

**GREAT SOUTH** 

Southland Regional Development Agency

# Great South Greenhouse Gas Emissions Inventory Report

FY 2023 - 2024

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## IMPARTIAL CARBON FOOTPRINT REVIEW

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TO THE DIRECTORS OF SOUTHLAND REGIONAL DEVELOPMENT AGENCY

Reporter: Southland Regional Development Agency (Great South)  
Registered address: 143 Spey Street, Invercargill, New Zealand

Ekos Kamahi Limited was engaged to conduct an impartial review of the greenhouse gas (GHG) calculations and associated organisational emissions reported by Great South. The review was completed on 10<sup>th</sup> April 2025. The intended users of this review are Ekos Kāmahī Limited (GHG Programme) and Great South. The determination of the GHG emissions and the sufficiency of the procedures is the sole responsibility of the intended users. Ekos Kamahi Limited was not involved in determining the GHG emissions. Our sole responsibility was to provide an impartial review on the accuracy of the GHG emissions quantification based on agreed-upon procedures.

The procedures as agreed with the Ekos GHG Programme included select parts of ISO 14064-1:2018, specifically:

- Organisational Boundary and Reporting Boundary.
- Consolidation Approach (Operational Control) and its application.
- Quantification of emissions.
- Materiality is set at 5%.
- Remote/desk-top review, and
- No verification of source activity data.

A separate findings log was documented and issued to Great South. There were no material findings issued.

- Total Gross GHG Emissions: 195.3 tonnes CO<sub>2</sub>e
- Period: 1 July 2023 to 30 June 2024
- Quantification reference: GS emissions inventory\_2024FY\_Ekos\_v3

A handwritten signature in black ink, appearing to read "Josh Leenhouders".

**Josh Leenhouders, Reviewer**

Ekos Kamahi Limited  
Nelson, New Zealand  
10<sup>th</sup> April 2025

\We consent to the release of this statement by you to interested parties but without accepting or assuming any responsibility or liability on our part to any other party who may have access to this statement. Any correspondence regarding this statement is to be directed to [ekos@ekos.co.nz](mailto:ekos@ekos.co.nz)

Report Title: Greenhouse Gas Emissions Inventory Great South FY 2023-2024

Measurement period: 1/07/2023 to 30/06/2024

Base year period: 1/07/2018 to 30/06/2019

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## Disclaimer

This report has been prepared by Great South (Southland Regional Development Agency) with all reasonable skill and diligence. Great South does not accept any kind of responsibility for third parties' use of the content. Interpretations, analyses, or statements made by third parties based on this report are beyond Great South's responsibility.

The scope of this report includes emissions from Space Operations New Zealand Limited (Space Ops). Great South owns 100% of Space Ops and provides administrative and logistical support.

If you have any suggestions, complaints, or any other feedback, please contact us at [info@greatsouth.nz](mailto:info@greatsouth.nz)

## Availability

This report will be accessible electronically to the public through the sustainability section of our website. A summary of the inventory will also be published in our Annual Report.

## Statement

This inventory is consistent with the International Standards Organisation's process for calculating and reporting GHG emissions 14064-1 (2018). However, while this measurement has been external reviewed as consistent with the ISO standard, it is an unverified inventory. This aim of this report and inventory is to achieve Ekos certification 'Carbon Conscious.'

# Document Control

## Version Log

Version	Date	Author	Description
v1	18/09/2024	J Kim	Initial draft revised
v2	26/10/2024	J Kim	Revised draft
v3	21/01/2025	J Kim	Final draft revised
v4	29/01/2025	J Kim	Final draft revised

## Review Log

Version	Date	Reviewed by	Comment
v1	26/10/2024	P López	Feedback and revision
v2	21/01/2025	S Canny	Feedback and revision
v3	06/03/2025	C Abeysinghe	Approved for release

# Executive Summary

This report represents Great South’s fifth greenhouse gas (GHG) emissions inventory for the 2023/24 Financial Year (FY). The inventory follows the World Resource Institute’s Greenhouse Gas Protocol (GHG Protocol) and ISO 14064-1 (2018) standards.

During this period, activities within the organisational boundaries generated about **195.3** metric tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e).

The largest contributors were Business travel (28.2%), Electricity used (23.9%) and Staff commute & Working from home (WFH) (16.6%). Scope 3 emissions (we can influence, but not control indirect GHG emissions), accounted for most emissions, followed by Scope 2 emissions from electricity. Table 1 shows the emissions by scope and sector. Figure 1 shows the contribution of organisational emissions by sector.

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

Scope and Sector		2018/19 Base year	2019/20	2020/21	2021/22	2022/23	2023/24
<b>Scope 1</b>		<b>53.5</b>	<b>35.5</b>	<b>49.4</b>	<b>26.5</b>	<b>18.4</b>	<b>16.3</b>
	Great South Space Ops	53.2 0.3	35.2 0.2	49.2 0.2	25.0 1.5	13.5 4.9	13.3 3.0
	Stationary fuel	20.2	13.8	21.8	3.7	-	-
	Transport fuel	33.1	21.6	27.4	22.8	18.4	16.3
	Refrigerants	0.2	-	0.2	0.02	-	-
<b>Scope 2</b>		<b>10.6</b>	<b>15.3</b>	<b>19.5</b>	<b>33.8</b>	<b>39.8</b>	<b>46.6</b>
	Great South Space Ops	5.2 5.4	6.6 8.7	6.8 12.7	5.5 28.3	4.4 35.5	4.7 41.9
	Electricity used*	10.6	15.3	19.5	33.8	39.8	46.6
<b>Scope 3</b>		<b>218.1</b>	<b>110.7</b>	<b>111.7</b>	<b>135.8</b>	<b>187.8</b>	<b>132.4</b>
	Great South Space Ops	205.0 13.1	98.5 12.2	107.9 3.8	125.1 10.6	137.5 50.3	97.1 35.3
	Business travel	116.9	39.3	43.7	20.0	85.0	55.1
	Staff commute + WFH	38.6	26.9	36.3	55.0	50.6	32.4
	ILT Kidzone event	15.4	15.2	-	26.4	13.4	16.8
	Electricity T&D losses	0.9	1.4	1.8	2.6	4.6	3.4
	Waste, wastewater, and water supply	3.0	3.2	3.5	4.7	2.5	1.0
	Freight	0.02	0.01	0.04	0.29	0.05	0.84
	WTT**	43.4	24.6	26.4	26.9	31.6	22.9
<b>Total emissions</b>		<b>282.2</b>	<b>161.4</b>	<b>180.6</b>	<b>196.0</b>	<b>246.0</b>	<b>195.3</b>
Emissions intensity (tCO <sub>2</sub> e per FTE)		<b>6.56</b>	<b>4.89</b>	<b>4.57</b>	<b>4.47</b>	<b>6.23</b>	<b>4.28</b>
<b>Reduction % from baseline</b>		<b>n/a</b>	<b>43%</b>	<b>36%</b>	<b>31%</b>	<b>13%</b>	<b>31%</b>

Note: Due to rounding, the numbers in the above table will not add correctly to give the total.

\*Level of carbon emissions for the electricity sector will depend primarily on the amount of fossil fuel used in any given year to maintain electricity supplies.

\*\*Well-To-Tank: all greenhouse gas emissions from the production, transportation, transformation, and distribution of the fuel used.

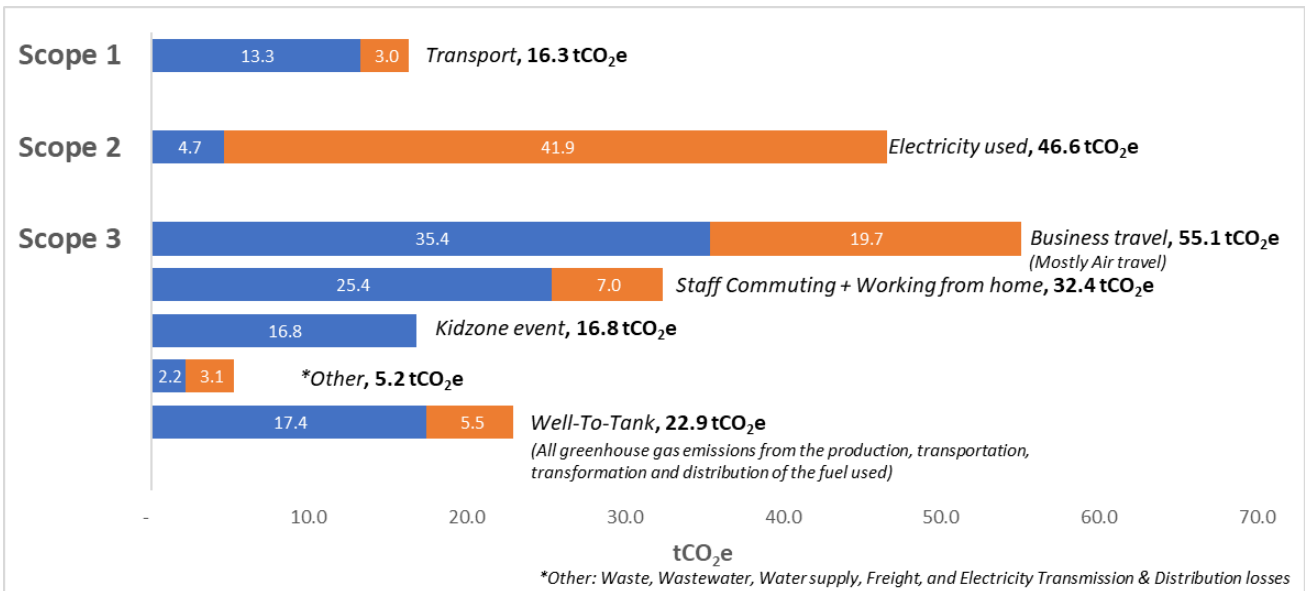


Figure 1 Great South's organisational emissions by sector for 2023/24

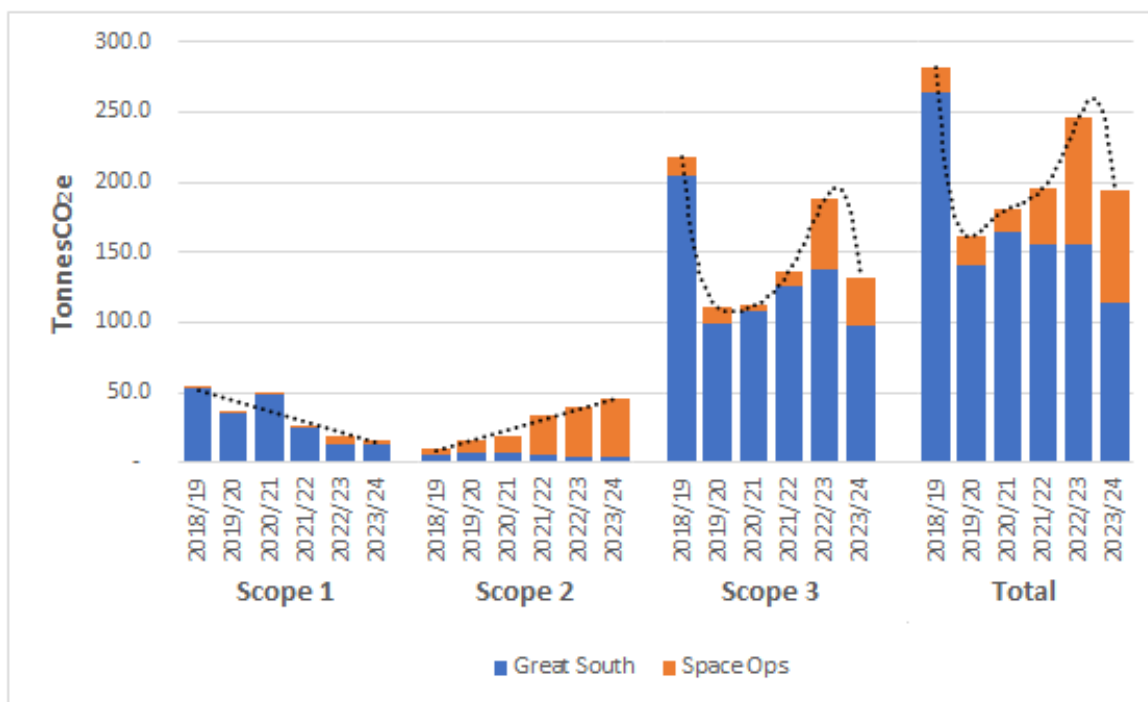


Figure 2 Summary of historical emissions inventories by scope

## Changes from 2018 baseline:

Great South's total emissions decreased by **31%** between 2018/19 and 2023/24. The changes are largely a result of a decrease in business travel, the replacement of the old diesel boiler with heat pumps and switching to hybrid and plug-in hybrid vehicles.

