1. Introduction

1.1 Background

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

No changes to the organisational boundary defined in the 2018/19 baseline has occurred. 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 the 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 (CO_2e), emitted by an entity.

1.2 Assumptions and Limitations

The 2019/20 emissions inventory is based on the same assumptions and limitations as the baseline year using 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 2020, EPA Victoria's greenhouse gas inventory management plan and UK government conversion factors for greenhouse gas reporting 2019 (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).

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 waste, business travel and accommodation, office paper, and water use.

Other Scope 3 emission sources, such as employee commuting, 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).

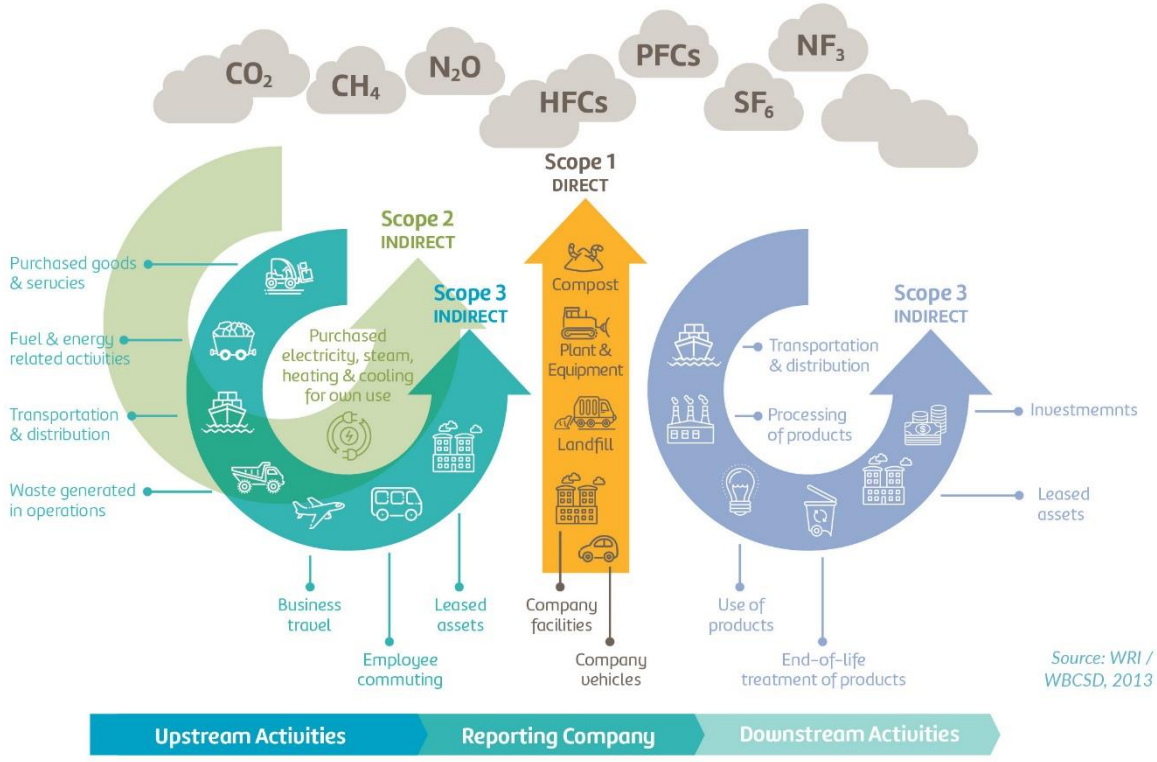


Figure 1 Overview of GHG Protocol scopes and emissions across Council's value chain[1]

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;
- 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."[2]

[1] Figure adapted from the WRI / WBCSD, 2013. GHG Protocol
[2] Climate Active, 2021. Climate Active Technical Guidance Manual, February 2021

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;
- 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 640 tCO_2e 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 2019/20 inventory are presented below in Table 1.1.

Table 1.1. Emissions excluded from 2019/20 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.
Employee commuting	3	The data available for FY20 was incomplete and hence emissions could not be calculated for this activity. It has been estimated that these emissions are possibly immaterial, however this needs to be investigated in future inventories. A survey of staff's mode of transport to work and distances travelled will be conducted for FY21.
Upstream transportation & distribution	3	There was insufficient data to calculate emissions from this category for FY19. 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 on CoL's emissions inventory.
Freight	3	There was no data supplied in order to calculate the emissions associated with freight travel.

