



Ministry for the
Environment
Manatū Mō Te Taiao

Measuring Emissions: A Guide for Organisations

CASE STUDY: AN EXAMPLE GHG REPORT

Acknowledgements

Prepared for the Ministry for the Environment by Enviro-Mark Solutions Limited.

This document may be cited as: Ministry for the Environment. 2019. *Measuring Emissions: A Guide for Organisations. Case Study: An Example GHG Report*. Wellington: Ministry for the Environment.

Published in May 2019 by the
Ministry for the Environment
Manatū Mō Te Taiao
PO Box 10362, Wellington 6143, New Zealand

ISBN: 978-1-98-857923-8 (online)

Publication number: ME 1418

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This document is available on the Ministry for the Environment website: www.mfe.govt.nz.



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Purpose of this case study

The Ministry for the Environment (MfE) supports organisations acting on climate change. We recognise there is strong interest from organisations across New Zealand to measure, report and reduce their emissions. We prepared this guide to help you measure and report your organisation’s greenhouse gas (GHG) emissions. Measuring and reporting emissions empowers organisations to manage and reduce emissions more effectively over time.

The guide aligns with and endorses the use of the *GHG Protocol* and *ISO 14064-1* (see the *Quick Guide*, section 1.3), and provides methods to apply emission factors to produce a GHG inventory (see *Detailed Guide* or *Quick Guide*).

The Case Study is a new addition to the tenth version of the guidance.

This Case Study is part of a suite of documents that comprise *Measuring Emissions: A Guide for Organisations*, as outlined in figure 1. This document is an Example GHG Report to demonstrate what an inventory might look like, and should be read alongside the *Example GHG Inventory*. For more information about producing a GHG report, see the *Quick Guide*, section 2.

Figure 1: Documents in *Measuring Emissions: A Guide for Organisations*

Measuring Emissions: A Guide for Organisations	
Quick Guide	The go-to document explaining changes since the last update, how to produce an inventory and what data you need to work out emissions from your activities
Detailed Guide	For users who need to know the data sources, methodologies, uncertainties and assumptions behind the emission factors for each emission source
Emission Factors Summary	Quick look up tables providing the main emission factors for each emission source
Emission Factors Workbook	As above but in excel format across multiple tabs
Emission Factors Flat File	Simple format for integration with software
Interactive Workbook	Use this spreadsheet to input your activity data, in order to work out your organisation’s emissions and produce an inventory
Example GHG Inventory	Shows what a finished inventory might look like
Example GHG Report	Shows what a finished report might look like

THIS DOCUMENT

Greenhouse Gas Emissions Report

Table 1: Emissions summary

Component gas (expressed as tCO ₂ e)							
	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Total tCO ₂ e
Scope 1	1,195.93	133.60	6.95	14.12	-	-	1,350.60
Scope 2	224.82	10.6	0.21	-	-	-	235.63
Scope 3	8,321.91	19.96	118.91	-	-	-	8,460.78
Total	9,742.66	164.16	126.07	14.12	-	-	10,047.01

Table 2: Biomass combustion

Biomass	Quantity	Tonnes biogenic CO ₂
Mobile combustion	-	-
Stationary combustion	89,563.00	78.50
Total	89,563.00	78.50

Table 3: Forestry

Source	Quantity	tCO ₂ e
Carbon lost (deforestation)	5.00	4,733.00
Carbon sequestered (forest growth)	56.00	-1,889.05
Net balance	n/a	2,843.95

Table 4: GHG stock liability

Source	Unit	Quantity	Potential liability tCO ₂ e
HCFC-22	kilograms	59.00	106.79
HFC-143a	kilograms	10.00	44.70
Total			151.49

Table 5: Forestry liabilities

Liability type	Liability tCO ₂ e
Contingent liability (carbon sequestered since base year)	1,889.05

Table 6: Emissions per KPI

Key performance indicator (KPI)	Quantity	Emissions tCO ₂ e / KPI
FTE – full-time employee	1,400.00	7.18
Km of pipeline laid	575.00	17.47
Tonnes of quarried aggregate	12,500.00	0.80

1 Introduction

This report is the annual greenhouse gas (GHG) emissions¹ inventory report for the named organisation. The inventory is a complete and accurate quantification of the amount of GHG emissions 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 *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004)* and *ISO 14064-1:2006 Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*.²

2 Statement of intent

This inventory forms part of OPQ Construction's commitment to measure and manage our emissions.

