

Greenhouse Gas Emissions Inventory Report

Transpower NZ Ltd

Version: Final

Inventory Period: 1 July 2021 to 30 June 2022

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Transpower Greenhouse Gas Emissions Inventory 2021/22

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Greenhouse Gas Emissions Inventory Summary

Transpower's total Greenhouse Gas (GHG) emissions for the 2022 Financial Year (1 July 2021 – 30 June 2022) were approximately 218,293 tonnes of carbon dioxide equivalent (tCO₂-e). Figure 1 and Table 1 below summarise the main sources of GHG emissions for the reporting period.

Figure 1. GHG Emissions Inventory Summary for Measurement Period 1st July 2021 to 30th June 2022

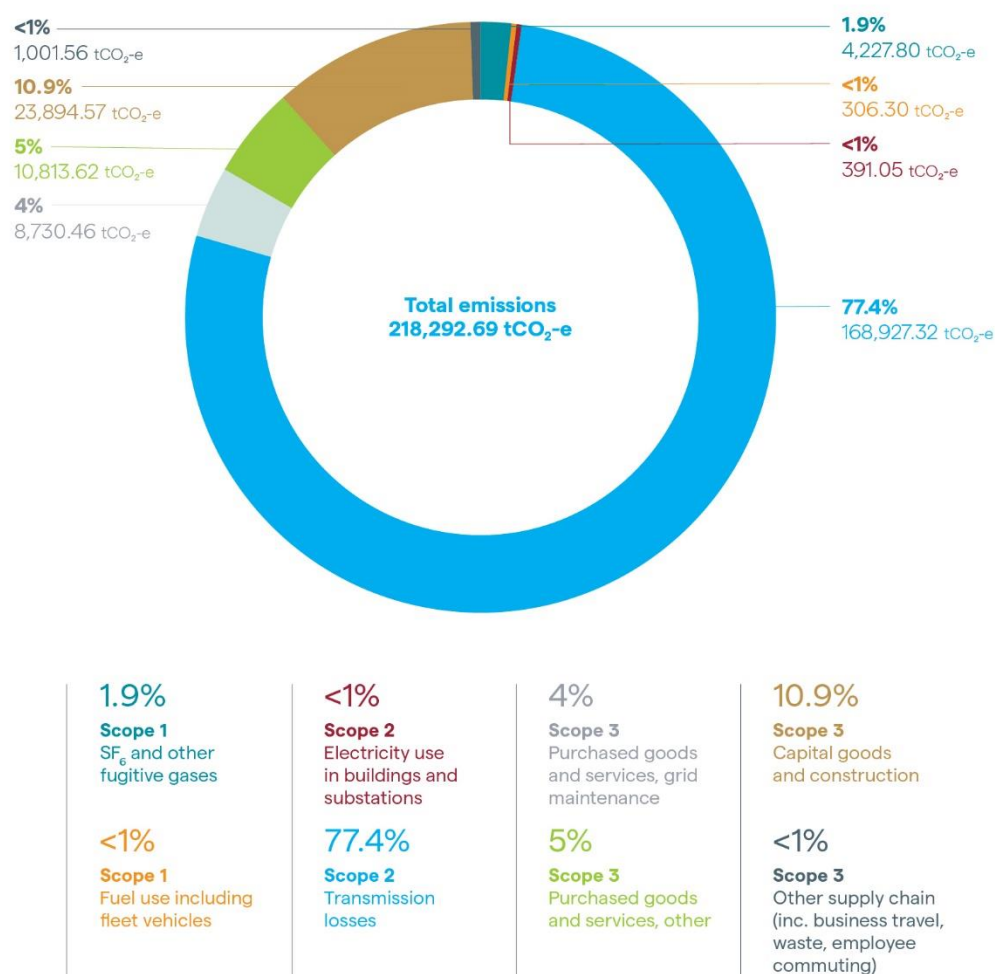


Table 1. GHG Emissions Inventory Summary for Financial Year 2022

Scope & Category	Emissions Source	2022 tCO ₂ -e
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	306
	SF6, and other fugitive gases	4,228
	<i>Subtotal:</i>	<i>4,534</i>
Total direct emissions:		4,534
Indirect emissions (Scope 2, Category 2)	Electricity use in buildings and substations	391
	Transmission losses	168,927
	<i>Subtotal:</i>	<i>169,318.37</i>
Indirect emissions (Scope 3, Categories 3, 4 & 6)	Purchased goods and services (grid maintenance)	8,731
	Purchased goods and services (other)	10,814
	Capital goods and construction	23,895
	Other supply chain (including business travel, employee commuting)	1,002
	<i>Subtotal:</i>	<i>44,440</i>
Total indirect emissions:		213,759
<u>Total gross emissions:</u>		<u>218,293</u>

1 Introduction

This Greenhouse Gas emissions inventory report (GHG Inventory Report) outlines specific Greenhouse Gas (GHG) emissions that can be attributed directly to Transpower operations in operating the National Grid for the 2022 Financial Year (1 July 2021 – 30 June 2022), as well as an approximate count of emissions that can be indirectly attributed to Transpower activities during this reporting period.

We have published this GHG Inventory Report in accordance with the international *Greenhouse Gas Protocol* (World Resources Institute, 2004) and ISO 14046-1 Greenhouse Gases – Part 1 standard (published by the International Standards Organisation, 2006). During Financial Year (FY) 2018/19, Transpower commissioned an external review of its carbon accounting methodology to ensure it aligned with the updated standard ISO 14064-1:2018 (International Standards Organisation, 2018). As a result, this GHG Inventory Report has been expanded to include more comprehensive supply chain data within the scope of our carbon accounting.

Transpower is committed to 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:

- The first focuses on increasing the share and availability of renewable energy generation in the electricity system by supporting new customer connections, investments across the National Grid and in terms of its real time operation. Not only does this help decarbonise the electricity system, it facilitates the provision of low-carbon energy for the decarbonisation of other sectors, most importantly, process heat and transport.
- Secondly, Transpower is committed to reducing the Greenhouse Gas emissions arising from its own operations, as well as building 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 (Transpower NZ Ltd, 2022), and the delivery 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 New Zealand’s National Grid.