- Electricity and Transmission and Distribution (T&D) losses from electricity were the only sectors with increased emissions (340% and 283% respectively), attributed to Space Ops NZ's business growth.
- Business travel emissions decreased the most (61.8 tCO<sub>2</sub>e or 52.9%), due to staff efforts to replace many business trips with online meetings.
- Stationary fuel emissions reached zero in August 2022 after replacing the diesel boiler with heat pumps.
- Transport fuel emissions decreased by 16.8 tCO<sub>2</sub>e or 50.7%, mainly due to the replacement of petrol and diesel vehicles with petrol hybrid and plug-in hybrid electric vehicles (PHEVs).
- Other sector emissions changed minimally.

## Key findings:

- In 2023/24 GS emitted a total of 16.3 tCO<sub>2</sub>e (Scope 1), 46.6 tCO<sub>2</sub>e (Scope 2), and 132.4 tCO<sub>2</sub>e (Scope 3). All scopes total 195.3 tCO<sub>2</sub>e, a 31% (86.9 tCO<sub>2</sub>e) reduction from the baseline.
- Business travel is the largest contributing sector, accounting for 28.2% of total emissions, with domestic and international flights accounting for 93.3% of this. Emissions from this sector surged post Covid-19 but decreased again this year due to many staff efforts to avoid business trips with online meetings.
- Electricity is the next largest source, accounting for 23.9% of total emissions. As Space Ops NZ (SO) business grows, emissions from electricity use increase significantly every year. 90% of electricity emissions are from the satellite ground station in Awarua and Warkworth.
- Staff commute & WFH contributes for 16.6% of total emissions, with Staff commute making up 98.9%.
- Emissions from Kidzone event are mainly from coal boilers (84%). Southland Girls High School, the venue of the event, will replace their coal boilers with wood pellet boilers by September 2024<sup>1</sup>, which is expected to be reduced the emissions by about 84%.
- The top three sources shown in the table below accounted for 68.6% of GS's total emissions during the 2023/24 reporting period.

Table 2 Historical top three emissions sources for all reporting periods

Reporting Period	Emission Sources	Percentage of total emissions	Total emissions (tCO <sub>2</sub> e)
Base year 2018/2019	1. Business travel	41.4%	116.9
	2. Staff Commuting & Working from home	13.7%	38.6
	3. Transport (company cars)	11.7%	33.1
2019/2020	1. Business travel	24.3%	39.3
	2. Staff Commuting & Working from home	16.7%	26.9
	3. Transport (company cars)	13.4%	21.6
2020/2021	1. Business travel	24.2%	43.7
	2. Staff Commuting & Working from home	20.1%	36.3
	3. Transport (company cars)	15.2%	27.4
2021/2022	1. Staff Commuting & Working from home	28.0%	55.0
	2. Electricity	17.2%	33.8
	3. ILT Kidzone	13.4%	26.4
2022/2023	1. Business travel	34.5%	85.0
	2. Staff Commuting & Working from home	20.6%	50.6
	3. Electricity	16.2%	39.8
2023/2024	1. Business travel	28.2%	55.1
	2. Electricity	23.9%	46.6
	3. Staff Commuting & Working from home	16.6%	32.4

Note: 2019/20: Covid 19 first lockdown, 2020/21: Covid 19 restrictions without lockdowns, ILT Kidzone was cancelled and 2021/22: Covid 19 second lockdown.

<sup>1</sup> <https://assets.education.govt.nz/public/Documents/Primary-Secondary/Property/MoE-Boiler-Replacement-Programme-Timeline-July-PCG.pdf>

## Main recommendations

To be carbon neutral organisation by 2026, it's important to emphasise that we cannot achieve this on our own. Even with our best efforts, the maximum reduction we can achieve is estimated to be **119 tonnes by June 2026**. Therefore, to reach neutrality, we will need to offset the remaining emissions.

Scope 1: Direct emissions from the combustion of petrol in vehicles.

- Electric cars: Replace *Travis-Toyota RAV4 (NVE819)* and *Niro-Kia Niro (NFY390)* with electric vehicles (EVs) with a range of 400 to 420 km.

Scope 2: Emissions from purchased electricity.

- Carbon neutral provider: Change electricity provider to Ecotricity or similar. By doing this we can claim our emissions from electricity as zero. Or:
- Renewable Energy Certificates (RECs): GS and SO keep current providers Contact - Meridian and buy RECs.

Scope 3: Indirect emissions that we do not fully control but we can influence.

- Travel policy: Set out a budget for flight travel per business unit and SO and define a process for approving flights.
- Board flights: Increase the number of online board meetings a year.

## Reduction Targets

GS is committed to managing and reducing its emissions in accordance with Te Ara Toitū – GS's Sustainability Plan. Based on a 1.5-degree scenario<sup>2</sup> of global warming, GS commits **by 2026** to:

- **Reduce Scope 1 emissions 81%** from a 2018 base year.
- **Reduce Scope 2 emissions 100%** by purchasing electricity from a carbon neutral provider or RECs\*.
- **Reduce Scope 3 emissions 50%** from a 2018 base year.

\*Renewable Energy Certificates- Certificate of origin for electricity from a renewable source

Table 3 Summary of reduction targets for each scope

Emissions (tCO <sub>2</sub> e)	Most recent year (2023/24)	Reduction by target year	Remaining carbon footprint	Interim year (June 2025)	Target year (June 2026)
<b>Scope 1</b>	16	-6	10	15	10
<b>Scope 2</b>	45	-45	0	50	0
<b>Scope 3</b>	132	-23	109	125	109
<b>Total</b>	<b>193</b>	<b>-74</b>	<b>119</b>	<b>190</b>	<b>119</b>

<sup>2</sup> A 1.5-degree scenario refers to a set of strategies and pathways aimed at limiting global warming to 1.5 degrees Celsius above pre-industrial levels, as outlined in the Paris Agreement.

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## Acronyms and Abbreviations

AR5	IPCC's fifth assessment report
CH <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
Electricity T&D losses	Electricity Transmission and distribution losses
EV	Electric Vehicle
FTE	Full-time equivalent Staff
FY	Financial Year
GHG	Greenhouse Gas
GS	Great South, Southland Regional Development Agency
GWP	Global Warming Potential
HEV	Hybrid Electric Vehicle
IPCC	Intergovernmental Panel on Climate Change
NZECS	New Zealand Certificate System
PHEV	Plug-in Hybrid Electric Vehicle
REC	Renewable Energy Certificate – Certificate of origin for electricity from a renewable source
SGHS	Southland Girls High School
T&D	Transmission and Distribution losses from purchased electricity
WFH	Working from home
WTT	Well-To-Tank, all greenhouse gas emissions from the production, transportation, transformation, and distribution of the fuel used

## Introduction

This is Great South's (GS) fifth greenhouse gas (GHG) emissions inventory report, measuring GHG emissions from activities during the 2023/24 Financial Year (FY). It aims to share the progress GS has made towards reaching its goal of becoming carbon neutral by 2026 and becoming a low waste and water hero.

GS was established as Southland's regional development agency in March 2019 and is responsible for economic development and promotion of the Murihiku Southland region. Its vision is 'even better lives through sustainable regional development.'

GS is a council-controlled organisation, with eight shareholders (Invercargill City Council, Southland District Council, Gore District Council, Environment Southland, Invercargill Licensing Trust, Maitaia Licensing Trust, Southland Chamber of Commerce and Southern Institute of Technology/Te Pūkenga) and member company, Community Trust South. GS is governed by an independent Board of Directors and has a memorandum of understanding with all four Murihiku Papatipu Rūnaka. GS receives funding from its shareholding councils to cover operational and core costs in line with agreed KPIs, Central Government agencies who contract GS to perform specific services, as well as private sector partners.

## Statement of Intent

Great South's Statement of Intent 2024–2027 key priorities are:

1. Regional development leadership
2. Regional promotion
3. Business support and diversification
4. Net Zero Southland

Within the Net Zero Southland priority, its goals are to

- Encourage low impact industry
- Monitor emissions
- Sustainable tourism destination management
- Energy planning

Intended users of this report include or will include, but are not limited to:

- Great South staff
- Great South shareholders
- General public

## Persons responsible

Responsibility for the preparation of the inventory and report:

- Sustainability Planner
- Strategic Projects Engineer

Responsibility for reduction performance as well as reporting results to the Chief Executive

- Sustainability Committee

Assisting with background data and supporting information:

- GM Finance, IT and Facilities
- Conference and Events Manager
- Front Desk Administrator
- Visit Fiordland Manager

Responsibility for an impartial review of the greenhouse gas calculations

- Ekos Kamahi Limited

The GS emissions inventory will be included as an agenda at the GS Sustainability Committee meetings. These meetings will have at least one representative per business unit. Emissions performance and related projects will be reviewed along with follow-up actions, as and when required to ensure the organisation is on track for meeting our emissions performance targets (Table 2).

## Staff Engagement

In June 2023 Te Ara Toitū –Sustainability Plan was launched. The Committee’s role includes the full implementation of the plan and empowering GS to take positive action towards carbon neutrality and minimise its environmental impact. Great South’s sustainability goals are:

1. Integrate environmental sustainability consideration in all we do
2. Be a carbon neutral organisation by 2026<sup>3</sup>
3. Reduce waste and water consumption

Each goal has specific actions and KPIs that are intended to be achieved during the financial year. GS’s staff are kept informed about our emissions reduction commitments through monthly general meetings, the company intranet, and the introduction of environmental awareness sessions.

