

Powerco Greenhouse gas emissions inventory report

Greenhouse gas emissions inventory report

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Executive summary

As one of Aotearoa New Zealand's largest electricity and gas distributors, we play a critical role in enabling our customers' transition to a sustainable and low-carbon energy future. Our biggest contribution to New Zealand's net-zero ambition, by a significant margin, is by enabling decarbonisation through electrification, and by preparing our gas network for emerging technologies and low carbon alternatives.

As well as helping our customers to decarbonise, Powerco is also committed to making sustainable choices in our own operations, as detailed in our [Climate Change Policy](#). By measuring and publicly disclosing our annual greenhouse gas (GHG) inventory, we will ensure we are accountable for the emissions that relate to our business operations.

This GHG inventory report covers the financial year ending 31 March 2024 (FY24).

As detailed in our report, our overall emissions have decreased compared to both FY23 and our base year. A significant contributor to this overall reduction is the decarbonisation of the electricity national grid. Our emissions sources that are influenced by this have benefited from the lower emission factor used in our FY24 calculations, which is a reflection of the decarbonisation of New Zealand's electricity grid. These include our scope 2 electricity line losses; the electricity used in our offices, substations and communication sites; and the scope 3 electricity used in our leased depots.

There are many areas where we are encouraged by the progress our actions have had on our emissions reductions during FY24. These include the ongoing implementation of our vehicle fleet decarbonisation programme, our electricity reduction plan, and our focus on business travel.

Two sources of our emissions that increased during FY24 were our stationary combustion and our SF₆ emissions. One factor in our stationary combustion was the increase in temporary rental generation because of more underground cable faults (compared to FY23). Diesel generation is usually considered for power supply when other options are not available. To help mitigate these emissions in the future, during FY24 we purchased four battery hybrid generators to deploy to these types of fault repairs in FY25. We are also reviewing our fault management standard to help gain efficiencies. Another factor is our recent changes to processes for keeping the power flowing to certain customers. When an early childcare centre, primary or secondary school experiences a temporary planned outage on Powerco's network, and other practical outage mitigation options are not available, we consider a diesel generator for power supply.

A third of our SF₆ emissions during FY24 were the result of two network assets suffering complete gas loss. We are working with the equipment supplier to understand the failure mode, as well as finding a viable alternative to our current SF₆ based equipment.

Table 1 below contains a high-level summary of our emissions for FY24. A more detailed breakdown can be found in Table 5.

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Table 1. GHG emissions by scope

Scope	FY24	FY23	Base year FY21	Variance	
	tCO ₂ e	tCO ₂ e	tCO ₂ e	tCO ₂ e	%
1	7,467.09	7,609.64	7,927.87	-460.78	-5.81
2	20,352.92	32,272.08	28,185.58	-7,832.66	-27.79
3	85,306.07	81,611.93	79,786.96	5,519.11	6.92
Total	113,126.08	121,493.65	115,900.41	-2,774.33	-2.39

FY24 in summary

- Our total reported emissions for FY24 decreased by 2.39% compared with the FY21 base year.
- Scope 1 emissions continued to decline in FY24, mainly driven by a decrease in our gas fugitive losses because of a decrease in natural gas supplied. Mobile combustion emissions were also lower than FY23 because of positive changes in fleet composition with fewer vehicles, fewer diesel and hybrid vehicles, and a small increase in EVs. Disappointingly, SF₆ losses were higher due to two pieces of equipment being fully degassed to the atmosphere, and stationary combustion increased due to increased use of generation to enable our focus on customer resilience when unplanned faults occur.
- Scope 2 emissions were significantly lower. This was largely because of a decreased electricity grid emissions factor for FY24. That said, a proactive programme to reduce electricity use has resulted in reductions in electricity consumption in our offices.
- Scope 3 emissions data is largely based on spend, using averaged emissions factors based on industry type. FY24 had a higher spend and has resulted in increased reported emissions. Positive results were seen in our travel emissions through a halt in the upward trend in business travel since COVID-19.

Introduction

This disclosure

This Inventory Report is a complete and accurate account of the GHG emissions that result from Powerco's operations within the declared boundary and scope for the reporting period and utilising all practically available sources of data.¹

Powerco's reporting processes and emissions categorisation is consistent with international protocols and standards and has been prepared in accordance with:

- Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard Revised Edition (2004).
- Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011).
- Global Reporting Index (GRI) - GRI 2 General Disclosures (2021); 305: Emissions (2016).
- ISO14064-1:2018.

This is our fifth public GHG emissions disclosure and relates to the year ended 31 March 2024.

¹ Contact person for GHG is the Sustainability Strategic Lead email: Corporate.sustainability@powerco.co.nz

Powerco Greenhouse gas emissions inventory report

Intended uses and audiences of the report

This report is intended to advise the stakeholders of Powerco on our GHG inventory for the reporting period FY24, along with the steps and measures taken by us to reduce the greenhouse gas emissions associated with our activities.

Stakeholders include shareholders, investors, regulators, customers and communities who we supply energy to, and employees, contractors and members of the public.

Scope and boundaries

Organisational boundary

The organisational boundary determines the parameters for GHG reporting and ensures a consistent approach is applied when assessing which factors to include. Powerco applies the operational control consolidation approach. This means we aggregate the emissions from Powerco Limited and its subsidiary companies to a single Powerco value.

Powerco's operations are conducted out of nine locations throughout New Plymouth, Whanganui, Palmerston North, Wellington, Tauranga, Masterton and Te Aroha. The Junction Street premises in New Plymouth is our registered office.

Powerco's operational control starts at grid exit points and gas gate stations, where energy is transferred to our networks from Transpower New Zealand and Firstgas and finishes at the point where the energy reaches our customers².

Our operational control includes additional off-site locations and all operational activities undertaken by Powerco. These activities include:

- Powerco owned transmission, subtransmission, distribution and service cables and lines, zone substations, distribution transformers and associated network equipment.
- Powerco owned gas pipes, valves, district regulator stations and associated network equipment.
- Administrative activities within the areas occupied by Powerco at each office location.
- The operations of subsidiary companies Base Power Ltd and Powerco Transmission Services Ltd.

Operational boundary

The GHG emission sources from the Powerco value chain were identified with reference to the methodology described in the GHG Protocol and the GRI 305 Standards. These have been classified as follows.

Scope 1 - Direct GHG emissions that are operationally controlled by Powerco including:

- Stationary combustion emissions relating to direct consumption of natural gas and non-biogenic fuels in generators.
- Mobile consumption emissions relating to non-biogenic fuels.

² For the electricity network, this is the pillar box or fuse before the service cable or line that enters the property boundary. For the gas network, this includes the service pipe and may or may not include the gas meter.