3 Organisation description

OPQ Construction Ltd is a wholly-owned subsidiary of OPQ New Zealand Ltd, which is owned by parent company OPQ International Inc. OPQ Construction has a turnover of over \$180 million, employing about 1400 permanent staff, with headquarters in Auckland. The company's core activities broadly cover utility works, civil engineering, cross-country pipelines, facilities management and plant hire. To carry out our work efficiently we have offices and depots throughout New Zealand.

OPQ Construction recognises that its operations may have a direct impact on the environment, and has made environmental management an integral part of its management system. OPQ Construction manages, monitors and improves its environmental performance through actively offering leadership and implementation of a formal environmental management system certified to the internationally recognised ISO 14001 standard.

OPQ Construction is committed to operating in an energy-efficient environment and considers the management of its GHG emissions to be a principal component of its environmental and sustainability objectives. It is our aim to exploit all opportunities for energy savings throughout the business, to establish ourselves as an environmentally responsible organisation as well as a contributor to national carbon reduction targets.

¹ Throughout this document 'emissions' means GHG emissions.

² Throughout this document 'GHG Protocol' means the *GHG Protocol Corporate Accounting and Reporting Standard* and 'ISO 14064-1:2006' means the international standard *Specification with Guidance at the Organizational Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*.

By enabling an energy-conscious culture within the company, we aim to balance our environmental and financial priorities throughout our operations and demonstrate regulatory compliance with existing and future legislation.

4 Organisational boundaries included for this reporting period

Organisational boundaries were set with reference to the methodology described in the *GHG Protocol* and *ISO 14064-1:2006* standards. The *GHG Protocol* allows two distinct approaches to consolidate GHG emissions: the equity share and control (financial or operational) approaches. We used an operational control consolidation approach to account for emissions.

Figure 1 shows the legal structure of the organisation. OPQ Construction International Inc is shown for transparency of the organisational boundary, to show the relationship to the parent company. OPQ Farms Ltd is a totally separate business from OPQ Construction.

Figure 2 shows the reporting structure chosen for accounting for the organisation’s emissions. The structure was developed based on physical sites the organisation occupies.

