TRANSPOWER

Greenhouse Gas Emissions Inventory Report

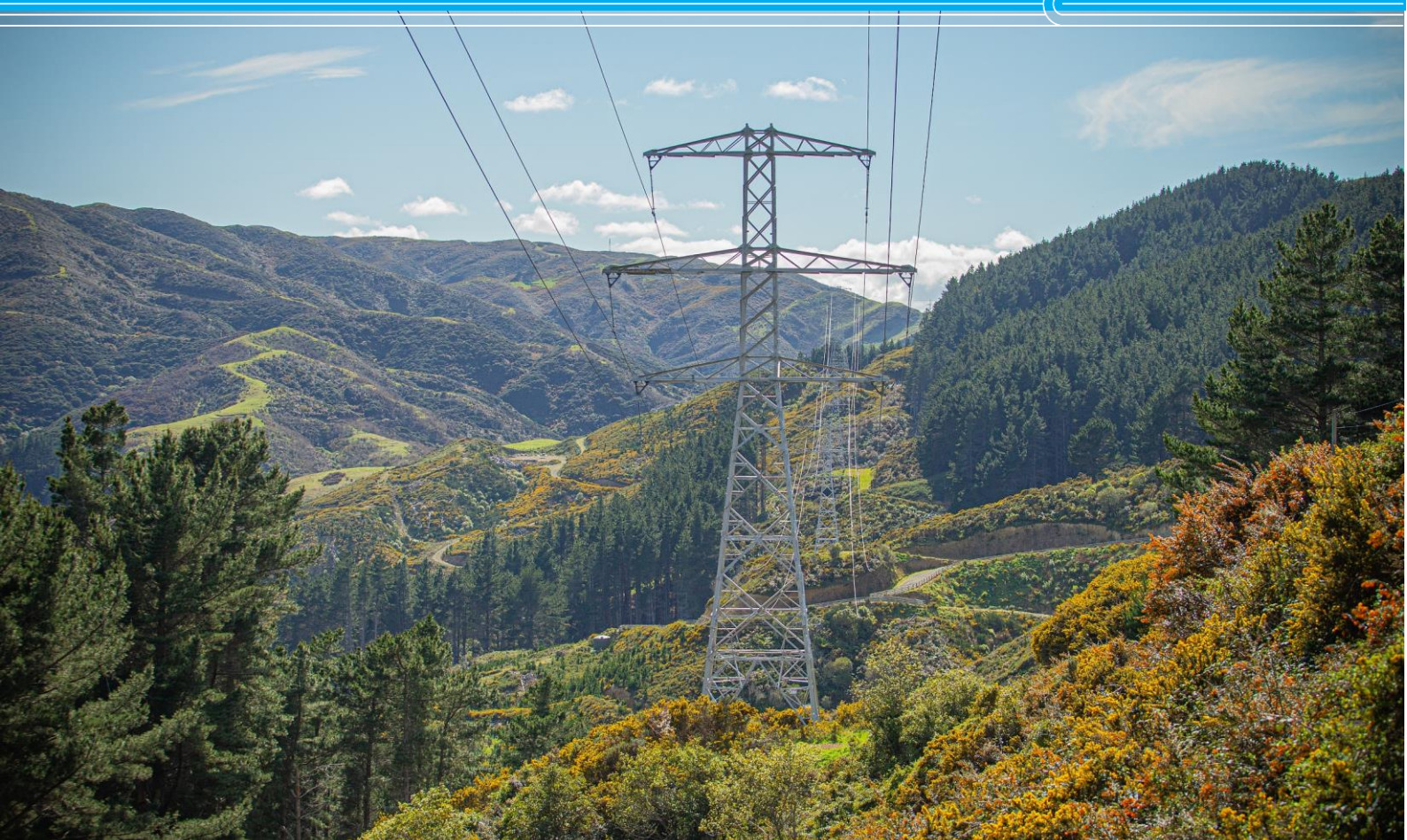
Transpower New Zealand Limited

Version: Final

Inventory Period: 1 July 2024 to 30 June 2025

Assurance Status: Assured

Date: 28 August 2025



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Aotearoa New Zealand Climate Standards Information Summary

Table 1 sets out where in the Greenhouse Gas (GHG) Emissions Inventory Report (GHG Inventory Report) for the financial year of 1 July 2024 - 30 June 2025 (FY25) the Aotearoa New Zealand Climate Standards (NZCS) information can be found.

Table 1. Location of NZCS requirements in the GHG Emissions Inventory Report

Requirement	NZCS Reference	Section/Page in FY25 GHG Emissions Inventory Report
Gross Scope 1, 2 (location-based), and 3 emissions	NZCS 1, Section 22(a)	Inventory Summary, Section 10
Measurement standards	NZCS 1, Section 24(a)	Section 1
Consolidation approach	NZCS 1, Section 24(b)	Section 7
Emission factor sources	NZCS 1, Section 24(c)	Section 6, Appendix 1
Emission exclusions	NZCS 1, Section 24(d)	Appendix 2
Assurance statement	NZCS 1, Section 26	Appendix 6 (EY Assurance Report)
Restatement of comparatives	NZCS 3, Section 46	Section 6, Appendix 4
Methodologies, assumptions, and limitations	NZCS 3, Section 52	Section 6, Appendix 1
Emission uncertainties	NZCS 3, Section 53	Section 6, Appendix 1
Base year restatement information	NZCS 3, Section 54	Section 6, Section 11, Appendix 4

This Greenhouse Gas Emissions Inventory Report is dated 28 August 2025 and is signed on behalf of the Board by:

Michele Embling
Board Chair
28 August 2025

Kevin Palmer
Audit and Risk Committee Chair
28 August 2025

Greenhouse Gas Emissions Inventory Summary

Transpower New Zealand Limited's (Transpower's) total gross GHG emissions for FY25 were approximately 224,356 tonnes of carbon dioxide equivalent (tCO_2e). Figure 1 and Table 2 below summarise the main sources of GHG emissions for FY25.

Methods and assumptions used in calculating the emissions are described in Section 6 below. This is further discussed in Appendix 4. All the GHG emissions in this GHG Inventory Report are gross emissions. Gross emissions are total GHG emissions excluding any removals, and excluding any purchase, sale or transfer of GHG emission offsets or allowances, as opposed to net GHG emission reductions – which are GHG emissions less offsets via carbon sequestration.

Figure 1. GHG Emissions Inventory Summary for Measurement Period 1 July 2024 to 30 June 2025

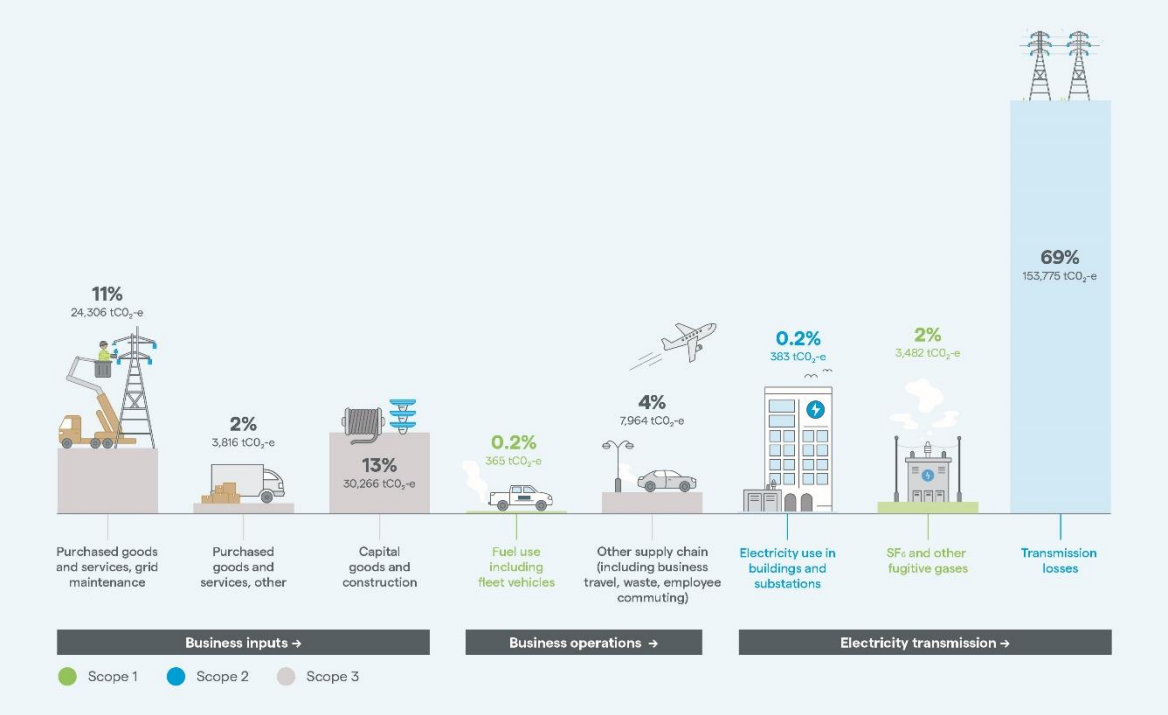


Table 2. Transpower FY25, FY24, and FY23 GHG Emissions Comparisons by GHG Protocol Scope and Category (tCO_2e)

Scope	Category	Subcategory	FY25	FY24 (Restated)[1]	FY23 (Restated)
Scope 1	*Fuel and vehicle*	Diesel	137	126	138
		Petrol	188	167	169
		Gas	40	50	42
		Fuel and vehicle total	*365*	*343*	*348*
	Fugitive gases	Refrigerants*	106	114	95
		SF_6	3,376[2]	3,091[3]	6,087
		Fugitive gases total	*3,482*	*3,205*	*6,181*
		Scope 1 total	**3,847**	**3,548**	**6,529**
Scope 2	*Electricity use (location-based)*	Non-operational buildings	250	187	172
		Operational buildings	133	92	77
		Electricity use total	*383*	*279*	*249*
	Transmission losses	Transmission losses*	*153,775*	*135,928*	*88,158*
		Scope 2 total	**154,157[4]**	**136,207**	**88,408**
Scope 3	*Purchased goods & services*	Grid maintenance*	20,203	18,512	9,158
		Engineering services*	1,843	1,841	1,617
		IT services*	2,259	2,213	1,956
		Other*	3,816	3,481	3,225
		Purchased goods and services total	*28,121*	*26,047*	*15,956*

[1] The emissions for the asterisked categories have been restated this year for FY21 to FY24. This is described in Sections 6 and 11 and Appendix 4.
[2] As noted in Section 6.1, Transpower uses the SF_6 global warming potential (GWP) required to be used by NZ ETS participants, which is based on the IPCC Fifth Assessment Report. An IPCC Sixth Assessment Report has been released, with an updated GWP for SF_6, which if used would result in Transpower's SF_6 emissions being 3,491 tCO_2e for FY25.
[3] In FY24 Transpower's reported SF_6 emissions data was calculated using gas transactions data reporting on the gas used to fill its assets or taken out of its assets when degassing them. The software and database Transpower uses also recognises situations where the cylinder weight used for a transaction or in stores weighs more or less than its finishing weight for the last gas transaction for which it was used or in a stocktake. The net delta differences of such anomalies equalled 4.3kg of SF_6 gas or 101 tCO_2e. This delta amount was not included in Transpower's total reported SF_6 emissions for FY24. If it had been then total SF_6 emissions would have increased by 3% to 3,192 tCO_2e.
[4] This number reflects the actual total of Scope 2 emissions including Swedish rounding.

Scope	Category	Subcategory	FY25	FY24 (Restated)[1]	FY23 (Restated)
Scope 3	*Capital goods*	Construction*	18,358	11,111	6,115
		Electrical equipment*	11,320	9,335	8,613
		Other*	588	448	113
		Capital goods total	*30,266*	*20,894*	*14,391*
	Fuel & energy related activities	Electricity T&D losses	27	18	37
		Gas T&D losses	1	2	2
		Fuel & energy related activities total	*28*	*20*	*39*
	Upstream transportation and distribution	Upstream transportation and distribution*	*5,793*	*4,329*	*3,907*
	Waste generated in operations	Waste generated in operations*	*630*	*315*	*244*
	Business travel	Hotel stay	43	42	30
		Air travel	846	804	949
		Vehicle use	90	100	74
		Business travel total	*979*	*946*	*1,053*
	Employee commuting	Employee commuting	500	425	241
		Working from home	6	4	48
		Employee commuting total	*506*	*428*	*289*
	Downstream transportation & distribution	Postal services*	*28*	*30*	*27*
		Scope 3 total	**66,351**	**53,009**	**35,906**
		Total gross emissions	**224,356[5]**	**192,765**	**130,843**

[5] This number reflects the actual total gross emissions including Swedish rounding.

1 Introduction

This GHG Emissions Inventory Report outlines specific GHG emissions that can be attributed directly to Transpower operations in operating the National Grid for FY25, as well as an estimate of GHG emissions that can be indirectly attributed to Transpower activities during FY25.