1.3.4 New Emission Sources

Two new emission sources were included in the 2019/20 inventory: staff taxi travel (Scope 3) and transmission and distribution (T&D) losses of fuel. While taxi travel by CoL staff is less than the 1% materiality threshold, the data provides an opportunity to track and reduce associated emissions.

T&D losses represents the emissions associated with energy loss during the transmission and distribution of various energy sources such as electricity, fossil fuel gas and fuel throughout energy infrastructure. For unknown reasons, the emissions associated with T&D losses for fuel were omitted from the 2019FY and have been included in the 2020FY as part of data collection improvement actions.

1.3.5 Activity Data

All emissions data is based on activity data sourced by CoL's utility providers, 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	Aurora
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	Aurora
T&D losses - fuel	3	CoL fuel purchase orders

2. Emissions Inventory 2019/20

2.1 Overall Emissions

Based on available data, CoL's total operational emissions in 2019/20 is approximately 65,066 tCO_2e.

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 93% of Scope 1 emissions, and 90% of CoL's total emissions. Scope 2 and 3 emissions each account for 1.3% 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.

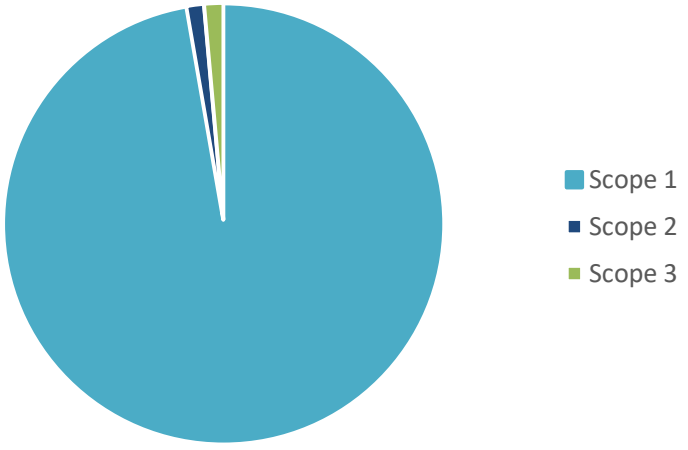


Figure 2.1 CoL emissions profile for 2019/20

Table 2.1 Summary of CoL emissions

Emission Source	Activity Data	Units	Emissions	% of Total Emissions
Landfill gas	58,638	t	58,638	90.1%
Gas consumption	54,736	GJ	2,821	4.3%
Fuel consumption	557	kL	1,503	2.3%
Composting	6,765	t	325	0.5%
Scope 1 total			**63,286**	**97.3%**
Electricity consumption	5,681,809	kWh	852	1.3%
Scope 2 total			**852**	**1.3%**
Water	282,797	kL	154	0.2%
Business travel - air & taxi travel	128,847	p.km	31	0.0%
Business travel - accommodation	152	nights	7	0.0%
Office Paper	2,285	reams	18	0.0%
T&D losses - gas	54,736	GJ	584	0.9%
T&D losses - electricity	5,681,809	kWh	57	0.2%
T&D losses - fuel consumption	557	kL	77	0.1%
Scope 3 total			**928**	**1.4%**
Total Emissions			**65,066**	**100%**

