



# GREENHOUSE GAS EMISSIONS INVENTORY AND MANAGEMENT REPORT

Toitū carbonreduce programme

Prepared in accordance with ISO 14064-1:2018 and the Technical Requirements of the Programme



Department of  
Conservation  
*Te Papa Atawhai*

## Department of Conservation - Te Papa Atawhai

Prepared by (lead author): Mat Nalder

Dated: 30 August 2022

Verification status: Reasonable for Categories 1 & 2 and Limited for Categories 3 & 4

Measurement period: 01 July 2021 to 30 June 2022

Base year period: 01 July 2020 to 30 June 2021

Approved for release by:

A handwritten signature in black ink, appearing to read "Mike Tully".

Mike Tully - Deputy Director General (Corporate Service Group - Climate Change Mitigation SPA)

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The consolidation approach chosen for the greenhouse gas inventory should not be used to make decisions related to the application of employment or taxation law.

This report shall not be used to make public greenhouse gas assertions without independent verification and issue of an assurance statement by Toitū Envirocare.

## AVAILABILITY

This Carbon Inventory and Management Report is available to Toitū Envirocare for FY2021/22 emission verification purposes, available to the Carbon Neutral Government Programme (CNGP) for emission reporting purposes, and for internal use to inform, plan, implement, and report emission reductions

## REPORT STRUCTURE

The Inventory Summary contains a high-level summary of this year's results and from year 2 onwards a brief comparison to historical inventories.

Chapter 1, the Emissions Inventory Report, includes the inventory details and forms the measure step of the organisation's application for Programme certification. The inventory is a complete and accurate quantification of the amount of GHG emissions and removals that can be directly attributed to the organisation's operations within the declared boundary and scope for the specified reporting period. The inventory has been prepared in accordance with the requirements of the Programme<sup>1</sup>, which is based on the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004) and ISO 14064-1:2018 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals<sup>2</sup>. Where relevant, the inventory is aligned with industry or sector best practice for emissions measurement and reporting.

Chapter 2, the reduction plan and progress report, forms the manage step part of the organisation's application for Programme certification.

See Appendix 1 and the related Spreadsheet for detailed emissions inventory results, including a breakdown of emissions by source and sink, emissions by greenhouse gas type, and non-biogenic and bio-genic emissions. Appendix 1 also contains detailed context on the inventory boundaries, inclusions and exclusions, calculation methodology, liabilities, and supplementary results.

This overall report provides emissions information that is of interest to most users but must be read in conjunction with the inventory workbook for covering all of the requirements of ISO 14064-1:2018.

<sup>1</sup> Programme refers to the Toitū carbonreduce and the Toitū carbonzero programmes.

<sup>2</sup> Throughout this document 'GHG Protocol' means the *GHG Protocol Corporate Accounting and Reporting Standard* and 'ISO 14064-1:2018' means the international standard *Specification with Guidance at the Organizational Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*.

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## EXECUTIVE SUMMARY

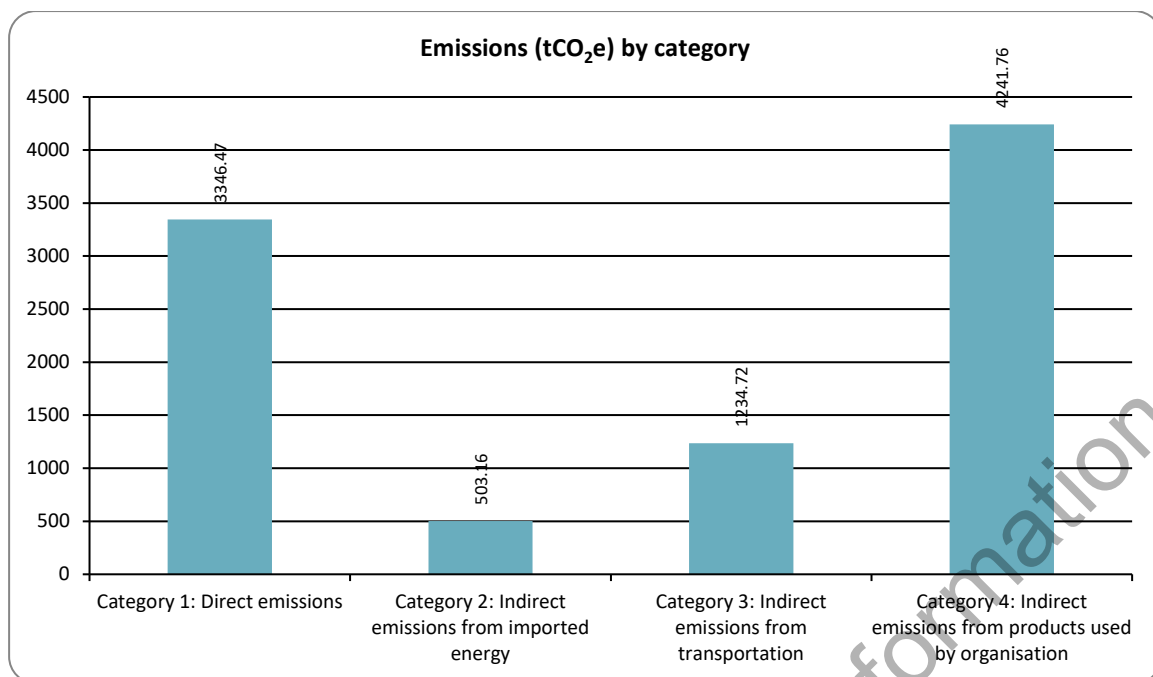
This is the annual greenhouse gas (GHG) emissions inventory and management report for Department of Conservation - Te Papa Atawhai covering the measurement period 01 July 2021 to 30 June 2022.<sup>3</sup>

Within the FY2021/22 emission reporting period, Te Papa Atawhai is reporting on forty-five emission activity sources that equate to a total of 9,326.11 tonnes of carbon emission equivalents (T CO<sub>2</sub>e). Of those emission sources, twenty-seven were reported on within the FY2020/21 base year, and twenty-four of those sources have reduced in emissions, one emission source remains unchanged, and the remaining two have increased. As a result of the reductions for twenty-four emission sources, we are on track to meet the 2025 target of a 21% reduction. Emission reductions with greatest impact are within areas that are of substantial scale such as Jet A1 (use of helicopters) which reduced by -6.96%, Diesel (use of fleet vehicles, vessels & plant) that reduced by -16.53%, and Domestic Air Travel (staff travel) which reduced by a combined average of -48.73%. Within FY2021/22 reporting period Te Papa Atawhai has extended the scope to include an additional eighteen emission sources. The expansion of emission reporting scope has not impacted our commitment to reduce our emissions to the 1.5°C of global warming target where our FY2021/22 reductions against our FY2020/21 base year is -15.91%.

**Table 1: Inventory summary**

Category (ISO 14064-1:2018)	Scopes (ISO 14064-1:2006)	2021	2022
Category 1: Direct emissions	Scope 1	3,862.90	3,346.47
Category 2: Indirect emissions from imported energy	Scope 2	602.57	503.16
Category 3: Indirect emissions from transportation	Scope 3	1,240.94	1,234.72
Category 4: Indirect emissions from products used by organisation		5,384.45	4,241.76
Category 5: Indirect emissions associated with the use of products from the organisation		0.00	0.00
Category 6: Indirect emissions from other sources		0.00	0.00
<b>Total direct emissions</b>		<b>3,862.90</b>	<b>3,346.47</b>
<b>Total indirect emissions</b>		<b>7,227.97</b>	<b>5,979.64</b>
<b>Total gross emissions</b>		<b>11,090.87</b>	<b>9,326.11</b>
Category 1 direct removals		0.00	0.00
Certified renewable electricity certificates		0.00	0.00
Purchased emission reductions		0.00	0.00
<b>Total net emissions</b>		<b>11,090.87</b>	<b>9,326.11</b>

<sup>3</sup> Throughout this document "emissions" means "GHG emissions".



**Figure 1: Emissions (tCO<sub>2</sub>e) by Category for this measurement period**

# CHAPTER 1: EMISSIONS INVENTORY REPORT

## 1.1. INTRODUCTION

This report is the annual greenhouse gas (GHG) emissions inventory and management report for Department of Conservation - Te Papa Atawhai.

This is the second annual greenhouse gas (GHG) emissions inventory report for Te Papa Atawhai. Data to produce this inventory report has been sourced from existing systems, including utilising manual processes.

As Te Papa Atawhai greenhouse gas emissions reporting maturity increases, it is expected that there will be increasing granularity of data and increasing automation of data gathering. Some data collection and data storage improvements have been made, resulting in refinements in how some data is reported between FY2020/21 and FY2021/22.

The inventory report and any GHG assertions are expected to be verified by a Programme-approved, third-party verifier. The level of assurance is reported in a separate Assurance Statement provided to the directors of the certification entity.

## 1.2. EMISSIONS INVENTORY RESULTS

**Table 2: GHG emissions inventory summary for this measurement period**

Measurement period: 01 July 2021 to 30 June 2022.

Category	Toitū carbon mandatory boundary (tCO <sub>2</sub> e)	Additional emissions (tCO <sub>2</sub> e)	Total emissions (tCO <sub>2</sub> e)
Category 1: Direct emissions	3,346.47 Coal default commercial, Diesel, Firewood, HCFC-22 (R-22, Genetron 22 or Freon 22), HFC-134a, HFC-143a, HFC-32, LPG, Natural Gas distributed commercial, Petrol premium, Petrol regular, R-12, R-404A, R-410A, R-417A, R-600A, Wastewater precalculated (tCO <sub>2</sub> e)	0.00	3,346.47
Category 2: Indirect emissions from imported energy	503.16 Electricity	0.00	503.16
Category 3: Indirect emissions from transportation	604.69 Accommodation - New Zealand, Air travel domestic (average), Air travel domestic (jet aircraft), Air travel domestic (medium aircraft), Air travel domestic (small aircraft), Air travel long haul (econ+), Air travel short haul (econ), Rental Car average (fuel type unknown), Taxi (regular)	630.03 Accommodation - Australia, Bus travel (average), Car Average (hybrid), Car Average (petrol), Ferry travel (other), Motorcycle, Rail metropolitan (average), Working from home	1,234.72
Category 4: Indirect emissions from products used by organisation	331.20 Composting, Electricity distributed T&D losses, Natural Gas distributed T&D losses, Waste landfilled No LFGR Mixed waste, Waste landfilled No LFGR Office waste	3910.56 Aviation gasoline, Jet A1, Paper use - default, Wastewater precalculated (tCO <sub>2</sub> e)	4,241.76

Category	Toitū carbon mandatory boundary (tCO <sub>2</sub> e)	Additional emissions (tCO <sub>2</sub> e)	Total emissions (tCO <sub>2</sub> e)
Category 5: Indirect emissions associated with the use of products from the organisation	0.00	0.00	0.00
Category 6: Indirect emissions from other sources	0.00	0.00	0.00
<b>Total direct emissions</b>	<b>3,346.47</b>	<b>0.00</b>	<b>3,346.47</b>
<b>Total indirect emissions</b>	<b>1,439.05</b>	<b>4540.59</b>	<b>5,979.64</b>
<b>Total gross emissions</b>	<b>4,785.52</b>	<b>4540.59</b>	<b>9,326.11</b>
Category 1 direct removals	0.00	0.00	0.00
Certified renewable electricity certificates	0.00	0.00	0.00
Purchased emission reductions	0.00	0.00	0.00
<b>Total net emissions</b>	<b>4,785.52</b>	<b>4540.59</b>	<b>9,326.11</b>
<b>Emissions intensity</b>		<b>Mandatory emissions</b>	<b>Total emissions</b>
Operating revenue (gross tCO <sub>2</sub> e / \$Millions)		6.94	13.53



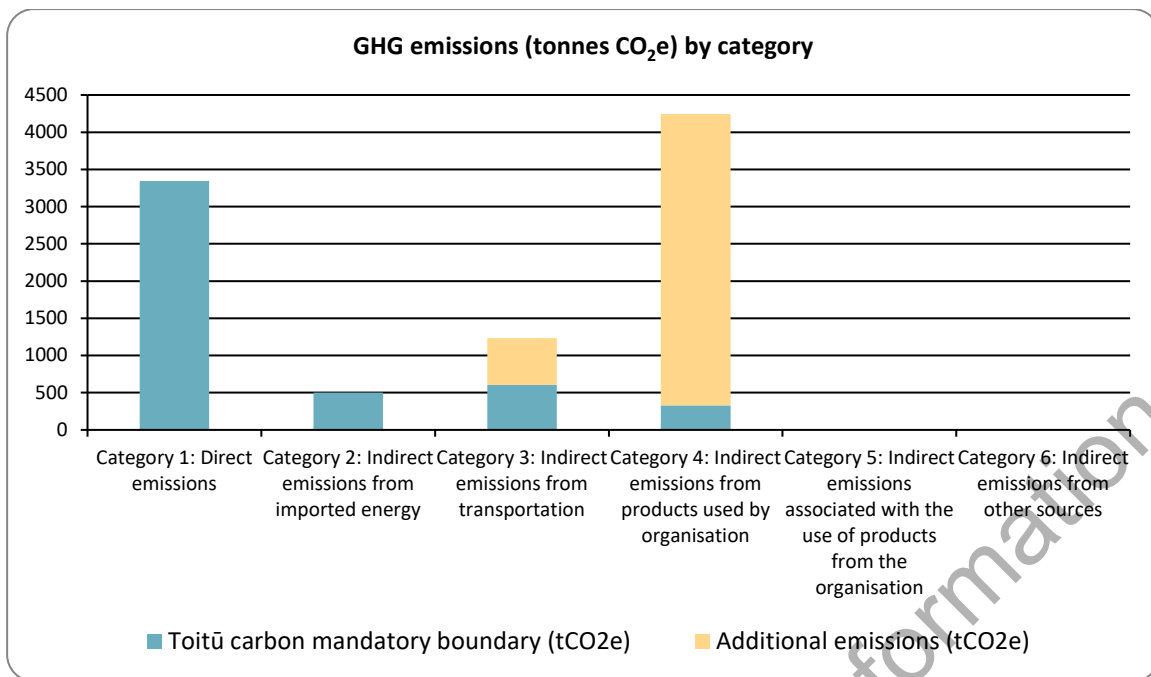


Figure 2: GHG emissions (tonnes CO<sub>2</sub>e) by category

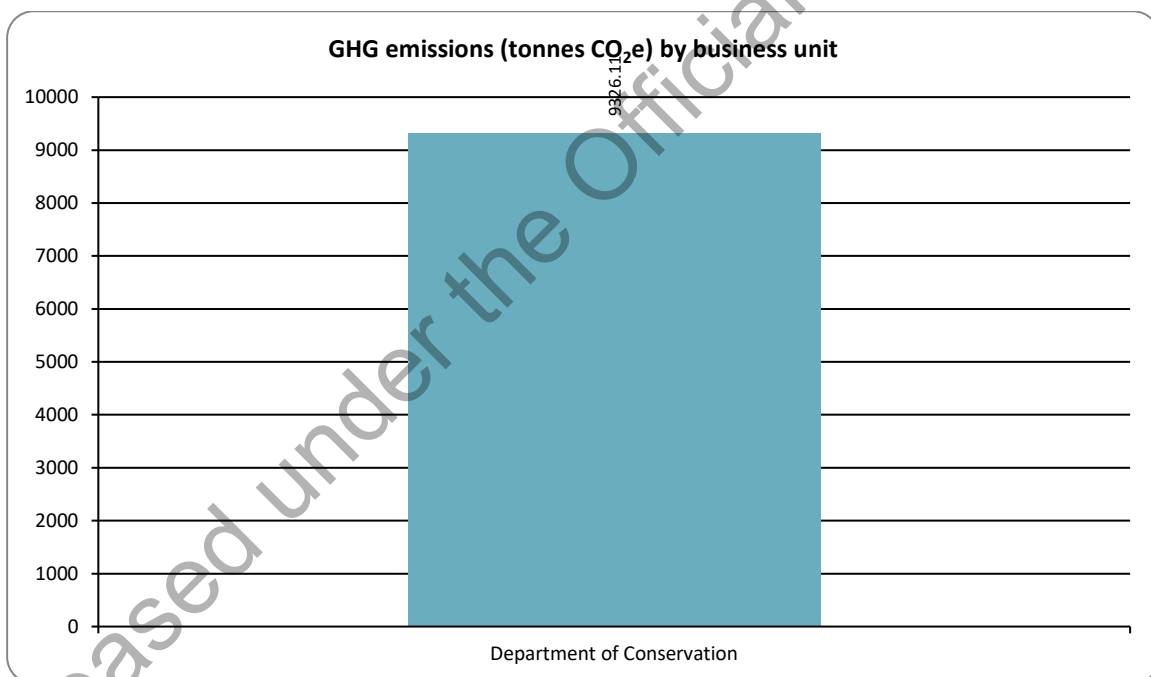


Figure 3: GHG emissions (tonnes CO<sub>2</sub>e) by business unit

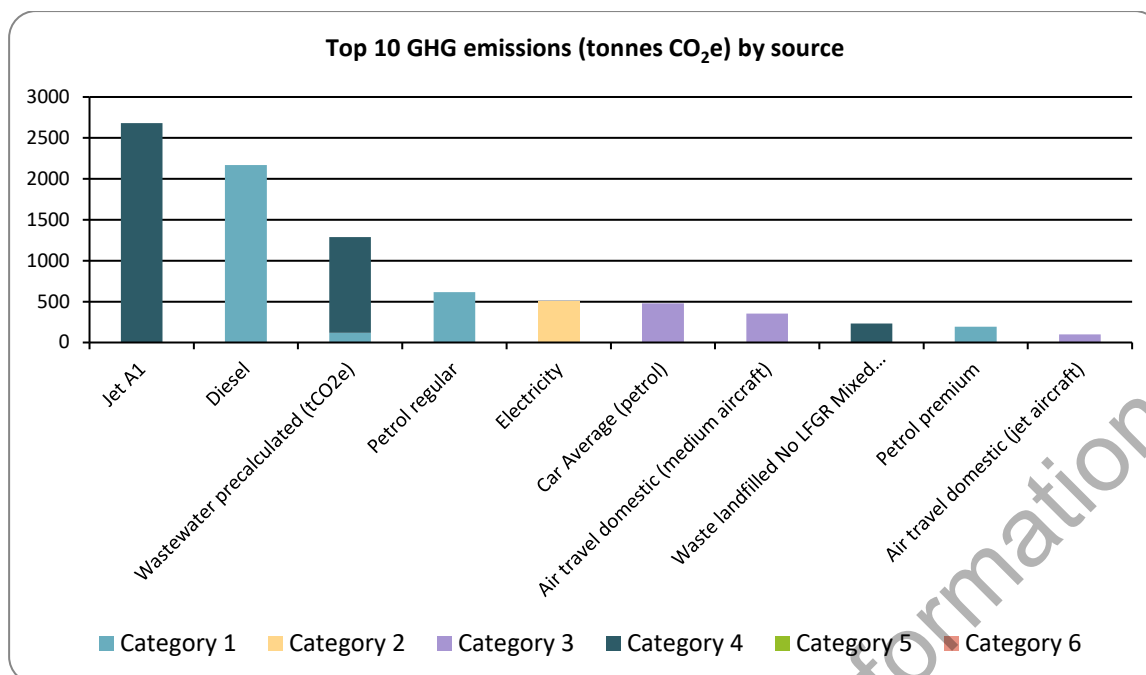


Figure 4: Top 10 GHG emissions (tonnes CO<sub>2</sub>e) by source

## 1.3. ORGANISATIONAL CONTEXT

### 1.3.1. Organisation description

The Te Papa Atawhai was formed as a result of the Conservation Act 1987 to integrate conservation management functions. This Act sets out the majority of the responsibilities and roles of Te Papa Atawhai.

Te Papa Atawhai has a particular responsibility under section 4 of the Conservation Act to interpret and administer the Act to give effect to the principles of the Treaty of Waitangi. This involves building and supporting effective conservation partnerships with tangata whenua at the local level. There is also specific legislation for such things as wildlife, reserves, and national parks.

Te Papa Atawhai administers 25 Acts of Parliament and contributes to others including the Resource Management Act 1991, the Fisheries Acts 1983 and 1996, the Biosecurity Act 1993, the Forest and Rural Fires Act 1977 and the Crown Pastoral Land Act 1998.

With accountability for approximately 1/3rd of the land mass of Aotearoa, as well as the marine environment, the operating approach of Te Papa Atawhai is characterised by a high level of public input. Conservation legislation also establishes a hierarchy of conservation boards and the New Zealand Conservation Authority, an independent body appointed by the Minister. The Authority has powers to approve formal management plans binding Te Papa Atawhai and serves to advise the Minister (adapted from <https://www.doc.govt.nz/about-us/our-role/legislation/>).

Traditionally, Te Papa Atawhai has operated on a high carbon management operating model. Delivering conservation management is still heavily reliant on fossil fuel-powered plant, vehicles, and vessels, as well as helicopter services.

For FY2021/22 Te Papa Atawhai delivered the following outputs which forms the basis of the emission 'Key Performance Indicators' (KPIs).

- A total employee workforce of 2,564 staff employed on permanent, fixed term, and external secondment contracts. This total excluded those employed on casual contracts.

- A combined sum of 2,670,912 hectares of treatment for possums, rats & mustelids, deer, goats, weeds, and wilding conifers.
- 4,832 concessions covering one-off and longer-term recreation and other resource-use concession permits, licences, leases, and easements.
- \$689,219,000 of appropriation via crown revenue.

### **Commitment to certification**

The Te Papa Atawhai senior leadership team sees climate change as the challenge it is, and knows that if it is not addressed, it will be increasingly difficult for Te Papa Atawhai to fulfil its vision of Papatūānuku thriving.

