

1. Introduction

1.1 Background

In line with the City of Launceston's (CoL) commitment to reduce its operational greenhouse gas emissions and become carbon neutral by 2025, CoL is undertaking an annual emissions desktop audit to track emissions against the 2018/19 baseline completed by a third party¹. The annual desktop audit will be completed in-house and independently verified by a third party.

There are no changes to the organisational boundary defined in the 2018/19 baseline. The emissions inventory encompasses Scope 1, 2 & 3 emissions along with a review of materiality of emission sources, whilst documenting exclusions and other assumptions.

Completing an annual emissions desktop audit or carbon footprint assists and offers greater control to CoL to manage potential risks and identify risk reduction opportunities. The creation of an emissions inventory enables public reporting and participation in voluntary emissions and mandatory reporting schemes, and, where applicable, participation in carbon markets. Emissions reporting also allows for recognition of CoL's actions in mitigating climate change.

Emissions/carbon accounting is the process of identifying and measuring the amount of emissions/carbon, measured in tonnes carbon dioxide equivalents (CO₂e), emitted by an entity.

1.2 Assumptions and Limitations

The 2021/22 emissions inventory is based on the same assumptions and limitations as the baseline year and is based on the Greenhouse Gas Protocol as developed by the World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI). The Scope 1 and 2 emission factors are taken from the National Greenhouse and Energy Reporting (NGER) Measurement Determination. The Scope 3 emission factors were sourced from National Greenhouse Accounts (NGA) Factors 2022, and EPA Victoria's greenhouse gas inventory management plan 2021 (for emissions associated with air travel and accommodation).

1.3 Emissions Boundary Reporting Approach

As per the baseline inventory, and typically used by other councils, the Operational Control approach was applied for this reporting year (refer to the 2018/19 report for further information on approach options). Operational control is determined by who has authority at a facility on a day to day basis. This is often demonstrated by the right to set environmental or health and safety policies and procedures at a site. The organisation deemed to have operational control is then responsible for reporting 100% of the emissions.

The reporting boundary for this inventory has been prepared by following the approach of the Australian Government's Climate Active Standard. The Climate Active program is the most commonly used approach for Australian organisations to certify their carbon neutral status, and it is based on the GHG Protocol and NGER Measurement Determination.

The emissions inventory includes a variety of emissions sources that we have deemed "relevant" and "material" to the City's operations.

1.3.1 Relevance

The Climate Active Standard states emissions sources considered to be relevant, whether or not they fall within the reporting organisation's boundary, must be included in the emissions boundary (subject to materiality).

¹¹ GHD, 2020.

The following emissions sources are deemed to be relevant to all organisations, as demonstrated in Figure 1:

- All scope 1 emissions (direct emissions)
- All scope 2 emissions (emissions from the generation of electricity, heat, cooling and steam purchased by the organisation).
- Scope 3 emissions from electricity consumption and fuel use (indirect emissions from the extraction, production and transport of fuel burned at generation, and the indirect emissions attributable to the electricity and gas lost in delivery in the transmission and distribution network).
- Scope 3 emissions from business travel and accommodation, employee commuting, office paper, and water use.

Other Scope 3 emission sources, such as postage and freight, stationary, printing, cleaning services etc., must be assessed for materiality. If deemed immaterial they may be excluded from the inventory taking into account the materiality threshold (see Section 1.3.2).

