costs and reduced revenue / carrying value³⁴ of hydro generation assets.

Current impact

Heavy rain around Lake Waikaremoana at the end of FY23, and beginning of FY24, resulted in a slip damaging an access road to some of the scheme's assets, which will be repaired in FY25. Genesis does not own the road and the slip has not impacted any programmed works. There were no other significant weather events that impacted hydro generation in FY24.

Strategy to manage risk

Our strategy is to maintain a diverse and flexible portfolio of renewable generation that is geographically spread, thereby reducing the risk that all sites are impacted by the same event.

We continually assess our infrastructure for improvements and actively review and update our asset management system, which is aligned with the principles of ISO 55000. The plans include lifecycle management and strategies to manage and track performance over time. Regular monitoring and inspections are completed to understand the health and performance of our assets.

As part of our Dam Safety Management System, we undertake periodic reviews of potential extreme flood estimates to assess capacity and resilience of dam and reservoir assets. Where potential issues are identified, these are managed through the deficiency management process outlined in the Dam Safety Management System. This can result in operational and/or physical changes to appropriately manage these risks.

Genesis is also an active contributor to the Dam Safety Hydrology Group (DSHG) and has helped to fund recent research and development of an updated Probable Maximum Precipitation (PMP) methodology, which allows incorporation of climate change scenarios to inform uncertainty associated with PMP estimates. This allows dam and reservoir owners to better understand potential risks associated with climate change and inform decisions around capacity and resilience.

When developing asset management plans, we incorporate relevant industry practice and guidance to assess our portfolio against various performance criteria, including natural hazards such as flooding, as well as considerations of future changes to these hazards. We also consider the existing asset specifications, the current and anticipated efficiency, flexibility, capacity, and reliability of the asset and future resilience requirements.

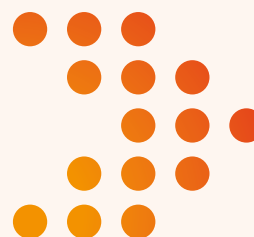
Asset health, criticality, risks and improvement opportunities are all considered when making decisions for investment and for the ongoing safe and reliable operation of our assets.

³⁴ Generation assets are recorded at fair value in the balance sheet. The valuation is based on a discounted cash flow model. Refer to note B1 of the Consolidated Financial Statements for more information.

Flexibility and security of supply

TRANSITION RISK

Government intervention caused by supply disruption (blackouts)



Anticipated impact

'System' risk remains New Zealand's greatest risk to a secure, reliable supply of electricity during the transition to a low carbon future. System risk refers to the risk of failure of one or more key components of the electricity supply chain occasioning interruptions to electricity supply (i.e. blackouts). The impact of such failures can be expected to increase as demand for electricity and intermittent renewable generation increases, which in turn results in greater reliance on aging thermal assets acting as a back-up. Supply disruption could result in government intervention as a second order impact. This has the potential to:

- Impact the Group structure, assets held, or contracts entered into.
- Require us to maintain and run fossil fuel generation assets, despite a potential cost imposition and reduced profitability or increased electricity prices for consumers if the cost of thermal generation is passed on through wholesale electricity prices.
- Compromise New Zealand's and our climate change mitigation goals.

Anticipated business unit / asset impacted

Group structure or the wholesale business unit depending on the level of government intervention – changes could impact earnings / carrying value³⁵ of thermal generation assets.

Current impact

There were no electricity supply interruptions due to a shortage of energy or available capacity in FY24. However, supply conditions at peak times remained 'tight', resulting in Transpower issuing several advisory notices calling on the industry to act to secure supply and on one occasion calling for consumers to reduce demand over a morning peak.

New Zealand is currently experiencing a shortage in domestic gas, which, combined with plant outages and below average hydro inflows, has resulted in an increased reliance on electricity generated from coal in FY24. The Government is currently working with industry, including Genesis, to find solutions to the gas shortage with measures expected to be announced throughout FY25.

Several measures aimed at improving electricity supply have already been announced by the Government but are not yet enacted. These include an improved consenting regime, and removal of restrictions on gas exploration introduced in 2018. The latter is part of a package of measures intended to increase upstream activity, which, if successful, would likely have the effect of improving the fuel supply available to electricity generation (among other use cases).

Refer to '[Speed of fossil fuel generation phase down](#)' risk for more information on the impact (including the financial impact) of the domestic gas supply constraints.

Strategy to manage risk

This risk is managed through our Gen35 strategy, which includes 1,400 MW of flexible generation assets at Huntly by FY35. In addition to this we:

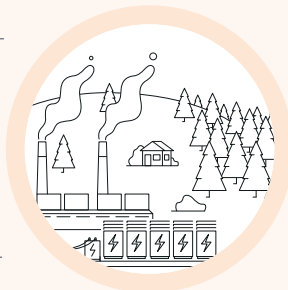
- Actively engage with regulators and industry groups to support the sector to align on the direction and effective regulations that will help New Zealand move quickly, and safely, towards a sustainable future.
- Continually assess our infrastructure for improvements and actively review and update our asset management system, which is aligned with the principles of ISO 55000. Refer to '[More frequent intense rain events and flooding impacting hydro generation](#)' on page 35 for information on how we manage our assets.

35. Generation assets are recorded at fair value in the balance sheet. The valuation is based on a discounted cash flow model. Refer to note B1 of the Consolidated Financial Statements for more information.

Flexibility and security of supply (continued)

● OPPORTUNITY

Development of flexible portfolio



Anticipated impact

Decarbonisation and growth in intermittent renewable generation increases volatility and dependence on a secure and reliable electricity network, increasing the need for firming and peaking products. Major disruption risk is likely to increase as New Zealand decarbonises. Different assets and fuels will be needed to meet future demand in a highly renewable electricity network. Batteries and fuel flexibility will be required to manage short term capacity constraints, whereas flexible gas arrangements and biofuels (such as biomass) will be required to manage inter-year disruption from energy constraints. Development of fuel flexibility allows Genesis to optimise wholesale generation mix, manage price volatility and increase security of supply. Development of a flexible fuel portfolio could extend the useful life of our thermal generation assets.

Anticipated business unit / asset impacted

Wholesale business unit – increased capital expenditure / investment in assets to support a flexible portfolio / increased earnings and increased carrying value of thermal generation assets.

Current impact

In FY24 we:

- Made good progress on establishing a supply chain for biomass and have commenced negotiating key contractual terms. We expect to procure our first volume of locally produced biomass in FY25, which will be scaled up over time.

- To grow our capability, we have established two new roles, a General Manager Fuels Strategy and a Group Manager Alternative Fuels. This allows us to have dedicated resources focused on developing this supply chain and coordinating commercial, legal, engineering, regulatory, sustainability, environmental and operational resources from across our business. We have also engaged with specialist technical resources to test waterproofing technologies for biomass.
- Established a project team to progress a business case for the construction of a 100 MW / 200MWh Battery Energy Storage System (BESS) at Huntly, undertaken a request for proposal process for the supply of equipment and evaluated the responses.
- Have been exploring opportunities for gas storage. Alongside this, we have also been working with our existing gas suppliers to understand the flexibility in their supply.

We have spent approximately \$1.7 million in FY24 on the activities discussed above. This includes internal labour and third-party costs.

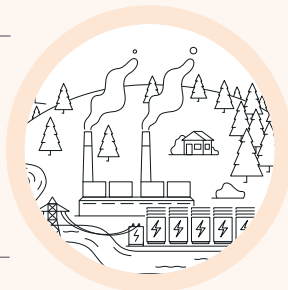
Strategy to manage opportunity

This opportunity is managed through our Gen35 strategy, which includes 1,400 MW of flexible generation assets at Huntly by FY35.

Flexibility and security of supply (continued)

● TRANSITION RISK

Speed of fossil fuel generation phase down



Anticipated impact

There is an expectation that thermal generation from fossil fuels will continue to decline over the next 10 years as it is replaced with either thermal generation using more renewable fuel sources (such as biomass) or other technology (such as batteries). There is also a risk that fossil fuel generation is displaced faster than anticipated due to: (1) domestic gas supply constraints; (2) government regulation; (3) advances in technology and construction of more flexible generation with lower emissions such as geothermal or use of batteries; and (4) commercial arrangements that include demand response features that provide alternative solutions to dry year risk (long period firming).

There is also a risk that the phase down is slower than expected due to delays in the development of renewable fuel sources or new technology or higher demand growth than new renewables can keep up with. This could result in the need to use coal longer than expected to support security of supply. This would impact our ability to decarbonise and meet our Science-Based Targets, which carries reputational impacts and increases the likelihood that other transition risks materialise (such as access to insurance, access to capital and changes in customer preferences).

Anticipated business unit / asset impacted

Wholesale business unit – reduced earnings and carrying value of thermal generation assets / increased exposure to wholesale electricity prices where the transition occurs faster than anticipated. If the transition occurs slower than anticipated, it could have the opposite impact.

Current impact

Thermal generation from fossil fuels increased by 51% compared to FY23. This was due to below average hydro inflows in FY24 compared to near record inflows in FY23, an unplanned outage for Unit 5 and gas availability constraints impacting Units 5 and 6.

Gas production across the country has continued to decline and the decline has been faster than official forecasts predicted. Ministry of Business, Innovation and Employment announced on 11 July 2024 that gas production is forecast to drop below demand for at least the next three years.

The previous Government’s policy to ban new gas exploration to support the transition to a low carbon future and onerous rehabilitation provisions, have contributed to a lack of investment in the sector, which has contributed to the gas supply constraints currently being experienced.

The tight gas supply market has resulted in increased cost to acquire gas and increased use of coal. These changes have a knock-on impact to wholesale electricity prices, which remained elevated during FY24.

We estimate that EBITDAF would have been between \$15 million and \$20 million higher if gas supply had not been constrained in FY24³⁶. This estimate is based on comparing our operating plan modelling against actual results.

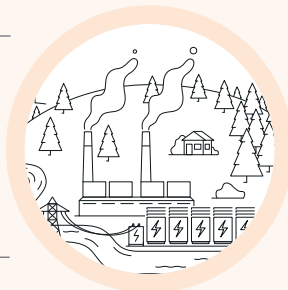
The gas supply constraints have also impacted the carrying value of our thermal generation assets, which are accounted for at fair value on our balance sheet. In calculating the fair value of our thermal generation assets, we anticipate fuel costs to increase and generation volumes to decrease for Unit 5 in the short-term because of the gas supply constraints.

36. This includes the impact of KS-9 which has also contributed to the domestic gas supply constraints.

Flexibility and security of supply (continued)

● TRANSITION RISK

Speed of fossil fuel generation phase down (continued)



The forecast wholesale electricity price path is anticipated to increase in the short-term as a result of delays in future build assumptions and higher fuel costs due to tight gas supply and forecasted need to import coal to make up the shortfall. It is not possible to isolate the impact of gas supply constraints on the forecasted wholesale price path and, as a result, we are unable to quantify the financial impact of the gas supply constraints separately from other changes in fair value.

The decrease in the fair value of Unit 5 of \$90.5 million (\$65.2 million net of deferred tax) was recognised in the 'Change in asset revaluation reserve' line in the Consolidated Statement of Changes in Equity in FY24.

The anticipated increase in fuel costs also impacts the Rankines, however, generation volumes are expected to increase in the short-term. The increase in the fair value of the Rankines of \$31.8 million (\$22.9 million net of deferred tax) was recognised in the 'Revaluation of generation assets' line in the Consolidated Comprehensive Income Statement in FY24.

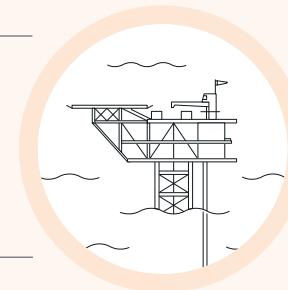
The change in fair value discussed above includes impacts not associated with the gas supply constraints. Refer to our FY24 Consolidated Financial Statements, note B1 contained in our [FY24 Integrated Report](#) for more information.

Strategy to manage risk

This risk is managed through our Gen35 strategy which includes (i) transitioning our fossil fuel generation assets to renewable fuel sources (such as biomass), (ii) developing flexible gas supply options to support the transition, and (iii) investing in utility scale batteries to provide back up to cover intraday variability caused by increased renewable generation.

● PHYSICAL RISK

Weather events impacting gas supply



Anticipated impact

Intense rain could result in landslides impacting the gas pipeline used to transport gas from Taranaki to the Huntly Power Station and other gas distribution networks. These weather events have the potential to impact thermal generation and gas supply to retail and wholesale customers, thereby reducing revenue and increasing operating costs. Storms and stronger sea currents have the potential to impact Kupe's umbilical cord or access to the platform, however, current forecasts see Kupe field depleted in the medium-term and it is therefore unlikely Kupe will be exposed to long-term weather-related risks.

Anticipated business unit / asset impacted

Kupe business unit – reduced earnings / carrying value of oil and gas assets.

Wholesale business unit – reduced earnings / carrying value of thermal generation assets and/or increased operating costs.

Retail business unit – reduced earnings.

Current impact

There were no significant weather events that impacted gas supply in FY24.

Strategy to manage risk

This risk is managed through maintaining a diverse fuel portfolio and our Gen35 strategy, which includes 1,400 MW of flexible generation assets at Huntly by FY35. We also mitigate our exposure by ensuring we have insurance to cover these risks.

Other transition risks

● TRANSITION RISK

Changes to the NZ Emissions Trading Scheme (ETS)



Anticipated impact

Given we hedge some of our exposure to carbon prices using forward contracts and forestry investments, and we have a plan to transition away from thermal generation that use fossil fuels, Genesis is less exposed to fluctuations in the price of carbon compared to entities who do not hedge their exposure to carbon prices. Changes to carbon pricing impacts our emission units held for trading, trading limits are used to manage this risk and therefore is not considered a material risk.

Changes in the structure or application of the ETS could have a material impact on our business depending on the nature of the change. It could also impact our customers who operate in Emission-Intensive Trade Exposed Industries, which would in turn impact retail sales if those customers choose to exit the market. Currently, there are no proposed structural changes to the ETS that impact Genesis.

Anticipated business unit / asset impacted

Wholesale business unit – increased operating costs / decreased carrying value of thermal generation assets if ETS related structural changes were made that negatively impact Genesis.

Retail business unit – reduced earnings.

Current impact

The ETS remained unchanged throughout FY24, with the coalition Government cancelling the review of the ETS that had been in progress. The Government has indicated it does not envisage making material changes to the ETS, which it has characterised as the primary policy lever for driving decarbonisation.

The Government is currently considering advice from the Climate Change Commission, which, if accepted, would reduce the volume of units ‘stockpiled’ by ETS participants. This could be expected to place upwards pressure on carbon prices. The Government will release its emissions reduction plan at the end of 2025, informed by the Climate Change Commission, which will set out the additional policy measures it will pursue to drive decarbonisation.

The spot price of carbon units in FY24 increased in the earlier half of FY24, but decreased in the second half, ultimately finishing in line with June 2023. The first two carbon auctions failed to clear, the third one only partially cleared, and the fourth failed to attract any bids. The change in spot price did not have a material financial impact on our FY24 financial performance as we had sufficient units on hand to cover our FY24 obligation (refer to [section 7.4](#) for information on how we manage our exposure to carbon prices). Emission units held for our own use are carried at historical cost and are not revalued.

Strategy to manage risk

We manage this risk by continually monitoring, and reviewing, proposed regulatory changes to the ETS and providing submissions when relevant.

Other transition risks (continued)

● TRANSITION RISK

Climate litigation



Anticipated impact

Climate litigation continues to evolve both domestically and in the international context as new cases continue to be brought before the Courts. Initial litigation claims have been predominantly directed against Governments, however, there has been an increasing trend in cases against private companies³⁷. Recent cases overseas have included allegations of greenwashing (making false or misleading environmental claims), breach of director duties and conducting operations or selling products that cause significant harm to the climate.

Our Gen35 strategy, in particular as it relates to the future of the Huntly Power Station (in terms of fuel diversity / flexibility) and building new renewable generation capacity, provides us with a pathway to decarbonisation and deliver on our ambition to be net zero by 2040. We are seeking to expedite execution of our strategy to transition our business in an orderly way that balances our ambitions to decarbonise and reduce thermal generation from fossil fuels with the need to maintain security of supply during periods when the rain doesn't fall, the wind doesn't blow, and / or the sun doesn't shine. Actions taken by Genesis to assist with security of supply potentially increases our exposure to climate litigation.