Figure 2: Organisational structure

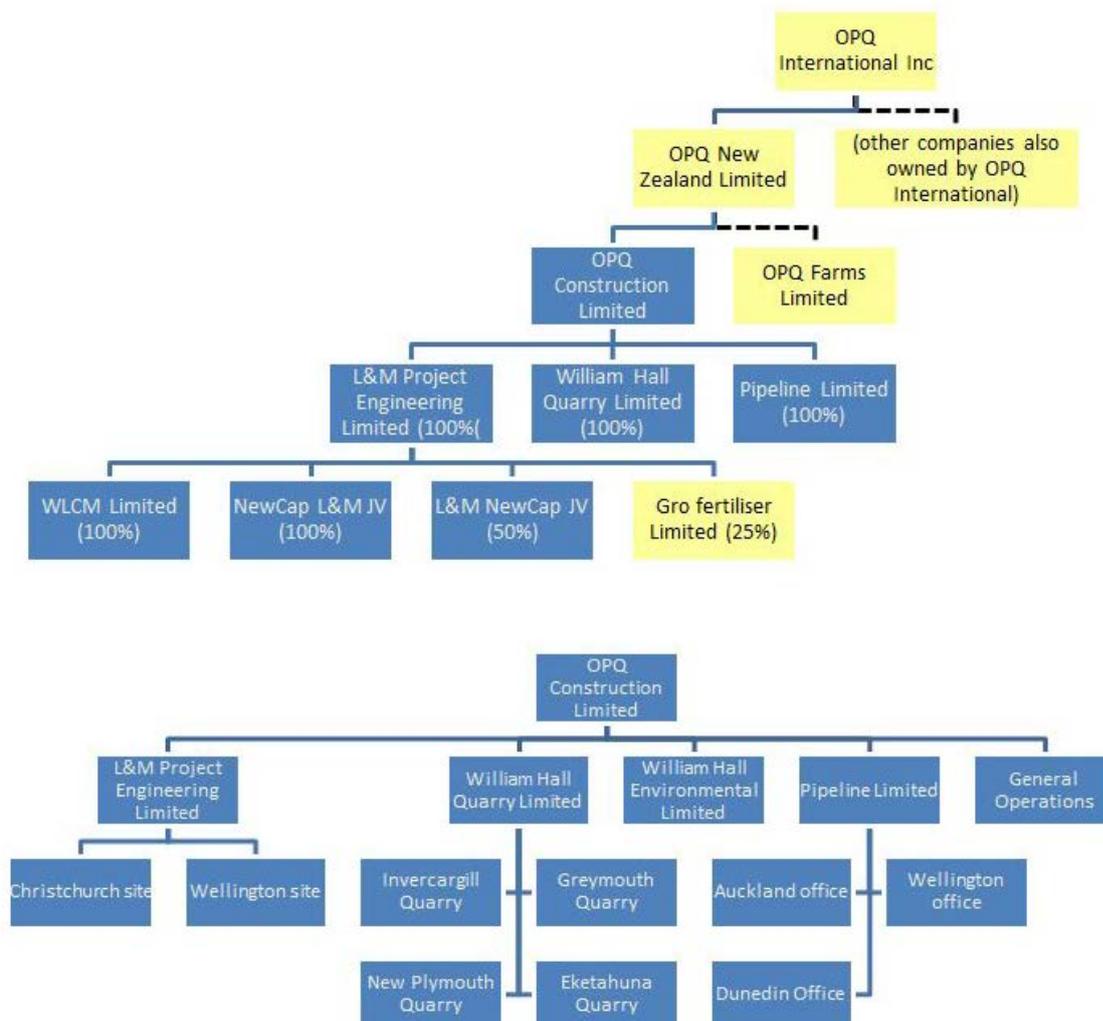


Table 7: Brief description of business units

Business unit	Address	Purpose
OPQ Construction Ltd	Site address: OPQ Construction Ltd (head office), 2334 Builders Ave, Auckland	Ownership of all subsidiary companies. Some activities are measured at this level, in relation to the head office
General operations	n/a	Covers miscellaneous emissions-sourcing activities associated with all reporting units that cannot be separated by reporting unit
L&M Project Engineering Ltd	Site address: OPQ Construction Ltd (head office), 2334 Builders Ave, Auckland	Management and marketing of general engineering and construction services. Activities at this level are accounted under head office
L&M Project Engineering Ltd > Christchurch site	Site address: 2 Engineers Ave, Christchurch	South Island operations depot for engineering and construction services
L&M Project Engineering Ltd > Wellington site	Site address: 34 Legos Rd, Wellington	North Island operations depot for engineering and construction services
Pipeline Ltd	Site address: OPQ Construction Ltd (head office), 2334 Builders Ave, Auckland	Management of the design, construction and installation of pipelines and related plant for the oil, gas, water and energy industries. Activities at this level are accounted under head office
Pipeline Ltd > Auckland	Site address: 7 Mayline Rd, Auckland	Warehouse and distribution hub for pipes and associated materials
Pipeline Ltd > Dunedin	Site address: 21 Pype Rd, Dunedin	Manufacturing site of pipes and associated materials
Pipeline Ltd > Wellington	Site address: 24 Linea Rd, Wellington	Warehouse and distribution hub for pipes and associated materials
William Hall Quarry Ltd	Site address: OPQ Construction Ltd (head office), 2334 Builders Ave, Auckland	Management of the quarry sites. Activities at this level are accounted under head office
William Hall Quarry Ltd > Eketahuna Quarry	Site address: Sandbank Way, Eketahuna	Quarrying of stone aggregate
William Hall Quarry Ltd > Greymouth Quarry	Site address: Riverwide Rd, Greymouth	Quarrying of stone aggregate
William Hall Quarry Ltd > Invercargill Quarry	Site address: Greywacke Rd, Invercargill	Quarrying of stone aggregate
William Hall Quarry Ltd > New Plymouth Quarry	Site address: Andesite Rd, New Plymouth	Quarrying of stone aggregate

5 Organisational business units excluded from inventory

L&M Project Engineering Ltd has a 25 per cent ownership in Gro Fertiliser Ltd, of which the organisation has no operational control. It is a fully discrete business with its own management and sites. Therefore, it has been excluded from the inventory.

6 GHG emission source inclusions

The GHG emissions sources included in this inventory were identified with reference to the methodology in the *GHG Protocol* and *ISO14064-1:2006* standards. As adapted from the *GHG Protocol*, these emissions were classified under the following categories:

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

The emissions sources in [table 8](#) have been included in the GHG emissions inventory.