Powerco Greenhouse gas emissions inventory report

Fugitive emissions including sulphur hexafluoride (SF₆) in relation to our electricity network, and carbon dioxide (CO₂) and methane (CH₄) in relation to our gas network and refrigerant losses (HFCs) in our offices and facilities.

Scope 2 - Indirect GHG emissions from imported energy:

- This includes the GHG emissions from distribution network line losses and purchased electricity consumed by Powerco.

Scope 3 - Other indirect GHG emissions not included in Scope 1 or 2 that occur in Powerco's value chain. These have been further categorised as:

- GHG Protocol Category 1 - Purchased goods and services
- GHG Protocol Category 5 - Waste
- GHG Protocol Category 6 - Business travel
- GHG Protocol Category 7 - Employee commuting and working from home
- GHG Protocol Category 9 - Downstream transportation and distribution
- GHG Protocol Category 13 - Downstream leased assets

A full list of exclusions and reasoning is included in Table 4.

Information management procedures

Powerco's GHG inventory reporting guidelines were first developed in 2015 and last revised in March 2024. This document details the measurement and reporting requirements for Powerco Limited with the objective of assessing and measuring the greenhouse gas emissions associated with Powerco's activities.

Powerco has developed and maintains GHG information management processes that: ensure conformance with the principles of the GHG Protocol and of ISO 14064-1:2018; provide routine and consistent reviews to ensure completeness and accuracy; ensure consistency with the intended use of the GHG inventory; manage and store documentation in a controlled and accessible manner; and identify and address omissions and errors.

Powerco's key GHG information management procedures are:

- Source data is collected directly from third party suppliers or from Powerco's financial and asset management systems.
- The data is stored in the Bravegen software database and reviewed by the Environment and Sustainability Team.
- Emissions factors and conversion factors in Bravegen are maintained by Bravegen.
- The GHG inventory is compiled using activity data and emission factors.
- The report is independently audited by Toitu Environcare.
- The report is reviewed to identify opportunities to improve the information management process.
- Senior management and all employees are kept informed of emissions reduction progress via internal dashboards and reporting.

Powerco Greenhouse gas emissions inventory report

Methodology

GHG emissions across scopes 1, 2, and 3 are calculated using a bottom-up approach where outputs from our activities are converted to a CO₂e value using an appropriate emission factor.

Emission factors

Table 2: Emission factors applied to our emission sources.

Scope	GHG Protocol category	Emission source	Emission factor	Reference
1	Stationary combustion	Purchased gas	0.194 kgCO ₂ e /kWh	NZ Ministry for the Environment (MfE) 2023
		Generators - diesel	2.69 kgCO ₂ e /L	
	Mobile combustion	Petrol	2.46 kgCO ₂ e /L	
		Diesel	2.71 kgCO ₂ e /L	
	Fugitive emissions	SF ₆	GWP = 23,500	EPA – Emissions Trading Scheme
		Gas network pipeline losses	GWP CH ₄ = 28 GWP CO ₂ = 1	Modified NGER Scheme Method 1 – see Appendix A
Refrigerants		GWP = varies	NZ Ministry for the Environment 2023	
2	Electricity	Electricity network line losses	0.074 kgCO ₂ e / kWh	NZ Ministry for the Environment 2023
		Purchased electricity	0.074 kgCO ₂ e / kWh	
3	Purchased goods and services including capital goods and transport	Contractor stationary combustion - Diesel	2.69 kgCO ₂ e /L	NZ Ministry for the Environment 2023
		Contractor stationary combustion - Petrol	2.10 kgCO ₂ e /L	UK Department for Business, Energy & Industry Strategy 2021
		Contractor stationary combustion - LPG	2.97 kg/CO ₂ e/kg	NZ Ministry for the Environment 2023
		Contractor mobile combustion	Petrol 2.46 kgCO ₂ e /L 0.251 kgCO ₂ e /km	
			Diesel 2.69 kgCO ₂ e /L 0.268 kgCO ₂ e /km	
Services	Varies kgCO ₂ e/ Spend NZD	Most applicable factors from M.E		

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Scope	GHG Protocol category	Emission source	Emission factor	Reference
		Purchased products	Varies kgCO ₂ e/ Spend NZD	Research Consumption Emission Modelling Report - prepared for Auckland Council March 2023
		Base Power units (stationary combustion of diesel)	2.69 kgCO ₂ e/ L	NZ Ministry for the Environment 2023
	Waste	Composting	1.75 kgCO ₂ e /kg	NZ Ministry for the Environment 2023 (excluding waste recycling which uses a DEFRA 2023 emissions factor)
		Waste to landfill (general)	0.72 kgCO ₂ e /kg	
		Waste recycling (mixed)	0.65 kgCO ₂ e /kg	
		Waste oil from transformers	2.98 kgCO ₂ e/ L	
	Business travel	Rental cars	0.238 kgCO ₂ e /L	
		- large diesel	0.231 kgCO ₂ e/L	
		- large petrol	0.200 kgCO ₂ e/L	
		- medium petrol	0.176 kgCO ₂ e/L	
Petrol hybrid medium		0.0170kgCO ₂ e/ kWh		
Electric				
	Taxis	0.0514 kgCO ₂ e /\$ (incl gst)		
	Flights (domestic, international short-haul and long-haul with radiative forcing and aircraft size)	Domestic 0.180 kgCO ₂ e / km 0.239 kgCO ₂ e / km 0.306 kgCO ₂ e / km Short haul 0.151 kgCO ₂ e / km 0.227 kgCO ₂ e / km Long haul 0.148 kgCO ₂ e / km 0.237 kgCO ₂ e / km 0.429 kgCO ₂ e / km		
	Accommodation (domestic, Australia, Canada, United States)	9.4 kgCO ₂ / night 38.9 kgCO ₂ / night 17.1 tCO ₂ e / night 19.8 kgCO ₂ / night		

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Scope	GHG Protocol category	Emission source	Emission factor	Reference
	Employee commuting	Travel to and from work in private vehicles (diesel, electric, petrol, hybrid, motorbike) and public transport (bus, rail)	0.272 kgCO ₂ / km 0.020 kgCO ₂ / km 0.252 kgCO ₂ / km 0.198 kgCO ₂ / km 0.121 kgCO ₂ / km 0.155 kgCO ₂ / km 0.019 kgCO ₂ / km	
		Working from home	0.799 kgCO ₂ / day	
	Downstream transportation and distribution	Road freight of scrap metals and plastics	0.135 kgCO ₂ / tkm	
	Downstream leased assets	Powerco owned leased depots purchased electricity	0.074 kgCO ₂ e/ kWh	

Reporting period and base year

The current reporting period is the financial year ended 31 March 2024 (FY24). The base year is the year ended 31 March 2021 (FY21).