We have published this GHG Inventory Report in accordance with:

- the *Greenhouse Gas Protocol* (World Resources Institute, 2004) - the GHG Protocol;
- *ISO 14064-1 Greenhouse Gases – Part 1 Standard* (International Standards Organisation, 2018) – ISO 14064-1;
- Aotearoa New Zealand Climate Standards (External Reporting Board, 2022) - NZCS.

While our data is primarily configured to the GHG Protocol Scopes 1, 2, and 3, we have also detailed how the data fits into the ISO 14064-1 Categories. For more information on Transpower's GHG Protocol emissions source inclusions and exclusions see Appendices 1 and 2 respectively.

Transpower is committed to Aotearoa New Zealand's sustainable future and long-term objective for a net-zero carbon economy and is taking a two-pronged approach in terms of the role it can play in the move towards a low-carbon future. Transpower is focused on serving Aotearoa New Zealand in its electrification journey – both in terms of enabling increasing electrification and an increasing availability of the share of renewable energy generation in the electricity system. As such, Transpower's work to deliver new generation and load connections, identify and deliver investments across the National Grid, and changes to enable real time operation through this period of change helps decarbonise the electricity system and facilitates the provision of low-carbon energy for the decarbonisation of other sectors (particularly process heat and transport).

Transpower is also committed to reducing GHG emissions arising from its own operations, and building the resilience of its assets to the effects of climate change (such as more frequent and severe extreme weather events and longer-term sea level rise). Both are central pillars in Transpower's *Sustainability Strategy*, and the delivery of such extends beyond Transpower to include acting alongside its service providers and key suppliers who undertake much of the work for the ongoing operation and maintenance of Aotearoa New Zealand's National Grid.

1.1 Statement of Intent

Transpower publishes its GHG Inventory Report annually and aims to consistently account for its GHG emissions using best practice GHG accounting standards.

This GHG Inventory Report relates to the GHG emissions of Transpower. It has been prepared according to ISO 14064-1, the GHG Protocol, *The Greenhouse Gas Protocol Scope 2 Guidance* (World Resources Institute, 2015), *The Greenhouse Gas Protocol Corporate Value Chain Standard* (World Resources Institute, 2011) – the GHG Protocol CVCS, and NZCS. It does not include any future forecasts.

This GHG Inventory Report has been assured by a third-party independent assurance provider – refer Appendix 6 – in accordance with the *NZ SAE 1* Assurance Engagements over Greenhouse Gas Emissions Disclosures, *ISAE* (New Zealand) 3410 (External Reporting Board, 2014) *Assurance Engagements on Greenhouse Gas Statements* and *Climate-related Disclosures (Aotearoa New Zealand Climate Standards 1 and 3)*.

2 Description of Transpower

Transpower owns and operates Aotearoa New Zealand's high voltage electricity transmission system, the National Grid. It is also responsible, in its role as System Operator, for the real-time operation of the electricity transmission system and wholesale electricity market.

Transpower is a limited liability company and a State-Owned Enterprise, with its shares held on behalf of the Crown by the Minister of Finance and the Minister for State-Owned Enterprises. Further information about Transpower is available at https://www.transpower.co.nz/about-us.

3 Transpower's Sustainability Strategy

Transpower's strategic publications, *Whakamana i Te Mauri Hiko – Empowering our Energy Future*, *Transmission Tomorrow*, and its *Electrification Roadmap* set out its plans for developing the transmission system of the future – one in which electricity demand increases as the transport and process heat sectors are electrified and as new renewable generation is added to the system. Developments in solar and battery technology, from grid scale down to residential installations, along with the electrification of process heat, will also define the low-carbon energy system of the future.

Aotearoa New Zealand's electricity system is already around 90% renewable. This is set to increase over the coming years. Transpower needs to make changes today to invest in its infrastructure and real-time operation of the electricity system, and encourage the investment in renewable generation, to maintain its safe, secure and reliable supply of renewable energy as demand grows. Its *Electrification Roadmap* outline the key strategies and actions needed to facilitate the acceleration of the electrification and associated decarbonisation of Aotearoa New Zealand's transport and process heat sectors.

To enable this work, Transpower's *Sustainability Strategy* guides its activities in the key challenge areas of climate change, environmental stewardship, and sustainable business. Key climate change and carbon management-related goals within the Sustainability Strategy are aligned with the United Nations Sustainable Development Goals: Goal 7: Clean and affordable energy, Goal 9: Industry, innovation and infrastructure, Goal 12: Responsible production and consumption, Goal 13: Climate action, and Goal 15: Life on land.

4 Reporting Period

This GHG Inventory Report describes Transpower's FY25 GHG emissions. A summary of this GHG Inventory Report is also published in Transpower's *Integrated Annual Report 2024/25* and its *Climate Statement 2024/25* (both published August 2025 on Transpower's website: www.transpower.co.nz).

5 Persons Responsible

This GHG Inventory Report has been primarily prepared by Transpower's Sustainability Team. Data inputs also came from a range of other sources at Transpower, as well as from Transpower's service providers and key suppliers, including:

- from Transpower's:
    - Energy Market Services (ems): National Grid transmission losses, energy consumption at substations;
    - Primary Assets Engineering: SF_6 gas emissions and inventory;
    - Facilities Management: office and warehouse energy consumption, vehicle fleet fuel, air travel and accommodation, backup generator diesel consumption;

    - Procurement: financial spend and analysis on Scope 3 purchased goods and services, capital goods;
    - Finance and Performance: staff travel mileage claims, car rental and taxis;
    - Treasury: NZU emission units; and
- from key service providers/suppliers: GHG emissions associated with work undertaken for Transpower.

6 Data Collection, Quantification and Uncertainties

The data collection methodology, including data source, uncertainties, and assumptions inherent in preparing this GHG Inventory Report, is detailed in Appendix 1. For GHG emissions sources included in this GHG Inventory Report, data was sourced from Transpower's Finance, Procurement, Facilities Management, Primary Assets, and ems teams, as well as other Transpower staff, its service providers, and key suppliers.

All emissions calculations not directly provided to Transpower were undertaken using BraveGen, a centralised carbon reporting software tool. This software uses a calculation methodology for quantifying the GHG inventory using emission source activity data multiplied by relevant GHG emissions factors. In the instances where Transpower is given emission data directly from service providers and suppliers, the emission calculations have been done by the relevant third party.

Except where stated and save where suppliers have provided emissions reports to Transpower in relation to our Scope 3 emissions, the emissions factors applied in this GHG Inventory Report were sourced either from:

- the most recently updated Ministry for the Environment (MfE) publications at the time of creating this FY25 GHG Inventory Report - *Te ine tukunga: He tohutohu pakihi - Measuring emissions: A guide for organisations: 2024 detailed guide* (2024) and supporting update *Measuring emissions guide: 2025* (2025);
- ems's electricity data hub, em6[6] (em6, 2025);
- *Quarterly Electricity Liquid Fuel Emissions Data* (Ministry for Business, Innovation and Employment, 2025); or
- *Spend-Based Emission Factors for New Zealand* (thinkstep-anz, 2022 – adjusted for inflation)[7].

Noting the following:

- The emission factor applied for converting sulphur hexafluoride (SF_6) gas into CO_2e has been sourced from The Intergovernmental Panel on Climate Change (IPCC) *Fifth Assessment Report* (The Intergovernmental Panel on Climate Change, 2013) consistent with the emission factor applied to SF_6 by the NZ Emission Trading Scheme (NZ ETS) as part of Transpower's annual SF_6 surrender.
- Where there are no electricity meters present at a Transpower site, the electricity usage data is estimated using data from a similar site (e.g. a similar location) and submitted to BraveGen.
- Emission factors applied to the electricity transmission losses from the National Grid (reported as Scope 2 emissions) were calculated using the most recent electricity generation emission data from Energy Market Service's em6 data (em6, 2025).
- The generation emission factor calculated from transmission losses (as described above) is used to calculate the emission factor applied to operational and non-operational buildings reported in Scope 2 (Category 2). This emission factor has been applied in the absence of a more accurate measure.
- Emission factors applied to electricity transmission and distribution losses associated with purchased electricity consumed in Transpower offices and substations were sourced from MfE with the emissions reported as Scope 3 (Category 6) (Ministry for the Environment, 2025).

[6] Em6 provides access to a range of electricity market data (including electricity generation and generation emissions) and is updated half-hourly.
[7] MfE and thinkstep-anz were used as sources of final emission factors, whereas MBIE and em6 were used as sources of data used in calculations for final emission factors.

- ADEME (The French Agency for Ecological Transition) emission factors have been used for some of our supplier-provided data.
- The emissions factors applied for air travel include radiative forcing for domestic air travel, and radiative forcing plus 9% uplift for international air travel (Ministry for the Environment, 2025).
- Quantities of each GHG are converted to tCO_2e using the Global Warming Potential (GWP) factors disclosed in Table 8.A.1 of IPCC's The Physical Science Basis (Intergovernmental Panel on Climate Change, 2013).
- The time horizon applied for GWP throughout the GHG Inventory is 100 years.
- All emissions data in this GHG Inventory Report is expressed in tCO_2e.

6.1 Changes to Approach Used Previously

In previous years, Transpower's Scope 3 emissions sources were calculated using expenditure-based emissions factors sourced from *Consumption-Based Greenhouse Gas Emissions Input-Output Model* (Motu Economic and Public Policy Research, 2014). These emission factors were based off a 2014 publication (using data from 2007), which was annually adjusted for inflation. From FY25 Transpower has moved to thinkstep-anz for its expenditure-based emissions factors as these provide more up-to-date data.

R410a[8] data from FY22 was used for Transpower's prior FY23 and FY24 GHG Inventory Reports, as this was the last year that estimates of average R410a leakage and replacement rates per equipment type and equipment inventory were able to be calculated by its service providers. For FY25 a new methodology has been created to provide more up-to-date estimations of all hydrofluorocarbons (HFCs) used in its heating, ventilation and air conditioning (HVAC) refrigerant systems.

Previously, MBIE's quarterly electricity generation data was used in Transpower's transmission losses emissions calculations. As the generation data for quarter four (1 April to 30 June 2024) was not published by the immediately following July when the then GHG Inventory Report data is compiled and assured, the quarterly MBIE electricity generation emission data from the fourth quarter period (1 April to 30 June) from the previous year was used as a proxy for the following quarter 4 reporting. From FY25 Transpower has used electricity generation data from ems' electricity data hub, em6. Em6 provides half-hourly generation data meaning a proxy is no longer needed. More information can be found in Appendix 4.

In FY22, given Transpower is a mandatory participant in the NZ ETS for the activity of using SF_6 in electrical switchgear, Transpower aligned the SF_6 emission factor used in the GHG Inventory Report with the SF_6 emission factor required to be used by participants in the NZ ETS. [9] For FY22 and FY23, the SF_6 emission factor required to be used for the NZ ETS was derived from the IPCC Fourth Assessment Report (The Intergovernmental Panel on Climate Change, 2007), and from the IPCC Fifth Assessment Report for FY24 and FY25. More information can be found in Appendix 4.

For consistency of methodologies across financial years, the new methodologies described in this section will be applied in all tables and figures of this GHG Inventory Report. This will result in variations to the data provided in previous GHG Inventory Reports. For completeness, comparisons across the previous financial years using the old and new methodologies can be found in Appendix 4.

6.2 Impact of Uncertainty

Some level of uncertainty is associated with the preparation of a GHG emissions inventory. Whilst Transpower data sources are verifiable, Appendices 1 and 2 of this GHG Inventory Report outline our approach to uncertainty considerations. For those emissions where estimates are required, Transpower has adopted more conservative estimates.

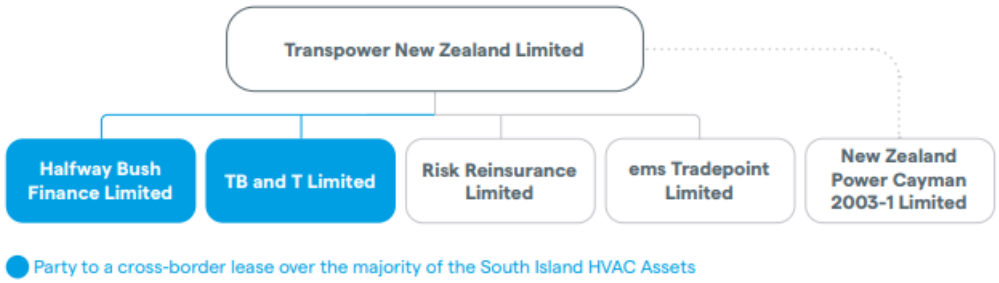
[8] A refrigerant.
[9] Pursuant to regulation 44C and Schedule 2A of the Climate Change (Stationary Energy and Industrial Processes) Regulations 2009 (CC(SEIP) Regulations).

