



TRANSPower

# Greenhouse Gas Emissions Inventory Report

Transpower NZ Ltd

**Version:** FINAL

**Inventory Period:** 1 July 2020 to 30 June 2021

**Audit Status:** Audited

**Date:** December 2021



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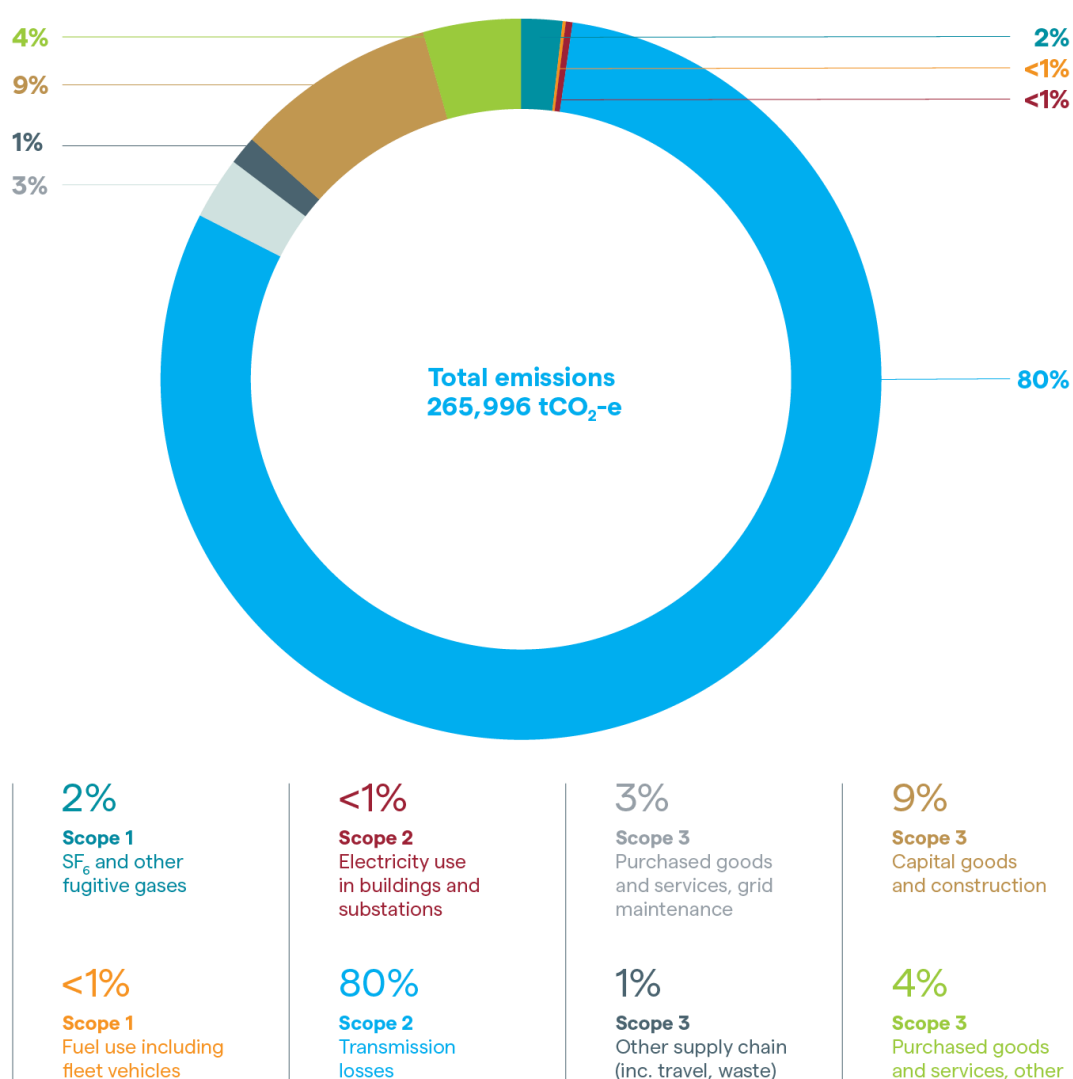
# Transpower Greenhouse Gas Emissions Inventory 2020/21

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# Greenhouse Gas Emissions Inventory Summary

Transpower's total Greenhouse Gas (GHG) emissions for the 2021 Financial Year were approximately 265,996 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>-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 2020 to 30th June 2021



**Table 1. GHG Emissions Inventory Summary for Financial Year 2021**

Scope & Category	Emissions Source	2021 tCO <sub>2</sub> -e
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	371
	SF6, and other fugitive gases	4,928
	<i>Subtotal:</i>	<i>5,300</i>
<b>Total direct emissions:</b>		<b>5,300</b>
Indirect emissions (Scope 2, Category 2)	Electricity use in buildings and substations	808
	Transmission losses	213,369
	<i>Subtotal:</i>	<i>214,177</i>
Indirect emissions (Scope 3, Categories 3, 4 & 6)	Purchased goods and services (grid maintenance)	7,436
	Purchased goods and services (other)	11,648
	Capital goods and construction	24,034
	Other supply chain (including business travel, employee commuting)	3,401
	<i>Subtotal:</i>	<i>46,519</i>
<b>Total indirect emissions:</b>		<b>260,696</b>
<b><u>Total gross emissions:</u></b>		<b><u>265,996</u></b>

# 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 2021 Financial Year (1 July 2020 – 30 June 2021), 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 for the 2020/21 reporting period.