1.1 Statement of Intent

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

This GHG Inventory Report relates to the GHG emissions of Transpower New Zealand Ltd. It has been prepared according to ISO 14064-1:2018 (International Standards Organisation, 2018), *The Greenhouse Gas Protocol* (World Resources Institute, 2004) and *The Greenhouse Gas Protocol Scope 2 Guidance* (World Resources Institute, 2015) and *The Greenhouse Gas Protocol Corporate Value Chain Standard* (World Resources Institute, 2011). It does not include any future forecasts.

This GHG Inventory Report has been audited by a third-party independent assurance provider – refer Appendix 4 – in accordance with the International Standard on Assurance Engagements (New Zealand) 3000 *Assurance Engagements other than Audits or Reviews of Historical Financial Information* (External Reporting Board, 2014) and International Standard on Assurance

Engagements (New Zealand) 3410 Assurance Engagements on Greenhouse Gas Statements (External Reporting Board, 2012).

Whilst this GHG Inventory Report will be of interest to government, investors, regulators, customers and non-governmental organisations, its primary purpose is to inform our own emissions management, reduction and reporting activities.

2 Description of Transpower

Transpower owns Aotearoa New Zealand's high voltage electricity transmission system, the National Grid. It is also responsible, under contract to the Electricity Authority 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 (SOE) 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 purpose is *Whakamana i te mauri hiko tū mai Aotearoa | Empowering the energy future for New Zealand*.

In 2020, we published our updated scenarios for the transition to a zero-carbon economy: *Whakamana i Te Mauri Hiko – Empowering our Energy Future* (Transpower NZ Ltd, 2020). This is principally driven by a move towards an increasingly renewable electricity system being used to electrify key sectors of the energy economy; principally transport and process heat.

Transpower's Strategy, *Transmission Tomorrow* (Transpower NZ Ltd, 2018), focuses on the actions we need to take to give effect to this transition. In our planning, investment, and operational functions, we work with our customers, within our regulatory framework, to deliver and operate the National Grid.

To enable this work, Transpower's Sustainability Strategy (Transpower NZ Ltd, 2022) guides our activities in the key challenge areas of climate change, environmental stewardship, sustainable business, and our communities. 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, and Goal 11 Climate action.

4 Reporting Period

This GHG Inventory Report describes Transpower's Greenhouse Gas (GHG) emissions for the reporting period 1 July 2021 to 30 June 2022. A summary of this GHG Inventory Report has been published in Transpower's Integrated Annual Report 2021/22 (published September 2022).

This GHG Inventory Report provides an accurate account of Transpower's Scope 1, 2 and some Scope 3 GHG emissions for the reporting period. The quality and availability of third-party source data for Scope 3 emissions in the reporting period is more approximate. This is further discussed in Section 9 of this GHG Inventory Report.

Both this GHG Inventory Report and the Transpower Integrated Annual Report are published on our 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:

- Energy Market Services (EMS): National Grid transmission losses, energy consumption at substations;
- Primary Assets Engineering: SF6 gas emissions and inventory;
- Facilities Management: office and warehouse energy consumption, vehicle fleet fuel, air travel and accommodation;
- 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;
- Tactical Engineering: engineering consultancy emissions reports; and
- Grid Delivery: Service Provider emissions reports, backup generator diesel consumption, heat pump refrigeration gas, emissions associated with work undertaken for Transpower.

6 Organisational Boundaries

Transpower applies the 'operational control' consolidation approach in accounting for the organisational boundary of our emissions in this GHG Inventory Report, in accordance with the

methodology described in the ISO 14064-1:2018 standard (International Standards Organisation, 2018).

This approach was chosen as it best aligns with the GHG Inventory Report's intended uses. Specifically, it allows Transpower to consider emissions sources for which we have greater control and can therefore influence via our Sustainability Strategy (Transpower NZ Ltd, 2022) and *Transmission Tomorrow* (Transpower NZ Ltd, 2018) objectives. The Transpower New Zealand Ltd (Transpower) organisational structure at 30 June 2022 is shown in Figure 2.

Figure 2. Organisational Structure of Transpower New Zealand, at 30 June 2022



The organisational boundary for this GHG Inventory Report includes the operations and emissions associated with Transpower as summarised in Table 2, below.

Halfway Bush Finance Limited and TB and T Limited are dormant and therefore have no operations against which emissions arise. Risk Reinsurance Limited (RRL) is Transpower's captive insurance subsidiary and has no operations against which emissions arise. Transpower no longer has an ownership interest in New Zealand Power Cayman 2003-1 Limited, which is consolidated for financial reporting purposes only.

Table 2. Emissions (tCO₂-e) by Facility for Financial Year 2022

Facility	2022 tCO ₂ -e
Transpower New Zealand Limited	218,293
Halfway Bush Finance Limited	0
TB and T Limited	0
Risk Reinsurance Limited	0
emsTradepoint Limited	0
New Zealand Power Cayman 2003-1 Limited	0
Total gross emissions:	218,293

7 Information Management Procedures

Transpower uses a centralised carbon reporting software tool, BraveGen, as a key part of the preparation of this GHG emissions inventory to ensure consistent data handling, information management processes, and assurance - and to increase the visibility of results for more regular management reporting and review.

The procedure for managing the Transpower GHG emissions inventory information for the FY22 reporting period was:

- Source activity data was collected directly from third party suppliers, Transpower National Grid metering systems, operational databases and procurement and accounting software;
- The GHG Inventory Report was compiled using activity source data and emission factors*;
- GHG emission results are calculated using BraveGen;
- The 2022 GHG Inventory Report data was analysed against previous years GHG emissions reports to identify anomalies and trends;
- Senior management, Transpower executives and staff are informed of emissions reduction progress; and
- The GHG Inventory Report and methodology goes through an independent audit process.