Table 8: GHG emission sources included in the inventory

Business unit	GHG emission source	GHG emissions level scope	Data source	Data collection unit	Uncertainty (description)
OPQ Construction/General operations	Air travel domestic (average) Air travel long haul (business) Air travel long haul (econ) Air travel short haul (econ)	Scope 3	Travel provider (Flyaway Peter Travel Ltd) annual activity report (obtained via our accounts team – Ian Dollar)	pkm	It is assumed data source represents a complete and accurate account of all travel activity. The organisation has a rule that all staff must book via the company travel provider. Discussion with the accounts team confirmed they were unaware of any travel being booked via staff credit card or staff expense claims
Other/OPQ Construction/William Hall Quarry/New Plymouth	Biodiesel	Outside scopes (CO ₂), Scope 1 (CH ₄ , N ₂ O)	Tank readings at start and end of measure period	GJ	It is assumed the tank readings were done correctly
Other/OPQ Construction/Head office	Bioethanol	Outside scopes (CO ₂), Scope 1 (CH ₄ , N ₂ O)	Tank readings at start and end of measure period	GJ	It is assumed the tank readings were done correctly
OPQ Construction/General operations	Car – diesel, <2000cc Car – petrol, <2000cc	Scope 3	Annual staff commuting survey	km	It is assumed the data source is an appropriate representation of activity. Assumptions are made on vehicle type and approximate travel distance from staff home locations
OPQ Construction/General operations OPQ Construction/Head office	Car – petrol, <2000cc	Scope 1	Rental car provider 12-month summary reports (Carls Car Rental Ltd)	km	It is assumed the rental car reports are complete and accurate and that all rental cars were booked via this rental car provider
OPQ Construction	Concrete 30 MPa	Scope 3	Quantity surveyor report	kg	It is assumed the QS report is complete and accurate and that all materials were used during the year of measurement
OPQ Construction/General operations OPQ Construction/L&M Project	Diesel	Scope 1	Online consumption report downloaded from supplier's	L	It is assumed the supplier reports are complete and accurate. A small number of fuel purchases are via credit

Engineering/Christchurch OPQ Construction/L&M Project Engineering/Wellington OPQ Construction/William Hall Quarry/Eketahuna Quarry OPQ Construction/William Hall Quarry/Greymouth Quarry OPQ Construction/William Hall Quarry/Invercargill Quarry OPQ Construction/William Hall Quarry/New Plymouth			(Gasoline Master Ltd) customer online login area		card, but in the base year this was deemed to be <i>de minimis</i> based on estimation methods
All business units	Electricity	Scope 2	Online consumption report downloaded from supplier's (Power Up Energy Ltd) customer online login area	kWh	It is assumed the supplier has provided data for all meters
OPQ Construction/Head office	Fertiliser nitrogen (N)	Scope 3	Delivery receipts from Agrisupply Ltd	kg	It is assumed all supplier receipts are complete and accurate
Other/William Hall Quarry Ltd > Eketahuna Quarry	Forest – growth	Forestry	Aerial maps showing areas by forest type	ha	It is assumed the aerial maps are accurate and the forest cover classification is appropriate
Other/William Hall Quarry Ltd > Eketahuna Quarry	Forest – harvested	Forestry	Forest harvest records and aerial maps showing areas	ha	It is assumed the forest harvest records are complete and accurate
OPQ Construction/General operations	Freight rail Freight average truck	Scope 3	Freight provider annual activity reports (spreadsheet supplied via email by Joe Bloggs at Postman Pat Freight Ltd)	tkm	A small amount of freight is done by other suppliers but in the base year this was deemed to be <i>de minimis</i> based on estimation methods
OPQ Construction/Pipeline/Dunedin	HCFC-22 (R-22, Genetron 22 or Freon 22)	Scope 1	Email correspondence with chiller maintenance provider (Chill Out Refrigeration Ltd)	kg	It is assumed the maintenance provider has supplied a complete and accurate record
OPQ Construction/General operations	Jet kerosene	Scope 1	Purchase records	L	It is assumed data source represents a complete and accurate account of all purchases
Other/OPQ Construction/William Hall Quarry/New Plymouth	Livestock – beef cattle	Scope 1	Stock management records	Head	It is assumed all livestock on the records were on the site for the full 12 months