Climate change will in some way affect every facet of work at Te Papa Atawhai based on shrinking ecosystems and movement of wildlife, recreational assets that will need to be relocated or retired from changing landscapes, huts and buildings will need to become more resilient by being self-sufficient and energy efficient, and there will be a need to move away from carbon-intensive ways of delivering day to day conservation work.

### **GHG Reporting**

By understanding our carbon emissions profile and working towards a low carbon conservation management operating model, we aim to meet the targets and requirements of the Carbon Neutral Government Programme.

### **Climate Change Impacts**

Te Papa Atawhai is responsible for delivering conservation outcomes across a broad range of topics. The main Climate Change impacts on those core conservation outcomes are listed below:

- Loss of fragile endemic ecosystems,
- Loss of endemic terrestrial and marine native Toanga species
- Loss of historic and archaeological sites,
- Accelerated geological change from increased intensity storm events and sea level rise
- Increase of invasive exotic species both on the terrestrial and marine environments
- Loss of management and visitor infrastructure
- Reduction and removal of existing conservation delivery tools that are associated to high carbon operating

### **1.3.2. Statement of intent**

This inventory forms part of the organisation's commitment to gain Toitū carbonreduce certification. The intended uses of this inventory are:

#### **Intended use and users**

This greenhouse gas (GHG) inventory is a comprehensive analysis of the Te Papa Atawhai GHG emissions profile within the defined boundaries for the FY2021/22 period. The emissions inventory report goals are to:

- To ensure compliance with the obligations of the 'Carbon Neutral Government Programme' (CNGP) to measure, verify and report annual emissions, reduction targets and progress aligned

to 1.5°C of global warming. This will be achieved via the Toitū Envirocare CarbonReduce programme.

- To ensure the inventory supports essential business functions to manage emission reductions and associated risks appropriately, to enable data-based decarbonisation decision making, and to include staff on the journey to a low / zero carbon operating model.
- To ensure a transparent disclosure of annual GHG emission profiles, reduction targets and progress in aid to respond to the public expectations, to maintain a social licence to operate, and to influence those that Te Papa Atawhai engages with.

#### **Other schemes and requirements**

This inventory forms part of the organisation's commitment to gain emissions certification. Information resulting from the FY2021/22 Carbon Emissions Inventory and Management Report will be utilised to inform:

- Emissions Reduction Plan
- Integrated Strategy
- Strategic Investment Plan
- Statement of Intent
- Heritage and Visitor Strategy He Rautaki Taonga Tuku Iho, Manuhiri Tūāurangi hoki
- Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy
- Te pae towahi whaia kia tata Digital Strategy
- Te Papa Atawhai he whakamahere hātepe urutau mō te huringa āhuarangi Climate Change Adaptation Plan
- Te Papa Atawhai Rautaki Toitū Sustainability Strategy
- Concessions regulatory guidelines
- Four-Year business planning processes
- Goods & Services procurement
- Visitor & Heritage strategies

#### **1.3.3. Person responsible**

Mike Tully - Deputy Director General (Corporate Service Group - Climate Change Mitigation SPA) is responsible for overall emission inventory measurement and reduction performance, as well as reporting results to top management.

Mike Tully - Deputy Director General (Corporate Service Group - Climate Change Mitigation SPA) has the authority to represent top management and has financial authority to authorise budget for the Programme, including Management projects and any Mitigation objectives.

#### **State any other people/entities involved**

The reporting is supported by the Outcomes Management Unit. The staff involved in emissions reporting have experience in:

- GHG source data collection and analysis experience
- Emissions verification & reporting experience

- Sustainable goods and services

The Deputy Director General of Biodiversity Group holds Single Point Accountability (SPA) for Climate Change Portfolio which includes the following programmes:

- Climate Change Adaptation
- Climate Change Mitigation
- Climate Change Sequestration

The Deputy Director General of Corporate Services Group (CSG) holds Single Point Accountability (SPA) for Climate Change Mitigation which includes reducing the emissions profile and waste management at Te Papa Atawhai. The responsibility of the Climate Change Mitigation SPA is to ensure Te Papa Atawhai is reducing emissions aligned with:

- UN Paris Agreement
- UN Sustainable Development Goals
- New Zealand legislation Climate Change Response (Zero Carbon) Amendment Act 2019. This legislation requires zero carbon by 2050
- Declared Climate Change Emergency (acknowledgement climate change is real and driven by human activities)
- Carbon Neutral Government Programme. This programme requires alignment to 1.5°C

Te Papa Atawhai is committed to the Governments objectives by playing its part to reduce its emissions to achieve a 'Low Carbon Conservation Management' business model. As part of this commitment Te Papa Atawhai is one of many central government agencies responding to the 'Carbon Neutral Government Programme' (CNGP) requirements under tranche 1. As part of this programme, agencies are required to:

- Measure, verify and report their emissions annually
- Set gross emissions reduction targets and longer-term reduction plans
- Introduce a plan to reduce their organisation's emissions
- Offset remaining gross emissions from 2025 to achieve carbon neutrality.

Te Papa Atawhai has signed up to Toitū Envirocare's 'CarbonReduce' emissions verification programme, where FY 2020/21 was the 'Base' year for reporting where emissions are verified at:

- FY2020/21 = 11,118.21 T CO<sub>2</sub>e (revised to 11,090.87 T CO<sub>2</sub>e).

Te Papa Atawhai is required under the CNGP to meet new aggressive reduction targets. The CNGP requirement of 1.5°C global warming equates to serious reduction targets from the reporting base year at 21% reduction for 2025 and 42% reduction for 2030. This means Te Papa Atawhai reduction targets will be:

- FY 2020/21 – 11,090.87 T CO<sub>2</sub>e  
(Verified based year)
- FY 2024/25 = 8761.79 T CO<sub>2</sub>e  
(21% reduction target. 21% reduction minimum which equates to 5.2% reduction per annum from FY 2020/21 on a linear trajectory, eg  $21 / 4 = 5.2$ )
- FY 2029/30 = 6432.70 T CO<sub>2</sub>e  
(42% reduction target. 42% reduction minimum which equates to 4.67% reduction per annum from FY 2020/21 on a linear trajectory, eg  $42 / 9 = 4.67$ )

The Climate Change Mitigation programme includes staff that have extensive state sector experience including:

- Govt3 programme experience
- GHG source data collection and analysis experience
- Emissions verification & reporting experience
- Sustainable goods and services experience

#### **Top management commitment**

The Senior Leadership Team is committed to emissions measurement, verification, and reduction. Reduction targets for the organisation will be agreed at Senior Leadership Team level and will be monitored regularly as an agenda item.

#### **Management involvement**

The Senior Leadership Team provides resources and budget for collection and processing of data and inventory report development. The lead author of this report is supported by staff from across the business. The results of the emissions verification are reported through our Annual Report.

### **1.3.4. Reporting period**

#### **Base year measurement period: 01 July 2020 to 30 June 2021**

The base year period was selected because it represents the first year of extensive emissions measurement.

The base year was impacted by global events such as COVID-19 pandemic nationwide lockdowns. The lockdown impacts enabled new technologies and systems that help change the way Te Papa Atawhai delivers conservation.

#### **Measurement period of this report: 01 July 2021 to 30 June 2022**

The verified emissions will be reported annually. The frequency and timing of reporting aligns to the Te Papa Atawhai annual report and CNGP emissions reporting.

Te Papa Atawhai will report annually. The reporting period from 1 July 2021 to 30 June 2022 aligns with our financial year.

### **1.3.5. Organisational boundary and consolidation approach**

An operational control consolidation approach was used to account for emissions.<sup>4</sup>

Organisational boundaries were set with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standards.

#### **Justification of consolidation approach**

Te Papa Atawhai is primarily an operational delivery government organisation. The operational delivery is either owned, controlled, or influenced, which includes direct and influenced emission sources.

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<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.

An operational control consolidation approach is most appropriate for emissions measurement and verification at Te Papa Atawhai.

### **Organisational structure**

Figure 5 shows what has been included in the context of the overall structure.

Te Papa Atawhai is structure into seven business groups of which have multiple directorates, and many multiple units. The Senior Leadership Team (SLT) is an overarching group lead by the Director-General, and the Deputy Directors-General of the seven business groups and supported by Chief Advisors. The predominant structure during FY2021/22 is detailed below.

#### The SLT members are:

- Director-General
- Deputy Director-General Biodiversity
- Deputy Director-General Corporate Services
- Deputy Director-General Kāhui Kaupapa Atawhai
- Deputy Director-General Operations
- Deputy Director-General People
- Deputy Director-General Policy and Visitors, and Partnerships and Engagement
- Director Office of the Director General

#### The Chief Advisors also support SLT:

- Chief Science Advisor
- Chief Advisor Jobs for Nature
- Chief Advisor Conservation

**NOTE:** Te Papa Atawhai is entering an organisational reset in early FY2022/23, therefore the legal structure including Business Groups and reporting lines will change. This report reflects the legal structure that was predominantly in place throughout FY2021/22.

Director-General Direct Reports:							
• Director Office Of The Director General							
• Chief Advisor To The Director Genraal							
• Chief Advisor Conservation							
• Chief Science Advisor							
• Deputy Director-General Biodiversity	• Deputy Director-General Corporate Services	• Deputy Director-General Kahui Kaupapa Atawhai	• Deputy Director-General Operations	• Deputy Director-General Partnerships	• Deputy Director-General People	• Deputy Director-General Policy & Visitors	
Biodiversity Includes:	Corporate Services Includes:	Kahui Kaupapa Atawhai Includes:	Operations Includes:	Partnerships includes:	People includes:	Policy & Visitors includes:	Projects includes:
• Biodiversity Leadership	• Corporate Services Leadership	• Kahui Kaupapa Atawhai Leadership	• Operations Leadership	• Partnerships Leadership	• People Leadership Team	• Policy & Visitors Leadership	• Projects Leadership
• Aquatic	• Business Assurance	• Ngā Whenua Rāhui	• Operations Northern North Island	• Business & International	• Health & Safety	• Commercial & Pricing Strategy	
• Planning and Support	• Business Support	• Te Tohu Huarahi	• Operations Auckland	• Community Engagement	• Human Resources	• Governance	
• Predator Free 2050	• Enterprise Portfolio Management Office	• Treaty Negotiations	• Operations Hauraki, Waikato and Taranaki	• Customer Engagement	• Organisational Development	• Government Services	
• Terrestrial Science	• Legal Services		• Operations Central North Island	• National Support		• Heritage & Visitors	
• Threats	• Finance		• Operations Lower North Island	• Partnerships		• Policy	
	• Information Systems & Services		• Operations Northern South Island				
	• Legal Services		• Operations Western South Island				
	• Outcomes		• Operations Eastern South Island				
	• Security & Investigations		• Operations Southern South Island				
			• Operations Issues & Programmes				
			• Operations Planning Unit				
			• Operations Strategic Support				
			• Planning, Permissions & Land				

Figure 5: Organisational structure



**Table 3. Brief description of business units, sites and locations included in this emissions inventory**

Company/Business unit/Facility	Physical location	Description
Ahuriri / Napier Office+C65B2AA2:C116	59 Marine Parade, Napier 4110	District operational delivery hub
Akaroa Base	13 Pawsons Road, Duvauchelle, Akaroa	Local operational base
Āniwaniwa Base	Lake Waikaremoana Road, Kaitawa Shed, RD 5, Wairoa 4195	Local operational base
Aoraki / Mt Cook National Park Visitor Centre	1 Larch Grove, Aoraki/Mt Cook	Visitor Centre
Aoraki / Mt Cook Office	66 Bowen Drive, Aoraki/Mt Cook 7946	District operational delivery hub
Aotea / Great Barrier Island Base	Okiwi Station, 1501 Aotea Road, Okiwi, Great Barrier Island 0962	Local operational base
Arthur's Pass National Park Visitor Centre	106 Main Westcoast Road, Arthur's Pass	Visitor Centre
Awarua / Haast Visitor Centre	Haast Junction, Corner SH6 and Jackson Bay Road, Haast, South Westland	Local operational base
Bay of Islands Office Fire Depot	34 Landing Road, Kerikeri 0230	Local operational base
Boundary Stream Mainland Island Base	1181 Pohokura Road, Tutira 4181	Local operational base
Burwood Bush Rearing Unit	Mossburn - Te Anau Highway, Te Anau 9672	Local operational base
Catchpool Base	1039 Coast Road, Wainuiomata	Local operational base
Dawson Falls Visitor Centre	Manaia Rd, Egmont National Park	Visitor Centre
DOC Biosecurity Depot	6 Fleet Street, Devonport	Local operational base
Dunedin Visitor Centre	50 The Octagon, Dunedin	Visitor Centre
Hanmer Springs Base	103 Jollies Pass Road, Hanmer Springs 7334	Local operational base
Hauraki Office	3/366 Ngati Maru Highway (SH25), Thames 3500	District operational delivery hub
Hokitika Office	10 Sewell Street, Hokitika 7810	Regional operational delivery hub
Kā Moana Haehae / Alexandra Office	43 Dunstan Road, Alexandra 9320	District operational delivery hub
Kaikoura Base	115 Ludstone Road, Kaikoura	Local operational base
Kāpiti Island Base	Kāpiti Island	Local operational base
Kāpiti Wellington Office	13b Wall Place, Kenepuru, Porirua 5022	District operational delivery hub
Kāpiti Wellington Visitor Centre	18 - 32 Manners Street, Wellington, 6011	Visitor Centre
Karamea Base	Main Road, Karamea 7805	Local operational base
Kauaeranga Visitor Centre	995C Kauaeranga Valley Road, Thames 3577	Visitor Centre

Company/Business unit/Facility	Physical location	Description
Kawatiri / Westport Office	Russell Street, Westport 7825	District operational delivery hub
Kawau Island Base	Kawau Island, Hauraki Gulf	Local operational base
Kirikiroa / Hamilton Office	Level 4, 73 Rostrevor Street, Hamilton 3204	Regional operational delivery hub
Macraes Base	497 Redbank Road, RD3, Macraes Flat 9483	Local operational base
Mahaanui / Sockburn Office	31 Nga Mahi Road, Sockburn, Christchurch	District operational delivery hub
Mahakipaoa / Havelock Base	13 Mahakipawa Road, Havelock 7100	Local operational base
Mahurangi / Warkworth Office	Unit 12, 30 Hudson Road, Warkworth	District operational delivery hub
Makarora Base	Haast Pass Highway, State Highway 6	Local operational base
Mana Island Base	Mana Island	Local operational base
Mangaweka Base	243 Wairanu Rd, Taihape 4793	Local operational base
Matiu / Somes Island Base	Matiu / Somes Island	Local operational base
Maungauika / North Head Office	North Head Historic Reserve, 18 Takarunga Road, Devonport, North Shore 0624	District operational delivery hub
Māwhera / Greymouth Office	17 High Street, Greymouth 7805	District operational delivery hub
Mimiwhangata Coastal Park	453 Mimiwhangata Road, RD, Hikurangi 0181	Local operational base
Motueka Office	406 High Street, Motueka 7120	District operational delivery hub
Motuihe Island Base	Motuihe Island	Local operational base
Motukarara Native Plant Nursery	Waihora Park, 136 Park Rd, Motukarara, Christchurch 7672	Local operational base
Murchison Base	Fairfax Street, Murchison 7007	Local operational base
Murihiku / Invercargill Office	7th Floor, CUE on Don, 33 Don Street, Invercargill 9810	Regional operational delivery hub
Murupara Office	Main Road, RD1, Murupara 3079	District operational delivery hub
Nga Whenua Rahui Hastings Base	C/- Taikura House, 304 Fitzroy Avenue, Hastings 4122	Local operational base
Ngāmotu / New Plymouth Office	55A Rimu Street, New Plymouth 4312	District operational delivery hub
Ngongotaha Fire Depot	1130 Paradise Valley Road, Rotorua 3072	Local operational base
Oamaru Base	8 Regina Lane, Oamaru North, Oamaru 9400	Local operational base

Company/Business unit/Facility	Physical location	Description
Ohakune Base	1 Mountain Road, Ohakune 4625	Local operational base
Ōpōtiki Office	70 Bridge Street, Opotiki	District operational delivery hub
Otaki Forks Base	1625, Otaki Gorge Rd, Otaki	Local operational base
Ōtautahi / Christchurch Office	Level 3, Grand Central, 161 Cashel Street, Christchurch 8011	Regional operational delivery hub
Ōtautahi / Christchurch Visitor Centre	28 Worcester Boulevard, Christchurch 8013	Visitor Centre
Ōtepoti / Dunedin Office	Level 1 John Wickliffe House, 265 Princes Street, Dunedin	District operational delivery hub
Ōwaka Base	16 Ryley Street, Owaka 9535	Local operational base
Palmerston North Fire Depot	717 Tremaine Avenue, Palmerston North 4414	Local operational base
Paparoa National Park Visitor Centre	4294 Coast Road, Punakaiki, RD 1, Runanga 7873	Visitor Centre
Pewhairangi / Bay of Islands Office	34 Landing Road, Kerikeri 0230	District operational delivery hub
Pipiriki Base	Owairua Road, Pipiriki Village 4576	Local operational base
Pukaha Mount Bruce National Wildlife Centre	State Highway 2, Masterton	Local operational base
Puke Nui / Anchor Island Base	Anchor Island	Local operational base
Punakaiki Base	4294 Coast Road, Punakaiki, RD 1, Runanga 7873	Local operational base
Pureora Base	House 5, Village Road, RD7, Pureora	Local operational base
Rakiura National Park Visitor Centre	15 Main Road, Oban	Local operational base
Rangiauria / Pitt Island Base	Rangiauria / Pitt Island	Local operational base
Rangiora Fire Depot	28 Oxford Road, Rangiora 7400	Local operational base
Rangiora Office	32 River Road, Rangiora 7400	District operational delivery hub
Rangitoto Base	Rangitoto Island	Local operational base
Raoul Island / Kermadecs Base	Raoul Island	Local operational base
Raukapuka / Geraldine Office	13 – 15 North Terrace, Geraldine 7930	District operational delivery hub
Reefton Base	67-69 Broadway, Reefton 7830	Local operational base
Rekohu / Wharekauri / Chatham Island Office	North Rd, Te One, Chatham Island	District operational delivery hub
Renwick Fire Depot	Gee Street, Renwick, Marlborough 7204	Local operational base
Rotoiti / Nelson Lakes Visitor Centre	View Road, St Arnaud	Local operational base

Company/Business unit/Facility	Physical location	Description
Rotorua Office	99 Sala Street, Rotorua 3010	District operational delivery hub
Ruatoria Base	1215 Waiomatatini Road, Ruatoria 4082	Local operational base
Tāhuna / Glenorchy Base	Cnr Mull & Oban Streets, Glenorchy 9350	Local operational base
Takaka Office	62 Commercial Street, Golden Bay	District operational delivery hub
Takapourewa / Stephens Island Base	Stephens Island, Outer Pelorus Sound	Local operational base
Tāmaki Makaurau / Auckland Office	Bledisloe House, Level 7, 24 Wellesley Street West, Auckland 1010	Regional operational delivery hub
Tāmaki Makaurau / Auckland Visitor Centre	Bledisloe House, Level 7, 24 Wellesley Street West, Auckland 1010	Visitor Centre
Taranaki / Egmont National Park Visitor Centre	2879 Egmont Rd, Egmont National Park	Visitor Centre
Taumarunui Base	Cherry Grove, Taumarunui	Local operational base
Taupō Base	155 Centennial Drive, Taupo 3378	Local operational base
Taupo Office	37 Motutaiko Street, Taupo 3330	Regional operational delivery hub
Tauranga Office	253 Chadwick Road West, Greerton West, Tauranga 3112	District operational delivery hub
Te Anau Office	Te Anau Office, Lakefront Drive, Te Anau 9600	District operational delivery hub
Te Araroa Base	Hospital Hill, Te Araroa	Local operational base
Te Aroha Base	Rewi Street, Te Aroha	Local operational base
Te Hauturu o Toi / Little Barrier Island Base	Little Barrier Island, Hauraki Gulf	Local operational base
Te Hiku / Kaitaia Office	25 Matthews Ave, Kaitaia 0441	District operational delivery hub
Te Kuiti Office	78 Taupiri Street, Te Kuiti 3910	District operational delivery hub
Te Manahuna / Twizel Office	15 Wairepo Road, Twizel 7901	District operational delivery hub
Te Pākeka / Maud Island Base	Maud Island, Pelorus Sound	Local operational base
Te Papaioea / Palmerston North Office	28 North Street, Palmerston North 4410	Regional operational delivery hub
Te Rapa Office	5 Northway St, Te Rapa, Hamilton 3200	District operational delivery hub
Te Rua-o-te-moko / Fiordland National Park Visitor Centre	Fiordland National Park, Visitor Centre, Lakefront Drive, Te Anau 9600	Visitor Centre

Company/Business unit/Facility	Physical location	Description
Te Tai Kauri / Kauri Coast Office	150 Colville Road, Dargaville	District operational delivery hub
Te Whanga Base	Turfrey Road, Napier 4110	Local operational base
Tiritiri Matangi Island Base	Tiritiri Matangi Island, Hauraki Gulf	Local operational base
Tititea / Mount Aspiring National Park Visitor Centre	1 Ballantyne Road, Wanaka 9305	Local operational base
Tongariro National Park Visitor Centre	Whakapapa Village, State Highway 48, Mount Ruapehu	Visitor Centre
Tōtaranui Base	1050 Totaranui Road, Abel Tasman National Park	Local operational base
Trounson Kauri Park Base	699 Trounson Park Road, Donnelly's Crossing, 379	Local operational base
Turanganui-a-Kiwa / Gisborne Office	63 Carnarvon Street, Gisborne 4010	District operational delivery hub
Tūrangi Office	3 Town Centre, Turangi 3334	District operational delivery hub
Waiau / Coromandel Base	TCDC Building, 355 Kapanga Road, Coromandel 3506	Local operational base
Wairau / Renwick Office	Gee Street, Renwick, Marlborough 7204	District operational delivery hub
Wairoa Base	46 Freyberg Street, Wairoa 4108	Local operational base
Waitohi / Picton Office	Port Marlborough Building, 14 Auckland Street, Picton 7220	District operational delivery hub
Weheka / Fox Glacier Base	Main Road, Fox Glacier	Local operational base
Westland Tai Poutini National Park Visitor Centre	69 Cron Street, Franz Josef Glacier 7856	Local operational base
Whakaoriori / Masterton Office	220 South Road, Masterton	District operational delivery hub
Whakatane Office	9 Louvain Street, Whakatane	District operational delivery hub
Whakatipu-wai-Māori / Queenstown Office	Cavells Building, 1 Arthurs Point Road, Queenstown, 9371	District operational delivery hub
Whakatipu-wai-Māori / Queenstown Visitor Centre	50 Stanley Street, Queenstown, 9300	Local operational base
Whakatū / Nelson Office	Monro State Building, 186 Bridge Street, Nelson 7010	Regional operational delivery hub
Whakatū / Nelson Visitor Centre	Millers Acre/Taha o te Awa, 79 Trafalgar Street, Nelson 7010	Visitor Centre
Whanganui Office	34-36 Taupo Quay, Whanganui 4500	District operational delivery hub

Company/Business unit/Facility	Physical location	Description
Whangarei Office	2 South End Ave, Raumanga, Whangarei 0110	Regional operational delivery hub
Whare Kaupapa Atawhai / Conservation House	18 - 32 Manners Street, Wellington, 6011	National operational delivery hub
Whenua Hou / Codfish Island Base	Whenua Hou / Codfish Island	Local operational base
Whitianga Base	2/20 Joan Gaskell Drive, Whitianga 3510	Local operational base

### 1.3.6. Excluded business units

No internal business units are excluded from the organisational boundary.