**Emissions factors and conversion factors used in the BraveGen software are maintained by BraveGen. All emissions factors for the 2021 reporting period were cross checked with emission factors used previously by Transpower and revisions undertaken where more relevant or accurate factors were identified.*

8 Operational Boundaries

Sources of Greenhouse Gas (GHG) emissions from our activities, deemed significant for inclusion in this GHG Inventory Report, are identified using the methodology from *The Greenhouse Gas Protocol* (World Resources Institute, 2004), ISO 14064-1:2018 (International Standards Organisation, 2018) and *The Greenhouse Gas Protocol Corporate Value Chain Standard* (World Resources Institute, 2011).

These GHG emissions sources are classified by the following categories:

- 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
- Scope 3 (Category 3-6): Indirect GHG emissions from Transpower supply chain. This accounts for all emissions occurring as a result of Transpower operations that are not included in Scope 1 or 2, including upstream and downstream emissions.

9 Data Collection, Quantification and Uncertainties

The data collection methodology including data source, uncertainties, and assumptions for this GHG Inventory Report is detailed in Appendix 1. For Greenhouse Gas emissions sources included in this GHG Inventory Report, data was sourced from our Finance, Procurement, Facilities Management, Tactical Engineering and Operations project teams, as well as other relevant Transpower staff and our Service Providers and key suppliers.

All emissions calculations were undertaken using BraveGen software. This software uses a calculation methodology for quantifying the GHG inventory using emission source activity data multiplied by relevant GHG emissions factors.

Except where stated, the emissions factors applied in this GHG Inventory Report were sourced from the most recently updated Ministry for the Environment publication, *Measuring Emissions: A Guide for Organisations* (2022), *Quarterly Electricity Liquid Fuel Emissions Data* (Ministry for Business, Innovation and Employment, 2022) or *Consumption-Based Greenhouse Gas Emissions Input-Output Model* (Motu Economic and Public Policy Research, 2013). Noting the following:

- The emission factor applied for converting sulphur hexafluoride (SF₆) gas into CO₂-e has been sourced from the *IPCC Fourth Assessment Report* (The Intergovernmental Panel on Climate Change, 2007).
- Emission factors applied to the electricity transmission losses from the National Grid (reported as Scope 2 emissions) were calculated using the most up to date MBIE electricity generation emission data (Ministry for Business, Innovation and Employment, 2022).
- Emission factors applied to electricity transmission and distribution losses associated with purchased electricity consumed in Transpower offices and substations were sourced from the Ministry for the Environment with the emissions reported as Scope 3 (Category 6).
- The emissions factors applied for air travel include radiative forcing (Ministry for the Environment, 2022).

Quantities of each Greenhouse Gas are converted to tonnes of carbon dioxide equivalent (tCO₂-e) using the global warming potential disclosed in Table 8.A.1 (Intergovernmental Panel on Climate Change, 2013). The time horizon applied is 100 years. All emissions data in this GHG Inventory Report is expressed in tonnes of carbon dioxide equivalent (tCO₂-e).

9.1 Changes to Approach Used Previously

In previous years the emission factor for SF₆ emissions was sourced from the fifth IPCC Assessment Report. For FY22 we have changed the SF₆ emission factor to be more consistent with the New Zealand Emissions Trading Scheme which uses the *IPCC Fourth Assessment Report* (The Intergovernmental Panel on Climate Change, 2007).

9.2 Impact of uncertainty

Some level of uncertainty is associated with the preparation of a Greenhouse Gas Emissions Inventory. Whilst Transpower data sources are verifiable, Appendix 1 & 2 of this GHG Inventory Report outlines our approach to uncertainty considerations. For those emissions where estimates are required, Transpower has adopted more conservative estimates

10 GHG Emissions Calculations and Results

Transpower's total operational emissions for the 2022 Financial Year reporting period are estimated at 218,293tCO₂-e, a decrease of 38,225tCO₂-e (or 15%) from that reported for the 2021 Financial Year.

The biggest decrease in emissions between the 2022 and 2021 reporting years was seen in Scope 2 emissions associated with transmission losses. In FY21, transmission losses increased 21% compared to FY20 which is explained by a lower-than-average period of hydro-electricity generation in response to lower lake levels, resulting in an increased emissions intensity across the grid. In FY22, emissions from transmission losses decreased 17% from FY21, reflecting an associated decrease in electricity grid emissions intensity.

A comparison of Transpower's total operational emissions for the 2021 and 2022 Financial Years by GHG emissions category and scope are shown in Figure 3 and Table 3 below.

