

# **Pūrongo Whakarārangi Tuku Haurehu Kati Mahana**

## **Greenhouse Gas Emissions Inventory Report**

# **2023**

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Te Pūkenga – New Zealand Institute of Skills and Technology



**Pūkenga**

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# He whakarāpopotonga | Summary

This is the second Greenhouse Gas (GHG) Emissions Inventory Report for Te Pūkenga – New Zealand Institute of Skills and Technology and has been prepared for the calendar year (1 January to 31 December) 2023. This aligns with our financial reporting year.

This report outlines the process used to prepare the GHG Inventory, which includes determining the organisational boundary, the emission source inclusions and exclusions, and the data collection methods used.

The calculations in this report have been completed by Te Pūkenga and have been verified by [Toitū Envirocare](#) as part of a verification process. The full audit report is attached to this document (Appendix 4).

## Results

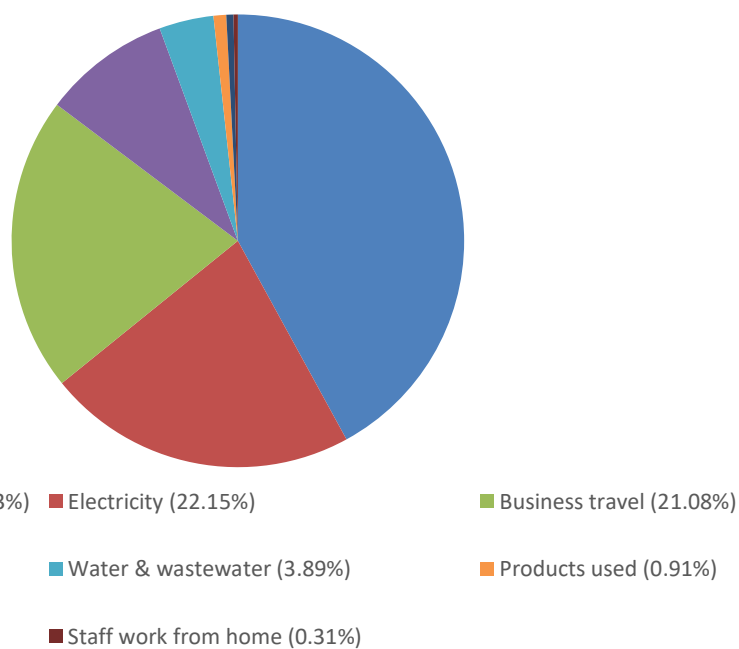
Te Pūkenga GHG emissions for 2023 were 21,262 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>-e).

**Table 1: Te Pūkenga GHG emissions for 2022 and 2023 by Category**

Emissions	2022 tCO <sub>2</sub> -e	2023 tCO <sub>2</sub> -e
Category 1 – Direct	8,823	8,957.9
Category 2 – Indirect energy	7,355	4,216.3*
Category 3 – Indirect transport	3,508	4,552.94
Category 4 – Indirect products/services	4,011	3534.89
<b>Total Gross Emissions</b>	<b>23,697</b>	<b>21,262</b>

\*The Reduction in electricity emissions is largely due to the reduction in the electricity emission factor in 2023.

**Figure 1: GHG Emissions by Emission Source 2023\***



\*Biogenic CO<sub>2</sub> emissions from biomass = 168 tCO<sub>2</sub>

# 1. Kupu Whakataki | Introduction

This report is the second greenhouse gas (GHG) emissions inventory report for Te Pūkenga. The inventory is a quantification of the amount of GHG emissions that can be attributed to the organisation's operations within the declared boundary and scope for the calendar year 2023.

Te Pūkenga is the largest tertiary education provider in New Zealand. From April 2020, New Zealand's 16 Institutes of Technology and Polytechnics (ITPs) and nine Industry Training Organisations (ITOs) began a process of integrating into one network, which was completed by 1 January, 2023. Te Pūkenga has approximately 8400 kaimahi (staff) and 236,000 ākonga (learners) within the network.

## Intended use and purpose of this document

This GHG emissions inventory (also known as a 'carbon footprint') has been developed as the 2023 inventory for Te Pūkenga.

The audience for this report is anticipated to be internal stakeholders including Te Pūkenga leadership who are seeking to understand the emissions of the organisation, and the Carbon Neutral Government Programme (CNGP) lead as part of a larger public sector emissions reduction programme.

This document will allow Te Pūkenga to understand what its emissions currently are, and where these emissions occur across the network.