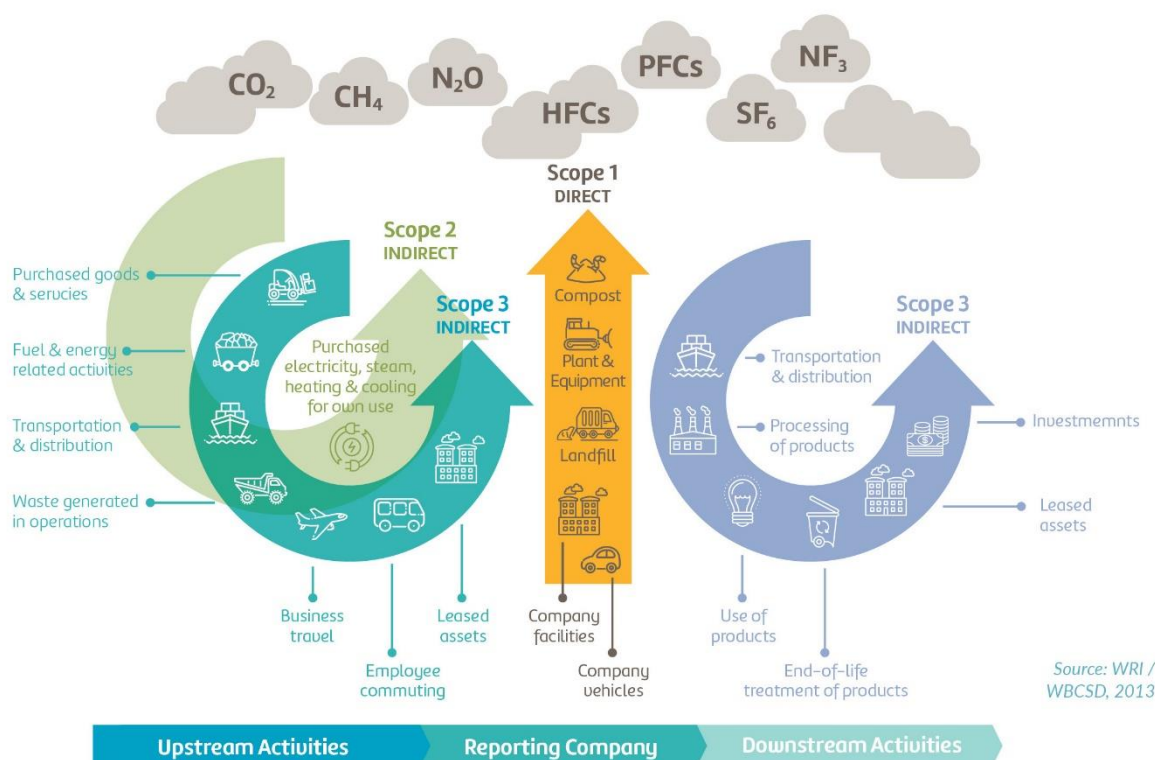


Figure 1 Overview of GHG Protocol scopes and emissions across Council's value chain²

The Climate Active Standard determines that all Scope 1 and 2 emissions are relevant, whereas a Scope 3 emissions source is relevant when any two of the following conditions are met.

- “the scope 3 emissions from a particular source are likely to be significant relative to the organisation’s scope 1 and scope 2 emissions;
- the scope 3 emissions from a particular source contribute to the organisation’s greenhouse gas risk exposure;
- the scope 3 emissions from a particular source are deemed relevant by key stakeholders;
- the responsible entity has the potential to influence the reduction of scope 3 emissions from a particular source;

² Figure adapted from the WRI / WBCSD, 2013. GHG Protocol

- the scope 3 emissions are from outsourced activities that were previously undertaken within the organisation's boundary or from outsourced activities that are typically undertaken within the boundary for comparable organisations.”³

Conversely, some Scope 3 emissions sources have been excluded, based on guidance from Section 2.3.1 of the National Carbon Offset Standard, exclusions are allowed on the basis that:

- Emissions are likely to be negligible (relative to other Scope 3 emissions);
- Determining emissions is not currently possible given available technology;
- Determining emissions will be very costly relative to their likely significance; and
- There is insufficient data for the specific source.

1.3.2 Materiality

Different standards stipulate different definitions and thresholds for materiality. An organisation can determine materiality themselves, but if reporting under a specific scheme then materiality is determined by the scheme's requirements and standards. Under Climate Active, an emissions source that constitutes 1% or more of the total carbon account is material. For an emissions inventory of the CoL's size the materiality threshold is therefore about 836 tCO₂e per annum. If a relevant emissions source is estimated to be material, it must be included within the emissions boundary, unless justification can be provided to demonstrate that such quantification would not be technically feasible, practicable or cost effective relative to its significance.