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, 2021), 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, 2021) 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 2020 to 30 June 2021. A summary of this GHG Inventory Report has been published in Transpower's Integrated Annual Report 2020/21 (published September 2021).

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](#).

## 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:

- Environmental Team: GHG emissions inventory data collection;
- 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; 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 and *Transmission Tomorrow* (Transpower NZ Ltd, 2018) objectives. The Transpower New Zealand Ltd (Transpower) organisational structure at 30 June 2021 is shown in Figure 2.

**Figure 2. Organisational Structure of Transpower New Zealand, at 30th June 2021**



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 (tCO<sub>2</sub>-e) by Facility for Financial Year 2021**

Facility	2021 tCO <sub>2</sub> -e
Transpower New Zealand Limited	265,996
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
<b>Total gross emissions</b>	<b>265,996</b>



## 7 Information Management Procedures

During Financial Year (FY) 2020, Transpower transferred the information management of Greenhouse Gas (GHG) emissions-related data into a centralised carbon reporting software tool, BraveGen, to improve data handling, information management processes, assurance - and to increase the visibility of results for more regular management reporting and review. We have continued to utilise the BraveGen tool as a key part of the preparation of this GHG Inventory Report for the 2021 Financial Year.

The procedure for managing the Transpower GHG emissions inventory information for the FY21 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;
- Source data was reviewed by the Sustainability Team as well as the Environmental Team before being transferred into the BraveGen carbon reporting software tool;
- The GHG Inventory Report was compiled using activity source data and emission factors\*;
- GHG emission results are calculated using BraveGen;
- The 2021 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 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 *Measuring Emissions: A Guide for Organisations* (Ministry for the Environment, 2020), *Quarterly Electricity Liquid Fuel Emissions Data* (Ministry for Business, Innovation and Employment, 2020) 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 (SF<sub>6</sub>) gas into CO<sub>2</sub>-e has been sourced from the *IPCC Fifth Assessment Report* (The Intergovernmental Panel on Climate Change, 2013).
- 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, 2020).
- 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 to account for emissions arising from aircrafts at high altitude (Ministry for the Environment, 2020).

Quantities of each Greenhouse Gas are converted to tonnes of carbon dioxide equivalent (tCO<sub>2</sub>-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 (tCO<sub>2</sub>-e).

## 9.1 Changes to Approach Used Previously

Transpower's Sustainability Strategy has several initiatives to reduce and manage our Greenhouse Gas emissions. In FY21, an extensive work programme to more accurately capture actual emissions data from our suppliers and Service Providers was undertaken in order to better understand and manage our Scope 3 supply chain emissions.

To ensure a more accurate GHG Inventory Report for the 2021 financial year, Transpower updated our historical UK-based emissions factors for some Scope 3 supply chain activities to more up-to-date and NZ-specific emissions factors sourced from Motu Economic and Public Policy Research NZ (notably for activities reported in category 4, and some activities in category 3).

## 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.

## 9.3 Revisions to GHG Emissions Inventory Post Assurance Audit

On 30 September 2021, Transpower published its [Annual Integrated Report](#), available on the Transpower website. Due to the timing of the ESG reporting requirements, Transpower's Integrated Report was published using the figures from the draft, unaudited, FY21 GHG Emissions Inventory. Following the GHG Emissions Inventory assurance process (refer Appendix 4 for EY assurance report) in November 2021, Transpower has subsequently updated the Transmission Loss emissions figure in this final GHG Emissions Inventory Report to reflect the recent publishing of approved emissions from electricity generation data for Q4 2020/21 by the Ministry of Business, Innovation and Energy (MBIE). The Q4 2020/21 figure is an update to the Q3 2020/21 data Transpower applied as a proxy for the unpublished Q4 2020/21 figure - due to it being the most recent available published data - used in Transpower's unaudited GHG Emissions Inventory Report. Using this data has increased the Transmission Loss emissions figure originally stated in the an-audited GHG Emissions Inventory Report and Annual Integrated Report by 9,478 tCO<sub>2</sub>-e.

Therefore, given Transpower's statutory annual reporting requirements, note that the figures in this final GHG Emissions Inventory Report differ from the figures initially published in the Transpower Integrated Report dated 30 September 2021. The audited FY2021 figures will be restated in the FY2022 Annual Integrated Report and GHG Emissions Inventory Report.