Released under the Official Information Act

## CHAPTER 2: EMISSIONS MANAGEMENT AND REDUCTION REPORT

### 2.1. EMISSIONS REDUCTION RESULTS

Greenhouse gas emissions for the organisation for the current reporting period are detailed in Table 4 below. Te Papa Atawhai has reduced its overall emissions from 11,090.87 T CO<sub>2</sub>e (FY2020/21 - Base Year) down to 9,326.11 T CO<sub>2</sub>e (FY2021/20). This reduction is despite increases in emission factors and the addition of multiple emission sources that were not measured in FY2020/21.

The emission reductions for FY2021/22 against FY2020/21 equate to -15.91% or 1,764.77 T CO<sub>2</sub>e of emission reductions. The overall emission reduction far exceeds the annual reduction target.

Some emission factors have significantly increased for FY2021/22 against the based year (eg Domestic Air Travel). However regardless of the emission factor increases that do not favour reductions, significant reductions have been made in many of those categories.

Below are the FY2021/22 emission (T CO<sub>2</sub>e) reduction and increase results from sources that were measured and verified in FY2020/21:

- A1 Jet reduced from 2,881.35 T CO<sub>2</sub>e to 2,680.89 T CO<sub>2</sub>e which equates to -6.96% or 200.45 T CO<sub>2</sub>e of reduction.
- Diesel reduced from 2,600.07 T CO<sub>2</sub>e to 2,170.21 T CO<sub>2</sub>e which equates to -16.53% or 429.86 T CO<sub>2</sub>e of reduction.
- Wastewater reduced from 2,018.00 T CO<sub>2</sub>e to 1,288.98 T CO<sub>2</sub>e which equates to -36.13% or 729.02 T CO<sub>2</sub>e of reduction.
- Petrol Regular reduced from 699.73 T CO<sub>2</sub>e to 616.86 T CO<sub>2</sub>e which equates to -11.84% or 82.87 T CO<sub>2</sub>e of reduction.
- Air travel domestic (medium aircraft) reduced from 637.74 T CO<sub>2</sub>e to 351.78 T CO<sub>2</sub>e which equates to -44.84% or 285.95 T CO<sub>2</sub>e of reduction.
- Electricity reduced from 602.57 T CO<sub>2</sub>e to 503.16 T CO<sub>2</sub>e which equates to -16.50% or 99.41 T CO<sub>2</sub>e of reduction
- Waste landfilled No LFGR Mixed waste reduced from 415.58 T CO<sub>2</sub>e to 231.77 T CO<sub>2</sub>e which equates to -44.23% or 183.81 T CO<sub>2</sub>e of reduction.
- Accommodation - New Zealand reduced from 198.71 T CO<sub>2</sub>e to 90.48 T CO<sub>2</sub>e which equates to -54.46% or 108.22 T CO<sub>2</sub>e of reduction.
- Air travel domestic (jet aircraft) reduced from 196.11 T CO<sub>2</sub>e to 97.26 T CO<sub>2</sub>e which equates to -50.41% or 98.85 T CO<sub>2</sub>e of reduction.
- Petrol premium increased from 171.44 T CO<sub>2</sub>e to 192.89 T CO<sub>2</sub>e which equates to +12.52% or 21.46 T CO<sub>2</sub>e of increase
- Rental Car average (fuel type unknown) reduced from 144.20 T CO<sub>2</sub>e to 14.52 T CO<sub>2</sub>e which equates to -89.93% or 129.68 T CO<sub>2</sub>e of reduction
- Coal default commercial reduced from 84.91 T CO<sub>2</sub>e to 50.36 T CO<sub>2</sub>e which equates to -40.69% or 34.55 T CO<sub>2</sub>e of reduction
- HFC-134a reduced from 70.66 T CO<sub>2</sub>e to 64.52 T CO<sub>2</sub>e which equates to -8.68% or 6.13 T CO<sub>2</sub>e of reduction
- Aviation gasoline reduced from 61.17 T CO<sub>2</sub>e to 50.99 T CO<sub>2</sub>e which equates to -16.64 T CO<sub>2</sub>e or 10.18 T CO<sub>2</sub>e of reduction

- R-410A reduced from 60.14 T CO<sub>2</sub>e to 39.95 T CO<sub>2</sub>e which equates to -33.56% or 20.18 T CO<sub>2</sub>e of reduction
- Electricity distributed T&D losses reduced from 51.65 T CO<sub>2</sub>e to 40.87 T CO<sub>2</sub>e which equates to -20.88% or 10.78 T CO<sub>2</sub>e reduction
- Waste landfilled No LFGR Office waste reduce from 47.74 T CO<sub>2</sub>e to 47.08 T CO<sub>2</sub>e which equates to -1.38% or 0.66 T CO<sub>2</sub>e of reduction
- Air travel domestic (small aircraft) reduced from 37.72 T CO<sub>2</sub>e to 12.63 T CO<sub>2</sub>e which equates to -66.53% or 25.09 T CO<sub>2</sub>e of reduction
- LPG increased from 31.93 T CO<sub>2</sub>e to 53.21 T CO<sub>2</sub>e which equates to 66.66% or +21.28 T CO<sub>2</sub>e of increase
- Paper use - default reduced from 17.45 T CO<sub>2</sub>e to 6.69 T CO<sub>2</sub>e which equates to -61.66% or 10.76 T CO<sub>2</sub>e of reduction
- Taxi (regular) reduced from 17.02 T CO<sub>2</sub>e to 12.55 T CO<sub>2</sub>e which equates to -26.28% or 4.47 T CO<sub>2</sub>e of reduction
- HFC-32 reduced from 12.23 T CO<sub>2</sub>e to 2.62 T CO<sub>2</sub>e which equates to -78.54% or 9.60 T CO<sub>2</sub>e reduction
- Composting increased from 11.52 T CO<sub>2</sub>e to 11.26 T CO<sub>2</sub>e which equates to +2.21% or 0.25 T CO<sub>2</sub>e of increase
- Air travel domestic (average) reduced from 9.45 T CO<sub>2</sub>e to 6.32 T CO<sub>2</sub>e which equates to -33.13% or 3.13 T CO<sub>2</sub>e reduction
- Wood industry (transitioned to Firewood) increased from 8.18 T CO<sub>2</sub>e to 31.05 T CO<sub>2</sub>e which equates to +279.75% or 22.87 T CO<sub>2</sub>e increase
- Natural Gas distributed commercial remains unchanged at 3.63 T CO<sub>2</sub>e
- R-600A increased from 0.000909 T CO<sub>2</sub>e to 0.001512 T CO<sub>2</sub>e which equates to +66.37% or 0.00060 T CO<sub>2</sub>e increase

Below are emission sources that are being measured for the first time and to be reported against FY2021/22:

- Car Average (petrol) emissions from staff commuting to work are 476.56 T CO<sub>2</sub>e
- Working from home emissions from staff not working from an office or field location are 87.26 CO<sub>2</sub>e
- Car Average (hybrid) emissions from staff commuting to work are 45.11 T CO<sub>2</sub>e
- Air travel long haul (econ+) emissions from staff international business travel are 18.86 T CO<sub>2</sub>e
- Ferry travel (other) emissions from staff commuting to work are 6.83 T CO<sub>2</sub>e
- Bus travel (average) emissions from staff commuting to work are 5.88 T CO<sub>2</sub>e
- Rail metropolitan (average) emissions from staff commute to work are 4.60 T CO<sub>2</sub>e
- Motorcycle emissions from staff commuting to work are 3.71 T CO<sub>2</sub>e
- R-12 emissions from refrigerants are 2.49 T CO<sub>2</sub>e
- HCFC-22 (R-22, Genetron 22 or Freon 22) emissions from refrigerants are 1.24 T CO<sub>2</sub>e



- Air travel short haul (econ) emissions from staff international business travel are 0.29 T CO<sub>2</sub>e
- R-404A emissions from refrigerants are 0.24 T CO<sub>2</sub>e
- Natural Gas T&D losses from hardwired natural gas supply are 0.22 T CO<sub>2</sub>e
- HFC-143a emissions from refrigerants are 0.11 T CO<sub>2</sub>e
- R-417A emissions from refrigerants are 0.08 T CO<sub>2</sub>e
- Accommodation - Australia from international business travel are 0.08 T CO<sub>2</sub>e
- Ammonia R717 (also known as NH<sub>3</sub>) from refrigerants are 0.00 T CO<sub>2</sub>e

**Table 4: Comparison of historical GHG inventories**

Category	2021	2022
Category 1: Direct emissions	3,862.90	3,346.47
Category 2: Indirect emissions from imported energy	602.57	503.16
Category 3: Indirect emissions from transportation	1,240.94	1,234.72
Category 4: Indirect emissions from products used by organisation	5,384.45	4,241.76
Category 5: Indirect emissions associated with the use of products from the organisation	0.00	0.00
Category 6: Indirect emissions from other sources	0.00	0.00
<b>Total direct emissions</b>	<b>3,862.90</b>	<b>3,346.47</b>
<b>Total indirect emissions</b>	<b>7,227.97</b>	<b>5,979.64</b>
<b>Total gross emissions</b>	<b>11,090.87</b>	<b>9,326.11</b>
Category 1 direct removals	0.00	0.00
Certified renewable electricity certificates	0.00	0.00

Category	2021	2022
Purchased emission reductions	0.00	0.00
<b>Total net emissions</b>	<b>11,090.87</b>	<b>9,326.11</b>
<b>Emissions intensity</b>		
Operating revenue (gross tCO <sub>2</sub> e / \$Millions)	18.77	13.53
Operating revenue (gross mandatory tCO <sub>2</sub> e / \$Millions)	13.76	6.94

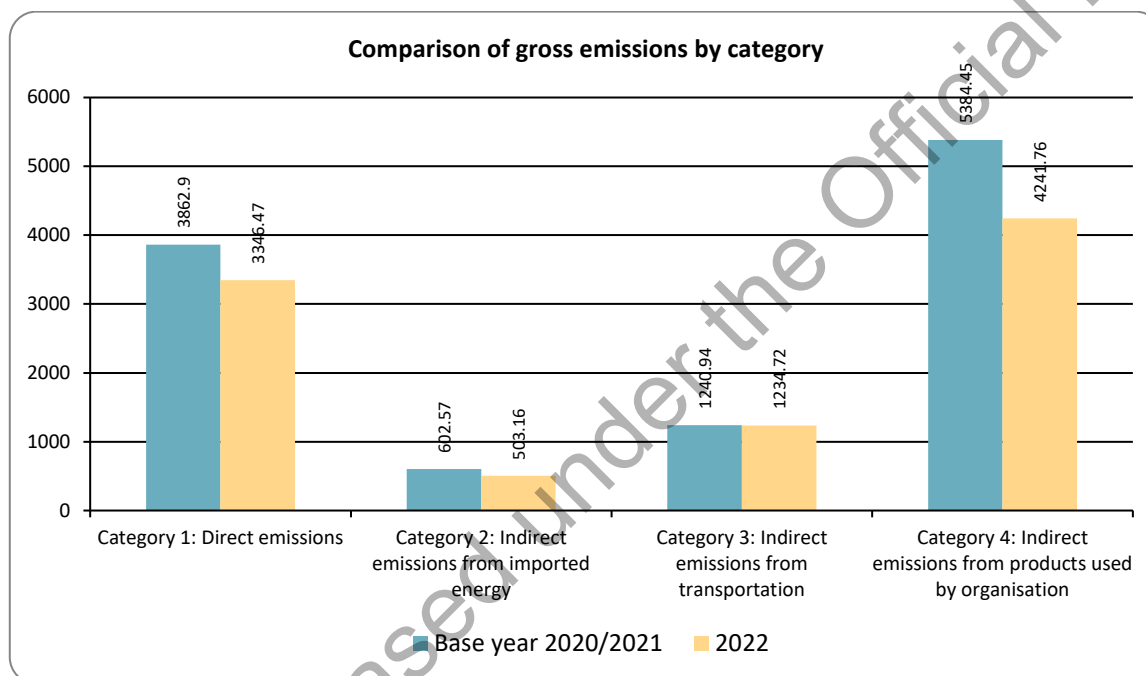
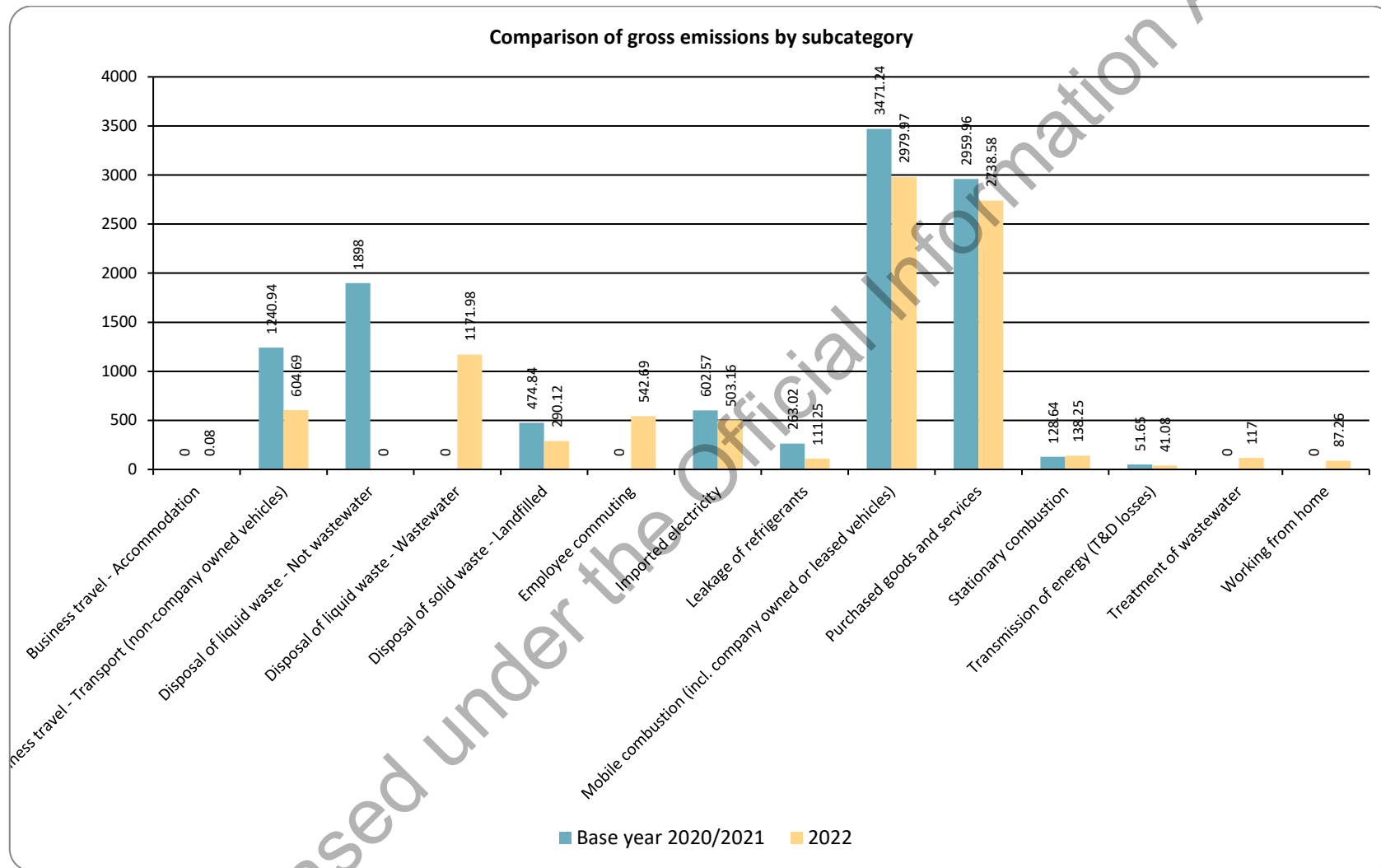


Figure 6: Comparison of gross emissions by category between the reporting periods



**Figure 7: Comparison of gross emissions by subcategory between the reporting periods**

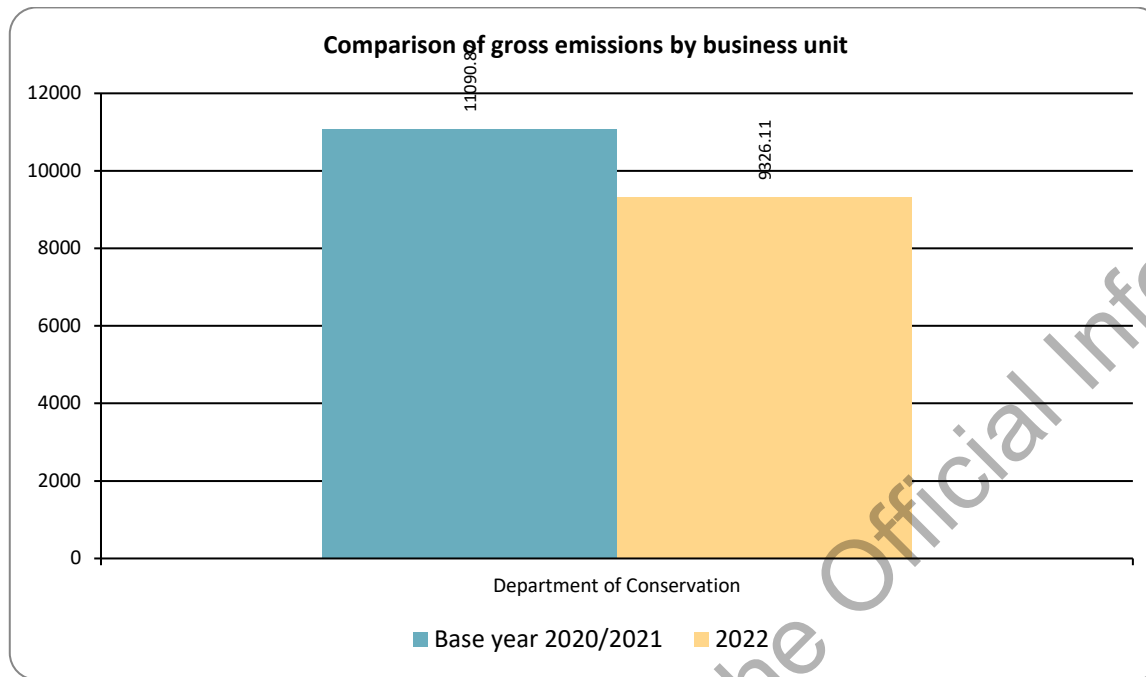


Figure 8: Comparison of gross emissions by business unit between the reporting periods