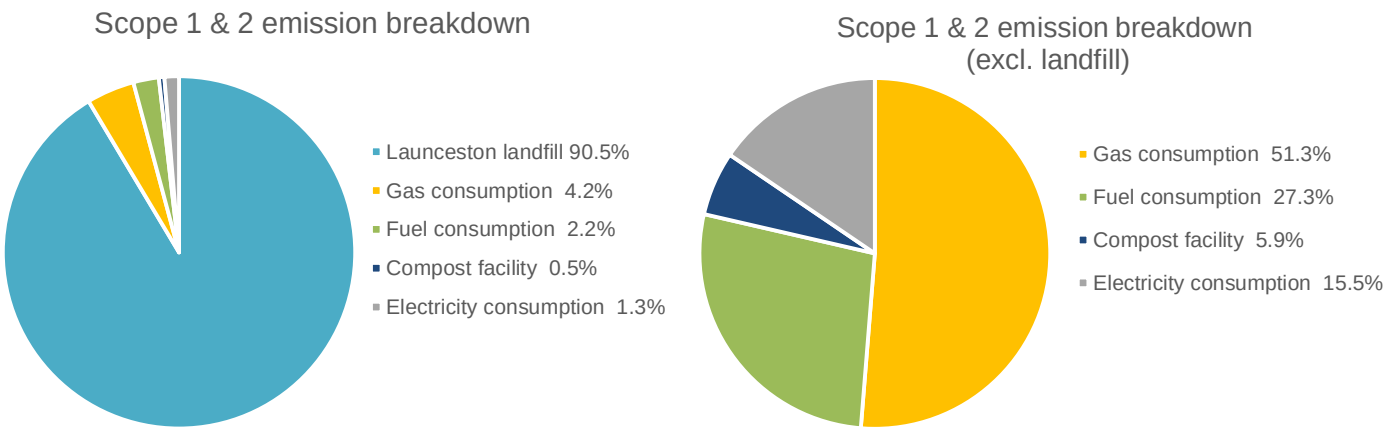


Figure 2.2 Scope 1 and 2 emission breakdown including and excluding the landfill

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 4.3% of CoL's total carbon inventory.

Table 2.2. Top six emissions intensive assets

Facility	Scope 1 Emissions (tCO2e)	Scope 2 Emissions (tCO2e)	Total Emissions (tCO2e)	% of Scope 1 & 2 Emissions
Launceston Landfill	58,638	-	58,638	91.42%
Launceston Aquatic Centre	2,757	154	2,910	4.54%
York Park Stadium	5	87	92	0.14%
QVMAG Inveresk	-	86	86	0.13%
Town Hall	-	84	84	0.13%
QVMAG Royal Park	3	80	83	0.13%

2.2 NGERs Reporting

CoL's emissions for the Launceston landfill is over the NGER reporting threshold of 25,000 tCO_2e. Therefore, CoL will register with the Clean Energy Regulator to report emissions in line with the NGER Act.

3. Comparison to Baseline Year

An increase of approximately 5,537 tCO_2e (9%) was reported compared to the previous year (also baseline year). If excluding landfill emissions, there was a decrease of approximately 147 tCO_2e (2%) from the other emissions sources.

At a scope level, an increase resulted in scope 1 emissions and a reduction reported across both scope 2 and 3 emissions. The increase in emissions was largely attributed to the following:

- Changes to carbon accounting factors - July 2020, the CER adopted a change in the Global Warming Potential (GWP) of methane, as recommended by the Intergovernmental Panel on Climate Change (IPCC). The change will result in one tonne of methane being worth 12% more in tonnes of Carbon Dioxide equivalent (tCO2e) – therefore the same volume of waste will report a 12% increase in emissions
- Increase in waste volumes entering the landfill - increase landfill gas generation
- Increase in organic waste diverted from landfill - results in an increase in emissions associated with composting. However, emissions are insignificant compared to the emissions abated by avoiding methane generation from decomposing organic waste.
- Increase in fuel usage volume - an overall increase in fuel usage was largely attributed to a strong 2019 spring season (increase in garden waste services), and heavy plant working on the final stages of the landfill cell requiring waste material to be pushed uphill for a large proportion of the works.

A reduction in purchased electricity, water usage, staff air travel and office paper usage is likely due to Council operations reducing during COVID and the associated reduced usage of Council buildings and travel from March to June 2020. This is likely to be reflected in the 2020/21 emissions inventory.

A comparison between the 2018/19 to 2019/20 reporting years is presented in Table 3.1 and Figure 3.1.