Other/OPQ Construction/William Hall Quarry/New Plymouth	Livestock – sheep	Scope 1	Stock management records	Head	It is assumed all livestock on the records were on the site for the full 12 months
OPQ Construction/General Operations OPQ Construction/Pipeline/Dunedin	LPG stationary commercial	Scope 1	Invoices from LPG supplier (Total Gas Ltd)	kg	It is assumed the supplier has provided complete and accurate invoice data
OPQ Construction/General operations	Paper use office virgin fibre	Scope 3	Purchase records from office supplies company (Office Supplies Ltd)	t	It is assumed the supplier has provided complete and accurate invoice data
OPQ Construction/Head office OPQ Construction/General operations OPQ Construction/L&M Project Engineering/Christchurch OPQ Construction/L&M Project Engineering/Wellington OPQ Construction/General operations	Petrol regular	Scope 1	Online consumption report downloaded from supplier's (Gasoline Master Ltd) customer online login area	L	It is assumed the supplier reports are complete and accurate. A small number of fuel purchases are via credit card but in the base year this was deemed to be <i>de minimis</i> based on estimation methods
OPQ Construction/L&M Project Engineering/Christchurch	Steel	Scope 3	Quantity surveyor report	t	It is assumed the QS report is complete and accurate, and that all materials were used during the year of measurement
OPQ Construction/L&M Project Engineering/Christchurch	Steel – virgin, structural	Scope 3	Supplier invoices (various suppliers)	t	It is assumed the supplier invoice records are complete and accurate
OPQ Construction/General operations OPQ Construction/Head office	Taxi (regular)	Scope 3	Travel provider (Flyaway Peter Travel Ltd) annual activity report (obtained via our accounts team – Ian Dollar)	\$	It is assumed data source represents a complete and accurate account of all travel activity. The organisation has a rule that all staff must book via the company travel provider. Discussion with the accounts team confirmed they were unaware of any travel being booked via staff credit card or staff expense claims
OPQ Construction/Head office	Waste landfilled – LFGR, food waste landfilled – LFGR, paper	Scope 3	Waste provider 12-month reports (Wallys Waste Ltd)	kg	It is assumed the provider reports are complete and accurate

OPQ Construction/General operations	Waste landfilled – LFGR, general	Scope 3	Waste provider 12-month reports (Wallys Waste Ltd)	kg	It is assumed the provider reports are complete and accurate
Other/OPQ Construction/L&M Project Engineering/Christchurch	Wood chips industry	Outside scopes (CO ₂), Scope 1 (CH ₄ , N ₂ O)	Will’s wood chip supplies – monthly invoices	kg	Wood chips are combusted in the boiler. The data source is complete and accurate, as the truck load is weighed on each delivery
OPQ Construction/L&M Project Engineering/Christchurch	Steel	Scope 3	Quantity surveyor report	t	It is assumed the QS report is complete and accurate, and that all materials were used during the year of measurement
OPQ Construction/L&M Project Engineering/Christchurch	Steel – virgin, structural	Scope 3	Supplier invoices (various suppliers)	t	It is assumed the supplier invoice records are complete and accurate
OPQ Construction/General operations OPQ Construction/Head office	Taxi (regular)	Scope 3	Travel provider (Flyaway Peter Travel Ltd) annual activity report (obtained via our accounts team – Ian Dollar)	\$	It is assumed data source represents a complete and accurate account of all travel activity. The organisation has a rule that all staff must book via the company travel provider. Discussion with the accounts team confirmed they were unaware of any travel being booked via staff credit card or staff expense claims
OPQ Construction/Head office	Waste landfilled – LFGR, food Waste landfilled – LFGR, paper	Scope 3	Waste provider 12-month reports (Wallys Waste Ltd)	kg	It is assumed the provider reports are complete and accurate
OPQ Construction/General operations	Waste landfilled – LFGR, general	Scope 3	Waste provider 12-month reports (Wallys Waste Ltd)	kg	It is assumed the provider reports are complete and accurate
Other/OPQ Construction/L&M Project Engineering/Christchurch	Wood chips industry	Outside scopes (CO ₂), Scope 1 (CH ₄ , N ₂ O)	Will’s Wood Chip Supplies – monthly invoices	kg	Wood chips are combusted in the boiler. The data source is complete and accurate, as the truck load is weighed on each delivery

7 GHG emission source exclusions

OPQ Construction recognises the extent of Scope 3 emissions is significant. We have chosen to declare the following notable emissions sources that have been excluded from the emissions inventory.