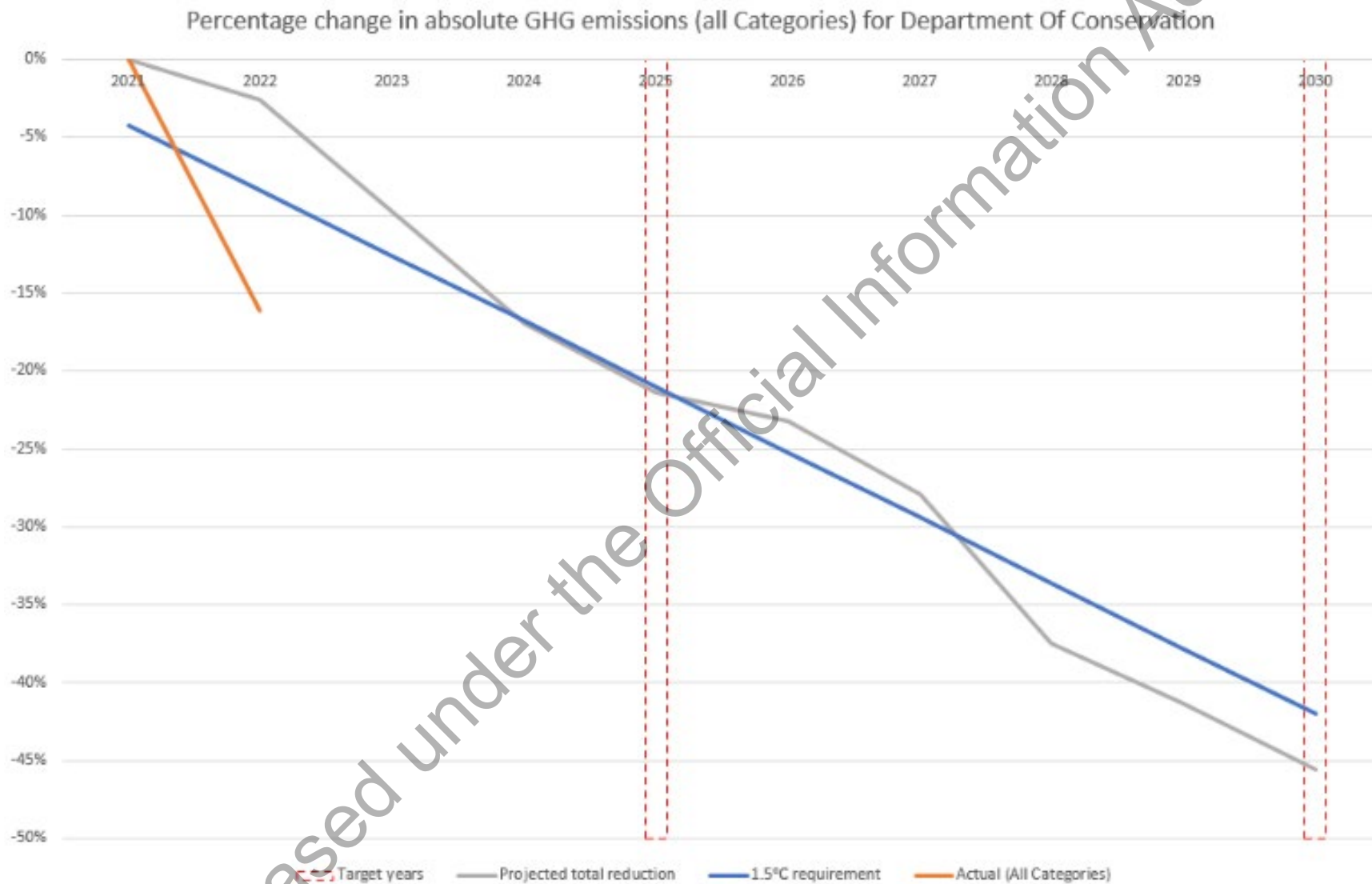


Figure 9: Performance against target since base year

**Table 5. Performance against plan**

Target name	Baseline period	Target date	Type of target	Current performance (tCO <sub>2</sub> e)	Current performance (%)	Comments
Cats Combined - FTEs	2021	2025	Intensity	3.63723	90.53	Slightly reduced numbers & reduced carbon
Cats Combined - Hectares Treated	2021	2025	Intensity	0.00349	100.44	Increased numbers & reduced carbon
Cats Combined - Concessions Managed	2021	2025	Intensity	1.93002	91.1	Increased numbers & reduced carbon
Cats Combined - Appropriation	2021	2025	Intensity	0.00001353	99.76	Slightly increased numbers & reduced carbon
Cat 1 - FTEs	2021	2025	Intensity	1.30371	78.17	Slightly reduced numbers & reduced carbon
Cat 1 - Hectares Treated	2021	2025	Intensity	0.00125	89.2	Increased numbers & reduced carbon
Cat 1 - Concessions Managed	2021	2025	Intensity	0.69179	78.81	Increased numbers & reduced carbon
Cat 1 - Appropriation	2021	2025	Intensity	0.00000485	88.44	Slightly increased numbers & reduced carbon
Cat 2 - FTEs	2021	2025	Intensity	0.19766	103.56	Slightly reduced numbers & reduced carbon
Cat 2 - Hectares Treated	2021	2025	Intensity	0.00019	112.29	Increased numbers & reduced carbon
Cat 2 - Concessions Managed	2021	2025	Intensity	0.10488	104.07	Increased numbers & reduced carbon
Cat 2 - Appropriation	2021	2025	Intensity	0.00000074	111.69	Slightly increased numbers & reduced carbon
Cat 3 - FTEs	2021	2025	Intensity	0.23587	149.39	Slightly reduced numbers & reduced carbon
Cat 3 - Hectares Treated	2021	2025	Intensity	0.00023	153.97	Increased numbers & reduced carbon
Cat 3 - Concessions Managed	2021	2025	Intensity	0.12516	149.65	Increased numbers & reduced carbon

Target name	Baseline period	Target date	Type of target	Current performance (tCO <sub>2</sub> e)	Current performance (%)	Comments
Cat 3 - Appropriation	2021	2025	Intensity	0.00000088	153.66	Slightly increased numbers & reduced carbon
Cat 4 - FTEs	2021	2025	Intensity	1.89999	79.85	Slightly reduced numbers & reduced carbon
Cat 4 - Hectares Treated	2021	2025	Intensity	0.00182	90.73	Increased numbers & reduced carbon
Cat 4 - Concessions Managed	2021	2025	Intensity	1.00819	80.48	Increased numbers & reduced carbon
Cat 4 - Appropriation	2021	2025	Intensity	0.00000707	89.98	Slightly increased numbers & reduced carbon

## 2.2. SIGNIFICANT EMISSIONS SOURCES

### Significant sources

Top emissions sources consist of A1 Jet, diesel, and wastewater.

- Category 4 - A1 Jet: 2634.35 T CO<sub>2</sub>e (FY2021/22 - Q1/Q2/Q3/Q4 - 1st July 2021 to 30 June 2022) where A1 Jet is related to the procurement of helicopter services.
- Category 1 - Diesel: 2,170.21 T CO<sub>2</sub>e (FY2021/22 - Q1/Q2/Q3/Q4 - 1st July 2021 to 30 June 2022) where Diesel is purchased fuel for owned and leased vehicles, vessels, and plant.
- Category 4 - Wastewater (Type 2 & 3): 1172 T CO<sub>2</sub>e (FY2021/22 - Q1/Q2/Q3/Q4 - 1st July 2021 to 30 June 2022) where Wastewater is from staff and visitor extracted volumes of blackwater and greywater systems

### Activities responsible for generating significant emissions

A1 Jet is related to the procurement of helicopter services with turbine engines that burn A1 Jet fuel. Te Papa Atawhai does not own or operate helicopters, however it is the largest New Zealand user of helicopters. Helicopter activities procured by Te Papa Atawhai are defined as:

- Aerial Spraying
- Transportation of staff and gear
- Underslung work (aerial lifting of gear and bait)
- Aerial shooting
- To launch site (heli ferry to and from hanger)
- Aerial surveying
- Skid hopping
- Aerial animal tracking
- Live animal capture
- Thermal imaging
- Avalanche assessment

The invoicing of helicopter services details the machine brand, model and registration, the helicopter activity, and the minutes flown, therefore emission data for helicopters is relatively granular.

Of the helicopter activities we procure, aerial spraying, transportation of staff and gear, and underslung work are forecast to be the larger helicopter emission activities for FY2021/22. Aerial spraying is primarily due to MPI management units that include the application of agrichemicals from helicopter. An example of aerial spraying is application of Basal agrichemicals. The transportation of staff and gear is a relatively generic everyday function of moving staff and equipment to, around, and from the remote backcountry is part of general operational delivery. An example of transporting staff and equipment is a 4-person team along with chainsaw, brush cutter equipment and multiday supplies being airlifted by helicopter into the back country with the purpose of them conducting annual track clearance on the operational walk out. Underslung work varies greatly from the transportation and distribution of bulk maintenance supplies to the application of pest control. The use of helicopters (and burning of A1 Jet) is a core conservation delivery function under the current high carbon operating model.

Diesel is used within owned or leased vehicles, vessels, and plant. As of 30/06/2022, Te Papa Atawhai had the following 366 owned diesel vehicles and 122 leased diesel vehicles:

- Owned: 12 Heavy Transport Trucks



- Owned: 345 Utility Vehicles (utes)
- Owned: 9 Passenger Vans
- Leased: 122 Utility Vehicles (utes)
- Leased: 1 Passenger Vans

Heavy transport diesel vehicles are often equipped with small tipper decks for transporting gravel and the likes. These types of vehicles are in areas of high use, or where 3rd party HT truck services are not readily available. The main portion of diesel vehicles are utility vehicles (utes), they are available in various formats including 2WD and 4WD, single cab and double cab, and flat deck, well side and canopy variants. Utes are used for multiple tasks including transporting Internal Combustion Engine (ICE) small plant, petroleum fuels, LPG, agrichemicals, explosives, and the likes externally on the deck trays. Utes can also be used purely for their 4WD off-road capabilities such as driving on braided riverbeds, or along sandy beaches, or on 4WD tracks. Utes also have towing capacities to pull heavy laden trailers that may be transporting small excavators (diggers), LUV's (light utility vehicles such as side by sides), or equipment and materials (gravels, building supplies, etc). Diesel passenger vehicles are used to transport staff between offices, towns, and main road locations. Most passenger diesel vehicles have been phased out over the FY2021/22 year.

As of 30/06/2022, Te Papa Atawhai had the following 5 diesel vessels:

- Hauturu
- Hananui
- Southern Winds
- Mataariki
- Mataara II

Diesel vessels feature either a single, or multiple internal (in-board) diesel power plant. The largest Te Papa Atawhai owned diesel vessel is the Southern Winds located in Fiordland, which consumes approximately 50,000L of diesel annually, or 110L diesel per hour at a cruise speed of 12 Knots. Annually the Southern Winds clocks approximately 1000 hours of use, over 180-200 days. Most trips are 150km one way. The Southern Winds is primarily used as staff floating accommodation along the Fordland coastline to transporting staff and equipment, servicing and supporting other operations along the remote coastline.

A smaller portion of Diesel is used within plant items that are owned or leased. Those items include, but not limited to are:

- Tractors
- Stationary diesel generators
- Excavators (diggers)
- Selected LUVs (Light Utility Vehicles)
- Argos (multi wheeled vehicles)
- Larger ride-on lawn mowers

Wastewater extracted from type 2 (solids) and type 3 (solids & water) systems is an emission source positioned within Category 4 as it is an influenced activity through providing amenities infrastructure.

Wastewater (type 2 & 3) extraction is directly related to wastewater removal services by a third-party.

The quantity of wastewater extracted annually is highly variable depending on the operational activities, and staffing quantities throughout the year, as well as recreational visitor numbers to the conservation estate.

FY2021/22 has experienced a significant downturn in visitor numbers due to Covid-19 impacts including minimal international tourism, restricted domestic tourism and more recent economic inflation impacts such as fuel price increases.

### Influences over the activities

A1 Jet emissions sources have the potential to fluctuate significantly from year to year due to the following reasons.

- Tourism visitor numbers
  - Fluctuating visitor numbers can increase or decrease maintenance and servicing frequency of remote infrastructure
  - Fluctuating visitor numbers can increase or decrease remote management of visitors
- Climatic variations
  - An increase in temperatures can result in invasive species impacts such as beach mast events initiating major aerial pest control operations.
  - A significant decrease in temperature over winter seasons / shoulder seasons can increase the need for additional energy such as firewood to be transported and distributed to remote locations
  - Major weather events can destroy remote management & visitor infrastructure initiating emergency recovery operations that result in increased helicopter use.
- National operational projects outside of BAU
  - Large scale remote projects can be planned over multiple years and delivered over a short period of time causing emission spikes
- Capital projects cycles
  - Remote infrastructure on maintenance, or replacement, or removal cycles
  - Large projects in remote locations can cause emission spikes
- Secured central budget funding
  - Te Papa Atawhai is part of the natural budget cluster (MPI / MFE / DOC)
  - Secured budget beyond annual budgets can cause emission spikes if associated to remote projects that require helicopter use (eg aerial pest control)
- Transitioning from high carbon to low / zero carbon delivery tools
  - Investing in new technologies and approaches to conservation delivery will contribute to reducing A1 Jet (eg at site green energy huts / remote tools such as drones).

Diesel emission sources have the potential to fluctuate significantly from year to year due to the following reasons.

- Number of FTEs
  - An increase of operational delivery FTEs requires more transportation and distribution of increased staff numbers
  - An increase of operational delivery FTEs may require an increase of diesel vehicles, vessels, and plant
- Tourism visitor numbers
  - Fluctuating visitor numbers can increase or decrease maintenance and servicing of remote infrastructure

- Fluctuating visitor numbers can increase or decrease remote management of visitors
- Transitioning from high carbon to low / zero carbon delivery tools
  - Investing in low / zero carbon tools (as a replacement to ICE) over time will decrease the diesel emission source (eg hydrogen fuel cell utility vehicles)
- Optimisation of existing tools
  - Building optimisation efficiency into work programmes will decrease the emission source. However, optimisation will be limited by a ceiling threshold
  - Deploying optimisation tools such as the fleet booking tool or the seat booking tool can decrease diesel emissions.

#### Significant sources that cannot be influenced

Te Papa Atawhai has little to no influence on reducing the emissions from wastewater.

The main wastewater (type 2 & 3) volumes are associated to visitors using Te Papa Atawhai wastewater facilities. These facilities are provided as a basic functional facility to meet customer experience expectations and to prevent to degradation of the conservation estate. Te Papa Atawhai is required under the Conservation Act to provide recreational opportunities and wastewater infrastructure is a key item to meet basic needs.

Reducing visitor amenity facilities could result in a reduction of visitor experiences and infrastructure. An example is the removal of selected huts and tracks, and these actions would not be taken lightly if they were to occur.

### 2.3. EMISSIONS REDUCTION TARGETS

The organisation is committed to managing and reducing its emissions in accordance with the Programme requirements. Table 6 provides details of the emission reduction targets to be implemented. These are 'SMART' targets (specific, measurable, achievable, realistic, and time-constrained).

Te Papa Atawhai is focusing its emissions reduction plan on the key areas of the Carbon Neutral Government Programme (CNGP). The 'Base' year for reporting verified FY2020/21 at 11,118.21 T CO<sub>2</sub>e (revised to 11,090.87 T CO<sub>2</sub>e).

The CNGP requirement of 1.5C global warming means Te Papa Atawhai reduction targets will be:

- FY 2024/25 = 8761.78 T CO<sub>2</sub>e (21% reduction target)
- FY 2029/30 = 6432.70 T CO<sub>2</sub>e (42% reduction target)

Te Papa Atawhai emission activity sources can be positioned into 3 volume size groupings which helps determine priority areas of emission reduction focus. Te Papa Atawhai acknowledges that emission activity sources are not isolated, and often have interdependencies between sources great and small. The size groupings are detailed below.

- greater than 1000 T CO<sub>2</sub>e (greater than 10%)
- greater than 100 T and less than 1000 T CO<sub>2</sub>e (between 1% & 10%)
- less than 100 T CO<sub>2</sub>e (less than 1%)

Reducing emission sources within the greater than 10% group is critical to meeting our CNGP obligations. However, emissions within this group are also directly related to conservation delivery via the use of helicopters, diesel in vehicles and vessels, and the creation of wastewater from visitors and staff.

Investment into technology opportunities will be critical, such as at-site green energy harvesting, electric vehicles, and fuel cell electric vehicles.

Using the CNGP target setting tool and proposed reduction projections, the required average reduction target by FY2024/25 for combined categories is as follows:

- Category 1 -21.33 %

Using the CNGP target setting tool and proposed reduction projections, the required average reduction target by FY2024/25 for each emissions category is as follows:

- Category 1 -27.19 %
- Category 2 -11.21 %
- Category 3 -1.11 %
- Category 4 -22.92 %

Te Papa Atawhai has made significant emission reductions in FY2021/22. The combined reduction target is 5.2% per annum to meet the Te Papa Atawhai 2025 reduction of 21%. During the FY2021/22 Te Papa Atawhai has reduced its emissions to 9,326.11 T CO<sub>2</sub>e which is a 1,764.77 T CO<sub>2</sub>e reduction from the FY2020/21 verified 11,090.87 T CO<sub>2</sub>e. This annual reduction equates to -15.91%, or approximately 3 years of required emission reduction.

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Table 6. Emission reduction targets

Target Name	Baseline Period	Target Date	Type Of Target	Category	Target			KPI	Responsibility	Rationale
					Reduction By 2025 End (%)	Baseline Emission (T CO <sub>2</sub> e/KPI)	Target Emission (T CO <sub>2</sub> e/KPI)			
Cats Combined - FTEs	2021	2025	Intensity	Category 1 2 3 4	-21.33	4.22	3.32	Number of permanent and fixed-term (FTE) staff as of 30 June	Climate Change SPA	Cats combined emissions reduction target is set based on a CO <sub>2</sub> e to FTE ratio aligned to 1.5°C
Cats Combined - Hectares Treated	2021	2025	Intensity	Category 1 2 3 4	-21.33	0.0045	0.0035	Number (combined sum) over lapping hectares of treatment for possums, rats & mustelids, deer, goats, weeds, and wilding conifers	Climate Change SPA	Cats combined emissions reduction target is set based on a CO <sub>2</sub> e to hectares of treatment ratio aligned to 1.5°C
Cats Combined - Concessions Managed	2021	2025	Intensity	Category 1 2 3 4	-21.33	2.25	1.77	Number of concessions managed (one-off and longer-term recreation and other resource-use concession permits, licences, leases and easements)	Climate Change SPA	Cats combined emissions reduction target is set based on a CO <sub>2</sub> e to # of concessions managed ratio aligned to 1.5°C
Cats Combined - Appropriation	2021	2025	Intensity	Category 1 2 3 4	-21.33	0.00002	0.00001	Total annual appropriation (including multi-year)	Climate Change SPA	Cats combined emissions reduction target is set based on a CO <sub>2</sub> e to total annual appropriation ratio aligned to 1.5°C
Cat 1 - FTEs	2021	2025	Intensity	Category 1	-27.19	1.47	1.07	Number of permanent and fixed-term (FTE) staff as of 30 June	Climate Change SPA	Cat 1 emissions reduction target is set based on a CO <sub>2</sub> e to FTE ratio aligned to 1.5°C

Target Name	Baseline Period	Target Date	Type Of Target	Category	Target			KPI	Responsibility	Rationale
Cat 1 - Hectares Treated	2021	2025	Intensity	Category 1	-27.19	0.0016	0.0011	Number (combined sum) over lapping hectares of treatment for possums, rats & mustelids, deer, goats, weeds, and wilding conifers	Climate Change SPA	Cat 1 emissions reduction target is set based on a CO <sub>2</sub> e to hectares of treatment ratio aligned to 1.5°C
Cat 1 - Concessions Managed	2021	2025	Intensity	Category 1	-27.19	0.78	0.57	Number of concessions managed (one-off and longer-term recreation and other resource-use concession permits, licences, leases and easements)	Climate Change SPA	Cat 1 emissions reduction target is set based on a CO <sub>2</sub> e to # of concessions managed ratio aligned to 1.5°C
Cat 1 - Appropriation	2021	2025	Intensity	Category 1	-27.19	0.00001	0	Total annual appropriation (including multi-year)	Climate Change SPA	Cat 1 emissions reduction target is set based on a CO <sub>2</sub> e to total annual appropriation ratio aligned to 1.5°C
Cat 2 - FTEs	2021	2025	Intensity	Category 2	-11.21	0.23	0.2	Number of permanent and fixed-term (FTE) staff as of 30 June	Climate Change SPA	Cat 2 emissions reduction target is set based on a CO <sub>2</sub> e to FTE ratio aligned to 1.5°C
Cat 2 - Hectares Treated	2021	2025	Intensity	Category 2	-11.21	0	0	Number (combined sum) over lapping hectares of treatment for possums, rats & mustelids, deer, goats, weeds, and wilding conifers	Climate Change SPA	Cat 2 emissions reduction target is set based on a CO <sub>2</sub> e to hectares of treatment ratio aligned to 1.5°C
Cat 2 - Concessions Managed	2021	2025	Intensity	Category 2	-11.21	0.12	0.11	Number of concessions managed (one-off and longer-term recreation and other resource-use concession permits, licences, leases and easements)	Climate Change SPA	Cat 2 emissions reduction target is set based on a CO <sub>2</sub> e to # of concessions managed ratio aligned to 1.5°C

Target Name	Baseline Period	Target Date	Type Of Target	Category	Target			KPI	Responsibility	Rationale
Cat 2 - Appropriation	2021	2025	Intensity	Category 2	-11.21	0	0	Total annual appropriation (including multi-year)	Climate Change SPA	Cat 2 emissions reduction target is set based on a CO <sub>2</sub> e to total annual appropriation ratio aligned to 1.5°C
Cat 3 - FTEs	2021	2025	Intensity	Category 3	-1.11	0.47	0.47	Number of permanent and fixed-term (FTE) staff as of 30 June	Climate Change SPA	Cat 3 emissions reduction target is set based on a CO <sub>2</sub> e to FTE ratio aligned to 1.5°C
Cat 3 - Hectares Treated	2021	2025	Intensity	Category 3	-1.11	0.0005	0.00049	Number (combined sum) over lapping hectares of treatment for possums, rats & mustelids, deer, goats, weeds, and wilding conifers	Climate Change SPA	Cat 3 emissions reduction target is set based on a CO <sub>2</sub> e to hectares of treatment ratio aligned to 1.5°C
Cat 3 - Concessions Managed	2021	2025	Intensity	Category 3	-1.11	0.25	0.25	Number of concessions managed (one-off and longer-term recreation and other resource-use concession permits, licences, leases and easements)	Climate Change SPA	Cat 3 emissions reduction target is set based on a CO <sub>2</sub> e to # of concessions managed ratio aligned to 1.5°C
Cat 3 - Appropriation	2021	2025	Intensity	Category 3	-1.11	0	0	Total annual appropriation (including multi-year)	Climate Change SPA	Cat 3 emissions reduction target is set based on a CO <sub>2</sub> e to total annual appropriation ratio aligned to 1.5°C
Cat 4 - FTEs	2021	2025	Intensity	Category 4	-22.92	2.05	1.58	Number of permanent and fixed-term (FTE) staff as of 30 June	Climate Change SPA	Cat 4 emissions reduction target is set based on a CO <sub>2</sub> e to FTE ratio aligned to 1.5°C
Cat 4 - Hectares Treated	2021	2025	Intensity	Category 4	-22.92	0.0022	0.0017	Number (combined sum) over lapping hectares of treatment for possums, rats & mustelids, deer, goats, weeds, and wilding conifers	Climate Change SPA	Cat 4 emissions reduction target is set based on a CO <sub>2</sub> e to hectares of treatment ratio aligned to 1.5°C

Target Name	Baseline Period	Target Date	Type Of Target	Category	Target			KPI	Responsibility	Rationale
Cat 4 - Concessions Managed	2021	2025	Intensity	Category 4	-22.92	1.09	0.84	Number of concessions managed (one-off and longer-term recreation and other resource-use concession permits, licences, leases and easements)	Climate Change SPA	Cat 4 emissions reduction target is set based on a CO <sub>2</sub> e to # of concessions managed ratio aligned to 1.5°C
Cat 4 - Appropriation	2021	2025	Intensity	Category 4	-22.92	0.00001	0.00001	Total annual appropriation (including multi-year)	Climate Change SPA	Cat 4 emissions reduction target is set based on a CO <sub>2</sub> e to total annual appropriation ratio aligned to 1.5°C

## 2.4. EMISSIONS REDUCTION PROJECTS

In order to achieve the reduction targets identified in Table 6, specific projects have been identified to achieve these targets, and are detailed in Table 7 below.