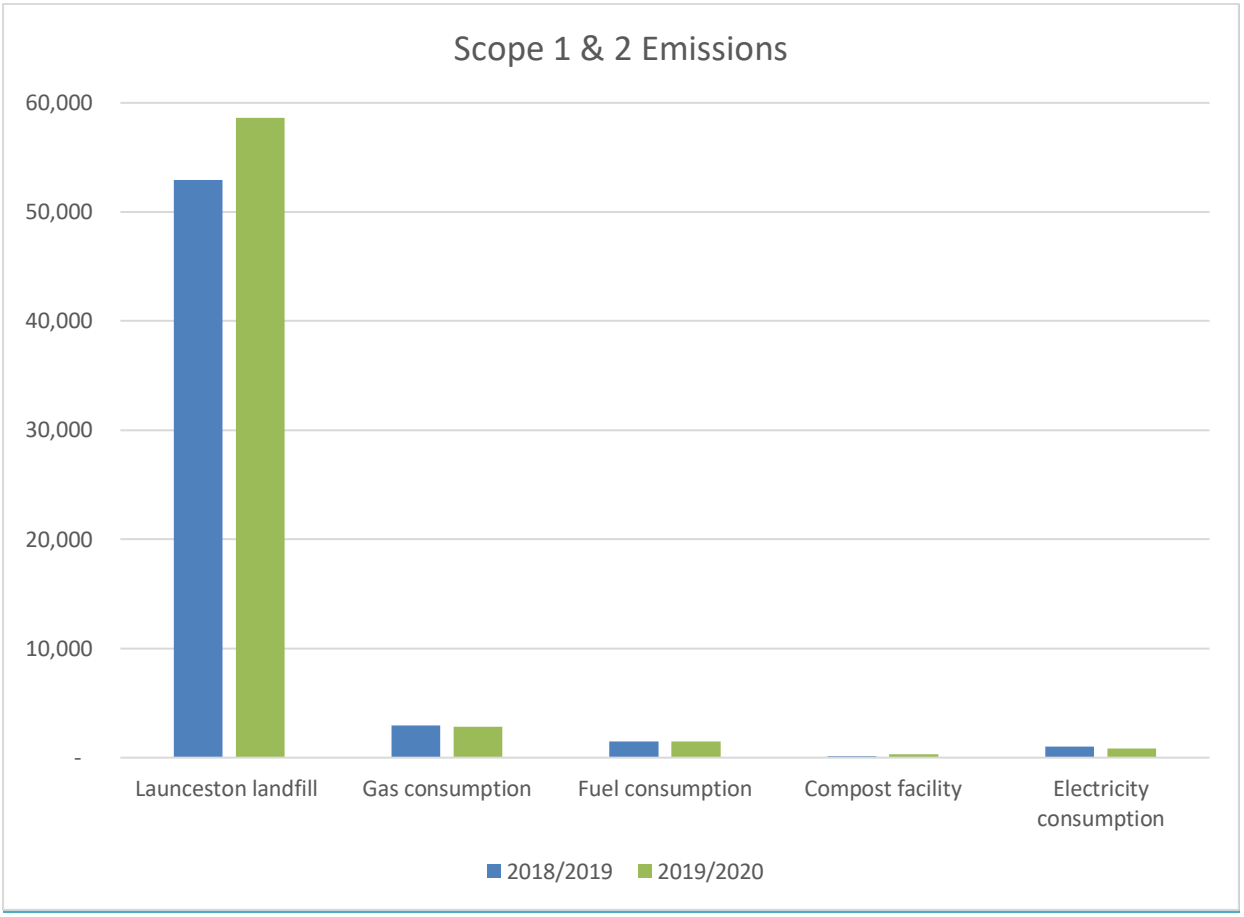
Table 3.1. Emissions comparison between 2018/19 to 2019/20