Table 9: Notable emission sources excluded from the inventory

Business unit	GHG emission source	GHG emissions level scope	Reason for exclusion
OPQ Construction/L&M Project Engineering/Christchurch	Staff taxi travel	Scope 3	Taxi travel is not separately coded in the accounting system, and therefore is impractical to obtain for this reporting period. An estimate indicated over \$550,000 would have to be spent on taxi travel to exceed 1% of the total emissions inventory. Expenditure is very unlikely to be more than this, as it was estimated only about \$20,000 would have been spent on taxi travel in New Zealand (based on a conservative assumption of \$100 on taxis for every staff travel flight taken). Given the small estimated impact on the total, we have chosen to exclude this.
L&M Project Engineering Ltd > Christchurch site	Waste landfilled	Scope 3	In this base year, estimates illustrate emissions from this source were only 0.01% of total emissions. Collating data for this source was very time-consuming, and given the small impact on the total, we have chosen to exclude this.
L&M Project Engineering Ltd > Wellington site	Waste landfilled	Scope 3	In this base year, estimates illustrate emissions from this source were only 0.01% of total emissions. Collating data for this source was very time-consuming, and given the small impact on the total, we have chosen to exclude this.
Head office	Refrigerants (HVAC)	Scope 3	Head office is in a leased building and all HVAC equipment is owned and maintained by the lessor. We do not have any ability to influence or reduce the emissions.

8 Data collection and uncertainties

Table 11 gives an overview of how data were collected for each GHG emissions source, the source of the data and an explanation of any uncertainties or assumptions.

A calculation methodology has been used for quantifying the emissions inventory using emissions source activity data multiplied by emission or removal factors. All emission factors were sourced from the Ministry for the Environment’s 2019 *Measuring Emissions: A Guide for Organisations*.

9 GHG emission calculations and results

GHG emissions for the organisation for this measurement period are provided in the GHG Inventory summary section at the start of this report.

Figures 3, 4, and 5 give an overview of where the emissions are occurring across the organisation. For more detail, see the *Example GHG Inventory*.

