



# **Greenhouse gas emissions inventory report**

Electricity and Gas distribution services

01 April 2021 – 31 March 2022

Published 16/11/2022

# Greenhouse gas emissions inventory report

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# Greenhouse gas emissions inventory report

## Executive summary

Powerco is committed to making sustainable choices that help our communities thrive now and into the future. Our action on climate change and greenhouse gas (GHG) emissions is part of our contribution to this. Powerco's Climate Change Policy commits to "applying a sustainability mindset to our investment decisions and operational practices to minimise their impacts on and from the climate".

This GHG inventory report covers the financial year ending 31 March 2022 (FY22).

This year we have worked to increase the accuracy of our inventory items by including a wider scope of emissions sources and in particular, substantially improving the extent of our scope 3 reporting.

Emissions (based on revenue spent) from purchased goods and services has been included in our reporting for the first time, and this has also been retrospectively included in our FY21 base year comparison. This category now makes up 99% of scope 3 emissions. Further improvements in data availability for scope 3 emissions sources meant that in addition to purchased goods and services, emissions from waste oil from transformers, scrap metal recycling and purchased electricity from Powerco owned depots have also been included in our reporting for the first time.

Our total reported emissions for FY22 decreased by 1.96% compared with the FY21 base year.

Compared to our base year of FY21, we saw emissions improvements from our vehicle fleet and our offices in terms of electricity consumption and waste. Recorded emissions from electricity line losses and gas pipeline losses were also reduced. Recorded emissions increased from air travel (scope 3), equipment on our network containing SF6 (scope 1), and from a higher use of diesel generators to supply back up energy to our communities (scope 1).

Table 1: GHG emissions (tCO<sub>2</sub>e) by scope

Scope	FY22	Base Year FY21	Variance	
	tCO <sub>2</sub> e	tCO <sub>2</sub> e	tCO <sub>2</sub> e	%
1	8,018.50	7,927.87	90.63	1.14
2	27,977.74	28,185.58	-207.84	-0.74
3	80,356.37	82,569.77	-2,213.40	-2.68
<b>Total</b>	<b>116,352.61</b>	<b>118,683.22</b>	<b>-2,330.61</b>	<b>-1.96</b>

# Greenhouse gas emissions inventory report

## Introduction

### Our vision

Powerco is committed to making sustainable choices that help our customers thrive.

Our commitment is underpinned by our purpose of connecting communities now and into the future. Our cultural framework, Ngā Tikanga – Our Way, aligns our purpose, values and how we work together with our communities and industry stakeholders. This ensures we make the right decisions that meet our collective needs, and drive leadership across our industry to enable a sustainable future.

To help us achieve this, we apply a sustainability mindset to our investment decisions and operational practices to minimise their impacts on the climate. Reporting of greenhouse gas (GHG) emissions supports our sustainability commitments and our desire to align Powerco with the United Nation's Sustainable Development Goal (SDG) 13 "Climate Action". The decarbonisation of New Zealand's economy and our own carbon emissions have been identified by our stakeholders as a material sustainability issue.

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.

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 (2004)
- Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011)
- Global Reporting Index (GRI) standards, specifically GRI 305: Emissions (2016) <sup>1</sup>
- ISO14064-1:2018

This is our third public GHG emissions disclosure and relates to the year ended 31 March 2022.

### Powerco's sustainability strategy

Powerco is one of New Zealand's largest electricity and gas distributors. We deliver safe and reliable energy by keeping the lights on and gas flowing to around 1.1m customers (across 452,000 homes, businesses, and organisations) across the North Island. Our assets include approximately 29,000 kilometres of electricity lines and 6,100 kilometres of gas pipelines<sup>2</sup>.

Our Corporate Sustainability strategy covers the triple bottom line of people, planet and profits and sets out Powerco's sustainability vision and framework to ensure we have an authentic balance across environmental, social, and financial outcomes.

Our target to offset any remaining emissions by 2030 for scope 1 and 2 emissions, excluding line losses, was approved by Powerco's Board of Directors in June 2020. In addition to this target, we will also be collaborating with our partners to reduce our scope 3 emissions.

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<sup>1</sup> Contact person for GHG is the Head of Sustainability email: [Corporate.sustainability@powerco.co.nz](mailto:Corporate.sustainability@powerco.co.nz)

<sup>2</sup> For further information about the organisation refer to [www.powerco.co.nz](http://www.powerco.co.nz)

# Greenhouse gas emissions inventory report

We have articulated our approach to climate change through the development of our Climate Change Policy. One of Powerco's commitments in this policy is our offsetting target, and we are currently aligning our internal emissions reduction plan with science. This GHG Inventory Report is our public accountability of progress towards these goals.

## Intended uses and audiences of the report

This report is intended to advise the stakeholders of Powerco Limited on our GHG inventory for the reporting period FY22, along with the steps and measures taken by us to reduce the greenhouse gas emissions associated with our activities.

Stakeholders include shareholders, investors, regulators, communities to whom we supply energy, 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 seven locations throughout New Plymouth, Whanganui, Palmerston North, Wellington, and Tauranga. 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 First Gas and finishes at the point where the energy reaches our customers<sup>3</sup>.

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

- Powerco owned transmission, sub-transmission, 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, Powerco Transmission Services Ltd, and The Gas Hub.