7 Organisational Boundaries

Transpower applies the 'operational control' consolidation approach in accounting for the organisational boundary of its GHG emissions in this GHG Inventory Report, in accordance with the methodology described in the *GHG Protocol* (World Resources Institute, 2004) and the *ISO 14064-1:2018* standard (International Standards Organisation, 2018).

This approach was chosen as it allows Transpower to consider emissions sources for which it has greater control, and can influence via its *Sustainability Strategy* and *Transmission Tomorrow* objectives. Transpower's organisational structure as of 30 June 2025 is shown in Figure 2.

Figure 2. Organisational Structure of Transpower, as of 30 June 2025



The organisational boundary for this GHG Inventory Report includes the operations and GHG emissions associated with Transpower as summarised in Table 3 below.

Halfway Bush Finance Limited and TB and T Limited have no active operations against which emissions arise. Risk Reinsurance Limited is Transpower's captive insurance subsidiary and has no operations against which emissions arise. emsTradepoint Limited is a carbon and gas trading subsidiary company of Transpower that operates out of Transpower's physical offices. The staff carrying out the work of emsTradepoint are small in number and its emissions are de minimis. These emissions have been consumed into Transpower's emissions for the purpose of this GHG Inventory Report. Transpower no longer has an ownership interest in New Zealand Power Cayman 2003-1 Limited, which is consolidated for financial reporting purposes only.

Table 3. Emissions (tCO_2e) by Facility for FY25

Facility	Emissions
Transpower New Zealand Limited	224,356
Halfway Bush Finance Limited	-
TB and T Limited	-
Risk Reinsurance Limited	-
emsTradepoint Limited	-
New Zealand Power Cayman 2003-1 Limited	-
Total gross emissions:	**224,356**

8 Information Management Procedures

Transpower uses BraveGen as a key part of the preparation of this GHG Inventory Report to ensure consistent data handling, information management processes, and assurance. Its use of BraveGen also increases its visibility of ongoing results for more regular management reporting and review of GHG emissions.

The procedure for managing the Transpower GHG emissions inventory information for FY25 was:

- source activity data was collected directly from third party suppliers, Transpower metering systems, operational databases, and procurement and financial accounting software;
- the GHG Inventory Report was compiled using activity source data and emission factors;[10]
- GHG emissions data was calculated using BraveGen;
- the FY25 GHG Inventory Report data was analysed against historical annual GHG Inventory Reports to identify anomalies and trends;
- Transpower's Board, senior management and staff were informed of emissions reduction progress;
- the GHG Inventory Report and methodology was independently assured; and
- the GHG Inventory Report was then published on Transpower's website.

9 Operational Boundaries

Sources of GHG emissions from Transpower's operational activities are identified using the methodology from the GHG Protocol, ISO 14064-1, and the GHG Protocol CVCS.

These GHG emissions sources are classified by the following GHG Protocol Scopes and ISO 14064-1:2018 Categories[11]:

- Scope 1 (Category 1): Direct GHG emissions, as a result of Transpower operations, including fuel usage and fugitive gases;
- Scope 2 (Category 2): Indirect GHG emissions from Transpower electricity usage and transmission losses from the National Grid; and
- Scope 3 (Category 3, 4, 6): Indirect GHG emissions from Transpower's supply chain. This accounts for all emissions occurring as a result of Transpower operations not included in Scope 1 or 2, including upstream and downstream emissions. Transpower reports on GHG Protocol Scope 3 Categories 1-7 and 9 only, as the other categories are not relevant or applicable to its operations.

10 GHG Emissions Calculations and Results

10.1 GHG Emissions Summary

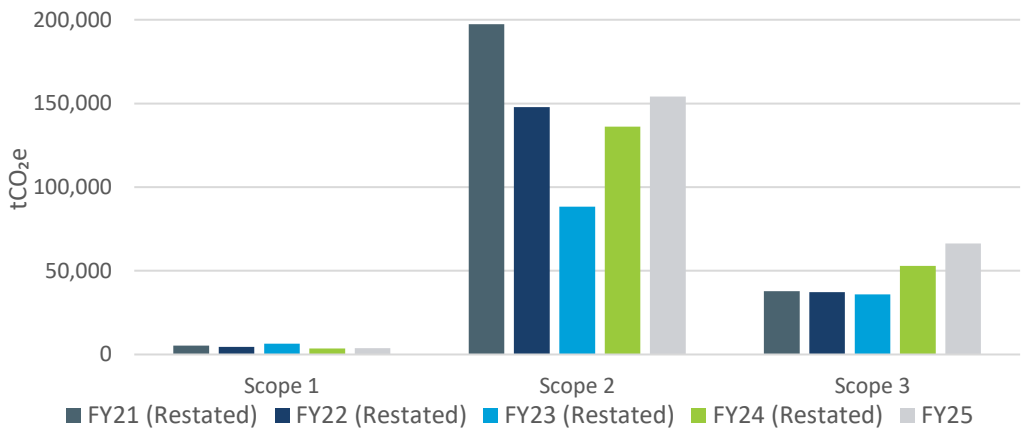
Transpower's total operational emissions for FY25 are estimated at 224,356 tCO_2e, an increase of 31,591 tCO_2e (or 16%) from that reported for FY24 (restated).

[10] Emissions factors and conversion factors used in the BraveGen software are maintained by BraveGen. All emissions factors for FY25 were cross checked with emission factors used previously by Transpower and revisions undertaken where more relevant or accurate factors were identified.

[11] Unless specified, 'Scope' will refer to the GHG Protocol Scopes and 'Category' will refer to ISO 14064-1:2018 Categories throughout the GHG Inventory Report.

A comparison of Transpower's total operational emissions for FY24 (restated) and FY25 by GHG emissions Category and Scope is shown in Figure 3 and Table 4 below. Figure 3 also shows data for FY21, FY22, and FY23 (all restated).

Figure 3. Transpower historical GHG emissions by GHG Scope



Transpower's total operational emissions for FY25 are broken down by GHG in Table 4 below. Of Transpower's total tCO_2e GHG emissions, 87% can be allocated to a specified gas type as set out in Table 4 below. The remaining 13% are Scope 3 emissions reported directly as tCO_2e from our suppliers or tCO_2e spend-based data where the specific gases are unknown.

Table 2. Total FY25 GHG Emissions by Greenhouse Gas[12]

GHG Scope & Category	tCO_2e	tCO_2	tN_2O	tCH_4	tSF_6	tHFCs	Unknown
Direct emissions (Scope 1, Category 1)	**3,837**	355	0.03	0.10	0.14	0.2	0
Indirect emissions (Scope 2, Category 2)	**154,157**	149,706	1.09	149	0	0	0
Indirect emissions (Scope 3, Categories 3, 4, 6)	**66,351**	37,451	0.02	3	0	0	28,900
Total	**224,356**	**187,512**	**1.14**	**152.10**	**0.14**	**0.2**	**28,900**

[12] PFCs and NF3s are not present in Transpower's network and are therefore not covered in this GHG Inventory Report.

10.2 Total Operational GHG Emissions by Category and Scope

Scope & Category 1 – Direct Emissions from Operations

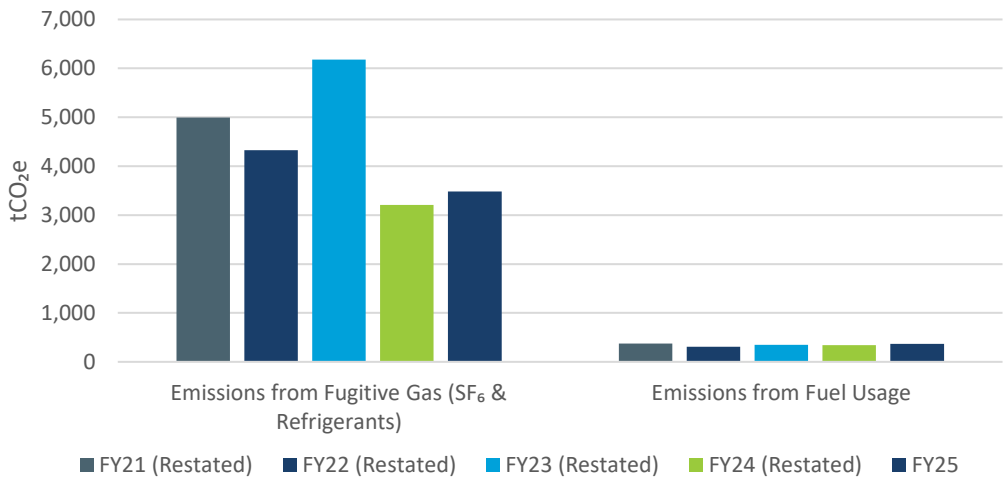
Transpower's direct, Scope 1, GHG emissions are shown in Figure 4 below. These direct GHG emissions include those arising from usage and loss of SF_6 and other gases, and fuel usage including vehicle combustion.

Transpower's SF_6 emissions increased 9% from 3,091 tCO_2e reported in FY24 figures to 3,376 tCO_2e in FY25. In FY25 Transpower concluded its SF_6 leak repairs on the Rangipo 220 kV GIS, which is a major milestone in our SF_6 emissions reduction work. As a result, Transpower anticipated a considerable decrease in its SF_6 emissions for FY25. This was not realised due to incidents with four circuit breakers. One SF_6 circuit breaker exploded due to a manufacturing defect, releasing 21kg of SF_6 (482 tCO_2e). There were also significant leaks from other three circuit breakers, which resulted in a loss of 23 kg of SF_6 (536 tCO_2e). All incidents have been investigated and addressed.

Managing emissions from SF_6 gases is an integral part of reducing Transpower's carbon footprint. Transpower's *Sustainability Strategy* and *SF_6 Management Strategy* set out several initiatives to manage these losses as part of its 2030 and 2050 emission reduction targets, and Aotearoa New Zealand's net-zero by 2050 aspirations. Its *SF_6 Management Strategy* commits Transpower to more accurate SF_6 handling, a proactive maintenance programme, and a phased equipment upgrade programme to replace lower voltage SF_6 switchgear to drive its long-term SF_6 emissions reductions.

GHG emissions from Transpower fuel usage, including from fleet vehicles, increased 7% from FY24 figures (a total of 365 tCO_2e reported in FY25). As outlined in its *Sustainability Strategy*, Transpower continues its long-running work programme to switch to electric vehicles, where suitable options exist. As of FY24, Transpower's passenger fleet has 100% electric battery and/or plug in hybrid vehicles.

Figure 4. Transpower Scope 1 Direct GHG Emissions

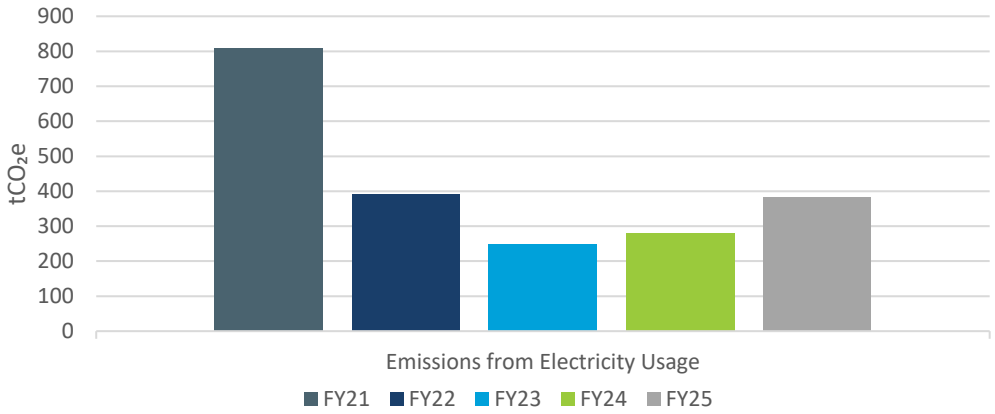


Scope 2 & Category 2 – Indirect Emissions from Electricity Usage

Transpower's indirect, Scope 2 GHG emissions include electricity usage in its buildings and substations, as well as emissions from transmission losses. These are shown in Figures 5 and 6 below.

Transpower's emissions from electricity usage in its buildings and substations increased from 279 tCO_2e in FY24 (restated) to 383 tCO_2e in FY25 (a 37% increase). It anticipates a continued increase in electricity emissions as the number of new substations built continues to increase, due to increased customer demand.