The primary impacts of climate litigation are time, and resource costs to the business, which distract from executing Gen35, legal fees and other financial costs associated with Court processes, and the financial and operational impact of any adverse rulings that may eventuate. Potential secondary impacts include reputational / brand impact and increasing the likelihood that other transition risks materialise (such as access to insurance, access to capital and changes in customer preferences).

Anticipated business unit / asset impacted

The business unit impacted will depend on the claim being made.

Current impact

In 2019, Mike Smith, an elder of Ngāpuhi and Ngāti Kahu and a climate change spokesman for the Iwi Chairs Forum, brought claims against seven corporate defendants (including Genesis) on the basis that they were each involved either in an industry that releases greenhouse gases into the atmosphere or manufactures and supplies products which release greenhouse gases when they are used.

Mr Smith brought claims in public nuisance, negligence and breach of a proposed new climate system damage duty to cease contributing to damage to the climate system.

In March 2020, the High Court struck out Mr Smith's claims in public nuisance and negligence but declined to strike out his proposed new climate system damage duty. Mr Smith appealed and the defendants cross-appealed. In October 2021, the Court of Appeal concluded that all claims should be struck out.

Mr Smith appealed this decision to the Supreme Court, which heard the appeal in August 2022. In a judgment released in February 2024, the Supreme Court unanimously overturned the decision of the Court of Appeal and held that each Mr Smith's claims should be reinstated and proceed to trial. This case did not have a material financial impact in FY24.

Strategy to manage risk

We manage this risk primarily through Gen35, adoption of Science-Based Targets and engagement with stakeholders.

37. Come hell or high water: A climate change litigation update published by MinterEllisonRuddWatts on 23 February 2024.

Other transition risks (continued)

TRANSITION RISK

Ability to access some forms of capital



Anticipated impact

Increased investor and lender awareness of climate change and a desire to invest in low carbon investments has the potential to reduce access to some forms of capital and/or funding options or increase the cost of capital. Given our current strategy, it is more likely that this risk will result in an increase in the cost of capital rather than restriction to some forms of capital funding options. This risk is not expected to have a material impact on Genesis given the current strategy.

Anticipated business unit / asset impacted

Corporate business unit – increased finance expense.

Wholesale business unit – reduced ability to fund new projects.

Current impact

During FY24 we successfully issued a \$240 million green bond to replace an existing capital bond and we restructured and increased our revolving credit facilities from \$475 million to \$535 million. Cost of debt increased from 5.2% in FY23 to 5.7% in FY24. The increase was primarily driven by increased interest rates not climate-related matters. There was no material financial impact in the current year from this risk.

Strategy to manage risk

We manage this risk through Gen35, adoption of Science-Based Targets, active engagement with investors and lenders and our [Sustainable Finance Framework](#).

Our [Sustainable Finance Framework](#) sets out the process we use to issue and manage bonds and loans to support our sustainability objectives. Our sustainable finance programme includes \$650 million of green bonds and \$250 million of sustainability-linked loan facilities (linked to achievement of our sustainability targets). The sustainability targets include annual targets to encourage us to deliver on our Science-Based Targets, increase our renewable generation capacity (either through PPAs or investment in new generation) and create education and employment opportunities for young people living in the communities around our generation sites.

We will pay a lower interest rate and availability fee³⁸ on the loan facilities if we achieve our sustainability targets. Conversely, we will pay a higher interest rate and availability fee if we don't. Refer to our [FY24 Sustainable Finance Report](#) for more information.

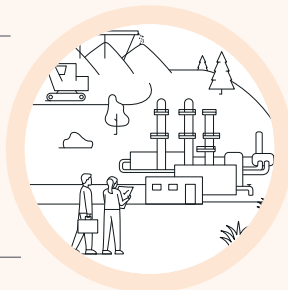
The [Sustainable Finance Framework](#) aligns to the Green Bond Principles 2021 and the Climate Transition Finance Handbook, as issued by the International Capital Markets Association.

38. Availability fees are charges that a borrower incurs for the portion of a loan that remains unused.

Other transition risks (continued)

● TRANSITION RISK

Ability to access insurance



Anticipated impact

As more insurers pursue ESG objectives, the number of insurers willing to insure fossil fuel generation and oil and gas assets is expected to reduce over time. Insurance costs for such assets will likely increase over the medium term as the pool of insurers declines. This risk is not expected to have a material impact on Genesis given the current strategy.

Anticipated business unit / asset impacted

Wholesale and Kupe business units – availability of insurance and increased insurance costs.

Current impact

Insurer approaches to insuring coal, oil and gas assets vary and continues to evolve. Some insurers exclude insuring coal, oil and gas related assets. Most provide cover, though a small (but growing) number are becoming more selective and reducing available cover. Decarbonisation strategies and progress towards these remain key to securing insurance. While insurance costs increased this year, market conditions and higher insurance valuations primarily drove this increase, not climate-related matters. There was no material financial impact from this risk in FY24 and no difficulties obtaining insurance.

Strategy to manage risk

We manage this risk primarily through seeking to accelerate the execution of Gen35, adoption of Science-Based Targets, active engagement with insurers and building the risk financing capacity of our captive insurance subsidiary over time.

7.4 Transition plan aspects of our strategy

Through the Zero Carbon Act³⁹, New Zealand has committed to achieving net zero emissions for most sectors of the economy by 2050. This commitment and similar actions in other countries will shape the operating environment over the decades to come.

Electrifying existing fossil fuel use in sectors like transport and heating is expected to drive a significant portion of the transition to a net zero economy. Electrification will create more demand for electricity.

Renewable electricity supply will need to increase substantially to meet the growing electricity demand. Wind and solar power are now the cheapest forms of new electricity production and are also expected to expand to displace most of the existing fossil fuelled generation.

Flexible generation will be needed to provide firming to a growing share of wind and solar, to ensure that electricity is available when needed and the electricity supply remains affordable and reliable to support electrification.

To achieve net zero by 2050, Climate Change Commission data and Boston Consulting Group analysis show that renewable electricity will make up 58% of energy consumed in 2050 (from a 19% base in 2022)⁴⁰, 95% of electricity generation will be renewable, and the supply of electricity will need to be 100% reliable and secure.

Gen35

Our strategy, Gen35, creates a pathway through this transition centred around electrification of customers lifestyles, developing renewables and providing flexible assets to support a reliable and secure supply of electricity. It aims to accelerate the low carbon transition across three different dimensions over the next decade:

- 1 **Customer** – supporting our customers with asset transition in homes and businesses
- 2 **Company** – transitioning our business to a net zero future based on renewable generation
- 3 **Country** – supporting the country to achieve a highly renewable, secure, and stable grid

Gen35 does this by orientating the business around three pillars:

- 1 **Electrification** – empowering a customer led transition
- 2 **Renewables** – growing our portfolio
- 3 **Flexibility** – transitioning our thermal generation portfolio

The strategy directs the business towards areas that have proven financial value. Renewable energy, flexible generation and electrification have consistently been referenced in global and international research as cost-effective and proven pathways that maximise transition value, mitigate regulatory and other risk, and produce fewer greenhouse gas emissions.

Optionality and resilience to navigate change will be important to manage the risk of over and under investment particularly given the uncertainty of future energy market conditions.

We believe the successful execution of Gen35 will support us to navigate the transition, establish a pathway that is consistent with a net zero SBTi approved target and create long-term value for shareholders.

39. Climate Change Response (Zero Carbon) Amendment Act 2019.

40. The Future is Electric, Boston Consulting Group, October 2022.

7.4 Transition plan aspects of our strategy (continued)

Our transition plan to a lower carbon future

NET ZERO 2050

COUNTRY

SECTOR

60% ELECTRIFICATION

95% RENEWABLES

100% RELIABILITY

COMPANY

CUSTOMER
Empowering the customer-led transition

COMPANY
Renewables 8,300 GWh
Net zero 2024

COUNTRY
Huntly flexibility 1,400 MW

OUR STRATEGIC OBJECTIVES



ELECTRIFICATION
Empowering the customer-led transition



GROW RENEWABLES
Grow our portfolio of renewable generation to support our net zero ambition



FLEXIBILITY
Transitioning our thermal generation portfolio while supporting a secure and stable grid

MANAGING THE TRANSITION

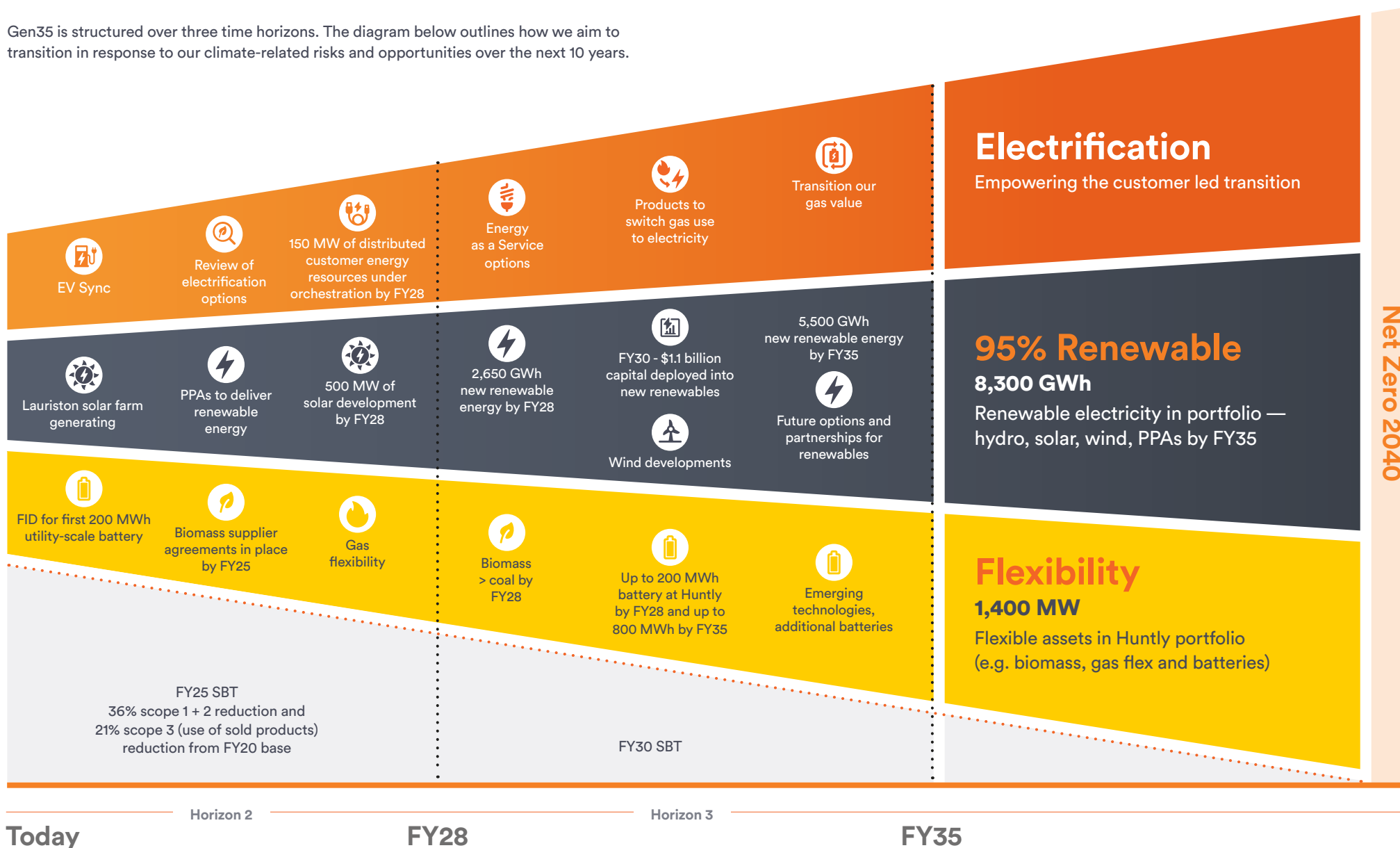
MANAGING A TRANSITION AWAY FROM FOSSIL FUELS

FINANCING THE TRANSITION

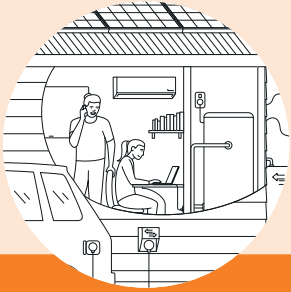
MANAGING OUR EXPOSURE TO CARBON PRICES

7.4 Transition plan aspects of our strategy (continued)

Gen35 is structured over three time horizons. The diagram below outlines how we aim to transition in response to our climate-related risks and opportunities over the next 10 years.



7.4 Transition plan aspects of our strategy (continued)



ELECTRIFICATION Empowering the customer-led transition

While New Zealand’s net zero commitment will drive a transition away from fossil fuel in homes and businesses, we recognise these fuels currently provide an essential option for many of our customers. The pace of the transition to low carbon assets remains uncertain due to various factors that create dynamic unpredictability. Improvements to electrified customer technologies and a lower cost-profile of changing fuels, alongside political initiatives play a vital role in making the transition away from gas, LPG and other fossil fuels practical for New Zealanders.

We see this transition as an opportunity to champion electric lifestyles, supporting our customers towards more sustainable choices for their homes and businesses.

One theme of Gen35 is to ‘extend beyond the meter’ and move into electricity-related value pools, maintaining reduced customer churn by providing additional propositions for electrification. This could include demand response, decarbonisation, and energy-related services such as solar, batteries, heat pumps and EVs. There may also be an opportunity to extend into supporting the financing of these devices to support the household and business energy transition.

Enabling value with customer energy resources

There is a large and growing number of digitally connected energy storing devices in customers' homes and businesses, like hot water storage, electric vehicles, or battery systems.

We’re working with partners to unlock electricity system flexibility from these existing assets and will be piloting the technology this year.

By controlling and optimising when large energy devices charge, we will be able to reduce electricity system costs and deliver value for our customers. Once we’ve proved the approach we will scale our efforts to unlock and orchestrate 150 MW of distributed customer energy resources by FY28.

Helping our residential customers manage their energy transition

Empowering the customer led transition includes providing tools and insights to help customers make informed decisions to reduce their carbon footprint. We do this through Energy IQ, electric vehicle charging technology and the Climate Change Hub (refer to our [FY24 Integrated Report](#) for more information).

Reducing transport emissions is a focus for the country. Electric vehicles are an electrification opportunity currently being pursued. We have developed unique offerings for the growing population of EV owners to provide flexibility and simplicity when charging their vehicles at home and on the road.

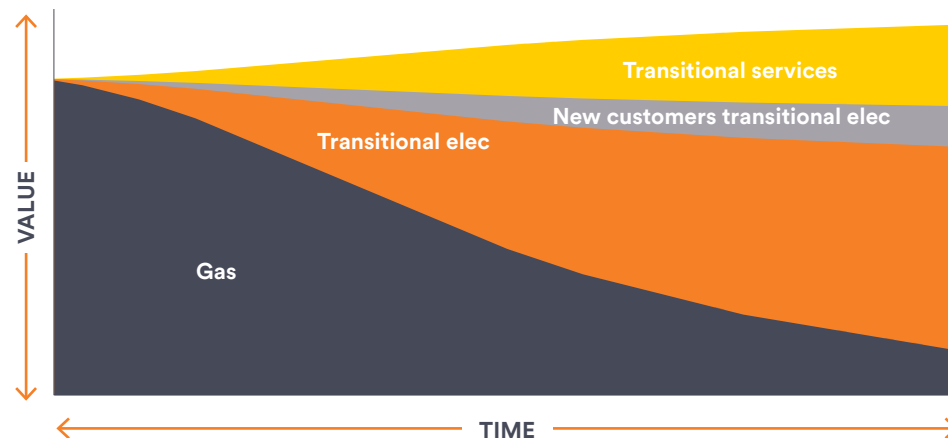
Helping our business customers manage their energy transition

We continue to investigate technology options that can help our customers transition to lower carbon options. Through this effort, we are positioning ourselves to identify early opportunities which might be ready to scale into offerings that appeal to a broad customer base in the near term.