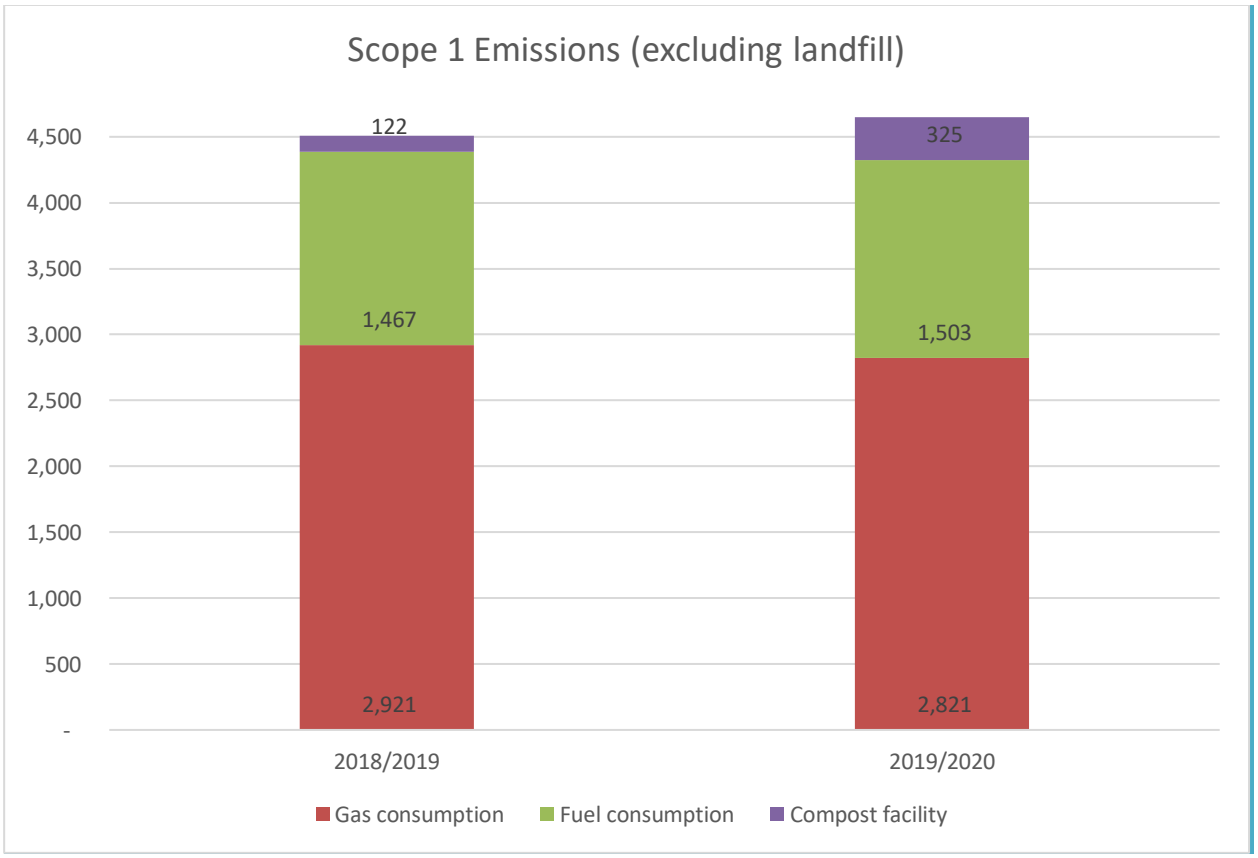
Emission Source	2018/19 Emissions (tCO2e)	% of Total Emissions	2019/20 Emissions (tCO2e)	% of Total Emissions	% Change
Landfill gas	52,954	89.0%	58,638	90.1%	+11%
Gas consumption	2,921	4.9%	2,821	4.3%	-3%
Fuel consumption*	*1,467*	*2.5%*	1,503	2.3%	*+2%*
Composting	122	0.2%	325	0.5%	+166%
Scope 1 total	**57,464**	**96.5%**	**63,286**	**97.3%**	**+10%**
Electricity consumption	1,003	1.7%	852	1.3%	-15%
Scope 2 total	**1,003**	**1.7%**	**852**	**1.3%**	**-15%**
Water	177	0.3%	154	0.2%	-13%
Business travel - air & taxi travel	63	0.1%	31	0.0%	-51%
Business travel - accommodation	26	0.0%	7	0.0%	-75%
Office Paper	57	0.1%	18	0.0%	-68%
T&D losses** - gas	605	1.0%	584	0.9%	-3%
T&D losses** - electricity	134	0.2%	57	0.1%	-15%
T&D losses*** - fuel	-	-	77	0.1%	na
Scope 3 total	**1,062**	**1.8%**	**928**	**1.4%**	**-13%**
Total Emissions	**59,352**	**100.0%**	**65,066**	**100.0%**	**+13%**

* A data discrepancy was identified in the 2019FY fuel usage totals which result in an increase in fuel usage totals and associated emissions.

** T&D losses represents the emissions associated with energy loss during the transmission and distribution of various energy sources such as electricity, fossil fuel gas and fuel throughout energy infrastructure.

*** The emissions associated with T&D losses for fuel were omitted from the 2019FY and have been included in the 2020FY as part of data collection improvement actions.