Emissions sources that are relevant but estimated to constitute less than the materiality threshold towards the total carbon account can be excluded from the emissions boundary. Under Climate Active standards, when applying the 1% materiality threshold, the total amount of emissions to be excluded must not exceed 5% of the total carbon account. Responsible entities are encouraged to include, measure and report as many emissions sources as possible, regardless of an emissions source's materiality. Data for emissions sources that are deemed as immaterial may still be included in the emissions inventory.

1.3.3 Exclusions

Emission sources excluded from the 2021/22 inventory are presented below in Table 1.1.

Table 1.1. Emissions excluded from 2021/22 inventory

Emission	Scope	Justification for exclusion
Emissions for postage/ courier services and food/ beverage services	3	Data for these items is insufficient for accurate reporting purposes, and based on the information that is available, it is estimated with confidence that these items represent less than 1% of total emissions.
Upstream transportation & distribution	3	There was insufficient data to calculate emissions from this category for FY22. Purchased goods and services and capital goods can become a material source of emissions if the CoL undertakes capital works that require a significant amount of steel and cement. Based on GHD 2019 Emissions Report, capital projects of \$10m and over use significant quantities of cement and steel which results in emissions. These emissions could exceed the materiality threshold and hence should be included in CoL's emissions inventory.
Freight	3	There was no data supplied in order to calculate the emissions associated with freight, however this needs to be investigated for future inventories.

1.3.4 New Emission Sources

One new emission source was included in the 2021/22 inventory: employee commuting (Scope 3). While employee commuting by CoL staff is less than the 1% materiality threshold, the data provides an opportunity to track and reduce associated emissions, particularly before and after the construction of the staff end-of-trip facility.

1.3.5 Activity Data

³ Climate Active, 2021. Climate Active Technical Guidance Manual, February 2021

All emissions data is based on activity data sourced by CoL's utility providers, Energy Detective (web based electricity monitoring program developed by LGAQ), the Launceston Waste Centre gate records, and purchase orders. Table 1.2 summarises the data source for all activity data.

Table 1.2. Activity data source

Emission	Scope	Source
Landfill gas	1	CoL Launceston Waste Centre gate records
Gas consumption	1	Aurora, TasGas and TasGas Networks
Fuel consumption	1	CoL fuel purchase orders
Composting	1	CoL Launceston Waste Centre gate records
Electricity consumption	2	Energy Detective
Water	3	TasWater
Business travel - air & taxi travel	3	RACQ Travel Agency purchase orders, CabCharge purchase orders
Business travel - accommodation	3	RACQ Travel Agency purchase orders
Office Paper	3	Winc purchase orders
T&D losses - gas	3	Aurora, TasGas and TasGas Networks
T&D losses - electricity	3	Energy Detective
T&D losses - fuel	3	CoL fuel purchase orders
Employee commuting	3	Voluntary staff survey

2. Emissions Inventory 2021/22

2.1 Overall Emissions

Based on available data, CoL's total operational emissions in 2021/22 is approximately 79,179tCO₂e.

Scope 1 accounts for 97% of total emissions; this is largely attributed to Launceston Waste Centre landfill that CoL owns and operates. The landfill emissions account for 96% of Scope 1 emissions, and 93% of CoL's total emissions. Scope 2 and 3 emissions account for 1.7% and 1.4%, respectively. The contribution of each scope is presented in Figure 2.1 and CoL's emissions inventory presented in Table 2.1.