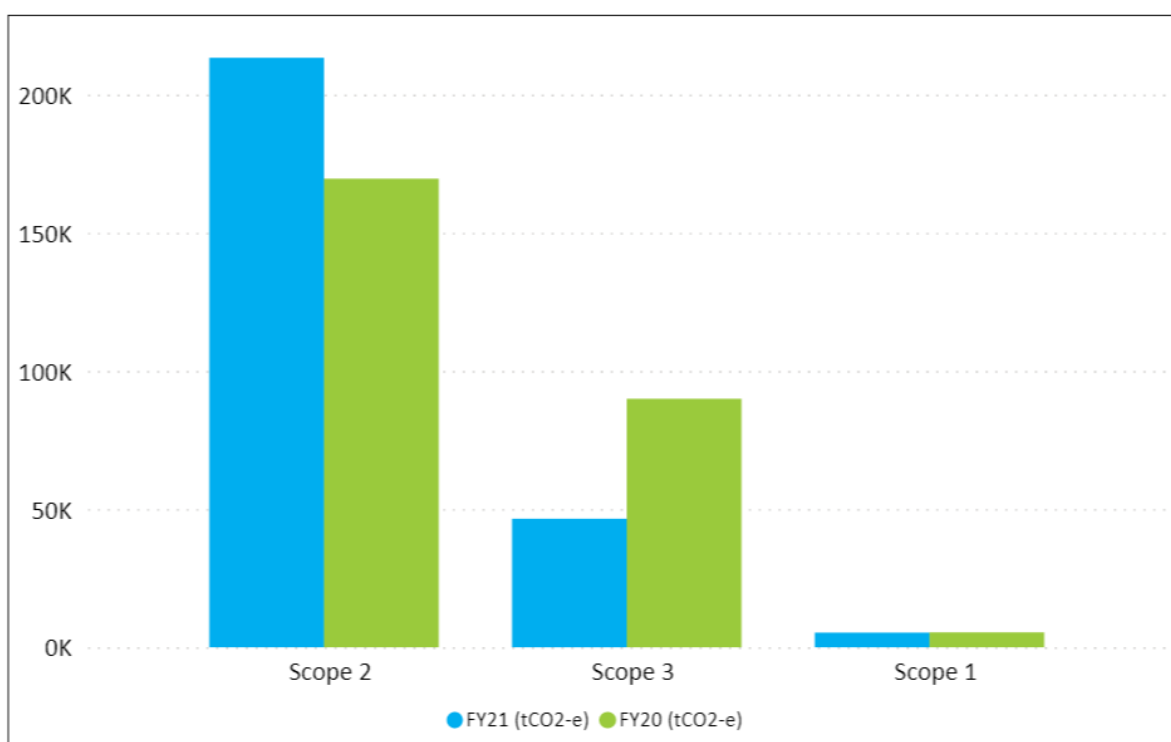
# 10 GHG Emissions Calculations and Results

Transpower's total operational emissions for the 2021 Financial Year reporting period are estimated at 265,996 tCO<sub>2</sub>-e, an increase of 1,050 tCO<sub>2</sub>-e (or <1%) from that reported for the 2020 Financial Year.

The biggest decrease in emissions between the 2021 and 2020 reporting years was seen in Scope 3 purchased goods and services, and capital goods and construction. This decrease has arisen through an improvement from an *estimated* financial expenditure-based approach for these categories in FY20 to a more accurate hybrid method of capturing *actual* emissions data from suppliers and Service Providers combined with financial-expenditure-based *estimated* data for the 2021 Financial Year.

A comparison of Transpower's total operational emissions for the 2020 and 2021 Financial Years by GHG emissions category and scope are shown in Figure 3 and Table 3 below.

**Figure 3. Transpower historical GHG emissions (tCO<sub>2</sub>-e) by GHG Scope**



**Table 3. Transpower 2020 and 2021 GHG Emissions Comparisons by Scope and Category**

GHG Scope & Category	GHG Emissions Source	2021 tCO <sub>2</sub> -e	2020 tCO <sub>2</sub> -e
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	371	355
	SF6, and other fugitive gases	4,928	5,037
	<i>Subtotal:</i>	<i>5,300</i>	<i>5,391</i>
<b>Total direct emissions:</b>		<b>5,300</b>	<b>5,391</b>

Indirect emissions (Scope 2, Category 2)	Electricity use in buildings and substations	808	448
	Transmission losses	213,369	169,161
	<i>Subtotal:</i>	<i>214,177</i>	<i>169,609</i>
Indirect emissions (Scope 3, Categories 3, 4 & 6)	Purchased goods and services (grid maintenance)	7,436	27,092
	Purchased goods and services (other)	11,648	12,124
	Capital goods and construction	24,034	49,348
	Other supply chain (including business travel, employee commuting)	3,401	1,381
	<i>Subtotal:</i>	<i>46,519</i>	<i>89,945</i>
<b>Total indirect emissions:</b>		<b>260,696</b>	<b>259,554</b>
<b><u>Total gross emissions:</u></b>		<b><u>265,996</u></b>	<b><u>264,946</u></b>

Transpower's total operational emissions for the 2021 Financial Year reporting period is broken down in more detail by different Greenhouse Gas (GHG) emissions in Table 4, below.

