



Net Zero Pathway 2026

Document Control

Issue	Date	Change	Checked	Approved
01	15/05/25	First Issue	BH	JP
02	20/05/25	Second Issue	BH	JP
03	20/06/25	Third Issue	BH	JP
04	04/08/25	Fourth Issue	BH	JP
05	09/01/26	Final Issue	BH	JP

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Acknowledgement of country

The dsquared team wish to acknowledge the Traditional Custodians of all country throughout Australia, and their cultural, spiritual, physical, and emotional connection with their land, waters, and community. We pay our respects to all Elders past, present, and emerging.

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Project Number: 3189



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Executive Summary

The City of Port Lincoln (Council) is committed to taking action to reduce the impacts of climate change.

This is illustrated in Council's *Environmental Sustainability Strategy 2025-2034*, which outlines Council's five environmental sustainability goals and key actions in the next 10 years to achieve them.

Goal 1- Towards Net Zero, includes actions to develop an emissions management framework and deliver carbon emissions reduction projects.

As such, this Net Zero Pathway 2026 (the Pathway) measures emissions from Council operations in line with best practice reporting standards, and develops a strategy to reduce emissions as far as possible as part of the net zero emissions transition. Emissions from Council operations include emissions from sources in direct control of the Council, and emissions from its supply chain which it can minimise and influence.

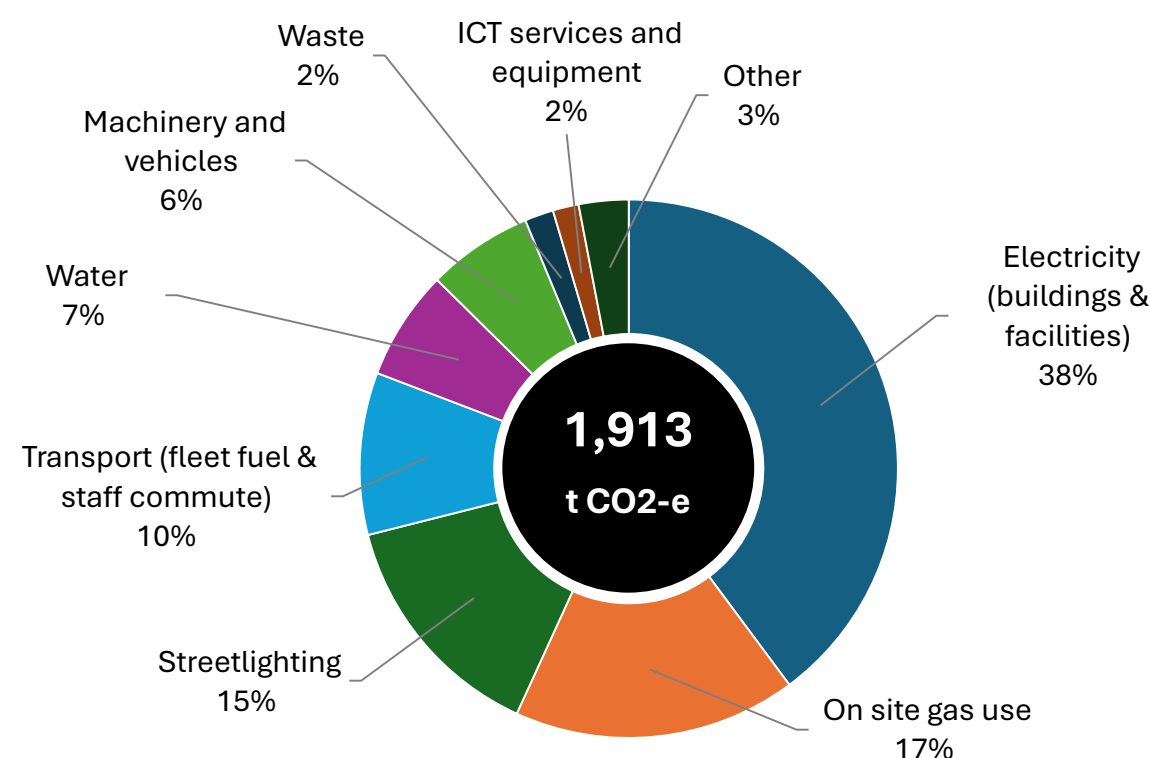
This Pathway has been developed in line with the GHG Protocol Corporate Standard, Climate Active Carbon Neutral Organisation Standard and reference documents.

The City of Port Lincoln provided detailed financial reporting (money spent), energy retailer reports, vehicle fuel reports and water supply reports, which were used to develop the FY24 emission inventory.

A market-based approach was then used to estimate electricity emissions and model emissions reduction pathways, applying reductions if Council purchases renewable energy (i.e. Green Power or renewable PPA).

The emissions inventory includes Scope 1, 2, and 3 emissions categories in Council's direct corporate control or where Council can influence emissions and totals 1,913 tCO₂-e.

Market based emissions - FY24

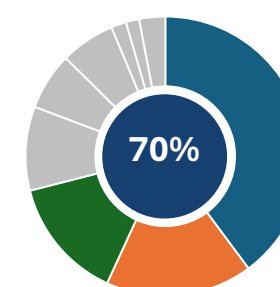


Emissions categories have been grouped into three main categories: **Energy Use, Transport, and Supply Chain**.

This Net Zero Pathway analyses emissions reduction opportunities, key actions and implementation dates to develop emissions reduction pathways under each category.

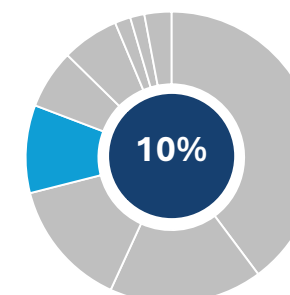
The main emission categories, emission reduction actions, and implementation dates are summarised below:

Energy Use



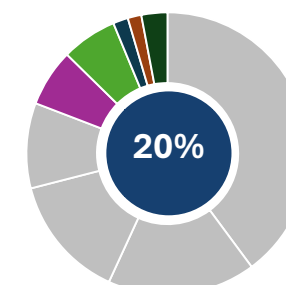
Emission reduction initiative	Implemented by
Leisure Centre transition to heat pumps plus additional 150kW solar PV leading to a reduction in total energy use of 47%.	FY28
Solar PV and energy efficiency upgrades (roof insulation and VRF air-conditioning) are proposed to Civic Centre/Nautilus Arts Centre (NAC), leading to a reduction in energy use of 20%.	Civic FY27 NAC FY29
Energy efficiency program and solar PV rollout for other facilities leading to a 5% reduction in total council energy use.	FY29
Complete LED streetlighting rollout leading to a 5% reduction in total streetlighting energy use.	FY29
100% renewable energy purchase (i.e. PPA) leading to a 100% reduction in energy use emissions (separate pathway).	FY30

Transport



Emission reduction initiative	Implemented by
Fleet vehicle optimisation and efficiency	FY27
70% of light passenger vehicles transition to battery electric or hybrid electric.	FY30
50% of medium & heavy vehicles transition to battery electric or hybrid electric.	FY32
Staff commuting reduces by 15% through incentive programs and EOT facilities	FY34

Supply Chain



Emission reduction initiative	Implemented by
Improved waste practices reduce waste to landfill by 15%	FY27
Reduced water use from Leisure Centre and other high water users- reducing water use by 30%	FY28
Increase expenditure and associated emissions from investment in electric vehicle fleet	FY30
Developing a sustainable procurement plan and selecting low carbon/carbon neutral products to reduce supply chain emissions by 10%	FY32

The emission reduction actions outlined have been combined to form a Net Zero Pathway.

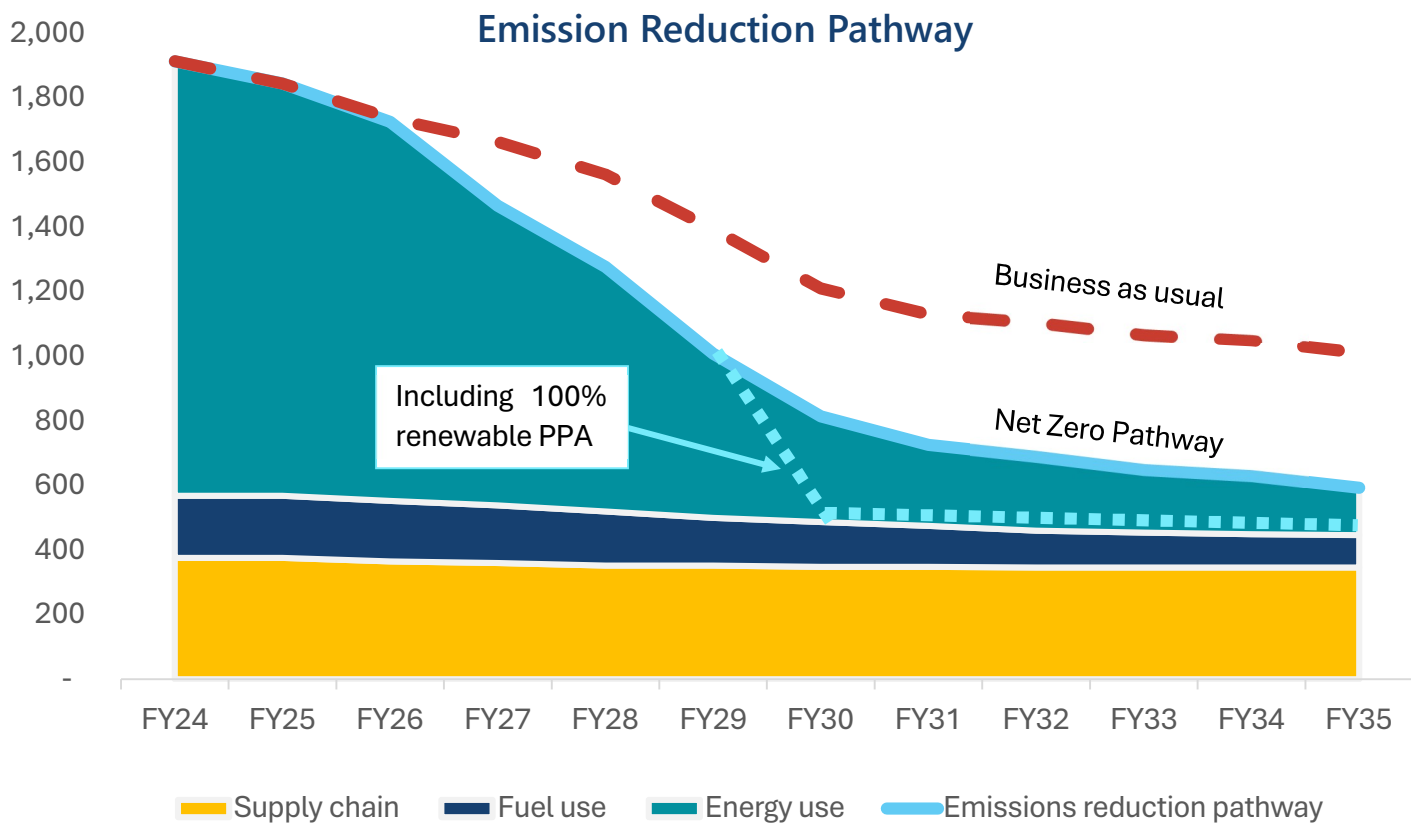
The Net Zero Pathway starts with the baseline year of FY24, and based on the projections, it is estimated that Council could achieve a 70% reduction in emission by FY35.