Figure 3. Transpower historical GHG emissions (tCO₂-e) by GHG Scope

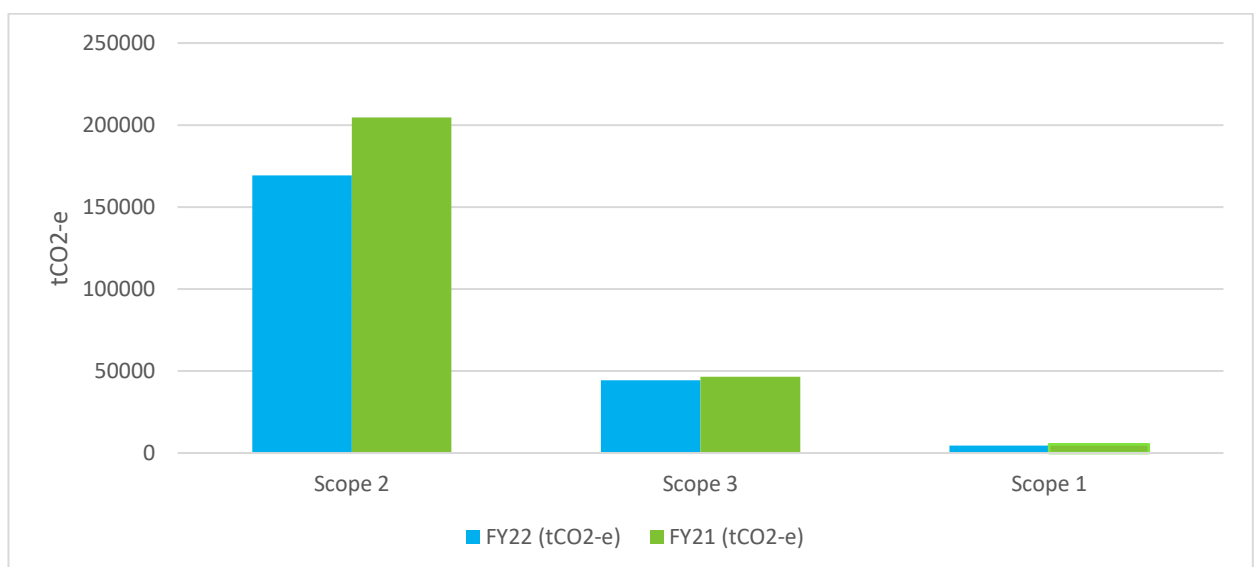


Table 3. Transpower 2021 and 2022 GHG Emissions Comparisons by Scope and Category

GHG Scope & Category	GHG Emissions Source	2022 tCO ₂ -e	2021 tCO ₂ -e
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	306	371
	SF6, and other fugitive gases	4,228	4,928
	<i>Subtotal:</i>	<i>4,534</i>	<i>5,300</i>
Total direct emissions:		4,534	5,300
Indirect emissions (Scope 2, Category 2)	Electricity use in buildings and substations	391	808
	Transmission losses	168,927	203,891
	<i>Subtotal:</i>	<i>169,318</i>	<i>204,699</i>
Indirect emissions (Scope 3, Categories 3, 4 & 6)	Purchased goods and services (grid maintenance)	8,730	7,436
	Purchased goods and services (other)	10,814	11,648
	Capital goods and construction	23,895	24,034
	Other supply chain (including business travel, employee commuting)	1,002	3,401
	<i>Subtotal:</i>	<i>44,440</i>	<i>46,519</i>
Total indirect emissions:		213,759	251,218
<u>Total gross emissions:</u>		<u>218,293</u>	<u>256,518</u>

Transpower's total operational emissions for the 2022 Financial Year reporting period is broken down by Greenhouse Gas (GHG) in Table 4, below.

Table 4. Total GHG Emissions by Greenhouse Gas

GHG Scope & Category	GHG Emissions Source	tCO ₂ -e	CO ₂	N ₂ O	CH ₄	SF ₆	HFC-32	Other
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	306	298	6	2	0	0	0
	SF ₆ , and other fugitive gases	4,228	0	0	0	4,210	17	0
Indirect emissions (Scope 2, Category 2)	Electricity (including Transmission Losses)	169,318	162,539	24	6,520	0	0	0
Indirect emissions (Scope 3, Categories 3, 4 & 6)	Purchased goods and services (grid maintenance)	8,730	0	0	0	0	0	8,730
	Purchased goods and services (other)	10,814	3,493	0	0	0	0	7,321
	Capital goods and construction	23,895	3,949	0	0	0	0	19,945
	Other supply chain (including business travel, employee commuting)	1,002	486	7	121	0	0	387
Total gross emissions:		218,293	171,766	37	6,658	4,210	17	36,383

10.1 Total Operational GHG Emissions by Category and Scope

Scope & Category 1 – Direct Emissions from Operations

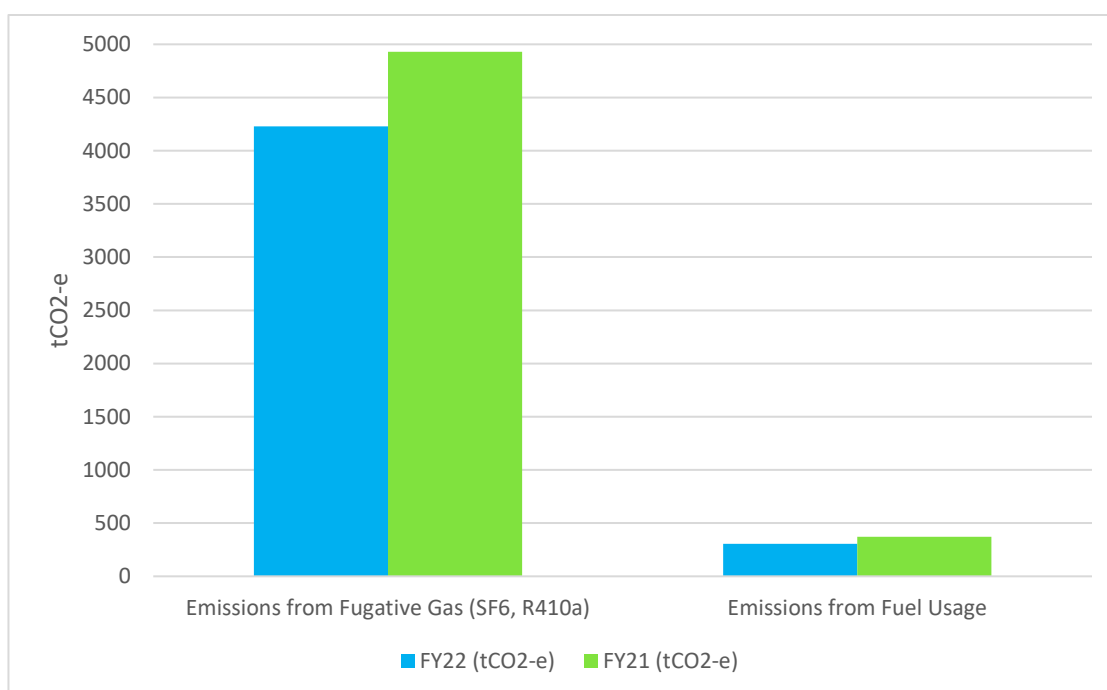
Transpower's Direct, Scope 1, emissions are shown in Figure 4 below. These direct emissions include those from Sulphur Hexafluoride (SF₆) and other gases, and fuel usage including vehicle combustion.