## Person responsible

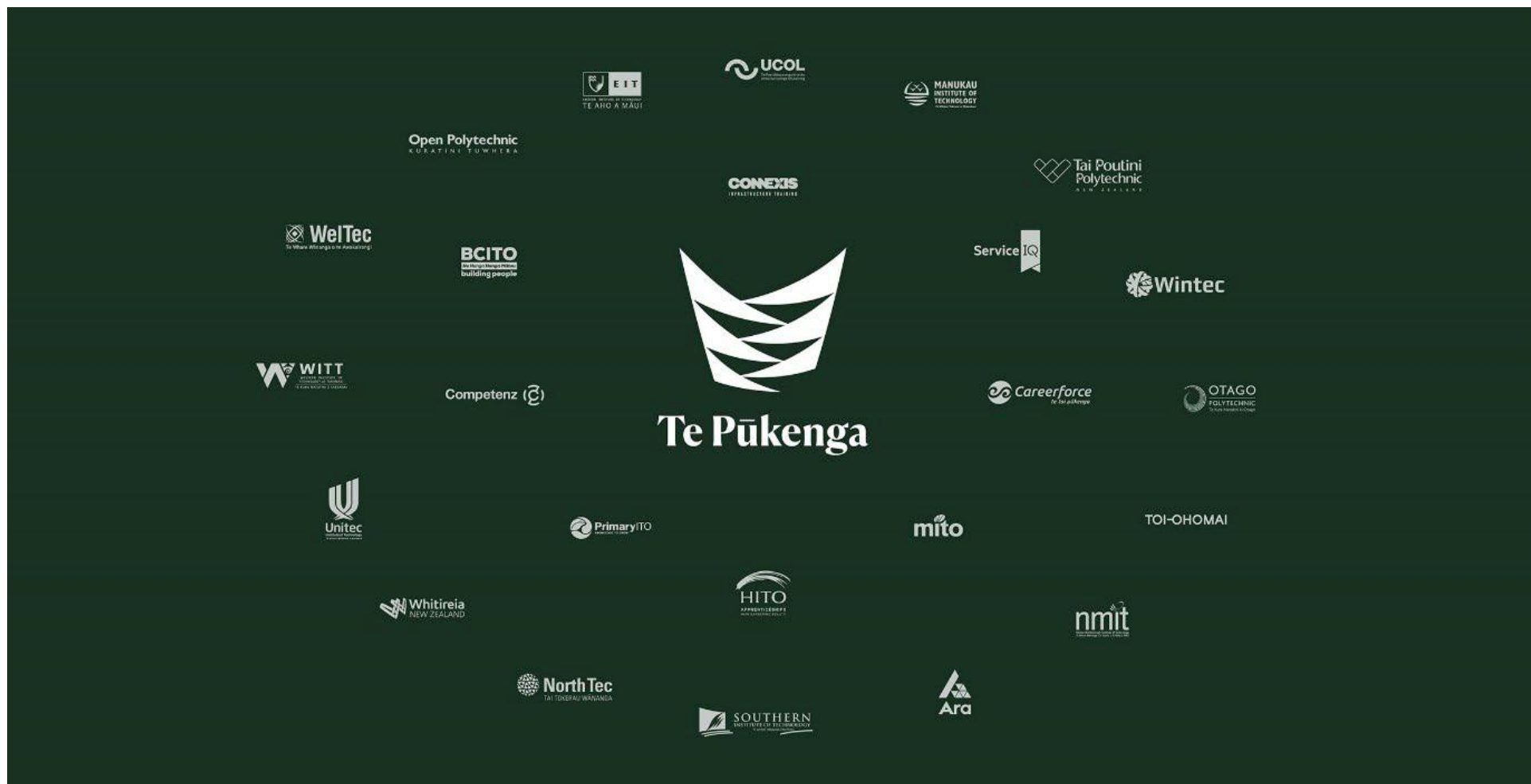
Ehsan Jacobi is the Sustainability Lead at Te Pūkenga and is responsible for the network's sustainability programme which includes obligations under the CNGP.

## 2. Taupā ā-Whakahaere | Organisational boundaries

In this inventory we have used an operational control consolidation approach to account for emissions in the reporting period.

The organisational boundary for this emissions inventory includes the operations and emissions associated with Te Pūkenga as shown below.

Table 2: Te Pūkenga organisational boundaries





### 3. Tikanga Whakahaere Mōhiohio | Information Management Procedures

2023 marks the second emissions inventory produced at the network level for Te Pūkenga, following last year's comprehensive screening process. The BraveGen software has been employed to streamline emissions data collection and calculation across Scope 1, 2, 3, and 4 categories.

The first phase involved collecting data directly from suppliers where feasible, focusing on material emissions sources. Suppliers were asked to provide activity data (e.g., kWh, litres of fuel), which was then uploaded into BraveGen. In instances where suppliers could not share information directly, each business division within Te Pūkenga was engaged to both confirm the accuracy of supplier-provided data and to supply any missing data that could not be gathered directly from suppliers.

Data submission into the BraveGen platform followed a structured approach. Where direct uploads of supplier data were not possible, BraveGen's "smart forms" were utilised for manual entry, ensuring flexibility in data handling. All submitted data entered the BraveGen system's "quarantine" stage, where it underwent a rigorous review and approval process. During this phase, data was double-checked to ensure accuracy before final approval.

To maintain consistency and accuracy in emissions calculations, activity data was converted into consistent units and transformed into CO<sub>2</sub>-e values using appropriate emission factors within the BraveGen system. The same 'de minimis' sources as identified in last year's inventory, including those estimated to contribute less than 1% to the total network footprint, were considered and excluded from reporting where applicable, in alignment with the CNGP thresholds. The sum of these exclusions remains less than 5% of the total network emissions footprint.

All data, including supplier data sets, invoices, reports, and manual entries via BraveGen's smart forms, has been securely stored and can be accessed for audit or review as needed.

This year's emissions have been compared to the base year (2022), allowing for an assessment of progress against the previous year's inventory. Future emissions reporting will depend on organisational circumstances, but this comparison provides a foundation for evaluating emissions trends over time.

## 4. Ngā manga pakihi i aukatia i te whakarārangi | Organisational business units excluded from inventory

Some subsidiaries of the organisations within Te Pūkenga network were excluded from the inventory due to either a lack of available data, or because Te Pūkenga does not have operational control.

Based on discussions with the applicable subsidiaries' parent organisation, the expectation is that none of the subsidiaries have a level of emissions that would be significant.

**Table 2: Subsidiaries of organisations within Te Pūkenga network**

Business Division	Subsidiary details	Operational Control?	Data included?
Otago Polytechnic	Open Education Resource Foundation Limited 100%	No	No
	Otago Polytechnic Education Foundation Trust 100%	No	No
	OPAIC Limited Partnership 50%	No	No
Unitec	Joint venture with WDHB for Awhina Waitaker Simulation Centre 50%	No	No
	UELC 100%	No	No
W&W	Wellington Student Accommodation Ltd (WSAL) 100%	Yes	Data unavailable.
	Le Cordon Blue NZ (LCB) 50%: partnership to be ended 2022	No	No
Wintec	SODA 100%	Yes	Data unavailable.
	Learning Works 100%	Yes	Data unavailable.
	Wintec accommodation trust 100%	Yes	Data unavailable.
	Jinhua Polytechnic - China	No	No - exclude
	Guizhou Light Industry Technical College - China	No	No - exclude

## 5. Tuku Haurehu Kati Mahana ngā mea whāiti mai | GHG emission source inclusions

The GHG emissions sources included in this inventory were identified with reference to the methodology in the ISO14064-1:2018 standard and CNGP requirements.