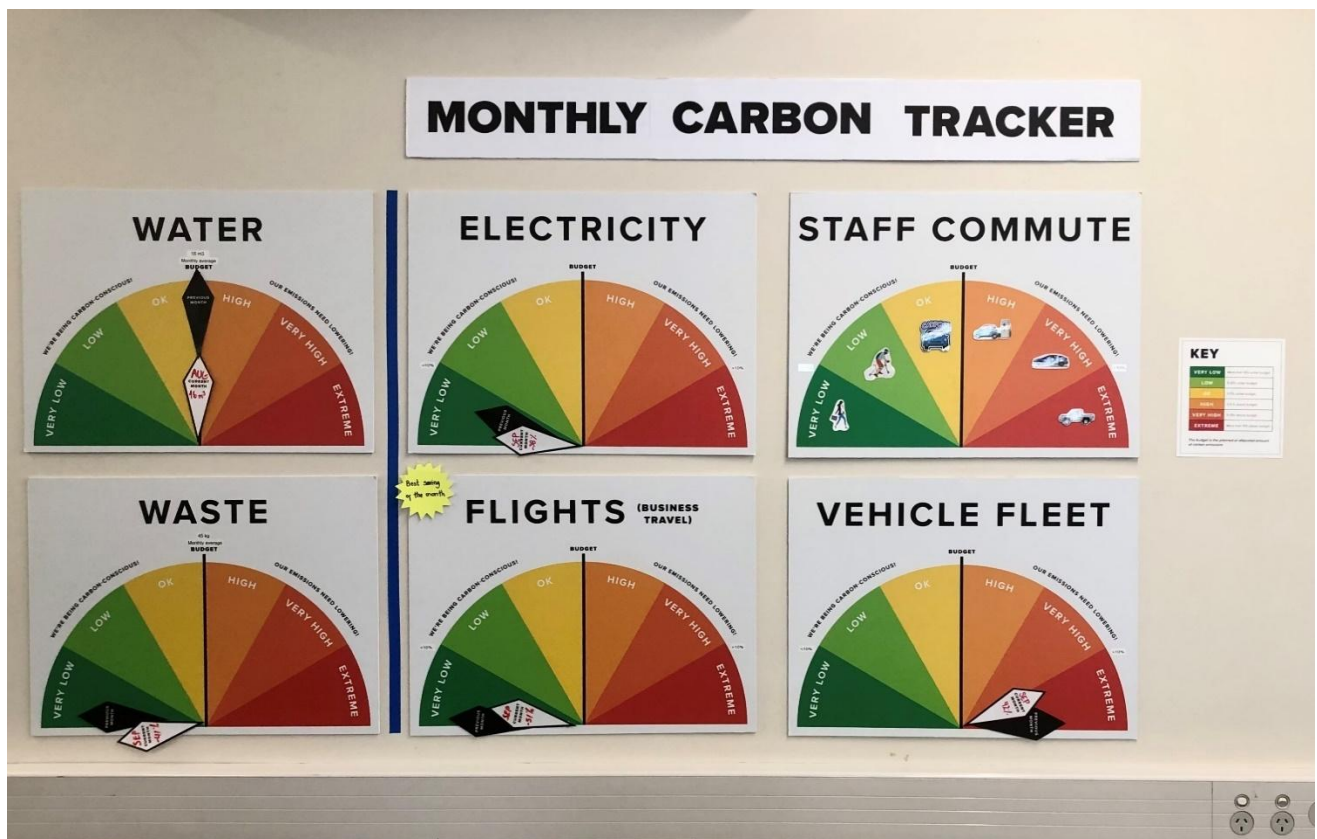


Figure 3 Monthly carbon tracker for staff engagement display in Spey Street office

The Great South Board receives regular update reports on the progress of the Te Ara Toitū plan to approve recommendations for its implementation.

## Methodology

This GHG inventory was prepared in accordance with the international Standards for calculating GHG emissions. The standards followed are the World Resource Institute’s ‘Greenhouse gas protocol: A corporate accounting and reporting standard’ (GHG Protocol) and ISO 14064-1:2018 ‘Specification with guidance at the

<sup>3</sup> On 6 Aug 2024 the Board decided to defer the carbon neutral goal to 2026 instead of 2025.

organisation level for quantification and reporting of GHG emissions and removals. In measuring this inventory, the five principles of ISO 14064-1:2018 were strictly applied.

Emissions factors were obtained from the Ministry for the Environment’s ‘2024 Emission Factors Workbook’ and UK government’s ‘Greenhouse gas reporting: conversion factors 2024’. The methodology used in measuring GS’s organisational GHG inventory is illustrated in the following diagram:

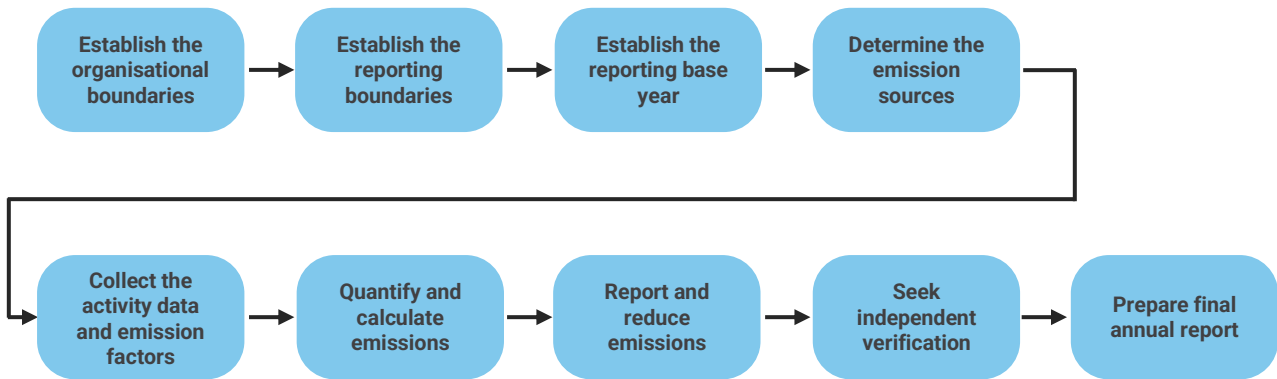


Figure 4 Emission Inventory Process Diagram

### Organisational boundary

Organisational boundaries were set with reference to the methodology described in the ISO 14064-1:2018 and the GHG Protocol 2004. The standard allows two distinct approaches to be used to consolidate GHG emissions: the equity share or control (either financial or operational) approaches<sup>4</sup>.

An operational control approach was used to account for emissions. This consolidation approach aligns with our intended users. In particular, it is considered to be more effective at reflecting our carbon risk exposure across the subsidiaries in which we have 100% ownership (Space Ops), but no financial control. Figure 4 shows the organisational structure of Great South.

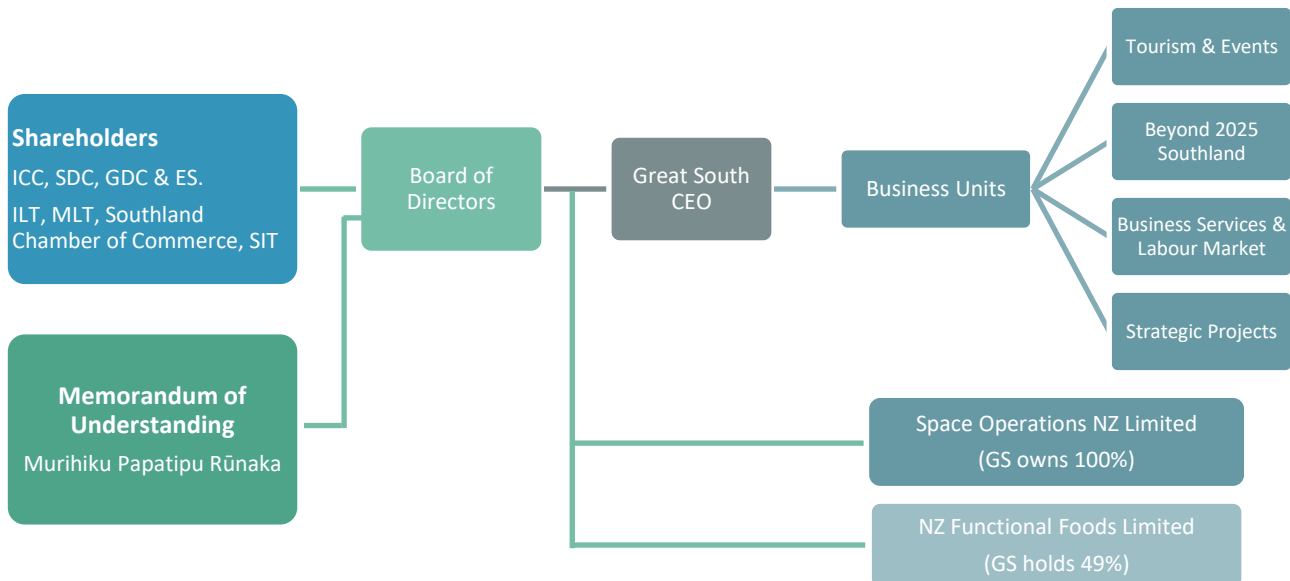


Figure 5 Southland Regional Development Agency Limited (trading as Great South) organisational structure

<sup>4</sup>Control: the organisation accounts for all GHG emissions and/or removals from facilities over which it has financial or operational control. Equity share: the organisation accounts for its portion of GHG emissions and/or removals from respective facilities.

## Physical operational sites

A storage unit at 115 Clyde Street, Invercargill only uses lights. As power consumption data is not available, it is excluded from this inventory. GS has a 49% share in NZ Functional Foods and this facility is excluded under the control approach. The table below shows what physical sites have been included in the context of the entire organisational profile.

Table 3 Brief description of the structure (physical operational sites) included in this emission inventory.

Physical operational sites	Location	Description
Spey Street office	143 Spey Street, Invercargill 9810	Great South Head Office accommodates most staff. Two storey building, with an approximate floor area 760m <sup>2</sup> – 450m <sup>2</sup> on the first floor and 310m <sup>2</sup> on the ground floor. There are 4 meeting rooms and a board room, 2 kitchens, 2 bathrooms and 2 EV charging stations.
Te Anau office	116 Town Centre, Te Anau 9600	GS took acquired this office on April 1, 2021. The upper floor is 200m <sup>2</sup> , with open plan office space, separated offices/meeting rooms, and one kitchenette and bathroom.
ILT Kidzone	328 Tweed Street, Invercargill 9812	Annual event run by GS held over five days in July 2023 at SGHS.
Hargest House (Space Ops office)	62 Deveron Street, Invercargill 9810	Space Ops NZ head office. 98m <sup>2</sup> , 50% open plan and 4 office spaces, 1 office is sub leased to a customer, one kitchen and shared use of toilets with the other tenants on the floor.
Awarua Satellite Ground Station (Satellite ground and radio tracking Space Ops)	781 Colyer Road, Awarua, Invercargill	Awarua Station operates antenna and electronics for both clients and SO. 31 hectares, 14 hectares is native vegetation, property with a 100m <sup>2</sup> control centre (office and IT systems), a 17m <sup>2</sup> generator shed and 40 plus antennas.
Warkworth Space Centre	121 Satellite Station Road, Warkworth, Auckland 0983	54 hectares, consisting of 2 buildings 1X1300m <sup>2</sup> and 1X20ft container @ 46m <sup>2</sup> , Both building house Office and IT equipment. Warkworth has 1 generator and 2 antennas, 1X30m housed on the 1300m <sup>2</sup> building and a 12m separately on a hill.