Figure 5. GHG Emissions arising from Electricity Usage (Location-based)



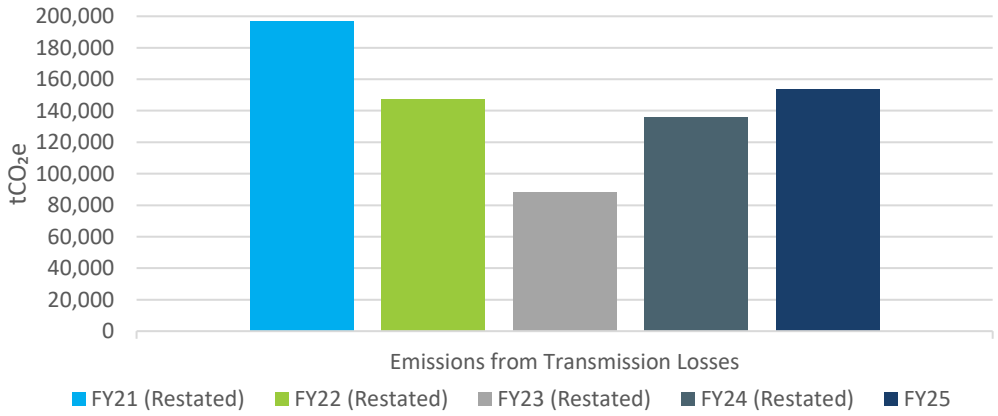
Transmission loss emissions are consistently Transpower's largest share of GHG emissions in the GHG Inventory Report. Transmission losses arise as a result of resistance caused by electricity passing through the National Grid and its equipment, such as lines and transformers. The GHG emissions associated with transmission losses arise from the relative carbon intensity of the electricity generation mix comprising the electricity being transmitted across the National Grid through the relevant financial year. For this GHG Inventory Report, transmission losses include grid losses from the alternating current (AC) and direct current (DC) transmission networks and substation electrical loads supplied from the National Grid.

Due to the generation mix in FY25, GHG emissions arising from transmission losses were estimated at 153,775 tCO_2e for FY25 (an increase of 13% from FY24 (restated)).

As transmission loss emissions are a function of the generation mix, they are largely outside of Transpower's control. However, given the current scale of transmission loss emissions across Aotearoa New Zealand's electricity network, Transpower will continue to monitor and report on them on behalf of the electricity sector. As part of this commitment, Transpower has a work programme under its *Sustainability Strategy* seeking to better understand Transpower's role in transmission losses, focusing effort on areas within Transpower control.

As shown in Figure 5 below, GHG emissions arising from transmission losses across the National Grid fluctuate year-to-year. This is largely driven by climatic patterns, which in turn often influence third parties' decisions in the Aotearoa New Zealand wholesale market about what electricity generation is made available and delivered in real-time. Generation patterns in turn impact the location of generation and the distance the generated electricity travels, which influences the amount of transmission losses arising in a given year. The generation mix impacts the amount of GHG emissions arising from such transmission losses (e.g., more rainfall often means more hydroelectricity and less coal or gas generation, which means less GHG emissions from transmission losses). Electricity generation plant availability is also a factor. For example, while there may be abundant hydro resources, major plant outages may mean they are not able to be used. The same applies to thermal generation, as outages can drive how renewables are used and when.

Figure 6. GHG Emissions arising from Transmission Losses



As a State-Owned Enterprise, Transpower has a commitment to significantly invest in upgrading the National Grid to accommodate Aotearoa New Zealand's electrification objectives and desire to increase the amount of renewable electricity generation available to the market. This will increase the amount of transmission network losses due to more extensive and larger-scale transmission infrastructure from new build and upgrade programmes, but is expected to result in fewer GHG emissions from such transmission losses as the electricity supply becomes increasingly more renewable.

Scope 3 & Categories 3, 4, and 6 – Indirect Emissions from Supply Chain

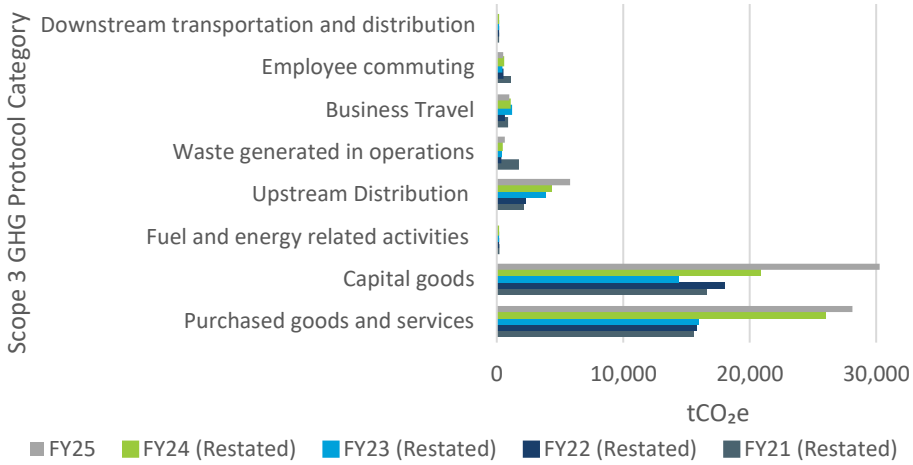
As shown in Figure 7 below, Transpower's Scope 3 emissions totalled 66,351 tCO_2e for FY25, an increase of 25% compared to FY24 (restated). These indirect GHG emissions include those associated with Transpower's purchased goods and services, capital goods and construction, and other supply chain activities such as business travel, waste, and employee commuting.

As part of a long-running *Sustainability Strategy* work programme to better understand, report, and manage its Scope 3 GHG emissions, Transpower has continued to work closely with its wider supply chain through FY25 to capture more accurate actual emissions data and reduce associated emissions systematically. FY25 saw a continued focus to move from an estimated financial expenditure-based approach to its Scope 3 emissions to a hybrid method – capturing both actual emissions data from its service providers and suppliers as well as some financial expenditure-based estimated data. For FY25, Transpower has captured 47% of its suppliers' actual GHG emissions data, which are in the Scope 3 Purchased Goods and Services and Capital Goods Scope 3 Categories. Within such Scope 3 Categories, 59% of Purchased Goods and Services emissions and 39% of Capital Goods emissions have been calculated using data provided directly by service providers.

As Transpower enables the electrification of Aotearoa New Zealand, its forecasting shows its Scope 3 emissions will increase as it further develops the National Grid. By gathering actual GHG emissions data from its service providers, Transpower can more accurately measure this increase and identify areas in its GHG inventory to target in its *Sustainability Strategy*.

In FY25, the Scope 3 Categories with the highest emissions were Capital Goods (with a 45% increase) and Purchased Goods and Services (with an 8% increase). Within these two Scope 3 Categories, the Subcategories with the highest increases were Construction, and Purchased Goods and Services – Other, respectively. Alongside continuous improved data collection reported from some of Transpower's service providers, these increases reflect the anticipated rise in Scope 3 emissions given the step up in Transpower's work programmes for FY25. As these emissions include those arising from its service providers as they undertake Transpower's work programmes, Transpower continues to work closely with its service providers to develop the National Grid sustainably.

Figure 7. Transpower Scope 3 Indirect GHG Emissions



11 GHG Removals and Emissions Reductions

11.1 Greenhouse Gas Removals

A GHG removal is defined by the GHG Protocol as an "*absorption or sequestration of GHGs from the atmosphere*" (World Resources Institute, 2004). Transpower undertook no formal GHG removals for FY25.

11.2 GHG Emissions Targets

In previous years, Transpower's short-term Scope 1 and 2 target was to achieve a 60% reduction of direct and controllable GHG emissions by 2030, against a FY06 baseline of 8,710 tCO_2e. This meant a controllable short-term Scope 1 and 2 GHG emissions target of 3,484 tCO_2e by 30 June 2030. GHG emissions arising from transmission losses were excluded as these are a function of the electricity generation mix, climatic conditions, and electricity market bids in a given financial year and thus are largely outside Transpower's control.

In FY25, Transpower revised its short-term Scope 1 and 2 GHG emissions targets and developed long-term GHG emissions targets for these scopes. Additionally, it has established both short-term and long-term Scope 3 GHG emissions targets, as well as a short-term overall GHG emissions target. Further details on each GHG emissions target are provided below.

Base year selected

Transpower has applied the reporting period of 1 July 2020 to 30 June 2021 (FY21) as the base year for its GHG Inventory Report. This change in the base year is due to Transpower setting new GHG emission targets in FY25, with a base year in relatively close proximity adopted in accordance with the GHG Protocol. FY21 was chosen as it is reflective of major projects undertaken, and of a typical year of forecasted activity. In addition, as per point number two in the *Base year recalculation policy* subsection below, Transpower considers there has been material enough changes to the methodology and emission sources used to calculate the FY25 GHG Inventory Report from previous years to warrant a recalculation of the base year.

This base year has been selected for all GHG emissions targets. All Figures contain restated data for FY21 to FY24.

Base year recalculation policy

We will recalculate our base year from FY21 if any of the following apply:

1. Significant structural changes to Transpower, including change of ownership or control.
2. Material changes in methodology used to calculate emissions, e.g., significant changes to emission factors.
3. Discovery of an error or miscalculation that is cumulative and collectively significant.

Base year and FY25 Reporting Period Comparison

Table 5 provides a breakdown of all GHG emissions in FY25 compared to the base year of FY21. Figures 8, 9, and 10 summarise historical Transpower Scope 1, 2, and 3 GHG emissions from the FY21 base year to FY25.

Table 5. Transpower Controllable Scope 1 and 2 GHG Emissions for FY25 Compared to Base Year (tCO_2e)

Scope	Category	FY25	Base Year FY21 (Restated)
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	365	371
	SF_6 and other fugitive gases	3,482	4,998
	Subtotal:	*3,847*	*5,369*
Indirect emissions (Scope 2, Category 2)	Electricity use in buildings and substations	383	808
	National Grid Transmission Losses	153,775	196,544
	Subtotal:	*154,157*	*197,352*
Indirect emissions (Scope 3, Category 3, 4, 6)	Purchased goods and services – grid maintenance	24,306	12,360
	Purchased goods and services - other	3,816	3,230
	Capital goods and construction	30,266	16,578
	Other supply chain	7,964	5,669
	Subtotal:	*66,351*	*37,837*
	Total emissions:	**224,356**	**240,558**

Figure 8. Transpower Scope 1 and 2 GHG Emissions for FY25 Compared to Base Year

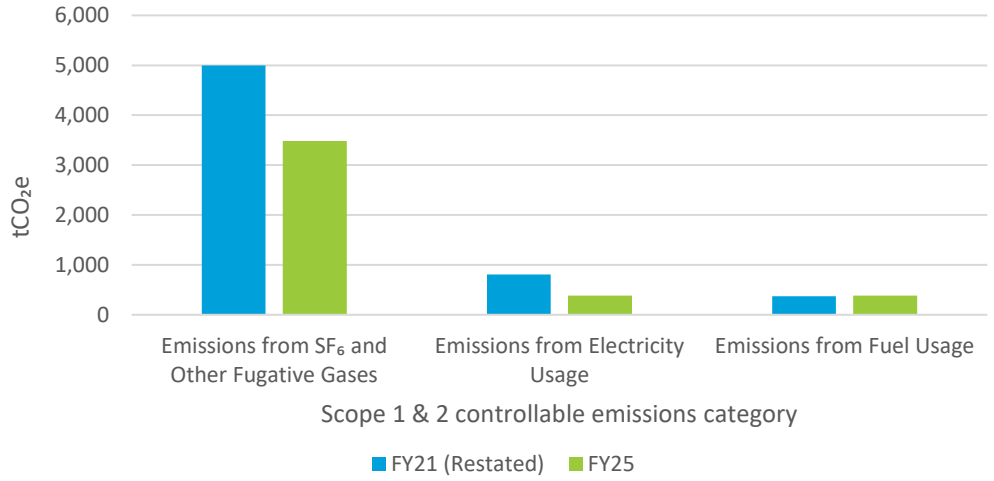


Figure 9. Transpower Transmission Losses Emissions for FY25 Compared to Base Year

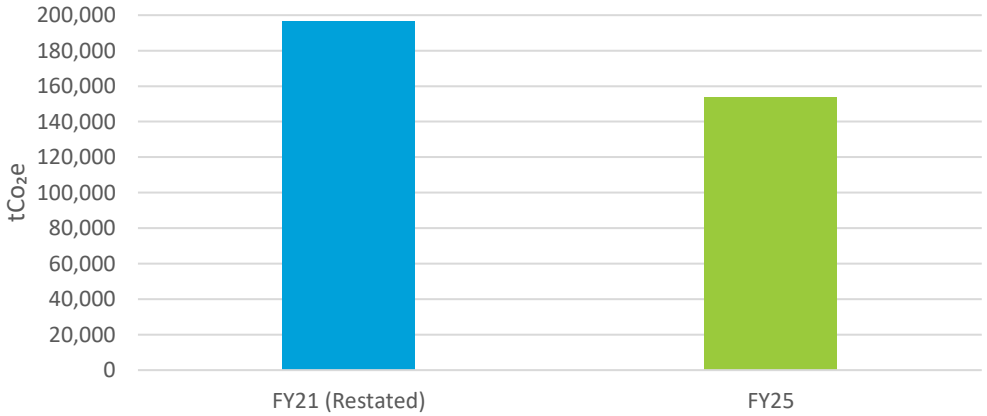
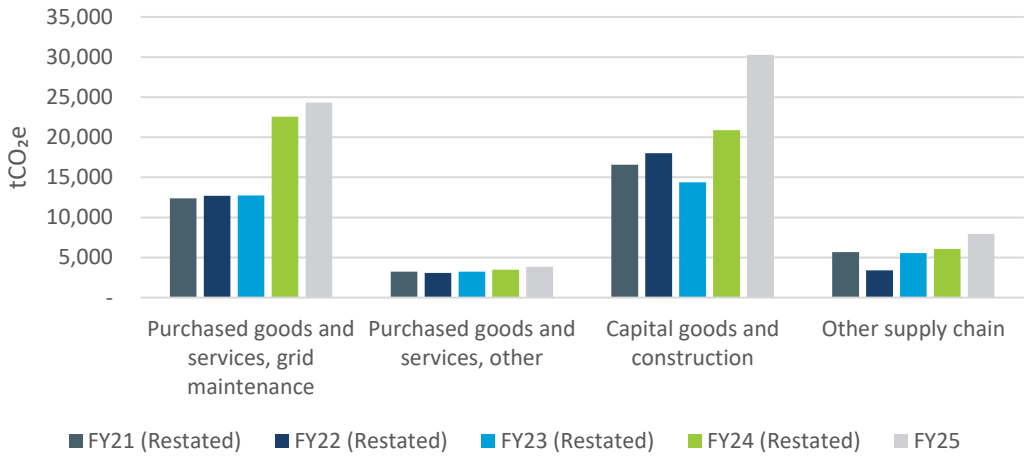