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<sup>3</sup> 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.

# Greenhouse gas emissions inventory report

## 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:

- Category 1 - Stationary combustion emissions relating to direct consumption of natural gas and non-biogenic fuels in generators.
- Category 3 - Mobile consumption emissions relating to non-biogenic fuels.
- Category 4- Fugitive emissions including sulphur hexafluoride (SF<sub>6</sub>) in relation to our electricity network, and carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) in relation to our gas network.

**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:

- Category 1 - Purchased goods and services
- Category 5 - Waste
- Category 6 - Business travel
- Category 7 - Employee commuting
- Category 9 - Downstream transportation and distribution
- 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 developed in 2015 and last revised and approved in March 2022. 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 maintained 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 Corporate 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 Deloitte.
- The report is reviewed to identify opportunities to improve the information management process.
- Senior management is informed of emissions reduction progress.

# 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 CO<sub>2</sub>e value using an appropriate emission factor.

### Emission factors

Table 2: Emission factors applied to our emission sources

Scope	Category	Emission source	Emission factor	Reference
1	Stationary combustion	Purchased gas	0.195 kgCO <sub>2</sub> e /kWh	NZ Ministry for the Environment 2020
		Generators - diesel	2.66 kgCO <sub>2</sub> e /L	
	Mobile combustion	Petrol	2.45 kgCO <sub>2</sub> e /L	
		Diesel	2.69 kgCO <sub>2</sub> e /L	
	Fugitive emissions	SF <sub>6</sub>	GWP = 22,800	EPA – Emissions Trading Scheme
		Gas network pipeline losses	GWP CH <sub>4</sub> = 28 GWP CO <sub>2</sub> = 1	Modified NGER Scheme Method 1 – see Appendix A
2	Electricity	Electricity network line losses	0.101 kgCO <sub>2</sub> e / kWh	NZ Ministry for the Environment 2020
		Purchased electricity	0.101 kgCO <sub>2</sub> e / kWh	
3	Purchased goods and services including Capital Goods and Transport	Diesel	2.66 kgCO <sub>2</sub> e /L	NZ Ministry for the Environment 2020
		Petrol	2.33 kgCO <sub>2</sub> e /L	UK Department for Business, Energy & Industry Strategy 2021
		LPG	3.03 kg/CO <sub>2</sub> e/kg	NZ Ministry for the Environment 2020
		Contractor fuel (operational maintenance and construction, petrol, and diesel)	Petrol 2.45 kgCO <sub>2</sub> e /L	
			Diesel 2.69 kgCO <sub>2</sub> e /L	
		Services	Varies kgCO <sub>2</sub> e/ Spend NZD	EORA 2017
		Purchased products	Varies kgCO <sub>2</sub> e/ Spend NZD	

# Greenhouse gas emissions inventory report

Scope	Category	Emission source	Emission factor	Reference
		Base Power units (stationary combustion of diesel)	2.66 kgCO <sub>2</sub> e/ L	NZ Ministry for the Environment 2020
	Waste	Composting Waste to landfill (general) Waste oil from transformers	1.72 kgCO <sub>2</sub> e /kg 1.17 kgCO <sub>2</sub> e /kg 2.92 kgCO <sub>2</sub> e/ L	NZ Ministry for the Environment 2020
	Business travel	Rental cars - large diesel - large petrol - medium petrol Petrol hybrid medium	0.235 kgCO <sub>2</sub> e /L 0.220 kgCO <sub>2</sub> e/L 0.198 kgCO <sub>2</sub> e/L 0.149 kgCO <sub>2</sub> e/L	
		Taxis	0.0702 kgCO <sub>2</sub> e /\$	
		Flights (domestic, international short-haul and long-haul without radiative forcing)	0.130 kgCO <sub>2</sub> e / Km 0.082 kgCO <sub>2</sub> e / Km 0.101 kgCO <sub>2</sub> e / Km	
		Accommodation	0.128 kgCO <sub>2</sub> / night	
	Employee commuting	Travel to and from work in private vehicles (medium petrol car) and public transport (taxi travel kms)	0.198 kgCO <sub>2</sub> / Km 0.225 kgCO <sub>2</sub> / Km	
		Working from home	0.908 kgCO <sub>2</sub> / day	
	Downstream transportation and distribution	International shipping of scrap metal	0.037 kgCO <sub>2</sub> / tKm	
	Downstream leased assets	Powerco owned leased depots purchased electricity	0.101 kgCO <sub>2</sub> e/ kWh	NZ Ministry for the Environment 2020



# Greenhouse gas emissions inventory report

## Reporting period and base year

The current reporting period is the financial year ended 31 March 2022 (FY22). The base year is the year ended 31 March 2021 (FY21). This has changed from our previously reported base year of FY19 due to the significant increase in the extent of our scope 3 emissions reporting through the inclusion of "Purchased goods and services". This has been retrospectively calculated back to FY21 as a base year and accounts for 99% of our scope 3 emissions in FY22.

FY21 was selected as the base year due to the availability of data and similarity of scope with FY22. 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, e.g., if the science behind the emissions factor is revised.
- On discovery of an error or cumulative errors that could be collectively significant.