GS (including Space Ops) has eleven company cars and five physical sites, Spey St office, Te Anau office, Hargest House (Space Ops office), Awarua Satellite Ground Station, Warkworth Space Centre, and runs one main annual event – the ILT Kidzone event currently held at Southland Girls High School (SGHS).

- The above operational sites are included in the report with the main variation being the addition of the Warkworth Ground Station facility in Auckland.

## Scope and Approach

As adapted from the GHG Protocol 2004, the emissions sources included in this inventory were classified into the following scopes.

- Scope 1: Direct GHG emissions from sources that are owned or controlled by the company. For example, emissions from combustion of fuel in vehicles owned or controlled by the organisation.
- Scope 2: Indirect GHG emissions (in the form of electricity, heat, or steam) from the generation of purchased energy that the organisation uses.
- Scope 3: Indirect GHG emissions that occur because of the company's activities but from sources not owned or controlled by the company. For example, air travel and staff commuting.

## Reporting Period

Base year measurement period: 01/07/2018 to 30/06/2019. This base year period was selected because it represents the first year in which we have access to a materially complete set of data records for forming the inventory. A financial year was chosen to align to our annual reporting cycles.

Measurement period of this report: 01/07/2023 – 30/06/2024. The frequency of reporting will be annual.

## GHG Information Management and monitoring procedures

GS is responsible for appropriate document retention, archiving, and record keeping for each emissions source. Ekos<sup>5</sup> annual review requirement is in place to ensure any errors and emissions in the GHG inventory report are addressed.

## Recalculation Policy

GS uses 2018/19 as baseline year. To accurately track progress towards carbon reduction targets, the base year emissions inventory will be adjusted for significant changes (>5% emission increase/decrease). Additionally, recalculations may occur for changes <5% if organisational structure changes occur.

**Organisational structure changes:** Including acquisition, divestment, mergers and permanent closures of business or facilities that existed during 2018/19.

**Methodology changes:** Include updated emission factors, improved data access/updated calculation methods or protocols, and the Global Warming Potential (GWP)<sup>6</sup>.

**Other changes:** We will recalculate our emissions if we discover a significant error resulting in an increase or decrease of more than 5%, if there are multiple cumulative errors, or if there is a change in our organisational<sup>7</sup> or operational boundaries<sup>8</sup>.

## Historical Recalculation

As the accumulated errors for 2021/22 FY exceeded 5%, recalculation has been conducted for 2021/22 FY in this report. The biggest changes after recalculation, occurred in three sectors: electricity use, business travel, and staff commuting.

- Electricity Used
  - As 11 electricity invoices were missing and those data were not applied, it was modified by adding the missing data which is 55,060 kWh in total.
- Business travel
  - NZ Functional Foods' business travels that had been previously included, were excluded (it should've been excluded under the control approach).
  - Three duplicated hotel stays were found and deleted.
- Staff commute
  - Since the annual FTE for staff commute was double counted, it was corrected.

Please refer to the Appendix 6: Recalculation for 2021/22 FY for details of the recalculation.

## Changes to methodology to FY 2022/23

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<sup>5</sup> Ekos Kamahi Limited is GS'S preferred supplier, as carbon certification company.

<sup>6</sup> All greenhouse gases (GHGs) in this report are reported in CO<sub>2</sub>e using Global Warming Potential (GWP100) values from the IPCC Fifth Assessment Report (AR5).

<sup>7</sup> Organisational boundary defines whether to account for GHG emissions by equity share or financial control.

<sup>8</sup> Operational boundary defines the scope of direct (Scope 1) and indirect emissions (Scope 2, Scope 3) for operations that fall within a company's established organisational boundary (WRI, 2004).

The electricity consumption of the Hargest House office was estimated and added using the electricity consumption per FTE from the Spey St. office and the Te Anau office.

# Results

This section includes historical recalculations and details the 2023/24 emissions profile by scope and emissions sector, and changes from baseline.

## Overview of Emissions

Total emissions came to **195.3** tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e). Scope 3 is the largest contributor to the total emissions for GS (68%), primarily from business travel and staff commute. There has been a 31% reduction in total emissions. In the 2022/23 FY, emissions from business travel increased significantly as Covid-19 restrictions ended, but this year, the emissions decreased significantly due to the efforts of employees by replacing their meetings with video meetings. Emissions intensity per full time employee was 4.28 tCO<sub>2</sub>e.

Table 4 Summary emissions (tCO<sub>2</sub>e) by scope and category

Scope	Emissions category	2018/19 Base year	2019/20	2020/21	2021/22	2022/23	2023/24	
1	<b>(1) Direct GHG Emissions</b>	<b>53.5</b>	<b>35.5</b>	<b>49.4</b>	<b>26.5</b>	<b>18.4</b>	<b>16.3</b>	
	Great South	53.2	35.2	49.2	25.0	13.5	13.3	
	Space Ops	0.3	0.2	0.2	1.5	4.9	3.0	
2	<b>(2) Indirect GHG Emissions from Imported Energy</b>	<b>10.6</b>	<b>15.3</b>	<b>19.5</b>	<b>33.8</b>	<b>39.8</b>	<b>46.6</b>	
	Great South	5.2	6.6	6.8	5.5	4.4	4.7	
	Space Ops	5.4	8.7	12.7	28.3	35.5	41.9	
3	<b>(3) Indirect GHG Emissions from Transportation &amp; Distribution</b>	<b>155.5</b>	<b>66.2</b>	<b>80.1</b>	<b>75.2</b>	<b>135.6</b>	<b>88.3</b>	
	Great South	144.7	56.5	77.8	68.6	97.1	61.6	
	Space Ops	10.8	9.7	2.2	6.6	38.5	26.7	
	<b>(4) Indirect GHG Emissions from products &amp; services used by the organisation</b>	<b>62.7</b>	<b>44.5</b>	<b>31.7</b>	<b>60.5</b>	<b>52.2</b>	<b>44.1</b>	
	Great South	60.4	42.1	30.1	56.5	40.4	35.6	
	Space Ops	2.3	2.4	1.5	4.0	11.8	8.5	
	<b>(5) Indirect GHG Emissions from the use of the Organisations Products</b>	-	-	-	-	-	-	
	<b>(6) Indirect GHG Emissions from other sources</b>	-	-	-	-	-	-	
	<b>Total Gross emissions (Location Based)</b>		<b>282.2</b>	<b>161.4</b>	<b>180.6</b>	<b>196.0</b>	<b>246.0</b>	<b>195.3</b>
	Great South	264.3	140.3	163.9	155.6	155.4	115.1	
Space Ops	18.8	21.1	16.7	40.4	90.7	80.3		
GHG removals / sinks		-	-	-	-	-	-	
Purchased credits / Pre-offset (Location Based)		-	-	-	-	-	-	
<b>Total Net GHG emissions (Location Based)</b>		<b>282.2</b>	<b>161.4</b>	<b>180.6</b>	<b>196.0</b>	<b>246.0</b>	<b>195.3</b>	
Great South	264.3	140.3	163.9	155.6	155.4	115.1		
Space Ops	18.8	21.1	16.7	40.4	90.7	80.3		
Full Time Equivalent Employee (FTE)		43.0	33.0	39.5	43.9	39.5*	45.6	
Gross revenue		\$4.4m**	\$4.4m	\$7.7m	\$9.3m	\$9.5m	\$8.8m	
<b>Emissions intensity (tCO<sub>2</sub>e per FTE per annum)</b>		<b>6.56</b>	<b>4.89</b>	<b>4.57</b>	<b>4.47</b>	<b>6.23</b>	<b>4.28</b>	
<b>Emissions intensity (tCO<sub>2</sub>e per \$1m revenue per annum)</b>		<b>64.1</b>	<b>36.6</b>	<b>23.6</b>	<b>21.2</b>	<b>26.0</b>	<b>22.6</b>	

Note: Due to rounding, the numbers in the above table will not add correctly to give the total.

\*FTE is adjusted from 43 to 39.5.

\*\*As Great South was established in March 2019, there was no revenue for 2018/19 FY. However, for comparison, the same revenue as in 2019/20 was applied in 2018/19 FY.

Meaningful changes over the five years since the 2018/19 baseline inventory are the decrease in Scope 1, the increase in Scope 2 every year, and the decrease in Scope 3 between 2019/20 and 2021/22 due to the Covid-19 restrictions.

The noticeable changes during the reporting period include the increase in emissions from Space Operations NZ, which is experiencing significant growth, and the addition of the Warkworth Ground Station site in Auckland. Details of these noticeable changes will be addressed in each sector.