By FY35, the Net Zero Pathway also achieves a 42% reduction compared to business as usual (i.e., no sustainability initiatives or investment).

This modelling uses the market based approach to calculate electricity emissions.

To achieve this target Council must continue to investigate and implement emissions reduction programs in line with this Pathway, including monitoring emerging technologies and solutions to fast track the strategy as the broader economy decarbonises.

The recommendations in this Pathway should be assessed against Council’s broader strategic priorities, budgets and operational planning.



Emissions impact by category - To FY35

- 90% reduction in energy use emissions
- 48% reduction in transport emissions
- 8% reduction in supply chain emissions

Emissions impact combined - To FY35

- 70% reduction in total emissions
- 3,280 tCO2-e total emissions saved over 10 years compared to business as usual

The below table provides a summary of the key actions and next steps to implement this Net Zero Pathway.

Table 1: Emissions reduction - Next Steps

FY24 Baseline	The FY24 market based inventory developed for this Pathway should be used as a new baseline to monitor emissions reduction initiatives and set targets. This aligns with best practice approaches for emissions inventories and will enable Council to track its emissions and reduction measures moving forward.
Set targets	Review the emission reduction strategies in this Pathway and set specific emissions reduction targets that will effectively steer Council decision-making processes. Consider setting intensity based targets to ensure Council is not penalised for expanding its services to the community, while working towards overall emissions reduction targets. This will ensure Council remains on a clear and strategic path towards Net Zero emissions.
Emissions reduction initiatives	Implementing immediate emissions reduction initiatives targeting the largest emissions sources is recommended. The largest opportunities include energy use, transport, and supply chain emissions with opportunities to reduce consumption, costs and emissions.
Consider embodied Emissions	Although embodied emissions related to the construction of roads/pathways and other capital works projects within Council has not been included in this Pathway, it is estimated that this would contribute a significant source of emissions (estimated >60% share). Implementing strategies to capture and record material and cost data will enable this to be tracked against targets and emissions reduction initiatives in the future.
Monitoring the industry	This Pathway has identified that achieving Net Zero emissions is dependent on the broader economy decarbonising. However, Council should regularly be monitoring opportunities for reducing emissions as the market develops and low emission options become available and affordable. This includes electric vehicle options (BEVs, HEVs, and PHEVs) for Council’s medium and heavy fleet. It also includes reviewing options for procuring low emission or carbon neutral products and services (including renewable energy contracts).
Publicly commit	It is recommended Council publicly commit to emissions reduction initiatives and targets to work towards, demonstrate leadership, and enable Council to celebrate achievements. Learnings from Council initiatives should also be shared to support community emissions reduction action.
Reporting	Considering a flexible and continual improvement model, the following approach to emissions reporting is recommended: • Undertake annual emissions reporting against the FY24 baseline. Notable emissions reduction is not expected to be achieved at shorter intervals, as building and infrastructure upgrades, fleet replacement programs, and sustainable procurement initiatives are implemented over longer periods of time. • Implement 6-monthly energy (electricity and gas) and fleet fuel (petrol and diesel) intensity reporting, demonstrating ongoing reductions in energy (kWh / sqm) and fuel (gCO2-e / km). This will help verify energy/fuel efficiency programs and initiatives are working effectively to reduce total emissions/emissions intensity.

1 Introduction

1.1 About this plan

The City of Port Lincoln (Council) is committed to taking action to reduce the impacts of climate change.

This is illustrated in Council's *Environmental Sustainability Strategy 2025-2034*, which outlines Council's five environmental sustainability goals and key actions in the next 10 years to achieve them.

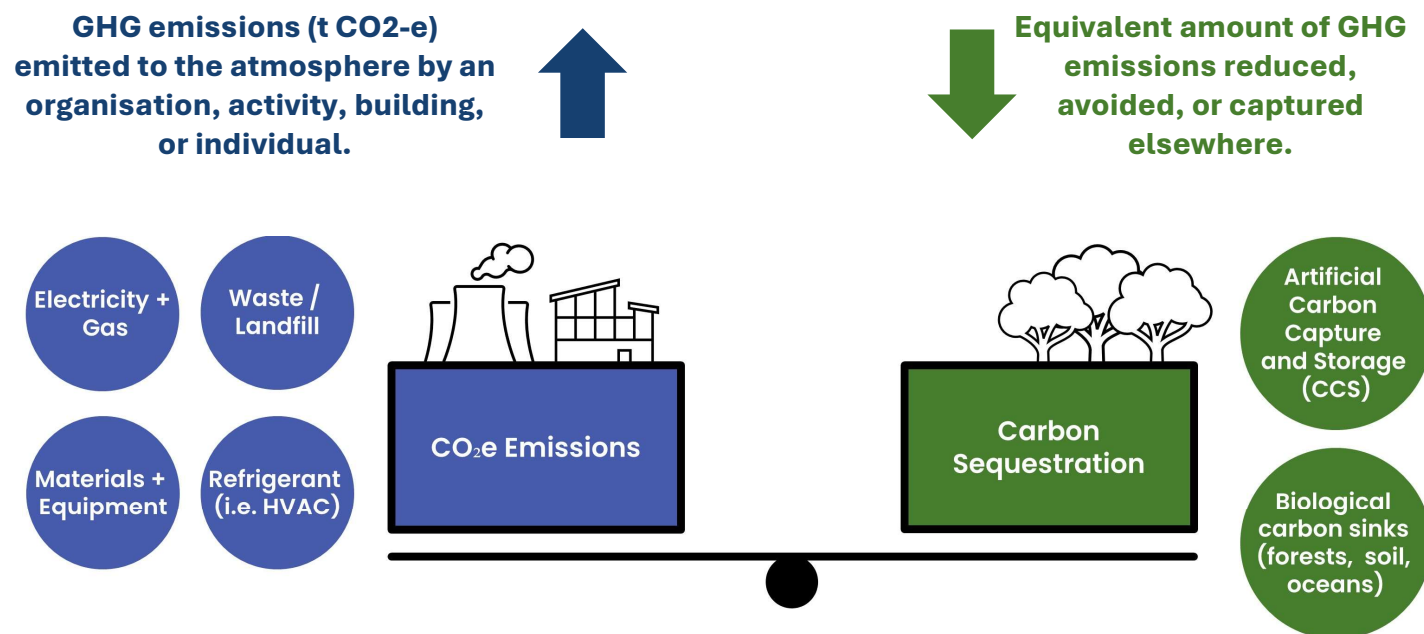
Goal 1- Towards Net Zero, includes actions to develop an emissions management framework and deliver carbon emissions reduction projects.

As such, this Net Zero Pathway (the Pathway) measures emissions from Council operations in line with best practice reporting standards, and develops a strategy to reduce emissions as far as possible as part of the net zero emissions transition. Emissions from Council operations include emissions from sources in direct control of the Council, and emissions from its supply chain which it can minimise and influence.

This Pathway has been developed to set a strategy to reduce emissions in line with the following United Nations net zero definition which acknowledges that reducing emissions is required across society. The aim of the Pathway is to reduce emissions as far as possible which will also reduce the amount of additional carbon sequestration required to balance GHG emissions.

The net zero emissions definition is¹:

“net zero means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere”



1.2 Why act?

GHG emissions have increased exponentially worldwide since the Industrial Revolution and are a major concern due to their ability to trap more heat in earth's atmosphere, resulting in changes to the climate which can have a negative impact on life. Some of the impacts include the following:



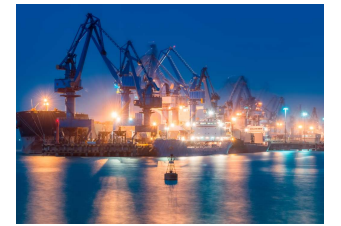
Greenhouse gas (GHG) emissions have increased exponentially and have been scientifically proven to trap more heat in the atmosphere, impacting the climate and resulting in increasing average temperatures, more variable and extreme weather, and rising sea levels.