FY21 was selected as the base year due to the availability of data and similarity of scope with our ongoing emissions. This definition will be reassessed if:

- We significantly change the scope of what we are measuring within our value chain.
- We buy or sell a company.
- Emission factors change significantly and affect previous years, eg if the science behind the emissions factor is revised.
- On discovery of an error or cumulative errors that could be collectively significant.

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Data collection and review process

Data for this report is collected by Powerco's Sustainability Analyst and uploaded into Bravegen³. The calculations and methodologies are reviewed by the Sustainability Strategic Lead and this report is approved for publication by the General Manager Corporate Services.

The data collection and review process are outlined in Table 3.

Bravegen software uses a calculation methodology for quantifying the GHG emissions inventory using emissions source activity data multiplied by the GHG emissions factors.

For calculation of SF₆ and refrigerant emissions, quantities are converted to tonnes of CO₂e using the global warming potential from the Intergovernmental Panel on Climate Change (IPCC) 2007 Assessment report 5 – AR5.

Data quality of reported emissions

In total, 17 sources of data are obtained from supplier invoices or reports and six from internal business units. Most data sources (n=21) are based on usage/quantities, while two scope 3 data sources (taxi and purchased goods and services) are spend based.

For scope 1 and 2 emissions, 29% of the data sources are internal and 71% are calculated using data obtained from suppliers or other value chain partners.

For scope 3 emissions, 79% of data sources are calculated using data obtained from suppliers or other value chain partners.

There are limitations to some data sources, specifically:

- Electricity line losses are based on a draft figure for electricity throughput and subsequent losses in order to publish this report in a timelier manner. We estimate the final audited figure could vary by up to 1.7%. Previous GHG Inventory Reports have been based on an audited figure for line losses.
- Electricity Transmission and Distribution (T&D) losses for energy delivered to ICPs – unmetered loads such as streetlights are estimated.
- Gas fugitive emissions are based in part on a percentage of gas gate volumes and averaged methane content, and not actual measured fugitive losses.
- There are uncertainties and estimations used to calculate employee commuting, such as averaging of travel range bands.
- Only tier 1 contractors' fuel emissions are calculated from actual usage. The remainder is accounted for in purchased goods and services.
- Stationary combustion figures for one of our major contractors uses three years of data averaged.
- LPG quantities have been estimated based on a minimum of one BBQ bottle.
- A spend based methodology has been used to calculate emissions for scope 3 category 1 – purchased goods and services, using the most applicable emissions factors from a locally sourced consumption emissions modelling report.
- Refrigerant emissions are based on a default leakage rate from MfE guidelines, average total holdings and deduced refrigerant types.

³ Bravegen is a New Zealand owned and operated, carbon accounting 'software as a service' system.

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Summary of emission source inclusions

Table 3: Data collection and review process

Scope	GHG category	ISO category	Emission source	Data	Data source
1	Stationary combustion	1: Direct emission and removals	Purchased gas	Gas usage (kWh)	External invoices
			BBQ bottle LPG	Estimated one bottle per year	Estimate based on less than one bottle used
			Diesel	Fuel usage (litres)	External generator hire and servicing contractors
	Mobile combustion	1	Petrol, diesel	Fuel usage (litres)	Automated report from external fuel supplier
	Fugitive emissions	1	SF ₆	Identified equipment and quantity ⁴	Internal report based on external equipment maintenance service provider (based on calendar year, rather than FY)
			Gas network pipeline losses	Refer appendix A	Internally reported gas gate volumes, used for Powerco's information disclosure for gas distribution ⁵
			Refrigerants	Leakage quantities	An inventory of equipment located in our offices, substations and communications sites

⁴ Calculated consistent with those specified by the Environmental Protection Authority (EPA) in the Climate Change Response Act Regulations accounting for losses of SF₆ gas to atmosphere and the corresponding tCO_{2e}.

⁵ See schedule 8(i) in the disclosures here <https://www.powerco.co.nz/who-we-are/pricing-and-disclosures/gas-disclosures>

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Scope	GHG category	ISO category	Emission source	Data	Data source
2	Electricity	2: Indirect emissions from imported energy	Electricity network lines losses	Electricity losses (GWh)	Average of three years of Powerco's audited electricity information disclosures ⁶
		2	Purchased electricity	Electricity usage (kWh)	Automated reports from electricity retailer
3	Purchased goods and services including capital goods and upstream transportation and distribution	4: Indirect emissions from products used by organisation	Capital goods and upstream transportation and distribution, etc.	Cost in \$NZD including GST	Internal Powerco financial spend data - SAP
		4	Petrol, diesel (stationary combustion)	Fuel usage (litres)	External report from tier one contractors
		4	LPG (stationary combustion)	Fuel usage (kg)	External report from tier one contractors
		4	Contractor fuel (operational maintenance and construction, petrol and diesel (mobile))	Distance travelled (km) and/or fuel (litres)	External report from tier one contractors
		4	Customer use of diesel in Powerco owned Base Power units	Fuel usage (litres)	Internal report from maintenance contractors
	Waste	4	Waste to landfill from offices	Waste to landfill and recyclables (tonnes)	External report from waste management company and external waste audits
		4	Waste oil from transformers	Fuel recovered (L)	External report from oil recovery company

⁶ See schedule 9e(ii) in the disclosures here <https://www.powerco.co.nz/who-we-are/pricing-and-disclosures/electricity-disclosures>

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Scope	GHG category	ISO category	Emission source	Data	Data source
	Business travel	3: Indirect emissions from transportation	Rental cars (petrol, diesel)	Distance travelled (km)	External report from rental agency
		3	Taxis	Financial cost including GST	Internal report from staff coding
		3	Flights (domestic, international short haul and long haul)	Distance between departure and arrival airports (km)	External report from travel provider
		3	Accommodation	Number of nights stayed	External report from travel provider
	Employee commuting	3	Travel to and from work (in private vehicles and public transport)	Distance to work per employee is pro-rated across Powerco's total FTEs (km)	Internal employee commute survey
		3	Working from home	Number of days	Internal employee commute survey
	Downstream transportation and distribution	3	Road freight	Distance travelled (km) per tonne	External report from scrap metal company
	Downstream leased assets	4	Depots leased to contractors	Purchased electricity	External report from contractor

Exclusions

The following data is currently excluded from the FY24 GHG Inventory Report:

Table 4: GHG emissions excluded from the FY24 GHG Inventory

Scope	GHG category	ISO category	Subcategory	Reasons for exclusion
Scope 3	Waste	4: Indirect emissions from products used by organisation	Construction and waste related to construction	Data not available
		4	Waste associated with the disposal of network equipment	Data not available, other than waste oil and the freight associated with scrap metal and PVC