**Table 3 GHG emission sources included in this inventory**

Scope	Emissions source	Data source	Data collection unit	Methodology and data quality
1	Stationary combustion - Natural gas	Supplier invoices and summaries	kWh	Actual data from suppliers, covering 100% of operations
1	Stationary combustion - LPG	Supplier invoices and summaries	Kg, GJ, L	Actual data from suppliers, covering 90% of operations
1	Stationary combustion - Coal	Supplier invoices and summaries	tonne	Actual data from suppliers, covering 100% of operations
3	Stationary combustion - Diesel	Supplier invoices and summaries	L	Actual data from suppliers, covering 90% of operations
1	Stationary combustion - Biomass	Supplier invoices and summaries	tonne	Actual data from suppliers, covering 100% of operations
1	Transport fuels - Vehicle fleet	Supplier invoices and summaries	L	Actual data from suppliers, covering 78% of operations
3	Refrigerants, medical and other gases	Supplier invoices and summaries	kg	Actual data from suppliers, covering 80% of operations
2	Electricity	Supplier invoices and summaries	kWh	Actual data from suppliers, covering 90% of operations
3	Flights	Supplier invoices and summaries	pkm by type and passenger class	Actual data from suppliers, covering 90% of operations
3	Accommodation	Supplier invoices and summaries	room-nights by country	Actual data from suppliers, covering 80% of operations
3	Rental Cars	Supplier invoices and summaries	km by car type	Actual data from suppliers, covering 90% of operations



3	Taxis	GL code spend data from head office	\$	GL code spend data
3	Mileage claims	GL code spend data from head office	\$	GL code spend data
3	Employee work from home	Employee survey (2022)	FTE	Extrapolated from survey results
3	Transmission and distribution losses (electricity)	Same activity data as electricity consumption	kWh	Based on electricity consumption
3	Transmission and distribution losses (natural gas)	Same activity data as natural gas consumption	kWh	Based on natural gas consumption
3	Waste to landfill	Supplier invoices and summaries	tonne	Actual data from suppliers, covering 90% of operations
3	Water	Supplier invoices and summaries	m3	Actual data from suppliers, covering 84% of operations
3	Wastewater	Supplier invoices and summaries	m3	Estimated based on staff and student numbers, actual data for 20% of operations

## 6. Tuku Haurehu Kati Mahana ngā mea i aukatia | GHG emission source exclusions

At this stage Te Pūkenga has not captured indirect emissions relating to the following:

Excluded emission sources	Reason for exclusion
Purchased goods and services (such as maintenance contractors)	Not mandatory
Capital goods (such as construction projects)	Not mandatory
Employee commuting	Not mandatory for the reporting period. Absence of accurate data due to inability to conduct a survey
Freight	(de minimis)
Fertiliser	(de minimis)
Welding gases	(de minimis)
Refrigerants liabilities	Absence of accurate data
Stationary fuel liabilities	Absence of accurate data
Coach rental	Absence of accurate data

Of these emissions sources, only freight was considered a 'mandatory' emissions source by the CNGP programme rules for the reporting period. However, an initial estimate of these emissions (based on spend data and economic emissions factors from Motu 2014) found that it was de minimis (<1%) at the group level.

We expect some of these emissions sources to be significant, but these were all excluded due to lack of available or accurate data.

## 7. Kohinga raraunga me ngā āhuatanga rangirua | Data collection and uncertainties

Section 7 of this report details the overall approach to data collection and uncertainties. Given that this is the second year of emissions reporting for Te Pūkenga, we were able to cross-reference data from our 2022 inventory to help identify any missing data for 2023. This comparison provided a useful benchmark to assess data completeness as it was received, allowing us to seek additional data if the totals were lower than expected, and guiding extrapolations where necessary.

Section 9 of this report outlines the specific methods used to collect data for each emissions source, as well as any uncertainties and assumptions where data was estimated. The data collection process was once again supported by Te Pūkenga finance and administration team, various suppliers, and relevant personnel across the organisation.

This year BraveGen software was employed to calculate the GHG emissions inventory. BraveGen provided a streamlined, efficient process for calculating emissions based on source activity data, which was multiplied by the appropriate GHG emissions factors to quantify the inventory.

The emissions factors applied this year remained consistent with those used last year. We sourced these from the Ministry for the Environment (MfE, NZ) and the Department for Business, Energy & Industrial Strategy (BEIS, UK), using the most up-to-date figures available at the time. The latest version of the MfE figures, published in 2023, was used to ensure accuracy. As with last year, emissions factors for air travel incorporated radiative forcing in alignment with the precautionary principle.

Quantities of each greenhouse gas were converted to tonnes of CO<sub>2</sub>-e using the global warming potentials (GWPs) from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5), with a 100-year time horizon. All emissions data in this report are expressed in tonnes of carbon dioxide equivalent (CO<sub>2</sub>-e).

Through comparison with the previous year's data, we observed improvements in data accuracy in many cases. As with last year, any assumptions and uncertainties related to emissions estimates are explained in detail in Section 9.

## 8. Ngā tātaitanga me ngā otinga Tuku Haurehu Kati Mahana | GHG emission calculations and results

Te Pūkenga GHG emissions for 2023 were 21,262 tCO<sub>2</sub>-e.

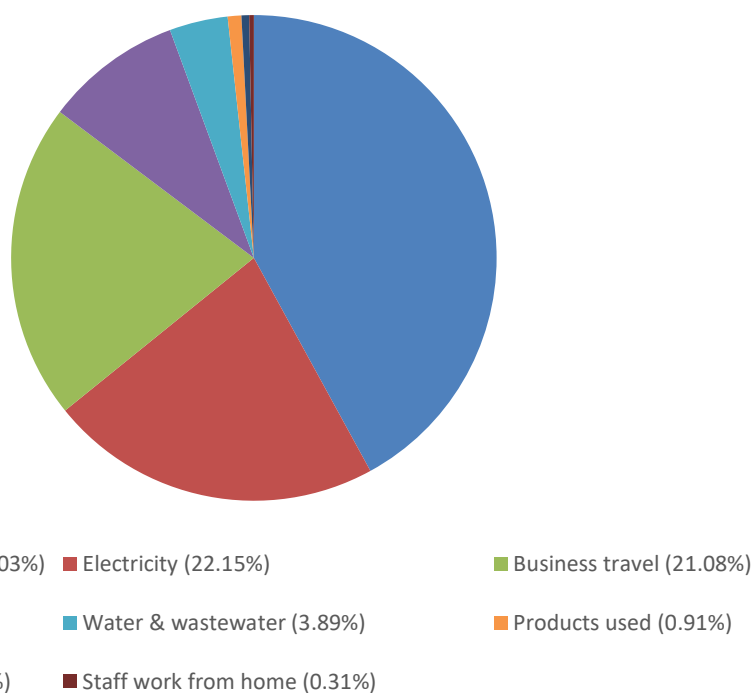
Figures 1, 3 and 4 and Table 1 provide an overview of where the emissions are occurring across the network.