## Data collection and review process

Data for this report is collected by Powerco's Sustainability Analyst and uploaded into BraveGen<sup>4</sup>. The calculations and methodologies are reviewed by the Head of Sustainability 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.

Quantities of each greenhouse gas are converted to tonnes of CO<sub>2</sub>e using the global warming potential from the Intergovernmental Panel on Climate Change (IPCC) 2007 Assessment report 4 – AR4.

## Data quality of reported emissions

In total, 15 sources of data are obtained from supplier invoices or reports and 8 from internal business units. The majority of 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 43% are from internal sources and 57% are calculated using data obtained from suppliers or other value chain partners.

For scope 3 emissions, 63% of emissions are calculated using data obtained from suppliers or other value chain partners.

There are limitations to some data sources. Specifically:

- 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.

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<sup>4</sup> BraveGen is a New Zealand owned and operated, carbon accounting "Software as a Service" system.

## Greenhouse gas emissions inventory report

- There is an estimated factor used to calculate waste emissions at a shared location where waste is not collected separately.
- Only tier 1 contractors' fuel emissions are calculated from actual usage. The remainder is accounted for in purchased goods and services.
- LPG quantities have been estimated based on a monetary spend figure.
- A spend based methodology has been used to calculate emissions for scope 3 category 1 – purchased goods and services, using approximated and averaged emissions factors.
- Scrap metal quantities will be under-represented as they are based on nine months' data instead of 12.

# Greenhouse gas emissions inventory report

## Summary of emission source inclusions

Table 3: Data collection and review process

Scope	Category	Emission source	Data	Data source
1	Stationary combustion	Purchased gas	Gas usage (kWh)	External invoices
		Diesel	Fuel usage (litres)	External generator hire and servicing contractors
	Mobile combustion	Petrol, diesel	Fuel usage (litres)	Automated report from external fuel supplier
	Fugitive emissions	SF <sub>6</sub>	Identified equipment and quantity <sup>5</sup>	Internal report based on external equipment maintenance service provider
		Gas network pipeline losses	Refer appendix A	Internally reported Gas Gate volumes, used for Powerco's information disclosure for gas distribution <sup>6</sup>
		Refrigerants	Leakage quantities	Annual report from external service provider
2	Electricity	Electricity network lines losses	Electricity losses (GWh)	Powerco's audited information disclosure for electricity distribution <sup>7</sup>
		Purchased electricity	Electricity usage (kWh)	Building owner invoices and automated reports from electricity retailer
3	Purchased goods and services including Capital Goods and Upstream Transportation and Distribution	Capital Goods and Upstream Transportation and Distribution etc.	Cost in \$NZD including GST	Powerco Financial spend data - SAP
		Petrol, Diesel (stationary combustion)	Fuel usage (litres)	External report from tier one contractors

<sup>5</sup> Calculated consistent with those specified by the Environmental Protection Authority (EPA) in the Climate Change Response Act Regulations accounting for losses of SF<sub>6</sub> gas to atmosphere and the corresponding tCO<sub>2e</sub>.

<sup>6</sup> See schedule 8(i) in the disclosures here <https://www.powerco.co.nz/who-we-are/pricing-and-disclosures/gas-disclosures>

<sup>7</sup> 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	Category	Emission source	Data	Data source
		LPG (stationary combustion)	Fuel usage (kg)	External report from tier one contractors
		Contractor fuel (operational maintenance and construction, petrol and diesel (mobile))	Distance travelled (kms) and/or fuel (litres)	External report from tier one contractors
		Customer use of diesel in non-leased Base Power units	Fuel usage (litres)	Internal report from maintenance contractors
	Waste	Waste to landfill from offices	Waste to landfill and recyclables (tonnes)	External report from waste management company and external waste audits
		Waste oil from transformers	Fuel recovered (L)	External report from oil recovery company
	Business travel	Rental cars (petrol, diesel)	Distance travelled (kms)	External report from rental agency
		Taxis	Financial cost excluding GST	Internal report from staff coding
		Flights (domestic, international short haul and long haul)	Distance between departure and arrival airports (kms)	External report from travel provider
		Accommodation	Number of nights stayed	External report from travel provider
	Employee commuting	Travel to and from work (in private vehicles and public transport)	Distance to work per employee is pro-rated across Powerco's total FTE's (kms)	Internal employee commute survey
Working from home		Number of days	Internal employee commute survey	
Downstream Transportation and distribution	International shipping	Distance travelled per tonne	External report from scrap metal company	
Downstream leased assets	Depots leased to contractors	Purchased electricity	External report from contractor	

# Greenhouse gas emissions inventory report

## Exclusions

The following data is currently excluded from the FY22 GHG Inventory Report:

Table 4: GHG emissions excluded from the FY22 GHG Inventory

Scope	Category	Subcategory	Reasons for exclusion
Scope 1	Stationary Combustion	LPG for on-site BBQs	Considered immaterial
	Fugitive Emissions	Refrigerants	Data for Palmerston North office not available
Scope 3	Waste	Construction and waste related to construction	Data not available
		Waste associated with the disposal of network equipment	Other than waste oil and the international freight associated with scrap metal, data not available
		Office waste from Whanganui, Masterton and Te Aroha locations	Data not available, small offices > 10 people
		Office waste from Wellington and Tauranga locations	Due to shared office buildings, data not currently available, except for recycling from Wellington office.
	Transmission and distribution losses		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		Considered immaterial
	Business Travel	Public transport	Data not available
	Fuel and energy related activities (not included in scope 1 or scope 2)		Data not available
	Upstream leased assets		Powerco does not have any upstream leased assets.
	Processing of sold products	Base Power	No units were sold in the FY22 reporting period
Use of sold products	Base Power	No units were sold in the FY22 reporting period	