We worked with New Zealand Green Investment Finance (NZGIF) on a pilot to help Van Lier Nurseries replace their fossil-fuelled heating asset with electricity. The pilot replaced Van Lier Nursery’s gas-fired boiler with a state-of-the-art 1 MW low emission heat pump to heat its greenhouses. NZGIF financed the heat pump which we own and maintain. By replacing their gas boiler, Van Lier Nurseries expects to save 640 tonnes of carbon emissions per annum over the heat pump’s 25-year life.

The pilot provided a tangible project to develop our business capability in electrification offerings. Experience and learnings from the pilot will be incorporated into future offerings for our business customers.

Electrification provides Genesis a transition revenue stream



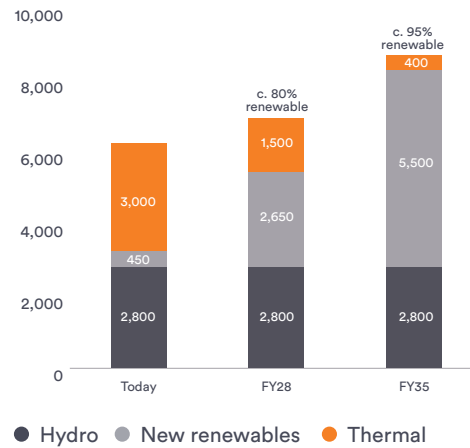
7.4 Transition plan aspects of our strategy (continued)



GROW RENEWABLES
Grow our portfolio of renewable generation to support our net zero ambition

We have re-sized our renewable goals to offset the expected reduction in thermal generation from our portfolio as well as participate in the growth expected to be driven by electrification. We are aiming to secure 2,650 GWh a year of new renewable electricity generation by FY28 growing to 5,500 GWh by FY35⁴¹.

Indicative portfolio change (GWh)



To achieve this growth, we are pursuing multiple pathways:

1. Co-developing new solar projects through our JV with FRV Australia.
2. PPAs with other renewable energy developers.
3. Exploring options to develop our own renewable generation and/or partnering with other developers.
4. Maintaining a watching brief on emerging technologies.

Co-developing new generation through our solar JV with FRV Australia

We have entered into a JV agreement with FRV Australia to develop up to 500 MW of solar (~740 GWh). We will enter into a PPA in respect of each solar site that is developed under the JV agreement. Construction began on the first 63 MWp solar JV project, Lauriston, in H2 FY24 with the bulk of the work to be carried out in H1 FY25.

Refer to [section 9](#) for progress towards reaching our goal of having 500 MW of solar.

PPAs with other renewable energy developers

To date we have signed PPAs for 1,297 GWh of new renewable generation including the offtake of wind and geothermal energy. We will continue to develop our PPA portfolio with additional renewable energy over the next decade.

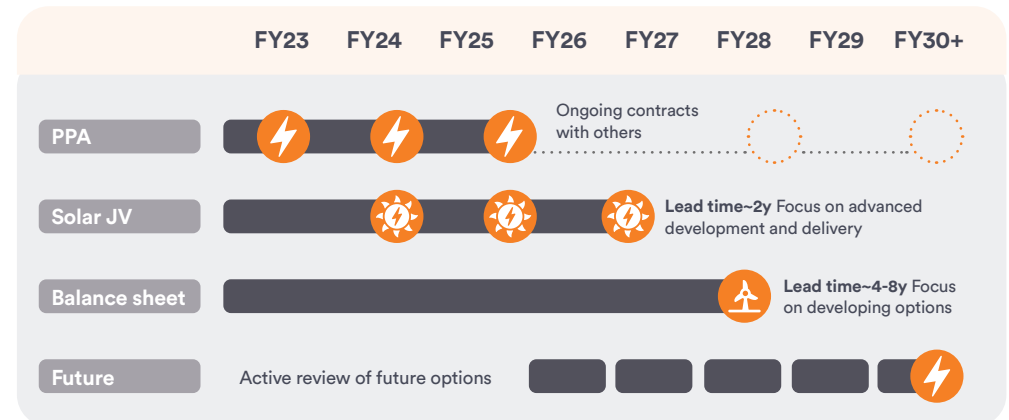
Exploring options to develop our own wind generation and/or partner with others

While wind development has recently been experiencing challenges across the globe, we continue to explore how we can develop wind generation to add to our portfolio.

We hold an option to develop a wind farm at Castle Hill and we continue to explore other options for future wind development, including potential offshore wind opportunities.

Maintaining a watching brief on emerging technologies

There are many new technologies being developed which could form part of a low carbon electricity system in the future. We continue to keep a watching brief on a range of opportunities that could prove valuable in New Zealand's electricity and energy system.



41. Against our FY20 baseline.

7.4 Transition plan aspects of our strategy (continued)



FLEXIBILITY

Transitioning our thermal generation portfolio while supporting a secure and stable grid

The price volatility of the wholesale market is likely to increase in response to greater reliance on weather-dependent forms of generation like solar, wind, and hydro. This volatility will occur across different timescales, from seasonal through to intra-day weather patterns and a mix of flexible assets and fuels will be needed to address this variation and greater peak capacity needs.

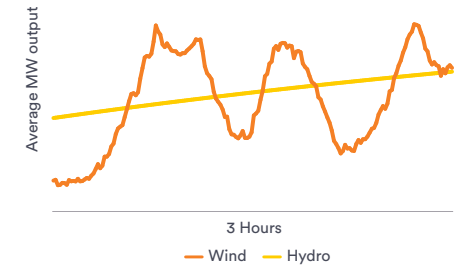
Our existing assets provide flexibility and firming for the current market with the capacity to meet existing peak demand. Our position at the intersection of the electricity and fuel markets, combined with our flexible assets, gives us optionality of how fuels can be used. This places us well to coordinate electricity and fuel supply deals and offer services to help manage security of supply in the electricity sector.

By FY35, we aim to operate a total of 1,400 MW of flexible assets in a suite of options at Huntly (the Huntly Portfolio) to capture the value of a more volatile market. While the Huntly Portfolio will centre around the power station, it may also encompass additional flexible assets that can be optimised collectively. Combined with our existing 640 MW of hydro capacity, our market share of the flexible capacity required to meet peak demand in FY35 would total close to 20%⁴².

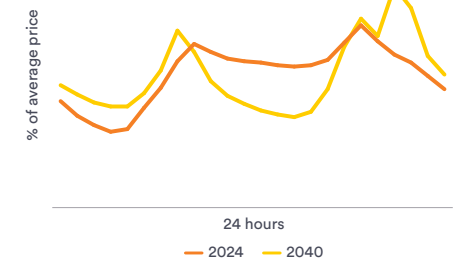
We are progressing a range of flexibility opportunities including:

1. Investing in utility scale batteries
 - ▶ Hourly flexibility
2. Contracting for gas flexibility
 - ▶ Weekly flexibility
3. Developing a biomass option
 - ▶ Yearly flexibility
4. Maintaining a watching brief on new technologies

Intra-hour: wind v hydro

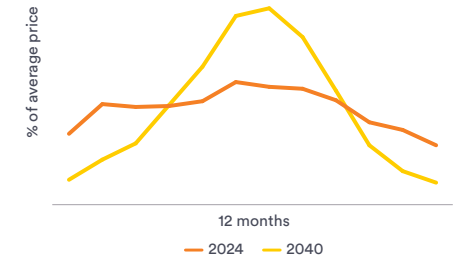


Intra-day: average price



Source: EnergyLink data

Seasonal: average price



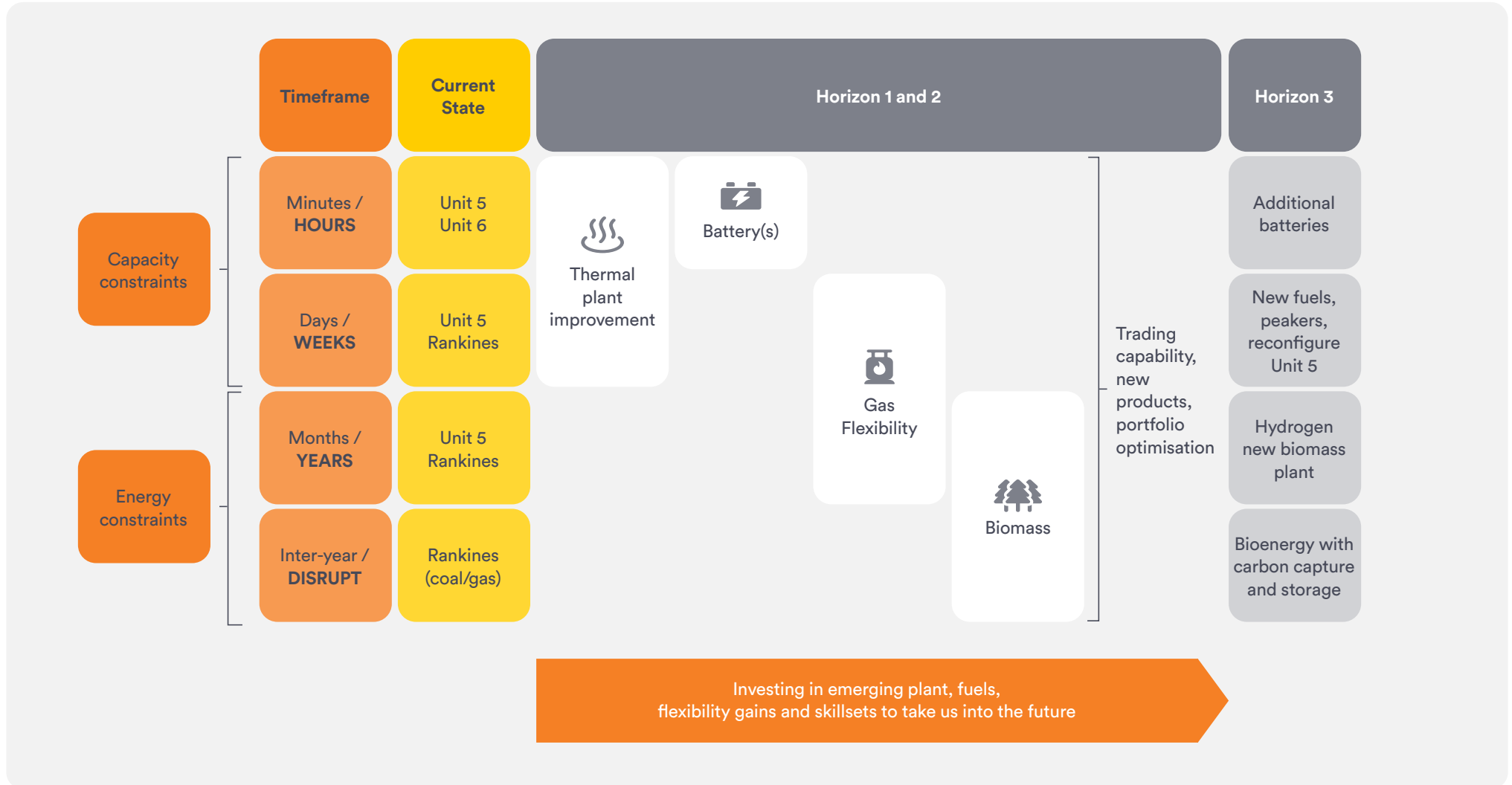
Source: EnergyLink data

42. Based on the Boston Consulting Group, 'The Future is Electric' report, estimates for dispatchable capacity to meet highest peak demand.

7.4 Transition plan aspects of our strategy (continued)

Huntly Portfolio can deliver future flexibility needs

Genesis will invest in more flexible plant and fuels and provide peaking and firming products



7.4 Transition plan aspects of our strategy (continued)

Investing in utility scale batteries

▶ Hourly flexibility

Utility scale batteries offer ‘fast-start’ optionality, and their cost has been decreasing. Genesis has identified physical space at Huntly Power Station for up to 400 MW / 800 MWh with more land available in time. Gen35 includes a target of developing and operationalising up to 200 MWh battery by FY28 and Huntly currently has 250 MW of connection capacity from a retired Rankine unit. Batteries will offer versatile energy storage that can create value through price arbitrage, portfolio optimisation and ancillary products.

Contracting for gas flexibility

▶ Weekly flexibility

The transition to a lower carbon future means gas generation is transitioning away from traditional baseload operations towards a more flexible firming role to deliver electricity when renewable generation availability is low and to meet peak demand needs. To deliver this role we are pursuing greater plant flexibility and gas fuel supply flexibility.

Fuel flexibility could be achieved through flexible supply contracts, flexibility in demand built into supply contracts, or contracting for gas storage.

Developing a biomass option

▶ Yearly flexibility

Currently, there are limited commercially feasible zero-carbon options to manage the challenges posed by seasonal demand variability and hydro variability (dry-year risk) in New Zealand.

We are committed to continuing to explore more renewable fuel options such as biomass. Biomass is an alternative to coal with no material fossil emissions (biogenic emissions vary between sources) that can be stockpiled. It can also be shipped easily which lends itself to the development of an international market that could improve supply flexibility and resilience which is important for a more renewable electricity system.

We successfully completed a biomass burn trial at Huntly Power Station in FY23, a significant step in our search for alternative fuel options for the Rankine units. We believe that using renewable biomass in the Rankine units could potentially form part of a portfolio of options to keep New Zealand’s electricity system reliable and affordable. The use of biomass could also extend the useful life and economic value of the units past their current asset valuations.

We are working on securing biomass to replace coal; however, we need to be confident that it is cost competitive, convenient to procure, commercially viable and a lower emissions option before a commercial arrangement can be reached.

Maintaining a watching brief on new technologies

There are a range of new and emerging technologies that might become commercially viable and could form part of the Huntly Portfolio in the future.

Genesis is keeping a watching brief on options, particularly those that could pair with existing assets at the Huntly sites. A few options of particular interest include:

- New fuels that could be used in existing assets, such as imported LNG, biodiesel or hydrogen, and new plant that could use new fuels.
- The potential for Biomass with Carbon Capture and Storage (BECCS) which could deliver negative emissions if combined with a sustainable source of bioenergy (e.g. waste or sustainably grown biomass).



Artist impression of grid scale battery at Huntly.

7.4 Transition plan aspects of our strategy (continued)

MANAGING THE TRANSITION

In this section we discuss how we are:

1. Managing a transition away from fossil fuels
2. Financing the transition
3. Managing our exposure to carbon prices

MANAGING A TRANSITION AWAY FROM FOSSIL FUELS

Fossil fuels currently play an important role in our society and economy providing affordable and reliable energy to homes, businesses, and the electricity sector. A transition completely away from fossil fuels is expected over the next few decades.

The process of transitioning away from fossil fuels create risks. Our transition can be considered in four parts:

1. Transitioning away from coal generation
2. Transitioning away from gas generation and the role of Kupe
3. Transitioning away from gas and LPG sales
4. Engaging with industry and regulators

Transitioning away from coal generation

Coal currently serves a unique role in the New Zealand electricity system. Through stockpiling and importing, coal can provide large amounts of energy on demand and for sustained periods to the electricity system. This is used for managing dry-year risk, or other unexpected events such as unplanned outages of generation plant or gas production constraints or delays in new renewable generation needed to meet growing electricity demand.

We believe thermal generation will need to be used to fill the shortfall from time to time until more low carbon options become economically viable. However, due to the uncertain speed of the transition and the variability in year-to-year hydrology, it is not clear how much coal will be needed. As discussed in the [‘Flexibility’](#) section (page 51) we are working on securing biomass to replace coal. We are aiming to displace coal use as soon as practical and we are targeting biomass use to exceed coal use by FY28 if a commercially viable, cost competitive, convenient to procure and emissions reducing source can be secured that meets the criteria above.

Transitioning away from gas generation and the role of Kupe

We use gas for electricity generation and sell gas to wholesale, Commercial and Industrial (C&I), Small to Medium Enterprises (SME) and residential customers. Each of these customer groups is expected to transition towards renewable options over the coming decade(s).

Kupe gas field remains an important asset in New Zealand’s energy transition particularly given the accelerating decline of available reserves in New Zealand⁴³ and the lack of planned investment going forward. Our partial ownership of Kupe and contracts for gas supply from the Kupe oil and gas field provides access to gas through the transition. We have completed our investment into a well development programme at the Kupe gas field (KS-9). It was hoped that additional gas would reduce the need for coal generation, but with the well not producing gas flow at this stage (still subject to possible additional intervention post winter 2024), it is now certain that emissions will be higher due to a greater need for coal generation in the near term.