**Table 7. Projects to reduce emissions**

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
COLLABORATION: Engaging industry knowledge in low carbon practices	Industry	Deputy Director-General Corporate Services	2025	Alignment with industry to ensure Te Papa Atawhai decarbonisation planning is aligned to a national industry roadmap.	Potential emerging technology information is confidential	Develop MOU's and CA's with aligned industry businesses



Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
COLLABORATION: Engaging with others in low carbon conservation management	Tertiary education	Deputy Director-General Corporate Services	2025	Utilisation of young talented people who are at the cutting edge	Could impact on limited internal resources. Could result in non-commercial blue-sky projects.	Develop MOU's and CA's with aligned tertiary education institutions. Develop structure and agreements to limit resource available and types of projects collaboration
COLLABORATION: Support MfE in offsetting frameworks	Natural Resources Sequestration	Deputy Director-General Corporate Services	2025	Budget bid funding via Climate Emergency Relief Funding (CERF) packages	Bidding could impact on limited internal resources if unsuccessful.	Limit upfront resource.
COLLABORATION: Supporting others in low carbon practices	Partners/Stakeholders	Deputy Director-General Corporate Services	2025	Concessionaires and uses could benefit from emissions knowledge sharing to help everyone upskill.	Bidding could impact on limited internal resources that is prioritised to measurement and reporting emissions	Develop MOU's and CA's with aligned tertiary education institutions. Develop structure and agreements to limit resource available and types of projects collaboration
COLLABORATION: Working across agencies to deliver for the Government	Fair collaboration	Deputy Director-General Corporate Services	2030	Potential to learn about, and adopt very solid climate change methodologies and processes, rather than having to build from scratch.	Could impact on limited internal resources.	Limit upfront resource.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
ENERGY - BIOFUELS PILOT: Trial transition to wood / biobriqs / pellets (staff usage)	Coal removal in property assets	Deputy Director-General Corporate Services	2022	Reduce diesel, petrol, LPG, coal, and firewood emissions. Reduce the transportation and distribution of those traditional energy sources.	Energy dense biobriqs can be combusted in existing infrastructure but requires a dry storage location that has a relatively low moisture content. Pellets require new combustion infrastructure technology.	Integrate greater moisture protection resilience into new storage facilities. Only roll out combustible technologies where combustion technology is already in place and of low-tech approach.
ENERGY - BIOFUELS PILOT: Trial transition to wood / biobriqs / pellets (visitor usage)	Coal removal in visitor assets	Deputy Director-General Corporate Services	2022	Reduce diesel, petrol, LPG, coal and firewood emissions. Reduce the transportation and distribution of those traditional energy sources.	Energy dense biobriqs can be combusted in existing infrastructure but requires a dry storage location that has a relatively low moisture content. Pellets require new combustion infrastructure technology.	Integrate greater moisture protection resilience into new storage facilities. Only roll out combustible technologies where combustion technology is already in place and of low-tech approach.
ENERGY - ENERGY HARVESTING PILOT: At site small scale methane gas (biogas) harvesting at site to replace LPG	Biogas harvesting at site	Deputy Director-General Operations	2025	Reduce transportation and distribution of A1 Jet (Heli emissions) / Diesel / Petrol. May reduce gas cert / compliance requirements and associated emissions?	May fragment systems (e.g. draw away from PV BESS / Hydrogen that could also cover LPG. May not produce enough energy in seasonal conditions so may require supplementation via another energy type adding complexity and emissions.	Complete a pilot trial and assess viability of at site green energy biogas harvesting

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
ENERGY - ENERGY HARVESTING PILOT: Producing and storing green energy at site	Green energy production & storage at site	Deputy Director-General Operations	2025	Reduce diesel, petrol, LPG, coal, and firewood emissions. Reduce the transportation and distribution of those traditional energy sources.	Replacement systems such as PV Solar / Hydro / Wind coupled with BESS or hydrogen FC (e.g., gas or hydrogen metal hydrate) would most likely result in more complex systems that require annual servicing and remote monitoring (e.g., connectivity to monitor)	Complete a pilot trial and assess viability of at site green production and storage.
ENERGY - ENERGY HARVESTING PILOT: Trial a high-tech hydrogen residual heat recovery for remote infrastructure	Low tech at site solar harvesting, energy storage and heat recovery	Deputy Director-General Corporate Services	2030	Reduce diesel, petrol, LPG, coal, and firewood emissions. Reduce the transportation and distribution of those traditional energy sources.	Residual heat energy that is not harnessed is lost, making the system less efficient.	Ensure hydrogen tech roadmap could harvest residual heat for stationary heating.
ENERGY - ENERGY HARVESTING PILOT: Trial a low-tech solar furnace for remote infrastructure heating / raising temp baselines	Low tech at site solar harvesting	Deputy Director-General Corporate Services	2025	Reduce diesel, petrol, LPG, coal, and firewood emissions. Reduce the transportation and distribution of those traditional energy sources.	Only supplements existing energy scenario via harvesting solar in a low-tech way when conditions are favourable.	Install prototype in appropriate location, monitor and manage with remote tools.
FLEET - TRANSITION PILOT: BEV / FCEV for small plant motorbikes / LUVs	Petrol reduction in small plant	Deputy Director-General Corporate Services	2025	Reduce Petrol Regular / Petrol Premium in ICE motorbikes / LUVs	Range and performance of selected battery electric motorbike equivalents is not adequate. Remote charging maybe required to enable return journeys. Hydrogen fuel cell technology is rapidly advancing, therefore could back the wrong technology.	Trials need to be conducted to ensure range and performance of Battery Electric motor bikes is acceptable. To be rolled out with integrated infrastructure to enable return journeys. Ensure BEV and FCEV technology is cross-compatible.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
FLEET – OPTIMISATION: Vehicle efficiency improvement via seat booking system	Pool fleet passenger seat booking system	Deputy Director-General Corporate Services	2021	Reduce the use of diesel, petrol, and electricity (PHEV / EV) emissions	None anticipated	None anticipated
FLEET – OPTIMISATION: Vehicle efficiency improvement via vehicle booking system	Pool fleet booking system	Deputy Director-General Corporate Services	2021	Reduce the use of diesel, petrol, and electricity (PHEV / EV) emissions	None anticipated	None anticipated
FLEET - TRANSITION PILOT: Pilot battery electric transition for small tender and medium runabout sized vessels	Petrol reduction in small fleet vessels	Deputy Director-General Corporate Services	2025	Reduce Petrol Regular / Petrol Premium in 4-stroke outboard engines	Range anxiety. Charging impacts if charging in remote off grid locations.	Work with NZ and international specialists.
FLEET - TRANSITION PILOT: Battery electric transition for small plant	Diesel & Petrol reduction in small plant	Deputy Director-General Corporate Services	2030	Reduce Diesel / Petrol Regular / Petrol Premium in small plant	Battery electric and hydrogen fuel cell electric maybe competing technologies	Ensure BEV and FCEV technology is cross-compatible. Seek to have more diverse FC energy supply to cover both BEV and FCEV options.
FLEET - TRANSITION PILOT: BEV / FCEV transition pilot for heavy transport vehicles	Diesel reduction in heavy transport vehicles	Deputy Director-General Corporate Services	2030	Reduce Diesel.	Availability of charging infrastructure. Electrical charging demands increase. BEV range capabilities if going battery electric. Hydrogen fuel supply if going FCEV.	Work with NZ and international specialists. Learn from other HT BEV / FCEV programmes. Rollout pilots where most applicable in terms of refuelling / charging.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
FLEET - TRANSITION PILOT: BEV / FCEV transition pilot for heavy vessels	Diesel reduction in heavy vessels	Deputy Director-General Corporate Services	2030	Reduce Diesel in heavy vessel fleet.	Pilot requires international brand supplier support to enable. Hydrogen fuelling stations are limited in numbers and locations.	Work with NZ and international specialists.
FLEET - TRANSITION PILOT: BEV / FCEV transition pilot for utility vehicles	Diesel reduction in utility vehicles	Deputy Director-General Corporate Services	2025	Reduce Diesel in utility vehicle fleet.	Availability of charging infrastructure. Electrical charging demands increase. BEV range capabilities if going battery electric. Hydrogen fuel supply if going FCEV.	Work with NZ and international specialists. Learn from other HT BEV / FCEV programmes. Rollout pilots where most applicable in terms of refuelling / charging.
FLEET - TRANSITION PILOT: Biofuels fuel trial in vehicle / vessel / plant	Diesel & Petrol reduction in vehicle / vessel / plant	Deputy Director-General Corporate Services	2030	Reduce Diesel.	Biofuels are a harsh solvent and require an upgrade of seals within the vehicle fuel system. May breach vehicle warranty.	Work with NZ and international specialists.
FLEET - TRANSITION PILOT: HHO hydrogen assist program on existing vehicles / vessels / plant	Diesel & Petrol reduction in vehicle / vessel / plant	Deputy Director-General Corporate Services	2025	Reduce Diesel / Petrol Regular / Petrol Premium in vehicles and plant.	After market modifications may impact product warranties. Maybe inappropriate for vessels as HHO is mainly applied to vehicles and plant.	Work with international HHO specialists. Focus on older diesel and petrol plant where product warranties are expired

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
FLEET - TRANSITION: Battery electric for small plant where appropriate	Petrol reduction in small plant	Deputy Director-General Corporate Services	2030	Reduce Petrol Regular use in 2-stroke & 4-stroke small plant ICE engines.	Electrical charging demands may require infrastructure upgrades. Battery capacities may not cover energy requirements of backcountry operations. Battery electric options may not have ICE equivalents (e.g., large chainsaws greater than 45cc)	Ensure transition to electric tools is where applicable. Ensure transition is supported by battery capacity that ensures tasks can be completed. Still have ICE options for small plant that cannot be transitioned.
FLEET - TRANSITION: Battery Electric Vehicle (BEV) transition for passenger fleet vehicles	Petrol reduction in passenger fleet vehicles	Deputy Director-General Corporate Services	2022	Reduce Diesel & Petrol Premium in passenger vehicles	Availability of charging infrastructure. Electrical charging demands increase. Electrical charging infrastructure required. BEV range anxiety from staff	Roll out 1:1 charging infrastructure, ensure charging compatibility across entire fleet. Complete electrical energy supply assessments & upgrade requirements prior to BEV deployment. Support BEV transition with staff training packages.
FOSSIL FUEL - REMOVAL: Phasing out of coal (staff usage)	Coal removal in property assets	Deputy Director-General Corporate Services	2023	Removal of a fossil fuel that goes against the image of conservation.	Increase in transportation & distribution of lower energy density fuels if still transporting energy. Biosecurity concerns for selected areas if moving to raw wood biofuel replacements.	Solutions support evolutionary transition, e.g., Biobriqs as 1st phase transition, at site green energy as 2nd phase transition. Requires long term roadmap.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
FOSSIL FUEL - REMOVAL: Phasing out of coal (visitor usage)	Coal removal in visitor assets	Deputy Director-General Operations	2023	Removal of a fossil fuel that goes against the image of conservation.	Increase in transportation & distribution of lower energy density fuels if still transporting energy. Biosecurity concerns for selected areas if moving to raw wood biofuel replacements.	Solutions support evolutionary transition, e.g., Biobriqs as 1st phase transition, at site green energy as 2nd phase transition. Requires long term roadmap.
FOSSIL FUEL REMOVAL: Phasing out of LPG (staff usage)	LPG removal in property assets	Deputy Director-General Corporate Services	2030	Reduce transportation and distribution of A1 Jet (Heli emissions) / Diesel / Petrol via improvements in at site infrastructure.	Increase of staff transporting compressed flammable fuels in a less regulated way than current approach. If users are transporting their own fuels, then there is increase consumerism of disposable cooking cannisters and impacts of imported gas.	For high use sites seek at site green energy solutions to maintain service standard, reduce H&S fire risks, and reduce consumerism and imported gas impacts.
FOSSIL FUEL REMOVAL: Phasing out of LPG (visitor usage)	LPG removal in visitor assets	Deputy Director-General Operations	2030	Reduce transportation and distribution of A1 Jet (Heli emissions) / Diesel / Petrol via improvements in at site infrastructure.	Potentially a reduction in provided services which may result in reduced visitor numbers. If users are transporting their own fuels, then there is increase consumerism of disposable cooking cannisters and impacts of imported gas. H&S fire risks may increase as personal cooking devices are not regulated. Increase in transportation & distribution of lower energy density fuels if still transporting energy.	For high use sites seek at site green energy solutions to maintain service standard, reduce H&S fire risks, and reduce consumerism and imported gas impacts.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
INTEGRATED CHANGE: Lead social change transition to low carbon operating model	Change management	Deputy Director-General Corporate Services	2023	Potential to influence change internally and externally	Subject to OIAs. Potential to influence change internally and externally	Ensure the Climate Change Mitigation programme is documented by the comms team.
OPTIMISATION: Build operational efficiency into conservation delivery	Helicopter Fuel & Diesel reductions	Deputy Director-General Operations	2022	Reduce diesel, petrol, LPG, coal, and firewood emissions. Reduce the transportation and distribution of those traditional energy sources.	None anticipated	None anticipated
OPTIMISATION: Reviewing what work we do and how we deliver it	Develop a Climate Change Mitigation continuous improvement (Kaizen) tool	Deputy Director-General Corporate Services	2025	Potential to track and follow continuous improvement	Continuous improvement requires continuous upskilling and training. Could be onerous.	Ensure improvements are staggered, e.g., bi-annually, or annually
POLICY & STANDARDS: Climate inclusive criteria within tendering processes	Tender criteria	Deputy Director-General Corporate Services	2023	Potential to procure goods and services that are of low / zero carbon as well as having good waste management principles	How to ensure all tenders are treated equally. E.g., are hut tender 'A' criteria comparable to hut tender 'B' criteria?	Develop high level trigger overlays that trigger key tender criteria topics
POLICY & STANDARDS: Describes what good looks like within 10 principles	Climate Change Mitigation principles 10 principles development	Deputy Director-General Corporate Services	2023	Help inform us what good looks like. E.g., not just soundbite evaluations, rather end to end evaluations.	How to ensure staff are applying the 10 principles	Include into staff induction process. Include into DOCLearn modules



Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
POLICY & STANDARDS: Eliminate whole of life high emission materials	Restricted materials list	Deputy Director-General Corporate Services	2030	Restrict the procurement of hazardous substances. Develop a real time dashboard manifest of hazardous substances. Ensure hazardous substances and packaging follow appropriate EOL processes.	Identifying hazardous substances and undertaking a stocktake will be challenging	Include H&S team. Seek advice and guidance from external specialists.
POLICY & STANDARDS: Ensuring that we adopt best practice via Taskforce Climate Financial Disclosures (TCFD) or similar	Taskforce Climate Financial Disclosures (TCFD)	Deputy Director-General Corporate Services	2025	Potential to develop robust systems that detail climate change maturity and future roadmap.	Will require all Climate Change groups (adaptation / sequestration / policy / governance / etc) buying into the TCFD	Get KPMG to present TCFD to senior leaders
POLICY & STANDARDS: Integrate environmental code of conduct within the supply chain	Supply chain code of environmental conduct integration	Deputy Director-General Corporate Services	2025	Drives climate change mitigation principles into the supply of goods and services.	Very wide topic from pest control toxins to T2 ICE tools. Some of these items are essential to delivering conservation outputs where others may challenge the environmental code of conduct for using those tools.	Code of conduct will need to detail the product to ensure greater good conservation outcomes
POLICY & STANDARDS: Working effectively within Te Papa Atawhai	Project Management Framework and P3	Deputy Director-General Corporate Services	2022	Portfolio / Programme / Project structure for climate change work to enable strong governance and cohesive collaboration.	Not fully functional yet.	Need all Climate Change SPAs to commit to the model.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
REMOTE TOOLS - PILOT: Monitoring away from the field, to reduce transport activity	Remote tools	Deputy Director-General Corporate Services	2025	Reduce A1 Jet / Diesel / Petrol / Aviation Gasoline	A very wide set of tools from aerial, to terrestrial, to freshwater to marine, from mobile to stationary. It will be hard to get all remote tools work under a collaborative and cohesive umbrella.	Requires operating standards, policies, investment etc to ensure remote tools is managed and deployed in a collaborative and cohesive manor
REMOTE TOOLS - PILOT: Mobile drone tools program - scope existing tech and trial across VTOL / heavy lift.	Aerial drone capabilities, roadmap & compliance	Deputy Director-General Corporate Services	2025	Reduce A1 Jet / Diesel / Petrol / Aviation Gasoline	Potential for significant impacts if developed and deployed in an ad hoc manor.	Remote tools capability development / regulations etc need to be in place as these tools fall under CAA and therefore need to be flown accordingly by certified pilots. Remote tools technology roadmaps need to be in place to ensure flow of technology and knowledge.
REMOTE TOOLS - PILOT: Visitor asset energy envelope and user behaviour assessment to assess real time ambient temperature / conditions, and behaviours to inform hut replacement program	Remote infrastructure energy and user behaviour assessment	Deputy Director-General Corporate Services	2025	Reduce transportation and distribution of A1 Jet (Heli emissions) / Diesel / Petrol via improvements in hut designs and visitor behaviours.	Increase at site complexity (e.g., connectivity to monitor). Greater level of analytics required.	Select locations that reduce connectivity issues. Ensure pilots integrate into visualisation tools.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
REMOTE TOOLS - PILOT: Visitor counter pilot via real time directional data collection	Remote infrastructure user behaviour assessment	Deputy Director-General Corporate Services	2025	Reduce transportation and distribution of A1 Jet (Heli emissions) / Diesel / Petrol via improvements in at site infrastructure.	Increase at site complexity (e.g., connectivity to monitor). Greater level of analytics required.	Select locations that reduce connectivity issues. Ensure pilots integrate into visualisation tools.
VISUALISATION & ASSESSMENT: Assess whole-of-life, including disposal at end of life (EOL)	Waste management of procured goods	Deputy Director-General Corporate Services	2030	Reduction of mixed waste and office waste to landfill	Organic waste and recyclable waste are end up in landfill. Procurement of products that cannot be recycle continues.	Conduct waste audits. Set waste to landfill standards with waste extraction service providers. Work with procure to consider onshore recycling when procuring goods.
VISUALISATION & ASSESSMENT - PILOT: Low CAPEX / OPEX carbon prefabricated construction with adaptation resilience	Improved visitor infrastructure carbon & energy envelopes	Deputy Director-General Operations	2025	Reduced embedded carbon (e.g., greater selection on materials due to manufacturing in a factory rather than back country). Improve manufacturing efficiencies and waste reduction (e.g., controlled manufacturing production line approach). Reduce project delivery carbon (e.g., reduced use of helicopters). Reduce servicing life emissions (e.g., increased energy efficiency). Reduce end of life emissions (e.g., repurposing / recycling opposed to landfill).	May result in over cautious approach where huts removed prematurely due to climate change adaptation impacts	Require an evaluation weighting system that triggers the removal of a hut due to climate change impacts.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
VISUALISATION & ASSESSMENT: Completion of 10 year verified emissions profile and emission reductions	Emissions Verification	Deputy Director-General Corporate Services	2021-2030	Measure, track, and verify emissions annually.	Complex organisations with multiple moving parts. Difficult to gather data	Improve emissions data harvesting and management via ne financial system / MDP / etc.
VISUALISATION & ASSESSMENT: Decarbonisation decision making model	Integrate the reduction hierarchy model into business planning	Deputy Director-General Corporate Services	2022	Feed into decision making tool	As a conservation focussed organisation, we tend to focus on offsetting rather than upfront mitigation.	Ensure reduction hierarchy model integrated into multiple decision-making processes.
VISUALISATION & ASSESSMENT: Granular environmental assessment of products & services	Product assessment (LCA, DFE & DFD)	Deputy Director-General Corporate Services	2025	Data based procurement of products that reduce emission created elsewhere, or long term impacts such waste to landfill	Mental models often cloud or act a bias on product selection. Emissions and waste fallout often challenge each other.	Communicate findings from LCAs etc. Communicate lesser of two evils decision approach.
VISUALISATION & ASSESSMENT: NABERSNZ assessment for offices over 2,000 square metres	Large office space energy assessment	Deputy Director-General Corporate Services	2022	Large office building meet energy efficiency thresholds	Do not occupy many owned or leased office buildings >2000m <sup>2</sup>	Apply to owned or leased office buildings <2000m <sup>2</sup> overtime.
VISUALISATION & ASSESSMENT: Prioritised reduction program	Emissions Reduction Plan (ERP)	Deputy Director-General Corporate Services	2021	Develop an ERP the aligns to 1.5C of global warming. Reduce emissions accordingly.	Impacted by external emission drivers that are difficult to control such as increased visitors, or storm events.	Trade-off emission impacts with reducing aggressively in other areas. Reset baseline if expanding emission activity sources.