# Greenhouse gas emissions inventory report

Scope	Category	Subcategory	Reasons for exclusion
	End of life treatment of sold products	Base Power	No units have reached end of life
	Downstream leased assets	Powerco owned leased depots Base Power	Data not available for purchased gas or refrigerants Data not available for diesel used in two leased Base Power units in Australia
	Franchises		Powerco does not have any franchises
	Investments		Powerco does not have any investments to report on

## FY22 GHG inventory analysis

### Emissions by activity

The table below shows Powerco's emissions by activity in tCO<sub>2</sub>e. Figures highlighted in either green or red indicate a salient change in emissions. Changes in emissions not highlighted are due to changes in data collection, have a lower data quality or an immaterial shift.

Table 5: FY22 GHG emissions (tCO<sub>2</sub>e) by activity

Category	FY22 tCO <sub>2</sub> e	FY21 tCO <sub>2</sub> e	Commentary
Mobile combustion	358.65	375.02	The ongoing implementation of our vehicle fleet electrification plan has started to replace diesel vehicles with electric and hybrid vehicles and reduced our overall fleet number.
Fugitive emissions - SF <sub>6</sub>	107.16	57.23	Our FY22 figure is potentially over-reported due to SF <sub>6</sub> data processing issues. We were unable to confidently confirm the degassing of some equipment and as a measure of prudence, we have assumed that these assets were disposed of. Our data processes will be reassessed during FY23.
Fugitive emissions - Gas network pipeline losses	7,120.33	7,246.65	A reduction in gas throughput positively impacts our current calculation for pipeline losses.
Stationary combustion	432.36	248.97	FY22 saw an increase in our use of diesel generators due to the routine maintenance of large assets supplying electricity to essential services such as hospitals and medical centres. It is likely that the upgrade of similar higher impact assets will continue over the next few years.

# Greenhouse gas emissions inventory report

Category	FY22 tCO2e	FY21 tCO2e	Commentary
<b>Total Scope 1</b>	<b>8,018.50</b>	<b>7,927.87</b>	
Electricity network line losses	27,582.21	27,785.02	Electricity entering our network increased, but our electricity line losses reduced. This resulted in a higher ratio of electricity delivered and a reduction in emissions.
Purchased electricity	395.53	400.56	A small reduction in emissions from purchased electricity, mainly due to office consolidation. We anticipate further efficiencies in FY23.
<b>Total Scope 2</b>	<b>27,977.74</b>	<b>28,185.58</b>	
Purchased goods and services	74,355.02	77,138.58	This data is based on spend and using an averaged emissions factor based on industry type. We have included these emissions in our reporting for completeness, but we have a low level of confidence in any comparison's year on year.
Contractor mobile and stationary combustion	5,330.21	5,009.66	Contractor emissions have increased mainly from use of diesel vehicles carrying out work on our network.
Powerco owned leased depots	24.10	2.58	We had an incomplete set of data for FY21 so comparison is not possible. However, FY22 emissions are indicative of purchased electricity consumption
Base Power	24.33	14.56	FY22 saw an Increase in fuel usage for Base Power units
Business travel	154.32	90.66	The main contributor to our increase in business travel is due to air travel, which is still well below pre-COVID (460tCO2e in FY19 v 114tCO2e in FY22).
Employee commuting and working from home	328.64	298.22	During FY22, we improved our employee survey process and response rate. This has resulted in a 95% confidence in this data, but 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 shipping of scrap metal)	139.75	15.52	The increase in total waste emissions is due to the inclusion of waste oil combustion and shipping of scrap metal, which we have reported on for the first time in FY22. However, in FY22 we successfully saw our office waste decrease from 15tCO2 to 10tCO2.
<b>Total Scope 3</b>	<b>80,356.37</b>	<b>82,569.78</b>	
<b>Total Scope 1, 2, and 3</b>	<b>116,352.61</b>	<b>118,683.23</b>	

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Powerco had no emissions associated with biomass in FY22

Table 6: FY22 total greenhouse gas emissions by greenhouse gas

Scope	tCO <sub>2</sub>	tCH <sub>4</sub>	tN <sub>2</sub> O	tSF <sub>6</sub>	Other tCO <sub>2</sub> e <sup>[8]</sup>	Total
1	824.04	7,079.85	7.46	107.16	0.00	8,018.50
2	26,869.82	1,069.54	38.39	0.00	0.00	27,977.75
3	5,861.19	30.29	81.74	0.00	74,382.16	80,355.37
<b>Total</b>	<b>33,555.05</b>	<b>8179.67</b>	<b>127.59</b>	<b>107.16</b>	<b>74,382.16</b>	<b>116,351.63</b>

## Emissions over time

The figure below shows Powerco’s total emissions and the breakdown by scope, from FY19 to FY22. The large uplift in FY21 is due to the full inclusion of our purchased goods and services (based on spend).