Production at Kupe is anticipated to reduce (in line with our Science-Based Targets) as the gas field approaches end of life in the 2030’s. In the interim period, 100% of Free Cash Flow⁴⁴ from Kupe will be dedicated to help fund renewable generation which is expected to reduce the volume of thermal generation from fossil fuels.

Transitioning away from retail gas and LPG sales

Gas and LPG are currently used by many homes and businesses across New Zealand. For customers to use renewable fuels, they will need to replace their existing gas and LPG appliances used for cooking, heating, and hot water with new equipment. While the Zero Carbon Act and the ETS will drive this transition, the timing of change is not clear and could be particularly difficult for those who cannot afford to transition. The timing will depend on factors such as: carbon prices, gas and LPG prices, the cost and installation challenges of renewable alternatives, incentives and subsidies, funding options, and customers preferences. We are mindful of balancing our decarbonisation efforts with the need to ensure our customers have reliable and cost-effective energy. Genesis is exploring how it can support customers to transition towards electric alternatives.

Engaging with industry and regulators

For the transition to a low carbon future to be efficient and effective it is important that industry and regulators work together. For example, poor regulatory or policy settings could disincentivise electrification through a higher-cost and less reliable electricity system.

We work with regulators and industry groups to support the sector to align on the direction and effective regulations that will help the country move quickly and safely towards a sustainable future. Refer to the [FY24 Integrated report](#) for a summary of submissions made in FY24.

43. Data supplied to MBIE showed a 17% decrease in Proven plus Probable (2P) reserves. 1635 Petajoules (PJ) of 2P Gas reserves were reported as at 1 January 2023, down from 1967 PJ a year earlier ([Petroleum reserves data shows decline in gas reserves | Ministry of Business, Innovation & Employment \(mbie.govt.nz\)](#)).

44. Free Cash Flow represents EBITDAF less cash tax paid, net interest costs and stay in business capital expenditure. Net interest costs is interest and other finance charges paid, less interest received.

7.4 Transition plan aspects of our strategy (continued)

FINANCING THE TRANSITION

We estimate that our renewable investment programme in Gen35 will cost approximately \$1.1 billion through to FY30. This includes investment in solar through the solar JV with FRV Australia and via other models, grid scale batteries and other new renewable assets owned partially or wholly by Genesis.

Our approach to funding this growth is flexible, utilising a variety of commercial partnerships and contracts to provide balanced investments that enable growth in renewables, including PPAs and development with equity partners. A large portion of the renewable generation developed by our solar JV with FRV Australia, will be financed through non-recourse project finance. These arrangements reduce the level of capital outlay required by us. Kupe's Free Cash Flows will be used to help fund assets constructed and owned by us. Using a mixture of funding methods will enable us to maintain our BBB+ credit rating.

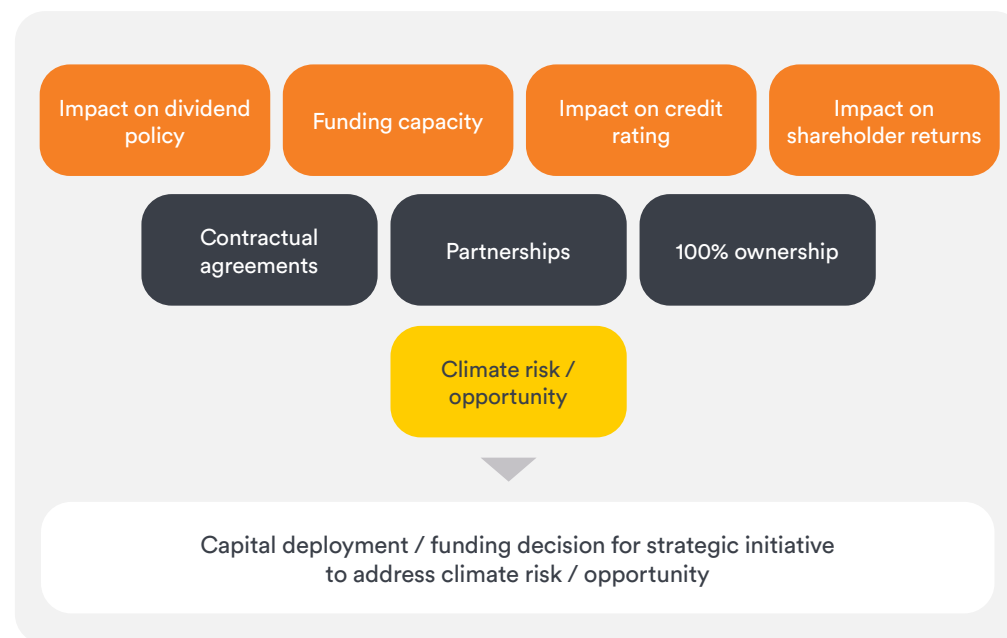
MANAGING OUR EXPOSURE TO CARBON PRICES

We have a policy to manage the price risk associated with carbon over the short term. Prices are managed using forward contracts and options. We are also involved in two forestry partnerships which are designed to provide lower cost emission units. These units help manage the future cost of thermal generation or can be sold to other emitters.

7.5 How we align transition plan aspects of our strategy with internal capital deployment and funding decisions

Climate-related risks and opportunities are integral to the development of Gen35, financial planning, capital deployment and funding decisions. When developing Gen35, we considered the capital that is required to be deployed to manage the risk or take advantage of the opportunity and how this could be funded. We considered the value of owning the asset compared to entering into partnerships or contractual arrangements, the capacity of our balance sheet to support the investment, the impact on our credit rating and return on investment to shareholders. As part of this process, we also consider future earnings, our dividend policy and our funding capacity.

We have established a number of forums to govern the planning and delivery of different aspects of the Gen35. These forums ensure programs of work are aligned with the strategic goals outlined in Gen35 and our risk appetite. They are also responsible for prioritisation of resources, approval of business cases and funding requests for new projects and changes to existing projects within their approved delegated authority, and monitoring budgets. Business cases and funding requests outside their delegated authority are presented to the relevant executive or the Board for approval in accordance with our Delegations of Authority Policy.



8. Metrics

This section includes the metrics outlined in NZ CS 1, industry-based metrics and other key performance indicators used to measure and manage our climate-related risks and opportunities. We used the industry-based guidance⁴⁵ published by the International Financial Reporting Standards (IFRS) Board to determine which industry-based metrics to include.

8.1 Our GHG emissions

Total scope 1 and 2 greenhouse gas (GHG) emissions⁴⁶ for the year ended 30 June 2024 were 2,442,729 tCO₂e. This is 127% more than FY23. The increase is mainly driven by higher thermal generation (51% higher than FY23) and, in particular, higher coal burn due to gas supply constraints and lower hydro inflows. FY23 had exceptionally high hydro inflows, which enabled a decrease in the volume of coal burnt, whereas there were periods of time in FY24 where hydro generation could only run on minimum flows. These hydrological conditions, combined with constrained gas supply and unplanned plant outages, resulted in coal burn increasing from 57 kilotonnes in FY23 to 729 kilotonnes in FY24.

Scope 3 emissions for the year ended 30 June 2024 were 788,413 tCO₂e. This is 17% less than FY23. The decrease is mainly driven by the decrease in wholesale gas sales, which decreased from 2.8 PJe in FY23 to 0.2 PJe in FY24.

Emissions in FY21 were higher than all the other years due to increased thermal generation as a result of below average hydro inflows.

45. 'Electric Utilities and Power Generators' and 'Gas Utilities and Distributors'.

46. Throughout this document 'emissions' means greenhouse gas emissions.

Scope	Category	FY24 tCO ₂ e	FY23 tCO ₂ e	FY22 tCO ₂ e	FY21 tCO ₂ e	FY20 tCO ₂ e
Direct emissions (Scope 1)	Attributable to customers	2,395,183	1,072,507	1,934,978	3,132,879	2,539,863
	Attributable to thermal backed electricity contracts*	45,094	–	286,398	805,398	149,491
	Stationary combustion attributable to thermal generation	2,440,277	1,072,507	2,221,376	3,938,277	2,689,354
	Mobile combustion	2,185	1,738	1,733	1,624	579
	Fugitive emissions	113	1,745	17	162	80
	Total scope 1	2,442,575	1,075,990	2,223,126	3,940,063	2,690,013
Indirect emissions (Scope 2)	Electricity consumption	154	160	217	262	240
	Total scope 2	154	160	217	262	240
Indirect emissions (Scope 3)	Purchased goods and services	15,290	16,480	15,492	14,898	15,348
	Capital goods [^]	9,364	–	–	–	–
	Fuel and energy related activities (upstream emissions)	213,413	234,351	410,177	438,837	412,475
	Waste generated in operations	174	16	21	26	19
	Business travel	573	409	146	215	1,975
	Employee commuting [^]	1,108	1,748	–	–	–
	Use of sold products	544,714	692,204	994,686	1,269,957	1,366,852
	Investments	3,777	4,789	7,184	8,547	8,080
	Total scope 3	788,413	949,997	1,427,706	1,732,480	1,804,749
	Total scope 1, 2 & 3	3,231,142	2,026,147	3,651,049	5,672,805	4,495,002

Items excluded from scope 1-3 in accordance with the GHG protocol

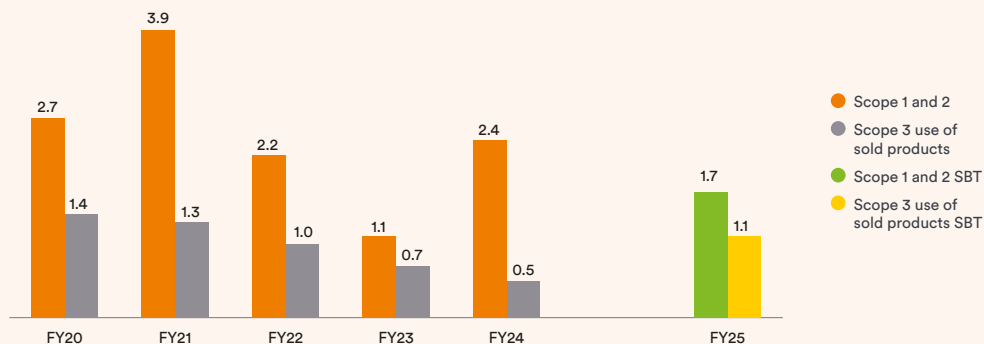
Biomass – CO₂	Stationary combustion of biomass attributable to thermal generation	–	857	–	–	–
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* FY24 includes generation emissions associated with Market Security Options (MSOs) and FY20-FY22 includes generation emissions associated with swaptions. The swaptions expired in December 2022 and were not called in FY23.

[^] FY24 is the first year that capital goods have been disclosed and FY23 was the first year that employee commuting was disclosed. The comparative periods were not restated for these changes.

8.1 Our GHG emissions (continued)

GHG emissions (MtCO₂e)



Performance against our SBT is included in [section 9](#).

How we calculate our GHG emissions

Our GHG emissions have been calculated in accordance with the GHG Protocol, using the operational control consolidated approach. We use the Ministry for the Environment’s (MfE) 2024 Greenhouse Gas Reporting emission factors for all scopes and categories except for:

- Scope 3 purchased goods and services and capital goods which use the emission factors from the Consumption Emissions Modelling Report (Market Economics Limited, 2023) prepared for Auckland Council (prior to FY24 the Department for Environment Food and Rural Affairs (DEFRA) lifecycle emission factors were used); and
- Scope 3 fuel and energy related activities which uses Agrilink lifecycle emission factors.

The MfE emission factors are based on 100-year global warming potential values from the IPCC’s Fifth Assessment Report (AR5) and Agrilink emission factors are based on 100-year global warming potential values from the IPCC’s Fourth Assessment Report (AR4). Refer to [Appendix II](#) for a summary of the significant uncertainties, [Appendix II](#), Table 2 for a summary of scope 3 items which have been excluded from the GHG inventory and [Appendix II](#), Table 3 for the methods and assumptions applied.

Assurance of GHG inventory

Deloitte has provided an unqualified limited assurance conclusion on the FY24 GHG inventory (refer to [Appendix III](#)). EY issued limited assurance opinions on the FY20, FY21, FY22 and FY23 GHG inventories. New scope 3 categories were, however, added in FY22⁴⁷. The comparatives for the new scope 3 categories added in FY22 were restated back to FY20 but were not subject to limited assurance.

New Zealand's regulatory regime

New Zealand has several regulations aimed at limiting emissions. One of the key mechanisms is the Emissions Trading Scheme (ETS) which requires businesses to measure and report their greenhouse gas emissions and surrender emission units for each tonne of emissions they emit. Genesis is a participant under the scheme for coal purchases (if the thresholds under the scheme are met) and Genesis’ 46% share of Kupe production. Emission units are also payable to most other entities who supply Genesis with gas, either that or the cost of the emissions is included in the purchase price. For this reason all of our scope 1 emissions are either covered directly or indirectly by a program intended to reduce emissions.

47. Three new categories (purchased goods and services, fuels and energy related activities and investments) were added to the FY22 GHG inventory. The FY21 and FY20 GHG inventories were restated to include these. These categories were not included in the FY20 and FY21 limited assurance reviews undertaken at that time.

8.1 Our GHG emissions (continued)

GHG emissions intensity

The emissions intensity of thermal generation is influenced by the mix of fuels used. Gas produces approximately half the emissions of coal. Thermal generation intensity was higher in FY24 and FY21 due to higher use of coal. FY24 was also impacted by Unit 5's unplanned outage, which required the less efficient Rankine units to run, primarily using gas to make up the shortfall.

The emission intensity in FY23 was significantly lower because almost all the thermal generation was from gas (refer to [section 8.2](#) for information on our thermal generation by fuel type). Total generation intensity was also significantly down in FY23 due to the reason noted previously and higher-than-normal hydro generation as a result of exceptionally high hydro inflows.

Retail emissions intensity continues to trend down. The significant decrease in FY23 is largely due to a decrease in the MfE emission factor for electricity, which is driven by the increase in renewable generation. Had we used the 2022 MfE factor the retail carbon intensity would have been 0.70 in FY23 and 0.64 in FY24.

GHG emissions intensity	FY24	FY23	FY22	FY21	FY20
Generation emissions intensity					
Thermal generation (GWh)	3,282	2,177	3,736	5,501	4,461
Thermal generation emissions intensity (tCO ₂ e* / thermal generation GWh)	744	493	595	716	603
Total generation (GWh)	5,960	5,858	6,481	8,027	6,805
Total generation emissions intensity (tCO ₂ e* / total generation GWh)	409	183	342	491	395
Retail emissions intensity					
Retail revenue (\$m) [~]	1,833	1,656	1,565	1,575	1,558
Retail emissions (kgCO ₂ e) [^]	967	962	1,192	1,207	1,218
Emissions intensity of retail revenue (kgCO ₂ e / retail revenue \$m)	0.53	0.58	0.76	0.77	0.78

* Scope 1 stationary combustion attributable to thermal generation.

[~] Revenue from electricity, gas, LPG and emissions on fuel sales and electricity contracts as outlined in note A1 of the Consolidated Financial Statements.

[^] Emissions from electricity purchases is based on factors published by the Ministry for the Environment (MfE) so that the metric is comparable with other entities.

8.2 Transition risk metrics

Thermal generation assets

The Rankine units and Unit 5 are carried at fair value, calculated using a discounted cash flow model based on a finite period (FY24: six years for the Rankine units and eight years for Unit 5). Key assumptions that are used to derive the fair value are the wholesale electricity price path, generation volumes, discount rate and the remaining economic useful life of the assets.

The wholesale electricity price path increased in FY24, reflecting certainty over Tiwai remaining, delays in future build assumptions and higher thermal fuel costs (due to tight gas supply and forecasted need to import coal to make up the shortfall). The increase in the wholesale electricity price path was partly offset by the passage of time, as the remaining useful lives of the assets remains unchanged.

The FY23 valuation of Unit 5 was also impacted by the unexpected outage on 30 June 2023 and in FY24 by the domestic gas supply constraints (which is expected to impact generation volumes). These factors also impacted the valuation of the Rankine units, with additional volumes forecasted to be generated through these units as a result. Refer to [page 38](#) for more information.