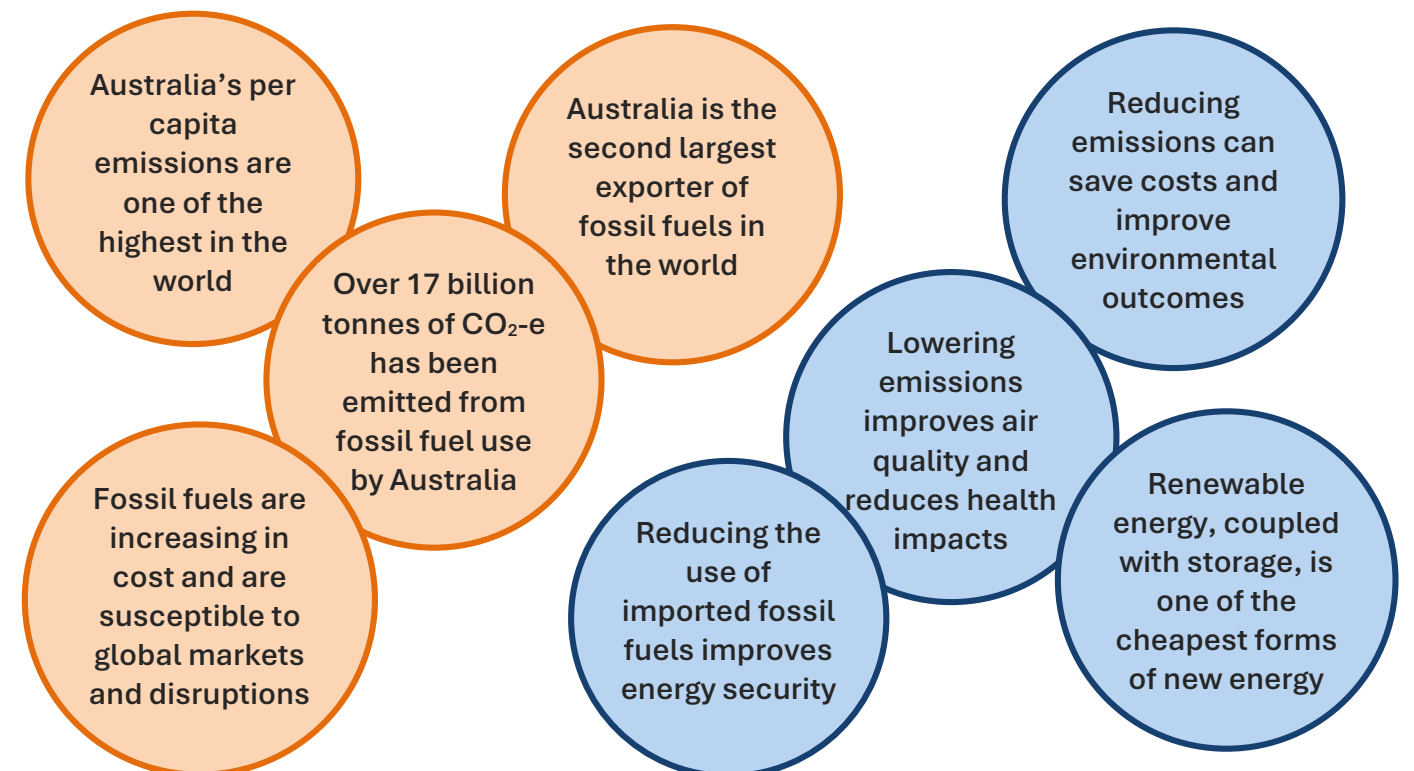
Extracting and burning fossil fuels negatively impacts natural environments, air quality, water quality, and flora and fauna. For example, there are over 6,500 coal mines worldwide covering approx. 100,000 square kilometres with 8.9 billion tonnes of coal mined each year.



Air quality impacts of burning fossil fuels have been shown to impact health including increasing the likelihood of asthma in children, respiratory complications, and increased likelihood of cancer and diabetes, which increases pressure on healthcare systems.



Fossil fuels are non-renewable, finite, becoming increasingly harder to mine and extract, and are susceptible to global supply interruptions and prices. The price of coal in Australia has doubled since 2020 largely due to international markets and the war in Ukraine.



¹ United Nations Climate Action – Net zero definition - <https://www.un.org/en/climatechange/net-zero-coalition>

2 Standards used

2.1 Emissions reporting standards

This Pathway has been developed in line with the GHG Protocol Corporate Standard, Climate Active Carbon Neutral Organisation Standard and reference documents. The GHG Protocol and Climate Active standards are summarised below.



The **GHG Protocol** is an internationally accepted set of standards and resources for GHG emissions accounting and reporting and is used by both public and private entities. The GHG Protocol is referenced by many GHG emissions tools and certifications including Climate Active and the Science Based Targets initiative (SBTi).



Climate Active Carbon Neutral Organisation Standards and Technical Guidance Manuals have been used throughout the development of this Plan and associated emission calculations, including setting an emissions boundary and baseline year, to ensure that in the event Council pursues Carbon Neutral certification, the emissions inventory and initiatives will meet the minimum requirements.

2.2 Understanding greenhouse gas emissions

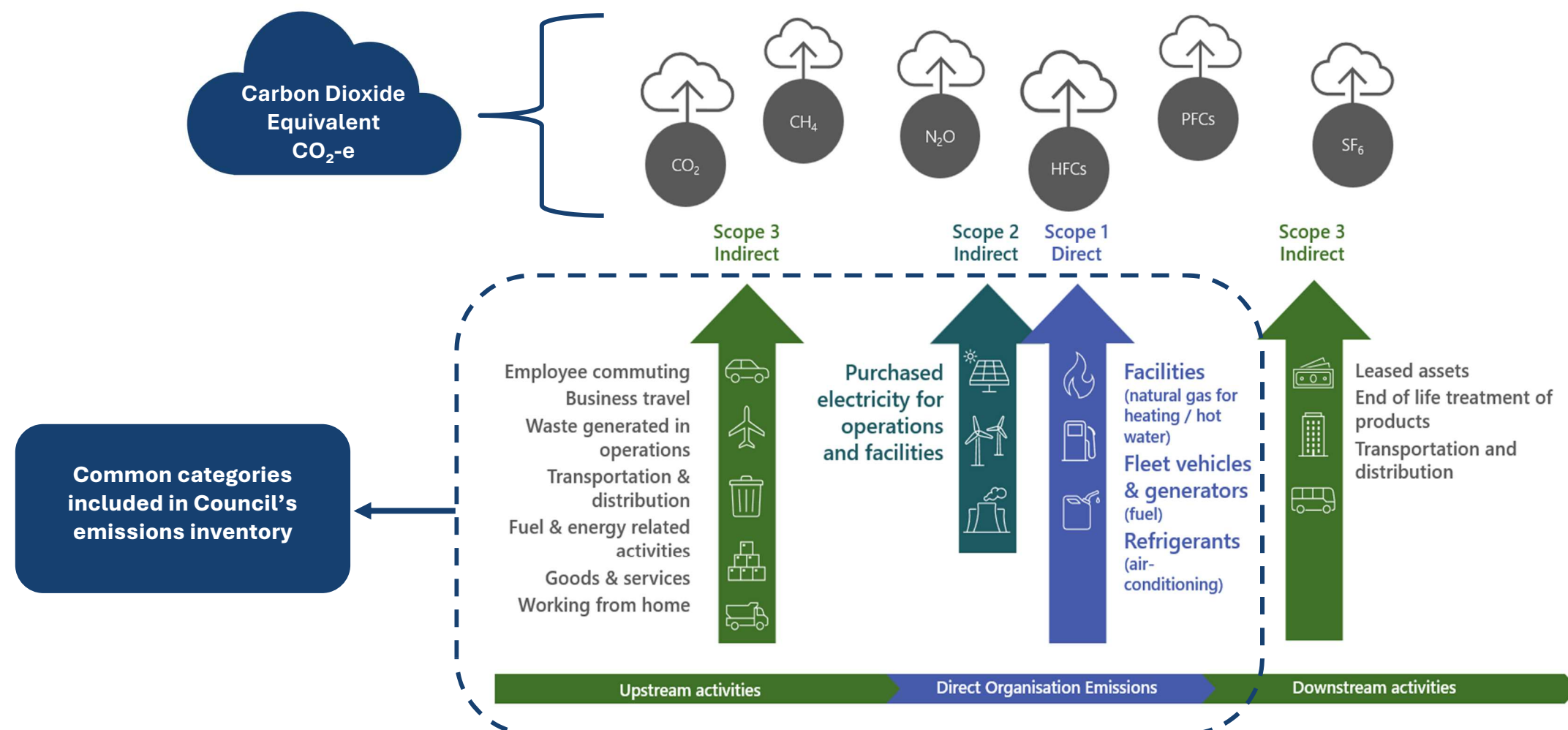
The emissions inventory is an account of Greenhouses gases (GHGs) which trap heat in the atmosphere and include gases such as carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). In alignment with reporting standards, the emissions inventory must account for the six greenhouse gases covered by the Kyoto Protocol, which are shown in the image below.

Greenhouse gases have varying global warming potential (GWP), for example CH₄ is 28 times more potent than CO₂ (based on the impact over 100 years). As such GHG emissions are represented in a standardised measure known as **carbon dioxide equivalent (CO₂-e)**, in order to compare the relative impact of different emission sources.

2.3 Scope 1, 2 & 3 emissions

The emissions inventory includes Scope 1, 2 & 3 emissions for emissions sources associated with Council's operations and community emissions. Emissions scopes are categorised as follows:

- **Scope 1:** Direct emissions from sources that are owned or controlled by the reporting organisation.
- **Scope 2:** Indirect emissions associated with the purchase of energy (e.g., electricity).
- **Scope 3:** Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organisation, but that the organisation indirectly impacts in its value chain.



2.4 National and State context

Emission reduction targets

Since 2009, Australia has decarbonised its economy by an average of 12 MtCO₂-e per year. In 2022 the Australian Government increased its commitment under the COP21 Paris Agreement to reduce emissions by 43% below 2005 levels, as well as committing to the goal of achieving net zero emissions by 2050, enshrined in the Climate Change Act 2022. Australia has also signed the Global Methane Pledge to collectively reduce global methane emissions by 30% by 2030.

In South Australia, the State Government has similarly set goals to reduce GHG emissions by more than 60% below 2005 levels by 2030 and achieve net zero emissions by 2050.