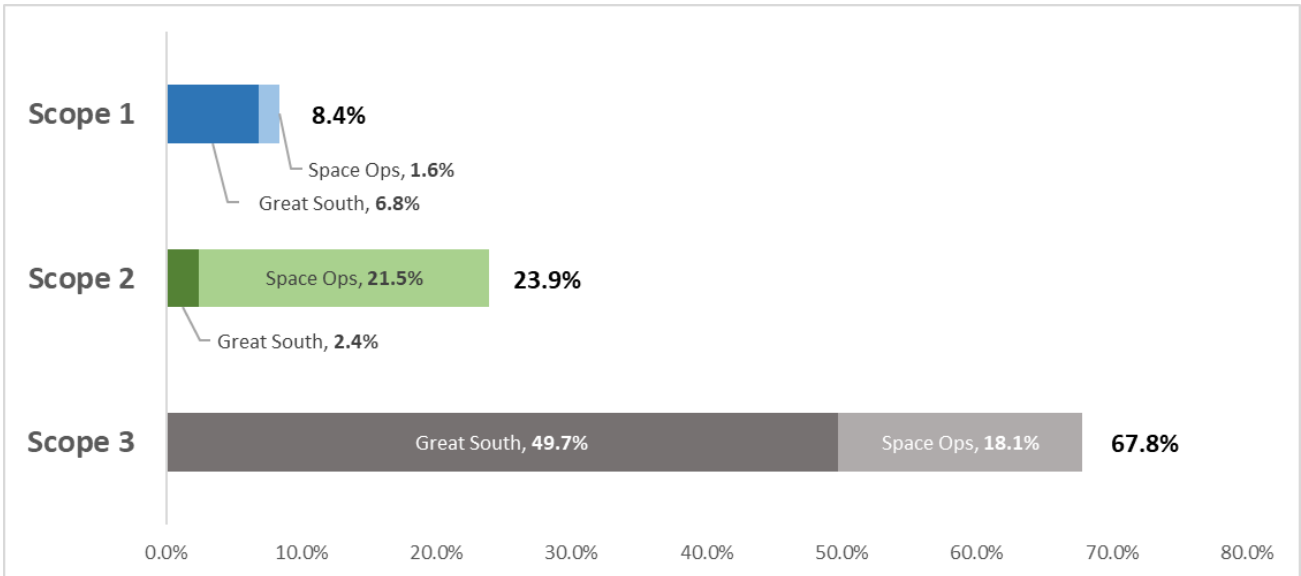


Figure 6 Emissions by scopes for this measurement period FY 2023-2024

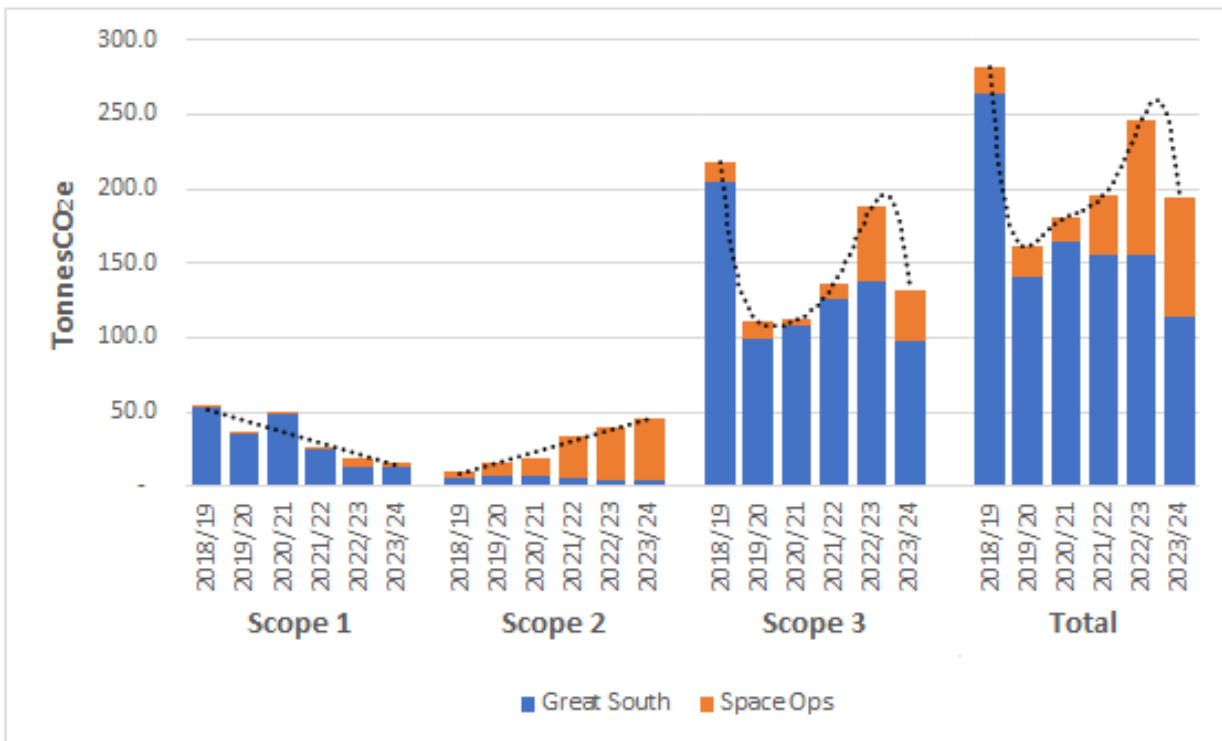


Figure 7 Summary of historical emissions inventories by scope

## Scope 1

Scope 1 emissions represented **8.4%** of total emissions in 2023/24 (16.3 tCO<sub>2</sub>e), the lowest contributor to organisational emissions. The sole source of emissions was transport fuel.

Table 5 Scope 1 emissions by sector (tCO<sub>2</sub>e)

Sector	2018/19 Base year	2019/20	2020/21	2021/22	2022/23	2023/24
<b>Stationary fuel</b>	<b>20.2</b>	<b>13.8</b>	<b>21.8</b>	<b>3.7</b>	-	-
Great South	19.9	13.6	21.6	3.7	-	-
Space Ops	0.3	0.2	0.2	-	-	-
<b>Transport fuel</b>	<b>33.1</b>	<b>21.6</b>	<b>27.4</b>	<b>22.8</b>	<b>18.4</b>	<b>16.3</b>
Great South	33.1	21.6	27.4	21.3	13.5	13.3
Space Ops*	-	-	-	1.5	4.9	3.0
<b>Refrigerants</b>	<b>0.2</b>	-	<b>0.2</b>	<b>0.02</b>	-	-
<b>Total</b>	<b>53.5</b>	<b>35.5</b>	<b>49.4</b>	<b>26.5</b>	<b>18.4</b>	<b>16.3</b>
Great South	53.2	35.2	49.2	25.0	13.5	13.3
Space Ops	0.3	0.2	0.2	1.5	4.9	3.0

Note: Due to rounding, the numbers in the above table will not add correctly to give the total.

\*There is no separate data for the first three years.

Emissions from the stationary fuel reached zero after replacing the diesel boiler with heat pumps and electric heaters in August 2022. Since 2018/19, the emissions from transport fuel decreased by 16.8 tCO<sub>2</sub>e or 50.7% over the past six years by replacing petrol and diesel vehicles with hybrid and plug-in hybrid vehicles. Refrigerant emissions are negligible. The total emission under Scope 1 decreased by 37.2 tCO<sub>2</sub>e or 69.5% since baseline.

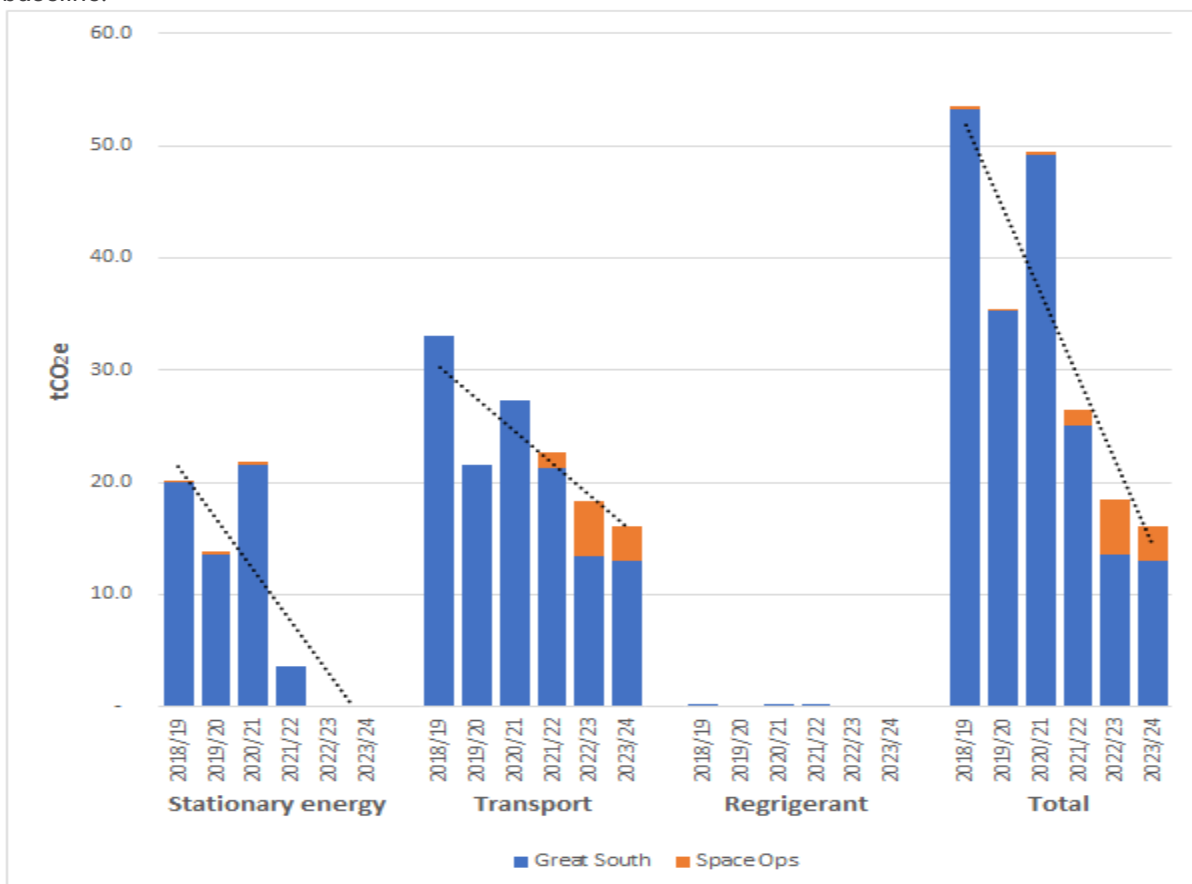


Figure 8 Scope 1 emissions by sector (tCO<sub>2</sub>e)

## Scope 2

Scope 2 emissions represented 23.9% of total emissions in 2023/24 (45.3 tCO<sub>2</sub>e), mainly from electricity used in Awarua and Warkworth satellite ground station.

Electricity emissions have consistently increased every year due to Space Ops NZ's business growth, with the addition of the Warkworth Ground Station site in Auckland this year further contributing to this rise. However, the growth rate is on the decline. A breakdown of the emissions generated by business is provided in the table below.

Table 6 Scope 2 emissions (electricity) by business (tCO<sub>2</sub>e)

Business	2018/19 Base year	2019/20	2020/21	2021/22	2022/23	2023/24
Great South	5.2	6.6	6.8	5.5	4.4	4.7
Space Ops	5.4	8.7	12.7	28.3	35.5	41.9
<b>Total</b>	<b>10.6</b>	<b>15.3</b>	<b>19.5</b>	<b>33.8</b>	<b>39.8</b>	<b>46.6</b>

Note: Due to rounding, the numbers in the above table will not add correctly to give the total.

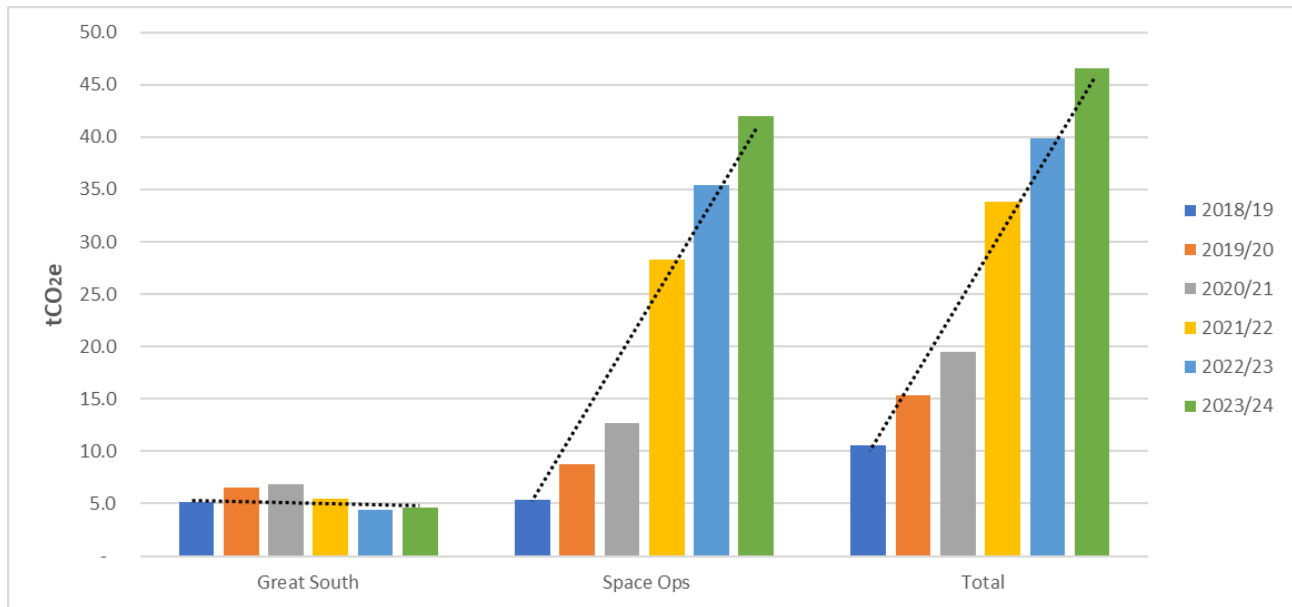


Figure 9 Scope 2 emissions (electricity) by business (tCO<sub>2</sub>e)

## Scope 3

Scope 3 accounted for 67.8% of the 2023/24 emissions (132.4 tCO<sub>2</sub>e), with business travel as the largest contributor at 28.2% of the total emissions. Staff commute & WFH contributes 16.6%. A breakdown of the emissions generated by sector under Scope 3 is provided in the table below.