Transpower's SF₆ emissions decreased from 4,907 tCO₂-e reported in the 2021 Financial Year to 4,210 tCO₂-e (a decrease of 14%) in FY22.

Transpower recognises that managing emissions from SF₆ gases is an integral part of reducing our carbon footprint. Transpower's Sustainability Strategy sets out several key initiatives to manage these losses as part of our 2030 and 2050 emission reduction targets. In FY22 we successfully maintained our SF₆ losses below 0.4% of nameplate capacity across our network. Transpower has an SF₆ management strategy to align our SF₆ emissions with our 2030 emission reduction target and net zero by 2050 aspirations. Our SF₆ management strategy commits us to more accurate SF₆ handling, a proactive maintenance programme and a phased equipment upgrade programme to replace lower voltage SF₆ switchgear to drive our long-term SF₆ emissions reductions.

GHG emissions associated with Transpower fuel usage, including from fleet vehicles, were 306 tCO₂-e in FY22 (a decrease of 18% over FY21). As outlined in the Sustainability Strategy, Transpower continues our long-running work programme to switch to electric vehicles where suitable options exist. In FY22, Transpower increased the number of battery and plug in hybrid vehicles to account for 90% of the passenger vehicle fleet, up from 80% of the passenger vehicle fleet in FY21 (and 15% in FY19).

Figure 4. Transpower Scope 1 Direct GHG Emissions (tCO₂-e)



Scope & Category 2 – Indirect Emissions from Electricity Usage

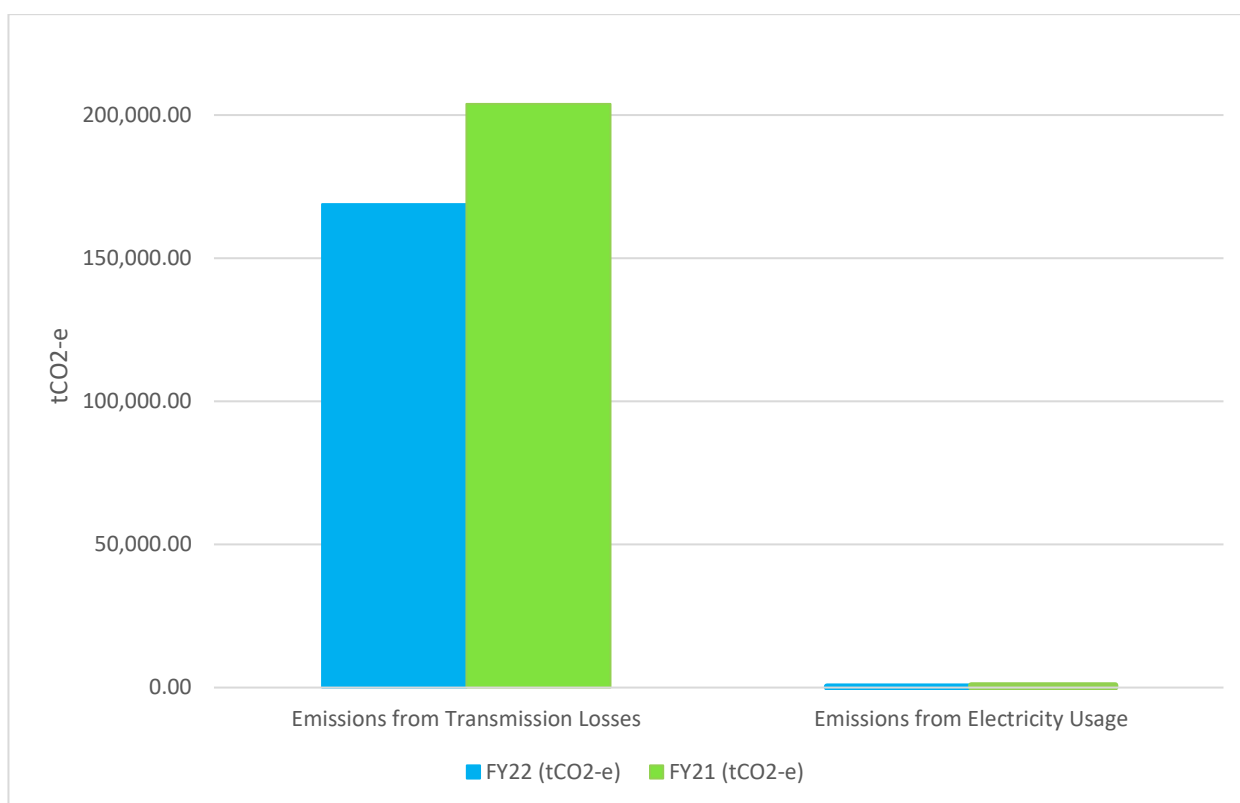
Indirect, Scope 2, GHG emissions include electricity usage in our buildings and substations, as well as Transmissions losses and are shown in Figure 5 below.

Transmission losses are a result of resistance caused by electricity passing through the National Grid transmission lines. The GHG emissions associated with the transmission losses arise from the relative carbon intensity of the electricity generation mix. For this GHG Inventory Report,

transmission losses include grid losses from the AC and DC transmission networks and substation electrical loads supplied from the National Grid. For the 2022 Financial Year, GHG emissions arising from transmission losses were estimated at 168,927 tCO₂-e (a decrease of 17% from FY21). As transmission losses are a function of the generation mix, they are largely outside of Transpower's control. However, given the scale of transmission losses across the network, Transpower will continue to monitor and report on them on behalf of the sector. As part of this commitment, Transpower has a work programme under the Sustainability Strategy seeking to better understand Transpower's role in transmission losses and prioritise our efforts in the areas where we do have control.

Emissions associated with our electricity usage in our buildings and substations decreased to less than reported in FY21. We attribute some of the decrease in our FY22 Scope 2 emissions to the reduced carbon intensity of the electricity generation mix, in response to the low hydro storage levels and subsequent increase in electricity generated from coal and gas in FY21.