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
VISUALISATION & ASSESSMENT: Understanding emissions resulting from our activities	Point of decision-making matrix tool development	Deputy Director-General Corporate Services	2023	Reduce all emission sources where appropriate	None anticipated	None anticipated
VISUALISATION & ASSESSMENT: Understanding expectations for managing carbon emissions	Development of a Strategic Energy Management Plan	Deputy Director-General Corporate Services	2025	Understand the current energy state, develop a roadmap and management plan to improve on current state.	Exceedingly difficult to gather data to evaluate current state.	Work with CSG Property, Operations and Biodiversity. May need to take a methodology extrapolation approach as assessing every asset would be resource heavy.
VISUALISATION & ASSESSMENT: Understanding potential emissions resulting from our planned activities	OPEX carbon calculator tool development	Deputy Director-General Corporate Services	2023	Reduce all emission sources where appropriate	None anticipated	None anticipated
VISUALISATION & ASSESSMENT: Understanding potential emissions resulting from our planned activities	CAPEX carbon calculator tool development or acquisition	Deputy Director-General Corporate Services	2023	Reduce all emission sources where appropriate	None anticipated	None anticipated
VISUALISATION & ASSESSMENT: Visualising carbon costs resulting from our activities	Suite of carbon dashboard development	Deputy Director-General Corporate Services	2023	Reduce all emission sources where appropriate	None anticipated	None anticipated

Objective	Project	Responsibility	Completion date	Potential co-benefits	Potential unintended consequences	Actions to minimise unintended consequence
VISUALISATION & ASSESSMENT: Wastewater sites, small plant, vessels, ICE bikes, EV motorbikes, E-Bikes	Inventory Program	Deputy Director-General Corporate Services	2023	Understand the current inventory state	Exceedingly difficult to gather data to evaluate current state, plus maintain.	New financial / asset management system may be able to resolve this issue.
WASTE MINIMISATION - PILOT: Wastewater removal at site to reduce waste transport operation - specifically visitor asset focused	Wastewater removal at site	Deputy Director-General Operations	2025	Reduce extraction of waste volumes via transportation and distribution of A1 Jet (Heli emissions) / Diesel / Petrol.	Unknown processing of dehydrated waste once extracted, unknown emissions associated	Complete a pilot trial and assess viability of wastewater dehydration. Include processing beyond extraction within assessment.

Table 8 highlights emission sources that have been identified for improving source the data quality in future inventories.

**Table 8. Projects to improve data quality**

Emissions source	Actions to improve data quality	Responsibility	Completion date
<ul style="list-style-type: none"> <li>• A1 Jet</li> <li>• Aviation Gasoline</li> </ul>	Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>• Diesel</li> <li>• Petrol Regular</li> <li>• Petrol Premium</li> </ul>	<p>Improve internal SOP for fuel purchases to improve data quality</p> <p>Work with supplier/s to provide / improve electronic reports for data quality</p> <p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>• Electricity</li> <li>• Natural Gas (Commercial Distributed)</li> </ul>	<p>Work with supplier/s to provide / improve electronic reports for data quality</p> <p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module.</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>• Air Travel International (Long Haul - Economy +)</li> <li>• Air Travel International (Short Haul - Economy)</li> <li>• Air Travel Domestic (Jet Aircraft)</li> <li>• Air Travel Domestic (Medium Aircraft)</li> <li>• Air Travel Domestic (Small Aircraft)</li> <li>• Air Travel Domestic (Average)</li> <li>• Accommodation (New Zealand)</li> <li>• Accommodation (Australia)</li> <li>• Rental Car Average (Fuel Unknown)</li> <li>• Taxi (Regular)</li> </ul>	<p>Improve internal SOP regarding coding to improve data quality (Taxi services)</p> <p>Work with supplier/s to provide / improve electronic reports for data quality</p> <p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module</p> <p>Improve internal data management</p>	DDG Corporate Services	FY2022/23

Emissions source	Actions to improve data quality	Responsibility	Completion date
<ul style="list-style-type: none"> <li>LPG</li> <li>Natural Gas (Distributed Commercial)</li> </ul>	<p>Work with supplier/s to provide / improve electronic reports for data quality</p> <p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>Coal</li> </ul>	<p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module</p> <p>Coal phase out by FY2021/22 end</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>Wood Industry</li> <li>Firewood</li> </ul>	<p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module. (Purchased firewood)</p> <p>Improve data quality by integrating into business reporting (Harvested firewood)</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>Wastewater (Cat 1 - Type 1 - Precalculated CO<sub>2</sub>e)</li> <li>Wastewater (Cat 4 - Type 2 &amp; 3 - Precalculated CO<sub>2</sub>e)</li> </ul>	<p>Improve data quality by integrating into business reporting (Category 1 - Type 1)</p> <p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module. (Category 4 - Type 2 &amp; Type 3)</p>	DDG Corporate Services DDG Operations	FY2022/23
<ul style="list-style-type: none"> <li>Refrigerant (R-12)</li> <li>Refrigerant (R-22)</li> <li>Refrigerant (R-32)</li> <li>Refrigerant (R-134A)</li> <li>Refrigerant (R-143A)</li> <li>Refrigerant (R-404A)</li> <li>Refrigerant (R-410A)</li> <li>Refrigerant (R-417A)</li> <li>Refrigerant (R-717)</li> </ul>	<p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module. (Purchased)</p> <p>Improve data quality by integrating into business reporting (Stocktake)</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>Staff Working From Home</li> <li>Staff Commute (Metropolitan Bus Average)</li> </ul>	Improve survey approach to remove bias, and inaccuracy	DDG Corporate Services	FY2022/23



Emissions source	Actions to improve data quality	Responsibility	Completion date
<ul style="list-style-type: none"> <li>• Staff Commute (Metropolitan Rail Average)</li> <li>• Staff Commute (Metropolitan Bus Average)</li> <li>• Staff Commute (Public Ferry Average)</li> <li>• Staff Commute (Car Average - Fuel Type Unknown)</li> <li>• Staff Commute (Private Motorbike &gt;60cc Pre 2010)</li> </ul>			
<ul style="list-style-type: none"> <li>• Waste Landfill No LFGR (Mixed Waste)</li> <li>• Waste Landfill No LFGR (Office Waste)</li> <li>• Composting</li> </ul>	<p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module</p> <p>Improve data quality by integrating into business reporting</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>• Transmission &amp; Distribution Losses (Electricity)</li> <li>• Transmission &amp; Distribution Losses (Natural Gas)</li> </ul>	<p>Work with supplier/s to provide / improve electronic reports for data quality</p> <p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>• Purchased Water</li> </ul>	<p>Work with supplier/s to provide / improve electronic reports for data quality</p> <p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module</p>	DDG Corporate Services	FY2022/23
<ul style="list-style-type: none"> <li>• Paper Use</li> </ul>	<p>Work with supplier/s to provide / improve electronic reports for data quality</p> <p>Improve supplier/s data quality and capture mechanism via a new Financial Management Information System (FMIS) that includes a purchase order module</p>	DDG Corporate Services	FY2022/23

The emissions inventory chapter identified various emissions liabilities (see Liabilities section). Table 9 details the actions that will be taken to prevent GHG emissions from these potential emissions sources.

**Table 9. Projects to prevent emissions from liabilities**

Liability source	Actions to prevent emissions	Responsibility	Completion date
Fleet – Small Quantity Fuel Storage (Diesel / Petrol Reg / Petrol Prem)	Small fuels volumes storage is in approved fuel containers and dedicated sheds that meet storage requirements	Vehicles Equipment and Machinery Manager	Ongoing
Fleet - Vehicles & Vessels (Diesel / Petrol Reg / Petrol Prem)	Regular fleet servicing and preventative maintenance	Vehicles Equipment and Machinery Manager	Ongoing
Fleet -Small Plant (Petrol Reg)	Regular small plant servicing and preventative maintenance	Vehicles Equipment and Machinery Manager	Ongoing
Plant - Stationary Generator Plant (Diesel)	Regular stationary generator plant servicing and preventative maintenance	Commercial Property Manager	Ongoing
Infrastructure - New Off-Grid Green Electricity Production (PV BESS)	Regular off grid green energy system remote monitoring, servicing, and preventative maintenance	Director Operations Planning / Commercial Property Manager	Ongoing
Infrastructure - Stationary Heating (LPG Hot Water & Cooking)	Regular LPG system compliance, servicing, and preventative maintenance	Director Operations Planning	Ongoing
Infrastructure – LPG Fuel Storage	Small LPG volumes storage is in approved LPG storage facilities (e.g., empty used bottle & new full bottle storage at workshop yards)	Commercial Property Manager	Ongoing
Infrastructure - Stationary Heating (Fossil & Biofuel Combustion)	Regular fireplace servicing and preventative maintenance	Director Operations Planning / Commercial Property Manager	Ongoing
Infrastructure - Wastewater Systems (Type 1)	Regular WWTP servicing and preventative maintenance	Director Operations Planning / Commercial Property Manager	Ongoing
Infrastructure - Wastewater Systems (Type 2 & Type 3)	Regular septic system, wastewater field, containment tank servicing and preventative maintenance	Director Operations Planning / Commercial Property Manager	Ongoing
Infrastructure - Refrigerants (Hard Plumbed & Non-Hard Plumbed Devices)	Regular Refrigerant device servicing and preventative maintenance	Director Operations Planning / Commercial Property Manager	Ongoing
Electrical - Appliances	Regular electrical device certification, servicing, and preventative maintenance	Business Support Manager	Ongoing
Electrical - Consumables	Regular electrical consumable servicing and preventative maintenance	Business Support Manager	Ongoing

## 2.5. STAFF ENGAGEMENT

The Climate Change Mitigation team at Te Papa Atawhai has engaged staff at all levels throughout the organisation with regards to climate context, climate challenges that we face and requirement to reduce emissions to mitigation this issue.

At a management level, the Senior Leadership Team have met to workshop key objectives and pledge commitment. Senior Leaders (Directors) have met to workshop scenarios and solutions.

Te Papa Atawhai is developing a range of 'Carbon Dashboards' which will be populated with Te Papa Atawhai verified emission results. The tool will be available within the FY2022/23 post verification certification to the Senior Leadership Team (SLT), Directors and Managers (carbon budget holders) so that they can:

- Understand their current carbon emission sources
- Understand the reduction potential
- Develop data-driven reduction road maps and make decisions based on carbon reduction planning
- Track their emission reductions against targets

Te Papa Atawhai has developed a proof-of-concept OPEX carbon calculator to enable staff to:

- Calculate emission scenarios for complex situations (eg helicopter machine burn rates, minutes flown, emission factors against fuel type outputs a CO<sub>2</sub> quantity)
- Use valid and appropriate emission factors and calculation methods.
- Plan emission reductions into their work by identifying and selecting lower emission conservation delivery options.

## 2.6. KEY PERFORMANCE INDICATORS

Te Papa Atawhai emission Key Performance Indicators (KPIs) are to:

- Ensure we align with 'Climate Change Response (Zero Carbon) Amendment Act 2019' legislation.
- Ensure the emissions reduction areas include government mandated objectives and focus areas within the 'Carbon Neutral Government Programme' (CNGP) including alignment with 1.5°C of global warming.
- Ensure a robust data source.

**Table 10. Key Performance Indicators (KPIs).**

Target name	Baseline period	Target date	Type of target	Current performance (tCO <sub>2</sub> e)	Current performance (%)	Comments
Cats Combined - FTEs	2021	2025	Intensity	3.63723	90.53	2025 target not met
Cats Combined - Hectares Treated	2021	2025	Intensity	0.00349	100.44	2025 target complete. Need to maintain out to 2025
Cats Combined - Concessions Managed	2021	2025	Intensity	1.93002	91.1	2025 target not met
Cats Combined - Appropriation	2021	2025	Intensity	0.00001	99.76	2025 target not met
Cat 1 - FTEs	2021	2025	Intensity	1.30371	78.17	2025 target not met

Target name	Baseline period	Target date	Type of target	Current performance (tCO <sub>2</sub> e)	Current performance (%)	Comments
Cat 1 - Hectares Treated	2021	2025	Intensity	0.00125	89.2	2026 target not met
Cat 1 - Concessions Managed	2021	2025	Intensity	0.69179	78.81	2027 target not met
Cat 1 - Appropriation	2021	2025	Intensity	0	88.44	2028 target not met
Cat 2 - FTEs	2021	2025	Intensity	0.19766	103.56	2025 target complete. Need to maintain out to 2025
Cat 2 - Hectares Treated	2021	2025	Intensity	0.00019	112.29	2025 target complete. Need to maintain out to 2025
Cat 2 - Concessions Managed	2021	2025	Intensity	0.10488	104.07	2025 target complete. Need to maintain out to 2025
Cat 2 - Appropriation	2021	2025	Intensity	0	111.69	2025 target complete. Need to maintain out to 2025
Cat 3 - FTEs	2021	2025	Intensity	0.23587	149.39	2025 target complete. Need to maintain out to 2025
Cat 3 - Hectares Treated	2021	2025	Intensity	0.00023	153.97	2025 target complete. Need to maintain out to 2025
Cat 3 - Concessions Managed	2021	2025	Intensity	0.12516	149.65	2025 target complete. Need to maintain out to 2025
Cat 3 - Appropriation	2021	2025	Intensity	0	153.66	2025 target complete. Need to maintain out to 2025
Cat 4 - FTEs	2021	2025	Intensity	1.89999	79.85	2028 target not met
Cat 4 - Hectares Treated	2021	2025	Intensity	0.00182	90.73	2028 target not met
Cat 4 - Concessions Managed	2021	2025	Intensity	1.00819	80.48	2028 target not met
Cat 4 - Appropriation	2021	2025	Intensity	0.00001	89.98	2028 target not met

## 2.7. MONITORING AND REPORTING

Senior Leadership Team (SLT) monitoring of Te Papa Atawhai emissions:

- The 'Senior Leadership Team' (SLT) will monitor Te Papa Atawhai emissions via SLT dashboards that include a high-level emissions data.
- The monitoring of emissions against targets to be led by the SPA for climate change and supported by the SPA Climate Change Mitigation.
- The frequency dashboard update is 1 month, therefore SLT monitoring will be 1 month or greater.

Climate Change Governance monitoring & reporting of Te Papa Atawhai emissions:

- Te Papa Atawhai Climate Change governance will monitor Te Papa Atawhai emissions via a carbon dashboard that present a detailed level of emission data
- The monitoring of emissions against targets to be led by the SPA of Climate Change Mitigation and supported by the Director of which Climate Change Mitigation reports to.
- The frequency dashboard update is 1 month, therefore Climate Change Governance monitoring and reporting of will be 1 month or greater.

Climate Change Mitigation monitoring & reporting of Te Papa Atawhai emissions:

- Te Papa Atawhai Climate Change Mitigation (Outcomes Management Office) will monitor Te Papa Atawhai emissions via a carbon dashboard, eManage, the CNGP emissions target setting tool, and the modern data platform that present in-depth detailed levels of emission data.
- The monitoring and reporting of emissions against targets to be led by the Principal Sustainability Advisor and supported by the Outcomes Management Office staff. The Outcomes Management Office is accountable for internal emission target reporting, and external accountability document reporting such as the annual report, and the emissions reduction plan, as well as CNGP / Toitū reporting. Generally reporting externally will be on a annual basis.
- The frequency dashboard update is 1 month, therefore Climate Change Governance monitoring and reporting of will be 1 month or greater.

General staff monitoring and reporting of Te Papa Atawhai emissions:

- Te Papa Atawhai staff will monitor emissions via a carbon dashboard. Carbon budgets to be assigned at a Business Group, or regional level.
- The monitoring of emissions against carbon budgets will be led by Directors and Deputy Director Generals of which those budgets are assigned to, and general staff within those reporting lines will provide support.
- The frequency dashboard update is 1 month, therefore carbon budget monitoring and reporting of will be 1 month or greater.

## APPENDIX 1: DETAILED GREENHOUSE GAS INVENTORY

Additional inventory details are disclosed in the tables below, and further GHG emissions data is available on the accompanying spreadsheet to this report (Appendix1-Data Summary Department of Conservation - Te Papa Atawhai.xls).

**Table 11. Direct GHG emissions and removals, quantified separately for each applicable gas**

Category	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	NF <sub>3</sub>	SF <sub>6</sub>	HFC	PFC	Desflurane	Sevoflurane	Isoflurane	Emissions total (tCO <sub>2</sub> e)
Stationary combustion	105.52	28.19	4.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	138.25
Mobile combustion (incl. company owned or leased vehicles)	2,907.80	11.94	60.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,979.97
Emissions - Industrial processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Removals - Industrial processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leakage of refrigerants	0.00	0.00	0.00	0.00	0.00	111.25	0.00	0.00	0.00	0.00	111.25
Treatment of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Treatment of wastewater	117.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	117.00
Emissions - Land use, land-use change and forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Removals - Land use, land-use change and forestry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertiliser use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Addition of livestock waste to soils	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Addition of crop residue to soils	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Enteric fermentation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Addition of lime to soils	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open burning of organic matter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total net emissions	3,130.31	40.13	64.78	0.00	0.00	111.25	0.00	0.00	0.00	0.00	3,346.47

**Table 12. Non-biogenic, biogenic anthropogenic and biogenic non-anthropogenic CO<sub>2</sub> emissions and removals by category**

Category	Anthropogenic biogenic CO <sub>2</sub> emissions	Anthropogenic biogenic (CH <sub>4</sub> and N <sub>2</sub> O) emissions (tCO <sub>2</sub> e)	Non-anthropogenic biogenic (tCO <sub>2</sub> e)
Category 1: Direct emissions	399.50	31.05	0.00
Category 2: Indirect emissions from imported energy	0.00	0.00	0.00
Category 3: Indirect emissions from transportation	0.00	0.00	0.00
Category 4: Indirect emissions from products used by organisation	0.00	278.85	0.00
Category 5: Indirect emissions associated with the use of products from the organisation	0.00	0.00	0.00
Category 6: Indirect emissions from other sources	0.00	0.00	0.00
<b>Total gross emissions</b>	<b>399.50</b>	<b>309.90</b>	<b>0.00</b>

## A1.1 REPORTING BOUNDARIES

### A1.1.1 Emission source identification method and significance criteria

The GHG emissions sources included in this inventory are those required for Programme certification and were identified with reference to the methodology described in the GHG Protocol and ISO 14064-1:2018 standards as well as the Programme Technical Requirements.

The methods used by Te Papa Atawhai to identify sources and sinks were:

- Communications with relevant staff
- Significant screening
- Review of assets
- Review of expenditure records
- Review of operational delivery activities

Significance of emissions sources within the organisational boundaries has been considered in the design of this inventory. The significance criteria used comprise:

- All direct emissions sources that contribute more than 1% of total Category 1 and 2 emissions
- All indirect emissions sources that are required by the Programme.

Additional detail on significance criteria used, by source and sink, is included in Appendix 2.

### A1.1.2 Included sources and activity data management

As adapted from ISO 14064-1, the emissions sources deemed significant for inclusion in this inventory were classified into the following categories:

- **Direct GHG emissions (Category 1):** GHG emissions from sources that are owned or controlled by the company.
- **Indirect GHG emissions (Category 2):** GHG emissions from the generation of purchased electricity, heat and steam consumed by the company.
- **Indirect GHG emissions (Categories 3-6):** GHG emissions that occur as a consequence of the activities of the company but occur from sources not owned or controlled by the company.

Table 13 provides detail on the categories of emissions included in the GHG emissions inventory, an overview of how activity data were collected for each emissions source, and an explanation of any uncertainties or assumptions made based on the source of activity data. Detail on estimated numerical uncertainties are reported in Appendix 1.