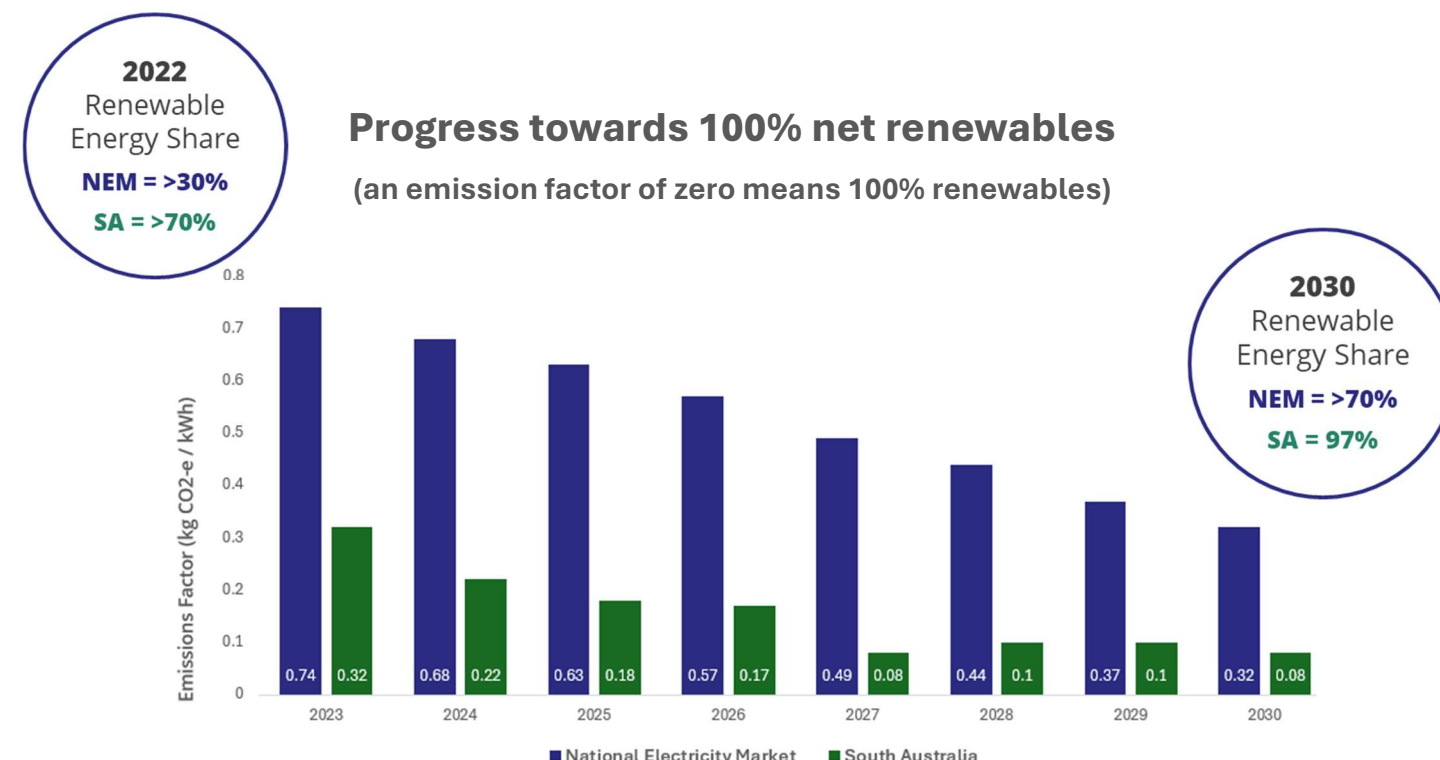
Australia is not currently on track to meet the 43% reduction or net zero by 2050 however the latest modelling is showing the target is achievable with continued implantation of emissions reduction policies and programs. Furthermore, as we address the more straightforward measures to reduce emissions such as transitioning to a renewable energy grid, the remaining emission sources (such as fuel use and waste) often need more complex processes and advanced technologies, which can be very costly to create and use. Therefore, support and immediate action from local government becomes critical to achieving these targets.

Greening of the grid

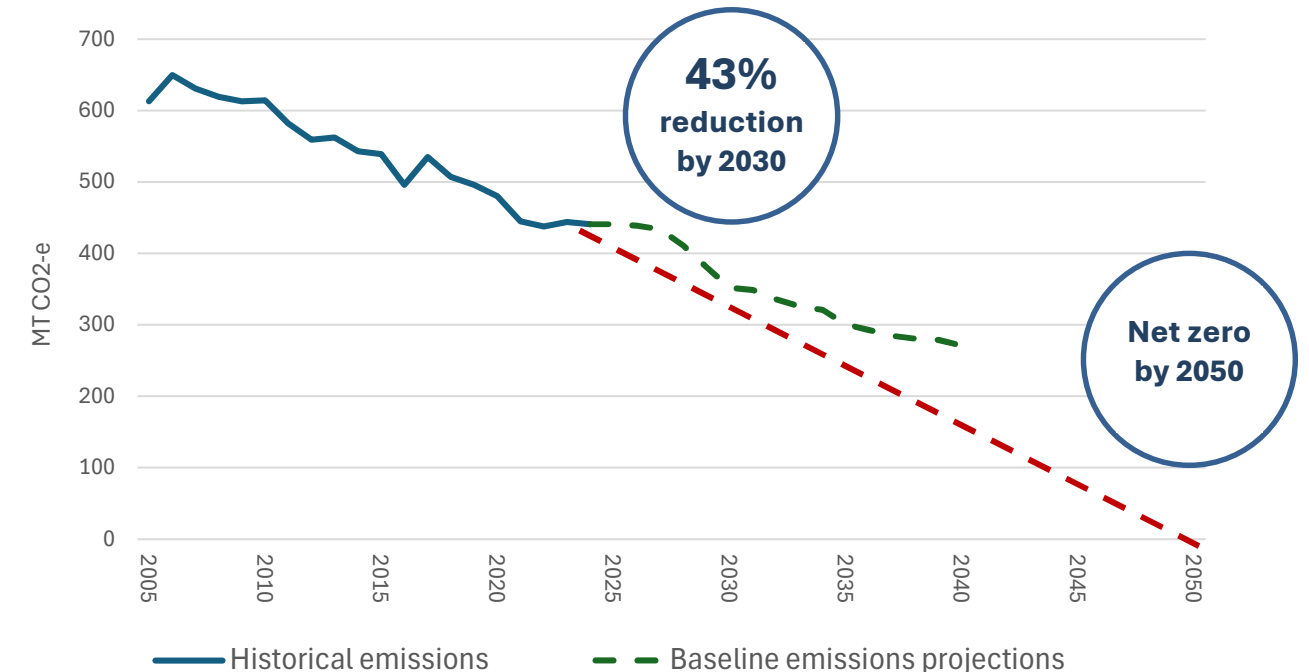
SA has been a national leader in the renewable energy transition, transforming its energy system to a share of 70% renewables in 2022 and achieving a 57% emissions reduction. The Australian Energy Market Operator forecasts renewable energy could rise to approximately 93% by 2025/2026, on track to meet the SA Government's aspiration to achieve 100% net renewables by the end of 2027.

The decarbonisation of energy sources within government, non-government and private industry, means electricity emissions will continue to reduce over time.

Therefore, whilst emissions from energy use were identified as significant for City of Port Lincoln, it is important to ensure emission reduction initiatives and capital is not over invested in electricity emissions related initiatives.



Progress towards Australian targets



Calculating electricity emissions

In this Pathway, a market-based approach has been used to estimate electricity emissions from purchased electricity. This means that an emissions factor based on the electricity market that the electricity has been purchased from has been used and an emissions reduction has been applied if Council purchases accredited renewable energy products, i.e. electricity contracts with Green Power or voluntarily surrendering Large-scale Generation Certificates as part of a Power Purchase Agreement (PPA).

Alternatively, a location-based approach uses an emissions factor based on the local electricity grid (South Australia), which has a higher proportion of renewable energy generation. In the event that Council do not pursue 100% renewable energy as part of their electricity contracts, there is the option to use the location-based approach.

The National Greenhouse and Energy Reporting Scheme (NGERS) in Australia uses location-based reporting to estimate emissions. However, NGERS has recently also included a market-based reporting option. Reporting on both approaches offers a more complete picture of an organisation's emissions by capturing both the physical location of the organisation, and the influence of market-based purchasing decisions.

As emission reduction initiatives are implemented and as Australia's electricity becomes greener with increasing renewable energy generation, the emissions factor for electricity use will reduce for both the market-based and location-based approach. As a result, the Council will need to continually update emissions data and track progression over time.

2 Emissions boundary

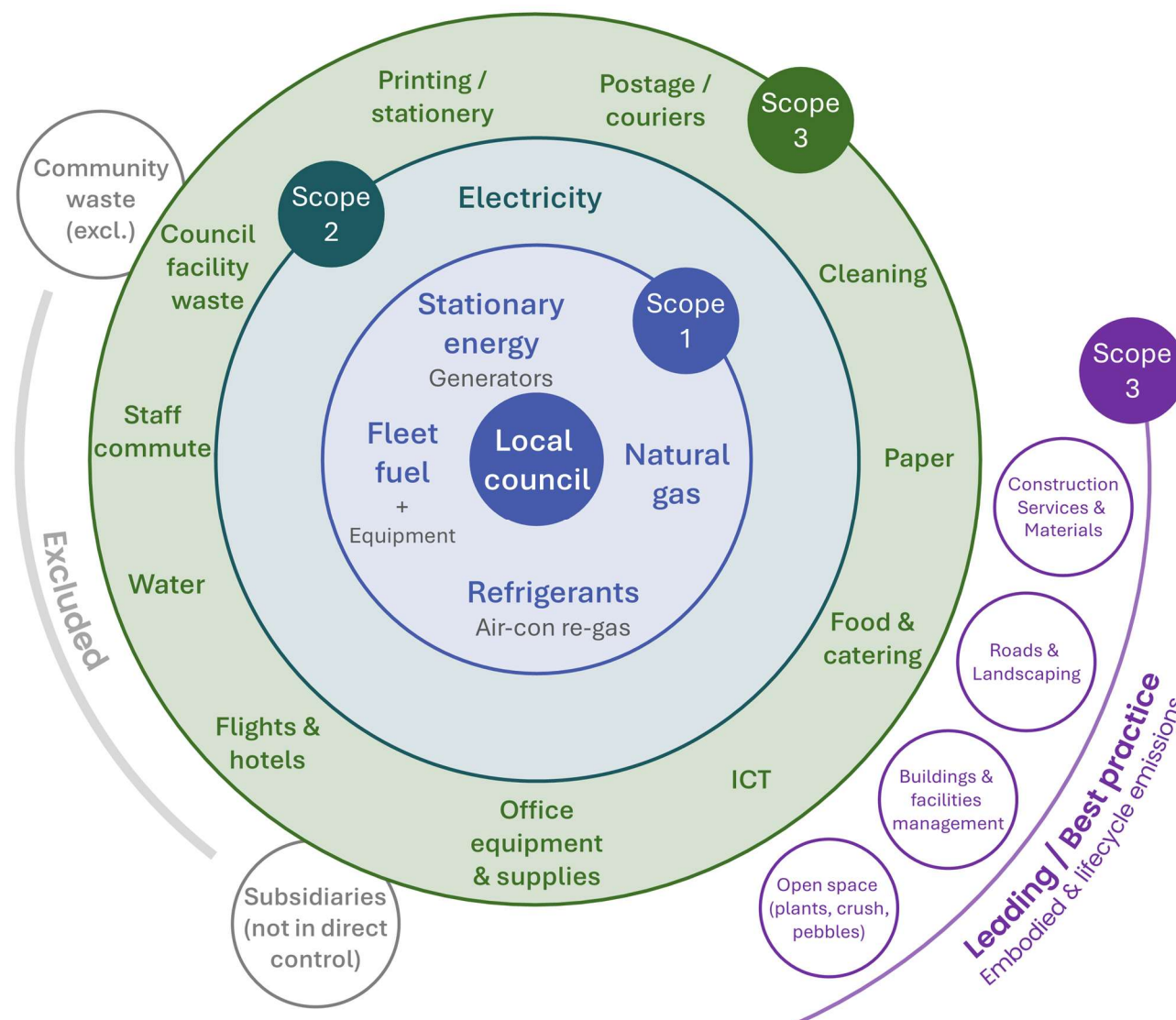
An Operational Control approach was used to define the emissions boundary.