Figure 2: GHG emissions by scope

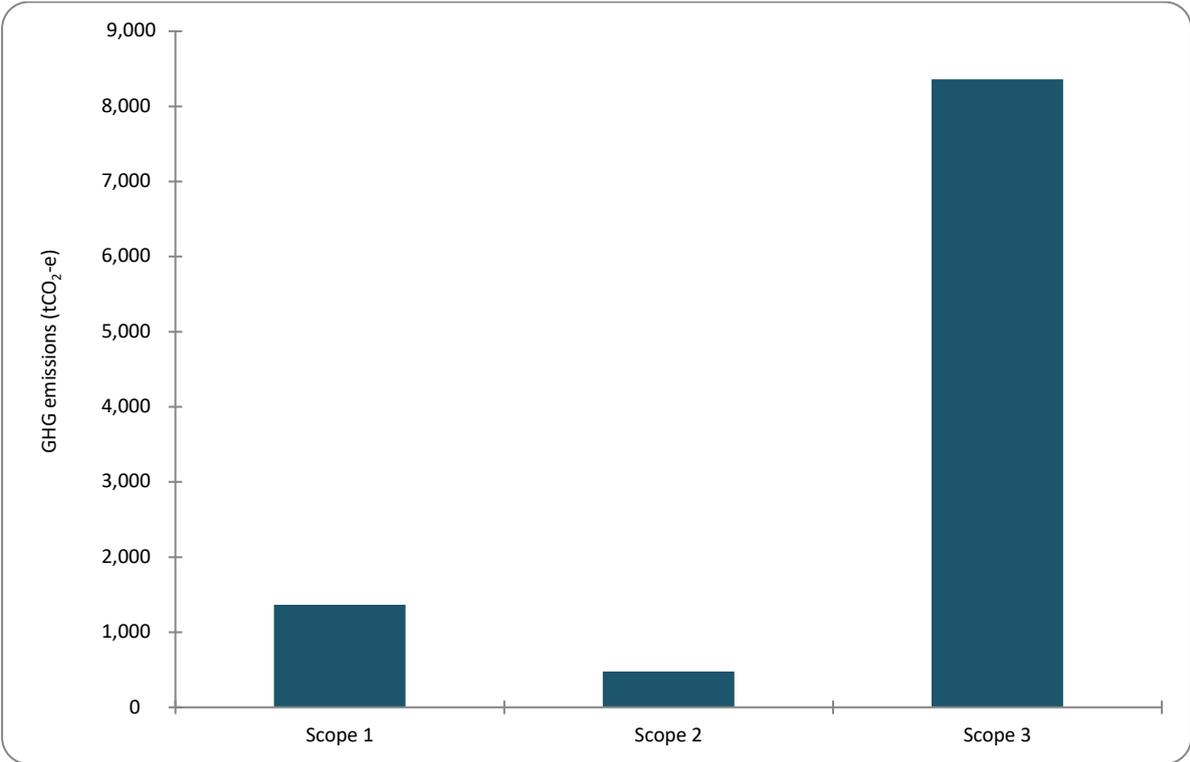


Figure 3: GHG emissions by business unit

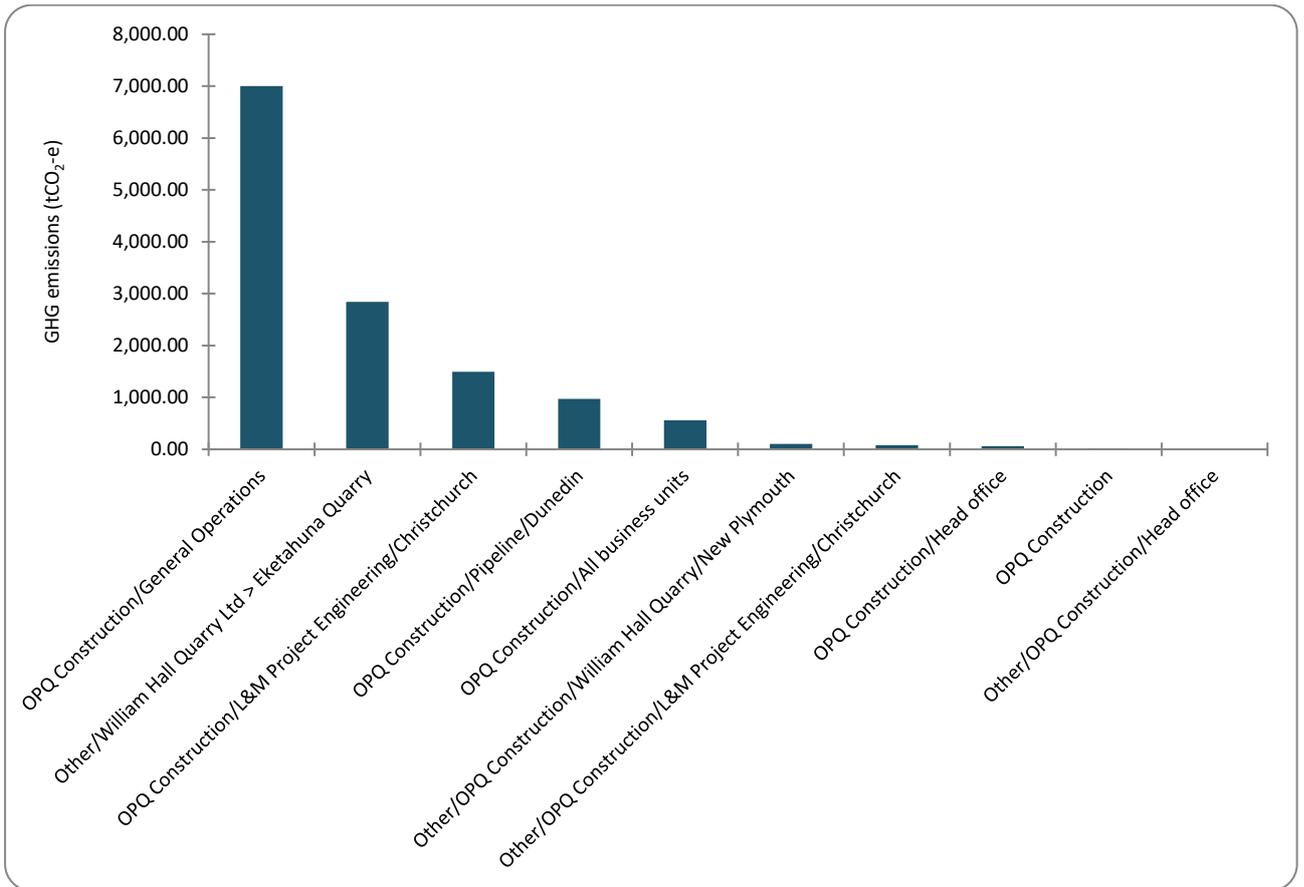
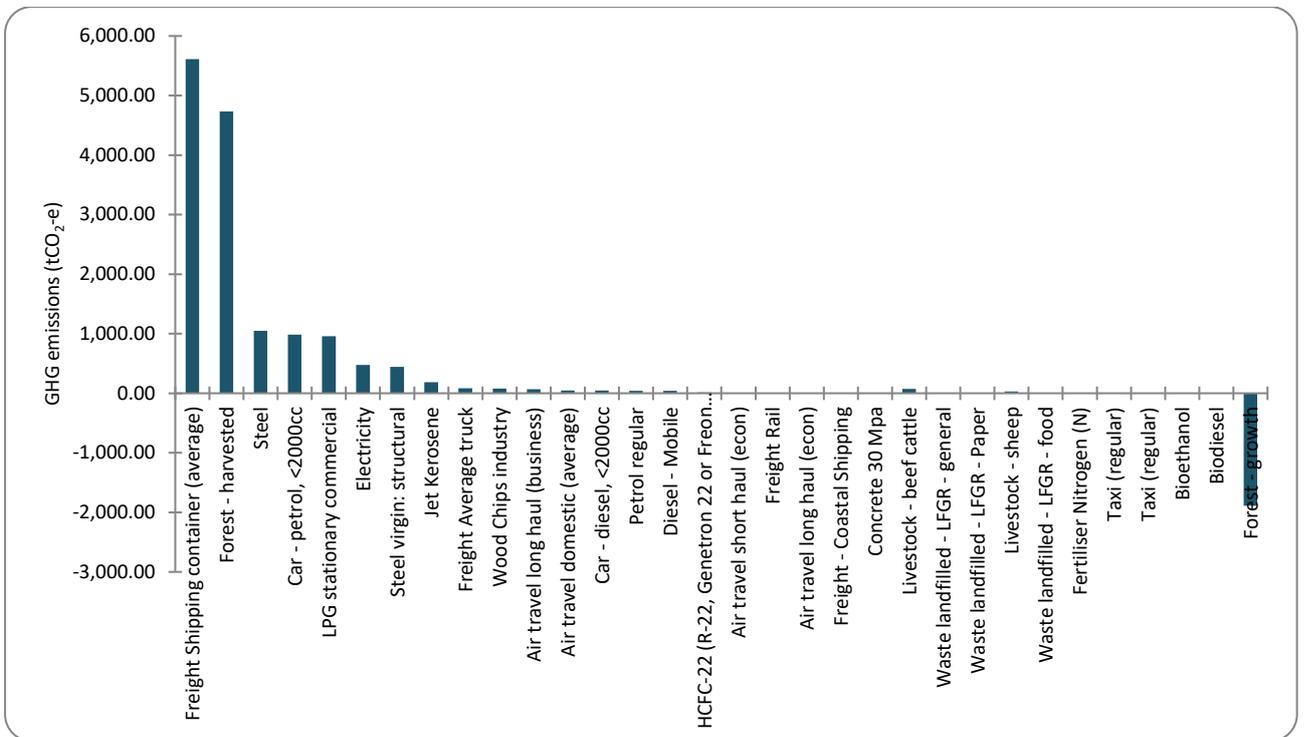


Figure 4: GHG emissions by source



10 Liabilities

10.1 GHG stocks held

HFCs, PFCs and SF₆ represent GHGs with high global warming potentials. Their accidental release could result in a large increase in emissions for the reporting period. Therefore, any GHG stocks are included in the greenhouse gas emissions inventory summary section at the start of this report (page 6), to identify significant liabilities and implement procedures for minimising the risk of their accidental release.

10.2 Land-use change

Organisations that own land subject to land-use change may achieve sequestration of carbon dioxide through a change in the carbon stock on that land. If a sequestration is claimed, this also represents a liability in future years should fire, flood or other management activities release the stored carbon.

Land-use change has been included in this inventory, specifically for the business unit William Hall Quarry Ltd – Eketahuna Quarry, where the forest block next to the quarry has been included.

11 References

International Organization for Standardization. 2006. ISO14064-1:2006. Greenhouse gases – Part 1: *Specification with guidance at the organisation level for quantification and reporting of greenhouse gas GHG emissions and removals*. Geneva: ISO.

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

Appendix 1: GHG emissions data summary

Further GHG emissions data are available on the accompanying spreadsheet(s) to this report:

- <https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/example-ghg-inventory.xlsx>