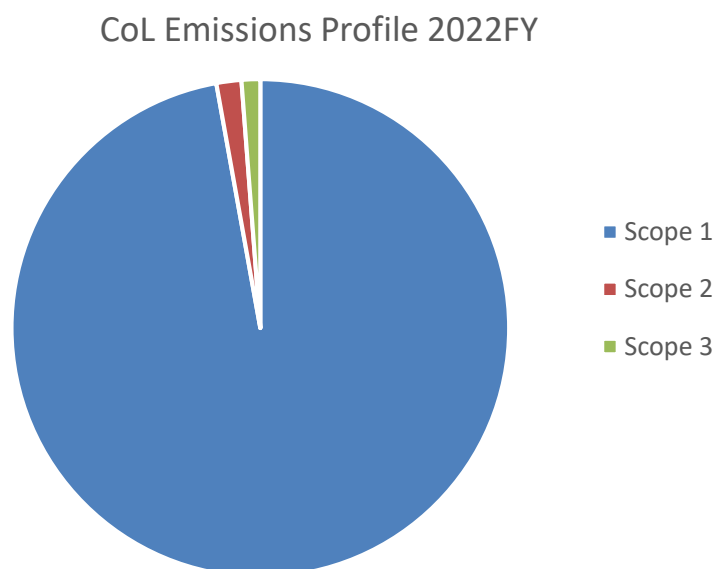


Figure 2.1 CoL emissions profile for 2021/22

Table 2.1 Summary of CoL emissions 2022FY

Emission Source	Activity Data	Units	Emissions	% of Total Emissions
Landfill gas	73,879	t	73,879.00	93.3%
Gas consumption	16,308.42	GJ	8,40.37	1.1%
Fuel consumption	545.63	kL	1,470.53	1.9%
Composting	11,094	t	510.32	0.6%
Scope 1 total			76,700.23	96.9%
Electricity consumption	7,968,939	kWh	1,354.72	1.7%
Scope 2 total			1,354.72	1.7%
Water	348,664	kL	233.35	0.3%
Business travel - air & taxi travel	58,400	p.km	14.25	0.02%
Business travel - accommodation	102	nights	4.35	0.01%
Office Paper	1,581	reams	10.22	0.01%
T&D losses - gas	414,972	m3	198.98	0.3%
T&D losses - electricity	7,968,939	kWh	79.69	0.1%
T&D losses - fuel consumption	20,927	GJ	359.94	0.5%
Employee Commuting	2,049,158	p.km	223.36	0.3%
Scope 3 total			952.46	1.4%
Total Emissions			79,179.07	

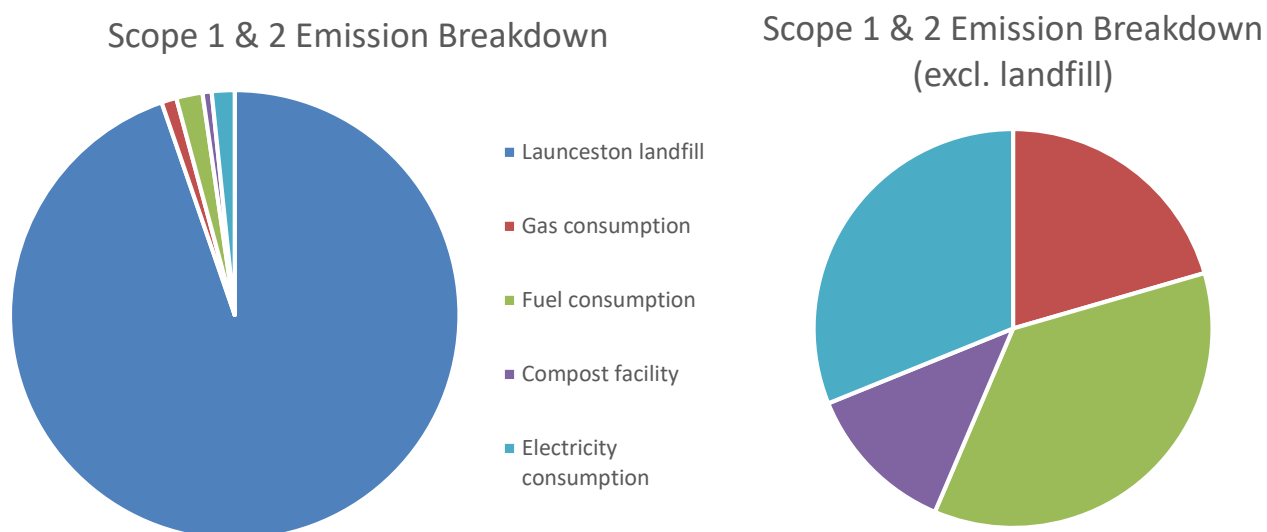
Figure 2.2 Scope 1 and 2 emission breakdown including and excluding the landfill

Table 2.2 presents CoL's most emission intensive facilities. The Launceston landfill was the largest contributor to emissions due to the generation of landfill gas emissions. Of the many facilities that are owned and operated by CoL, the Launceston Aquatic Centre was the largest consumer of energy (both gas and electricity), and the second highest emitter of emissions, representing 1.25% of CoL's total carbon inventory.