This approach captures all emissions which are in Council's direct control or where Council can influence operations and emissions as part of its policies and procedures.

In addition to the Operational Control approach, local Councils are in a unique position where they have emissions associated with their corporate operations, while also providing services and infrastructure to the community. As a result, developing a Council emissions inventory is typically separated into:

- **Corporate emissions** relating to the Council's corporate operations, similar to a commercial company. Corporate emissions are typically included in the inventory.
- **Community emissions** relating to services and infrastructure provided to the community e.g., kerbside waste services. Community emissions are typically excluded from the inventory.

For the purpose of this Pathway, corporate emissions only have been included in the boundary.



2.5 Emission sources

Below is a summary of the main emissions categories included in Council's corporate emissions profile:

Energy Use

- Energy use is split into electricity and gas which is used to power buildings, facilities and streetlights, including hot water and pool heating, as well as recycled water treatment.

Transport

• Fleet fuel:

Transport includes fuel used in the Council's corporate fleet vehicles, maintenance vehicles and equipment (e.g. machinery and mowers), as well as flights and the use of taxis and Uber. The majority of transport emissions are attributed to diesel powered vehicles and equipment which also produce pollutants and particulate matter that are harmful to human health.

• Staff commute:

The transport category also includes staff commuting, which is considered an indirect emissions source. Emissions associated with employee travel to and from work has been calculated based on approximate distances from staff postcodes, average WFH days and average SA travel mode split (car, bus, bike etc) published by the Australian Bureau of Statistics.

Supply chain

• Waste

Operational waste from the Council's corporate facilities has been included with landfill methane emissions a significant source of greenhouse gas (GHG) emissions. The waste emissions calculations in this Pathway was based on the different bin types provided at each Council facility and typical waste generation rates provided by Green Industries SA (GISA). The Council facilities within Council's boundary include leased assets whereby Council maintain some control, i.e., Council provides the waste collection services. Community kerbside waste collection is not included however is an important part of the community's emissions profile.

• Water

Although 50% of water consumption is supplied by the Council Recycled Water Network, Council still uses a large volume of potable water to operate its corporate and community facilities and irrigate parks and reserves for community use. Emissions associated with water include pumping and water treatment and wastewater treatment. Due to most water being used for irrigation and operation of the Leisure Centre and public toilet facilities, Council's water emissions are largely associated with potable water supply, with a small amount associated with wastewater charges for sites connected to the SA Water sewer network.

• Supply chain (other)

Supply chain emissions from the purchase of vehicles and maintenance/repair, ICT services and equipment, telecommunications, postage and courier services, food and catering, professional/consulting services, refrigerants from air-conditioning systems, cleaning, accommodation and office supplies have been included.

All of these categories contribute indirect Scope 3 emissions to Council's corporate emissions profile.

3 Emissions inventory

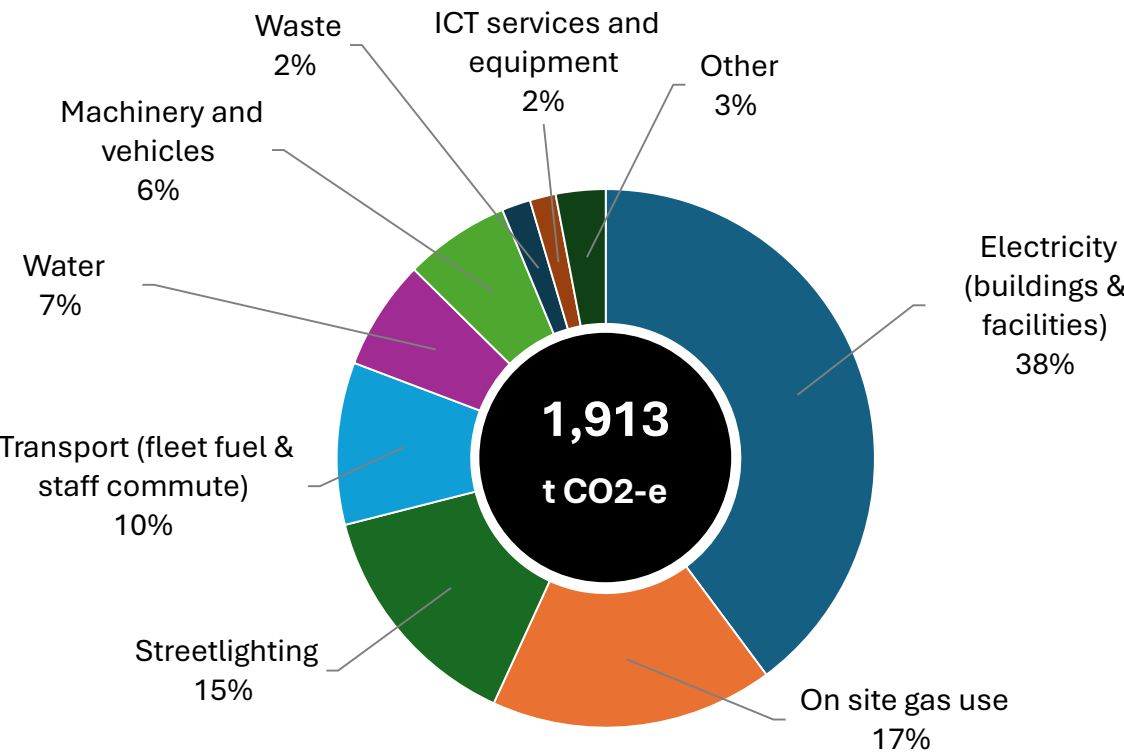
3.1 Market based emissions inventory

The City of Port Lincoln provided detailed financial reporting (money spent), energy retailer reports, vehicle fuel reports and water supply reports, which were used to develop the FY24 emission inventory.

A market-based approach was then used to estimate electricity emissions and model emissions reduction pathways, applying reductions if Council purchases renewable energy (i.e. Green Power or renewable PPA).

The emissions inventory includes Scope 1, 2, and 3 emissions categories in Council’s direct corporate control or where Council can influence emissions and totals 1,913 tCO2-e (refer below).

Market based emissions - FY24



Emissions breakdown (t CO2-e)	Scope 1	Scope 2	Scope 3	Total emissions
Electricity (buildings and facilities)	-	646	80	726
On site gas use	252	-	84	336
Streetlighting	-	-	284	284
Transport (fleet fuel & staff commute)	114	-	78	192
Water	-	-	130	130
Machinery and vehicles	-	-	125	125
Waste	-	-	34	34
ICT services and equipment	-	-	31	31
Other	1	-	55	56
Total emissions (t CO2-e)	367	646	900	1,913
Contribution (%)	19%	34%	47%	100%

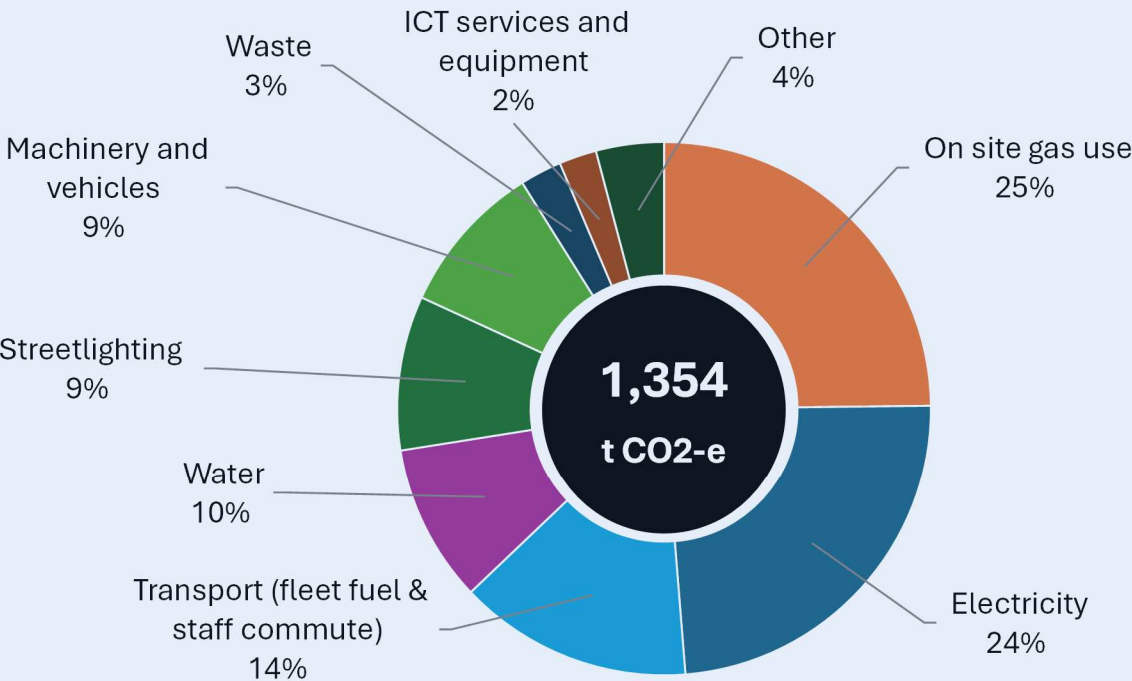
Market based approach has been used for this Pathway. Location based emissions shown for comparison only.