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Scope	GHG category	ISO category	Subcategory	Reasons for exclusion
		4	Office waste from Whanganui, Masterton and Te Aroha locations	Data not available, small offices > 10 people
		4	Office waste from Wellington location	Due to shared office buildings, data not currently available, except for recycling for the Wellington office.
	Transmission and distribution losses	4		Powerco has not reported transmission and distribution losses for gas and electricity consumed separately, as the full distribution losses for the entire network are reported in scope 1 and scope 2.
	Water and wastewater	4		Considered immaterial
	Upstream leased assets	4		Powerco does not have any upstream leased assets.
	Processing of sold products	5: Indirect emissions associated with the use of products from the organisation	Base Power	Six Base Power units were sold in the FY24 reporting period.
	Use of sold products	5	Base Power	Six Base Power units were sold in the FY24 reporting period. However, all units in FY24 were sold to Powerco (and their use is accounted for in this inventory), so use of sold products for this year is not an exclusion.
	End of life treatment of sold products	5	Base Power	No units have reached end of life
	Downstream leased assets	5	Powerco owned leased depots	Data not available for purchased gas or refrigerants.
	Franchises	5		Powerco does not have any franchises.
	Investments	5		Powerco does not have any investments to report on.

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FY24 GHG inventory analysis

Emissions by GHG Protocol category

The table below shows Powerco's emissions by category in tCO₂e. Figures highlighted in either green or red indicate a salient change in emissions compared with the previous year (FY23). Changes in emissions not highlighted are because of changes outside of Powerco's control, changes in data collection, where we have low data quality, or an immaterial shift.

Table 5: FY24 GHG emissions (tCO₂e) by activity

GHG Protocol category	FY24 tCO ₂ e	FY23 tCO ₂ e	FY22 tCO ₂ e	FY21 tCO ₂ e	Commentary
Mobile combustion	345.71	388.99	358.65	375.02	The ongoing implementation of our vehicle fleet decarbonisation plan has resulted in a reduced overall fleet, fewer diesel and hybrid vehicles, and a small increase in EVs.
Fugitive emissions - SF ₆	158.63	10.34	107.16	57.23	Of the SF ₆ containing assets removed from the network, 75% of the gas was recovered. However, a third of our SF ₆ emissions were the result of two network assets suffering complete gas loss. We are working with the equipment supplier to understand the failure mode, as well as finding a viable alternative to our current SF ₆ based equipment. A more robust decommissioning standard was implemented during FY24 to ensure greater visibility of asset decommissioning data; this has inevitably led to an increase in reported losses.
Fugitive emissions - gas network pipeline losses	6,503.75	6,862.13	7,120.33	7,246.65	As our current calculation for fugitive pipeline losses is directly linked to gas throughput, a reduction in throughput has positively impacted our emissions. We are currently implementing a more accurate fugitive emissions model based on leak detection monitoring.

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GHG Protocol category	FY24 tCO2e	FY23 tCO2e	FY22 tCO2e	FY21 tCO2e	Commentary
Stationary combustion – diesel, LPG, NG	435.12	348.19	432.36	248.97	One factor in our stationary combustion was the increase in temporary rental generation because of more underground cable faults (compared to FY23). Diesel generation is usually considered for power supply when other options are not available. To help mitigate these emissions in the future, during FY24 we purchased four battery hybrid generators to deploy to these types of fault repairs in FY25. We are also reviewing our fault management standard to help gain efficiencies.
Fugitive emissions - refrigerants/HV AC	23.88				This emission source has not previously been included in our emission inventory, but is now included for completeness.
Total Scope 1	7,467.09	7,609.65	8,018.50	7,927.87	
Electricity network line losses	20,052.69	31,800.00	27,582.21	27,785.02	FY24 line losses are based on an averaged figure from Powerco's past three years' audited information disclosures. The emissions factor used for FY24 was 38% lower than that used in FY23, so the reduction in line loss emissions can largely be attributed to the decarbonisation of New Zealand's electricity grid.
Purchased electricity	300.23	472.08	395.53	400.56	Efficiency projects in our offices have resulted in a small decrease for our purchased electricity consumption. This combined with the lower emissions factor has resulted in fewer emissions.
Total Scope 2	20,352.92	32272.08	27,977.74	28,185.58	

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GHG Protocol category	FY24 tCO2e	FY23 tCO2e	FY22 tCO2e	FY21 tCO2e	Commentary
Purchased goods and services	76,164.66	75,075.35	69,813.94	74,355.76	Purchased goods and services data is based on spend, using averaged emissions factors based on industry type. We have included these emissions in our reporting for completeness, and to proportionally focus our efforts in the right areas. However, we have a low level of confidence in any comparisons year on year. FY24 had a higher spend and has resulted in increased emissions.
Contractor mobile and stationary combustion	6,134.20	5,596.42	5330.21	5,009.66	Contractor emissions have increased mainly from use of diesel vehicles carrying out work on our behalf.
Powerco owned leased depots	28.62	54.59	24.10	2.58	Lower reported electricity consumption in our leased depots along with a lower emissions factor has resulted in lower emissions compared to FY23. FY21 data was an incomplete data set, so comparison is not possible.
Base Power	51.63	24.41	24.33	14.56	Three out of the 22 Base Power units on our footprint, make up 63% of the fuel used. The three high-use units will be investigated during FY25. Note: Fuel use is based on run-time hours, so is an estimated data point. During FY25, we are looking to automate reporting from all units to ensure more accurate information.

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GHG Protocol category	FY24 tCO2e	FY23 tCO2e	FY22 tCO2e	FY21 tCO2e	Commentary
Business travel	447.62	433.00	254.00	714.00	During FY24, a significant emissions reduction programme was implemented to halt the rapid increase we were witnessing in business travel post COVID. A particular focus on air travel has resulted in very similar emissions in FY24 to FY23. This focus will continue in FY25. (Baseline figures have been updated to include radiative forcing.)
Employee commuting and working from home	311.51	345.37	328.64	298.22	FY24 commuting and working from home emissions were based on an employee survey conducted during FY24. A very high response rate achieved a 95% confidence. We have a low confidence in the granularity of the FY21 data to be able to compare year on year.
Waste (office waste, waste oil combustion and road freight of recyclable materials)	2167.83	209.21	139.75	15.52	Our FY24 waste emissions now include road freight associated with network recyclable materials and the addition of recycled PVC. Our waste is now recycled in New Zealand which has eliminated offshore shipping emissions. Office waste continues to trend downwards as we divert more from landfill. Third-party office waste audits were conducted during FY24, and waste reduction plans have been implemented. However, scrap metal accounts for 88% of currently reported waste. Compared to FY23, we have sent more scrap metal and oil to recyclers in FY24. We currently do not account for our network waste to landfill, so an increase in recycling emissions is not necessarily a negative.