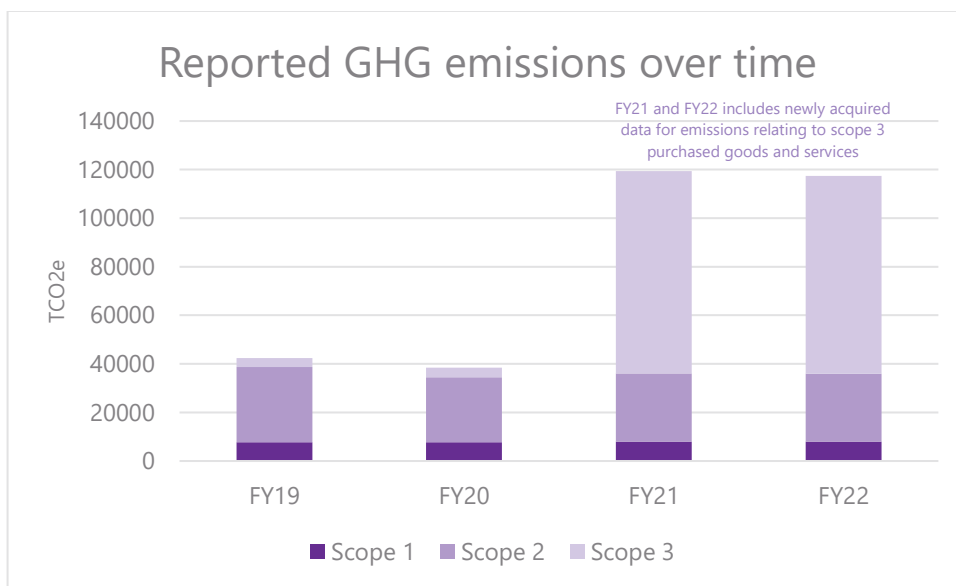


Figure 1: Comparison of total reported GHG emissions over time

## GHG emissions intensity

Emissions intensity is a measure of carbon emissions in relation to a suitable business metric. Our FY22 GHG emissions intensity for scope 1 and 2 emissions is 4.67tCO<sub>2</sub>e per GWh of energy transported through our network. This is a decrease from 4.73tCO<sub>2</sub>e in our base year of FY21. The decrease in emissions intensity is due to decrease in our scope 1 and 2 emissions combined with a slight increase in energy transported through the

<sup>8</sup> Powerco has no emissions from HFCs PFCs or NF3.



# Greenhouse gas emissions inventory report

networks, as shown in table 7 below. The emissions intensity calculation includes scope 1 and 2; with a separate intensity calculation for scope 3.

Table 7: GHG intensity

	FY22	Base year FY21	Variance	
	tCO <sub>2</sub> e	tCO <sub>2</sub> e	tCO <sub>2</sub> e	%
Total GWh of energy transported through networks	7,708.51	7,639.84	68.67	0.90
Scope 1 & 2 emissions tCO <sub>2</sub> e	35,996.20	36,113.45	117.19	-0.32
<b>Emissions intensity tCO<sub>2</sub>e/GWh Scope 1 &amp; 2</b>	<b>4.67</b>	<b>4.73</b>	<b>-0.06</b>	<b>-1.28</b>
Scope 3 emissions	80,356.37	82,569.77	-2,213.40	-2.68
<b>Emissions intensity tCO<sub>2</sub>e/GWh Scope 3</b>	<b>2.23</b>	<b>2.29</b>	<b>-0.05</b>	<b>-2.36</b>

Figure 2 shows a steady decrease in emissions intensity over time as energy delivered to ICPs increases while our emissions remain fairly static.

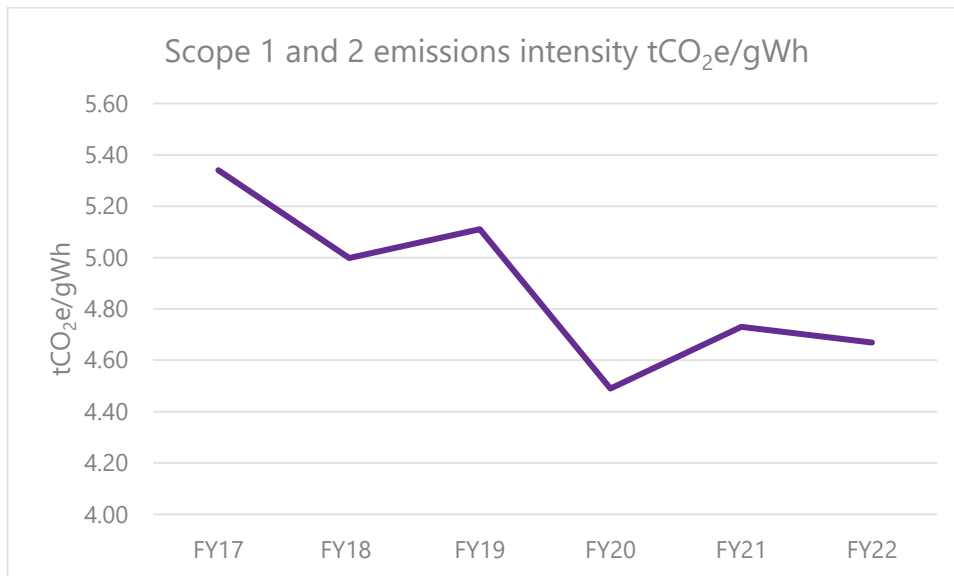


Figure 2: Comparison of GHG intensity over time

# Greenhouse gas emissions inventory report

## 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”. There are no removals quantified for this reporting period.

Powerco’s business sustainability targets include a voluntary commitment to offset any remaining emissions by 2030 from our reduction target of scope 1 and 2 emissions, excluding distribution line losses. Powerco is working to ensure that any such offsetting activities align with MfE’s guidelines for voluntary offsetting and we are looking to partner with landowners who share our values-based approach.