Figure 10. Transpower Scope 3 GHG Emissions for FY25 Compared to Base Year



Scope 1 and 2 GHG Emissions Reduction Targets

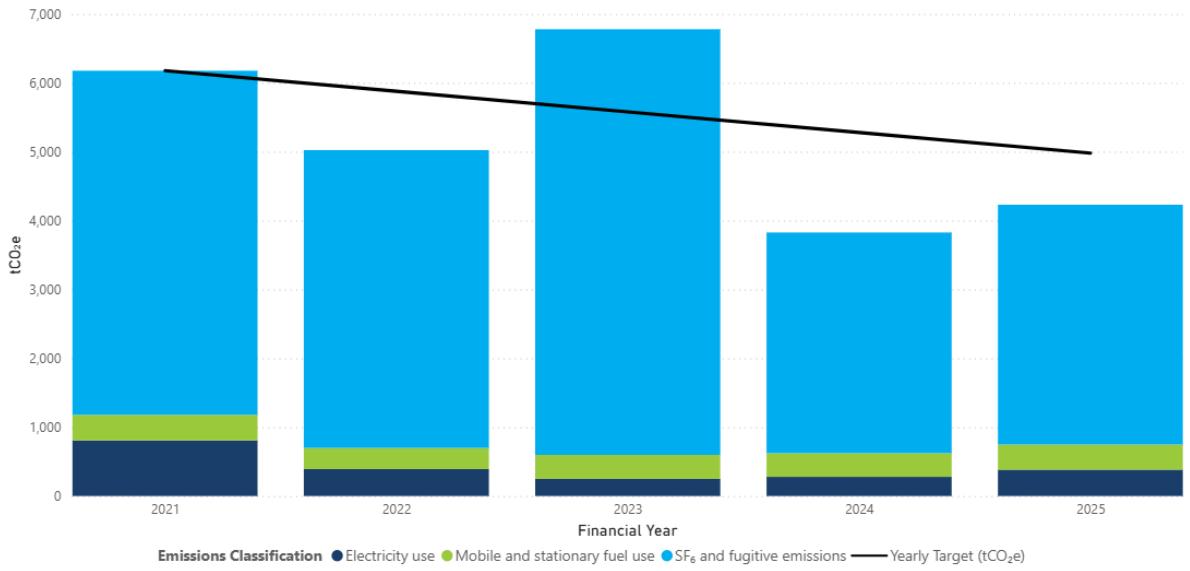
Controllable Scope 1 and 2 Short-term GHG Emissions Target

Though the base year has changed from FY06 to FY21, Transpower's short-term controllable Scope 1 and 2 emissions target of 3,484 tCO_2e by 30 June 2030 remains the same. With this base year change, Transpower's GHG emissions reduction target is now to achieve a 44% reduction of direct and controllable Scope 1 and 2 GHG emissions by 2030, against an FY21 baseline of 6,177 tCO_2e. As in previous years, the short-term Scope 1 and 2 GHG emissions target excludes emissions from transmission losses. Our revised Scope 1 & 2 short-term GHG emissions target is not a Science Based Targets initiative (SBTi) accredited target, but is aligned with SBTi.

Transpower's FY25 controllable Scope 1 and 2 GHG emissions totalled 4,230 tCO_2e, a 32% decrease compared to our FY21 baseline (6,177 tCO_2e). As at FY25, this equates to an achievement of 72% of Transpower's stated 44% GHG emission reduction target for 2030.

Figure 11 below summarises historical Transpower controllable Scope 1 and 2 GHG emissions from the FY21 base year to FY25. Transpower's FY25 Scope 1 and 2 GHG emissions demonstrate Transpower is currently on track to meet its short-term Scope 1 and 2 GHG emissions target.

Figure 11. Historical Controllable Scope 1 and 2 GHG Emissions Against Short-term Reduction Target



Scope 1 and 2 Long-term GHG Emissions Target

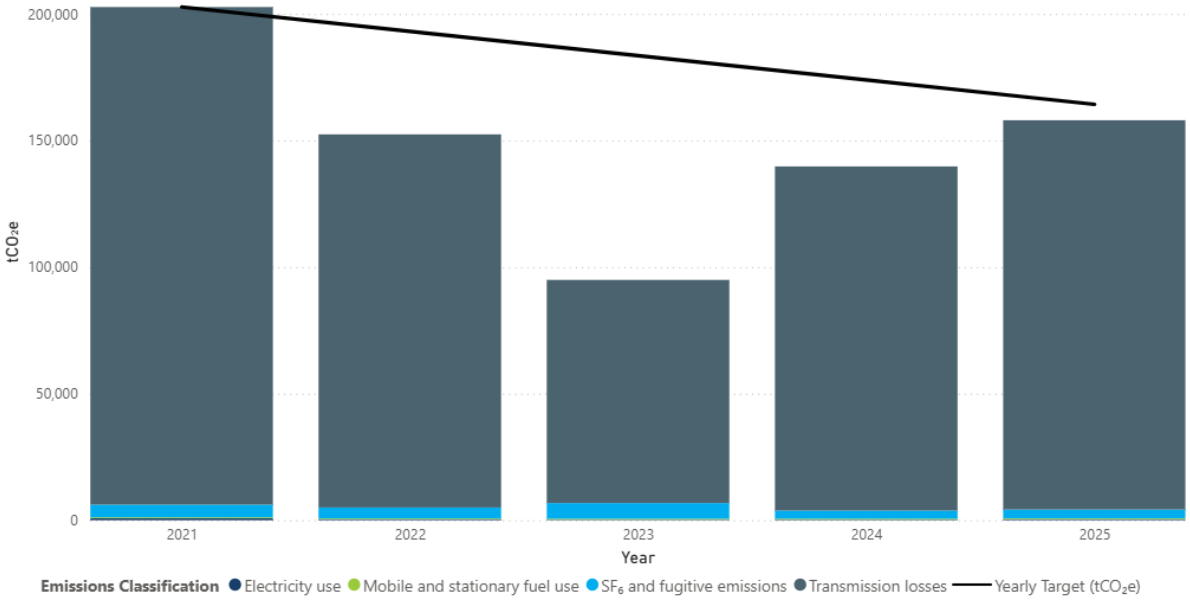
Transpower has also implemented a long-term GHG emissions reduction target for Scope 1 and 2. While the short-term target excludes transmission loss GHG emissions, the long-term target includes them. This reflects Transpower's focus on enabling Aotearoa New Zealand's electrification journey, including the increasing connection of additional renewable generation which will result in a decrease of GHG emissions from transmission losses in due course.

Our long-term GHG emissions target is to achieve net-zero Scope 1 and 2 GHG emissions by 2040 with an absolute target of a 90% reduction, against a baseline of FY21 (202,721 tCO_2e), of Scope 1 and 2 GHG emissions (including transmission loss GHG emissions).

Transpower's Scope 1 and 2 GHG emissions totalled 158,005 tCO_2e, a 22% decrease compared to our FY21 baseline (202,721 tCO_2e). As at FY25, this equates to an achievement of 25% of Transpower's stated overall long-term GHG emission reduction target (20,272 tCO_2e) for 2030.

Figure 12 below shows historical Transpower Scope 1 and 2 GHG emissions from the FY21 base year to FY25. Transpower's FY25 Scope 1 and 2 GHG emissions demonstrate Transpower is currently on track to meet its target.

Figure 12. Historical Scope 1 and 2 GHG Emissions Against Long-term Reduction Target



Scope 3 GHG Emissions Targets

Transpower has developed both short- and long-term targets for its Scope 3 GHG emissions. It is not possible for Transpower to align its short-term Scope 3 emissions target and overall Scope 1, 2, and 3 emissions target with SBTi, given it is impacted by the significant uplift in Transpower's work over at least the next 10 years to enable the electrification necessary to support Aotearoa New Zealand's net-zero 2050 emissions journey.

As Transpower enables electrification and the increasing connection of renewable generation and batteries by building new connection points and upgrading the national grid, its own Scope 3 carbon footprint is set to increase significantly.[13] This is due to the increase in embodied carbon and associated delivery works as part of the physical construction and upgrade of network infrastructure. While Transpower's own Scope 3 emissions will rise as it builds the infrastructure required to enable electrification, Transpower's increasing emissions are an essential enabler of Aotearoa New Zealand's electrification and are required for the country to meet its net-zero by 2050 emissions target.

Transpower has a wide range of existing emissions reduction initiatives within its Sustainability Strategy to drive emissions reductions to meet these targets.

Scope 3 Short-term GHG Emissions Target

The expected increase of Transpower's Scope 3 carbon footprint in the near-term will ultimately be offset by the net benefit of electrification to the country. Transpower has engaged with the Climate Leaders Coalition on this challenge and received an exemption from an overall emissions reduction target under the Climate Leaders Coalition Statement of Ambition. Despite the exemption, Transpower has set a short-term Scope 3 emissions target with effect from FY25, which is to achieve less than a 64% increase of Scope 3 emissions by 2030, against a FY21 baseline of 37,837 tCO_2e.

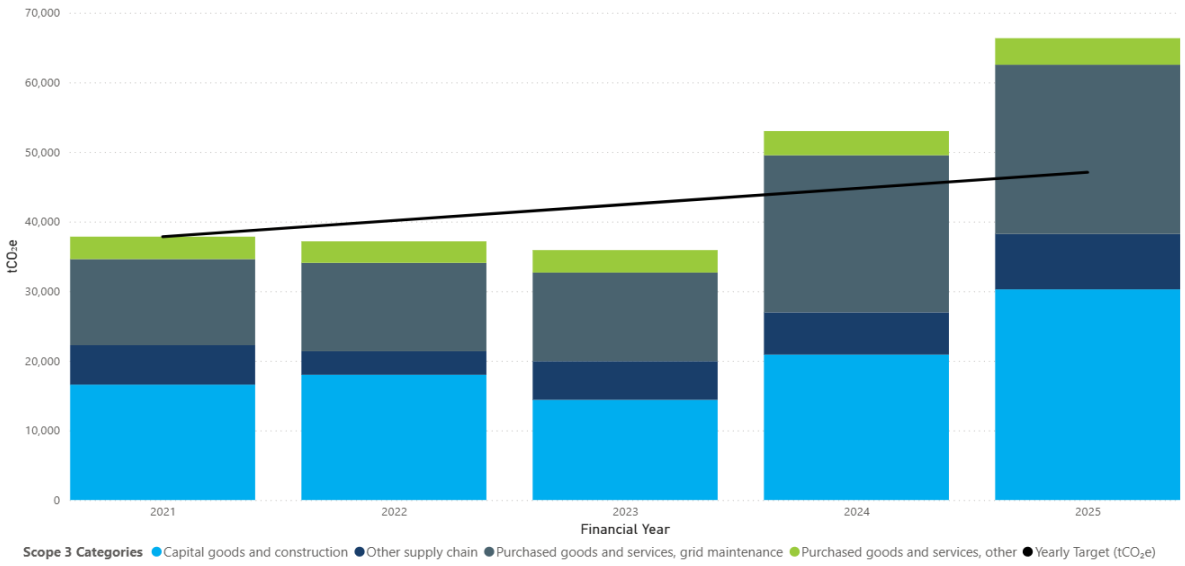
[13] Transpower modelled the forecast expenditure associated with base capital expenditure and forecast Capital Goods and Purchased Goods and Services categories to FY30 (based on its Regulatory Control Period 4 proposal, current anticipated major capital projects, and a reasonable forecast of customer connections) using the Scope 3 GHG Protocol categories and applied estimated emission factors for each Scope 3 category. This has enabled forecasting of the corresponding growth in Scope 3 emissions through to FY30, which is estimated to be significant.