Kupe assets

Kupe assets are carried at historic cost and most of the assets are depleted on a units of use basis using proved remaining reserves (1P). The carrying value of the assets have declined over the last four years due to annual depletion and amortisation charges.

During FY24 a development well, KS-9 was drilled in the eastern block of the Kupe field. Reserves information collected from the well development programme indicated that the central field and eastern block were connected. The JV Operator conducted a review of Kupe's reserves that lead to a downgrade and resulted in the recognition of a \$64.1 million impairment loss excluding deferred tax. The impairment largely offset the cost of the development well. The change in reserves did not impact Kupe's end of life, which is expected to be in the 2030's.

Retail LPG assets

LPG assets are carried at historic cost and depreciated over their useful lives. This balance includes LPG depots, reticulated networks and customer installs. The carrying value of these assets has declined due to annual depreciation and amortisation charges. This trend is expected to continue.

Assets vulnerable to transition risk*	FY24	FY23	FY22	FY21	FY20
Carrying value net of deferred tax*					
Thermal generation assets (fair value)					
Rankine units (gas and coal fired) (\$m)	92.2	78.1	44.2	40.8	24.1
Unit 5 (gas fired) (\$m)	175.5	272.4	464.6	295.5	335.6
Thermal generation assets as a % of total generation fixed assets	10%	15%	20%	14%	16%
Kupe assets					
Oil and gas and intangible assets (\$m)	187.4	207.1	222.3	228.9	240.1
Retail LPG assets					
LPG (\$m)	72.9	74.2	77.3	80.9	82.1
Total carrying value of assets vulnerable to transition risks net of deferred tax (\$m)*	528.1	631.8	808.4	646.1	681.9

* Assets vulnerable to transition risks are defined as assets that have the potential to become stranded or where their carrying value could be materially impacted (either through reduction in fair value or impairment) because of the transition risks outlined in [section 7.3](#). Deferred tax includes the movement associated with a change in fair value or impairment but excludes the impact arising from disposal of assets.

8.2 Transition risk metrics (continued)

Earnings vulnerable to transition risk [*]	FY24	FY23	FY22	FY21	FY20
Thermal generation					
Thermal generation (GWh)	3,282	2,177	3,736	5,501	4,461
Generation by fuel source					
Gas	32%	35%	43%	32%	46%
Coal	23%	2%	15%	37%	20%
Biomass	–	–	–	–	–
Total thermal generation	55%	37%	58%	69%	66%
% of retail purchases covered by thermal generation [^]	50%	31%	48%	58%	64%
Kupe					
Gas sales (PJ)	7.0	8.4	11.1	10.6	10.7
Oil sales (kbbbl)	109	254	292	306	366
LPG sales (T)	29,968	36,520	47,413	45,798	46,751
Kupe EBITDAF (\$m)	38.7	66.6	77.4	87.4	93.8
Retail and wholesale					
Retail gas sales (PJ) [#]	7.0	7.2	7.4	8.0	7.8
Wholesale gas sales (PJ)	0.2	2.8	7.4	11.9	14.1
Gas gross margin (\$m) [~]	53.8	47.3	38.4	(6.7)	(23.0)
Retail LPG sales (T) [#]	43,339	43,874	44,341	43,542	42,347
Wholesale LPG sales (T)	6,246	7,262	17,094	15,458	5,360
LPG gross margin (\$m) [~]	59.7	45.7	54.0	45.4	38.6

* Earnings vulnerable to transition risks are defined as earnings from business activities that have the potential to be materially impacted by the transition risks outlined in [section 7.3](#).

[^] Wholesale electricity generation is usually higher than retail electricity purchases (i.e., long). As we are disclosing the vulnerable portion of retail electricity purchases to spot prices, we have calculated the thermal portion as being the difference between total retail electricity purchases and renewable electricity generation including PPAs divided by total retail electricity purchases.

[#] Refer to our [FY24 ESG Datasheet and GRI Index](#) for a breakdown of sales by customer segment.

[~] Gross margin is the lowest level of earnings reported for gas and LPG.

Thermal generation

Thermal generation in FY24 was higher than FY23 mainly due to below average hydro inflows in FY24 (compared with significantly above average hydro inflows in FY23). The increase in coal generation was mainly due to plant outages and domestic gas supply constraints. Unit 5 was out for more than six months in FY24, which resulted in increased use of the less efficient Rankines.

The percentage of retail purchases covered by thermal generation has been decreasing up until FY24, mainly due to declining retail volumes relative to hydro generation and the notional purchase of renewable electricity under the Waipipi PPA from November 2020. FY24 has increased due to higher retail volumes. Renewable generation in FY24 was in line with the previous years with the exception of FY23.

Kupe

Kupe sales and EBITDAF have declined due to field decline, timing of oil sales, and changes in selling prices. Kupe production, and therefore, sales and EBITDAF was also impacted in FY24 by the planned maintenance outage in November 2023 and, to a lesser extent, plant downtime to enable the KS-9 well development work.

Gas

Retail gas sale volumes have remained relatively consistent year on year. Wholesale gas sales have declined in the current year mainly due to all available gas being used for electricity generation and retail customers. The decline in the earlier comparative periods was mainly due to our strategy to move away from long term wholesale gas sale contracts. The gas gross margin has increased over time mainly due to our focus on selling gas into higher value retail channels.

LPG

Retail LPG sale volumes have remained relatively consistent year on year. Wholesale LPG sales increased in FY21 due to the Wholesale segment on-selling more of the LPG acquired from Kupe. The decrease in FY23 and FY24 was mainly due to the decrease in Kupe's production as noted above. LPG gross margin has grown over time due to increased sale volumes and improved retail pricing. The reduction in FY23 is mainly due to reduced sale volumes and a contractual price adjustment relating to FY22.

8.2 Transition risk metrics (continued)

Earnings vulnerable to transition risk*	FY24	FY23	FY22	FY21	FY20
Retail customers using fossil fuels (count)					
Gas only	10,281	11,918	14,003	16,086	15,888
LPG only	29,871	34,275	34,748	34,007	33,569
Multi fuel	150,557	142,987	133,550	128,214	121,110
Percentage of our customer base	39%	39%	39%	38%	35%
Net customer churn					
Genesis	13.5%	12.1%	12.8%	15.9%	14.8%
Frank Energy	16.2%	17.9%	20.2%	24.6%	24.5%
New Zealand gas and LPG consumption (PJ)⁺					
Residential and commercial gas	<	14.7	14.4	15.1	15.2
Industrial gas	<	50.5	53.5	57.3	63.7
LPG (all categories)	<	9.6	9.5	9.4	9.2
Active gas ICPs in New Zealand^{>}	308,021	307,376	302,285	297,311	292,666
Carbon hedging					
Forecast number of full years of carbon hedging in place at year end [^]	2	6	5	4	7
Cost of debt					
Weighted average interest rate	5.7%	5.2%	4.2%	4.5%	5.5%

* Earnings vulnerable to transition risks are defined as earnings from business activities that have the potential to be materially impacted by the transition risks outlined in [section 7.3](#).

+ As published by the Ministry of Business, Innovation and Employment (MBIE).

< FY24 quarter four information for New Zealand gas and LPG consumption had not be released by MBIE at the time of writing this report.

> As reported by the Gas Industry Co.

[^] The FY24 and FY23 forecast uses 90 years of historical hydro inflow data to calculate the average thermal generation forecasted to occur and assumes expected plant and gas availability at year end. The FY20-FY23 uses 83 years of historical hydro inflow data. Actual thermal generation may differ to this.

Retail customers using fossil fuels

Overall retail customer numbers have increased year on year. While the number of single fuel gas and LPG customers continues to slowly decline this is mainly due to customers moving to multi fuel offerings.

Net customer churn

Customer churn in FY24 primarily reflects the relative price position of each brand in their respective market. Genesis brand pricing was in the upper range compared to other Tier 1 retailers for most of FY24, driving churn higher. Frank customer churn reduced year on year reflecting its competitive price position and improved customer experience.

New Zealand retail gas and LPG consumption

NZ residential and commercial gas and LPG consumption has remained relatively static year on year, but industrial gas consumption has been in decline since Covid mainly due to the closure of several large industrial users. The number of active gas connections continues to grow year on year.

Carbon hedging

The duration of carbon hedging is impacted by median hydrology, expected coal and gas conditions and renewable development. The decrease in FY24 is due to forecasted domestic gas supply constraints, delay in market-wide renewable development (both of these impacts result in a forecasted need to burn more coal) and a refresh of our approach to carbon hedging.

Cost of debt

The weighted average interest rate has increased in line with floating interest rates.

8.3 Physical risk metrics

Assets and earnings vulnerable to physical risk	FY24	FY23	FY22	FY21	FY20
Carrying value net of deferred tax*					
Hydro generation assets (fair value) (\$m)	2,342.4	2,040.4	2,028.2	2,016.4	1,925.3
Earnings vulnerable to physical risks^					
Hydro inflows (GWh)~	2,470	3,993	3,000	2,393	2,706
Hydro generation (GWh)	2,664	3,669	2,733	2,507	2,321
Hydro generation as a % of total generation	45%	63%	42%	31%	34%

* Assets vulnerable to transition risks are defined as assets that have the potential to become stranded or where their carrying value could be materially impacted (either through reduction in fair value or impairment) because of the physical risks outlined in [section 7.3](#). The main reason that hydro generation assets have been included here is because they are carried at fair value in the Consolidated Financial Statements. Hydro generation assets are unlikely to become stranded or written off as a result of the physical risks however the earnings from these assets could be impacted, which would in turn impact their fair value. For this reason, they have been disclosed as assets vulnerable to physical risks. Refer to [section 8.2](#) for Kupe asset values. Deferred tax includes the movement associated with a change in fair value or impairment but excludes the impact arising from disposal of assets.

^ Earnings vulnerable to physical risks are defined as earnings from business activities that have the potential to be materially impacted by the physical risks outlined in [section 7.3](#). Refer to [section 8.2](#) for Kupe earnings.

~ Based on the aqueduct tool on the World Resource Institute's website no catchments in New Zealand are rated high or extremely high. Refer to our [FY24 ESG Datasheet and GRI Index](#) for more information on our use of water.

Hydro generation assets

Hydro generation assets are carried at fair value, calculated using a discounted cash flow model. The fair value is materially impacted by long-term wholesale electricity prices and discount rates.

The increase in the fair value in FY24 is primarily due to the forecasted increase in wholesale electricity prices.

Hydro inflows are significantly impacted by acute weather events and seasonal variations. Near record inflows were recorded in FY23, which enabled increased hydro generation. In contrast, hydro inflows in FY24 were below average with extended periods where hydro generation could only run on minimum flows.

8.4 Climate-related opportunity metrics

	FY24	FY23	FY22	FY21	FY20
Electricity consumption					
New Zealand electricity sales (consumption) (GWh) ⁻	<	39,477	39,539	40,228	40,198
Genesis retail electricity sales (GWh) [*]	5,919	5,663	5,806	6,241	6,244
Genesis % share of New Zealand electricity sales	<	14%	15%	16%	16%
Electricity generation					
New Zealand electricity generation from hydro (GWh) ⁻	<	27,912	24,683	23,179	24,693
New Zealand hydro generation as a % of total electricity sales (consumption)	<	71%	63%	58%	62%
Genesis % share of New Zealand hydro generation	<	13%	11%	11%	9%
Cumulative increase in renewable energy generation from plant efficiencies (GWh) ⁺	29	29	27	+	+
Products or services that support a lower carbon future					
Number of customers on an EV plan at 30 June	8,325	4,153	1,610	332	-

~ As published by MBIE. These volumes are updated each reporting period to align with the most recently published data.

< FY24 quarter four information for New Zealand electricity sales (consumption) and hydro generation had not been released by MBIE at the time of writing this report, as a result Genesis % share is unable to be disclosed.

* Refer to our [FY24 ESG Datasheet and GRI Index](#) for a breakdown of sales by customer segment.

+ From an FY20 base year. Comparatives for FY20 and FY21 are unable to be reported as efficiencies from capital work were not reported for these years. In addition to the GWh efficiencies reported for FY22, FY23 and FY24, work has also been completed which increased the individual capacity of three generators at Tuai by 2 MW. The total GWh efficiency gained depends on whether all three generators are run at the same time. Due to constraints on the station the full impact of the efficiency is only gained when the station is operating below the maximum output of 60 MW. For this reason, this efficiency gain has not been included in the reported numbers.

Electricity consumption and generation

National electricity consumption, and Genesis' share of that consumption, have remained relatively constant. National hydro electricity generation dipped in FY21 due to below average hydro inflows, and peaked in FY23 due to near record inflows. Genesis' share of hydro generation has remained relatively consistent, except for FY23, which was impacted by near record inflows into our catchments.

We continue to invest in hydro assets to improve efficiencies. Most of the work undertaken in FY24 focused on extending the life and reliability of assets as well as increasing the efficiency of our units within certain operating conditions rather than increasing the total maximum capacity. Refer to our [FY24 Integrated Report](#) for further information on generation site upgrades.

Products or services that support a lower carbon future

We continue to see a strong uptake for our EV plans and products in FY24. The growth rate has, however, slowed as national EV sales have decreased since the removal of government incentives.

8.5 Capital deployment metrics

	FY24	FY23	FY22	FY21	FY20
Investments held at 30 June					
Solar partnerships (\$m)	0.6	–	–	–	–
Forestry partnerships (\$m)	72.5	53.7	32.0	15.1	5.3
Capital contributions/expenditure on climate-related initiatives during the year					
Climate-related initiatives (\$m) [^]	5.5	0.9	–	–	–
Forestry partnerships (\$m)	20.5	23.3	17.4	10.3	5.7
Unit upgrades and efficiencies (\$m) [~]	2.8	11.6	16.4	2.8	6.6
Research and development on climate-related initiatives during the year (\$m)	0.6	2.7	2.8	0.2	–
Capital committed to climate-related initiatives at 30 June[*]					
Climate-related initiatives (\$m)	10.1	1.9	–	–	–
Forestry partnerships (\$m)	27.9	48.4	71.7	14.1	24.4
Unit upgrades and efficiencies (\$m)	1.2	3.8	7.0	8.1	7.3

[^] This includes capital contributions to solar partnerships, our share of net profit/loss from the solar JV, internal labour and third-party costs.

[~] Total expenditure on projects which have increased the capacity or operating efficiency of the units when compared to their original design.

^{*} This represents the amount of funding committed to JVs, partnerships or projects but not yet spent at 30 June. This is a broader definition than the commitments in our Consolidated Financial Statements which are based on the contractual commitments of each of our associates or JVs in accordance with New Zealand Equivalents to International Accounting Standard 16.

Investments

In FY22, we entered into a JV with FRV Australia to establish up to 500 MW of solar. The solar JV is proportionally consolidated in our Consolidated Financial Statements and therefore does not appear as an investment on our balance sheet. In FY24 the solar JV established Lauriston Solar Project (2023) Limited Partnership, the first solar development project under the solar JV arrangement. Lauriston Solar Project (2023) Limited Partnership commenced development of Lauriston solar farm during the year. The project is funded by a non-recourse loan as well as contributions from ourselves and FRV Australia.

Our investment in our two forestry partnerships (which are designed to provide lower cost emission units that will be used to meet our obligations under the ETS) have increased year on year as the partnerships develop their forestry portfolios.

Capital contributions/expenditure

We continue to invest in climate-related initiatives that help our business transition to a low carbon future and improve operating efficiencies of our assets. The work completed on climate-related initiatives in FY24 is discussed in section 7.4 '[Development of new renewable generation](#)' and '[Development of flexible portfolio](#)'.

Capital expenditure on unit upgrades and efficiencies fluctuates year on year depending on when multiyear projects are completed. In FY24 the seven-year project to upgrade 3 generators at Tuai was completed and planning was undertaken for the full replacement of two generators at Kaitawa.

Research and development

Research and development includes investigating the viability of biomass and technologies associated with EV offerings.

Capital committed

Capital commitments on climate-related initiatives increased in FY24 due to the commencement of the Lauriston solar farm development.

Forestry partnerships capital commitments peaked in FY22 due to the establishment of Forest Partners Limited Partnership and have subsequently declined year on year due to the establishment of the forest portfolios.

Capital commitments on hydro generator upgrades to improve efficiencies have declined, as projects have been completed. A significant program of upgrades at Tuai, Piripaua and Tekapo were undertaken over the last seven years. Further work is planned in FY25 for the two hydro generators at Kaitawa. This has not been included in capital commitments at 30 June 2024 as the contracts were still being finalised at year end.