The methods used by Te Papa Atawhai to collect FY2021/22 emissions activity sources data were:

- Financial Management Information System (FMIS - SAP)
- MS Forms
- Goods & service supplier reports
- MS Excel records
- Staff surveys
- Emails

The methods used by Te Papa Atawhai to manage FY2021/22 emissions activity sources data are:

- DOC-CM (Te Papa Atawhai content management system)
- MDP (Modern Data Platform - data warehouse)
- SharePoint



**Table 13. GHG emissions activity data collection methods and inherent uncertainties and assumptions**

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Category 1: Direct emissions and removals	Direct emissions from stationary combustion	Coal (purchased unknown extrapolation)	<p>Methodology for fossil fuel (coal) third party suppliers where data is not accurate, or not provided.</p> <ul style="list-style-type: none"> <li>Some third-party fossil fuel (coal) goods providers have provided coal volumes accurately within invoicing (e.g., a specific weight in kg, coal quality, and a cost to supply).</li> <li>Some third party fossil fuel (coal) goods providers have provided generic coal volume descriptions within invoicing (e.g., 1 bag and a cost to supply).</li> <li>Some 3rd party fossil fuel (coal) goods providers have not provided coal volume descriptions within invoicing (eg only a cost to supply).</li> </ul> <p>The methodology to calculate unknown third-party fossil fuel (coal) is to:</p> <ul style="list-style-type: none"> <li>Extrapolating known data to identify an average volume of coal to cost ratio.</li> <li>Apply this ratio to the generic description costings and non-description costings.</li> </ul>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting
Category 1: Direct emissions and removals	Direct emissions from stationary combustion	Biofuel (purchased unknown extrapolation)	<p>Methodology for biofuel (firewood) 3rd party suppliers where data is not accurate, or not provided.</p> <ul style="list-style-type: none"> <li>Some 3rd party biofuel (firewood) goods providers have provided volumes accurately within invoicing (eg volume in m<sup>3</sup>, cord or fadge, and a cost to supply).</li> <li>Some 3rd party biofuel (firewood) goods providers have provided generic volume descriptions within invoicing (eg 1 trailer, 1 truck and a cost to supply).</li> </ul>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>Some 3rd party biofuel (firewood) goods providers have not provided volume descriptions within invoicing (eg only a cost to supply).</li> </ul> <p>The methodology to calculate unknown 3rd party biofuel (firewood) is to:</p> <ul style="list-style-type: none"> <li>Extrapolating known data to identify an average volume of firewood to cost ratio.</li> <li>Apply this ratio to the generic description costings and non description costings.</li> </ul> <p>Scope 1: Biofuel (harvested):</p> <p>Methodology for Scope 1 biofuel (firewood) that is harvested by Te Papa Atawhai.</p> <ul style="list-style-type: none"> <li>Use Southern South Island (SSI) as a representative model of harvested firewood.</li> <li>No purchased biofuel (firewood) has been identified for SSI. Therefore assume 100% harvested.</li> </ul> <p>The methodology to calculate unknown Te Papa Atawhai biofuel (firewood) is to:</p> <ul style="list-style-type: none"> <li>Assume all region supply same quantity of firewood as worst case scenario.</li> <li>Extrapolate out other regions based on percentage of purchased to harvested firewood ratio.</li> <li>Apply SSI percentage ratio to remaining regions.</li> </ul>		
Category 1: Direct emissions and removals	Direct emissions from stationary combustion	Biofuel (purchased unknown extrapolation)	Methodology for biofuel (firewood) third party suppliers where data is not accurate, or not provided.		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>• Some third-party biofuel (firewood) goods providers have provided volumes accurately within invoicing (e.g., volume in m<sup>3</sup>, cord or fadge, and a cost to supply).</li> <li>• Some third-party biofuel (firewood) goods providers have provided generic volume descriptions within invoicing (e.g., 1 trailer, 1 truck and a cost to supply).</li> <li>• Some third- party biofuel (firewood) goods providers have not provided volume descriptions within invoicing (e.g., only a cost to supply).</li> </ul> <p>The methodology to calculate unknown third-party biofuel (firewood) is to:</p> <ul style="list-style-type: none"> <li>• Extrapolating known data to identify an average volume of firewood to cost ratio.</li> <li>• Apply this ratio to the generic description costings and non-description costings.</li> </ul> <p>Scope 1: Biofuel (harvested):</p> <p>Methodology for Scope 1 biofuel (firewood) that is harvested by Te Papa Atawhai.</p> <ul style="list-style-type: none"> <li>• Use FY2020/21 Southern South Island (SSI) as a representative model of harvested firewood. However, use a 25% reduction to represent FY2021/22 visitor downturn.</li> <li>• No purchased biofuel (firewood) for FY2020/21 was identified for SSI. Therefore assume 100% harvested.</li> </ul> <p>The methodology to calculate unknown Te Papa Atawhai biofuel (firewood) is to:</p> <ul style="list-style-type: none"> <li>• Assume all regions (excluding NNI) supply same quantity of firewood as worst-case scenario.</li> </ul>		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>• Extrapolate out other regions based on percentage of purchased to harvested firewood ratio.</li> <li>• Apply SSI percentage ratio to remaining regions</li> </ul>		
Category 1: Direct emissions and removals	Direct emissions from stationary combustion	Biofuel (weight to m <sup>3</sup> ratio)	<p>Methodology for biofuel (firewood) where data is not accurate, or not provided.</p> <ul style="list-style-type: none"> <li>• Some 3rd party biofuel (firewood) goods providers have not provided firewood weight to volume descriptions within invoicing (e.g., only a cost to supply).</li> <li>• Some 3rd party biofuel (firewood) that is harvested by Te Papa Atawhai does not detail weight to volume descriptions.</li> </ul> <p>The methodology to calculate the weight to m<sup>3</sup> ratio of biofuel (firewood) is to:</p> <ul style="list-style-type: none"> <li>• Use thrown m<sup>3</sup> firewood as the storage / transportation format.</li> <li>• Use the average seasoned weight for the most common exotic firewood species types, as follows: <ul style="list-style-type: none"> <li>- Eucalyptus firewood: 820kg / solid m<sup>3</sup></li> <li>- Douglas Fir firewood: 530Kg / solid m<sup>3</sup></li> <li>- Pinus Radiata firewood: 480kg / solid m<sup>3</sup></li> <li>- Average = 610kg / solid m<sup>3</sup></li> </ul> </li> <li>• Use the thrown firewood mix of approximately 70% firewood to 30% air ratio (0.70 per m<sup>3</sup>).</li> <li>• Therefore, the average weight for thrown firewood is 0.7 x 610 = 427kg per m<sup>3</sup>.</li> </ul>		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Category 1: Direct emissions and removals	Direct emissions from mobile combustion	Diesel, Petrol premium, Petrol regular (P Card purchases)	<p>Methodologies to calculate the emissions of 'P' Card purchased fuels where multiple data are not accurate, or not provided.</p> <ul style="list-style-type: none"> <li>• Te Papa Atawhai staff sometimes use 'P' Cards to purchase diesel fuels. Costs are known; however fuel type and quantities are not.</li> <li>• Te Papa Atawhai staff sometimes use 'P' Cards to purchase petrol (regular) fuels. Costs are known; however, fuel type and quantities are not.</li> <li>• Te Papa Atawhai staff sometimes use 'P' Cards to purchase petrol (premium) fuels. Costs are known; however, fuel type and quantities are not.</li> <li>• FY2021/22 fuel purchases on P Cards (GST inc) were \$30,981.18 (GST inc) using 'P' Cards.</li> </ul> <p>Methodologies to calculate the 'P' Card purchased fuels are:</p> <ul style="list-style-type: none"> <li>• Use MBIE 2021 July 1st to 2022 30th June weekly fuel prices at pump</li> <li>• Use the worst-case scenario emissions factor from diesel at 2.69 kg CO<sub>2</sub> per litre of fuel.</li> <li>• \$30,981.18 (GST inc) was spent on P Card fuel purchases.</li> <li>• Pairing this with weekly MBIE diesel retail fuel prices at the pump, 16,561.02 theoretical litres of fuel purchase via 'P' cards</li> </ul>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting
Category 1: Direct emissions and removals	Direct emissions from mobile combustion	Diesel, Petrol premium, Petrol regular (P Card purchases)	<p>Methodologies to calculate the emissions of 'P' Card purchased fuels where multiple data are not accurate, or not provided.</p>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>• Te Papa Atawhai staff sometimes use 'P' Cards to purchase diesel fuels. Costs are known, however fuel type and quantities are not.</li> <li>• Te Papa Atawhai staff sometimes use 'P' Cards to purchase petrol (regular) fuels. Costs are known, however fuel type and quantities are not.</li> <li>• Te Papa Atawhai staff sometimes use 'P' Cards to purchase petrol (premium) fuels. Costs are known, however fuel type and quantities are not.</li> <li>• FY2021/22 fuel purchases on P Cards (GST inc) was \$30,981.18 (GST inc) using 'P' Cards.</li> </ul> <p>Methodologies to calculate the 'P' Card purchased fuels are:</p> <ul style="list-style-type: none"> <li>• Use MBIE 2021 July 1st to 2022 30th June weekly fuel prices at pump</li> <li>• Use the worst case scenario emissions factor from diesel at 2.69 kg CO<sub>2</sub> per litre of fuel.</li> <li>• \$30,981.18 (GST inc) was spent on P Card fuel purchases.</li> <li>• Pairing this with weekly MBIE diesel retail fuel prices at the pump, 16,561.02 theoretical litres of fuel purchase via 'P' cards.</li> </ul>		
Category 1: Direct emissions and removals	Direct emissions from wastewater (type 1 systems)	Wastewater (unknown data for type 1 WWTP systems)	<ul style="list-style-type: none"> <li>• Some large scale WWTP systems owned and controlled by Te Papa Atawhai do not have crucial WWTP data as it is not a reporting requirement by the local consenting authority.</li> <li>• Some large scale WWTP systems do not have a stable population as they are seasonal WWTP systems (e.g., campgrounds / seasonal townships on PCL).</li> </ul> <p>The methodology to calculate unknown wastewater for Scope 1 large scale WWTP systems is to:</p>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>• Use a population approach via known bed-nights.</li> <li>• Calculate the total bed-nights, then divide by 365 to identify a theoretical daily population.</li> </ul>		
Category 1: Direct emissions and removals	Emissions from fertiliser	Fertiliser (extrapolation calculation)	<p>Methodologies for Fertiliser where multiple data sets are unknown:</p> <ul style="list-style-type: none"> <li>• Some fertiliser purchases are extremely difficult due to fertiliser being embedded in purchased potting mixes.</li> <li>• Some fertiliser purchases are extremely difficult due to the ad hoc nature of purchasing.</li> <li>• Some fertiliser purchases are extremely difficult due to the extremely small quantities at point of purchase purchases.</li> <li>• Fertiliser purchases are extremely difficult due to no single GL code for purchasing fertiliser, therefore embedded in other codes.</li> <li>• Motukarara Native Plant Nursey is DOCs only commercial plant nursery.</li> <li>• General Purpose potting mix contains slow-release fertiliser. However, this is supplied within a purchased product so no control.</li> <li>• Seed Mix potting mix contains slow-release fertiliser. However, this is supplied within a purchased product so no control.</li> <li>• Seedlings are planted with and without 10g slow-release fertiliser tablets.</li> <li>• Chemical Analysis of slow-release fertiliser tablets: <ul style="list-style-type: none"> <li>- Nitrogen 20.0%</li> <li>- Phosphorous 4.0%</li> </ul> </li> </ul>		

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>- Potassium 4.0%</li> <li>- Sulphur 2.0%</li> <li>- Magnesium 2.0%</li> <li>- Calcium 1.5%</li> <li>- Boron 0.06%</li> <li>- Copper 0.10%</li> <li>- Iron 0.75%</li> <li>- Manganese 0.25%</li> <li>- Zinc 0.25%</li> </ul> <ul style="list-style-type: none"> <li>• Motukarara FY2020/21 General Purpose (GP) potting mixture consumption = 48.5m<sup>3</sup> per annum with a 5kg /m<sup>3</sup> fertiliser ratio. Therefore 242.5kg slow-release fertiliser.</li> <li>• Motukarara FY2020/21 Seed Mix (SM) potting mixture consumption = 1.5m<sup>3</sup> per annum with a 1kg/m<sup>3</sup> fertiliser ratio. Therefore 1.3kg slow-release fertiliser.</li> <li>• Motukarara plant out 170,000 plants per annum with 10g fertiliser tablet. Therefore 1,700kg slow-release fertiliser.</li> </ul> <p>The methodology to calculate unknown Fertiliser quantities are:</p> <ul style="list-style-type: none"> <li>• Assume potting mix slow-release fertiliser has the same nitrogen percentage as fertiliser tablets.</li> <li>• Assume slow-release fertiliser elements all have equivalent weights, therefore only apply emission factors to nitrogen percentage of 20% of weight.</li> </ul>		



GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>• Assume Motukarara Native Plant Nursey represents a 'worst case' scenario for a region, therefore extrapolate out across 9 regions.</li> <li>• Assume worst case that all seedlings are planted with fertiliser tablets.</li> <li>• Apply General Purpose (GP) potting mix slow-release fertiliser is included in profile and QTYs per region is 242.5kg.</li> <li>• Apply Seed Mix (SM) potting mix slow-release fertiliser is included in profile and QTYs per region is 1.3kg.</li> <li>• Apply slow-release fertiliser tablet QTY per region is 170,000 units where each unit is 0.01 KG.</li> <li>• Use 9 regions x 242.5 kg GP = 2,182.2 KG Total.</li> <li>• Use 9 regions x 1.3 = 11.7 kg SM Total.</li> <li>• Use 9 regions x 170,000 plants x 0.01 kg tablet= 15,300 kg Total.</li> <li>• Therefore, combined slow-release fertiliser consumption total weight = 17,493.90 kg.</li> <li>• Therefore, slow release fertiliser nitrogen percentage of 20% = 3,498.78 kg.</li> </ul>		
Category 1: Direct emissions and removals	Direct emissions from mobile combustion	Diesel, Petrol premium, Petrol regular coming from fuel card reports, invoices & GL codes	Assumed all supplier reports are accurate and all additional fuel spend has been captured within our internal financial tracking systems. There is a higher level of uncertainty in regard to the spend based data compared to the fuel card report but it represents a smaller proportion	The internal claim for fuel process does not capture litres of fuel purchased.	

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
Overall assessment of uncertainty for Category 1 emissions and removals		0%	Very low		
Category 3: Indirect emissions from transportation	Business travel	Air travel domestic (average), Air travel domestic (jet aircraft), Air travel domestic (medium aircraft), Air travel domestic (small aircraft)	Assumed all supplier reports are accurate and all additional air travel spend has been captured within our internal financial tracking systems.		
Overall assessment of uncertainty for Category 3 emissions and removals		0%	Very low		
Category 4: Indirect emissions from products used by organisation	Emissions from fixed wing planes	Aviation gasoline (unknown data)	<p>Methodology for Transportation &amp; Distribution (av gas from fixed wing) by third party suppliers where data is not provided.</p> <ul style="list-style-type: none"> <li>Some third-party transportation &amp; distributions (av gas from fixed wing) have not provided minutes flown data.</li> <li>Some third-party transportation &amp; distributions (av gas from fixed wing) have not provided machine type data.</li> </ul> <p>The methodology to calculate unknown third-party transportation &amp; distribution (av gas from fixed wing) is to:</p> <ul style="list-style-type: none"> <li>Identify an average minute to cost ratio through using known costings for transportation and distribution (av gas from fixed wing).</li> </ul>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>Extrapolate and apply this ratio to the generic description costings and non-description costings.</li> </ul>		
Category 4: Indirect emissions from products used by organisation	Emissions from fixed wing planes	Aviation gasoline (cost to minutes ratio fixed wing)	<p>Methodologies for Transportation &amp; Distribution (cost to minutes ratio fixed wing) where multiple data sets are unknown.</p> <ul style="list-style-type: none"> <li>Some charter fixed wing service providers have not provided machine brand or model of small aircraft.</li> <li>Some charter fixed wing service providers have not provided distance travelled.</li> <li>Some charter fixed wing service providers have not provided fly time for services.</li> </ul> <p>The methodologies to calculate the unknown minutes flown to cost ratio of fixed wing charter flights are:</p> <ul style="list-style-type: none"> <li>Charter fixed wing suppliers are primarily associated to procured small aircraft services.</li> <li>Use chartered flights between Invercargill Airport and Whenua Hou Island distance of 66km (132km return) as the methodology baseline.</li> <li>Use small aircraft type 'Cessna A185E Skywagon 185' with a cruising speed of 269 km/h as a default aircraft brand &amp; model.</li> <li>With a cruising speed of 269km/h and a total distance of 132km return, the theoretical total fly time is 29 minutes 27 seconds.</li> <li>Add 25% contingency for fly time to cover take off and landings plus non favourable cruising conditions = 36.8.</li> <li>Invercargill Airport to Whenua Hao return is \$610 inc GST for 36.8 minutes.</li> </ul>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>Therefore, the minutes flown to cost ratio is \$610 / 36.8 minutes of fly time = \$16.57 per minute ratio.</li> </ul>		
Category 4: Indirect emissions from products used by organisation	Emissions from disposal of wastewater (type 2 solids & Type 3 solids + liquids)	Wastewater (unknown data for type 2 & 3 systems)	<p>Methodology for Wastewater processed by 3rd party suppliers where data is not accurate, or not provided.</p> <ul style="list-style-type: none"> <li>Some 3rd party wastewater service providers have provided wastewater volumes accurately within invoicing (eg a specific volume in litres, and a cost to remove).</li> <li>Some 3rd party wastewater service providers have provided generic wastewater volume descriptions within invoicing (e.g., 1 tank, 1 norski, etc, and a cost to remove).</li> <li>Some 3rd party wastewater service providers have not provided wastewater volume descriptions within invoicing (eg only a cost to remove).</li> </ul> <p>The methodology to calculate unknown 3rd party wastewater processing volume is to:</p> <ul style="list-style-type: none"> <li>Identify an average volume to cost ratio for wastewater removals.</li> <li>Extrapolate and apply this ratio to the generic description costings and non-description costings</li> </ul>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting
Category 4: Indirect emissions from products used by organisation	Emissions from disposal of general waste	Waste to landfill (unknown volume data for general waste removals)	<p>General Waste to Landfill (Via 3rd Party Rubbish Skip &amp; DOC Trailers):</p> <p>Methodologies for Scope 3 General Waste to Landfill (general skip waste) where multiple data sets are unknown.</p> <ul style="list-style-type: none"> <li>Some waste to landfill service providers 3rd party data via invoicing is vague / unknown as data generally does not detail landfill weight, or landfill description.</li> </ul>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>Some offices take general waste to landfill via internal managed DOC vehicles / trailers and volumes are not recorded, or is vague, and does not detail landfill weight, or landfill description.</li> </ul> <p>The methodologies to calculate the e unknown general waste to landfill are:</p> <ul style="list-style-type: none"> <li>Assume Conservation House does have a general waste skip due to office waste approach.</li> <li>Assume Regional Offices do not have a general waste skip due to office waste approach.</li> <li>Use Motueka District office as a worst-case scenario example of 'General Skip Waste' volumes based on office size and high visitor numbers (skip size &amp; empty frequency).</li> <li>Use a 4m<sup>3</sup> rubbish skip as the baseline size for extrapolation.</li> <li>Use 200kg as a maximum weight per m<sup>3</sup> as a worst-case scenario - <a href="https://www.trashcontrol.co.nz/bin-prices/skip-bins/">https://www.trashcontrol.co.nz/bin-prices/skip-bins/</a></li> <li>Use 8 skips emptied per annum per location as a representative qty.</li> <li>Apply Regional Offices at 10%.</li> <li>Apply District Offices at 100%.</li> <li>Apply VC / Bases / Other Offices at 25%.</li> <li>Apply weight calculation</li> </ul>		
Category 4: Indirect emissions from products used by organisation	Emissions from disposal of general waste	Waste & compost to landfill (known office waste to landfill & compost waste to landfill extrapolation)	<p>Methodologies for Scope 3 Office Waste to Landfill &amp; Compost Waste where multiple data sets are unknown.</p> <ul style="list-style-type: none"> <li>Office waste to landfill and compost waste data is not collected at offices.</li> </ul>		Yes, this methodology was used in the base year (FY2020/21) of emissions reporting

GHG emissions category	GHG emissions source or sink subcategory	Overview of activity data and evidence	Explanation of uncertainties or assumptions around your data and evidence	Use of default and average emissions factors	Pre-verified data
			<ul style="list-style-type: none"> <li>• Cardboard and paper waste enters local recycling programmes.</li> <li>• Conservation House conducted an office waste audit against FTE across waste to landfill and waste to compost and waste to recycling.</li> <li>• Conservation House audit represents 1.0 FTEs, not 0.5 FTEs, etc.</li> </ul> <p>The methodology to calculate unknown Office Waste to Landfill &amp; Compost Waste are:</p> <ul style="list-style-type: none"> <li>• Assume Conservation House staff are representative of all staff waste across the nation and use as an FTE baseline</li> <li>• Use a nationwide staff count of 2564 which represents as worst case scenario as it assumes all are 1.0 FTEs</li> <li>• Use Conservation House 1.0 FTE staff = 25.61 kg compost per annum based on waste audit</li> <li>• Use Conservation House 1.0 FTE staff = 9.88 kg office waste per annum based on waste audit</li> <li>• Calculate compost weight by FY2021/22 FTE #</li> <li>• Calculate office waste weight by FY2021/22 FTE #</li> </ul>		
Overall assessment of uncertainty for Category 4 emissions and removals		0%	Very low		

### A1.1.3 Excluded emissions sources and sinks

Emissions sources in Table 14 have been identified and excluded from this inventory.