Figure 5. Transpower Scope 2 Indirect GHG Emissions (tCO₂-e)



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

As shown in Figure 6 below, Transpower's Scope 3 emissions totalled 44,440 tCO₂-e for the 2022 Financial Year, a decrease of 4% compared to FY21. These indirect emissions include those associated with our purchased goods and services, capital goods and construction and other supply chain activities such as business travel, waste, and employee commuting.

As part of preparing this GHG inventory, a system error has resulted in emissions from car travel (private vehicles) not being recorded. Based on historical values (FY20 and FY21 in particular) these emissions are anticipated to be around 0.002% of total emissions. FY22 emissions from private

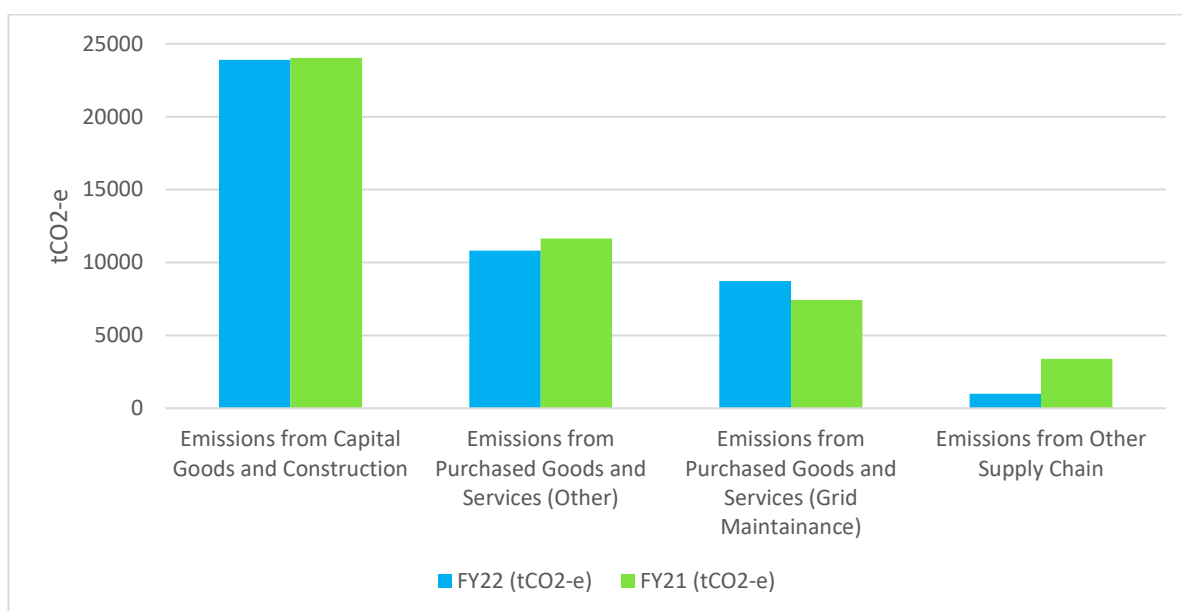
vehicles have been excluded from this report and will be recorded in future GHG emission inventory reports.

Transpower continues to work closely with our wider supply chain to better understand, report and manage our Scope 3 GHG emissions. To address this challenge, several work programmes were initiated in FY21 under our Sustainability Strategy focused on improving data capture and reducing associated Scope 3 emissions with our key Service Providers and suppliers.

As part of the Sustainability Strategy work programme, FY22 saw a continued focus to move from an estimated financial expenditure-based approach to our Scope 3 emissions to a hybrid method – capturing both actual emissions data from our Service Providers and suppliers as well as some financial expenditure-based estimated data. Due to this new reporting method and more accurate emissions factors, Transpower’s Scope 3 emissions associated with purchased goods and services, and capital goods and construction, continued the trend of decline from FY20.

As set out in the Sustainability Strategy, Transpower is committed to continue working closely with our Service Providers and suppliers to capture more accurate actual emissions data and reduce those associated emissions systematically.

Figure 6. Transpower Scope 3 Indirect GHG Emissions (tCO₂-e)



11 GHG Removals and Emissions Reductions

11.1 Greenhouse Gas Removals

A Greenhouse Gas removal is defined by ISO 14064-1:2018 as a “*withdrawal of a GHG from the atmosphere by GHG sinks*” (International Standards Organisation, 2018). Transpower undertook no formal Greenhouse Gas removals for the 2020 Financial Year reporting period.

11.2 Emissions Reductions

Transpower's emissions reduction target is to achieve a 60% reduction of direct, controllable, Scope 1 and 2 emissions by 2030, against a FY06 baseline of 8,710 tCO₂-e. This emissions reduction target excludes emissions arising from transmission losses as these are a function of the generation mix and largely outside of Transpower control.

As shown in Figure 7 and Table 5 below, in FY22, Transpower's controllable emissions totalled 4,925 tCO₂-e, a 43% decrease compared to the 2005 baseline (8,710 tCO₂-e), equating an achievement of 72% towards our reduction target during the 2022 Financial Year.