In addition to our offsetting plans, Powerco has partnered with Restore Taranaki 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 restoring natural biodiversity and habitats. This initiative is an ongoing commitment for Powerco, bringing benefits to future generations. During FY22, we planted 2,500 trees near Te Rewa Rewa bridge in New Plymouth. We also continued our partnership with Trees for Survival to support schools throughout the Coromandel to grow and plant native trees along waterways and erosion prone hillsides, including Opoutere School, Te Rerenga School and Coromandel Area School. Powerco also supported the ongoing restoration of Te Mata Reserve through our sponsorship of Waihi Beach School’s planting programme.

### Emission reduction initiatives

Table 8: Emission reduction initiatives status’

Initiative	Part of business	Status
Electrification (EV and hybrid) of vehicle fleet	Group	In progress
New Plymouth office consolidation to one site	Group	In progress
Palmerston North PV installation	Group	Completed – will be included in FY23 reporting
Reset of substation building HVAC system heating and cooling set points	Electricity Network	In progress
Trialling of hydrogen catalyser technology for reduction of diesel consumption	Group	In progress
Collaborating with our supply chain to understand how we can reduce scope 3 emissions from “Purchased goods and services”	Group	Start in FY23

# Greenhouse gas emissions inventory report

Initiative	Part of business	Status
Investigation of Marcogaz, a model to provide greater ability to calculate potential reductions in fugitive gas leaks	Gas Network	Start in FY23
Refurbishment of Tauranga office	Group	Due for completion in FY23

## Emissions avoided

Powerco has three small photovoltaic solar arrays; one connected to the Network Operations Centre building, one to a new refurbished office building in New Plymouth and a third at our new Palmerston North office. All the renewable electricity generated by the array is consumed by the buildings. In FY22, 20MWh of electricity was generated. This equates to 2.03tCO<sub>2</sub>e avoided from our scope 2 emissions. Electricity generated from our Palmerston North office was unavailable for reporting and has not been included.

During FY21, Powerco commissioned a mobile substation that allows us to bypass zone substations during planned maintenance and upgrades. In FY22, Powerco's mobile substation was not used as a direct substitute for diesel generators so emissions avoided cannot be strictly attributed to the reasons for its use.

We have also assisted remote rural customers to install stand-alone power supplies (Base Power units) and as a result have then decommissioned the electricity lines supplying those customers. We hope in the future to be able to calculate the network lines loss emissions avoided.

## Emissions reduction and offsetting targets

Our first priority for reducing emissions is to enable our customers to decarbonise. We are currently investigating aligning our own emissions reduction pathway with science. This will then feed into our goal to offset our scope 1 and 2 emissions, excluding those associated with distribution line losses, by 2030. These are the emissions that Powerco has the most direct ability to influence.

During FY22, total emissions for our offsetting target increased 19.59% compared to the FY21 base year (Table 9). This is largely due to increases in diesel generator usage and reported SF<sub>6</sub> emissions (Table 5). We have seen a small decrease in vehicle emissions as our fleet electrifies and small reductions in purchased electricity as we consolidate our offices.

# Greenhouse gas emissions inventory report

Table 9: Emissions (tCO<sub>2</sub>e) relating to our offsetting target

Emission source	FY22	Base year FY21	Variance	
	tCO <sub>2</sub> e	tCO <sub>2</sub> e	tCO <sub>2</sub> e	%
Mobile combustion	358.65	375.02	-16.37	-4.37
SF <sub>6</sub>	107.16	57.23	49.93	87.24
Purchased gas	0.10	0.12	-0.02	-16.67
Stationary combustion	432.26	248.85	183.41	73.70
Purchased electricity	395.53	400.56	-5.03	-1.26
<b>Total</b>	<b>1,293.7</b>	<b>1,081.78</b>	<b>211.92</b>	<b>19.59</b>