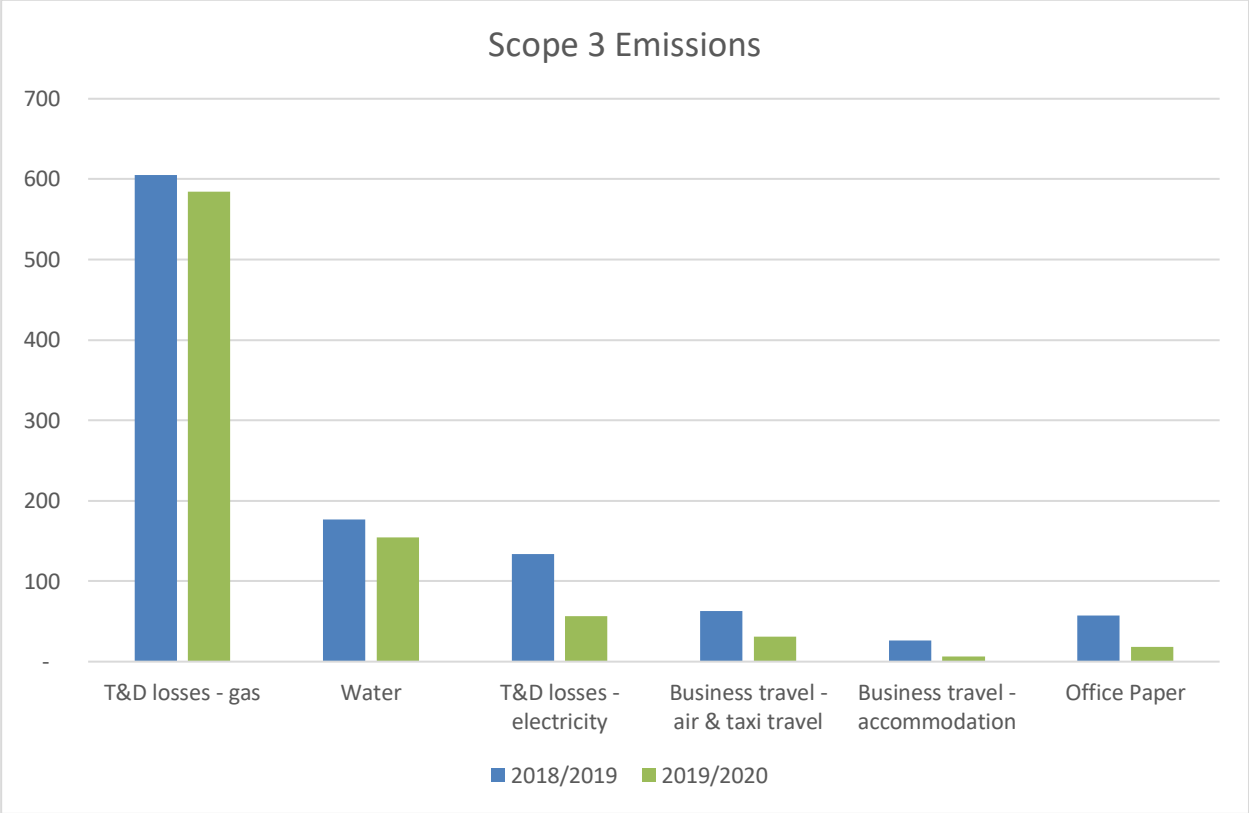


Figure 3.1. Scope 2 & 3 emissions comparison between 2018/19 and 2019/20

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, 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 reduction totals across Scope 1, 2 and 3 emission sources. Electricity generated from rooftop solar PV systems were not monitored during the 2019FY and therefore abatement totals exclude solar generation.

The emission reduction initiatives implemented during 2019/20 and prior, is estimated to avoid 72,893 tCO_2e during the reporting year. Based on this year's emissions total of 65,066 tCO_2e, the abatement represents a 53% reduction in annual emissions.

Table 4.1 Estimated emissions abatement for 2019/20

Emission Source	Scope	Description of reduction measure	Annual Emission Reduction (tCO2e)
Scope 1 emissions			
Landfill gas	1	Since 2007, the landfill gas capture system avoids abates approximately 60,000 tCO2-e.	60,000
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.	54.4
	1	Addition of an EV to Council's fleet in 2019.	4.6
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 CO2e.	11,190
Scope 1 total			**71,249**
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 10 Council facilities generating kWh per annum	NA - solar generation is unknown for the FY
Scope 2 total			**1,644** + unmetered solar PV
Scope 3 emissions			
T&D losses - electricity	3	The reduction in electricity consumption reduces emissions associated with electricity losses during the transmission and distribution via energy infrastructure	NA - solar generation is unknown for the FY
Scope 3 total			NA
Total Emissions Abated			**72,893 + solar PV**

5. Recommendations

Based on CoL's 2019/20 emissions inventory, the actions outlined in the Towards Zero Emissions Action Plan (Action Plan) must be delivered. The Action Plan sets 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. Register and report to the Clean Energy Regulator in line with the NGER Scheme
3. Develop a framework to track 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.