Table 2.2. Top six emissions intensive assets

Facility	Scope 1 Emissions (tCO ₂ e)	Scope 2 Emissions (tCO ₂ e)	Total Emissions (tCO ₂ e)	% of Scope 1 & 2 Emissions
Launceston Landfill	73,879	0	73,879	94.65%
Launceston Aquatic Centre	408	569	977	1.25%
York Park Stadium	4	106	110	0.14%
QVMAG Inveresk	0.0	120	120	0.15%
Town Hall	0.0	100	100	0.13%
QVMAG Royal Park	289	100	389	0.50%

2.2 NGERs Reporting

While CoL's emissions for the landfill is over the NGER reporting threshold of 25,000 tCO₂e, Council has been advised by the Clean Energy Regulator (CER) that CoL does not qualify as a constitutional corporation and therefore is not required to report under the NGER Scheme. Council will keep up to date with the CER's requirements to ensure this advice is applicable in future reporting years.

3. Comparison to Baseline Year

The reported landfill gas emissions increased by 20,925 tCO₂e compared to the baseline year (2018/19). However, several of the other emissions sources reported decreases since the baseline year, resulting in an overall net increase of 19,650 tCO₂e (33%) compared to the baseline. If excluding landfill emissions, there was a decrease of about 1,275 tCO₂e (-19%). A decrease of about 2,281 tCO₂e (-3%) was reported compared to the previous year (2020/21). If excluding landfill emissions, there was a decrease of approximately 1,297 tCO₂e (-20%) from the other emissions sources.

At a scope level, scope 1 emissions sources reported a decrease, while scope 2 and 3 emissions sources reported an increase. The decrease in emissions was largely attributed to the following:

- Decrease in landfill emissions - due to the increased capture of landfill methane gas, converted to electricity generation and carbon dioxide.
- Decrease in gas usage - at the end of 2021, a large energy upgrade commenced at the LAC to transition the facility from gas to heat pumps and roof-top solar, therefore removing CoL's former largest gas user.
- Paper usage has also decreased across the organisation likely due to an increase in staff awareness of reducing paper waste and digital advances in electronic document management resulting from the introduction of the electronic signature procedure in April, 2022, and the associated awareness presentations to staff. Furthermore, the type of paper used was transitioned to majority recycled paper in late 2021, contributing to the reduced emissions.

The increase in emissions was attributed to the following:

- Increase in electricity usage - at the end of 2021, a large energy upgrade commenced at the LAC to transition the facility from gas to heat pumps and roof-top solar. As CoL's largest energy user, LAC's electricity usage accounted for majority of the increase usage.
- Increase in water usage - the summer of 2021/22 was the driest on record for 40 years for Launceston, potentially contributing the increased usage of water for park maintenance.
- Increase in business travel - the relaxation of COVID-19 travel restrictions in 2021/22 likely contributed to the increase of business travel compared to the previous year.
- Employee commuting - this emissions source was included for the first time in 2021/22 as part of data collection improvement actions, therefore registering an increase compared to the previous years.
- Increase in scope 2 electricity emissions factor - the National Greenhouse Accounts Factors 2022 revised the Tasmanian scope 2 and 3 emissions factors from the consumption of purchased electricity from a grid to be 0.17 kg CO₂-e/kWh (previously 0.16), and 0.01 kg CO₂-e/kWh (previously 0.02), respectively.
- Increase in scope 3 liquid fuel emissions factor - the Australian Government recalculated the emission factors for the National Greenhouse Accounts Factors 2022, with results finding the automotive gasoline/ petrol factor to be 17.2 kg CO₂e/GJ (nearly five times higher than the previously reported 3.6 kg CO₂e/GJ).