8.6 Internal emissions price

	FY24	FY23	FY22	FY21	FY20
Internal emission price (\$/tCO ₂ e)	\$56	\$64	\$87	\$44	\$35

The internal emissions price is a key input in calculating the wholesale electricity price path and determining the cost of thermal generation used in our operating and investing decisions. The price is based on the current market price and is adjusted over time to match the target price published by the Climate Change Commission (FY24 was \$230/tCO₂e in 2050 in real terms, prior to FY24 it was \$250/tCO₂e in 2050 in real terms). The table provides the average market price for the next financial year as calculated at 30 June.

The price is updated during the year if there is a material change in the market price. Wholesale electricity prices from two independent third parties are also used to assess investment decisions. These wholesale electricity prices incorporate an emission price assumption. The change in the emission price is reflective of the change in market prices over the period.

8.7 Remuneration metrics

	FY24	FY23	FY22	FY21	FY20
Short-term incentives linked to sustainability objectives	32%-37%	12%	18%-36%	12%	–
Long-term incentives linked to SBTs	20%	20%	–	–	–

Sustainability metrics were introduced into the short-term incentives in FY21 and achievement of Science Base Targets was incorporated into the long-term incentives in FY23. The ‘Executive remuneration’ section of the [FY24 Integrated Report](#) provides a summary of these goals.

9. Targets

Overall objective	Target	Target year	Base year	Performance				Commentary
				Base year	FY22	FY23	FY24	
Electrification Empowering the customer led transition	150 MW of distributed customer energy resources under orchestration	FY28	FY24	0 MW	N/A	N/A	0 MW	Leveraging the capability and footprint of Ecotricity.
	Reduce absolute scope 3 emissions from use of sold products by 21% by FY25	FY25	FY20	N/A	27% reduction	49% reduction	60% reduction	The target has been met and exceeded since FY22.
Grow renewables Grow our portfolio of renewable generation to support our net zero 2040 ambition	Increase renewable generation by 2,650 GWh	FY28	FY20	0 GWh	1,200 GWh	1,200 GWh	1,297 GWh	The increase in FY24 relates to the PPA for Lauriston solar farm. During FY24 we continued to assess several North Island development sites as well as a range of solar development opportunities as part of a growing pipeline of development options.
	Increase renewable generation by 5,500 GWh	FY35						
Aim is to have ~8,300 GWh of renewable generation from hydro, solar and wind by FY35 (+5,500 GWh from FY20 base of 2,800 GWh)	500 MW of solar development	FY28	FY20	0 MW	0 MW	0 MW	63 MW	Lauriston solar farm is the first solar farm being developed with FRV Australia. It is expected to be operational in the second quarter of FY25.
	Reduce absolute scope 1 and 2 GHG emissions by 36% by FY25	FY25	FY20	N/A	17% reduction	60% reduction	9% reduction	Below average hydro inflows, gas shortages and the unplanned outage of Unit 5 for almost six months of the year resulted in an increase in emission intensity, and therefore absolute emissions in FY24 relative to the comparative periods.
Flexibility Transition our thermal generation portfolio Aim is to have 1,400 MW flexible assets at Huntly by FY35	Up to 200 MWh Battery Energy Storage System operational	FY28	FY24	0 MWh	N/A	N/A	0 MWh	Established a project team to progress a business case for the construction of a 100 MW / 200MWh Battery Energy Storage System at Huntly, undertaken a request for proposal process for the supply of equipment and evaluated the responses. A Final Investment Decision is expected to be made in FY25.
	Up to 800 MWh Battery Energy Storage System operational	FY35						
	Commercial arrangements in place for the supply of biomass	FY25	FY24	None	N/A	N/A	No	We made good progress in FY24 on establishing a supply chain for biomass and have commenced negotiating key contractual terms. We expect to procure our first volume of locally produced biomass in FY25, which will be scaled up over time.
	Biomass generation > coal generation	FY28	FY24	0 GWh	N/A	N/A	0 GWh ⁴⁸	

48. The FY25 target relating to biomass commercial arrangements needs to be met before this target is applicable.

9. Targets (continued)

Overall objective	Target	Measurement method and assumptions
Electrification Empowering the customer led transition	150 MW of distributed customer energy resources under orchestration	Orchestration means the point at which the customer installed distributed customer energy resources (solar, EV, battery, hot water, heat) are flexibly used to optimise value for customers and Genesis in response to the market. MW is based on peak capacity of the assets under orchestration. Performance is measured using the MW of assets under orchestration at 30 June.
	Reduce absolute scope 3 emissions from use of sold products by 21% by FY25	Absolute target, aligned with a 1.5°C pathway, approved by SBTi. Measured in t/CO ₂ e using GHG protocol. Performance is measured as the % difference between actual emissions for the year compared to the base year. The target and actual performance do not include the use of offsets.
Grow renewables Grow our portfolio of renewable generation to support our net zero 2040 ambition Aim is to have ~8,300 GWh of renewable generation from hydro, solar and wind by FY35 (+5,500 GWh from FY20 base of 2,800 GWh)	Increase renewable generation by 2,650 GWh	Includes new renewable generation assets or PPAs that meet the criteria below after the base year. The only exception to this is Waipipi PPA which was signed in FY19 but was included in the target increase when the target was established. For projects wholly owned by Genesis the GWh are included when financial close is met. For PPAs the GWh are included when the contract is executed. PPAs on assets that met financial close before 30 June 2020 are not counted.
	Increase renewable generation by 5,500 GWh	The GWh is based on the annual P50 generation expected to be obtained from the asset as outlined in the design documents for assets wholly owned by Genesis or as outlined in the PPA. If Genesis partially owns an asset (i.e. via JV or partnership) and has a PPA only the PPA is counted.
	500 MW of solar development	MW is based on peak capacity. The MW are included when financial close for the project is met. If the project is developed through a JV arrangement the MW are based on the peak capacity for the whole project to align with the PPA.
	Reduce absolute scope 1 and 2 GHG emissions by 36% by FY25	Absolute target, aligned with a 1.5°C pathway, approved by SBTi. Measured in t/CO ₂ e using GHG protocol. Performance is measured as the % difference between actual emissions for the year compared to the base year. The target and actual performance do not include the use of offsets.
Flexibility Transition our thermal generation portfolio Aim is to have 1,400 MW flexible assets at Huntly by FY35	Up to 200 MWh Battery Energy Storage System operational	MWh is based on the peak storage capacity. Operational means able to be discharged into the market.
	Up to 800 MWh Battery Energy Storage System operational	
	Commercial arrangements in place for the supply of biomass	Target is met when there is a signed supply agreement in place for biomass.
	Biomass generation > coal generation	Target is met when biomass generation exceeds coal generation, calculated based on the volume of GWh produced in the year using each fuel.

Appendix I: Climate scenario data and reference models

This Appendix outlines the data and reference material used to construct each scenario.

[Climate Change Commission](#). (2021). *Scenarios Dataset Final Advice*.

[Coal in Net Zero Transitions](#). (2022). *Global Energy and Climate Model*.

[Intergovernmental Panel on Climate Change](#). (2021). *Sixth Climate Change Assessment Report*.

[International Energy Agency](#). (2022). *Global Energy and Climate Model*.

[Ministry for the Environment](#). (2018). *Climate change projections for New Zealand*.

[Ministry for the Environment](#). (2022). *Emissions reduction plan*.

[Ministry for the Environment](#). (2022). *Interim guidance on the use of new sea-level rise projections*.

[Ministry of Business, Innovation and Employment](#). (2022). *Carbon capture and storage*.

[Ministry of Business, Innovation and Employment](#). (2022). *New Zealand Energy Strategy*.

[Ministry of Business, Innovation and Employment](#). (2016). *Shared-climate Policy Assumptions for New Zealand in Exploring Options for New Zealand under Different Global Climates. Synthesis Report RA5. Climate Changes, Impacts and Implications*.

[International Energy Agency/Net Zero by 2050](#) (2022). *Climate Change Commission. (2021). Scenarios Dataset Final Advice: Global Energy and Climate Model*.

[International Institute for Applied Systems Analysis](#). (2018). *SSP Database (Shared Socioeconomic Pathways) Scenario Explorer*.

[StatsNZ](#). (2022). *National Population Projections 2022 (base)-2073*.

[Treasury New Zealand](#). (2022). *CBAx Tool User Guidance*.

[XRB \(External Reporting Board\)](#). (2022). *Climate-related disclosure. NZ CS1: Guidance for all sectors*.

Appendix II: GHG inventory methods, assumptions and uncertainties

Purpose

The GHG inventory has been prepared in accordance with the requirements of the Greenhouse Gas Protocol: *A Corporate Accounting and Reporting Standard (revised edition)* and the *Corporate Value Chain (Scope 3) Accounting and Reporting Standard (GHG Protocol)* which is an internationally recognised framework for carbon reporting. Using a recognised and widely adopted framework ensures transparency, robustness and consistency in approach across the energy sector.

Organisational boundaries

Organisational boundaries determine the parameters for emissions reporting and ensure consistency when determining which factors to include. Genesis' boundaries have been set in accordance with the methodology outlined in the GHG Protocol.

The GHG Protocol allows two distinct approaches to consolidate emissions: the equity share approach or the control approach (control can be defined in either financial or operational terms).

Genesis has applied the **operational control consolidation approach**, which ensures we focus on those emission sources that we have control over and therefore the ability to manage. Operational control is defined in the GHG Protocol as having the full authority to introduce and implement operating policies at the operation under consideration. Under the operational control approach, an entity accounts for 100% of emissions from operations over which it or one of its subsidiaries has operational control.

The organisation boundary includes Genesis and all its subsidiaries (refer to our [FY24 Integrated Report](#) for a list of subsidiaries).

Business units excluded

All of Genesis' joint ventures, joint operations and associates are excluded from scope 1 and 2 emissions on the basis that Genesis does not have operational control of these entities. Refer to our [FY24 Integrated Report](#) for a list of entities.

Kupe Venture Limited sells its 46% share of gas and LPG produced from Kupe JV to Genesis. These products are either used in the generation of electricity or sold to customers, as a result these products are included in either scope 1 or scope 3 depending on how they were used. The sale of oil produced by the Kupe JV is managed by the Operator, Beach Energy, and as a result has not been included in scope 3 emissions on the basis that Genesis does not have operational control.

Operational boundaries

The emission sources included in this report were identified with reference to the methodology outlined in the GHG Protocol.

Scope 1 – Direct emissions

Scope 1 includes emissions from sources that are owned or controlled by Genesis. This includes electricity generation, fuel used in vehicles owned or leased by Genesis and any fugitive emissions released.

During FY23 we successfully completed a biomass burn trial at Huntly Power Station. The CO₂ from combustion of the biomass has been excluded from scope 1 emissions and has been reported separately in accordance with the GHG Protocol.

Scope 2 – Indirect emissions, electricity

Scope 2 includes emissions from purchased electricity consumed by Genesis and therefore brought into our organisational boundary. It includes electricity that is consumed at LPG branches and depots, corporate offices and office buildings at generation sites where the electricity is drawn from the grid. It excludes electricity consumed at generation sites where the electricity was not drawn from the grid.

Scope 2 emissions have been calculated using location-based emissions factors.

Scope 3 – Other indirect emissions

Scope 3 emissions are a consequence of Genesis' activities but occur from sources not owned or controlled by us. Reporting on these emissions is optional under the GHG Protocol.

The Corporate Value Chain (Scope 3) Accounting and Reporting Standard (a supplement to the GHG Protocol) categorises scope 3 emissions into 15 distinct categories. Genesis has determined which scope 3 categories are relevant using the following criteria:

- (a) relevance to our operations;
- (b) significant contributor to overall emissions;
- (c) availability of data; and
- (d) ability to influence and/or reduce.

Table 1 details which categories have been included and the boundary applied and **Table 2** details which categories have been excluded and why.

Table 1: Scope 3 inclusions

Category	Boundary applied
Purchased goods and services	This category includes goods and services purchased in the financial year and that are not disclosed in another category noted below.
Capital goods	This category includes emissions on goods and services that have been capitalised for accounting purposes. Emissions are recognised as the spend is incurred.
Fuel and energy related activities	This category includes upstream emissions on fuels purchased for use in the generation of electricity as well as fuels sold to customers. Upstream emissions on coal and LPG are accounted for when the fuel is purchased rather than when it is burnt or sold to customers. Coal purchases in transit at year end are recognised as purchases in the financial year the coal is recorded on the coal stockpile.
Waste generated in operations	This category includes waste for Auckland, Hamilton, and Christchurch corporate offices and Huntly Power Station ⁴⁹ . General waste produced at operational sites other than Huntly is not currently measured. Given the nature of operations, emissions from general waste are not expected to be material.
Business travel	This category includes air travel, accommodation and taxi services used during the financial year.
Employee commuting	This category includes emissions associated with employee's transportation to and from work and working from home.
Use of sold product	This category includes gas and LPG sold to customers during the financial year. The sale of oil produced by the Kupe JV is excluded because this process is managed by the Operator, Beach Energy, and therefore is outside Genesis' operational control.
Investments	<p>This category includes 46% of Kupe JV's scope 1 and 2 emissions relating to the production of oil. The 46% share of Kupe JV's scope 1 and 2 emissions relating to the production of gas and LPG have been included in scope 3 fuel and energy related activities category. The 46% share of Kupe JV's scope 3 emissions have been excluded because this information is not currently reported by the JV. The GHG protocol does not require scope 3 emissions from investments to be included in this category.</p> <p>Emissions associated with DrylandCarbon One Limited Partnership, Forest Partners Limited Partnership and Solar Joint Venture have been excluded as emissions reporting is not currently completed by these entities. Given the nature of these entities, the scope 1 and 2 emissions from these activities are not expected to be material. Emissions associated with Ecotricity Limited Partnership activities have been excluded as the information is not available at the time Genesis completed its reporting and they are highly immaterial.</p>

Table 2: Scope 3 exclusions

Category	Justification for excluding
Upstream transportation and distribution	Emissions on transportation are included in scope 3 fuel and energy related activities or scope 1.
Upstream leased assets	Emissions from upstream leased assets are included in scope 1 and 2.
Downstream transportation and distribution	There is no transportation or distribution of products after the point of sale.
Processing of sold products	Genesis does not sell intermediate products therefore there is no processing of sold products.
End of life treatment of sold products	Sold products are consumed by customers therefore there are no end-of-life emissions to account for.
Downstream leased assets	Emissions from downstream leased vehicles are included in the fuels and energy related activities category and emissions associated with leased LPG bottles and tanks are included in use of products sold category.
Franchises	Genesis does not have anything that falls within this category.

49. Waste for Huntly has only been reported since FY24.

Base year

The base year is 1 July 2019 to 30 June 2020 (FY20), which is consistent with the base year used for our SBTs. Total scope 1 and 2 emissions for FY20 were 2,690,253 tCO₂e and scope 3 were 1,804,749 tCO₂e.

Base year recalculation

The base year or any other reported year included in this document must be recalculated and restated in accordance with the GHG Protocol if any of the following circumstances result in a 5% or more change in total reported scope 1, 2 and 3 emissions⁵⁰:

- Change in structure (acquire or sell a business)
- Change in calculation methodology such as improved emission factors or activity data
- Change in consolidation approach or operating boundary
- Discovery of an error

The base year or any other reported year may be restated for changes less than 5% if the Chief Financial Officer considers the change necessary to provide a consistent and meaningful comparison of the GHG inventory over time.

There were no significant changes during 1 July 2023 to 30 June 2024 that required the base year or any other reported year to be recalculated and restated.

50. The 5% threshold is calculated using the base year total reported scope 1, 2 and 3 emissions.

51. Measuring emissions: A guide for organisations: 2024 detailed guide and the 2024 Emission Factors workbook have been used to calculate the FY24 emissions.

52. New Zealand fuel and electricity total primary energy and life cycle greenhouse gas emission factors 2023.

Methodology

This GHG inventory has been calculated using activity data multiplied by emission factors. We have used emission factors published by the Ministry for the Environment (MfE)⁵¹ for all scopes and categories except for:

- Scope 3 purchased goods and services and capital goods which use the emission factors from the Consumption Emissions Modelling Report (Market Economics Limited, 2023) prepared for Auckland Council (prior to FY24 the Department for Environment Food and Rural Affairs (DEFRA) lifecycle emission factors were used); and
- Scope 3 fuel and energy related activities which uses Agrilink⁵² lifecycle emission factors.