**Table 3: Te Pūkenga GHG emissions for 2022 and 2023 by Category**

Emissions	2022 tCO <sub>2</sub> -e	2023 tCO <sub>2</sub> -e
Category 1 – Direct	8,823	8,957.9
Category 2 – Indirect energy	7,355	4,216.3*
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<b>Total Gross Emissions</b>	<b>23,697</b>	<b>21,262</b>

\*The reduction in electricity emissions is largely due to the reduction in the electricity emission factor in 2023.

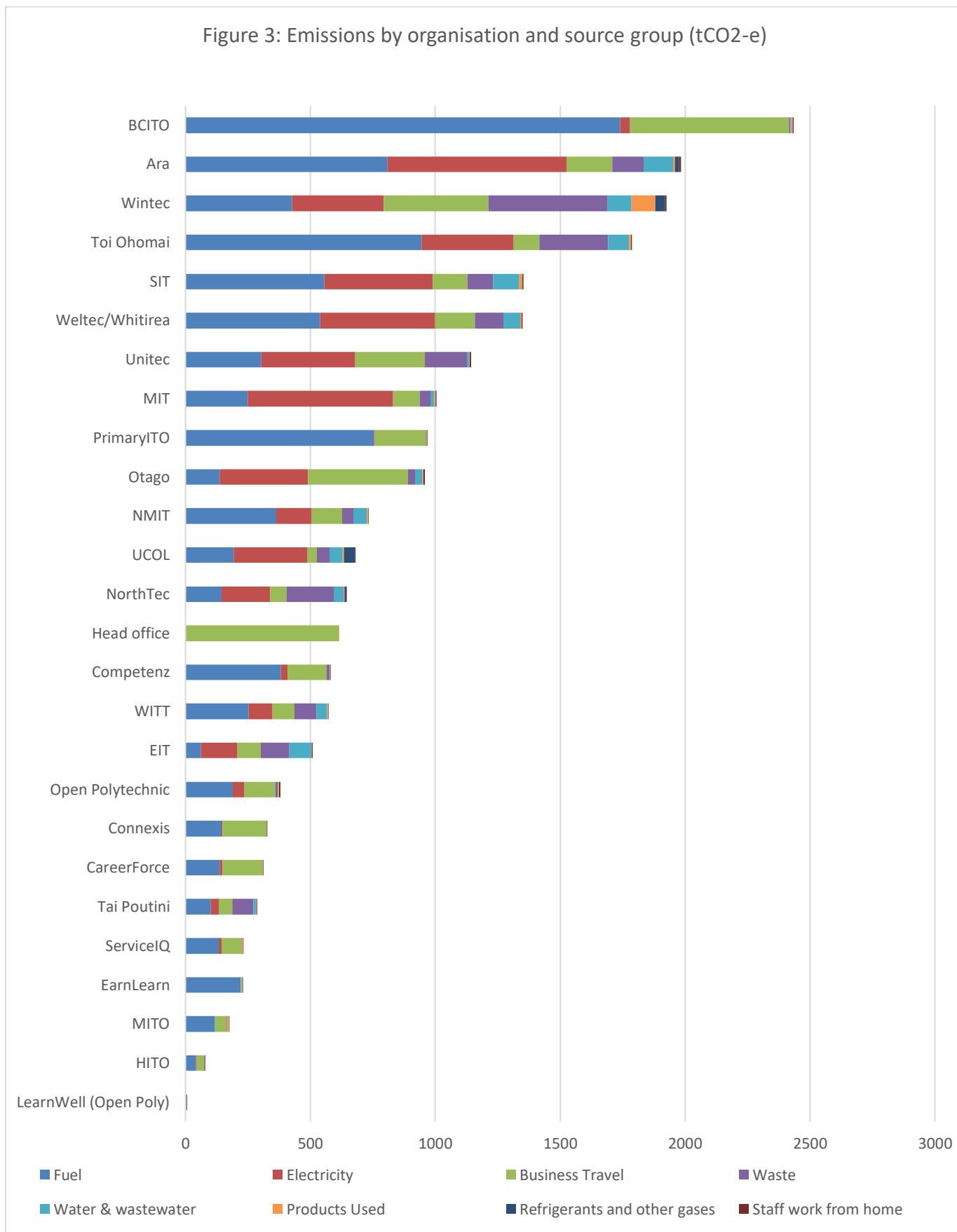
Figure 2: GHG Emissions by Emission Source 2023\*



\*Biogenic CO<sub>2</sub> emissions from biomass = 168 tCO<sub>2</sub>

The largest single emissions source remains electricity as shown in Figure 2 (Please note that Fuel includes multiple sources and is shown as one group in the figure). The next largest emissions source is stationary fuels (coal, diesel, gas), followed by transport fuels (petrol, diesel), and travel (flights, mileage claims, taxis).

Figure 3 visualises the contribution by organisation and emissions source.



## 9. Ngā Pūnama Tuku Haurehu Kati Mahana | GHG liabilities and Removals

As Te Pūkenga does not have any forestry land, liabilities relate to refrigerants held in HVAC equipment and fuels held on site at the end of the reporting period.

Holdings of fuels have already been accounted for in inventory as fuels are recorded at point of purchase/delivery and not when combusted.

Stocks of refrigerants held were requested from suppliers but were unable to be provided and there is no reliable inventory of the refrigerants held in HVAC equipment across Te Pūkenga network.

There were no GHG removals.



# Āpitianga 1 – Ripanga Whakarāpopoto Tuku ā-Kōtuinga | Appendix 1 – Network Summary Emissions Table

Scope	Data Collection Group	Carbon Dioxide (CO <sub>2</sub> )	Methane (CH <sub>4</sub> )	Nitrous Oxide (N <sub>2</sub> O)	Hydrofluoro-carbons (HFCs)	Emissions
		tCO <sub>2</sub> e	tCO <sub>2</sub> e	tCO <sub>2</sub> e	tCO <sub>2</sub> e	tCO <sub>2</sub> e
1	Fuel	8,623.72	63.82	162.16	0	8,849.70
	Refrigerants and other gases	0	0	0	108.2	108.2
<b>Scope 1 Total</b>		<b>8,623.72</b>	<b>63.82</b>	<b>162.16</b>	<b>108.2</b>	<b>8,958</b>
2	Electricity	4,097.00	110.2	9	0	4,216.30
<b>Scope 2 Total</b>		<b>4,097.00</b>	<b>110.2</b>	<b>9</b>	<b>0</b>	<b>4,216.30</b>
3	Business travel	4,444.68	7.23	30.89	0	4,482.80
	Electricity – Transmission and Distribution Losses	471	20.6	1	0	492.7
	Fuel - Transmission and Distribution Losses	0	86.7	0	0	86.7
	Products used	193.2	0	0	0	193.2
	Staff work from home	63.5	2	0	0	65.5
	Waste	0	1,931.20	8.6	0	1,939.80
	Water and Wastewater	134.25	290.01	402.74	0	827
<b>Scope 3 Total</b>		<b>5,307</b>	<b>2,338</b>	<b>443.23</b>	<b>0</b>	<b>8,088</b>
<b>Grand Total</b>		<b>18,027</b>	<b>2,512</b>	<b>614.39</b>	<b>108.2</b>	<b>21,262</b>