Table 7 Scope 3 emissions by sector (tCO<sub>2</sub>e)

Sector		2018/19 Base year	2019/20	2020/21	2021/22	2022/23	2023/24
<b>Business travel</b>		<b>116.9</b>	<b>39.3</b>	<b>43.7</b>	<b>20.0</b>	<b>85.0</b>	<b>55.1</b>
Great South	Great South	106.1	29.5	41.5	19.6	51.8	35.4
	Domestic flights	63.4	27.9	40.1	17.2	41.1	32.0
	International flights	36.7	0.7	-	1.3	9.0	2.1
	Hotel stay+Rental&Personal car	6.1	1.0	1.3	1.1	1.7	1.3
	Space Ops	10.8	9.7	2.2	0.4	33.2	19.7
	Domestic flights	2.2	1.9	2.2	0.4	4.1	7.2
	International flights	8.6	7.6	-	-	27.3	10.1
	Hotel stay+Rental&Personal car	-	0.2	0.04	-	1.8	2.4
<b>Staff commute &amp; WFH</b>		<b>38.6</b>	<b>26.9</b>	<b>36.3</b>	<b>55.0</b>	<b>50.6</b>	<b>32.4</b>
Great South	Great South	38.6	26.9	36.3	48.7	45.3	25.4
	Space Ops*	-	-	-	6.3	5.3	7.0
<b>Kidzone event</b>		<b>15.4</b>	<b>15.2</b>	<b>-</b>	<b>26.4</b>	<b>13.4</b>	<b>16.8</b>
<b>Electricity T&amp;D losses</b>		<b>0.9</b>	<b>1.4</b>	<b>1.8</b>	<b>2.6</b>	<b>4.6</b>	<b>3.4</b>
Great South	Great South	0.4	0.6	0.6	0.4	0.5	0.3
	Space Ops	0.5	0.8	1.1	2.2	4.1	3.1
<b>Waste, wastewater, and water supply</b>		<b>3.0</b>	<b>3.2</b>	<b>3.5</b>	<b>4.7</b>	<b>2.5</b>	<b>1.0</b>
<b>Freight</b>		<b>0.02</b>	<b>0.01</b>	<b>0.04</b>	<b>0.29</b>	<b>0.05</b>	<b>0.84</b>
<b>WTT**</b>		<b>43.4</b>	<b>24.6</b>	<b>26.4</b>	<b>26.9</b>	<b>31.6</b>	<b>22.9</b>
Great South	Great South	41.6	23.0	26.0	25.1	24.0	17.4
	Space Ops	1.8	1.6	0.4	1.8	7.7	5.5
<b>Total</b>		<b>218.1</b>	<b>110.7</b>	<b>111.7</b>	<b>135.8</b>	<b>187.8</b>	<b>132.4</b>
Great South	Great South	205.0	98.5	107.9	125.1	137.5	97.1
	Space Ops	13.1	12.2	3.8	10.6	50.3	35.3

Note: Due to rounding, the numbers in the above table will not add correctly to give the total.

\*There is no separate data for the first three years.

\*\*Well-To-Tank: all greenhouse gas emissions from the production, transportation, transformation, and distribution of the fuel used.

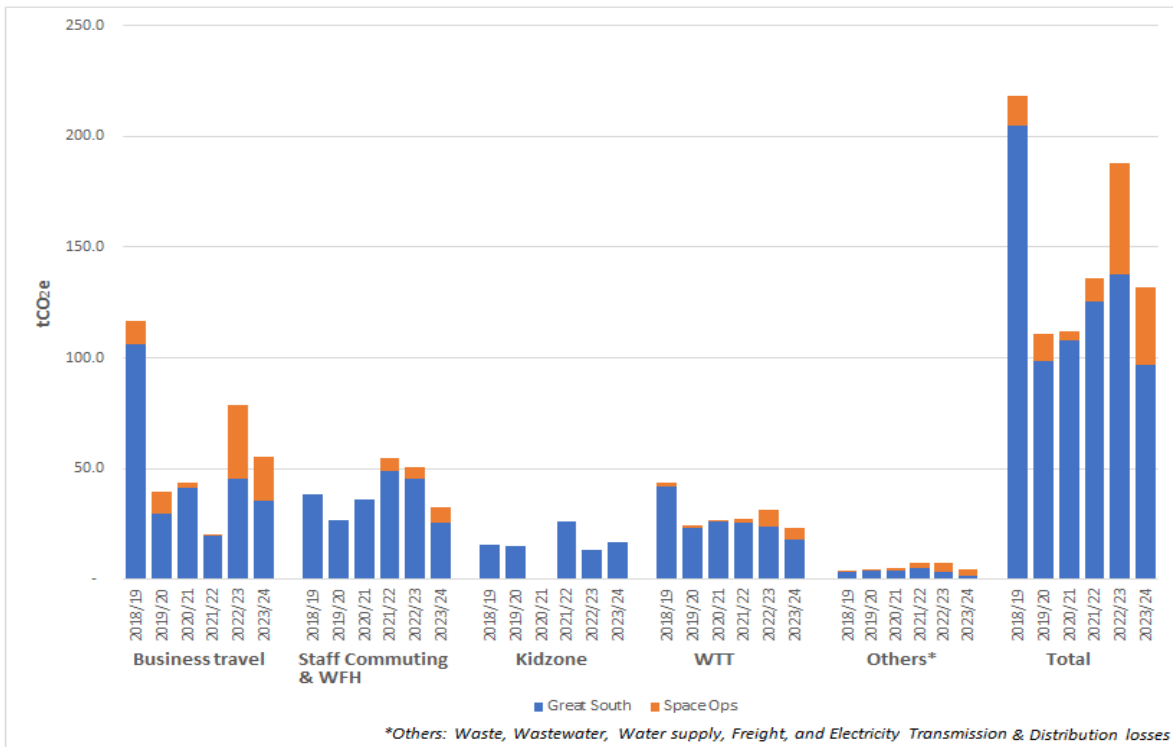
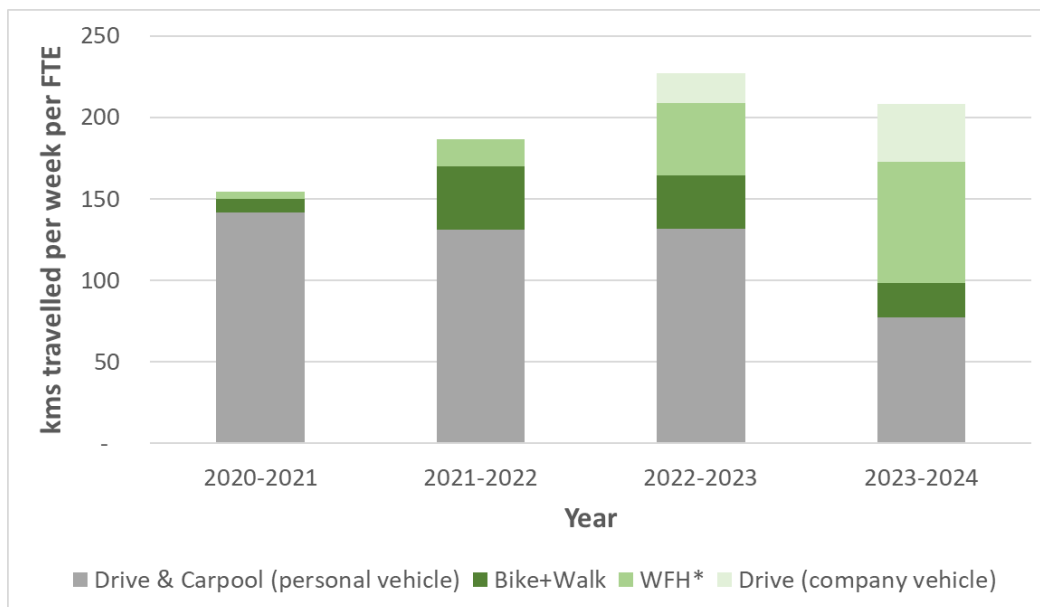


Figure 10 Scope 3 emissions by sector (tCO<sub>2</sub>e)

For the first time since Covid-19 restrictions ended, emissions from Business travel have decreased. This is a 35% or 29.9 tCO<sub>2</sub>e decrease from the previous year and a 53% or 61.8 tCO<sub>2</sub>e decrease from the base year.



\*Working From Home: there is no travel for WFH, but to show the effect of it, the travel distance avoided by WFH was added.

Figure 11 Staff commute (kms travelled per week per FTE)

Staff commuting surveys have been conducted four times since the base year. Commuting means include Drives, Carpools, Walks, Bikes, and WFH, of which only Drives and Carpools emit greenhouse gases. In case company vehicles are used for commute, the emissions are included to the Transport sector in Scope 1, and only if personal vehicles are used for it, it is included under the Staff commute sector. In the graph above, the grey columns represent Drive and Carpool using personal vehicles. Total kms travelled for this year is the second highest after the previous year but Drives and Carpools using personal vehicles are the lowest. This is due to a significant decrease in kms travelled as the WFH days increased. Emissions from the Staff commute have been decreased by 36% or 18.2 tCO<sub>2</sub>e compared to the previous year and 16% or 6.2 CO<sub>2</sub>e compared to the base year.

Kidzone event emissions are mainly from coal boilers. However, SGHS, the venue of the event, will replace the boilers with wood pellet boilers by September 2024<sup>9</sup>, which is expected to reduce the emissions from this sector by about 84% from 2025/26.

WTT is the third largest contributor to organisational emissions under Scope 3. If emissions from other sectors decrease, WTT emission will decrease accordingly. A breakdown of the WTT emissions generated by sector is provided in table 8.

Table 8 WTT emissions by sector (tCO<sub>2</sub>e)

Sector	2018/19 Base year	2019/20	2020/21	2021/22	2022/23	2023/24
<b>Business travel</b>	<b>18.0</b>	<b>6.2</b>	<b>6.8</b>	<b>3.3</b>	<b>13.3</b>	<b>9.3</b>
Great South	16.2	4.6	6.5	3.2	8.0	6.0
Space Ops	1.8	1.6	0.3	0.1	5.3	3.3
<b>Staff commute</b>	<b>8.5</b>	<b>5.8</b>	<b>8.0</b>	<b>12.1</b>	<b>11.0</b>	<b>6.5</b>
Great South	8.5	5.8	8.0	10.7	9.8	5.1
Space Ops*	-	-	-	1.4	1.1	1.4
<b>Transport fuel</b>	<b>8.0</b>	<b>5.2</b>	<b>6.6</b>	<b>5.7</b>	<b>4.6</b>	<b>4.2</b>
Great South	8.0	5.2	6.6	5.3	3.3	3.4
Space Ops*	-	-	-	0.4	1.2	0.8
<b>Stationary fuel</b>	<b>4.7</b>	<b>3.2</b>	<b>5.1</b>	<b>0.9</b>	-	-
Great South	4.6	3.2	5.0	0.9	-	-
Space Ops	0.1	0.1	0.05	-	-	-
<b>Kidzone event</b>	<b>4.3</b>	<b>4.3</b>	-	<b>5.0</b>	<b>2.8</b>	<b>2.9</b>
<b>Freight</b>	<b>0.005</b>	<b>0.002</b>	<b>0.013</b>	<b>0.031</b>	<b>0.008</b>	<b>0.057</b>
<b>Total</b>	<b>43.4</b>	<b>24.6</b>	<b>26.4</b>	<b>26.9</b>	<b>31.6</b>	<b>22.9</b>
Great South	41.6	23.0	26.0	25.1	24.0	17.4
Space Ops	1.8	1.6	0.4	1.8	7.7	5.5

Note: Due to rounding, the numbers in the above table will not add correctly to give the total.