**Table 4. Total GHG Emissions by Greenhouse Gas**

GHG Scope & Category	GHG Emissions Source	tCO <sub>2</sub> -e	CO <sub>2</sub>	N <sub>2</sub> O	CH <sub>4</sub>	SF <sub>6</sub>	HFC- 32	Other
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	<b>371</b>	362	7	2	0	0	0
	SF <sub>6</sub> , and other fugitive gases	<b>4,928</b>	0	0	0	4,907	21	0
Indirect emissions (Scope 2, Category 2)	Electricity (including Transmission Losses)	<b>214,177</b>	205,610	30	8,267	0	0	0
Indirect emissions (Scope 3,	Purchased goods and services	<b>18,758</b>	4,755	0	0	0	0	14,003

Categories 3, 4 & 6)	Capital goods	<b>20,513</b>	2,361	0	0	0	0	18,152
	Fuel and energy related activities	<b>60</b>	55	0	2	0	0	0
	Upstream transportation and distribution	<b>3,794</b>	0	0	0	0	0	3,794
	Waste generated in operations	<b>1,534</b>	0	0	1,534	0	0	0
	Business travel	<b>734</b>	510	8	2	0	0	214
	Employee commuting	<b>1,073</b>	0	0	0	0	0	1,073
	Downstream transportation and distribution	<b>54</b>	0	0	0	0	0	54
<b>Total gross emissions</b>		<b><u>265,996</u></b>	<b>213,653</b>	<b>45</b>	<b>9,807</b>	<b>4,907</b>	<b>21</b>	<b>37,290</b>

## 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 (SF<sub>6</sub>) and other gases, and fuel usage including vehicle combustion.

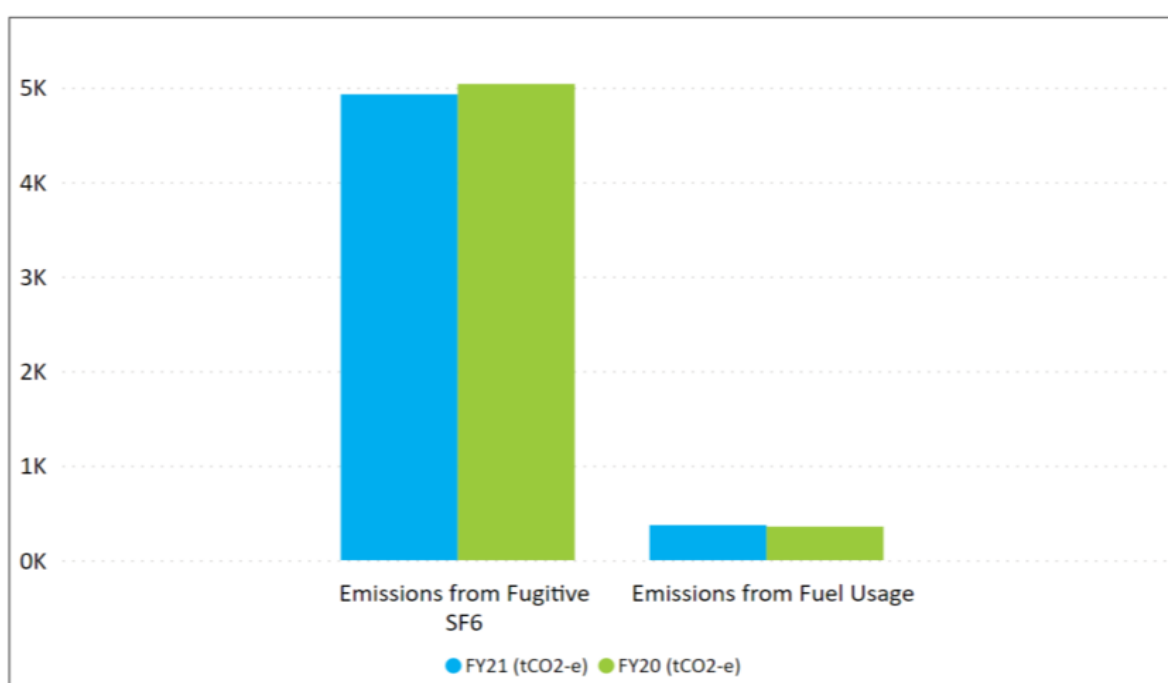
Transpower SF<sub>6</sub> emissions decreased from 5,037 tCO<sub>2</sub>-e in the 2020 Financial Year to 4,928 tCO<sub>2</sub>-e (approximately 2%) in the 2021 Financial Year.

Transpower recognises that managing emissions from SF<sub>6</sub> gases is an integral part of reducing our carbon footprint. Across our fleet of SF<sub>6</sub> containing equipment, the loss rate varies between 0-4-0.8% of the stated nameplate capacity of the SF<sub>6</sub> switchgear. Transpower's Sustainability Strategy sets out several key initiatives to manage these losses to a target of <0.8% of the installed nameplate capacity. Transpower also has a work programme underway to develop a long-term SF<sub>6</sub> reduction plan, including targeted proactive seal replacements and SF<sub>6</sub> equipment refurbishment – as well as a programme to implement practices to reduce SF<sub>6</sub> emissions that occur when handling SF<sub>6</sub> gas during equipment installation, maintenance and disposal. Transpower has also commenced deploying SF<sub>6</sub>-free alternatives where suitable opportunities exist. Whilst SF<sub>6</sub>-free alternatives are

available at lower voltage equipment, they are still under development for higher voltage applications. Transpower continues to work with our suppliers to monitor the market for SF<sub>6</sub>-free equipment.