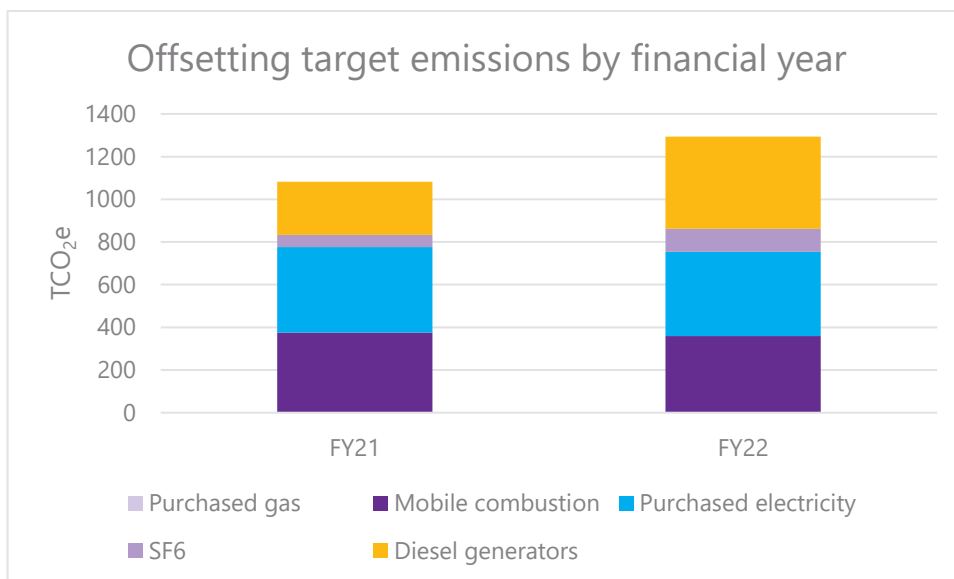


Figure 3: Offsetting target emissions

## Exclusion of line losses from our reduction and offsetting targets

Powerco has committed to offset any remaining greenhouse gas emissions by 2030 from our scope 1 and 2 emissions, excluding those associated with distribution line losses. The exclusion of line losses from our offsetting target is necessary for the following reasons:

- Access to electricity is a key enabler for decarbonisation due to New Zealand’s very high proportion of electricity generation being renewable.
- The forecasted increase in electricity demand will likely lead to an increase in electricity distribution line losses, as asset utilisation increases.
- Other than limiting the volume of electricity delivered to Powerco customers (which will hamper New Zealand’s decarbonisation efforts), there is limited ability for distributors to influence electricity line losses, with any material change coming at an unpalatable cost to consumers.
- As the grid moves closer to 100% renewable, the carbon content of losses will reduce per unit, but the increase in losses due to greater electricity utilisation could keep total emissions at similar levels.

## Greenhouse gas emissions inventory report

- In New Zealand, natural gas plays an important role as a lower carbon transition source, maintaining energy security and affordability. Powerco is looking to align with New Zealand's gas transition plan, which is still under development (due 2023) and will contribute to New Zealand's energy strategy.
- Powerco's current calculation of gas pipeline losses are based on gas throughput. This means any actual reduction in pipeline losses due to leaks is unaccounted for in Powerco's emissions reporting.
- We are currently investigating a model called Marcogaz that will enable better visibility of actual gas leaks and provide information to understand Powerco's reduction potential and guide practical solutions to prioritise these.

# 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 tCO<sub>2</sub>e 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)<sup>9</sup>.

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 (CO<sub>2</sub>) and methane (CH<sub>4</sub>) lost from the gas pipelines as a result of distribution, in tonnes, multiplied by the Global Warming Potential of each gas and expressed as tCO<sub>2</sub>e.

<b><math>E = (TP * 26.137) * 0.2\% * F * D * GWP / 1000</math></b>	
<b>E</b>	emissions
<b>TP</b>	throughput (GJ)
<b>26.137</b>	converts GJ to m <sup>3</sup>
<b>0.2%</b>	estimated gas line losses (from Maunsell’s 2007 Report)
<b>F</b>	average fraction of gas in mix (methane or carbon dioxide) expressed as a percentage
<b>D</b>	density of gas in kg/m <sup>3</sup> (methane = 0.678, carbon dioxide = 1.98) <sup>10</sup>
<b>GWP</b>	global warming potential of gas (tCO <sub>2</sub> e/tonne)
<b>1000</b>	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 table below maps the content of this document to the GRI disclosure requirements.

<sup>9</sup> [National Greenhouse and Energy Reporting \(Measurement\) Determination 2008](#) – see page 147, section 3.81 for Method 1

<sup>10</sup> 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

# Greenhouse gas emissions inventory report

GRI standard	Disclosure	Reference or response	Page
103 Management approach	103-1 Explanation of the material topic and its boundaries	Introduction section of report Operational boundary section	4 5,6
	103-2 The management approach and its components	Powerco, GHG and Sustainability section Emissions initiatives	4 18,19
	103-3 Evaluation of the management approach	Emissions initiatives progress Offsets – NZETS	18,19 19,20,21
305 Emissions	305-1 Direct (Scope 1) GHG emissions	Table 5 – FY22 GHG emissions by activity Base year selected Table 2 – Emission factors Organisational boundary section Data collection process section Methodology section and appendix A – Modified NGERS method 1 Table 8 – Exclusions	14,15 9 7,8 5 9 22 13-14
	305-2 Energy Indirect (Scope 2) GHG emissions	Table 5 – FY22 GHG emissions by activity Base year selected Table 2 – Emission factors Organisational boundary section Data collection process section Methodology section	14,15 9 7,8 5 9 7
	305-3 Other indirect (Scope 3) GHG emissions	Table 5 – FY22 GHG emissions by activity Base year selected Table 2 – Emission factors Organisational boundary section Data collection process section Methodology section Table 8 - Exclusions	14,15 9 7,8 5 9 7 13-14
	305-4 GHG emissions intensity	Table 7 – GHG intensity	17