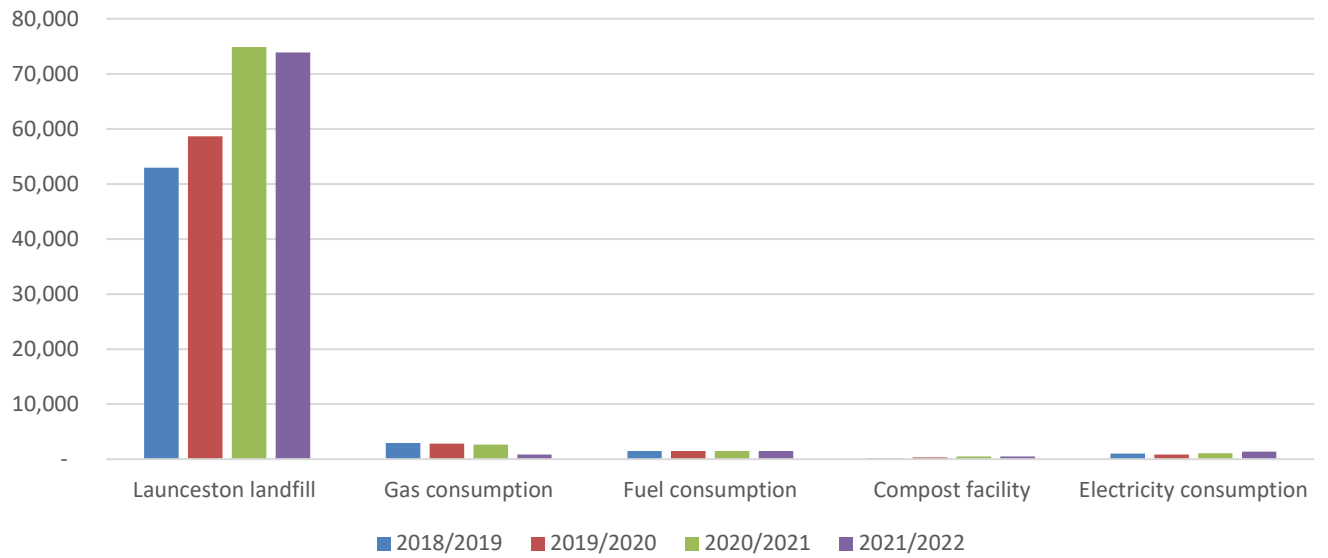
A comparison between the four reporting years (2018/19 to 2021/22) is presented in Table 3.1 and Figure 3.1.