This short-term Scope 3 target reflects Transpower's growing carbon footprint from its electrification work programme. It is also a 35% reduction against Transpower's forecast 2030 Scope 3 emissions of 90,220 tCO_2e. Transpower's short-term Scope 3 emissions target has been set alongside a new short-term overall emissions target for 2030, as outlined below, and a new long-term Scope 3 emissions target.

Transpower's Scope 3 GHG emissions totalled 66,351 tCO_2e in FY25, a 75% increase compared to its FY21 baseline (37,837 tCO_2e). As a result, as of FY25 Transpower Scope 3 has overshot its stated short-term Scope 3 GHG emissions target for FY30 (58,643 tCO_2e).

Figure 13 below depicts historical Transpower Scope 3 GHG emissions from the FY21 base year to FY25. As shown in Figure 13, Transpower's FY25 Scope 3 GHG emissions are currently not on track to meet its target.

Figure 13. Historical Scope 3 GHG Emissions Against Short-term Target



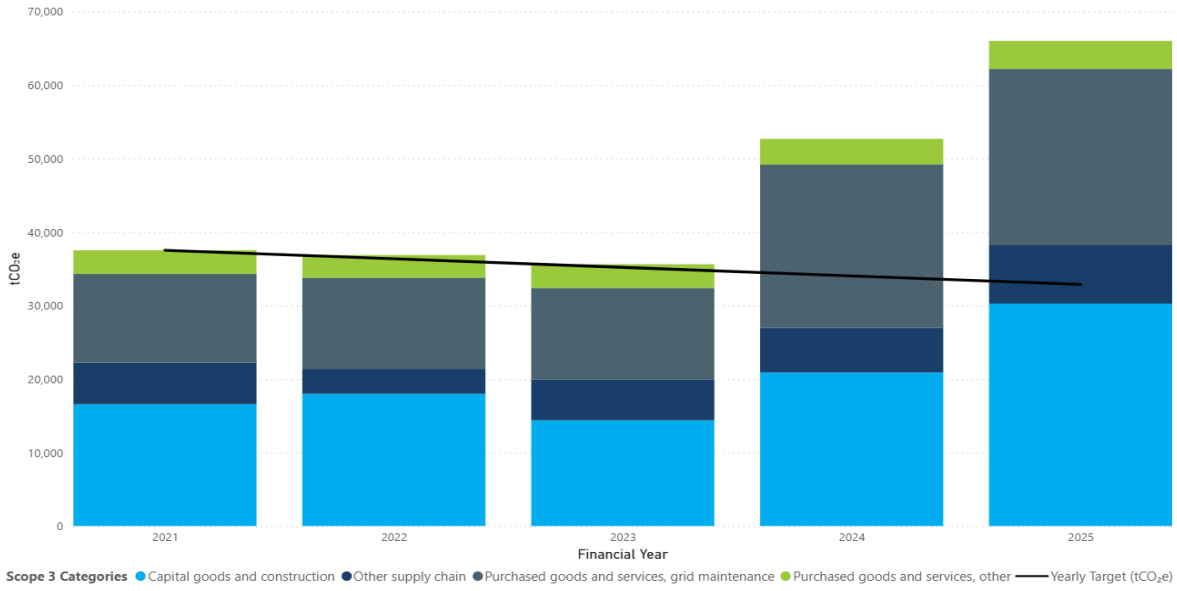
Scope 3 Long term GHG Emissions Target

The new long-term Scope 3 GHG emissions target effective from FY25 is Transpower's Scope 3 emissions being net-zero by 2050, with an absolute target of a 90% reduction of Scope 3 emissions by 2050, against a FY21 baseline of 37,837 tCO_2e.

Transpower's Scope 3 emissions totalled 66,351 tCO_2e in FY25, a 75% increase compared to its FY21 baseline (37,837 tCO_2e) – meaning as at FY25 Transpower's is exceeding its stated emission reduction target (3,784 tCO_2e) by 84%.

Figure 14 below shows historical Transpower Scope 3 GHG emissions from the FY21 base year to FY25. Transpower's FY25 Scope 3 GHG emissions demonstrate Transpower is currently not on track to meet its target.

Figure 14. Historical Scope 3 GHG Emissions Against Long-term Reduction Target



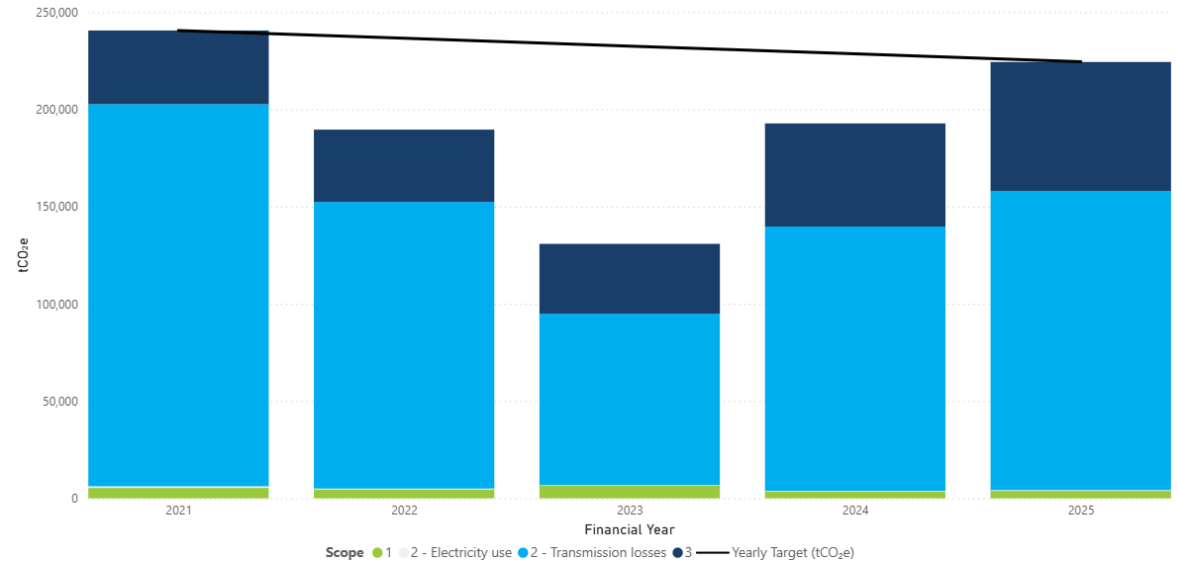
Short-term Overall GHG Emissions Reduction Target

In time, Transpower's overall net GHG emissions are expected to fall, as a result of declining emissions from transmission losses as thermal generation is utilised less and/or is retired. It is not possible for Transpower to align its overall short-term Scope 1, 2, and 3 GHG emissions target with SBTi, given it is impacted by the significant uplift in Transpower's work over at least the next 10 years to enable the electrification necessary to support Aotearoa New Zealand's net-zero 2050 emissions journey. Transpower has set an overall Scope 1, 2, and 3 emissions target (including transmission loss emissions) with effect from FY25, which is to achieve a 15% decrease of overall Scope 1, 2, and 3 GHG emissions by FY30, against a FY21 baseline of 240,558 tCO_2e.

Transpower's overall gross GHG emissions totalled 224,356 tCO_2e, a 7% decrease compared to its FY21 baseline. As of FY25, this equates to an achievement of 45% towards Transpower's stated 15% emission reduction target for FY30 (204,474 tCO_2e).

Figure 15 below summarises historical Transpower gross GHG emissions from the FY21 base year to FY25. Transpower's FY25 gross GHG emissions shows Transpower is currently on track to meet its target.

Figure 15. Historical Overall GHG Emissions Against Short-term Reduction Target



12 Surrendering units under the NZ Emissions Trading Scheme

Under the NZ ETS, Transpower is obligated to surrender New Zealand Units (NZUs) for emissions related to fugitive SF_6 gases. Pursuant to the NZ ETS, participants are required to report against calendar years (1 January – 31 December), whilst Transpower's GHG emissions reporting is by Financial Year (1 July - 30 June). Therefore, some of the emissions reported in this FY25 GHG Inventory Report were reported for regulatory compliance purposes in Transpower's NZ ETS emissions return for 2024 and the remainder will be reported in Transpower's emissions return for 2025 (which will be submitted in 2026). NZUs are surrendered for all the fugitive SF_6 gas emissions Transpower reports.

For the 2024 calendar year, Transpower surrendered NZUs equivalent to 3,037 tCO_2e related to fugitive SF_6 gases, an 18 % decrease from the 2023 calendar year (3,714 tCO_2e). This decrease was largely due to the work undertaken to repair leaking circuit breakers, including some significant leaks repaired in 2023 at the Rangipo GIS and Wairau Road substation. Contributing factors also included a 17% lower top-up amount in 2024 than 2023.

13 GHG Emission Liabilities

Transpower stores SF_6 gas to service and maintain its existing SF_6-filled equipment and new installations of SF_6-filled equipment. This SF_6 stock is held in secure depots and stores.

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Appendices

Appendix 1. Summary of GHG Emissions Source Inclusions

Details on the GHG emissions sources that inform this GHG Inventory Report are described in Table 6 below. The methodology outlined in the table below is derived from Management's assessment of the most accurate data available, taking into account materiality, the feasibility of acquiring the necessary data, and compliance with reporting standards. Transpower does not report on the other GHG Protocol Scope 3 Categories as they are not relevant or applicable to its operations.

Table 6. Summary of Emissions Sources and Associated Methodology by GHG Protocol Scope and Category

Scope	Category	GHG Emissions source	Calculation method	Data source	Data collection unit	Emission factor source	Methodology data quality, uncertainty, and limitations (qualitative)	Reliability of data
Scope 1	Fugitive emissions	Fugitive emissions from SF_6	Average-based[14]	Transpower SF_6 inventory database	Primary Assets Engineering Team	IPCC AR5	Accurate records of operational gas holdings, top-ups, and recovery during asset decommissioning	Reasonable. Data is entered into EcoGas with a cut-off period for the reporting year
		Fugitive refrigerant emissions from air conditioning units	Average-based	Air conditioning units	Service Providers	IPCC AR5	Estimates of average leakage and replacement rates per equipment type and equipment inventory	Impacted by estimations and averages of data used due to required data not currently being recorded

[14] Average-based data is calculated by multiplying the quantity of data (e.g. litres or kilograms) by the relevant emission factor.

Scope	Category	GHG Emissions source	Calculation method	Data source	Data collection unit	Emission factor source	Methodology data quality, uncertainty, and limitations (qualitative)	Reliability of data
Scope 1	Mobile fuel use	Car travel (owned, leased, rented)	Average-based	Fuel cards purchase data, rental provider activity reports	Fuel card records and expense management systems	MfE	Owned and leased vehicles. Litres of fuel used calculated from accurate records of fuel card transactions	Good. Does not account for missing information such as where employee does not use their fuel card
	Stationary fuel use	Combusted diesel used in back-up generators	Average-based	Operational records	Service providers	MfE	Records of operational diesel use	Good, due to use of actual records
		Natural gas used in HVAC systems	Average-based	Operational records	Building landlord	MfE	Landlord provides accurate report in volume usage	Good, due to use of actual records
Scope 2	Electricity use	Electricity used in offices and warehouses	Average-based	Records from ICP billing systems	Retail providers	ems	Accurate records from billing system	Good, due to use of actual records
		Electricity consumed in substations	Average-based	Records from metering, and engineering estimates	Energy Market Services, Finance and Performance Team, and Substation Engineering Team	ems	Substations electricity is supplied from one of three sources: 1. Direct feed from distribution network (metered data available) 2. Feed from transmission system, therefore data is included within transmission losses category (site consumption data is not metered)	Good, though some estimation is used for sites that aren't metered

Scope	Category	GHG Emissions source	Calculation method	Data source	Data collection unit	Emission factor source	Methodology data quality, uncertainty, and limitations (qualitative)	Reliability of data
							3. Accurate data from retail providers	
Scope 2	Transmission losses	National Grid transmission line losses	Average-based	Transpower National Grid metering data	Energy Market Services	ems/em6	Accurate net metering of National Grid inputs and outputs. Several substations are directly fed from the National Grid and are included in this category	Good. Em6 provides half hourly generation data allowing for reasonable assurance of accurate data across the FY. An average of the FY is used for this data, as the difference between half hourly and annual is immaterial
Scope 3	1. Purchased goods and services	Upstream emissions associated with good and services	Spend-based[15] for emissions data not provided from service providers	Procurement records	Procurement Team	Thinkstep-anz	Spend per invoices are categorised against the most relevant emission factor from within the (inflation adjusted) thinkstep-anz emission factor set. Uncertainty arises from both the lack of specific GHG emissions data associated with each product or service, as well as the emission factors being	Good data (accurate and complete) derived from our finance system. Emissions data is less certain – fair, due to low specificity in the emission factors

[15] Spend-based data is calculated by multiplying the financial spend by the relevant emission factor.