GHG emissions associated with Transpower fuel usage, including from fleet vehicles, were 371 tCO<sub>2</sub>-e (an increase of 5% over FY20). As outlined in the Sustainability Strategy, Transpower continues our long-running work programme to switch to electric vehicles where suitable options exist. In FY21, Transpower increased the number of battery and plug in hybrid vehicles to account for 80% of the passenger vehicle fleet, up from 50% of the passenger vehicle fleet in FY20 (and 15% in FY19). Transpower is aiming to convert 100% of passenger vehicles to battery or plug in hybrids by June 2022 and will continue to explore opportunities to decarbonise our 4x4 vehicle fleet.

**Figure 4. Transpower Scope 1 Direct GHG Emissions (tCO<sub>2</sub>-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.

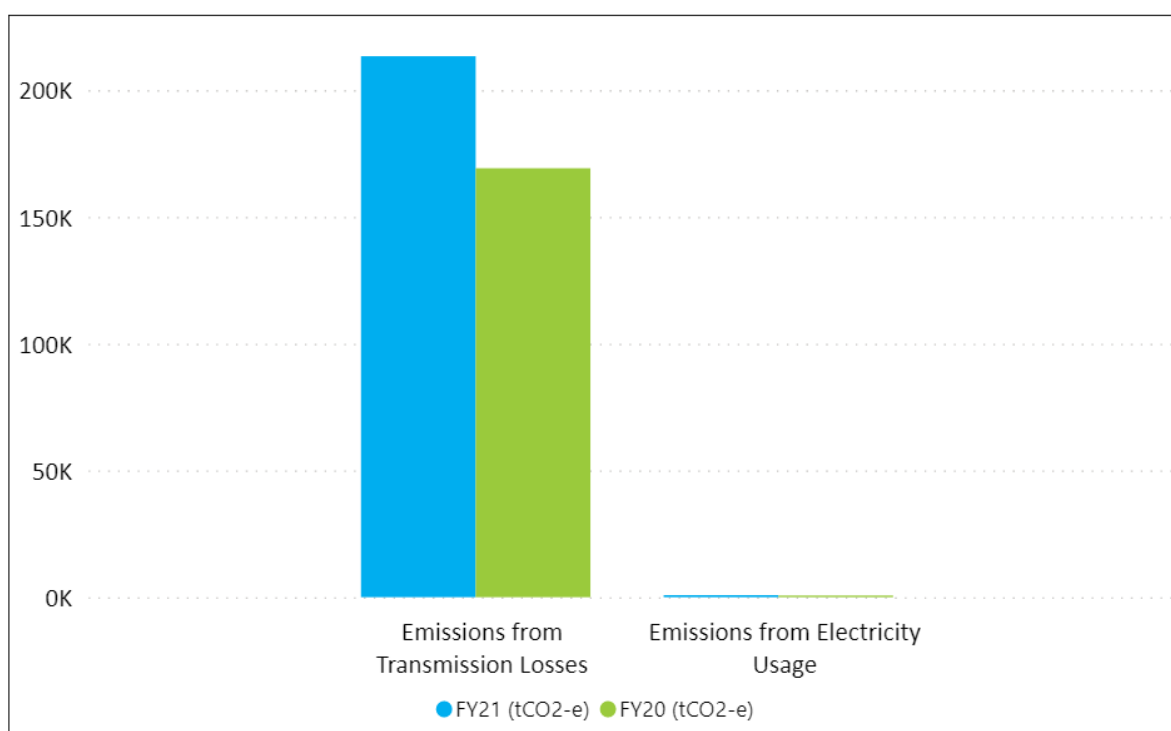
Transmission losses are a result of resistance caused by electricity passing through the National Grid transmission lines. The GHG emissions associated with the transmission losses arise from the relative carbon intensity of the electricity generation mix. For the purpose of this GHG Inventory Report, transmission losses include grid losses from the AC and DC transmission networks and substation electrical loads supplied from the National Grid. For the 2021 Financial Year, GHG emissions arising from transmission losses were estimated at 213,369 tCO<sub>2</sub>-e (an increase of 21% from FY20).

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 rose to 808 tCO<sub>2</sub>-e, an 80% increase from FY20. We attribute some of the increase in our Scope 2 emissions to the increased carbon intensity of the electricity generation mix that was seen during this reporting period, likely due to the combination of lower hydro-storage levels across New Zealand over the 2020/21 summer combined with reduced gas supply over the same period.

There have been some discrepancies identified in historical electricity usage meter readings which have seen some inconsistencies in total electricity kWh reported. Work is underway to improve the assurance process for electricity usage for the 2022 reporting year.

**Figure 5. Transpower Scope 2 Indirect GHG Emissions (tCO<sub>2</sub>-e)**



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

As shown in Figure 6 below, Transpower's Scope 3 emissions totalled 46,519 tCO<sub>2</sub>-e for the 2021 Financial Year, a decrease of 48% over FY20. 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.