Table 3.1. Emissions comparison between 2018/19 to 2021/22

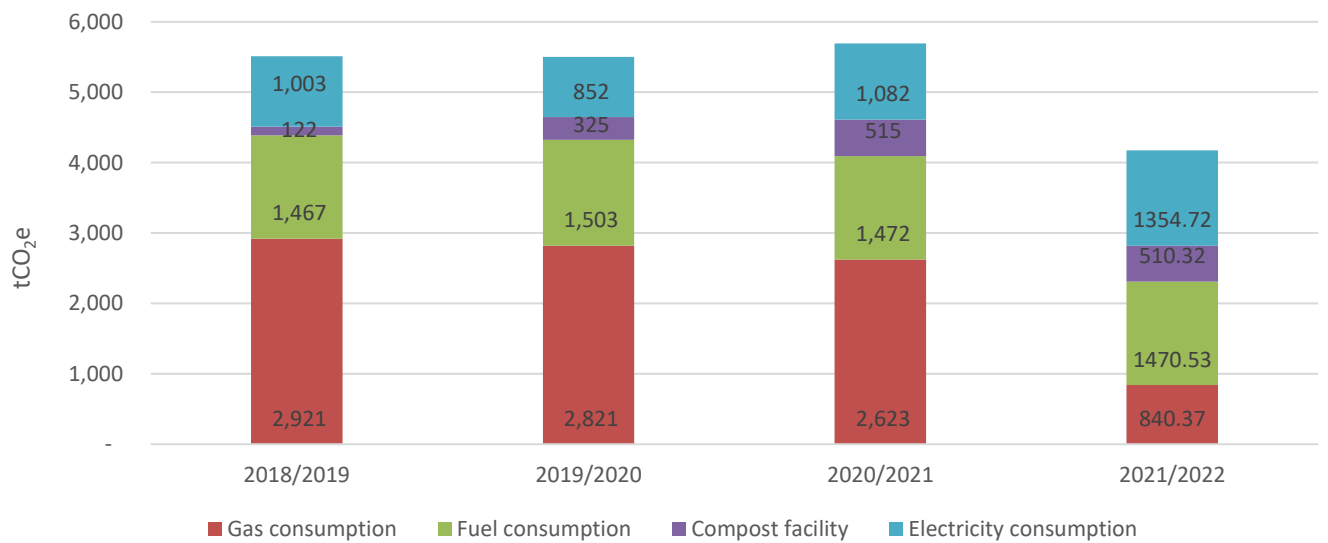
Emission Source	2018/19 Emissions (tCO2e)	% of Total Emissions	2019/20 Emissions (tCO2e)	% of Total Emissions	2020/21 Emissions (tCO2e)	% of Total Emissions	2021/22 Emissions (tCO2e)	% of Total Emissions	% Change to baseline	% Change to 2020/21
Landfill gas	52,954	89.0%	58,638	90.1%	74,863	91.9%	73879.00	93.3%	40%	-1%
Gas consumption	2,921	4.9%	2,821	4.3%	2,623	3.2%	840.37	1.1%	-71%	-68%
Fuel consumption	1,467	2.5%	1,503	2.3%	1,472	1.8%	1470.53	1.9%	0%	0%
Composting	122	0.2%	325	0.5%	515	0.6%	510.32	0.6%	318%	-1%
Scope 1 total	57,464	96.5%	63,286	97.3%	79,473	97.6%	76700.23	96.9%	33%	-3%
Electricity consumption	1,003	1.7%	852	1.3%	1,082	1.3%	1354.72	1.7%	35%	25%
Scope 2 total	1,003	1.7%	852	1.3%	1,082	1.3%	1354.72	1.7%	35%	25%
Water	177	0.3%	154	0.2%	130	0.2%	233.35	0.3%	80%	32%
Business travel - air & taxi travel	63	0.1%	31	0.0%	13	<0.1%	14.25	0.02%	-77%	13%
Business travel - accommodation	26	0.0%	7	0.0%	4	<0.1%	4.35	0.01%	-83%	22%
Office Paper	57	0.1%	18	0.0%	14	<0.1%	10.22	0.01%	-82%	-25%
T&D losses - gas	605	1.0%	584	0.9%	543	0.7%	198.98	0.3%	-67%	-63%
T&D losses - electricity	134	0.2%	57	0.1%	132	0.2%	79.69	0.1%	-41%	-37%
T&D losses* - fuel	-	-	77	0.1%	75	0.1%	75.34	359.94	0.5%	-
Employee Commuting	-	-	-	-0	-	-	223.36	0.3%	-	-
Scope 3 total	1,062	1.8%	928	1.4%	905	1.1%	1124.12	1.4%	-10%	5%
Total Emissions	59,352	100.0%	65,066	100.0%	81,460	100.0%	79179.07	100.0%	33%	-3%

* The emissions associated with T&D losses for fuel were omitted from the 2019FY and have been included in the 2020FY and 2021FY as part of data collection improvement actions. Similarly, the emissions associated with Employee Commuting were included for the first time in the 2022FY as part of data collection improvement actions.

Scope 1 & 2 Emissions (direct emissions)



Scope 1 Emissions (excluding landfill)



Scope 3 Emissions (indirect emissions)



Figure 3.1. Scope 1, 2 & 3 emissions comparison between reporting years since baseline

4. Emissions Abatement

For more than a decade, the City of Launceston has implemented emission reduction initiatives and minimised resource use across the large and diverse portfolio of services and assets. The City of Launceston has undertaken a series of emission reduction and capture projects including landfill gas capture and electricity generation, food and garden organic (FOGO) landfill diversion and composting, transitioning buildings off gas, large scale LED lighting installations, building energy efficiency initiatives, the purchase of electric (EV) and fuel efficient vehicles, installation of EV charging stations, and the installation of rooftop solar photovoltaic (PV) panels and hot water systems across Council facilities.

Table 4.1 outlines the annual estimated emission abatements across Scope 1 and 2 emission sources. Electricity generated from all rooftop solar PV systems was not measured during the 2022FY and therefore abatement totals exclude 3 of the 11 solar PV systems.