The MfE emission factors are based on 100-year global warming potential values from the IPCC's Fifth Assessment Report (AR5) and Agrilink emission factors are based on 100-year global warming potential values from the IPCC's Fourth Assessment Report (AR4).

Uncertainties

Quantification of emissions is subject to inherent uncertainty because the scientific knowledge and methodologies used to determine the emission factors and processes to calculate and estimate quantities of emissions are still evolving. As a result, the GHG inventory is subject to more inherent limitations and uncertainties than financial information.

All material emission calculations are prepared by our financial reporting system using data collated for financial reporting purposes. There are however inherent limitations when using published emission factors as they:

- Are not specific to individual entities, they are based on industry averages;
- Are often inferred using data collated for other purposes and assumptions are required where scientific data is incomplete; and
- Are based on data collected in previous years, countries or use studies performed several years ago. This particularly impacts the Agrilink and DEFRA lifecycle emission factors which is discussed further in the significant uncertainties section.

These inherent limitations mean that the GHG inventory represents our best estimate of our emissions using the best data available at the time the information is reported. It is possible disclosures made in this report may be amended, updated, recalculated, and restated in the future if the scientific knowledge and methodologies used to determine emission factors are found to materially change previously reported numbers. The methods, data sources and assessment of their reliability are shown in **Table 3**.

Significant Uncertainties

Certain scope 3 emission categories are required to be measured using lifecycle analysis (LCA) methodology. There are currently a limited number of New Zealand specific lifecycle emission factors available mainly due to the ability to access information and the process involved in calculating the emission factors, as a result lifecycle emission factors are often based on data collected in previous years, countries or use studies performed several years ago.

As outlined in **Table 3**, the calculation of scope 3:

- Purchased goods and services for FY20 through to FY23 were calculated using DEFRA lifecycle emission factors which are based on 2011 data. Purchased goods and services in FY23 made up less than 1% of our emissions; and
- Fuel and energy related activities (upstream emissions) relating to thermal generation and use of sold products are calculated using Agrilink lifecycle emission factors which are based on 2010 data published by the Ministry of Economic Development. These subcategories make up approximately 6% of our emissions in FY24.

The application of these emission factors creates a significant uncertainty in relation to the calculation of scope 3 emissions as they may be out of date. A reasonableness test was performed on the Agrilink emission factors in FY22 using data from other sources. Based on this testing we determined that Agrilink emission factors were the most representative lifecycle emission factors to use given the activities they were being applied to. We review the market and consider whether the emission factors used in our GHG inventory remain the most appropriate, on an annual basis.

Table 3: Summary of methods and assumptions applied

	Category	Emission source	Calculation method	Emission factor source	Data source	Reliability of data
Scope 1	Stationary combustion	Fuel used for electricity generation (includes gas, coal, LPG and diesel)	Average-data method ⁵³	MfE	Fuel records used for financial reporting which are also used for our Emissions Trading Scheme (ETS) returns	Data quality is good. Reliable due to use of financial records
	Mobile combustion	Fuel used in vehicles (owned and leased)	Average-data method	MfE	Fuel usage from financial records for plant vehicles and fleet manager for all other vehicles	Data quality is good but it does rely on accuracy and completeness of fleet manager data for non-plant vehicles
	Fugitive emissions	Fugitive emissions of Sulphur Hexafluoride (SF6)	Average-data method	MfE	Maintenance reporting system	Calculated at sites where reliable information is available. Fugitive emissions exclude any potential emissions from Genesis' LPG business based on immateriality of the emissions from this source
Scope 2	Electricity	Electricity consumed at LPG branches and depots, corporate offices and office buildings at generation sites where the electricity is drawn from the grid	Average-data method	MfE	Records from billing system	ICP points were used to measure consumption at various sites. Where auxiliary power is consumed it is excluded as it has not yet gone to the grid
Scope 3	Purchased goods and services	Extraction, production, and transportation of goods and services acquired but not included in the other categories	Spend-based method ⁵⁴	Consumption Emissions Modelling Report prepared for Auckland Council ⁵⁵	Purchased goods and services from financial records	Data quality is good. Reliable due to use of financial records
	Capital goods	Goods and services capitalised for accounting purposes	Spend-based method	Consumption Emissions Modelling Report prepared for Auckland Council ⁵⁵	Purchased goods and services from financial records	Data quality is good. Reliable due to use of financial records
	Fuel and energy related activities	Extraction, production, and transportation of fuel and energy acquired and consumed in the generation of electricity or sold to customers	Average-data method	AgriLink for activities associated with generation and use of sold products and MfE for transmission and distribution and net retail electricity purchases	Fuel records used for financial reporting which are also used for our Emissions Trading Scheme (ETS) returns	Data quality is good. Reliable due to use of financial records

53. The average-data method estimates emissions by collecting data on the quantity (e.g., kilograms, gigajoules, litres) of product used multiplied by an appropriate emission factor.

54. The spend-based method estimates emissions by collecting data on the cost of goods and services purchased multiplied by an appropriate emission factor.

55. The emission factors from the Consumption Emissions Modelling Report (Market Economics Limited, 2023) prepared for Auckland Council have been adjusted for inflation.

Table 3: Summary of methods and assumptions applied (continued)

	Category	Emission source	Calculation method	Emission factor source	Data source	Reliability of data
Scope 3	Waste generated in operations	Disposal and treatment of waste	Waste type specific method ⁵⁶	MfE	Waste data as measured by our suppliers	Data quality is good but is reliant on accuracy and completeness of supplier data
	Business travel	Employees travelling nationally and internationally for business purposes	Distance based method ⁵⁷ for air travel, spend-based method for taxis and ubers and average-data method for accommodation	MfE	Air travel, hotel stays, and rental cars from our corporate travel manager	Data quality is good but is reliant on the accuracy and completeness of the travel manager records
	Employee commuting	Employees travelling to and from work and working from home	Distance-based method for travel and average-data method for working from home	MfE	Employee surveys	Data quality is impacted by how employees interpret and respond to survey questions and by the number of responses received. The results of the survey are extrapolated to account for employees who do not complete the surveys
	Use of sold products	Usage of LPG, gas and coal sold to customers	Direct use-phase method ⁵⁸	MfE	LPG and gas sales data from financial records	Data quality is good
	Investments	Scope 1 and 2 information for Kupe JV	Investment-specific method ⁵⁹	Field specific factors for scope 1 and MfE for scope 2	Information submitted under ETS returns and electricity consumption from Kupe JV	Data quality is good. Reliable due to use of ETS return information and consumption data from Kupe JV
Excluded items	Biomass	Biomass used for electricity generation	Average-data method	MfE	Fuel records used for financial reporting	Data quality is good. Reliable due to use of financial records

56. The waste type specific method estimates emissions by collecting data on the quantity of waste produced multiplied by emission factors for specific waste types and waste treatment methods.

57. The distance-based method estimates emissions by collecting data from service providers and employees on the volume, distance and mode of transport used multiplied by an appropriate emission factor.

58. The direct use-phase method estimates emissions by collecting data on the products sold to customers multiplied by an appropriate emission factor.

59. The investment-specific method estimates emissions by collecting scope 1 and scope 2 emissions from the investee company and allocating the emissions based upon Genesis share of the investment.

GHG inventory summary

Table 4: GHG inventory

Scope	Category	FY24 tCO ₂ e	FY23 tCO ₂ e	FY22 tCO ₂ e	FY21 tCO ₂ e	FY20 tCO ₂ e
Direct emissions (Scope 1)	Attributable to customers	2,395,183	1,072,507	1,934,978	3,132,879	2,539,863
	Attributable to thermal backed electricity contracts*	45,094	–	286,398	805,398	149,491
	Stationary combustion attributable to thermal generation	2,440,277	1,072,507	2,221,376	3,938,277	2,689,354
	Mobile combustion	2,185	1,738	1,733	1,624	579
	Fugitive emissions	113	1,745	17	162	80
	Total scope 1	2,442,575	1,075,990	2,223,126	3,940,063	2,690,013
Indirect emissions (Scope 2)	Electricity consumption	154	160	217	262	240
	Total scope 2	154	160	217	262	240
	Total scope 1 & 2	2,442,729	1,076,150	2,223,343	3,940,325	2,690,253
Indirect emissions (Scope 3)	Purchased goods and services	15,290	16,480	15,492	14,898	15,348
	Capital goods ^	9,364	–	–	–	–
	Fuel and energy related activities (upstream emissions)					
	– Related to thermal generation	124,980	139,479	286,017	279,781	239,840
	– Related to sold products	67,376	86,759	124,140	159,031	172,611
	– Transmission and distribution losses on electricity purchases	11	19	20	25	24
	– Net retail electricity purchases (after deducting generation)	21,046	8,094	–	–	–
	Waste generated in operations	174	16	21	26	19
	Business travel	573	409	146	215	1,975
	Employee commuting ^	1,108	1,748	–	–	–
	Use of sold products					
	– LPG Retail	129,459	129,230	130,372	128,665	121,802
	– LPG Wholesale	18,560	21,578	51,773	46,838	52,820
	– Gas Retail	383,098	390,937	406,308	441,033	429,893
	– Gas Wholesale	11,191	150,459	406,233	653,421	762,337
	– Coal Wholesale	2,406	–	–	–	–
	Investments	3,777	4,789	7,184	8,547	8,080
Total scope 3	788,413	949,997	1,427,706	1,732,480	1,804,749	
Total scope 1, 2 & 3	3,231,142	2,026,147	3,651,049	5,672,805	4,495,002	
Items excluded from scope 1-3 in accordance with the GHG protocol						
Biomass – CO₂	Stationary combustion of biomass attributable to thermal generation	–	857	–	–	–

* FY24 includes generation emissions associated with Market Security Options (MSOs) and FY20-FY22 includes generation emissions associated with swaptions. The swaptions expired in December 2022 and were not called in FY23.

^ FY24 is the first year that capital goods has been disclosed and FY23 was the first year employee commuting was disclosed. The comparative periods were not restated for these changes.

GHG inventory summary (continued)

Table 5: Emissions by gas component

Component gas	Scope 1 tCO ₂ e	Scope 2 tCO ₂ e	Scope 3 tCO ₂ e	Total tCO ₂ e
CO ₂	2,431,382	149	565,278	2,996,809
CH ₄	4,658	5	2,198	6,861
N ₂ O	6,422	–	298	6,720
SF ₆	113	–	–	113
Unknown*	–	–	220,639	220,639
Total tCO₂e	2,442,575	154	788,413	3,231,142

* The breakdown by gas component is not published for cradle to gate lifecycle emission factors and therefore this information is unable to be disclosed by gas component for some scope 3 emissions.

GHG holdings

We use sulphur hexafluoride (SF₆) in circuit breakers. SF₆ has a global warming potential much higher than carbon dioxide. We monitor the gas pressure in the circuit breakers to identify and remediate leaks. The table below records the GHG holdings at 30 June each year. We also hold an immaterial volume of HFCs in air conditioning units and refrigerators. The HFC holdings have not been disclosed below because they are immaterial.

	FY24 kgs	FY23 kgs	FY22 kgs	FY21 kgs	FY20 kgs
SF ₆ Holding	897	897	1,023	1,027	1,033

Assurance of GHG inventory

Deloitte has provided an unqualified limited assurance conclusion on the FY24 GHG inventory (refer to [Appendix III](#)). EY issued limited assurance opinions on the FY20, FY21, FY22 and FY23 GHG inventories. New scope 3 categories were, however, added in FY22⁶⁰. The comparatives for the new scope 3 categories added in FY22 were restated back to FY20 but were not subject to limited assurance.

60. Three new categories (purchased goods and services, fuels and energy related activities and investments) were added to the FY22 GHG inventory. The FY21 and FY20 GHG inventories were restated to include these. These categories were not included in the FY20 and FY21 limited assurance reviews undertaken at that time.

Appendix III: GHG inventory assurance report



INDEPENDENT ASSURANCE REPORT TO THE BOARD OF DIRECTORS OF GENESIS ENERGY LIMITED

Report on Greenhouse Gas Emissions Inventory Report

We have undertaken a limited assurance engagement relating to the Greenhouse Gas Emissions Inventory Report (the 'Inventory') of Genesis Energy Limited and its subsidiaries ('Genesis') for the year ended 30 June 2024, comprising the Emissions Inventory and the explanatory notes set out on pages 67 to 73.

The Inventory provides information about the greenhouse gas emissions of Genesis for the year ended 30 June 2024 and is based on historical information. This information is stated in accordance with the requirements of the *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004)* and the *Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)* (collectively referred to as the 'GHG Protocol') which can be accessed at <https://ghgprotocol.org/>.

Our report does not cover any forward-looking statements made by Genesis, or external references or hyperlinked documents.

Board of Directors' Responsibility

The Board of Directors are responsible for the preparation of the Inventory, in accordance with the GHG Protocol. This responsibility includes the design, implementation, and maintenance of internal control relevant to the preparation of an Inventory that is free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express a limited assurance conclusion on the Inventory based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with International Standard on Assurance Engagements (New Zealand) 3410: *Assurance Engagements on Greenhouse Gas Statements* ('ISAE (NZ) 3410'), issued by the New Zealand Auditing and Assurance Standards Board. That standard requires that we plan and perform this engagement to obtain limited assurance about whether the Inventory is free from material misstatement.

A limited assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves assessing the suitability in the circumstances of Genesis's use of the GHG Protocol as the basis for the preparation of the Inventory, assessing the risks of material misstatement of the Inventory whether due to fraud or error, responding to the assessed risks as necessary in the circumstances, and evaluating the overall presentation of the

Inventory. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

The procedures we performed were based on our professional judgement and included enquiries, observations of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records.

Given the circumstances of the engagement, in performing the procedures listed above we:

- Through enquiries, obtained an understanding of Genesis's control environment and information systems relevant to emissions quantification and reporting, but did not evaluate the design of particular control activities, obtain evidence about their implementation, or test their operating effectiveness.
- Reviewed material quantitative data, including corroborative enquiry and examination of selected supported documentation and calculations.
- Evaluated whether Genesis's methods for developing estimates are appropriate and had been consistently applied. However, our procedures did not include testing the data on which the estimates

are based on or separately developing our own estimates against which to evaluate Genesis's estimates.

- Reviewed adherence to the principles and requirements outlined in GHG Protocol.
- Undertook site visits at one site to assess the completeness of the emissions sources, data collection methods, source data and relevant assumptions applicable to the sites. The sites selected for testing were chosen taking into consideration their emissions in relation to total emissions, emissions sources, and sites selected in prior periods. Our procedures did not include testing information systems to collect and aggregate facility data, or the controls at these sites.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement. Accordingly, we do not express a reasonable assurance opinion about whether Genesis Energy Limited's Inventory has been prepared, in all material respects, in accordance with the GHG Protocol.

Deloitte.

Inherent Limitations

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

As the procedures performed for this engagement are not performed continuously throughout the relevant period and the procedures performed in respect of Genesis's compliance with the GHG Protocol are undertaken on a test basis, our assurance engagement cannot be relied on to detect all instances where Genesis may not have complied with the GHG Protocol. Because of these inherent limitations, it is possible that fraud, error, or non-compliance may occur and not be detected.

Our Independence and Quality Management

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 *International Code of Ethics for Assurance Practitioners (including International Independence Standards) (New Zealand)* ('PES-1') issued by the

New Zealand Auditing and Assurance Standards Board, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour.

In addition to our role as limited assurance provider of the Inventory and as statutory auditor of the Genesis consolidated financial statements, our firm carries out other assignments for Genesis in the areas of sustainability linked loan assurance, trustee reporting, review of the interim financial statements, HR training, and non-assurance services provided to the Corporate Taxpayer Group of which Genesis is a member. These services have not impaired our independence as limited assurance provider or auditor of Genesis.

In addition to these assignments, principals and employees of our firm deal with Genesis on normal terms within the ordinary course of trading activities of Genesis. Other than the audit and these assignments and trading activities, we have no relationship with, or interests in Genesis.