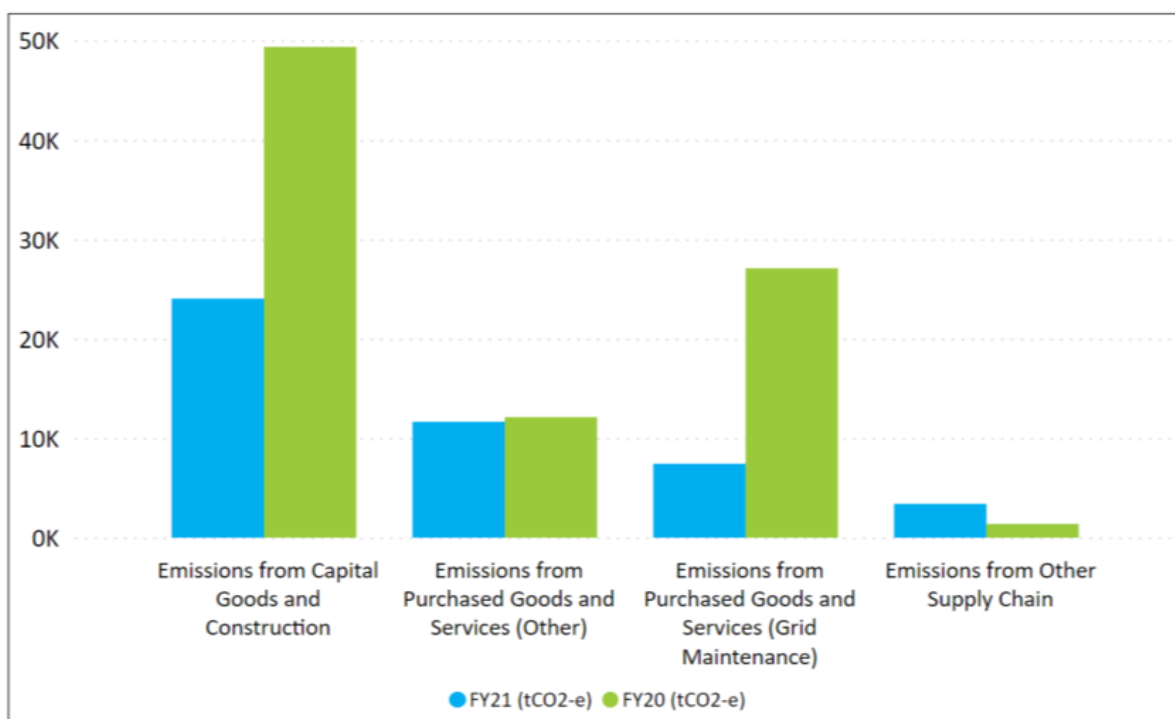
Transpower is committed to working across our wider supply chain to better understand, report and manage our Scope 3 GHG emissions. To address this challenge, we have initiated several work programmes under our Sustainability Strategy focused on improving data capture and reducing associated Scope 3 emissions with our key Service Providers and suppliers.

As part of the Sustainability Strategy work programme, over the current 2021 Financial Year reporting period, Transpower moved from using 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, decreased substantially compared to 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.

GHG emissions associated with other Scope 3 supply chain activities increased this year, primarily due to improved data collection processes for our office waste as well as updated and more accurate Transpower employee commuting information and emissions factors.

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



# 11 GHG Removals and Emissions Reductions

## 11.1 Greenhouse Gas Removals

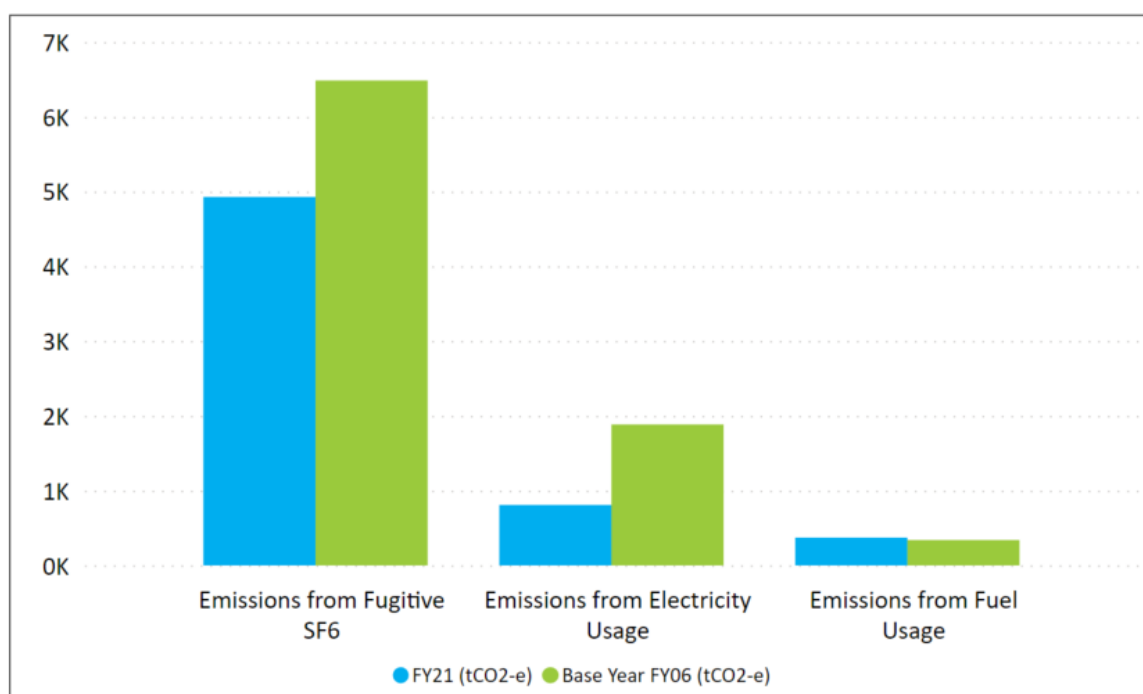
A Greenhouse Gas removal is defined by ISO 14064-1:2018 as a “*withdrawal of a GHG from the atmosphere by GHG sinks*” (International Standards Organisation, 2018). Transpower undertook no formal Greenhouse Gas removals for the 2020 Financial Year reporting period.