Scope	Category	GHG Emissions source	Calculation method	Data source	Data collection unit	Emission factor source	Methodology data quality, uncertainty, and limitations (qualitative)	Reliability of data
							based on industry averages. Where there has been a choice Transpower has used the basic price emission factor as the majority of our spend is from buying direct without retail or wholesale	
Scope 3	1. Purchased goods and services	Upstream emissions associated with good and services	Direct data provided from service providers	Supplier data	Supplier/ Service Providers,	MfE, thinkstep-anz, ADEME	Supplied directly by suppliers/service providers. Some of this directly supplied data includes spend-based emissions data calculated by the particular supplier/service provider. For the uncertainties and limitations related to spend-based emissions, see Scope 3 Category 1: Purchased goods and services, spend-based method	Methodology of material data understood by Transpower. A mix of good data (assumed supplier records are complete and accurate for direct emission data provided) and fair data (due to the service provider/suppliers inclusion of calculated estimations based on spend).
	2. Capital goods	Upstream emissions associated with National Grid assets	Spend-based[16] for emissions data not	Procurement records	Procurement Team	MfE, thinkstep-anz, ADEME	For the uncertainties and limitations related to spend-based emissions, see Scope 3 Category 1: Purchased goods	Good data (accurate and complete) derived from our finance system. Emissions data

[16] Spend-based data is calculated by multiplying the financial spend by the relevant emission factor.

Scope	Category	GHG Emissions source	Calculation method	Data source	Data collection unit	Emission factor source	Methodology data quality, uncertainty, and limitations (qualitative)	Reliability of data
		and capital equipment purchased	provided from service providers				and services, spend-based method	is less certain – fair, due to low specificity in the emission factors
Scope 3	2. Capital goods	Upstream emissions associated with National Grid assets and capital equipment purchased	Direct data provided from service providers	Supplier data	Supplier/Service providers	Thinkstep-anz	Supplied directly by suppliers/service providers. Some of this directly supplied data includes spend-based emissions data calculated by the particular supplier/service provider. For the uncertainties and limitations related to spend-based emissions, see Scope 3 Category 1: Purchased goods and services, spend-based method	Methodology of material data understood by Transpower. A mix of good data (assumed supplier records are complete and accurate for direct emission data provided) and fair data (due to the service provider/suppliers inclusion of calculated estimations based on spend).
	3. Fuel and energy related activities (not included in scope 1 or scope 2)	Transmission and distribution (T&D) losses associated with purchased electricity used in offices and substations, purchased gas in offices	Average-based	Records from metering, and engineering estimates	Energy Market Services, Finance and Performance Team, and Substation Engineering Team	MfE	T&D losses applied to the purchased electricity reported in Scope 2 and gas in Scope 1 Categories	Good, due to use of actual records

Scope	Category	GHG Emissions source	Calculation method	Data source	Data collection unit	Emission factor source	Methodology data quality, uncertainty, and limitations (qualitative)	Reliability of data
Scope 3	4. Upstream transportation and distribution	Emissions associated with upstream transport	Spend-based	Procurement records	Procurement Team	Thinkstep-anz	Estimated freight factor applied to overseas manufacturers of electrical equipment based on spend, and emission factor applied to purchasing records relating to freight. For the uncertainties and limitations related to spend-based emissions, see Scope 3 Category 1: Purchased goods and services, spend-based method	Fair, due to calculated estimations based on spend
	5. Waste	Waste to landfill from offices and operations	Average-data for office landfill waste, spend-based for the rest	Procurement records, supplier data & estimated values	Procurement Team, waste management providers	Thinkstep-anz, MfE	For operations: estimated waste factor applied to civil construction and asbestos removal. For offices: actual landfill waste records obtained from each office and warehouse	Good. Waste to landfill from offices based on actual data, with the rest of waste generated in operations calculated using spend based data and via service providers directly
	6. Business travel	Air travel - domestic and international	Distance-based[17]	Travel provider reports based of internal purchases	Travel management provider	MfE	Supplier records of flights ticketed by our suppliers. Outputs are calculated using the distances travelled by sector split into domestic, short	Good, due to reliance on accuracy of actual records

[17] Distance-based data is calculated by collecting distance and mode of transport information and multiplying by the relevant emission factor.

Scope	Category	GHG Emissions source	Calculation method	Data source	Data collection unit	Emission factor source	Methodology data quality, uncertainty, and limitations (qualitative)	Reliability of data
							haul and long-haul split by class of travel	
		Car travel (taxis and rideshare)	Spend-based for taxis and staff claims, distance-based for rental cars	Purchasing records expense management system)	Finance and Performance Team	MfE	Records of expenditure on taxis. For the uncertainties and limitations related to spend-based emissions, see Scope 3 Category 1: Purchased goods and services, spend-based method	Good, due to reliance on actual data provided by third parties
Scope 3		Hotel accommodation	Average-based	Purchase records (supplier data, internal purchasing systems)	Travel Management Provider	MfE	Hotel nights provided by travel provider, categorised by country/continent: NZ, Australia, Europe, North America, and Asia	Good, due to reliance on accuracy of actual records
	7. Employee commuting and working from home	Employer travel to and from work (in private vehicles and public transport)	Distance-based for employee commuting, average-based for working from home	Estimated values	Sustainability Team	MfE	Estimated based on FY25 average office occupancy and average commuting data based on 2024 Transpower employee commuting survey	Impacted by number of responses and interpretation of the survey questions

Scope	Category	GHG Emissions source	Calculation method	Data source	Data collection unit	Emission factor source	Methodology data quality, uncertainty, and limitations (qualitative)	Reliability of data
Scope 3	9. Downstream transportation and distribution	Postal services	Spend-based	Purchase records	Procurement Team	Thinkstep-anz	Emission factor applied to postal related services. For the uncertainties and limitations related to spend-based emissions, see Scope 3 Category 1: Purchased goods and services, spend-based method	Fair, due to calculated estimations based on spend

Other GHG Emissions – Biogenic Emissions

There were no biogenic GHG emissions in FY25 as there was no combustion of biomass in Transpower operations during the reporting period.

Appendix 2. Summary of GHG Emissions Source Exclusions

The GHG emissions sources outlined in Table 7 below have been excluded from this GHG Inventory Report. It was not technically feasible to obtain this data at the time of GHG Inventory Report preparation, and the associated GHG emissions are not considered to be material in the context of this GHG Inventory Report.

Table 7. Emissions Sources Excluded

Scope	Category	GHG emissions source	Reason for exclusion
Scope 1 Direct GHG emissions	Fugitive emissions	Fugitive emissions from fridges and vehicle AC systems	Difficult to obtain the data, emissions estimated to be *de minimis* from Transpower-contracted equipment maintenance specialists

Appendix 3. Transpower emissions by ISO 14064-1:2018 Categories

Table 8 provides a breakdown of Transpower's total GHG emissions for FY25 by *ISO 14064-1:2018* Category.

Table 8. Transpower's total GHG emissions broken down by ISO Category (tCO_2e)

ISO Category	Subcategory	FY25
Direct GHG emissions and removals	Stationary and mobile fuel	365
	Fugitive emissions	3,482
	Direct emissions total	**3,847**
Indirect GHG emissions from imported energy	Electricity consumption	383
	Transmission losses	153,775
	Indirect GHG emissions from imported energy total	*154,157*
Indirect GHG emissions from transportation	Business travel	979
	Freight	707
	Employee commuting	500
	Grid plant & equipment sourced overseas uplift	5,086
	Postal services	28
	Indirect GHG emissions from transportation total	*7,300*
Indirect GHG emissions from products used by an organisation	Purchased goods and services	28,121
	Capital goods	30,266
	T&D losses	28
	Waste	630
	Working from home	6
	Indirect GHG emissions from products used by an organisation total	*59,051*
	Indirect emissions total	**220,508**
	Total emissions	***224,356***

Appendix 4. Restated Methodologies Comparison

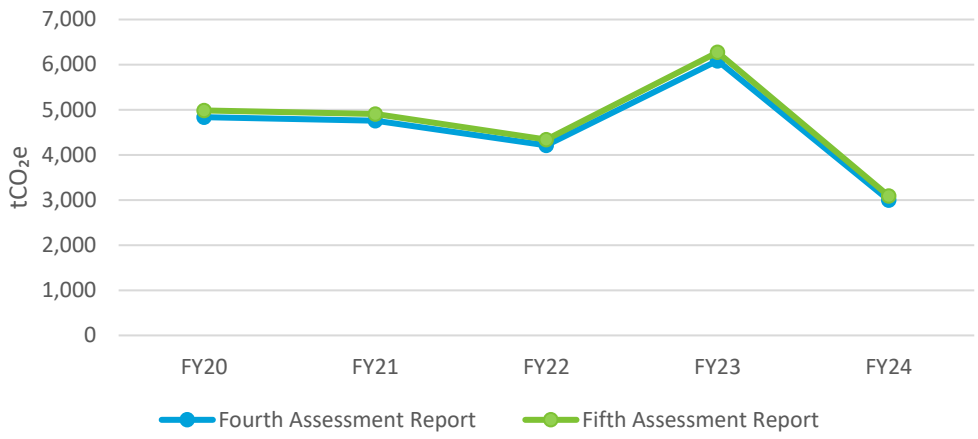
Transpower has made changes to some of its data collection methodologies. For accuracy and completeness across reporting years, it has provided a comparison of both methodologies for each of these data sources. Section 9.1 provides further information on each methodology change.

Scope 1

SF_6

Figure 16 shows Transpower's SF_6 emissions for FY periods 2021 to 2024 using the emission factors from both the IPCC *Fourth* and *Fifth Assessment Reports*.

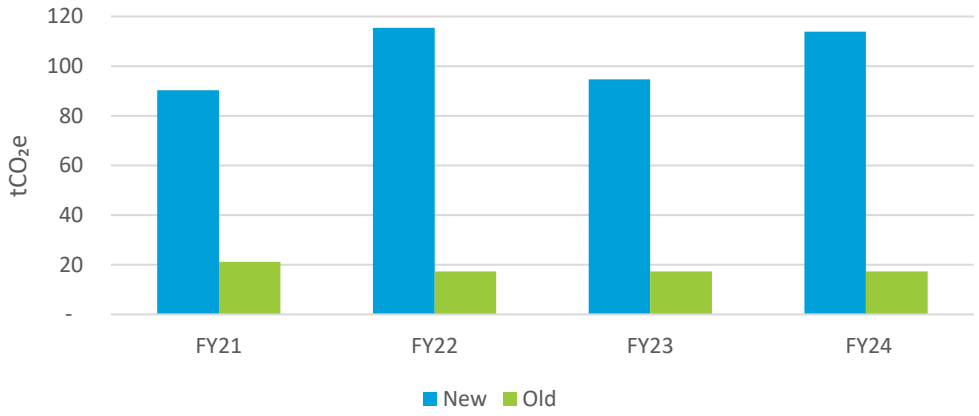
Figure 16. Transpower SF_6 emissions (tCO_2e)



HFCs

Transpower has updated its reporting on HFC use in HVAC systems. As a result of more accurate data, recorded HFC GHG emissions have increased materially. Figure 17 provides both the old and new methodologies for comparison.

Figure 17. Transpower HFC Emissions (tCO_2e)



Scope 2

Transmission loss emissions

From FY25 Transpower has used ems' em6 electricity generation data in Transpower's transmission loss emissions calculations. Table 9 shows the comparison between previously published data (using MBIE generation data using quarter four from the prior financial year as the reporting financial year's quarter four

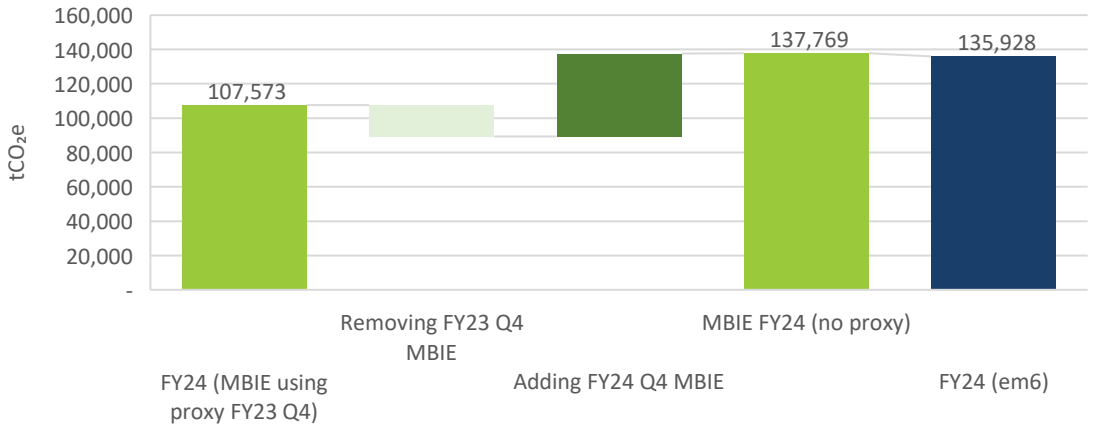
proxy) and recalculated data (using em6 data for the four quarters in the reporting financial year) for FYs 2021 to 2025.