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GHG Protocol category	FY24 tCO ₂ e	FY23 tCO ₂ e	FY22 tCO ₂ e	FY21 tCO ₂ e	Commentary
Total scope 3	85,306.07	81,611.93	75,815.29	79,786.96	
Total scope 1, 2, and 3	113,126.08	121,493.66	111,811.53	115,900.41	

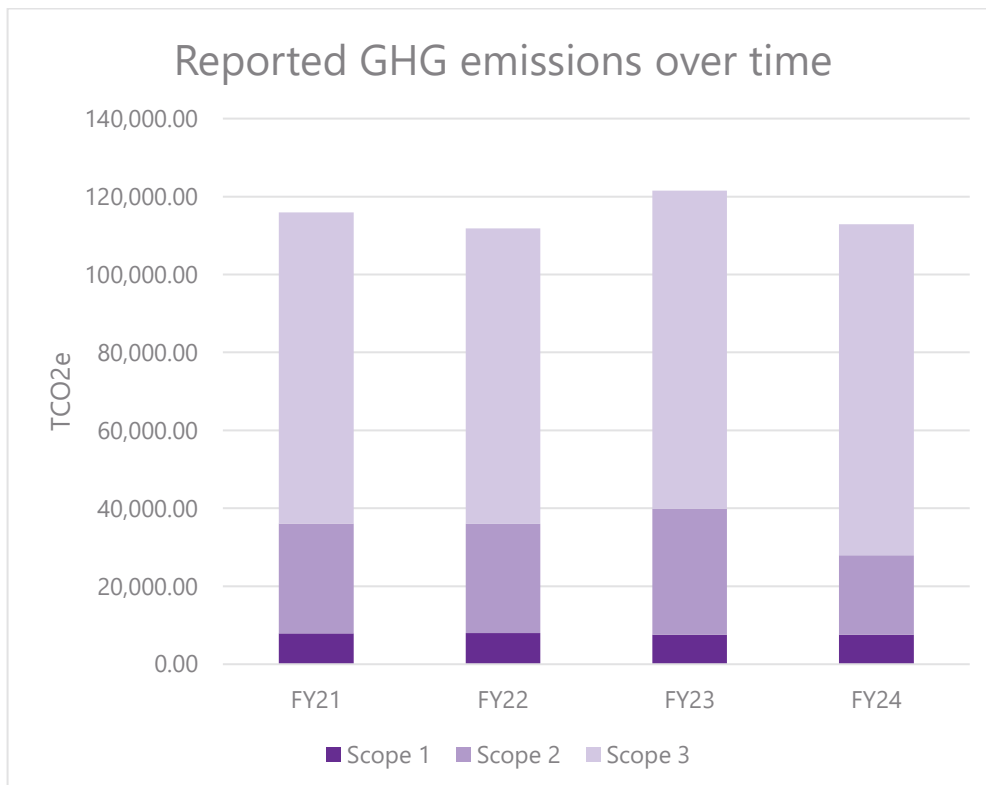
Emissions by greenhouse gas type

Table 6: FY24 total greenhouse gas emissions by greenhouse gas

Scope	tCO ₂	tCH ₄	tN ₂ O	tSF ₆	Other tCO ₂ e [1]	Total
1	807.00	6468.00	8.00	159.00	26.00	7468.00
2	19777.30	532.20	43.50	0.00	0.00	20353.00
3	7078.29	24.87	87.54	0.00	78114.97	85305.67
Total	27662.59	7025.07	139.04	159.00	78140.97	113126.67

Emissions over time

The figure below shows Powerco's total emissions and the breakdown by scope, from FY21 to FY24.



Powerco Greenhouse gas emissions inventory report

Figure 1: Comparison of total reported GHG emissions over time.

GHG emissions intensity

Emissions intensity is a measure of carbon emissions in relation to a suitable business metric. Our FY24 GHG emissions intensity for scope 1 and 2 emissions is 3.74tCO₂e per GWh of energy transported through our network. This is a decrease from 4.73tCO₂e in our base year of FY21. The increase in emissions intensity is largely driven by a change in the emissions factor. We are, however, also accounting for a decrease in total energy transported. The emissions intensity calculation includes scope 1 and 2, with a separate intensity calculation for scope 3.

Table 7: GHG intensity

	FY24	Base year FY21	Variance	
				%
Total GWh of energy transported through networks	7,446.00	7,639.84	-183.84	-2.41
Scope 1 and 2 emissions tCO ₂ e	27,821.00	36,113.45	-8,292.45	-22.96
Emissions intensity tCO₂e/GWh scope 1 and 2	3.74	4.73	-1.00	-21.06
Scope 3 emissions	85,482.87	79,786.96	5695.91	7.14
Emissions intensity tCO₂e/GWh scope 3	11.46	10.44	1.01	9.70

Figure 2 shows a steady decrease in emissions intensity up to FY20. From FY21 to FY23, our emissions intensity has risen because of declining gas throughput and increasing scope 2 emission factors. FY24 intensity has reduced, largely because of a decreased emissions factor (based on New Zealand's electricity grid mix).

Powerco Greenhouse gas emissions inventory report

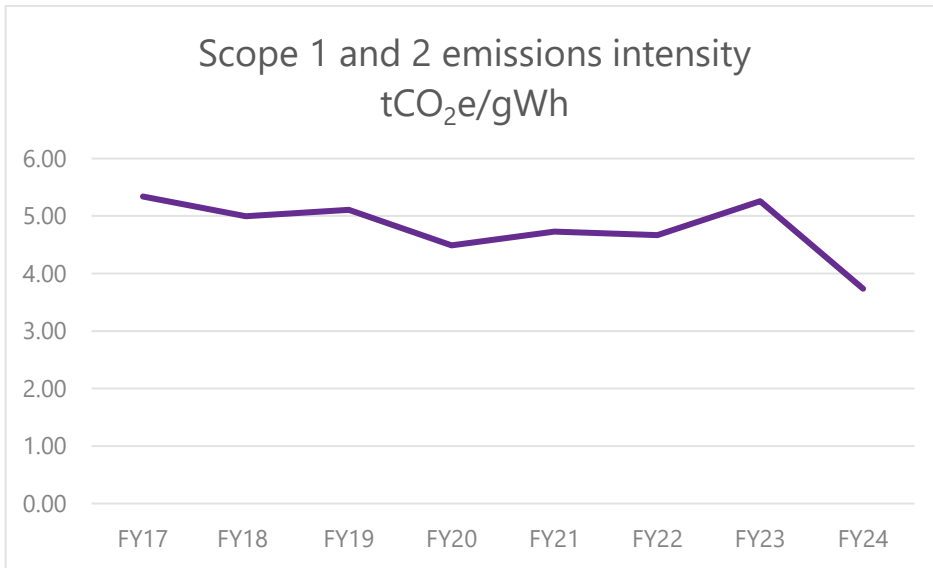


Figure 2: Comparison of GHG intensity over time.