3.2 Location based emissions inventory

Alternatively, Council can use a location-based approach to calculate electricity emissions. The location based approach uses South Australia's emissions factor, which is higher in renewable energy and therefore results in lower electricity emissions. However, if Council wishes to purchase renewable energy in future these reductions cannot be applied to location based reporting.

Therefore, reporting on both market based and location based approaches offers a more complete picture of an organisation’s emissions by capturing both the physical location of the organisation, and the influence of market-based purchasing decisions. The location based emissions inventory totals 1,354 tCO2-e (refer below).

Location based emissions - FY24



Emissions breakdown (t CO2-e)	Scope 1	Scope 2	Scope 3	Total emissions
On site gas use	252	-	84	336
Electricity (buildings and facilities)	-	245	78	324
Transport (fleet fuel & staff commute)	114	-	78	192
Water	-	-	130	130
Streetlighting	-	-	127	127
Machinery and vehicles	-	-	125	125
Waste	-	-	34	34
ICT services and equipment	-	-	31	31
Other	1	-	55	56
Total	367	245	742	1,354
Contribution (%)	27%	18%	55%	100%

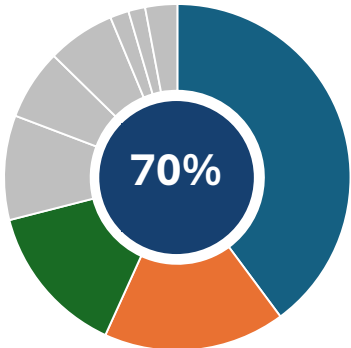
3.3 Emissions breakdown

Emissions categories have been grouped into three main categories based on the market based emissions inventory: **Energy Use, Transport, and Supply Chain.**

Emissions reduction opportunities were analysed to develop an illustrative emissions reduction pathway under each category. Each emissions reduction pathway is then combined to form Council’s Net Zero Pathway.

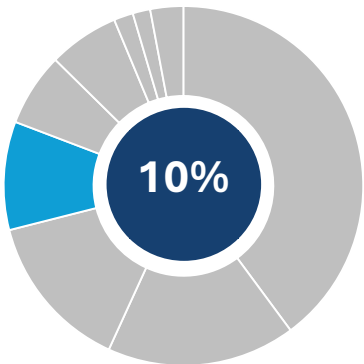
Primary emission categories	Key findings
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Energy Use:



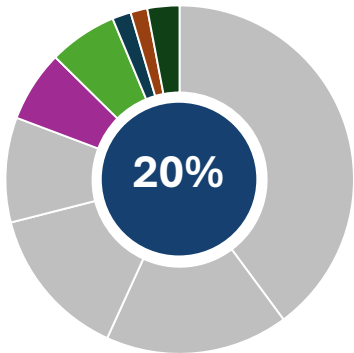
- 17% of electricity use from buildings was from the Civic Centre & Nautilus Arts Centre.
- 58% electricity use from buildings was from the Leisure Centre.
- 100% the on-site gas use was from the Leisure Centre.
- Electricity and gas use have increased by approximately 30% since FY21.

Transport:



- 74% of transport emissions were estimated to come from fleet fuel use.
- 26% of transport emissions were estimated to come from staff commuting.
- <1% of transport emissions came from staff travel for business (flights, taxis, Ubers).

Supply Chain:

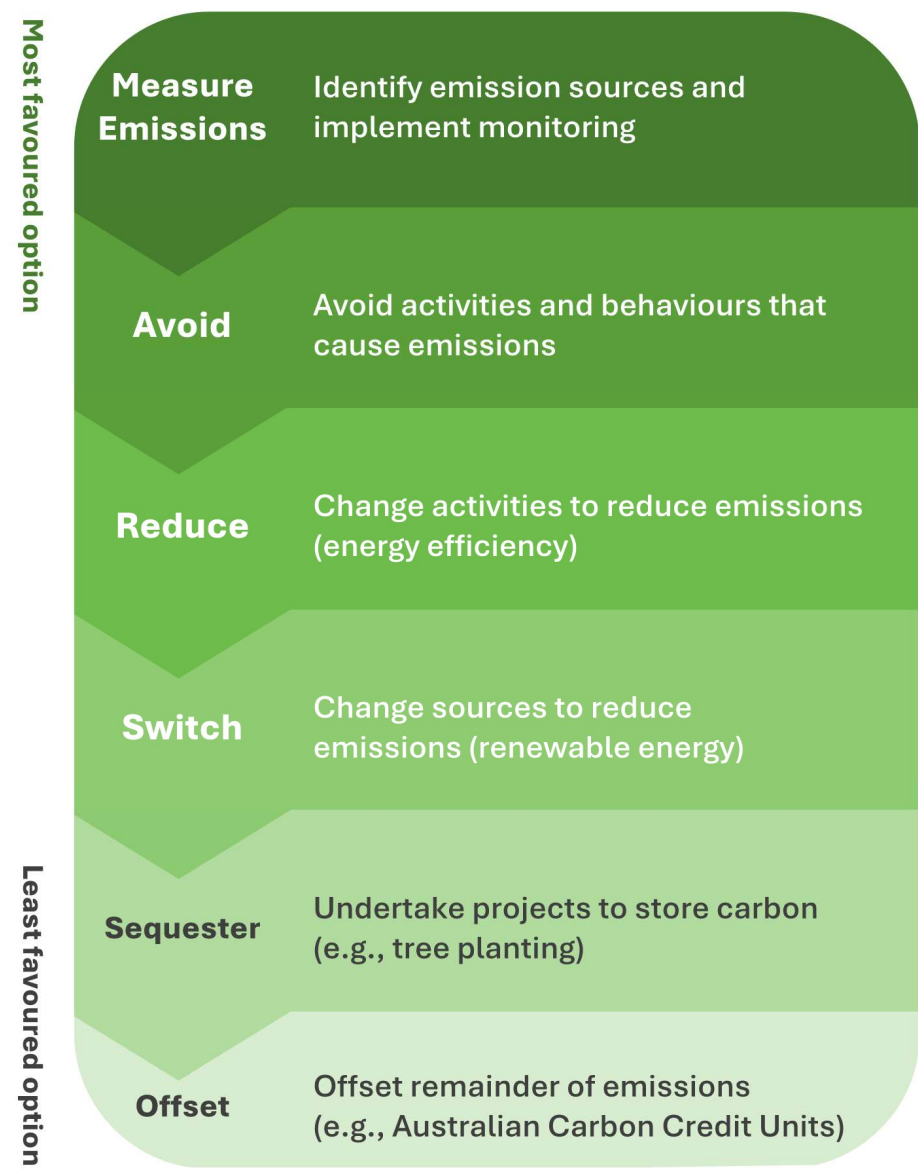


- 30% of water use was from the Leisure Centre.
- ‘Other’ emissions includes all emissions sources that individually contribute <1% to the emissions profile, including:
 - o Cleaning services,
 - o Office equipment & supplies,
 - o Postage, courier & freight,
 - o Food & catering, and
 - o Refrigerant gases in air-conditioning systems.

4 Emissions reduction principles

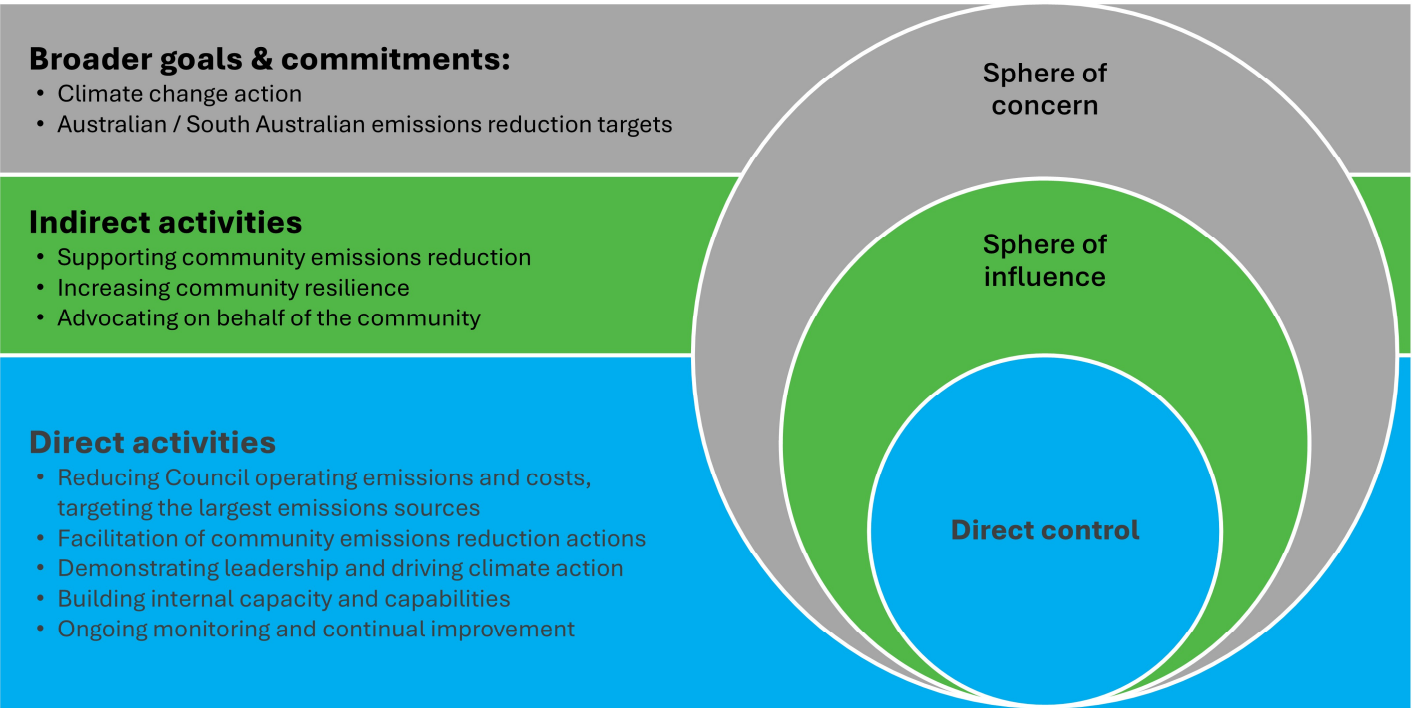
4.1 Carbon management hierarchy

The below carbon management hierarchy has been used to develop this Pathway with a focus on initiatives that will avoid and reduce emissions as the highest priority, while also reducing costs for Council.