## Āpitianga 2 – Ripanga Tuku ā-Whakahaere | Appendix 2 – Emissions by Organisation Table

Business Division	Fuel	Electricity	Business Travel	Waste	Water & wastewater	Products Used	Refrigerants and other gases	Staff work from home	Total Bisness Division tCO2-e
LearnWell (Open Poly)	0	1.02	0.2	3.26	0.02	0.18	0	0.04	4.72
HITO	41.89	2.18	30.91	1.39	0.25	0.58	0	0.2	77.4
MITO	118.24	0	47.41	1.79	0.83	5.85	0	0.72	174.84
EarnLearn	220.05	0	4.54	0.7	0.99	2.71	0	0.82	229.81
ServiceIQ	132.95	11.91	79.02	0.18	0.7	5.28	0	0.63	230.67
Tai Poutini	101.19	31.6	53.97	85.38	10.33	1.23	0.48	0.49	284.67
CareerForce	135.82	12.15	160.55	0	1.46	0.41	0	1.25	311.64
Connexis	143.28	4.17	176.11	0.04	0.61	0.83	0	0.47	325.51
Open Polytechnic	188.33	46.38	124.01	9.29	2.03	4.49	0	4.53	379.06
EIT	61.55	145.72	93.83	113.65	89.43	0.87	0	3.96	509.01
WITT	252.61	95.7	87.39	88.39	42.09	4.43	0	1.4	572.01
Competenz	380.95	27.05	156.98	10.78	1.58	3.39	0	1.4	582.13
Head office	0	0	614	0	0	0.11	0	0	614.11
NorthTec	144.97	194.1	65.5	188.79	38.94	4.59	6.16	1.7	644.75
UCOL	193.1	296.2	36.37	50.44	52.07	6.16	44.54	3.06	681.94
NMIT	362.68	141.89	122.2	44.54	55.58	4.06	0	2.59	733.54
Otago	135.96	355.2	399.78	27.93	29.96	4.15	0	4.63	957.61
PrimaryITO	754.26	3.08	204.26	0.92	2.16	2.69	0	1.82	969.19
MIT	249.05	580.95	108.41	41.3	16.36	4.44	0	4.3	1004.81
Unitec	303.1	375.88	278.66	168.75	8.73	2.73	0	5.07	1142.92
Weltec/Whitirea	538.53	460.88	159.55	113.98	66.21	5.48	0	4.09	1348.72
SIT	556.4	433.08	138.17	104.42	104.56	12.11	1.15	2.95	1352.84
Toi Ohomai	945.8	367.4	103.25	275.48	83.86	6.92	0	5.07	1787.78
Wintec	425.87	367.23	418.94	477.26	96.24	95.49	38.81	4.83	1924.67
Ara	809.35	716.29	182.3	125.8	118.39	7.64	17.06	6.42	1983.25
BCITO	1740.48	38.9	636.5	5.37	3.65	6.4	0	3.11	2434.41
<b>Total tCO2-e by Source</b>	<b>8936.41</b>	<b>4708.96</b>	<b>4482.81</b>	<b>1939.83</b>	<b>827.03</b>	<b>193.22</b>	<b>108.2</b>	<b>65.55</b>	<b>21,262</b>

## ĀpitiHanga 3 – Tohutoro | Appendix 3 – References

The emission factors used for this emission inventory were taken from the following sources:

International Organization for Standardization. 2018. ISO14064-1:2018. Greenhouse gases – Part 1: *Specification with guidance at the organisation level for quantification and reporting of greenhouse gas GHG emissions and removals*. Geneva: ISO.

Ministry for the Environment. August 2023. Measuring Emissions: A Guide for Organisations: 2023 Detailed Guide. Wellington: Ministry for the Environment.

Department for Business, Energy & Industrial Strategy. June 2023. Greenhouse gas reporting: conversion factors 2023. London: Department for Business, Energy & Industrial Strategy, UK Government.

“Consumption-based greenhouse gas emissions input-output model”. 2014. Obtained by Motu Economic and Public Policy Research from Statistics New Zealand, MBIE and MFE in 2013. Unrestricted dataset available online from: [www.motu.org.nz](http://www.motu.org.nz)

New Zealand Reserve Bank. 2023. Inflation Calculator. Available online from: <https://www.rbnz.govt.nz/monetary-policy/about-monetary-policy/inflation-calculator>.

**Āpitianga 4 – Tā te Kaitātari Motuhake Whakaaro: Whakamanatanga Toitū |**  
Appendix 4 – Independent Audit Opinion: Toitū Verification

# TOITŪ ASSESSMENT REPORT

## ISO 14064-1 Verification

### Organisation:

Te Pūkenga - New Zealand Institute of Skills and Technology

Lead Auditor	Natalie Clee
Team members	Tina Hartung, Toby Green
Verification firm	Enviro-Mark Solutions Limited (trading as Toitū Envirocare)
Contact details	Natalie.clee@toitu.co.nz +64 9 574 4293
Client Contact	Ehsan Yaeghoobi
Contact details	Ehsan.Yaeghoobi@tepukenga.ac.nz +64 21 057 9555
Report date	15 November 2024
Report reviewed by	Billy Ziemann, Toitū Envirocare, 21 November 2024

## AUDIT OBJECTIVES

The objective of the audit was to determine if:

- the organisation's GHG measurement (emissions data and calculations) meet(s) the criteria and requirements of ISO 14064-1:2018.