GHG removals and reductions

Removals

A greenhouse gas removal is defined by ISO14064-1 as the 'total mass of greenhouse gas removed from the atmosphere over a specified period of time'. We had no quantified removals for this reporting period.

Since 2020, Powerco has partnered with Wild for Taranaki, the Waiwhakaiho restoration project and our vegetation management contractor Asplundh Tree Expert Company LLC to create native habitats which, in turn, will contribute to cleaner air and water and restore natural biodiversity and habitats. This initiative is an ongoing commitment for Powerco, bringing benefits to future generations. During FY24, we planted another 2,500 trees in the Te Rewa Rewa reserve, New Plymouth.

Powerco partnered with the Tauranga City Council to plant 1,700 trees in Gordon Carmichael Reserve. We also continued our partnership with Trees for Survival, with seed and seedling planting support for schools to grow and plant native trees along waterways and erosion prone hillsides in on the Coromandel Peninsula (2,925 trees).

Powerco also supported the restoration of Te Mata Reserve in Waihi (through our sponsorship of Waihi Beach School's planting programme), and Duxfield Reserve in Putāruru (through our sponsorship and partnering with the Pokaiwhenua Catchment Group) by planting 2,000 trees.

Powerco Greenhouse gas emissions inventory report

Emission reduction initiatives

Table 8: Emission reduction initiatives status

Initiative	Part of business	FY24 status
Electrification (EV and hybrid) of vehicle fleet	Group	In progress. 100% of the pool fleet has now transitioned to electric vehicles and approximately 50% (21 vehicles) of the diesel fleet was replaced with hybrid electric vehicles in FY24.
New Plymouth office consolidation to one site	Group	Completed in early FY24. It is anticipated that office consolidation will result in a 3.3% reduction in electricity consumption from our corporate office total.
Development of a carbon abatement cost curve	Group	In progress. During FY24, we developed the first of our carbon abatement cost curves for our target emissions sources.
Review of our substation building designs, including energy efficiency impacts	Electricity network	In progress. Energy efficiency initiatives have been scoped and will be incorporated into an emissions reduction pathway for network electricity consumption in FY25.
Investigating initiatives for the reduction of diesel consumption	Electricity network	Completed. Emphasis was placed on investigating diesel consumption related to outage management (diesel generation during planned network outages). This work identified several reduction initiatives that will be incorporated into an emissions reduction pathway in FY25.
Renewable gas development	Gas network	In progress. Two renewable gas initiatives are being investigated to determine feasibility of using biogas in our network.
Use of a gas leak detection vehicle to improve network leak information and inform our leak maintenance programme	Gas network	In progress. In FY24 the leak detection vehicle was successfully commissioned. Surveying of the network will commence in early FY25 and is anticipated it could take 12 months to complete a full survey of the gas network. This information will inform our emissions reduction programme.
Improved office waste data	Group	Completed. Waste audits were completed across all our corporate offices for the first time. This data benchmarked our corporate diversion rate and identified areas for improvement. FY25 we will set a diversion improvement plan and implement waste reduction initiatives identified from the audits.

Powerco Greenhouse gas emissions inventory report

Initiative	Part of business	FY24 status
SF ₆ management review	Electricity network	In progress. An SF ₆ feed study was published in FY24, identifying SF ₆ asset types and whether alternatives were either approved for use or available for procurement. In FY25, we plan to work with suppliers to determine viable alternatives to those asset types without a viable current alternative to SF ₆ .

Emissions avoided

Powerco has three small photovoltaic solar arrays – one connected to our Network Operations Centre building, one to an office building in New Plymouth and a third at our Palmerston North office. All the renewable electricity generated by the array is consumed by the buildings. In FY24, 62MWh of electricity was generated. This equates to 4.60 tCO₂e avoided from our scope 2 emissions.

During FY24, we installed two new stand-alone power supplies (Base Power units). Installation of these units is used strategically on our network to assist remote rural customers with energy supply while enabling Powerco to decommission the electricity lines supplying those customers. In addition, Powerco has purchased four mobile units that will be used for unplanned outages.

Powerco had no emissions from the combustion of biomass.

Emissions reduction target

Emissions reduction target

As detailed in Table 8 of this report, we have been scoping and implementing emissions reduction initiatives for many years. These are largely based on a group of target emissions where we believe we have the most ability to impact. These emissions are our scope 1 and 2 emissions, excluding electricity and gas line losses.

However, in our FY23 GHG Inventory Report, we described the strategic shift in our organisation's emissions reduction strategy to direct more of our shorter-term resource into broadening our emissions reductions and scoping reduction initiatives for our target emissions sources.

During FY24, we have developed a carbon abatement cost curve and improved the quality and granularity of our emissions data. Importantly, our emissions reduction efforts now also include our fugitive gas losses. FY25 will see the public release of an emissions reduction target.

Offsetting remains excluded from this shorter-term focus, but we may revisit its role in the future.

Powerco Greenhouse gas emissions inventory report

FY24 outcomes

During FY24, total target emissions were 14.60% higher compared with the FY21 base year (Table 9). This is largely because of an increase in SF₆ emissions and in diesel consumption used in back-up generators.

Compared with the previous year (FY23), our target emissions have increased by 1.64%.

Table 9: FY24 Target emissions (tCO₂e)

Emission source	FY24	FY23	FY22	Base year FY21	Variance	
	tCO ₂ e	tCO ₂ e	tCO ₂ e	tCO ₂ e	tCO ₂ e	%
Mobile combustion	345.71	388.99	358.65	375.02	-29.31	-7.82
SF ₆	158.63	10.34	107.16	57.23	101.4	177.18
Purchased gas	0.07	0.14	0.1	0.12	-0.05	-41.67
Diesel generators	435.12	348.19	432.26	248.85	186.27	74.85
Purchased electricity	300.23	472.08	395.53	400.56	-100.33	-25.05
Total	1239.76	1219.74	1293.7	1081.78	157.98	14.60