\*There is no separate data for the first three years.

<sup>9</sup> <https://assets.education.govt.nz/public/Documents/Primary-Secondary/Property/MoE-Boiler-Replacement-Programme-Timeline-July-PCG.pdf>

## Emissions Intensity

### Per Full time Equivalent Employee (FTE)

Emissions per FTE decreased by 35% compared to the baseline year. Using FTEs as a unit of measurement for business activity ensures that increased activity, like more business travel, is not penalised when calculating emissions or making comparisons across organisations of varying sizes.

While FTEs affect emissions in areas such as wastewater and travel, some categories remain unchanged even given FTE fluctuations – such as electricity or building heating. Therefore, an increase in FTEs is expected to reduce emission per FTEs, as the fixed emissions are shared across more employees.



Figure 12 Summary of Great South's emissions per FTE over time, overlaid with actual FTEs reported in those periods.

### Per revenue

For every \$1,000,000 of revenue earned in the reporting period 22.6 tCO<sub>2</sub>e were emitted. Based on \$ 8,767,765 gross revenue, 2024 Annual Report.

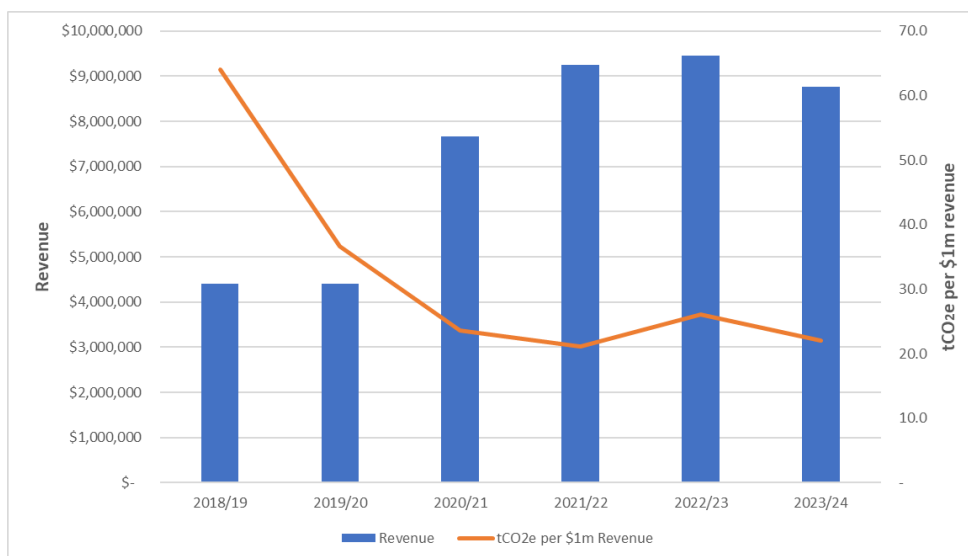


Figure 13 Summary of Great South's emissions per FTE over time, overlaid with actual FTEs reported in those periods.

As Great South was established in March 2019, there was no revenue for 2018/19 FY. However, for comparison, the same revenue as in 2019/20 was applied in 2018/19 FY.

## Reduction Plan

Based on a 1.5-degree scenario<sup>10</sup> of global warming, GS commits **by 2026** to:

- **Reduce Scope 1 emissions 81%** from a 2018 base year.
- **Reduce Scope 2 emissions 100%** by purchasing electricity from a carbon neutral provider.
- **Reduce Scope 3 emissions 50%** from a 2018 base year.

Table 9 summarises the reduction targets for each scope for both interim year and target year 2026. To be carbon neutral organisation by 2026 it's important to emphasise that we cannot achieve this on our own. Even with our best efforts, the maximum reduction we can achieve is estimated to be **119 tonnes by June 2026**. Therefore, to reach neutrality, we will need to offset the remaining emissions.

Table 9 Summary of reduction targets for each scope.

Emissions (tCO <sub>2</sub> e)	Most recent year (2023/24)	Reduction by target year	Remaining carbon footprint	Interim year (June 2025)	Target year (June 2026)
<b>Scope 1</b>	16	-6	10	15	10
<b>Scope 2</b>	45	-45	0	50	0
<b>Scope 3</b>	132	-23	109	125	109
<b>Total</b>	<b>193</b>	<b>-74</b>	<b>119</b>	<b>190</b>	<b>119</b>

## Reduction Projects

Table 10 Projects to reduce emissions.

Scope	Emission Source	Project	Responsibility	Completion date
<b>Scope 1</b>	<b>Fuel company cars</b>	<b>Electric cars:</b> Replace Travis-Toyota RAV4 (NVE819) and Niro-Kia Niro (NFY390) with electric vehicles (EVs) with a range of 400 to 420 km.	GM Corporate Services	Jun 2025
		<b>EV charger:</b> Add 2 new Wallbox Pulsar Pro EV chargers. The best and most cost-effective installation site is the west side wall where guests park, as it's closer to the current switchboard, eliminating the need for a long cable run.	GM Corporate Services	Jun 2025
<b>Scope 2</b>	<b>Electricity</b>	<b>Renewable Energy Certificates (RECs):</b> GS and SO keep current providers Contact - Meridian and buy RECs.	GM Corporate Services	Mar 2026
		<b>Airlock sheet:</b> install an airlock sheet in Spey Street building to reduce energy needed for heating the room.	GM Corporate Services	Dec 2024
<b>Scope 3</b>	<b>Air travel</b>	<b>Board flights:</b> Increase the number of online board meetings a year.	Chief Executive	Feb 2025
		<b>Travel policy:</b> Set out a budget for flight travel per business unit and SO and define a process for approving flights.	Chief Executive	Dec 2024
	<b>Waste</b>	<b>Recycling station:</b> Upgrade the recycling station with award-winning bins and automated data tracking.	GM Corporate Services	Mar 2026
		<b>Reusable cups:</b> Provide staff GS-branded reusable cups.	GM Corporate Services	Dec 2024

<sup>10</sup> A 1.5-degree scenario refers to a set of strategies and pathways aimed at limiting global warming to 1.5 degrees Celsius above pre-industrial levels, as outlined in the Paris Agreement.

## References

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# Appendix 1: Detailed GHG Inventory

Additional inventory details are disclosed in the tables below, and further GHG emissions data is available on the spreadsheet accompanying this report.

## 1. Fugitive Emissions (refrigerants)

No sites have reported any top-ups of gas for this reporting period. Air conditioning is excluded from the inventory where offices are leased.

## 2. Combustion of Biomass

No known combustion of biomass occurred from the operation during this reporting period and therefore no emissions from the combustion of biomass are included in this inventory.

## 3. Land use and Land use Change

No deforestation has been undertaken by the organisation on land it owns during this measurement period. Therefore, no emissions from deforestation are included in this inventory.

## 4. Pre-verified data

Pre-verified data is included within the inventory are as follows: Electricity from a Carbon Neutral Source for the New Zealand office.

## 5. Double counting or pre-offsets

No double counting or offsets have been used by the organisation.

Table 4 GHG emissions, quantified separately for CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, NF<sub>3</sub>, SF<sub>6</sub>, and Total (tCO<sub>2</sub>e)

Gas type	CO <sub>2</sub> (tCO <sub>2</sub> e)	CH <sub>4</sub> (tCO <sub>2</sub> e)	N <sub>2</sub> O (tCO <sub>2</sub> e)	NF <sub>3</sub> (tCO <sub>2</sub> e)	SF <sub>6</sub> (tCO <sub>2</sub> e)	HFC (tCO <sub>2</sub> e)	PFC (tCO <sub>2</sub> e)	Total (tCO <sub>2</sub> e)
Direct emissions from stationary combustion	-	-	-	-	-	-	-	-
Direct emissions from mobile combustion	16.180	0.213	0.488	-	-	-	-	16.314
Direct emissions from Refrigerants	-	-	-	-	-	-	-	-
Electricity used	43.643	1.615	0.047	-	-	-	-	45.305
Business travel	52.468	0.023	0.265	-	-	-	-	55.134*
Staff commuting & WFH	31.527	0.220	0.669					32.395
Freight	0.809	0.009	0.022					0.839
Category 8 Upstream leased assets (Kidzone event)	16.586	0.138	0.060	-	-	-	-	16.784
Electricity T&D losses	3.192	0.118	0.003	-	-	-	-	3.314
Waste, water supply & wastewater treatment	0.017	0.940	0.043	-	-	-	-	1.000
WTT	-	-	-	-	-	-	-	22.928*

Note: Due to rounding, the numbers in the above table will not add correctly to give the total.

\* As the emissions factors for the hotel stay and WTT by GHG type are not available, only total emissions from these sectors are provided, not by GHG type.

## Appendix 2: Organisational / Reporting Boundaries

### 2.1 Emission source identification method and significance criteria

The GHG emissions sources included in this inventory were identified as those required, with reference to the methodology described in the ISO 14064-1:2018 standard and the Greenhouse Gas Protocol 2004. This included personal communications with relevant staff, review of invoices and staff commuting survey.

### 2.2 Included emissions sources and activity data collection.

As adapted from the GHG Protocol 2004, the emissions sources deemed significant for inclusion in this inventory were classified into the following scopes.

- Scope 1: Direct GHG emissions from sources that are owned or controlled by the company. For example, emissions from combustion of fuel in vehicles owned or controlled by the organisation.
- Scope 2: Indirect GHG emissions (in the form of electricity, heat, or steam) from the generation of purchased energy that the organisation uses.
- Scope 3: Indirect GHG emissions that occur as a consequence of the company's activities but from sources not owned or controlled by the company. For example, air travel and staff commuting.

For the report period 2023/24 FY ISO 14064-1:2018 categories will be use.