## AUDIT CRITERIA AND SCOPE

The audit criteria and scope are detailed in the following table:

<b>Audit criteria</b>	ISO 14064-1:2018 ISO 14064-3:2019 Carbon Neutral Government Programme: A guide to measuring and reporting greenhouse gas emissions Audit & Certification Technical Requirements 3.1
<b>Audit date</b>	7/10/2024
<b>Reporting year</b>	01/01/2023 – 31/12/2023
<b>Base year</b>	01/01/2022 – 31/12/2022
<b>Consolidation methodology</b>	Operational control
<b>Materiality threshold</b>	5%
<b>GHG statement</b>	Te Pūkenga - New Zealand Institute of Skills and Technology has measured its greenhouse gas emissions in accordance with ISO 14064-1:2018 in respect of the operational emissions of its organisation including emissions under category 1 and 2, category 3 emissions associated with business travel, accommodation, staff working from home, staff commuting and freight paid for by the organisation, and category 4 emissions associated with waste disposed of by the organisation, the transmissions and distribution of electricity and natural gas where appropriate, water supply and wastewater, and purchased goods and services.
<b>Intended users</b>	Te Pūkenga's Senior Management
<b>Registered office address</b>	Level 2, Wintec House, Cnr Anglesea & Nisbet Streets, Hamilton, 3204, New Zealand
<b>Locations visited</b>	Weltec Whitirea Campus, Wi Neera Drive, Porirua, New Zealand
<b>Audit Type</b>	Verification only
<b>Activities undertaken remotely</b>	Where audit activities have been undertaken using remote/ICT based approaches, it is confirmed that the methods used allowed all relevant audit activities to be undertaken effectively.

## CONCLUSION

The following total emissions have been verified:

Emissions summary by categories	All verified emissions	Units
Category 1 total	8,957.88	tCO <sub>2</sub> e
Category 2 total	4,216.29	tCO <sub>2</sub> e
Category 3 total	4,548.36	tCO <sub>2</sub> e
Category 4 total	3,539.79	tCO <sub>2</sub> e
<b>Total gross inventory:</b>	<b>21,262.32</b>	<b>tCO<sub>2</sub>e</b>

An assessment of materiality was made against the defined threshold. From this analysis it is concluded that the stated emissions are free from material error.



# AUDIT SUMMARY

## SCOPE AND BOUNDARIES

The scope of the emissions inventory includes all activities within the operational boundaries of Te Pūkenga including but not limited to all of New Zealand’s 16 Institutes of Technology and Polytechnics (ITPs) and 9 Industry Training Organisations (ITOs). It is noted that there are a range of activities that have previously been shown to be *de minimis* or out of scope. Therefore, these are excluded from the scope of the inventory. These include but are not limited to:

- Purchased goods and services (such as maintenance contractors)
- Capital goods (such as construction projects)
- Employee commuting
- Freight (de minimis)
- Fertiliser (de minimis)
- Welding gases (de minimis)
- Coach rental
- Refrigerant and fuel liabilities

## EMISSIONS FACTORS

The emissions factors were checked for all emission sources and were found to align with the following sources:

- Ministry for the Environment. August 2023. Measuring Emissions: A Guide for Organisations: 2023 Detailed Guide. WELLINGTON: MINISTRY FOR THE ENVIRONMENT.
- Department for Business, Energy & Industrial Strategy. June 2023. Greenhouse gas reporting: conversion factors 2023. London: Department for Business, Energy & Industrial Strategy, UK Government.
- “Consumption-based greenhouse gas emissions input-output model”. 2014. Obtained by Motu Economic and Public Policy Research from Statistics New Zealand, MBIE and MFE in 2013. Unrestricted dataset available online from: [www.motu.org.nz](http://www.motu.org.nz)
- New Zealand Reserve Bank. 2023. Inflation Calculator. Available online from: <https://www.rbnz.govt.nz/monetary/>

## VERIFICATION PROCEDURES

Verification evidence-gathering procedures for the stated emission sources are as follows:

Verification Level	Emissions sources
<b>Detailed review:</b> Verification from reported emissions back to actual source data in accordance with the appropriate data sampling protocols (checking supplier or other source data, calculations, scope and boundaries of data, date ranges, emissions factors and key assumptions). The extent to which the verification was conducted varied depending on level of controls noted at the emission source level.	Natural Gas, LPG, Transport Fuel use,, Electricity, Air travel (domestic and long-haul), Rental cars, Wastewater

<p><b>Limited review (Sense checks):</b> Professional judgment that the reported emissions are of the correct order of magnitude; that all emissions factors are correct; that stated <i>de minimis</i> sources are appropriately justified. The extent to which the verification was conducted varied depending on level of controls noted at the emission source level.</p>	All remaining
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As part of the audit, the below criteria/documents were reviewed:

Criteria/documents	Status
Organisational boundaries	Meets requirements.
The Greenhouse Gas Emissions Inventory report	Meets requirements.
Application of the accounting principles	Meets requirements.

A total of 2 non-conformances, 9 minor non-conformances and 6 observations were raised during this visit. Full details of the findings are given in the findings log below.

Using our Data Quality Assessment tool for analysing data against completeness and assumed uncertainty an inventory “quality” can be classified as follows:

- High
- Good
- Fair
- Poor

From the analysis conducted your inventory is classified as: Good.

This is not subject to any further client actions.

## ADDITIONAL NOTES

The organisation needs to ensure that any claims relating to their GHG emissions do not indicate that Te Pūkenga – NZ Institute of Skills and Technology has gained Toitū carbonreduce or carbonzero certification.

## CONCLUSION

Please refer to the separate Audit Opinion document for further information.

<b>Level of Assurance</b>	Reasonable and Limited.
<b>Qualifications/Limitations</b>	The opinion is unmodified.