Emissions reduction approach

The following has been used to guide the recommendations with a focus on direct emissions reduction activities, whilst also considering where Council can use its influence to support the community on reducing emissions. The recommendations have also been aligned with broader goals and commitments on climate action.



The highest priority should be placed on reviewing existing operation, practices, and behaviours to avoid activities that result in emissions, and demonstrating leadership for the community.

Carbon offsets are the final stage and used to achieve Carbon Neutral certification to reduce emissions to zero.

4.2 Carbon sequestration

Capturing and removing emissions permanently from the atmosphere is an approach to offsetting organisational emissions and is commonly achieved via biological process, such as planting trees, or artificial carbon capture and storage (CCS) technologies.

A 2023 research collaboration between 33 South Australian council's, determined that metropolitan councils did not have sufficient land area across verges, reserves and parks to generate carbon offsets from tree planting activities and that partnership with regional Councils would be required. As such tree planting and greening activities across Council land will not contribute to a reduction in the emissions inventory.

However, improving biodiversity and tree canopy have a range of other benefits including:

- Reducing the impact of the urban heat island effect (cooler local environments),
- Developing climate resilience and adaptation to increased temperatures, and
- Improving resident wellbeing and amenities.

4.3 Energy use emissions

Introduction

Energy use is the largest emissions source for Council's corporate operations, contributing 70% to the emissions profile. A key focus of this Pathway is to identify opportunities to reduce energy consumption, costs, and emissions.

Energy consumption

Energy consumption includes electricity kilowatt hours (kWh) and natural gas megajoules (MJ) and Council's top energy consuming sites and trends have been summarised below. Electricity (kWh) has been converted to MJ to enable a comparison of total energy consumption. Overall, energy consumption has increased by 10% from FY21 which may be linked to increased services post-COVID.

Site	Electricity (MJ)	Gas (MJ)	Total (MJ)	Contribution %
Leisure Centre	2,102,738	4,143,300	6,246,038	69%
Streetlights	1,380,985	-	1,380,985	15%
Nautilus Arts Centre	554,293	-	554,293	6%
Ravendale Sportsfield	284,710	-	284,710	3%
Civic Centre	270,381	-	270,381	3%
Other (combined)	319,780	-	319,780	4%
Total	4,912,888	4,143,300	9,056,188	100%

Energy efficiency

Council should first undertake a review of Council owned facilities, including energy audits or assessments for the facilities with the highest energy consumption, to identify opportunities for energy use reduction.

Opportunities may include:

- Thermal improvements, such as insulation, glazing and building sealing activities.
- Replacement or upgrade of building services equipment, such as lighting, fixtures, building plant.
- Installation of smart metering and energy management systems.

Renewable energy

A small number Council facilities have solar photovoltaic (PV) systems installed which are reducing electricity consumption, costs, and emissions. Overall, existing PV systems were responsible for reducing Council's electricity grid use by 162,000kWh. This is equivalent to 118 tCO₂-e, reducing Council's total corporate emissions profile by between 5-6%.

However, there is significant opportunity to invest in additional PV systems on Council facilities. Therefore, it is recommended Council:

- Undertake energy audits to identify additional Council facilities that would benefit most from PV systems and develop a solar PV rollout program.
- Review opportunities for improved solar monitoring systems including generation, self-consumption, export to the grid, and alerts.

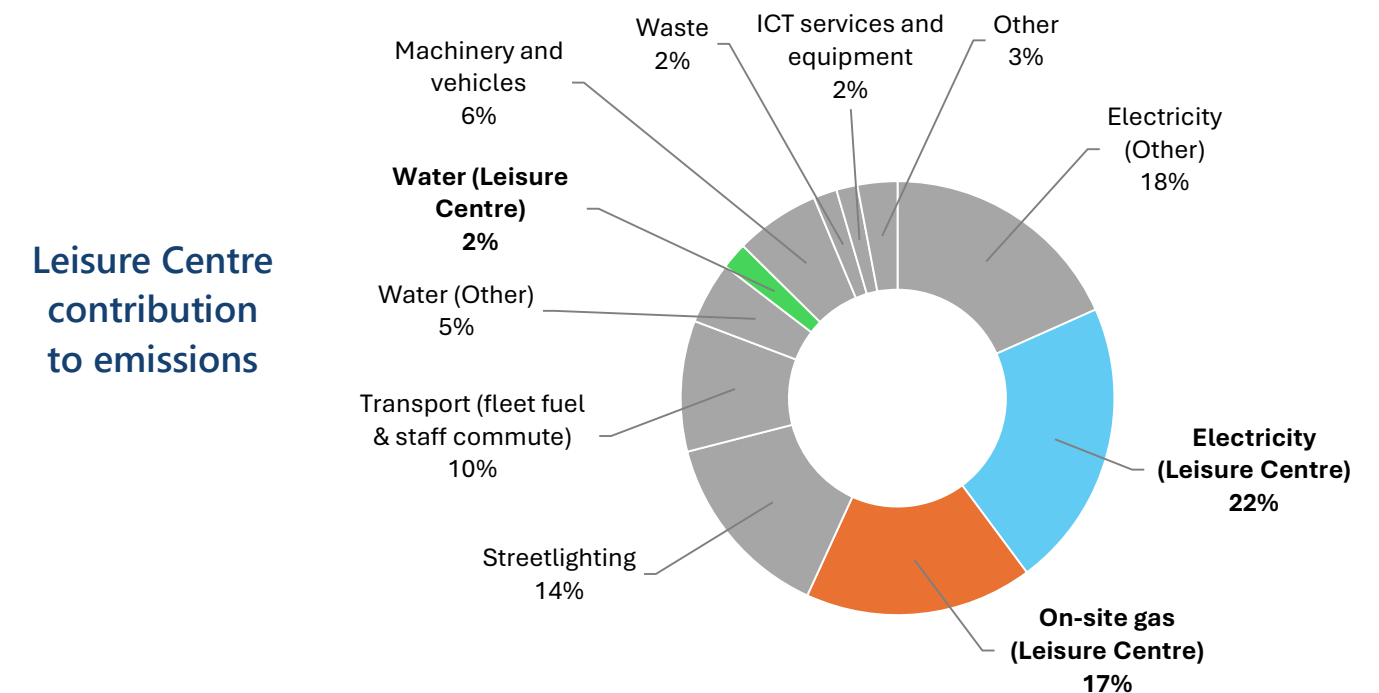
- Ensure existing faults are identified and addressed on sites with existing solar PV systems before considering additional solar PV systems or expansions.
- It is recommended that Council monitor opportunities for energy storage as battery prices continue to reduce, however this will have a minor impact on emissions as most of Council's sites are not generating sufficient energy to charge batteries.

Renewable energy contract

Together with solar PV rollout and energy efficiency upgrade programs, it is recommended Council considers procuring a 100% renewable energy supply contract, i.e., Power Purchasing Agreement (PPA) or procuring Green Power / Large-scale Generation Certificates (LGCs) as part of its electricity contracting. This option supports broader renewable energy projects across Australia, whilst resulting in zero emissions associated with Council's electricity use. This option requires resources/investment for initial investigations into PPA options.

Leisure Centre analysis

The Leisure Centre is responsible for 69% of energy use, and 41% of Council's corporate emissions as follows:



Council identified that the Leisure Centre is the priority for improving energy efficiency and reducing associated emissions. As such, Council has applied for Community Energy Upgrade Funding (CEUF) to transition from LPG gas boilers to heat pump hot water/air-conditioning systems, whilst installing larger on-site solar PV systems to reduce electricity grid demand.

dsquared provided an energy upgrade analysis to support the CEUF application and this analysis identified that transitioning to heat pumps, coupled with additional 150kW solar PV, is expected to achieve the following annual savings:

- Reduce total Council energy use from buildings by 52%,
- Reduce energy costs by approximately \$280,000, and
- Reduce emissions by approximately 394 t CO₂-e.

4.4 Transport emissions

Introduction

Transport emissions relating to fleet fuel consumption and staff commuting were found to contribute 10% to City of Port Lincoln's corporate emissions profile. Due to fuel consumption being a Scope 1 direct emissions source (fossil fuel combustion and direct emissions to the atmosphere), it is a priority that Council implement emissions reduction initiatives to support a low and zero emissions fleet transition, as well as more sustainable commutes for Council staff.

The following provides a summary of the emissions reduction outcomes of transitioning to low and zero emission forms of transport per kilometre travelled. For public transport the figure is based on per person per kilometre travelled based on average trip data and fuel use for Adelaide Metro.



Staff commute

Staff commuting was estimated to contributed 26% to Council's transport emissions.

The inclusion of staff commuting in Council's emissions inventory is the result of meeting several criteria of the Relevance Test from the GHG Protocol. Staff commuting emissions contributed significantly to emissions and Council have influence over emissions reduction, through supporting the development of local active transport networks, installing end-of trip facilities at Council buildings and supplying low emission or electric fleet vehicles for staff that commute in Council vehicles.

In addition, this approach aligns with the Best Practice Guide developed as part of the Local Government Association of SA Net Zero Accelerate Program (sector guidance) and emission reporting from undertaken by other SA Councils.