The firm applies Professional and Ethical Standard 3: *Quality Management for Firms that Perform Audits or Reviews of Financial Statements, or Other Assurance or Related Services Engagements*, which requires the firm to design, implement and operate a system of quality management including policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

Use of Report

Our assurance report is made solely to the directors of Genesis in accordance with the terms of our engagement. Our report is not to be used for any other purpose, recited, or referred to in any document, copied or made available (in whole or in part) to any other person without our prior written express consent. We accept or assume no duty, responsibility, or liability to any other party in connection with the report or this engagement, including without limitation, liability for negligence in relation to the opinion expressed in this report.

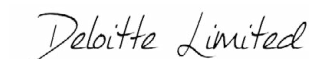
Limited Assurance Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that Genesis Energy Limited's Inventory for the year ended 30 June 2024 is not prepared, in all material respects, in accordance with the requirements of the GHG Protocol.

Emphasis of Matter – Comparative Information

As described in 'Assurance of GHG emissions' within the GHG inventory ([Appendix II](#)), the comparative GHG disclosures for the periods ended 30 June 2023, 30 June 2022, 30 June 2021 and 30 June 2020 have been subject to limited assurance by another assurance provider, who expressed unmodified reports

in their assurance reports dated 21 August 2023, 4 August 2022, 11 August 2021, and 19 August 2020 respectively. Our conclusion is not modified in respect of this matter.



21 August 2024
Auckland, New Zealand

This limited assurance report relates to the Greenhouse Gas Inventory of Genesis Energy Limited (the 'Genesis') for the year ended 30 June 2024 included on the Genesis website. The Directors are responsible for the maintenance and integrity of the Genesis website. We have not been engaged to report on the integrity of the Genesis website. We accept no responsibility for any changes that may have occurred to the information since they were initially presented on the website. The limited assurance report refers only to the information named above. It does not provide an opinion on any other information which may have been hyperlinked to/from this information. If readers of this report are concerned with the inherent risks arising from electronic data communication, they should refer to the published hard copy of the Greenhouse Gas Inventory and related limited assurance report dated 21 August 2024 to confirm the information included in the information presented on this website.

Appendix IV: Description of physical assets and contractual arrangements

Asset	Description
Kupe	<p>We have a 46% interest in the Kupe JV, which owns the Kupe gas field situated off the south Taranaki coast.</p> <p>Kupe's assets comprise three wellheads, an unmanned offshore platform, a 30 km pipeline and subsea utilities umbilical cable to an onshore production station near Hawera, oil storage facilities at New Plymouth, and an onshore gas pipeline.</p> <p>Reflecting our interest in the JV, we receive 46% of the natural gas produced. We have also entered long-term contracts with the other JV partners to purchase the remainder of the current natural gas produced and have rights in respect of all future production from the field.</p> <p>LPG and oil are secondary products of the field. We receive 46% of the LPG and oil produced by the JV.</p>
LPG depots and networks	<p>We own and operate a network of LPG distribution hubs across New Zealand and two reticulated LPG networks (piped LPG) in the South Island: Dunedin and the Faringdon development.</p>
Huntly Power Station	<p>Huntly (Raahui Pookeka) is on the banks of the Waikato River and is close to both Auckland and Hamilton. Several types of thermal generation operate at the power station site to the west of the river.</p> <p>Rankine Units</p> <p>Three Rankine cycle units are the original plant, built to be able to operate on either natural gas or coal. Each unit has a nominal capacity of 250 MW.</p> <p>Water cooling for the units from the Waikato River is limited at higher river temperatures, however cooling towers enable one of the Rankine Units to operate even when river temperatures are approaching limits.</p> <p>Unit 5</p> <p>This Combined Cycle Gas Turbine (CCGT) is the most efficient gas generator in New Zealand and has a capacity of up to 403 MW.</p> <p>Unit 6</p> <p>This is a 50.8 MW open cycle gas turbine, which can burn 100% gas or diesel to generate electricity.</p>

Asset	Description
Waikaremoana Hydro scheme	<p>The Waikaremoana Power Scheme is a hydro power development in northern Hawke's Bay and consists of three power stations fed from Lake Waikaremoana. The scheme is located between Te Urewera and Wairoa, along the upper 7 km of the Waikaretaheke River. The 138 MW hydro scheme comprises three power stations – Kaitawa (36 MW), Tuai (60 MW) and Piripaua (42 MW).</p>
Tongariro Hydro scheme	<p>The Tongariro Power Scheme comprises three hydro power stations – Rangipo (120 MW, underground), Tokaanu (240 MW) and Mangaio (1.8 MW) and has a catchment area of more than 2,600 km² in the North Island's central volcanic plateau.</p>
Tekapo Hydro scheme	<p>The Tekapo Power Scheme is at the head of the Waitaki Valley in the Mackenzie District of the South Island. It has been owned and operated by us since June 2011 and has a generation capacity of 190 MW and uses water from the glacial-fed Lake Tekapo/Takapō to generate electricity through two power stations – Tekapo A and Tekapo B – connected by a canal. Tekapo B sits in the bed of Lake Pūkaki.</p>
Hau Nui Wind farm	<p>Hau Nui Wind Farm is in the hills south of Martinborough in the Wairarapa. Its 15 turbines have a combined capacity of 8.65 MW.</p>
Power Purchase Agreements	<p>Waipipi</p> <p>We have a 20-year electricity offtake agreement for the energy from Waipipi's 31 wind-turbines. The generation capacity of the site is 133.3 MW and it produces approximately 450 GWh per year. Waipipi commenced operations in November 2020.</p> <p>Tauhara</p> <p>We have a 15-year electricity offtake agreement which starts at 62.5 MW of the energy generated from the Tauhara geothermal project. The contract is anticipated to provide up to 520 GWh per year commencing on 1 January 2025.</p> <p>Kaiwaikawe</p> <p>We have a 20-year electricity offtake agreement for the energy from Kaiwaikawe wind farm. The proposed generating capacity of the site is 72 MW which is anticipated to produce approximately 230 GWh per year. The Final Investment Decision for this project has not yet been reached.</p>

Appendix V: Glossary and definitions

Term	Definition
Aotearoa New Zealand Climate Standards	Standards issued by the External Reporting Board that comprise the climate-related disclosure framework. Climate-related disclosure framework has the same meaning set out in section 9AA of the Financial Reporting Act 2013.
Base year	An historical datapoint (a specific year or an average over multiple years) against which a metric is tracked over time.
Carrying value	The value recorded on our balance sheet at 30 June.
Climate-related opportunities	The potentially positive climate-related outcomes for Genesis. Efforts to mitigate and adapt to climate change can produce opportunities for entities, such as through resource efficiency and cost savings, the adoption and utilisation of lower emission energy sources, the development of new products and services, and building resilience along the value chain.
Climate-related risks	The potential negative impacts of climate change on Genesis. See also the definitions of physical risks and transition risks.
Climate-related scenario	A plausible, challenging description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces and relationships covering both physical and transition risks in an integrated manner. Climate-related scenarios are not intended to be probabilistic or predictive, or to identify the ‘most likely’ outcome(s) of climate change. They are intended to provide an opportunity for entities to develop their internal capacity to better understand and prepare for the uncertain future impacts of climate change.
Cross-cutting risk	A risk that impacts multiple areas, sectors, or disciplines, rather than being confined to a single domain.
Debt	Includes all debt drawn down at 30 June excluding lease liabilities, fair value interest rate risk adjustments, capitalised issue costs and accrued interest. Refer to our Consolidated Financial Statements for a breakdown of our debt.
Distributed customer energy resources	Customer devices that can generate, store, or manage electricity behind the meter such as hot water cylinders, electric vehicles, rooftop solar and batteries.
EBITDAF	Earnings before net finance expense, income tax, depreciation, depletion, amortisation, impairment, unrealised fair value.
Emissions	Refers to GHG emissions calculated in accordance with the GHG Protocol.
Emission factor	A factor allowing GHG emissions to be estimated from a unit of available activity data (for example, tonnes of fuel consumed, tonnes of product produced) and absolute GHG emissions.
Emissions intensity	Intensity ratios used to express GHG emissions impact per unit of physical activity or unit of economic output.
ETS	New Zealand’s Emissions Trading Scheme.
EV plan	Genesis’s plan for discounted 9pm – 7am purchase of electricity. To be eligible for this plan you must own a plug-in electric car and have a communicating smart meter. Refer to our website for more information (Energy EV Electric Car Plan Genesis NZ (genesisenergy.co.nz)).
Financial impact	The translation of impacts into current or anticipated impacts on financial performance, financial position, and cash flows.
Final investment decision (FID)	The point at which a company or investor commits significant financial resources to proceed with the project’s execution.
Flexible assets	Flexible assets are characterised by versatility and responsiveness to increasingly dynamic demands of the energy market. They are characterised by one or more of the following characteristics: (a) fast start capability, (b) fuel storage capacity, (c) energy storage technology, (d) multi-fuel functionality or (e) adaptability to emerging fuels such as hydrogen or biogas.

Term	Definition
Free cash flows	Free cash flow represents EBITDAF less cash tax paid, net interest costs and stay in business capital expenditure.
FY19, FY20, FY21, FY22, FY23, FY24, FY25, FY28, FY35	'FY' refers to Genesis' financial year from 1 July to 30 June. The number refers to the financial year ended 30 June of that calendar year.
Gen35	Genesis' new mission and strategy launched in FY24, which outlines Genesis' unique and vital role in energy transition over the next 10 years, for Genesis' customers, country and company through electrification (helping our customers to electrify their lives), growing renewables (investing significantly in renewables) and flexibility (evolving the Huntly Power Station to increase its flexibility).
Generation	Electricity generated using physical assets owned by Genesis as outlined in Appendix IV .
GHG emissions	Greenhouse Gas Emissions. The greenhouse gases listed in the Kyoto Protocol: carbon dioxide (CO ₂); methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), nitrogen trifluoride (NF ₃), perfluorocarbons (PFCs), and sulphur hexafluoride (SF ₆).
GHG Protocol	Greenhouse Gas Protocol: <i>A Corporate Accounting and Reporting Standard (revised edition) and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard</i> .
Green debt	Bonds and/or loans where the proceeds are exclusively used to finance or refinance eligible assets under our Sustainable Finance Framework .
Gross margin	Revenue less direct costs. Refer to our FY24 Results Presentation for information on what is included for each of the products we sell.
GWh	Gigawatt hour is a unit of energy that represents the amount of electricity generated or consumed over a one-hour period. It is equivalent to 1,000 megawatt hours (MWh).
ICP	Installation Connection Point, is a physical point of connection between a gas network and a consumer's installation.
Impacts	The effects (also referred to as consequences or outcomes) of climate change occurring for an entity. These effects will, in turn, depend on the impacts of climate change on the broader socioeconomic and ecological systems an entity operates within (including an entity's value chain).
Inflows	The amount of water flowing into a lake or catchment that is connected to one of our hydro schemes noted in Appendix IV .
Internal emissions price	A monetary value on GHG emissions that an entity uses internally to guide its decision-making process in relation to climate-related impacts, risks and opportunities.
Lower emissions	Lower emissions refer to the reduction in GHG emissions released into the atmosphere, such as carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), and other greenhouse gases. These emissions are typically produced by activities like burning fossil fuels for energy, transportation, and industrial processes. Reducing emissions is crucial for mitigating climate change, improving air quality, and protecting public health. Efforts to lower emissions can include using cleaner energy sources, improving energy efficiency, and adopting sustainable practices in various sectors.
MBIE	Ministry of Business, Innovation and Employment.
MfE	Ministry for the Environment.
MW	Megawatt is a unit of power equal to one million watts.
MWh	Megawatt hour is a unit of energy that represents the amount of electricity generated or consumed over a one-hour period. It is equivalent to one-million-watt hours.
MWp	Megawatt peak is a unit of measurement used to describe the maximum electrical output of a power source such as solar or wind under optimal conditions.
Net customer churn	Percentage of residential customers that finalise in the financial year.
Net zero 2040	A commitment to reduce our GHG emissions by >90 percent from a FY20 base year by 2040. This commitment is based on the Science Based Targets Initiative's <i>Corporate Net Zero</i> guidance which provides companies a clearly-defined path to reduce greenhouse gas emissions in line with limiting global warming to 1.5°C.

Term	Definition
Net zero 2050	Refers to New Zealand's emission reduction target as outlined in the Climate Change Response (Zero Carbon) Amendment Act 2019 which amended the Climate Change Response Act 2002.
Physical risk	Risks related to the physical impacts of climate change. Physical risks emanating from climate change can be event-driven (acute) such as increased severity of extreme weather events. They can also relate to longer-term shifts (chronic) in precipitation and temperature and increased variability in weather patterns, such as sea level rise.
PPA	Power Purchase Agreement, is a long-term financial arrangement where the buyer and seller agree on a fixed price for electricity generated from a particular asset, but the generation itself is sold into the national grid at market prices. The buyer either receives or pays the difference between the fixed price and the market price. It is effectively hedging against price volatility. They are often used to support the development of new generation.
Principal risk	Principal risks are the most important enterprise-wide risks, as determined by the Board or ELT even if they do not meet 'materiality' thresholds.
Rankines	Three Rankine cycle units that utilise boiler and steam turbine technology to generate electricity. Refer to Appendix IV for more information.
RCP	Representative Concentration Pathway.
Renewable generation	Renewable generation uses natural resources that can be replenished such as water, sun, wind to generate electricity.
Research and development on climate-related initiatives	An activity that is carried out with the purpose of resolving scientific or technological uncertainty or creating new knowledge, or new or improved processes, goods or services associated with climate-related initiatives.
Retail customers	Retail electricity and gas customers defined by a single customer view, regardless of number of connections (ICP's)
Retail emissions	Greenhouse gas emissions on electricity, gas and LPG purchased and on sold to retail customers. Calculated using the Ministry for the Environment (MfE) emission factors.
Retail revenue	Electricity revenue, gas revenue, LPG revenue and emissions on fuel sales and electricity contracts for our retail segment as outlined in note A1 of our Consolidated Financial Statements.
SBT	Science Based Target approved by the SBTi.
SBTi	Science Based Target Initiative.
Scenario analysis	A process for systematically exploring the effects of a range of plausible future events under conditions of uncertainty. Engaging in this process helps an entity to identify its climate-related risks and opportunities and develop a better understanding of the resilience of its business model and strategy.
Scope 1	Direct GHG emissions from sources owned or controlled by the entity.
Scope 2	Indirect GHG emissions from consumption of purchased electricity, heat, or steam.
Scope 3	Other indirect GHG emissions not covered in scope 2 that occur in the value chain of the reporting entity, including upstream and downstream GHG emissions. Scope 3 categories are purchased goods and services, capital goods, fuel-related and energy-related activities, upstream transportation and distribution, waste generated in operations, business travel, employee commuting, upstream leased assets, downstream transportation and distribution, processing of sold products, use of sold products, end-of-life treatment of sold products, downstream leased assets, franchises, and investments.
Sustainable finance	Includes green bonds and loans and sustainability linked bonds and loans issued under our Sustainable Finance Framework .
Thermal generation	Thermal generation uses steam power created by natural gas or coal to rotate generators and create electricity.
SSP	Shared Socio-economic Pathway.

Term	Definition
Transition risk	Risks related to the transition to a lower emissions, climate-resilient global and domestic economy, such as policy, legal, technology, market and reputation changes associated with the mitigation and adaptation requirements relating to climate change.
Use of sold products	Emissions from the use of goods and services sold by Genesis to customers. This is a specific category within scope 3 of the Greenhouse Gas Protocol.
Unit 5	Combined cycle gas turbine used to generate electricity.
Value chain	The full range of activities, resources and relationships related to an entity's business model and the external environment in which it operates. A value chain encompasses the activities, resources and relationships an entity uses and relies on to create its products or services from conception to delivery, consumption and end of life. Relevant activities, resources and relationships include those in an entity's operations, such as human resource; those along its supply, marketing and distribution channels, such as materials and service sourcing and product and service sale and delivery; and the financing, geographical, geopolitical and regulatory environments in which an entity operates.
Weighted average interest rate	An interest rate that reflects the average interest expense on all debt for the year, taking into account the relative size of each debt.

ELECTRIFICATION

Empowering the customer-led transition

GROW RENEWABLES

Grow our portfolio of renewable generation to support our net zero ambition

FLEXIBILITY

Transitioning our thermal generation portfolio while supporting a secure and stable grid