The emission reduction initiatives implemented during 2021/22 and prior, is estimated to avoid **84,262 tCO₂e** during the reporting year. Based on this year's emissions total of 79,179 tCO₂e, the abatement represents a minimum of 52% reduction in annual emissions.

Table 4.1 Estimated emissions abatement for 2021/22

Emission Source	Scope	Description of reduction measure	Annual Emission Reduction (tCO ₂ e)
Scope 1 emissions			
Landfill gas	1	Since 2007, the landfill gas capture system annually abates over 60,000 tCO ₂ e. This year, LMS provided a more accurate figure of emissions abated. However, it must be noted that despite these emissions being abated, LMS owns the carbon rights to these emissions and sells them as ACCU carbon credits in the Australian carbon market. Therefore, City of Launceston cannot claim these abated emissions towards its future carbon neutrality certification.	61,825
Fuel consumption	1	In 2018, a GPS-based guidance system was installed in the heavy waste compactor to allow drivers to easily identify which parts of a landfill cell require compaction. This initiative has resulted in the compactor using 20,000L less fuel annually.	54.40
	1	Addition of EVs to Council's fleet in 2019 and 2020. The emissions abated by the EVs are calculated as the emissions avoided from not consuming the equivalent fuel for the distance travelled, from the previous car that the EVs replaced.	3.3
Diversion of organic waste	1	Since 2018, the Launceston Waste Centre has diverted the region's food organic and garden organic (FOGO) waste from the kerbside collection and other Council's, and produces compost. The aerobic composting of organic waste reduces emissions while diverting nutrients from the site. Each tonne of organic waste disposed of as landfill and broken down by anaerobic processes releases approximately two tonnes CO ₂ e.	22,188
Scope 1 total			84,070.70
Scope 2 emissions			
Electricity consumption	2	The landfill gas capture system generates over 9,000 MWh of renewable electricity every year, enough to power over 1,000 homes 24/7 in the local community.	Abatement totals already captured in Solid Waste Calculator
	2	Rooftop solar PV panels installed on 11 Council facilities. Power generation for 7 facilities is available totalling 52,728 kWh per annum.	8.4
Scope 2 total			8.4 + unmetered solar PV
Total Emissions Abated			84,262.30 + solar PV

5. Recommendations

Based on CoL's 2021/22 emissions inventory, the actions outlined in the Sustainability Action Plan (SAP) and Towards Zero Emissions Action Plan (TZEAP) must be delivered. The Action Plans set out how the City of Launceston will achieve carbon neutrality by 2025 while playing our role to help meet the Paris Agreement and avoid a global average temperature rise of 2°C by 2050.

A summary of key actions contained in the Action Plan likely to result in the largest emissions abatement are outlined below:

Measuring, reporting and tracking

1. Continue to undertake an annual desktop audit of operational emissions
2. Publically report Council's annual emissions on the CoL website
3. Commence tracking emission reduction actions and provide publicly-available updates on the progress of actions

Waste avoidance and recovery

4. Coordinate the increase gas capture capacity and efficiencies in the existing landfill gas extraction system
5. Promote commercial FOGO services for organisations and other Councils generating large volumes of organic waste e.g. supermarkets, restaurants, hospitals, hotels, retirement homes, schools, Launceston airport
6. Invest in expanding the composting facility to cater for increases in materials
7. Establish a construction and demolition recovery facility

Reduce energy use, increase efficiencies and transition to renewable energy sources

8. Transition gas powered facilities to electrification
9. Continue upgrading Council facilities to increase energy efficiencies e.g. efficient HVAC systems, adequate insulation and ventilation, window glazing, high efficiency LED lighting and de-lamping etc.
10. Continue fuel efficiency and the transition of light vehicle fleet, plant and equipment to electrification and battery power
11. Investigate and trial alternative transport options for work travel e.g. introduction of e-bikes and e-scooters to Council's fleet
12. Investigate and roll out new technology in renewable energy powered plant and equipment, where feasible e.g. renewable hydrogen powered trucks, electric street sweepers, battery operated garden tools
13. Further understand the electricity generated by existing solar PV systems.