**Table 14. GHG emissions sources excluded from the inventory**

Business unit	GHG emissions source or sink	GHG emissions category	Reason for exclusion
People	Uniforms	Category 4	Unknown / Complex Data Set
Corporate Services	Postal Charges, Couriers, Freight, Postal	Category 4	Unknown / Complex Data Set
Corporate Services	Software Expenses	Category 4	Unknown / Complex Data Set
Corporate Services	IT Outsourcing (excl servicing)	Category 4	Unknown / Complex Data Set
Corporate Services	ITMS/As a Service Contracts	Category 4	Unknown / Complex Data Set
Corporate Services	Property Rental Costs	Category 4	Unknown / Complex Data Set
Corporate Services	Property repairs and maintenance	Category 4	Unknown / Complex Data Set
Corporate Services	Office Cleaning Supplies and Services	Category 4	Unknown / Complex Data Set
Biodiversity	Science and Research Contracts/Grants	Category 4	Unknown / Complex Data Set
All Business Groups	Consultants & Prof - Corporate advice	Category 4	Unknown / Complex Data Set
All Business Groups	Consultants & Prof - Operation advice	Category 4	Unknown / Complex Data Set
Operations / Biodiversity / Partnerships	Field Equipment - Purchase	Category 4	Unknown / Complex Data Set
Operations	Field Equipment - Repairs and Maintenance	Category 4	Unknown / Complex Data Set
Operations / Biodiversity / Partnerships	Bait Supplies	Category 4	Unknown / Complex Data Set
Operations	Fire equipment	Category 4	Unknown / Complex Data Set
All Business Groups	Safety Equipment	Category 4	Unknown / Complex Data Set
Operations	Grocery Items	Category 4	Unknown / Complex Data Set
Operations / Biodiversity / Partnerships	Trap Costs	Category 4	Unknown / Complex Data Set
Operations / Biodiversity / Partnerships	Weedspray Supplies	Category 4	Unknown / Complex Data Set
Operations / Biodiversity / Partnerships	Field Operation Supplies	Category 4	Unknown / Complex Data Set
Operations	Building/Hardware Supplies	Category 4	Unknown / Complex Data Set

Business unit	GHG emissions source or sink	GHG emissions category	Reason for exclusion
All Business Groups	Contractors paid by Payroll	Category 4	Unknown / Complex Data Set
Operations	Field Services - Outsourced Trade Work	Category 4	Unknown / Complex Data Set
People	Publication-Print, Audio Visual & Digital	Category 4	Unknown / Complex Data Set
All Business Groups	Education Costs	Category 4	Unknown / Complex Data Set
All Business Groups	Catering/Food Provided	Category 4	Unknown / Complex Data Set
All Business Groups	Miscellaneous Expenses	Category 4	Unknown / Complex Data Set
All Business Groups	Grants/Sponsorships Paid	Category 5	Unknown / Complex Data Set
Operations	Roads-Ops-112 Unsealed Pavement Maintenance	Category 4	Unknown / Complex Data Set
Operations	Fertiliser	Category 4	De minimis
Corporate Services	Purchased Water	Category 4	Unknown / Complex Data Set
Corporate Services	Freight > 2 kg	Category 4	De minimis / >2kg Unknown / Complex Data Set

## A1.2 QUANTIFIED INVENTORY OF EMISSIONS AND REMOVALS

### A1.2.1 Calculation methodology

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(es) has not changed since the previous measurement period

All emissions were calculated using Toitū emanage with emissions factors and Global Warming Potentials provided by the Programme (see Appendix 1 - data summary.xls). Global Warming Potentials (GWP) from the IPCC fifth assessment report (AR5) are the preferred GWP conversion<sup>5</sup>.

Where applicable, unit conversions applied when processing the activity data has been disclosed.

There are systems and procedures in place that will ensure applied quantification methodologies will continue in future GHG emissions inventories.

<sup>5</sup> If emission factors have been derived from recognised publications approved by the programme, which still use earlier GWPs, the emission factors have not been altered from as published.



## A1.2.2 Liabilities

### A1.2.2.1 GHG STOCKS HELD

HFCs<sup>6</sup>, PFCs and SF<sub>6</sub> represent GHGs with high global warming potentials. Their accidental release could result in a large increase in emissions for that year, and therefore the stock holdings are reported under the Programme (Table 15).

**Table 15. HFCs, PFCs and SF<sub>6</sub> GHG emissions liabilities**

GHG gas stock held	Quantity (kg)	Potential liability (tCO <sub>2</sub> e)
Ammonia R717 (also known as NH <sub>3</sub> )	5.32	0.00
HCFC-22 (R-22, Genetron 22 or Freon 22)	22.85	41.37
HFC-134a	80.16	114.62
HFC-143a	0.61	2.74
HFC-32	129.78	87.60
R-12	7.41	80.76
R-404A	1.92	7.53
R-410A	637.92	1,331.65
R-417A	1.20	2.82
R-600A	16.85	0.05
<b>Total</b>	<b>904.02</b>	<b>1,669.12</b>

## A1.2.3 Supplementary results

Holdings and transactions in GHG-related financial or contractual instruments such as permits, allowances, renewable energy certificates or equivalent, verified offsets or other purchased emissions reductions from eligible schemes recognised by the Programme are reported separately here.

### A1.2.3.1 CONTRACTUAL INSTRUMENTS FOR GHG ATTRIBUTES

Contractual instruments are any type of contract between two parties for the sale and purchase of energy bundled with attributes about the energy generation, or for unbundled attribute claims. This includes Renewable Energy Certificates.

Te Papa Atawhai has numerous off-grid green energy production systems. These systems include solar photovoltaics, wind, and hydro green energy production.

Te Papa Atawhai is able to calculate the green energy production for systems that have kilowatt production data capture capabilities. The following island systems represent a small portion of green energy production at Te Papa Atawhai.

- 15,648 kW - Raoul Island (PV / BESS)
- 5,758 kW - Kapiti Island (PV / Hydro / BESS)

<sup>6</sup> HFC stock liabilities for systems under 3 kg can be excluded.

- 2,385 kW - Mana Island (PV / BESS)
- 3,857 KW - Rekohu Island (PV / BESS)
- 972 kW - Takapourewa Island (PV / BESS)
- 2,791 kW - Whenua Hou (PV / BESS)
- 2,066 kW - Pukenui (PV / BESS)

Te Papa Atawhai has numerous other large scale off-grid green energy production systems. Over time as these system are upgraded, remote monitoring will be installed to ensure production data is captured.

Te Papa Atawhai is investigating the possibility of procuring Category 2 Electrical Energy with Renewables Energy Certificates (RECs). At this point in time there is no vehicle for a CNGP Tranche 1 government organisation to procure these, however Te Papa Atawhai is working with MfE on how this might be possible in the future.

#### A1.2.3.2 DOUBLE COUNTING AND DOUBLE OFFSETTING

There are various definitions of double counting or double offsetting. For this report, it refers to:

- Parts of the organisation have been prior offset.
- The same emissions sources have been reported (and offset) in both an organisational inventory and product footprint.
- Emissions have been included and potentially offset in the GHG emissions inventories of two different organisations, e.g. a company and one of its suppliers/contractors. This is particularly relevant to indirect (Categories 2 and 3) emissions sources.
- Programme approved 'pre-offset' products or services that contribute to the organisation inventory
- The organisation generates renewable electricity, uses or exports the electricity and claims the carbon benefits.
- Emissions reductions are counted as removals in an organisation's GHG emissions inventory and are counted or used as offsets/carbon credits by another organisation.

Double counting / double offsetting has not been included in this inventory.

#### Details

(No information supplied)

## APPENDIX 2: SIGNIFICANCE CRITERIA USED

Table 16. Significance criteria used for identifying inclusion of indirect emissions

Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Category 1: Diesel	Significant (>5% of estimated total)	Moderate	New business model opportunity	Yes	No	Yes	Yes	Include	Intended Use and Users
Category 1: Petrol Regular	Significant (>5% of estimated total)	Moderate	New business model opportunity	Yes	No	Yes	Yes	Include	Intended Use and Users
Category 1: Petrol Premium	Moderate (1-5% of estimated total)	High	New business model opportunity	Yes	No	Yes	Yes	Include	Intended Use and Users
Category 1: LPG	De minimis (<1% of estimated total)	Low	New business model opportunity	No	No	Yes	Yes	Include	Risk or opportunity
Category 1: Coal (Default Commercial)	De minimis (<1% of estimated total)	High	Litigation risk	Yes	No	Yes	Yes	Include	Sector specific guidance
Category 1: Wood Industry (transition to Firewood source)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	Yes	Yes	Include	Risk or opportunity
Category 1: Refrigerant (R-12)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (R-22)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria

Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Category 1: Refrigerant (HFC-32a)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (HFC-134a)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (HFC-143a)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (R-404A)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (R-410A)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (R-417A)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (HFC-32)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (R-600A)	De minimis (<1% of estimated total)	Low	Opportunities	No	No	No	Yes	Include	Irrelevant to most criteria
Category 1: Refrigerant (Ammonia R-717)	De minimis (<1% of estimated total)	Low	Opportunities	No	No	No	Yes	Include	Irrelevant to most criteria

Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Category 1: Wastewater (Precalculated CO <sub>2</sub> e)	De minimis (<1% of estimated total)	Low	Technology Risk	Yes	No	No	Yes	Include	Magnitude
Category 2: Grid Electricity	Significant (>5% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Intended Use and Users
Category 2: Natural Gas (Commercial Distributed)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Intended Use and Users
Category 3: Air Travel International (Long Haul Economy +)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Magnitude
Category 3: Air Travel International (Short Haul Economy)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Magnitude
Category 3: Air Travel Domestic (Medium Aircraft)	Moderate (1-5% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Magnitude
Category 3: Air Travel Domestic (Jet Aircraft)	Moderate (1-5% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Magnitude
Category 3: Air Travel Domestic (Small Aircraft)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Employee engagement
Category 3: Air Travel Domestic (Average Aircraft)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Employee engagement

Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Category 3: Accommodation (New Zealand)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Employee engagement
Category 3: Accommodation (Australia)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Employee engagement
Category 3: Rental Car (Average - Fuel Type Unknown)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Employee engagement
Category3: Taxi (Regular)	De minimis (<1% of estimated total)	Moderate	New business model opportunity	No	No	Yes	Yes	Include	Employee engagement
Category 4: Jet A1	Significant (>5% of estimated total)	Moderate	Technology Risk	Yes	Yes	Yes	Yes	Include	Magnitude
Category 4: Aviation Gasoline	De minimis (<1% of estimated total)	Moderate	Technology Risk	No	No	Yes	Yes	Include	Level of influence
Category 4: Wastewater (Precalculated CO <sub>2</sub> e)	Significant (>5% of estimated total)	Low	Technology Risk	Yes	Yes	No	Yes	Include	Magnitude
Category 4: Purchased Water	De minimis (<1% of estimated total)	Moderate	Supply chain risk	No	No	No	Yes	Include	Sector specific guidance
Category 4: Waste Landfill No LFGR (Mixed Waste)	Moderate (1-5% of estimated total)	High	New business model opportunity	No	No	Yes	Yes	Include	Magnitude

Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Category 4: Waste Landfill No LFGR (Office Waste)	De minimis (<1% of estimated total)	High	New business model opportunity	No	No	Yes	Yes	Include	Level of influence
Category 4: Composting	De minimis (<1% of estimated total)	Moderate	None identified	No	No	Yes	Yes	Include	Level of influence
Category 4: Paper Use (Default)	De minimis (<1% of estimated total)	High	New business model opportunity	No	No	Yes	Yes	Include	Level of influence
Category 4: Staff Commute (Public Bus Average)	De minimis (<1% of estimated total)	Low	Technology Risk	No	No	Yes	Yes	Include	Sector specific guidance
Category 4: Staff Commute (Public Rail Average)	De minimis (<1% of estimated total)	Low	Technology Risk	No	No	Yes	Yes	Include	Sector specific guidance
Category 4: Staff Commute (Public Ferry Average)	De minimis (<1% of estimated total)	Low	Technology Risk	No	No	Yes	Yes	Include	Sector specific guidance
Category 4: Staff Commute (Private Vehicle Petrol)	Significant (>5% of estimated total)	Low	Technology Risk	No	No	Yes	Yes	Include	Sector specific guidance
Category 4: Staff Commute (Private Vehicle Hybrid)	De minimis (<1% of estimated total)	Low	Technology Risk	No	No	Yes	Yes	Include	Sector specific guidance
Category 4: Staff Commute (Private Motorcycle Average)	De minimis (<1% of estimated total)	Low	Technology Risk	No	No	Yes	Yes	Include	Sector specific guidance

Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Category 4: Working From Home	De minimis (<1% of estimated total)	Low	New business model opportunity	No	Yes	Yes	Yes	Include	Outsourcing
Category 4: Transmission & Distribution Losses (Electricity)	De minimis (<1% of estimated total)	Low	New business model opportunity	No	No	Yes	Yes	Include	Intended Use and Users
Category 4: Transmission & Distribution Losses (Natural Gas)	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	Yes	Yes	Include	Intended Use and Users
Te Papa Atawhai 'carbonreduce' programme boundary sources (Excluded):									
Uniforms	Moderate (1-5% of estimated total)	Moderate	Litigation risk	No	No	Yes	Yes	Exclude	Magnitude
Postal Charges, Couriers, Freight, Postal	Moderate (1-5% of estimated total)	Moderate	Supply chain risk	No	No	Yes	Yes	Exclude	Magnitude
Software Expenses	Moderate (1-5% of estimated total)	Moderate	Technology Risk	No	No	No	Yes	Exclude	Level of influence
IT Outsourcing (excl servicing)	Moderate (1-5% of estimated total)	Low	Technology Risk	No	No	No	Yes	Exclude	Level of influence
ITMS/As a Service Contracts	Significant (>5% of estimated total)	Low	Technology Risk	No	No	No	Yes	Exclude	Level of influence



Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Property Rental Costs	Significant (>5% of estimated total)	Moderate	Reputational risk	No	No	No	Yes	Exclude	Risk or opportunity
Property Repairs And Maintenance	Moderate (1-5% of estimated total)	Moderate	Litigation risk	No	No	No	Yes	Exclude	Risk or opportunity
Office Cleaning Supplies And Services	Moderate (1-5% of estimated total)	Moderate	Supply chain risk	No	No	No	Yes	Exclude	Level of influence
Science and Research Contracts/Grants	Significant (>5% of estimated total)	Moderate	Reputational risk	No	No	No	Yes	Exclude	Risk or opportunity
Consultants & Prof - Corporate advice	Significant (>5% of estimated total)	Low	Opportunities	No	No	No	Yes	Exclude	Risk or opportunity
Consultants & Prof - Operation advice	Significant (>5% of estimated total)	Low	Opportunities	No	No	No	Yes	Exclude	Risk or opportunity
Field Equipment - Purchase	Significant (>5% of estimated total)	Moderate	Reputational risk	No	No	Yes	Yes	Exclude	Risk or opportunity
Field Equipment - Repairs and Maintenance	Significant (>5% of estimated total)	Moderate	Regulatory risk	No	No	Yes	Yes	Exclude	Risk or opportunity
Bait Supplies	Significant (>5% of estimated total)	Moderate	Litigation risk	No	No	No	Yes	Exclude	Level of influence

Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Fire equipment	Moderate (1-5% of estimated total)	Moderate	Litigation risk	No	No	No	Yes	Exclude	Level of influence
Safety Equipment	Significant (>5% of estimated total)	Moderate	Litigation risk	No	No	No	Yes	Exclude	Level of influence
Grocery Items	Moderate (1-5% of estimated total)	High	Reputational risk	No	No	Yes	Yes	Exclude	Magnitude
Trap Costs	Significant (>5% of estimated total)	Moderate	Litigation risk	No	No	No	Yes	Exclude	Level of influence
Weed spray Supplies	Significant (>5% of estimated total)	Moderate	Litigation risk	No	No	No	Yes	Exclude	Risk or opportunity
Field Operation Supplies	Significant (>5% of estimated total)	Moderate	Litigation risk	No	No	No	Yes	Exclude	Risk or opportunity
Building/Hardware Supplies	Moderate (1-5% of estimated total)	Moderate	Litigation risk	No	No	No	Yes	Exclude	Risk or opportunity
Contractors Paid By Payroll	Moderate (1-5% of estimated total)	High	Financial risk	No	Yes	No	Yes	Exclude	Outsourcing
Field Services - Outsourced Trade Work	Significant (>5% of estimated total)	Low	Litigation risk	No	No	No	Yes	Exclude	Outsourcing

Emissions source	Magnitude	Level of influence	Risk or opportunity	Sector specific guidance	Outsourcing	Employee engagement	Intended Use and Users	Include in inventory?	Primary reason for decision to include or exclude
Publication-Print, Audio Visual & Digital	Moderate (1-5% of estimated total)	Moderate	Reputational risk	No	No	No	Yes	Exclude	Level of influence
Education Costs	Moderate (1-5% of estimated total)	High	Litigation risk	No	No	No	Yes	Exclude	Risk or opportunity
Catering/Food Provided	Moderate (1-5% of estimated total)	Moderate	Reputational risk	No	No	Yes	Yes	Exclude	Magnitude
Miscellaneous Expenses	Moderate (1-5% of estimated total)	Low	None identified	No	No	No	Yes	Exclude	Irrelevant to most criteria
Grants/Sponsorships Paid	Significant (>5% of estimated total)	High	Opportunities	No	No	No	Yes	Exclude	Risk or opportunity
Roads-Ops-112 Unsealed Pavement Maintenance	Moderate (1-5% of estimated total)	Low	Litigation risk	No	No	No	Yes	Exclude	Risk or opportunity
Fertiliser	De minimis (<1% of estimated total)	Low	Reputational risk	No	No	No	Yes	Exclude	Level of influence
Purchased Water	De minimis (<1% of estimated total)	Low	None identified	No	No	No	Yes	Exclude	Level of influence

## APPENDIX 3: CERTIFICATION MARK USE

Te Papa Atawhai has not used emission certification marks to date for FY2020/21 reporting. Te Papa Atawhai will seek to use the emission certification marks for FY2021/22 reporting within the annual report at a minimum and for internal communication purposes only.

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## APPENDIX 4: REFERENCES

International Organization for Standardization, 2018. ISO 14064-1:2018. Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. ISO: Geneva, Switzerland.

World Resources Institute and World Business Council for Sustainable Development, 2004 (revised). The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. WBCSD: Geneva, Switzerland.

World Resources Institute and World Business Council for Sustainable Development, 2015 (revised). The Greenhouse Gas Protocol: Scope 2 Guidance. An amendment to the GHG Protocol Corporate Standard. WBCSD: Geneva, Switzerland.

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## APPENDIX 5: REPORTING INDEX

This report template aligns with ISO 14064-1:2018 and meet Toitū carbonreduce programme Organisation Technical Requirements. The following table cross references the requirements against the relevant section(s) of this report.

Section of this report	ISO 14064-1:2018 clause	Organisational Technical Requirement rule
<a href="#">Cover page</a>	9.3.1 b, c, r 9.3.2 d,	TR8.2, TR8.3
<a href="#">Availability</a>	9.2 g	
<a href="#">Chapter 1: Emissions Inventory Report</a>		
<a href="#">1.1. Introduction</a>	9.3.2 a	
<a href="#">1.2. Emissions inventory results</a>	9.3.1 f, h, j	TR4.14
<a href="#">1.3. Organisational context</a>	9.3.1 a	
<a href="#">1.3.1. Organisation description</a>	9.3.1 a	
<a href="#">1.3.2. Statement of intent</a>		TR4.2
<a href="#">1.3.3. Person responsible</a>	9.3.1 b	
<a href="#">1.3.4. Reporting period</a>	9.3.1 l	TR5.1, TR5.8
<a href="#">1.3.5. Organisational boundary and consolidation approach</a>	9.3.1.d	TR4.3, TR4.5, TR4.7, TR4.11
<a href="#">1.3.6. Excluded business units</a>		
<a href="#">Chapter 2: Emissions Management and Reduction Report</a>		
<a href="#">2.1. Emissions reduction results</a>	9.3.1 f, h, j, k 9.3.2 j, k	TR4.14, TR6.18
<a href="#">2.2. Significant emissions sources</a>		
<a href="#">2.3. Emissions reduction targets</a>		TR6.1, TR6.2, TR6.4, TR6.6, TR6.8,
<a href="#">2.4. Emissions reduction projects</a>	9.3.2 b	TR6.8, TR6.11, TR6.12, TR6.13, TR6.14, TR6.15
<a href="#">2.5. Staff engagement</a>		TR6.1, TR6.9
<a href="#">2.6. Key performance indicators</a>		TR6.19
<a href="#">2.7. Monitoring and reporting</a>	9.3.2 h	TR6.2
<a href="#">Appendix 1: Detailed greenhouse gas inventory</a>	9.3.1 f, g	TR4.9, TR4.15
<a href="#">A1.1 Reporting boundaries</a>		
<a href="#">A1.1.1 Emission source identification method and significance criteria</a>	9.3.1 e	TR4.12, TR4.13
<a href="#">A1.1.2 Included emissions sources and activity data collection</a>	9.3.1 p, q 9.3.2 i	TR5.4, TR5.6, TR5.17, TR5.18,
<a href="#">A1.1.3 Treatment of biogenic emissions and removals</a>	9.3.1 g	TR4.15
<a href="#">A1.1.4 Excluded emissions sources and sinks</a>	9.3.1 i	TR5.21, TR5.22, TR5.23
<a href="#">A1.2 Quantified inventory of emissions and removals</a>		
<a href="#">A1.2.1 Calculation methodology</a>	9.3.1 m, n, o, t	
<a href="#">A1.2.2 Historical recalculations</a>		
<a href="#">A1.2.3 Liabilities</a>		
<a href="#">A1.2.3.1 GHG stocks held</a>		TR4.18
<a href="#">A1.2.3.2 Land-use liabilities</a>	9.3.3.	TR4.19

<a href="#">A1.2.4 Supplementary results</a>		
<a href="#">A1.2.4.1 Contractual instruments for GHG attributes</a>	9.3.3	TR4.16, TR4.17
<a href="#">A1.2.4.2 Carbon credits and offsets</a>	9.3.3.3	
<a href="#">A1.2.4.3 Purchased or developed reduction or removal enhancement projects</a>	9.3.2 c	
<a href="#">A1.2.4.4 Double counting and double offsetting</a>		
<a href="#">Appendix 2: Significance criteria used</a>	9.3.1.e	TR4.12
<a href="#">Appendix 3: Certification mark use</a>		TR3.6
<a href="#">Appendix 4: References</a>		
<a href="#">Appendix 5: Reporting index</a>		

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