Table 9. GHG Emissions arising from Transmission Losses (tCO_2e)

Electricity generation source	FY21	FY22	FY23	FY24
MBIE[18]	203,891	168,927	111,323	107,573
em6	196,554	147,395	88,158	135,928
Difference	-7,337	-21,532	-23,165	+28,355

As detailed in Section 6.1 and Figure 18 below, the use of the proxy quarter four for the MBIE data largely accounts for the discrepancies between the MBIE- and em6-related calculations for each particular financial year.

Figure 18. Electricity generation from new and previous data sets (tCO_2e)



Scope 3 by category

In FY25 Transpower replaced its use of Motu emissions factors for its spend-based emission factors with thinkstep-anz's emissions factors, resulting in a change to its spend-based Scope 3 emissions. Table 10 below shows Transpower's overall Scope 3 indirect GHG emissions using both spend-based emission factor sets.

Table 10. Transpower Scope 3 Indirect GHG Emissions (tCO_2e)

Emission factor source	FY21	FY22	FY23	FY24
Motu	46,517	44,440	44,859	58,182
Thinkstep-anz	37,837	37,165	35,906	53,009
Difference	-8,680	-7,275	-8,953	-5,173

[18] The MBIE generation data uses a proxy Q4 from the previous year. This largely accounts for the discrepancies between the two pieces of data.

Appendix 5. ISO 14064-1:2018 Reporting Index

ISO Reporting Section	in this GHG Inventory Report
9.2 (g)	Section 4
9.3.1 (a)	Section 3
9.3.1 (b)	Section 5
9.3.1 (c)	Title, Section 4
9.3.1 (d)	Section 7
9.3.1 (e)	Section 9, Appendix 1 & 2
9.3.1 (f)	Section 10
9.3.1 (g)	Appendix 1
9.3.1 (h)	Section 11
9.3.1 (i)	Section 11
9.3.1 (j)	GHG Inventory Report Summary, Section 11
9.3.1 (k)	Section 11
9.3.1 (l)	Section 11
9.3.1 (m)	Section 6 & 9
9.3.1 (n)	Section 6, Section 11
9.3.1 (o)	Section 6 & 8
9.3.1 (p)	Section 6
9.3.1 (q)	Section 6, Appendix 1 & 2
9.3.1 (r)	Section 1
9.3.1 (s)	Section 1
9.3.1 (t)	Section 6
9.3.2 (a)	Section 3
9.3.2 (b)	Section 11
9.3.2 (f)	Section 1 & 10
9.3.2 (h)	Section 11
9.3.2 (i)	Section 8
9.3.2 (j)	Section 10 & 11
9.3.2 (k)	Section 10
9.3.3	Section 12

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INDEPENDENT LIMITED ASSURANCE REPORT TO THE SHAREHOLDERS OF TRANSPOWER NEW ZEALAND LIMITED ON THE GREENHOUSE GAS EMISSIONS DISCLOSURES FOR THE YEAR ENDED 30 JUNE 2025

Under section 461ZH(3) of the Financial Markets Conduct Act 2013, the Auditor-General is the assurance practitioner of Transpower New Zealand Limited (the Company) and its subsidiaries (the Group). The Auditor-General has appointed me, Matthew Cowie, using the staff and resources of Ernst & Young Limited, to carry out a limited assurance engagement, on his behalf, on the greenhouse gas (GHG) emissions information (GHG disclosures) (as described in 'scope of the engagement' section below), for the year ended 30 June 2025. The GHG disclosures in the Group's Greenhouse Gas Emissions Inventory Report (GHG Inventory Report) form part of its Climate Statement for the year ended 30 June 2025.

Scope of the engagement

The GHG disclosures below are within the scope of our limited assurance engagement:

- The gross emissions, in metric tonnes of carbon dioxide equivalent, classified as Scope 1, Scope 2 (calculated using the location-based method) and Scope 3, on pages 5 to 6 of the GHG Inventory Report
- The statement describing that GHG emissions have been measured in accordance with the GHG Protocol Corporate Accounting and Reporting Standard, Revised Edition (2004), the GHG Protocol Scope 2 Guidance (2015), the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011) and ISO 14064-1:2018 Greenhouse Gases – Part 1, on page 7 of the GHG Inventory Report
- The approach used to consolidate GHG emissions (operational control) on page 11 of the GHG Inventory Report
- The sources (or references to sources, where applicable) of emission factors and the global warming potential rates used, on pages 9 to 10 and pages 27 to 34 of the GHG Inventory Report
- The summary of specific exclusions of Scope 1, Scope 2 (calculated using the location-based method) and Scope 3 emissions sources, including facilities, operations or assets with a justification for their exclusion, on page 36 of the GHG Inventory Report
- The description of the methods and assumptions used (including the rationale for doing so, where applicable) to calculate or estimate Scope 1, Scope 2 (calculated using the location-based method) and Scope 3 GHG emissions, and the limitations of those methods, on pages 27 to 34 of the GHG Inventory Report
- The description of any uncertainties relevant to the Group's quantification of its Scope 1, Scope 2 (calculated using the location-based method) and Scope 3 GHG emissions, including the effects of these uncertainties on GHG disclosures, on page 10 and pages 27 to 34 of the GHG Inventory Report
- The explanation for base year GHG emissions restatements (where applicable) relating to Scope 1, Scope 2 (calculated using the location-based method) and Scope 3 emissions, on page 10, page 17 and pages 38 to 39 of the GHG Inventory Report

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 the Group's GHG disclosures within the scope of our limited assurance engagement for the year ended 30 June 2025, are not fairly presented and prepared, in all material respects, in accordance with Aotearoa New Zealand Climate Standards, issued by the External Reporting Board.

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Other matter

The comparative information, being the 2024 and 2023 GHG disclosures on pages 5 and 6, was assured by Ernst & Young Limited in the firm's own capacity. Ernst & Young Limited expressed an unmodified report dated 7 August 2024 and 8 August 2023 respectively.

Key matters

Key matters are those matters that, in our professional judgement, were of most significance in carrying out this limited assurance engagement on GHG disclosures for the current year.

Key matters were addressed in the context of our limited assurance engagement on GHG disclosures, and in forming our conclusion thereon. We do not provide a separate conclusion on these matters.

The key matters are described below:

Spend-based method used in estimation of certain Scope 3 emissions	
Description of key matter	**How we addressed this matter**
As explained on pages 29 to 31 of the GHG Inventory Report, the Group has measured the GHG emissions from "Scope 3 – Purchased goods and services", "Scope 3 – Capital goods" and "Scope 3 – Transportation and Distribution" using the spend-based calculation method. These emission categories make up a significant proportion of the total GHG emissions for the period ended 30 June 2025. The spend-based calculation method estimates emissions for goods and services by multiplying the value of goods and services purchased with emission factors relevant to the type of good or service. This method relies on average emissions per dollar spend factors, which may differ significantly from the emissions actually created from a certain spend as a result of differences between the supply chain and characteristics of the product purchased and the assumed average. The use of the spend-based calculation method comes with inherent uncertainty and may result in significantly different estimated emissions than methods that are more supplier or product specific. Due to the high level of estimation involved, improvements to the calculation method or assumptions for these emission sources could result in future material changes to, and restatement of, previously reported amounts. In the current year, Transpower have used spend-based emissions factors estimated for 2022 as opposed to an older source of spend-based emissions factors previously used. This has resulted in a material restatement of emissions previously reported in relation to the "Scope 3 – Purchased goods and services", "Scope 3 – Capital goods" and "Scope 3 – Transportation and Distribution" categories.	In considering Transpower's reported Scope 3 emissions measured using the spend-based method we: ▸ Obtained an understanding of the spend-based calculation method, assumptions and estimation uncertainties; ▸ Considered whether the application of the spend-based calculation methodology by Transpower and a number of their suppliers aligned with the GHG Protocol; ▸ Considered the reasonableness of the selected spend-based emission factors and their application in the calculation process by Transpower and a limited sample of suppliers who used the spend-based method; ▸ Considered the spend on purchased goods, capital goods and transportation and distribution used in the calculations by performing analytics and inquiry; and ▸ Considered the disclosures made by Transpower in relation to the calculation method, assumptions and uncertainties estimating these emission sources and the related prior year restatements on pages 10 and 39.

The Board of Directors' responsibilities

Subparts 2 to 4 of the Financial Markets Conduct Act 2013 set out requirements for a climate reporting entity in preparing a climate statement, which includes proper record keeping, compliance with the climate-related disclosure framework and subjecting it to assurance.

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The Aotearoa New Zealand Climate Standards have been issued by the External Reporting Board as the framework that applies for preparing and presenting a climate statement. The Board of Directors of the Company is therefore responsible for preparing and fairly presenting a climate statement for the year ended date, in accordance with those standards.

The Board of Directors is also responsible for the design, implementation, and maintenance of internal control relevant to preparing the climate statement that is free from material misstatement, whether due to fraud or error.

Our responsibilities

Section 461ZH of the Financial Markets Conduct Act 2013, requires the GHG disclosures included in the Group's Climate Statement to be the subject of an assurance engagement.

NZ CS1 *Climate-related disclosures,* paragraph 25 requires such an assurance engagement at a minimum to be a limited assurance engagement, and paragraph 26 specifies the scope of the assurance engagement on GHG disclosures.

To meet these responsibilities, we planned and performed procedures (as summarised below), to provide limited assurance in accordance with New Zealand Standard on Assurance Engagements 1 *Assurance Engagements over Greenhouse Gas Emissions Disclosures,* and International Standard on Assurance Engagements (NZ) 3410 *Assurance Engagements on Greenhouse Gas Statements*, issued by the New Zealand Auditing and Assurance Standards Board.

Summary of Work Performed

The procedures we performed were based on our professional judgement and included enquiries, observation 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 obtained, through enquiries, an understanding of the Group's control environment, processes and information systems relevant to the preparation of the Scope 1, Scope 2 and Scope 3 disclosures. We did not evaluate the design of particular control activities or obtain evidence about their implementation.
- We evaluated whether the Group's methods for developing estimates are appropriate and had been consistently applied. Our procedures did not include testing the data on which the estimates are based or separately developing our own estimates against which to evaluate the Group's estimates.
- We performed analytical procedures on particular emission categories by comparing the expected GHG emissions to recorded GHG emissions and made inquiries of management to obtain explanations for any significant differences we identified.
- We evaluated the appropriateness of the emission factors applied in the Scope 1, Scope 2 and Scope 3 measurement process.
- We evaluated the overall presentation and disclosure of the Scope 1, Scope 2 and Scope 3 disclosures.

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 a reasonable assurance engagement been performed.

We believe that the evidence obtained is sufficient and appropriate to provide a basis for our limited assurance conclusion.

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Inherent limitations

As outlined on page 10, GHG quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

Other information

The Climate Statement, which includes the GHG Inventory Report, contains information other than the GHG disclosures and the assurance report thereon. The Board of Directors is responsible for the other information.

Our assurance engagement does not extend to any other information included, or referred to, in the Climate Statement or the GHG Inventory Report, other than pages 5 to 7, 9 to 11, 17, 27 to 34, 36 and 38 to 39 of the GHG Inventory Report, and therefore, no conclusion is expressed thereon. We read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the GHG disclosures, or our knowledge obtained in the assurance engagement, or otherwise appears to be materially misstated.

Where such an inconsistency or misstatement is identified, we are required to discuss it with the Board of Directors and take appropriate action under the circumstances, to resolve the matter. There are no inconsistencies or misstatements to report.

Independence and quality management

We complied with the Auditor-General's independence and other ethical requirements, which incorporate the 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. PES 1 is founded on the fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour. These principles for example, do not permit us to be involved in the preparation of the current year's GHG information as doing so would compromise our independence.

We have also complied with the Auditor-General's quality management requirements, which incorporate the requirements of Professional and Ethical Standard *3 Quality Management for Firms that Perform Audits or Reviews of Financial Statements, or Other Assurance or Related Services Engagements* (PES 3) and Professional and Ethical Standard 4 *Engagement Quality Reviews* issued by the New Zealand Auditing and Assurance Standards Board (PES 4). PES 3 requires our firm to design, implement and operate a system of quality management including policies or procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. PES 4 deals with an engagement quality reviewer's appointment, eligibility, and responsibilities.

In addition to this engagement we have carried out assignments in the areas of financial statement audits, interim financial statement reviews, other assurance services, agreed upon procedures, remuneration benchmarking and non-GHG climate disclosure related pre-assessment services which are compatible with those independence requirements. Other than this engagement and these assignments, we have no relationship with or interests in the Company or any of its subsidiaries

Matthew Cowie
Ernst & Young Limited
On behalf of the Auditor-General
Auckland, New Zealand
28 August 2025

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