Figure 7. Transpower controllable Scope 1 and 2 GHG Emissions (tCO₂-e) for Reporting Period Compared to Base Year

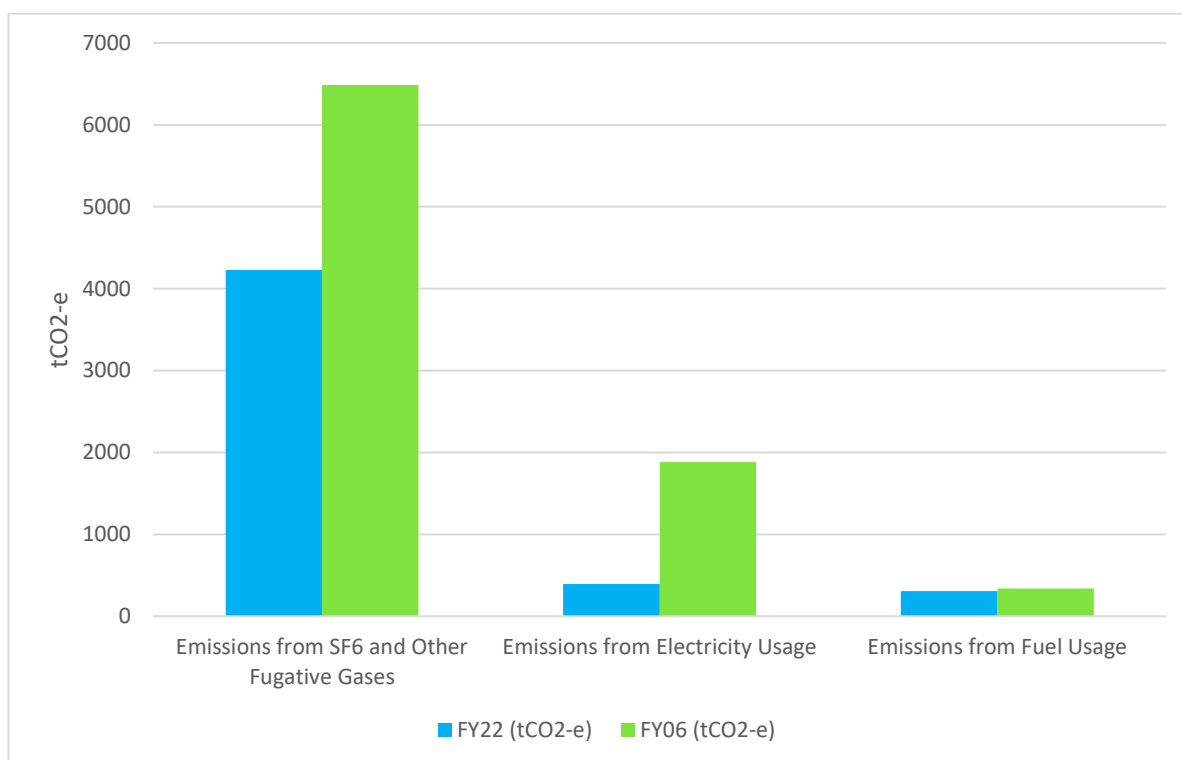


Table 5. Transpower Controllable Scope 1 and 2 GHG Emissions for Reporting Period Compared to Base Year

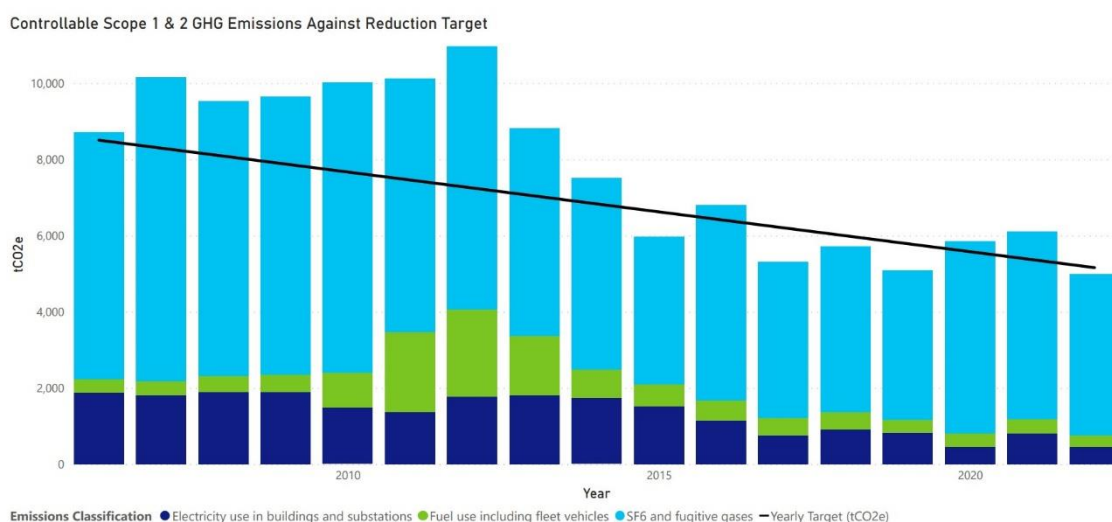
Scope	Category	2021/22 tCO ₂ -e	Base Year FY06 tCO ₂ -e
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	306	339
	SF6, and other fugitive gases	4,228	6,486

	<i>Subtotal:</i>	4,534	6,825
Indirect emissions (Scope 2, Category 2)	Electricity use in buildings and substations	391	1,885
	<i>Subtotal:</i>	91	1,885
Total emissions:		4,925	8,710

Base Year Selected

Transpower has applied the reporting period of 1 July 2005 to 30 June 2006 (FY06) as the base year for the Greenhouse Gas (GHG) Emissions Inventory. FY06 was chosen as the base year following the NZ Government ratifying the Kyoto Protocol, and the treaty coming into effect in 2005 in New Zealand. Transpower began collecting GHG data more systematically from this point and engaged an independent third party to prepare its first GHG emissions inventory for the 2006 Financial Year reporting period. Figure 8, below, summarises historical Transpower controllable Scope 1 and 2 GHG emissions from the FY06 base year to this reporting round, FY22, against the reduction target of a 60% reduction of base levels by 2030.

Figure 8. Historical Controllable Scope 1 and 2 GHG Emissions Against our Reduction Target



Changes to Historic Base Year

There have been no changes to the historic base year chosen.

12 Surrendering units under the NZ Emissions Trading Scheme

Under the New Zealand Emissions Trading Scheme (ETS), Transpower is obligated to surrender New Zealand Units (NZUs) for emissions related to fugitive SF₆. ETS reporting is by calendar year, whilst Transpower GHG emissions reporting is by financial year (1 July - 30 June). Therefore, emissions reported in this GHG Inventory Report occurring in FY2022 will be offset in our calendar year 2022 ETS return.