## FINDINGS LOG

<b>Date issued:</b>	07/10/2024
<b>Verifier:</b>	Natalie Clee
<b>Company issued to:</b>	Te Pūkenga – New Zealand Institute of Skills and Technology

A finding marked <b>NCR</b> must be corrected before audit can be closed out, unless otherwise approved by the Certification Manager
A finding marked <b>mNCR</b> is not required to be corrected for this verification, but may need to be addressed/checked for your next inventory, or it may become a NCR. You may voluntarily correct a mNCR for completeness
A finding marked <b>Obs</b> is an observation or recommendation from the verifier that may be helpful to you
<b>--- corrective actions are expected to be closed out within 15 days of the date raised---</b>

Ref #	Issue	Status	Type	Comments / Agreed Corrective Actions	Date closed	Evidence sighted to close out the issue where corrective action required.
NCR 1	GHG Report - to amend as discussed in meeting 10.10.24. Include all excluded emissions with a justification. Ensure biogenic total emissions are separately listed. Ensure there is a total for Direct and Indirect emissions for the year. Your base year figures should be included in the table for comparatives.	Closed	NCR	Please update GHG narrative report as discussed for all outstanding items.	12/11/2024	GHG Report updated as requested.
NCR 2	Direct GHG emissions, quantified separately for CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NF <sub>3</sub> , SF <sub>6</sub> and other appropriate GHG groups (HFCs, PFCs, etc.) in tonnes of CO <sub>2</sub> e (5.2.2)	Closed	NCR	Client is not easily able to prepare this from Bravegen. It will be raised in the Assurance Report.	12/11/2024	updated in GHG report.
mNCR 1	SIT - LPG - has got quantities which are not correct. The conversion rate from kg to litres was not correctly applied. Whilst the figure is overstated in ESP Bravegen this is not material to the inventory - with an impact of around 2 tCO <sub>2</sub> e.	Open	mNCR			Not adjusted.
mNCR 2	Otago BioFuel - August 2023 has an entry which is not supported by invoice. It is unclear what has occurred in Bravegen.	Open	mNCR			Not adjusted.

Ref #	Issue	Status	Type	Comments / Agreed Corrective Actions	Date closed	Evidence sighted to close out the issue where corrective action required.
mNCR 3	Electricity, Natural Gas and LPG T&D losses and EF Electricity: Reported T&D losses do not match the reported electricity. 387,721 kWh are missing in electricity T&D losses. An additional entry of 116,436 (possibly kWh) has no measurement unit, please update with unit. Immaterial difference of approx. 6 tCO <sub>2</sub> e. Natural Gas: reported TnD losses do not match consumption, please update. There is one entry of 155,000 kWh that does not have a measurement unit associated, please add. Natural Gas TnD losses EF: EFs used for reported GJ and kWh are not correct. EF for kWh is 0.00713 kgCO <sub>2</sub> e and for GJ it is 1.98 kgCO <sub>2</sub> e. LPG (mainly for Ara from Rockgas) - there are no losses associated with reticulated LPG, therefore no need to report in inventory. However, it looks like you might have added the TnD losses for LPG to Natural Gas TnD losses reported as GJ? Immaterial impact overall.	Closed	mNCR	This adjustment should be made to ensure the consumption for Scope 2 and Scope 3 matches.	01/11/2024	Electricity updated. Natural Gas - not corrected. Difference is not material.
mNCR 4	Waste Landfill - wrong EFs 1. LFGR - Office Waste - 717 t, EF is 0.3 when it should be 0.666, resulting in 478 tCO <sub>2</sub> e, difference of 261 tCO <sub>2</sub> e or 1.3 % 2. no LFGR - Office Waste, EF should be 2.081, resulting in 910 tCO <sub>2</sub> e; difference of 596 tCO <sub>2</sub> e or 3 % 3. Recycled waste - Paper and mixed waste (Wastebusters) - reported in kg, EF should be 0.0000213, immaterial difference of 0.00 %	Closed	mNCR	Please update as this is near the materiality threshold.	01/11/2024	updated
mNCR 5	Waste Landfill - Chemical Waste No measurement unit, please update. Agreed to Industrial waste EF from MfE (0.588 kgCO <sub>2</sub> e/kg). Difference is likely to be de minimis (below 0.1 %).	Closed	mNCR		01/11/2024	updated
mNCR 6	Waste Landfill without GR Waste for Wintec (170t) is reported as LF without GR when waste very likely goes to Hampden Downs and therefore could be reported as LFGR. Immaterial difference	Open	mNCR	Not updated	01/11/2024	Not adjusted.
mNCR 7	Electricity usage: Northtec and Toi Ohomai Northtec - confirmed back to client schedule downloaded from BraveGen - this indicates that actual usage data wasn't available, and client has estimated usage based on \$\$ spend. The year on year comparison for Northtec electricity usage suggests that this may result in the FY23 kWh being overstated by around 1.2m kWh. Toi Ohomai - Checked back to schedule from Facilities Manager for Toi Ohomai. This details all ICPS	Open	mNCR			Not adjusted.

Ref #	Issue	Status	Type	Comments / Agreed Corrective Actions	Date closed	Evidence sighted to close out the issue where corrective action required.
	by month. Total is approx. 2.4m kWh more than is currently disclosed in the client WPs. Have combined the two differences - this gives a difference of approx. 84.50 tCO <sub>2</sub> e					
mNCR8	Waste Landfill & Recycling - Completeness 4 institutions have only reported 5 months of waste for landfill and recycling: Connexis (several offices in CHC, Hamilton, Wlgt), MIT, Otago Polytechnic, ServiceIQ - these numbers should be extrapolated to full year. Total amount for landfill waste (general waste) is 762 t and landfill (office waste) 762 t. Difference of 0.22 %	Closed	mNCR			extrapolated the figures for 2023 (the average per month from the months that they reported) and used this average per month for each of the months missing ONLY for MIT and Otago as advised by Tina. The other two were minimal.
mNCR 9	Taxi spend Should be reported including GST (not excluding GST). Immaterial difference of 1.8 tCO <sub>2</sub> e.	Open	mNCR	Not updated	01/11/2024	Not updated.
OBS 1	Fuels - a summary spreadsheet would be useful particularly for LPG which has different units and suppliers for each site.	Open	Obs			Not adjusted.
OBS 2	Concerns around travel data: 1. Rental cars - some uncertainty 2. Taxi - Reported taxi spend ca. 60 % less than last year, while air travel has increased for all segments. 60 % of data is estimated. 3. Mileage - 60 % of data is estimated	Open	Obs			Not adjusted.
OBS 3	Data Quality - A large number of emission sources from some of the BU's are based on reported values. As such the data quality is low as we cannot agree back to supplier invoices. There is an inherent risk that there are some errors within these figures.	Open	Obs	For the client to consider		
OBS 4	CNGP reporting requirements are to detail the organisation's plan to meet reduction certain GHG reduction targets. Te Pukenga as a Tranche 3 client is not required to complete this. We would for completeness recommend including a note to say that, given the organisation is due to be dissolved at the end of the current year, no reduction targets have been set	Open	Obs	For the client to consider		
OBS 5	Noted with client that there were some minor discrepancies noted in figures previously reported for 2022 base year (fuels and electricity). These are not material and thus no FFAV has been raised.	Open	Obs	For the client to consider		