## 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 2005/06 reporting period (FY06) baseline of 8,710 tCO<sub>2</sub>-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 FY21, Transpower’s controllable emissions totalled 6,108 tCO<sub>2</sub>-e, a 30% decrease compared to the FY06 baseline (8,710 tCO<sub>2</sub>-e), equating an achievement of 50% towards our reduction target during this financial year.

**Figure 7. Transpower controllable Scope 1 and 2 GHG Emissions (tCO<sub>2</sub>-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**

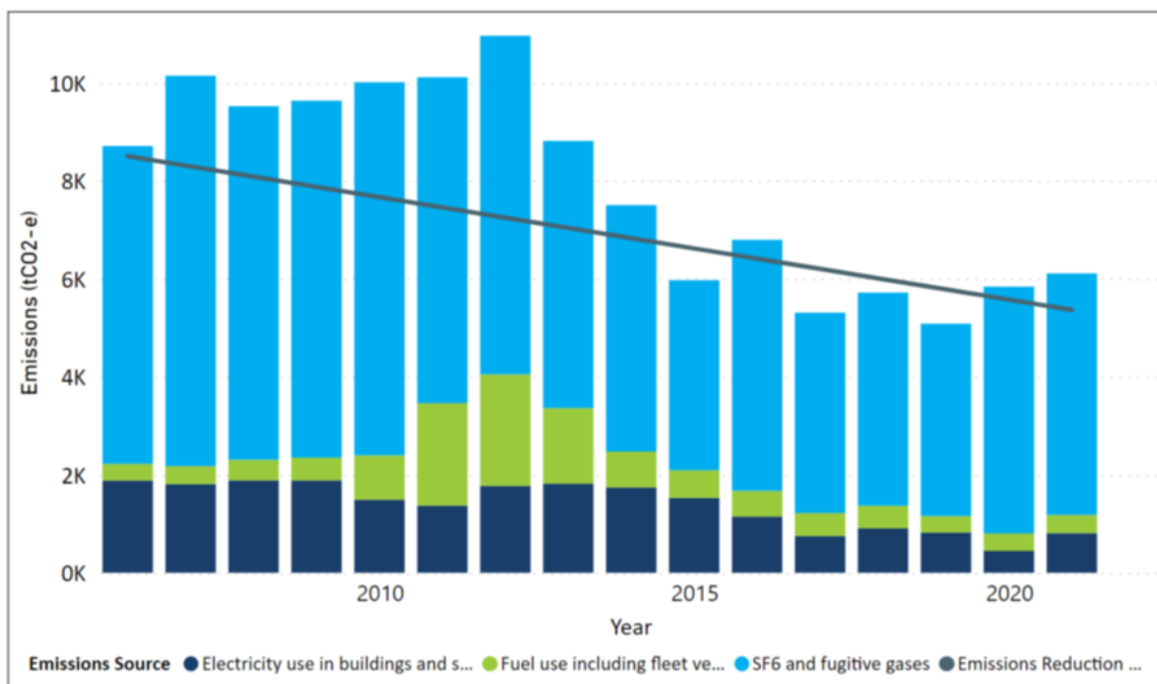
Scope	Category	2020/21 tCO <sub>2</sub> -e	Base Year 2005/06 tCO <sub>2</sub> -e
Direct emissions (Scope 1, Category 1)	Fuel use including fleet vehicles	371	339
	SF6, and other fugitive gases	4,928	6,486
	<i>Subtotal:</i>	<i>5,300</i>	<i>6,825</i>
Indirect emissions (Scope 2, Category 2)	Electricity use in buildings and substations	808	1,885
	<i>Subtotal:</i>	<i>808</i>	<i>1,885</i>
<b>Total emissions:</b>		<b>6,108</b>	<b>8,710</b>

### 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, FY21, 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 GHG Emission Offsets

Under the New Zealand Emissions Trading Scheme (NZETS), Transpower is obligated to surrender New Zealand Units (NZUs) for emissions related to fugitive SF<sub>6</sub>. NZETS 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 2021 will be offset in our 2021 NZETS return.