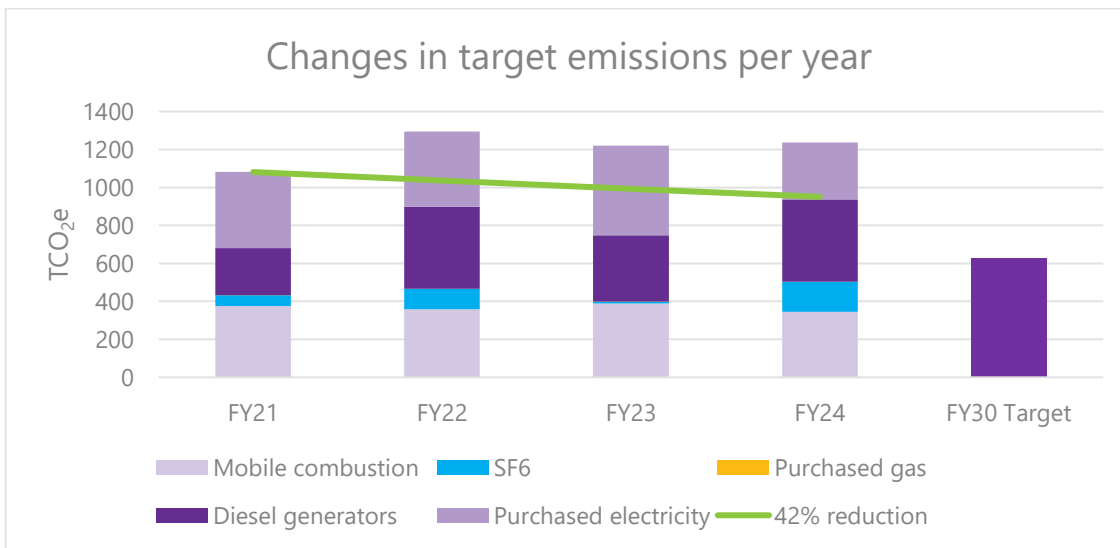


Figure 3: Change in target emissions per year.

Powerco Greenhouse gas emissions inventory report

Appendices

Appendix A – Modified NGER Scheme Method 1

Powerco’s natural gas pipeline loss calculation is based on the Australian NGER (National Greenhouse and Energy Reporting) Scheme Method 1, modified for New Zealand. This formula estimates fugitive emissions based on the total emissions measured in tCO₂e that pass through the network equipment and a region-specific emissions factor. A detailed explanation of this formula can be found on page 147 of the NGER Determination (2008)⁷.

In the absence of a reliable emissions factor for the New Zealand context, the formula was modified to reflect the Maunsell Report’s (2007) recommended average gas line loss of 0.2%. The modified formula calculates the amount of unburnt carbon dioxide (CO₂) and methane (CH₄) lost from the gas pipelines as a result of distribution, in tonnes, multiplied by the global warming potential of each gas and expressed as tCO₂e.

$E = (TP * 26.137) * 0.2\% * F * D * GWP / 1000$	
E	Emissions
TP	Throughput (GJ)
26.137	Converts GJ to m ³
0.2%	Estimated gas line losses (from Maunsell’s 2007 Report)
F	Average fraction of gas in mix (methane or carbon dioxide) expressed as a percentage
D	Density of gas in kg/m ³ (methane = 0.678, carbon dioxide = 1.98) ⁸
GWP	Global warming potential of gas (tCO ₂ e/tonne)
1000	Converts to tonnes

The calculation is completed twice with different values of F: Once for the methane component of the gas (81.00%) and once for the carbon dioxide component (5.75%). The resulting emissions are summed to give the total amount of emissions from natural gas pipeline losses.

Appendix B – GRI standards reporting index

This report contains standard disclosures from the GRI Sustainability Reporting Guidelines.

The following table maps the content of this document to the GRI disclosure requirements.

⁷ [National Greenhouse and Energy Reporting \(Measurement\) Determination 2008](#) – see page 147, section 3.81 for Method 1.

⁸ From: Schäfer, Michael; Richter, Markus; Span, Roland (2015). 'Measurements of the viscosity of carbon dioxide at temperatures from (253.15 to 473.15)K with pressures up to 1.2MPa'. The Journal of Chemical Thermodynamics. 89: 7–15. doi:10.1016/j.jct.2015.04.015. ISSN 0021-9614.

Powerco Greenhouse gas emissions inventory report

GRI standard	Disclosure	Reference or response	Page
3-3 Management of material topics 2021	Disclosures of material topics	The executive summary, and scope sections of this report describes the importance of this topic.	5
		The GHG inventory analysis section outlines the management approach.	15
		The emissions initiative progress and offsets section shows examples of evaluation.	22
305 Emissions 2016	305-1 Direct (scope 1) GHG emissions	Table 5 – FY24 GHG emissions by activity	15
		Base year selected	9
		Table 2 – Emission factors	7
		Organisational boundary section	5
		Data collection process section	7
		Methodology section and appendix A – Modified NGERS method 1	7,25
		Table 4 – Exclusions	15
	305-2 Energy indirect (scope 2) GHG emissions	Table 5 – FY22 GHG emissions by activity	15
		Base year selected	9
		Table 2 – Emission factors	7
		Organisational boundary section	5
		Data collection process section	7
		Methodology section	7,25
	305-3 Other indirect (scope 3) GHG emissions	Table 5 – FY22 GHG emissions by activity	15
		Base year selected	9
		Table 2 – Emission factors	7
Organisational boundary section		5	
Data collection process section		7	
Methodology section		7,25	
Table 4 - Exclusions		15	
305-4 GHG emissions intensity	Table 7 – GHG intensity	20	

Powerco Greenhouse gas emissions inventory report

Appendix C – ISO 14064-1:2018 Reporting Index

ISO reporting	Section in this report	Page
9.3.1 (a)	Executive summary – Powerco’s approach	3
9.3.1 (b)	Data collection and review process	6,7
9.3.1 (c)	Reporting period and base year	3
9.3.1 (d)	Organisational boundary	5
9.3.1 (e)	Operational boundary	5
9.3.1 (f)	Emissions by activity – Table 5	15
9.3.1 (g)	Other emissions – CO ₂ emissions from the combustion of biomass	23
9.3.1 (h)	GHG removals and reductions	21
9.3.1 (i)	Exclusions – Table 4	13
9.3.1 (j)	Emissions by activity – Table 5	15
9.3.1 (k)	Reporting period and base year	3
9.3.1 (l)	Reporting period and base year	3
9.3.1 (m)	Summary of emission source inclusions - Table 3	11
9.3.1 (n)	Data collection and review process	10
9.3.1 (o)	Emission factors – Table 2	7
9.3.1 (p)	Data quality of reported emissions	10
9.3.1 (q)	Data quality of reported emissions	10
9.3.1 (r)	Introduction	4
9.3.1 (s)	Audit report	29
9.3.1 (t)	Data collection and review process	10

ISO reporting	Section in this report	Page
9.3.2 (a)	Introduction	4
9.3.2 (b)	GHG removals and reductions	21
9.3.2 (c)	GHG removals and reductions	21
9.3.2 (d)	N/A	

Powerco Greenhouse gas emissions inventory report

ISO reporting	Section in this report	Page
9.3.2 (e)	N/A	
9.3.2 (f)	Emissions by activity – Table 5	15
9.3.2 (g)	GHG intensity - Table 7	20
9.3.2 (h)	Emissions reduction target	23
9.3.2 (i)	Information management procedures	6
9.3.2 (j)	Emissions over time	19
9.3.2 (k)	Emissions over time	19

ISO reporting	Section in this report	Page
9.3.3	Emissions reduction target	23

Powerco Greenhouse gas emissions inventory report

Audit report

This GHG Inventory Report has been audited by Toitu Envirocare, a third-party independent assurance provider. The following levels of assurance relate to ISO 14064-1:2018 and GHG Protocol respectively, and have been given for the assertions and quantification included in this report:

- Category 1 and 2/scope 1 and 2 – reasonable assurance
- Category 3 and 4 / scope 3 – limited assurance

The GHG assurance report is on the following page(s).