Ref #	Issue	Status	Type	Comments / Agreed Corrective Actions	Date closed	Evidence sighted to close out the issue where corrective action required.
OBS 6	With Te Pukenga being disbanded, we would recommend at a minimum that the individual units maintain at least the Excel summary of emission sources with data, with a view to reporting these individually going forward.	Open	Obs	For the client to consider		



## NOTES

1. The detailed audit findings and calculations are given in the Verification Plan and Working Papers associated with this audit. These contain proprietary verification methodologies and remain confidential to Toitū Envirocare.
2. The audit is based upon sampling and as such nonconformities may exist that have not yet been identified.
3. We have reviewed the company's GHG emissions inventory for the period. The inventory is based on historical information which is stated in accordance with the requirements of ISO 14064-1:2018.
4. The scope of the review was limited to personnel interview, analytical review procedures applied to GHG emissions data, and review of the input of data into the emissions inventory. Based on our review the inventory is compliant with the requirements of ISO 14064-1:2018.
5. A **non-conformance (NCR)** indicates that the auditor has found a non-conformance with scheme Technical Requirements (audit criteria) and requires you to take the appropriate corrective action and provide evidence of this correction within two weeks. This may require resubmission of an updated Emissions Inventory Report and Emissions Management and Reduction Plan.
6. A **minor non-conformance (mNCR)** which the auditor has found which is not material to the outcome of the inventory, but to which a failure to address in the preparation of future inventories could lead to a major Non-Conformance (NCR).
7. **Observations** made by your auditor are strongly advised but the actions are not required for the organisation to be recommended for certification.
8. Neither Toitū Envirocare nor the auditor has any interest in the organisation, other than in our capacity as assurance providers. We have not carried out any work with this business prior to this review other than conducting the previous verification.
9. This report has been prepared solely for the use of the organisation and Toitū Envirocare as part of a GHG verification in accordance with relevant international standards as outlined in the audit criteria above. It may be relied on solely by the organisation and Toitū Envirocare for that purpose only. Toitū Envirocare does not accept or assume any responsibility to any person other than the organisation in relation to the statements or findings expressed or implied in this report.
10. Any correspondence regarding this audit report should be directed to your Lead Auditor.
11. A copy of this report has been provided to the nominated client contact.
12. A copy of this report may be made available to intended users upon request.
13. **Confidentiality:** All information obtained during this assessment will remain confidential to Te Pūkenga – NZ Institute of Skills and Technology, the verifier and Enviro-Mark Solutions Limited (trading as Toitū Envirocare). No information will be released to any other party without your express permission except as required by law or Toitū's accreditation body JASANZ, or if it is in aggregate and/or de-identified form. This report must not be copied except in full without the permission of the Responsible Party and Toitū Envirocare.

# INDEPENDENT AUDIT OPINION

## Toitū Verification

### To the intended users

Organisation subject to audit: Te Pūkenga – New Zealand Institute of Skills and Technology

ISO 14064-1:2018

ISO 14064-3:2019

Audit Criteria: Carbon Neutral Government Programme: A guide to measuring and reporting greenhouse gas emissions

Audit & Certification Technical Requirements 3.1

Responsible Party: Te Pūkenga – New Zealand Institute of Skills and Technology

Intended users: Internal stakeholders including Te Pūkenga's management

Registered address: Level 2, Wintec House, Cnr Anglesea & Nisbet Streets, Hamilton, 3204, New Zealand

Inventory period: 1/01/2023 - 31/12/2023

Inventory report: TP 2023 Greenhouse-Gas-Emissions-Inventory for Verification.pdf

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

### Responsible Party's Responsibilities

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

### Responsibilities of verifiers

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

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

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

GHG quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

## Basis of verification opinion

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

## Verification

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

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

## Verification strategy

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

- activities to inspect the completeness of the inventory;
- interviews of site personnel to confirm operational behaviour and standard operating procedures;
- re-perform access controls to onsite records;
- sampling of electricity reports to confirm accuracy of source data into calculations;
- reconciliation of fuel, LPG, natural gas and air travel emissions;
- detailed retracing of pre-calculated fuel and wastewater emissions;
- analytical procedures between production and energy consumption.

The data examined during the verification were historical in nature.

## Basis for modified verification opinion

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

The opinion is unmodified.

## Verification level of assurance

ISO CATEGORY	LOCATION BASED tCO <sub>2</sub> e	LEVEL OF ASSURANCE
Direct Emissions:		
Category 1	8,957.88	Reasonable
Indirect emissions from imported energy:		
Category 2	4,216.29	Reasonable
Indirect emissions from transportation		
Category 3	4,305.51	Reasonable
Category 3	242.85	Limited
Indirect emissions from products used by organisation:		
Category 4	2,712.77	Reasonable
Category 4	827.02	Limited
<b>TOTAL INVENTORY</b>	<b>21,262.32</b>	

GHG PROTOCOL CATEGORIES

GHG SCOPE	tCO <sub>2</sub> e
Scope 1	8,957.88
Scope 2	4,216.29
Scope 3	8,088.15
<b>TOTAL INVENTORY</b>	<b>21,262.32</b>

## Responsible party's greenhouse gas assertion (claim)

Te Pūkenga - New Zealand Institute of Skills and Technology has measured its greenhouse gas emissions in accordance with ISO 14064-1:2018 in respect of the operational emissions of its organisation including emissions under category 1 and 2, category 3 emissions associated with business travel, accommodation, staff working from home, staff commuting and freight paid for by the organisation, and category 4 emissions associated with waste disposed of by the organisation, the transmissions and distribution of electricity and natural gas where appropriate, water supply and wastewater, and purchased goods and services.

## Verification conclusion

### EMISSIONS - REASONABLE ASSURANCE

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

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

### EMISSIONS - LIMITED ASSURANCE

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the emissions, removals and storage defined in the inventory report:



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

## Other information

The responsible party is responsible for the provision of Other Information. The Other Information may include emissions management and reduction plan and purchase of carbon credits, but does not include the information we verified, and our auditor's opinion thereon.

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



	VERIFIED BY	AUTHORISED BY
Name:	Natalie Clee	Billy Ziemann
Position:	Verifier, Toitū Envirocare	Certifier, Toitū Envirocare
Signature:		

Date verification audit: 7 October 2024

Date opinion expressed: Tuesday, 12 November 2024 21 November 2024