For the 2020 calendar year, Transpower NZ surrendered NZUs to the value of 4,158 tCO<sub>2</sub>-e related to fugitive SF<sub>6</sub> gases.

## 13 GHG Emission Liabilities

As at June 2021, Transpower holds 3,436kg of SF<sub>6</sub> gas in storage. This SF<sub>6</sub> stock is held in secure depots and stores to service and maintain our existing SF<sub>6</sub> filled equipment and new installations of SF<sub>6</sub> filled equipment. Transpower's SF<sub>6</sub> 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 SF <sub>6</sub> emissions from substation circuit breakers and SF <sub>6</sub> handling	Transpower SF <sub>6</sub> 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 site headcount 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 FY21 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>

## 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 2020/21 Assurance Report



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### Independent Limited Assurance Statement to the Management and Directors of Transpower New Zealand Limited

#### Assurance Conclusion

Ernst & Young ("EY", "we") was engaged by Transpower New Zealand Limited ("Transpower") to undertake limited assurance as defined by the International Standards on Assurance Engagements (New Zealand) 3000, over Transpower's voluntary greenhouse gas emissions inventory ("GHG inventory") disclosures (including scope 1, scope 2 and certain scope 3 emissions from business travel, office waste and use of sold products) for the year ended 30 June 2021. Based on our limited assurance procedures, nothing came to our attention that caused us to believe that Transpower's GHG inventory for the year ended 30 June 2021 disclosed in the Transpower 2020-2021 Greenhouse Gas Emissions Inventory report, has not been prepared and presented fairly, in all material respects, in accordance with the Criteria defined below.

#### What our review covered

The subject matter and criteria covered by our assurance procedures are detailed in the table below.

Subject Matter	Criteria
Transpower's total greenhouse gas emissions inventory (including scope 1, scope 2 and certain scope 3 emissions from business travel, office waste and use of sold products) for the year ended 30 June 2021, disclosed in Transpower's 2020-21 Greenhouse Gas Emissions Inventory Report.	Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, with emissions factors from: <ul style="list-style-type: none"> <li>New Zealand Ministry for the Environment's guidance for Voluntary Corporate Greenhouse Gas Reporting</li> <li>IPCC (2013) Fifth Assessment Report: Climate Change</li> <li>UK DEFRA (2018) Conversion factors for Company Reporting</li> <li>Motu (2014) New Zealand: A Preliminary Consumption-Based Analysis</li> </ul>

#### Reviewed GHG inventory

Total scope 1, 2, and certain 3 emissions (tCO <sub>2</sub> e)	265,996
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#### Key responsibilities

##### EY's responsibility and independence

Our responsibility was to express a conclusion on Transpower's voluntary GHG inventory disclosure for the year ended 30 June 2021 based on our review. We have complied with the relevant ethical requirements relating to assurance engagements, which include independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour.

In accordance with the Professional and Ethical Standard (PES) 3 (Amended), Ernst & Young Limited maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

##### Transpower's responsibility

Transpower management ("management") was responsible for selecting the Criteria and preparing and fairly presenting the GHG inventory for the year ended 30 June 2021 in accordance with that Criteria. This responsibility includes establishing and maintaining internal controls, adequate records and making estimates that are reasonable in the circumstances.

##### Our approach to conducting the engagement

We conducted this review in accordance with the International Standard on Assurance Engagements ISAE (NZ) 3000: Assurance Engagements Other than Audits and Reviews of Historical Financial Information and ISAE (NZ) 3410: Assurance Engagements on Greenhouse Gas Statements and the terms of reference for this engagement as agreed with Transpower on 21 September 2021

##### Summary of procedures performed

A member firm of Ernst & Young Global Limited

A limited assurance engagement consists of making enquiries and applying analytical, appropriate testing, and other evidence-gathering procedures. Our procedures included, but were not limited to:

- ▶ Conducting interviews with personnel to understand the business and reporting process
- ▶ Checking that the flow of information from site metering or monitoring through to calculation spreadsheets is accurate
- ▶ Identifying and testing assumptions supporting the calculations
- ▶ Comparing year-on-year activities-based greenhouse gas and energy data, where possible
- ▶ Checking organisational and operational boundaries to test completeness of greenhouse gas emissions sources
- ▶ Tests of calculation and aggregation
- ▶ Checking that emissions factors and methodologies have been correctly applied as per the criteria
- ▶ Reviewing the appropriateness of the presentation of disclosures.
- ▶ Seeking management representation on key assertions

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

#### Limited Assurance

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.

While we considered the effectiveness of management's internal controls when determining the nature and extent of our procedures, our assurance engagement was not designed to provide assurance on internal controls. Our procedures did not include testing controls or performing procedures relating to checking aggregation or calculation of data within IT systems.

#### Use of our Assurance Statement

We disclaim any assumption of responsibility for any reliance on this assurance report to any persons other than Management and the Directors of Transpower or for any purpose other than that for which it was prepared.

Ernst & Young Limited  
Pip Best, Partner – Climate Change and Sustainability  
Services  
New Zealand  
23rd December 2021