INDEPENDENT AUDIT OPINION

Toitū Verification

TO THE INTENDED USERS

Organisation subject to audit: Powerco Limited

Audit Criteria: ISO 14064-1:2018
ISO 14064-3:2019
Audit & Certification Technical Requirements 3.0

Responsible Party: Powerco Limited

Intended users: Stakeholders including shareholders, investors, regulators, customers and communities to whom energy is supplied, employees, contractors, and members of the public

Registered address: 35 Junction Street, Welbourn, New Plymouth, 4312, New Zealand

Inventory period: 01/04/2023 to 31/03/2024

Inventory report: FY24 GHG inventory report - Certified by Toitū 27 May 2024.pdf

We have reviewed the greenhouse gas emissions inventory report ("the inventory report") for the above named Responsible Party for the stated inventory period.

RESPONSIBLE PARTY'S RESPONSIBILITIES

The Management of the Responsible Party is responsible for the preparation of the GHG statement in accordance with ISO 14064-1:2018. This responsibility includes the design, implementation and maintenance of internal controls relevant to the preparation of a GHG statement that is free from material misstatement.

VERIFIERS' RESPONSIBILITIES

Our responsibility as verifiers is to express a verification opinion to the agreed level of assurance on the GHG statement, based on the evidence we have obtained and in accordance with the audit criteria. We conducted our verification engagement as agreed in the audit letter, which define the scope, objectives, criteria and level of assurance of the verification.

The International Standard ISO 14064-3:2019 requires that we comply with ethical requirements and plan and perform the verification to obtain the agreed level of assurance that the GHG emissions, removals and storage in the GHG statement are free from material misstatement.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit carried out in accordance with the ISO 14064-3:2019 Standards will always detect a material misstatement when it exists. The procedures performed on a limited level of assurance vary in nature and timing from, and are less in extent compared to reasonable assurance, which is a high level of assurance. The procedures performed on a limited level of assurance vary in nature and timing from, and are less in extent compared to reasonable assurance, which is a high level of assurance. Misstatements are differences or omissions of amounts or disclosures, and can arise from fraud or error. Misstatements are considered material if, individually or in the aggregate, they could reasonably be expected to influence the decisions of readers, taken on the basis of the information we audited.

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.

BASIS OF VERIFICATION OPINION

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

VERIFICATION

We have undertaken a verification engagement relating to the Greenhouse Gas Emissions Inventory Report (the 'Inventory Report')/Emissions Inventory and Management Report of the organisation listed at the top of this statement and described in the emissions inventory report for the period stated above.

The Inventory Report provides information about the greenhouse gas emissions of the organisation for the defined measurement period and is based on historical information. This information is stated in accordance with the requirements of International Standard ISO 14064-1 Greenhouse gases – Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals (ISO 14064-1:2018).

VERIFICATION STRATEGY

Our verification strategy used a combined data and controls testing approach. Evidence-gathering procedures included but were not limited to:

- activities to inspect the completeness of the inventory;
- interviews of site personnel to confirm operational behaviour and standard operating procedures;
- reconciliation of contracted diesel use & purchased goods and services;
- sampling of gas network pipeline losses;
- estimate testing of electricity network line losses;
- retracing/sense checking of minor emission sources.

The data examined during the verification were historical in nature.

QUALIFICATIONS TO VERIFICATION OPINION

The following qualifications have been raised in relation to the verification opinion:

Category 4 emission sources for purchased goods & services are heavily assumptions based, using dollar spend data and an industry average to estimate emissions. Changes in assumptions could significantly impact the measurement of these emissions.

VERIFICATION LEVEL OF ASSURANCE

	tCO ₂ e Location based		Level of Assurance
Direct Emissions:			
Category 1	7,467.04		Reasonable
Indirect emissions from imported energy:			
Category 2	20,352.92		Reasonable
Indirect emissions from transportation			
Category 3	2,657.01		Limited
Indirect emissions from products used by organisation:			
Category 4	82,649.06		Limited
Total gross emissions	113,126.03		

RESPONSIBLE PARTY'S GREENHOUSE GAS ASSERTION (CERTIFICATION CLAIM)

Powerco Limited has measured its greenhouse gas emissions in accordance with ISO 14064-1:2018 in respect of the operational emissions of its organisation.

VERIFICATION CONCLUSION

EMISSIONS - REASONABLE ASSURANCE

We have obtained all the information and explanations we have required. In our opinion, the emissions, removals and storage defined in the inventory report, in all material respects:

- comply with ISO 14064-1:2018 ; and
- provide a true and fair view of the emissions inventory of the Responsible Party for the stated inventory period.

EMISSIONS - LIMITED ASSURANCE

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 emissions, removals and storage defined in the inventory report:

- do not comply with ISO 14064-1:2018 ; and
- do not provide a true and fair view of the emissions inventory of the Responsible Party for the stated inventory period.

ADDITIONAL INFORMATION RELEVANT TO INTENDED USERS



Without qualifying our opinion expressed above, we wish to draw the attention of the intended users to the following :

Electricity line losses - were estimated using the average of previous 3 years audited figures, and may change on completion of the Commerce Commission audit.

OTHER INFORMATION

The responsible party is responsible for the provision of Other Information to meet Programme requirements. The Other Information may include climate related disclosures around Governance, Strategy and Risk management, emissions management, reduction plan and purchase of carbon credits, but does not include the information we verified, and our auditor's opinion thereon.

Our opinion on the information we verified does not cover the Other Information and we do not express any form of audit opinion or assurance conclusion thereon. Our responsibility is to read and review the Other Information and consider it in terms of the programme requirements. In doing so, we consider whether the Other Information is materially inconsistent with the information we verified or our knowledge obtained during the verification.

Verified by:		Authorised by:	
Name:	Pieter Fransen	Name:	Billy Ziemann
Position:	Verifier, Toitū Envirocare	Position:	Certifier, Toitū Envirocare
Signature:		Signature:	
Date verification audit:	7 May 2024	Date:	30 May 2024
Date opinion expressed:	17 May 2024		