For the 2021 calendar year, Transpower NZ surrendered NZUs to the value of 3,510 tCO₂-e related to fugitive SF₆ gases, a 16% reduction from the 2020 calendar year.

13 GHG Emission Liabilities

As at June 2022, Transpower holds 3,382kg of SF₆ gas in storage. This SF₆ stock is held in secure depots and stores to service and maintain our existing SF₆ filled equipment and new installations of SF₆ filled equipment. Transpower's SF₆ management practices are consistent with best international management practices and standards.

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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.

Table 6. Summary of Emissions Sources and Associated Methodology

Scope & Category	Emissions Activity	GHG Emissions source	Data source	Data collection unit	Methodology data quality, uncertainty (qualitative)
Direct Scope 1 & Category 1 GHG emissions	Fugitive emissions	Fugitive SF6 emissions from substation circuit breakers and SF6 handling	Transpower SF6 inventory database	Primary Assets Engineering Team	Accurate records of operational gas holdings, top-ups, and recovery during asset decommissioning
		Fugitive refrigerant emissions from air conditioning units	Air conditioning units	Service Providers	Estimates of average leakage rates per equipment type and equipment inventory Accurate records from one Service Providers
	Vehicles	Car travel (owned, leased, rented)	GPS generated odometer readings, fuel card purchase data, rental provider activity reports	Fuel card records and expense management systems	Owned and leased vehicles. Litres of fuel used calculated from accurate records of fuel card transactions Rental vehicles start/end odometer data Emergency purchases from financial systems

	Combusted diesel	Back-up diesel generators	Operational records	Service Providers	Records of operational diesel use
	Combusted natural gas	HVAC systems	Operational records	Building landlord	Landlord provides accurate report in volume usage
Indirect Scope 2 & Category 2 GHG Emissions	Electricity transmission losses	National Grid transmission line losses	Transpower National Grid metering data	Energy Metering Services Team	Accurate net metering of National Grid inputs and outputs. A number of substations are directly fed from the National Grid and are included in this category
	Electricity consumed – offices and warehouses	Electricity used in offices and warehouses	Records from ICP billing systems	Retail providers	Accurate records from billing system
	Electricity consumed – substations	Electricity consumed in substations	Records from metering, and engineering estimates	Energy Metering Services Team, Finance and Performance Team, and Substation Engineering Team	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) 3. Accurate data from retail providers
Indirect Scope 3 (Category 3, 4 & 6) GHG Emissions	Category 3: Business travel	Air travel (domestic and international)	Travel provider reports (supplier data, internal)	Travel Management Provider	Supplier records of flights ticketed by our suppliers Outputs are calculated using the distances travelled by sector split into

			purchasing systems)		domestic, short haul and long-haul split by class of travel
		Car travel (taxis and rideshare)	Purchasing records expense management system)	Finance and Performance Team	Records of expenditure on taxis
		Car travel (private vehicles)	Odometer readings	Finance and Performance Team	Expense claims
		Hotel accommodation	Purchase records (supplier data, internal purchasing systems)	Travel Management Provider	Hotel nights provided by travel provider Categorised by country/continent: NZ, Australia, Europe, North America and Asia
	Category 3: Employee commuting	Employer travel to and from work (in private vehicles and public transport)	Estimated values	Sustainability Team	Estimated based on FY22 average office occupancy and average commuting data based on 2021 commuting survey
	Category 3: Upstream transportation and distribution	Emissions associated with upstream transport	Procurement records	Procurement Team	Estimated freight factor applied to overseas manufacturers of electrical equipment
	Category 4: Capital goods	Upstream emissions associated with National Grid assets and capital equipment purchased	Supplier data, Procurement records	Supplier/Service Providers, Procurement Team	Accurate purchasing records are categorised by activity type and emission factors assigned to generate emissions data. Some data supplied directly by suppliers/Service Providers.

	Category 4: Purchased goods and services	Upstream emissions associated with good and services	Supplier data, Procurement records	Supplier/Service Provider, Procurement Team	Accurate purchasing records are categorised by activity type and emission factors assigned to generate emissions data. Some data supplied directly by suppliers/Service Providers.
	Category 4: Waste generated in operations	Emissions associated with civil construction waste and asbestos removal	Procurement records	Procurement Team	Estimated waste factor applied to civil construction and asbestos removal
	Category 4: Waste to landfill from our sites	Emissions associated with waste disposed at landfill from our offices	Supplier data, estimated values	Waste Management Providers	Accurate disposal records obtained for some sites. Waste from remainder of sites estimated using averages based upon actual disposal records.
	Category 6: Transmission and distribution losses	Transmission and distribution losses associated with purchased electricity used in offices and substations	Records from metering, and engineering estimates	Energy metering services team, Finance and Performance Team, and substation engineering team	T&D losses applied to the purchased electricity reported in scope 2

Other GHG Emissions – Biogenic Emissions

There were no biogenic Greenhouse Gas emissions arisen in FY22 as there was no combustion of biomass in Transpower operations during this 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 emissions are not considered to be material in the context of this inventory.

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, estimated to be <i>de minimis</i>
Scope 3 Indirect emissions	Business Travel	Car travel (private vehicles)	System error occurred where a unit of measure was not identified, therefore emissions were not recorded

Appendix 3. 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 6
9.3.1 (e)	Section 8, 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 8 & 9
9.3.1 (n)	Section 9, Section 11
9.3.1 (o)	Section 7 & 9
9.3.1 (p)	Section 9
9.3.1 (q)	Section 9, Appendix 1 & 2
9.3.1 (r)	Section 1
9.3.1 (s)	Section 1
9.3.1 (t)	Section 9
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 7
9.3.2 (j)	Section 10 & 11
9.3.2 (k)	Section 10
9.3.3	Section 12

Appendix 4. EY 2021/22 Assurance Report

You can view the assurance report online [here](#).