# Greenhouse gas emissions inventory report

## Appendix C – ISO 14064-1:2018 Reporting Index

ISO Reporting	Section in this report	Page
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ISO Reporting	Section in this report	Page
9.3.2 (a)	Introduction – Our vision	4
9.3.2 (b)	GHG removals and reductions	19,20
9.3.2 (c)	GHG removals and reductions	19,20
9.3.2 (d)	N/A	



# Greenhouse gas emissions inventory report

9.3.2 (e)	N/A	
9.3.2 (f)	Emissions by activity – Table 5	14,15
9.3.2 (g)	GHG Intensity - Table 7	17
9.3.2 (h)	Emissions reduction and offsetting targets	19
9.3.2 (i)	Information management procedures	6
9.3.2 (j)	Emissions over time	16
9.3.2 (k)	Emissions over time	16

<b>ISO Reporting</b>	<b>Section in this report</b>	<b>Page</b>
9.3.3	Emissions reduction and offsetting targets	19

# Greenhouse gas emissions inventory report

## Audit report

This GHG inventory report has been audited by Deloitte, a third-party independent assurance provider. A reasonable level of assurance has been given over the assertions and quantification included in this report.

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



**INDEPENDENT ASSURANCE REPORT ON POWERCO LIMITED'S GREENHOUSE GAS EMISSIONS INVENTORY REPORT  
TO THE BOARD OF DIRECTORS OF POWERCO LIMITED**

**Report on Greenhouse Gas Emissions Inventory Report**

We have undertaken a limited assurance engagement relating to the Greenhouse Gas Emissions Inventory Report (the 'inventory report') of Powerco Limited (the 'Company') for the year ended 31 March 2022, comprising the Emissions Inventory and the explanatory notes set out on pages 3 to 21.

The inventory report provides information about the greenhouse gas emissions of the Company for the year ended 31 March 2022 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'), the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) ('the GHG Protocol') which can be accessed at <https://ghgprotocol.org/corporate-standard> and the Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011) ('the Corporate Value Chain Standard').

**Board of Directors' Responsibility**

The Board of Directors are responsible for the preparation of the inventory report, in accordance with ISO 14064-1:2018, GHG Protocol and the Corporate Value Chain Standard. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation of an inventory report that is free from material misstatement, whether due to fraud or error.

**Our Responsibility**

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

A limited assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves assessing the suitability in the circumstances of the Company's use of ISO 14064-1:2018, the GHG Protocol, and the Corporate Value Chain Standard as the basis for the preparation of the inventory report, assessing the risks of material misstatement of the inventory report whether due to fraud or error, responding to the assessed risks as necessary in the circumstances, and evaluating the overall presentation of the inventory report. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

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

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

- Through enquiries, obtained an understanding of the Company's control environment and information systems relevant to emissions quantification and reporting, but did not evaluate the design of particular control activities, obtain evidence about their implementation or test their operating effectiveness.
- Evaluated whether the Company's methods for developing estimates are appropriate and had been consistently applied. However, our procedures did not include testing the data on which the estimates are based or separately developing our own estimates against which to evaluate the Company's estimates.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance



engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement. Accordingly, we do not express a reasonable assurance opinion about whether Powerco Limited's inventory report have been prepared, in all material respects, in accordance with the ISO 14064-1:2018, the GHG Protocol and the Corporate Value Chain Standard.

### **Inherent Limitations**

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.

### **Our Independence and Quality Control**

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 *International Code of Ethics for Assurance Practitioners (including International Independence Standards) (New Zealand)* ('PES-1') issued by the New Zealand Auditing and Assurance Standards Board, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

Other than this engagement and our role as auditor of the financial statements, our firm carries out other assurance services including the audit of regulatory disclosure statements and project quality assurance, we have no relationship with or interests in the Company or any of its subsidiaries.

The firm applies Professional and Ethical Standard 3 (Amended): *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements* issued by the New Zealand Auditing and Assurance Standards Board, and accordingly 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.

### **Use of Report**

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

### **Limited Assurance Conclusion**

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that Powerco Limited's inventory report for the year ended 31 March 2022 is not prepared, in all material respects, in accordance with the requirements of ISO 14064-1:2018, the GHG Protocol and the Corporate Value Chain Standard.

### **Chartered Accountants**

16 November 2022

Auckland, New Zealand

*This limited assurance report relates to the Greenhouse Gas Emissions Inventory Report of Powerco Limited for the year ended 31 March 2022 included on Powerco Limited's website. Powerco Limited responsible for the maintenance and integrity of Powerco Limited's website. We have not been engaged to report on the integrity of Powerco Limited's website. We accept no responsibility for any changes that may have occurred to the Greenhouse Gas Emissions Inventory Report since they were initially presented on the website. The limited assurance report refers only to the Greenhouse Gas Emissions Inventory Report named above. It does not provide an opinion on any other information which may have been hyperlinked to/from these Greenhouse Gas Emissions Inventory. If readers of this report are concerned with the inherent risks arising from electronic data communication, they should refer to the published hard copy of the Greenhouse Gas Emissions Inventory and related limited assurance report dated 10 November 2022 to confirm the information included in the Greenhouse Gas Emissions Inventory presented on this website.*