Category 1 direct emissions

Category 1 direct removals

Category 2 indirect emissions (imported energy)

Category 3 indirect emissions (transportation & distribution)

Category 4 indirect emissions (products & services used by organisation)

Category 5 indirect emissions (use of products from the organisation)

Category 6 indirect emissions (other sources)

Table 12 Inclusions and exclusions of emissions

Emissions category & sources	Ekos rule	Include/ Exclude/ Not relevant	Data source difficult/expensive to obtain	Limited level of influence	Insignificant / de minimis
<b>Category 1) Direct GHG emissions and removals; (GHG Protocol Scope 1)</b>					
Stationary combustion	Mandatory	Exclude	NA	NA	0
Mobile combustion	Mandatory	Include	NA	NA	NA
Chemical and industrial processes	Mandatory	Not Relevant	NA	NA	NA
Fugitive emissions	Mandatory	Include	NA	NA	NA
Land use and Land Use changes	Mandatory	Exclude	NA	NA	0
<b>Category 2) Indirect GHG emissions from imported energy; (GHG Protocol Scope 2)</b>					
Purchased electricity	Mandatory	Include	NA	NA	NA
<b>Category 3) indirect GHG emissions from transportation (GHG Protocol Scope 3)</b>					
Upstream transport and distribution of goods	Mandatory	Include	NA	NA	NA
Business travel	Mandatory	Include	NA	NA	NA
Employee commuting	Non-mandatory	Include	NA	NA	NA
Downstream transport and distribution of goods	Non-mandatory	Not Relevant	NA	NA	NA
<b>Category 4) Indirect GHG emissions from products used by organization; (GHG Protocol Scope 3)</b>					
Waste generated in operations	Mandatory	Include	NA	NA	NA
Fuel and energy related activities (T & D Losses)	Mandatory	Include	NA	NA	NA
Fuel and energy related activities (WTT emissions for fuel)	Mandatory	Include	NA	NA	NA
Emissions from purchased goods	Non-mandatory	Include	NA	NA	NA
Emissions from the use of services	Non-mandatory	Exclude	NA	NA	NA
Capital goods	Non-mandatory	Not Relevant	NA	NA	NA
Upstream leased assets	Non-mandatory	Include	NA	NA	NA
<b>Category 5) Indirect GHG emissions associated with the use of products from the organization; (GHG Protocol Scope 3)</b>					
Downstream leased assets	Mandatory	Not Relevant	NA	NA	NA
Processing of the sold product	Non-mandatory	Not Relevant	NA	NA	NA
Use stage of the product	Non-mandatory	Not Relevant	NA	NA	NA
End of life stage of the product	Non-mandatory	Not Relevant	NA	NA	NA
Franchises	Non-mandatory	Not Relevant	NA	NA	NA
Investments	Non-mandatory	Not Relevant	NA	NA	NA
<b>Category 6) Indirect GHG emissions from other sources (GHG Protocol Scope 3)</b>					
Working from home – Default	Non-mandatory	Include	NA	NA	NA

## Appendix 3: Great South Financial Statements

During the 2023/24 financial year the organisation had a revenue of \$8,208,267 and an expenditure of \$8,209,081. Organisational activities can be summarised as the delivery of projects, services, and events. Most of GS's expenditure was in its staff and other expenses. The only exception to this was the events it ran.

Table 53 Summary of GS areas of work, revenue, and expenditure budget 2023/24

Areas of work	Expenditure 2023/24	Our work examples
Regional Economic Development*	\$ 2,058,898	Support Space Operations New Zealand Ltd. Support implementation of Net Zero Southland Report Develop Southland Regional Energy Strategy Support energy planning in Rakiura Stewart Island and Piopiotahi Milford Sound
Business Support Services	\$ 480,817	Administer tourism business funding. Create a marketing toolkit with video and imagery to support businesses Deliver the Southland Youth Futures programme
Regional Tourism Development	\$ 1,038,214	Destination marketing and development Tourism product development
Regional Event Delivery	\$ 1,018,833	Southlandnz.com Support key events ILT Kidzone event
<b>Total</b>	<b>\$4,596,762</b>	

## Appendix 4: Quantified Inventory of Emissions and Removals

A calculation methodology has been used for quantifying the emissions inventory based on the following calculation approach, unless otherwise stated below:

$$\text{Emissions} = \text{activity data} \times \text{emissions factor}$$

The quantification approach has not changed since the previous measurement period. All emissions were calculated using emissions factors and Global Warming Potentials provided by the MfE. Global Warming Potentials (GWP) from the IPCC fifth assessment report (AR5) are used.

## Appendix 5: GHG emission sources included in the inventory.

Emissions Sources	Scope and Category	Data Source	Data collection unit	Data quality	Uncertainty (description)
Mobile fuel	Scope 1 Category 1	Fuel card purchase data Reimbursement data	LeasePlan- Litres	High	The fuel purchased with the 'fuel card' and the fuel personally purchased and reimbursed have all been included. Mobile combustion for mowing at the Warkworth site has been excluded from this report, based on its likely de minimis contribution relative to total emissions. However, this will be monitored in future reports.
Refrigerants		Plate units. Gas type and kg	GS team- kg	Medium	Minimal use of refrigerants. Refrigerants were only reported in base year 2018/19 and when new units were purchased in 2021/22, using Method B: Screening. The Spey Street building is leased, but refrigerant units are owned.
Land Use and Land Use Changes	Scope 2 Category 2	Excluded	na	Low	These emissions are excluded, based on its likely de minimis contribution relative to total emissions. However, this will be monitored in future reports.
Electricity used		Contact Energy and Meridian invoices	GS Finance team- kWh	High	Calculated exact kWh usage from electricity invoices for Spey Street and Te Anau office, Awarua, and Warkworth. There is no electricity invoice for Hargest House.
Business travel		Orbit report. Flights, accommodation, and rental cars. Reimbursement data	GS Finance team - p.km, km, room per night	High	There may be some flights booked outside Orbit and reimbursed to staff have not been included. Additionally, there may be data gaps in the km of rental cars in Orbit Reports. When these gaps are identified, an email is sent to request additional information. And reimbursed fuel cost for personal cars has all been included.
Staff commute		Staff commute survey	GS team- km	Low-Medium	Survey carried out over a set period – provides a snapshot in time that is extrapolated to cover the whole reporting period. Staff and commuting changes will have occurred outside the survey window that are not represented.
Working from home		Staff commute survey	GS team- Days	Low	Survey carried out over a set period – provides a snapshot in time that is extrapolated to cover the whole reporting period. Staff and commuting changes will have occurred outside the survey window that are not represented.
Freight	Scope 3 Category 3	Front desk courier register	GS administration team-tkm	Low	Actual weights are not recorded, therefore estimated weights are likely to provide a somewhat inaccurate measure. Sticker may not accurately represent type/size of parcels - i.e., staff may use the wrong sticker, with the difference paid later by accounts. Incoming freight is also not captured here. Since there were no records of inward freight, a conservative approach was taken by applying twice the amount of outward freight.

Water supply and wastewater	Scope 3 Category 4	Meter reading records	GS administration team-Litres	Medium-High	Only Spey Street office water meter is read. It is estimated that 95% of the potable water becomes wastewater. There is no information of water consumption and wastage in Te Anau or Hargest House. However, this is likely to be minimal.
Transmission & distribution losses		Contact Energy and Meridian invoices	GS Finance team- kWh	High	Calculated exact kWh usage from contact receipts for Spey Street and Te Anau office, Awarua, Warkworth and Kidzone. There is no electricity invoice for Hargest House.
Waste		Waste reading records	GS administration team-Litres	High	Waste weighed each time the bins are emptied at the Spey Street and Te Anau offices. This occurs daily, every second day or weekly. Scale accuracy and correct reading are not taken into account.
Upstream leased assets		Invoice from Southland Girls High School.	GS events team-kg	Medium	Sub-bituminous coal. Kidzone. There is no electricity invoice for Southland Girls High School. Coal and electricity consumption is estimated by the facility manager.
Well-to-tank		Above data sources	GS team-tkm, pkm, km, kg, and l.	Medium	As there is no WTT emission factors for New Zealand, UK's emission factors are used. And as UK's emission factors for overseas electricity are not available, WTT emissions for electricity and electricity T&D losses are not calculated. When WTT emission factors for electricity and electricity T&D losses are available, it will be calculated.

# Appendix 6: Recalculation for 2021/22 FY

## 6.1 Activity data

- Electricity Used
  - As 11 electricity invoices were missing and those data were not applied, it was modified adding the missing data which is 55,060 kWh in total.
- Business travel
  - NZ Functional Foods' business travels that had been previously included, were excluded (6 flights and 2 hotel stays).
  - Three duplicated Hotel stays were found and deleted.
- Staff commute
  - The annual commuting distance for all staff was calculated by proportional application using annual FTE to the results of the staff commute survey. And previously, the average annual commuting distance per FTE was calculated by applying 'worked weeks' to existing staff for 46 weeks and new staff for actual working weeks from the results of the survey.
  - However, since the annual FTE was double counted in this methodology, the 'worked weeks' for new staff was amended to 46 weeks to avoid this double counting issue.
- Freight
  - As 'tonne km' data were applied where the 'km' data are needed, it is corrected.
  - For inward freight, a conservative estimate was applied by using 200% of outward freight.
- Electricity T&D losses
  - It is modified for the same reason as the activity data used in the above electrical use. It is increased by 55,060 kWh.
  - The electricity consumption of the Hargest House office was estimated and added using the electricity consumption per FTE from the Spey St. office and the Te Anau office.
- Well-To-Tank
  - All of the above revised data are applied.
  - Coal WTT emission factor is changed from 'domestic' coal to 'industrial' coal.

## 6.2 Emission Factors

- Emission Factors from Ministry for the Environment
  - 2024 Emission factors are applied for all category other than WTT.
- Emission Factors from UK's Department for Energy Security and Net Zero
  - 2024 Emission factors are applied for WTT.

## 6.3 Results of recalculation

- Staff commute is the largest increasing sector (8 tCO<sub>2</sub>e), followed by Electricity used (7.5 tCO<sub>2</sub>e) and WTT (1.3 tCO<sub>2</sub>e).
- Business travel is the largest decreasing sector (2.9 tCO<sub>2</sub>e), followed by Transport fuel (0.7 tCO<sub>2</sub>e).
- Total emissions increased by 13.3 tCO<sub>2</sub>e, a 7.3% increase from the previous total emissions.

Table 64 Comparison of previous and recalculated emissions (tCO<sub>2</sub>e)

Scope	Category	Sector	Previous	Recalculation	Difference
1	<b>(1) Direct GHG Emissions</b>		<b>27.1</b>	<b>26.5</b>	<b>-2.4%</b>
		Stationary fuel	3.7	3.7	-0.4%
		Transport fuel	23.5	22.8	-2.8%
		Refrigerants	0.02	0.02	-
2	<b>(2) Indirect GHG Emissions from Imported Energy</b>		<b>25.6</b>	<b>33.8</b>	<b>32.0%</b>
		Electricity used	25.6	33.8	32.0%
3	<b>(3) Indirect GHG Emissions from Transportation &amp; Distribution</b>		<b>69.9</b>	<b>75.2</b>	<b>7.6%</b>
		Business travel	22.9	20.0	-12.7%
		Staff commute + WFH	47.0	55.0	16.9%
		Freight	0.03	0.29	966.6%
	<b>(4) Indirect GHG Emissions from products &amp; services used by the organisation</b>		<b>59.2</b>	<b>60.5</b>	<b>2.2%</b>
		Upstream leased assets (ILT Kidzone event)	26.3	26.4	0.2%
		Electricity T&D losses	2.4	2.6	6.1%
		Waste, wastewater and water supply	4.8	4.7	-2.8%
	WTT	25.6	26.9	5.1%	
<b>Total</b>			<b>181.8</b>	<b>196.0</b>	<b>7.8%</b>

Note: Due to rounding, the numbers in the above table will not add correctly to give the total.