To improve the accuracy of staff commuting emissions, it is recommended that Council undertake an annual staff survey collating actual commuting distances, predominant transport mode and average days working from home (i.e. no commute). This can then assist Council to make informed decisions on initiatives, such as end-of-trip facilities, electric vehicle (EV) charging infrastructure and working from home (WFH) policies.

Fleet fuel

Fleet fuel use was estimated to contributed 74% to Council's transport emissions.

The first opportunity for Council to reduce fuel emissions is by optimising the existing fleet, as it can offer immediate impact and cost-effectiveness without significant upfront investment. By right-sizing vehicles, increasing vehicle sharing, and maintaining regular vehicle maintenance, Council can quickly reduce fuel consumption, emissions, and operating costs.

It is recommended Council undertake a detailed review of existing fleet and implement fleet optimisation opportunities before transitioning directly to electric and hybrid alternatives. This may include transitioning some medium fleet to light fleet (i.e. Utes to SUV), or medium sized passenger vehicles to small sized passenger vehicles (i.e. SUV to sedan). Council may also consider including minimum fuel efficiency standards (max L/100km) in vehicle procurement policies.

It is recommended that medium and commercial vehicles such as Utes could be transitioned to hybrid and electric options over the next 3-5 years as vehicle availability increases and costs reduce. It is projected that EVs may reach price parity with internal combustion vehicles between 2027 to 2030 as EV production and material costs reduce with greater uptake and more efficient technologies. Limited options are currently available on the market, however further Ute options that may be suitable for Council are expected from 2025.



BYD Shark 6 PHEV
\$58k (before on roads)
Currently available



Ford Ranger PHEV
\$75k (before on roads)
Available to order

Recommendations

The following is recommended for consideration as part of the ongoing low emission fleet transition:

- Fleet optimisation review, procuring appropriately sized vehicles for the role/position, and setting emissions intensity requirements.
- Review vehicle use for fleet optimisation, considering where medium fleet vehicles (i.e. Utes) may be suitable to be substituted for electric passenger vehicles, allowing for an earlier transition of these vehicles as market availability for electric and hybrid options are limited.
- Where practical, transition light passenger vehicle transition to battery electric vehicles (BEVs) in the next replacement cycle.
- Continually review the performance of current EV fleet from an operation, costs an emissions prospective.
- Monitor upfront costs, insurance, repair costs and resale value of low emissions vehicles as it is expected prices will reduce over the next 2-3 years as more options enter the market.
- Review EV charging infrastructure requirements based on the initial EV rollout. It is expected EV ranges will reach >700km by 2027 which will reduce the need for large numbers of charges.
- Develop a procedure / approach for EV charging at home for staff that use fleet vehicles for daily commute, as well as implementing processes for public charging.
- Review Work Health and Safety (WHS) risks associated with electric vehicles, including cable management to avoid trip hazards, back-up power provision for charging during a power outage, electric capacity and distances between charging locations.

EV fires are topical, however based on worldwide statistics EVs have a 0.0012 per cent chance of catching fire, compared to 0.1 per cent for internal combustion vehicles. However, EV fires can be significantly more difficult to contain due to thermal runaway. Charging locations should preference locations in open car parks with clear access for firefighters and include automatic shutdown isolation buttons in safe locations away from the charging stations to isolate the electrical supply.

4.5 Supply chain emissions

Introduction

It is recommended that the City of Port Lincoln investigate and implement procurement procedures to reduce Scope 3 emissions, which accounts for 20% of total Council emissions. As energy and fleet continue to decarbonise over time, the share of emissions from the supply chain will continue to grow. In addition, scope 3 embodied emissions from capital works projects have not been included in this emissions inventory, however, are expected to be significant.

Sustainable Procurement

For the largest impact on emission reduction, it is recommended that the top supply chain emissions are targeted for review and implementation of initiatives based on the following sustainable procurement principles:



The top 5 supply chain emissions sources for Council are:

1	2	3	4	5
Water supply	Machinery and Vehicles	Waste generated	ICT services and equipment	Other
Potable and recycled water supply to council buildings and irrigation.	Including the purchase of vehicles and maintenance / repair.	Waste from Council facilities that goes to landfill.	Over 90% of emissions in this category relate to technical ICT services.	All other supply chain emissions sources that individually contribute <1%.

It is recommended that Council investigate criteria and KPIs for their supply chain, including implementation of procedures that align with ISO 20400:2017 – Sustainable Procurement. Key stages of ISO 20400 are outlined below:

Plan – Increase understanding by:

- analysing Council needs and suppliers,
- consult internally and externally, analysing supply market,
- define procurement strategy, including drafting specifications/contracts and develop evaluation criteria, and
- Implement plan with largest suppliers first.

Source – Go to market to:

- engage with suppliers and clarify/query,
- evaluate offers and negotiate, and
- award contract in support of policies and KPIs.

Manage – Continually manage procurement delivery by:

- implementing contracts,
- manage transition,
- review and manage of supplier performance,
- drive continuous improvement, evaluating policies and KPIs, and
- celebrate success.

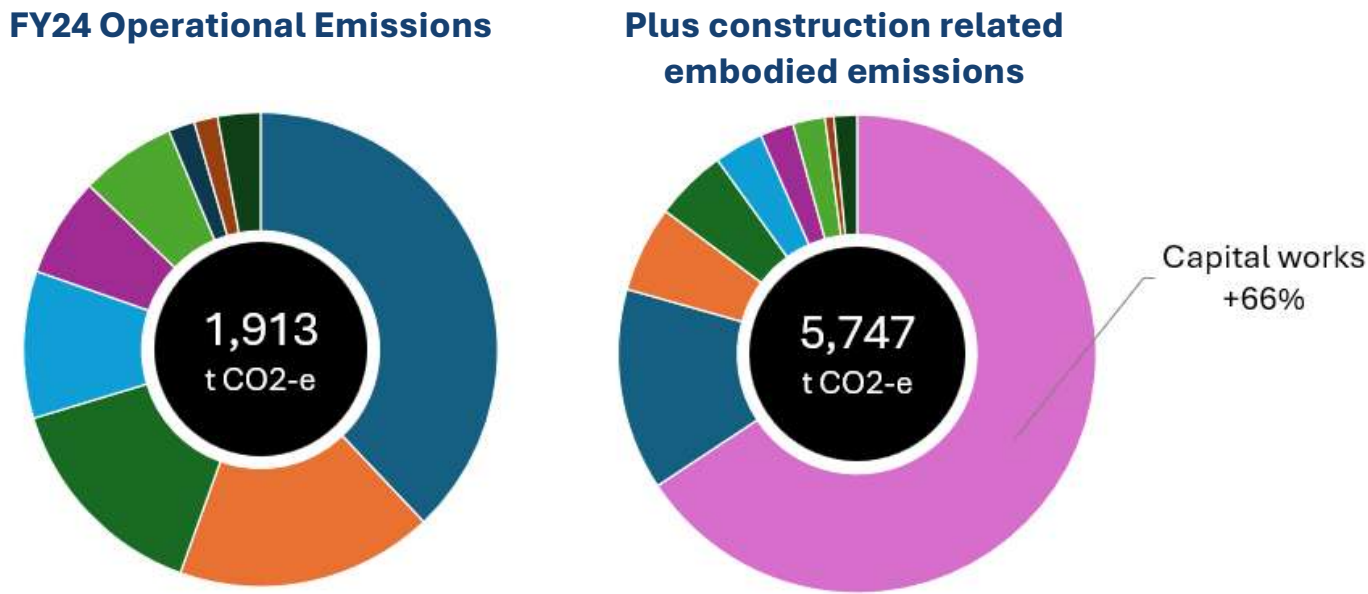
4.6 Embodied emissions

Introduction

Construction materials such as concrete, steel and asphalt used in infrastructure and capital works projects have high embodied emissions across the supply chain. Based on previous assessments of Council projects and inventories, the largest emissions sources are expected to be:

- Asphalt associated with road replacement programs.
- Concrete for curbs and pedestrian pathways and pavements.
- Concrete and steel in capital works and maintenance projects.

The City of Port Lincoln provided some high level financial expenditure on capital works projects for FY24, with the estimated impact on the emissions inventory as follows:



This aligns with previous Local Government assessments, which found that embodied emissions contribute >60% to total corporate emissions. However, before embodied emissions can be included in Council’s corporate emissions profile, data accuracy and management would need to be improved.

The first step in managing embodied emissions is to implement robust data collection for quantities and costs of these materials, so that the impact can be quantified, and improvements or opportunities can be measured and evaluated for decisions making. In addition, robust data practices will enable construction materials to be easily captured in future emissions reporting.

From here, priorities can be identified and strategies evaluated to reduce construction-related emissions, such as:

- Optimising designs to reduce the use of high embodied emissions materials.
- Mandating a minimum embodied emissions reduction as part of major capital works projects.
- Incorporating an embodied emissions / recycled content assessment for all infrastructure projects as a tender requirement for suppliers, encouraging suppliers to increase product and emissions transparency and data availability.

- Expanding the use of recycled and low emission materials as part of infrastructure works and tracking progression over time to demonstrate leadership to the community.
- Reducing construction and demolition waste to landfill as part of road and capital works projects.
- Implementing a staged approach, targeting the largest embodied emissions sources and key projects that incorporate large amounts of asphalt and concrete.

Opportunities

The following embodied emissions opportunities can be considered with a focus on local South Australian suppliers and manufacturers, and products that support circular economy practices, such as recycled content, buy-back or reuse materials collected as part of kerbside recycling services.

However not all options will be available locally and typically have a higher upfront cost. Therefore, opportunities and costs to reduce embodied emissions should be considered against other emissions reduction initiatives and potential co-benefits, such supporting the local economy or demonstrating leadership.

Opportunity	Summary
 Low emission / carbon neutral concrete	Low emission concrete: Target a 30% emissions reduction through improved process efficiencies and design optimisation + increased recycled content such as fly ash. Carbon neutral concrete: Low emissions concrete + carbon neutral certified.
 Green / recycled steel	Investigating steel supplies with a higher percentage of recycled content or green steel which uses lower emission production processes such as electric arc furnaces powered by renewable energy.
 Recycled asphalt content	Continue to use recycled content for asphalt such as Reconophalt which reduces embodied emissions by 20-30%.
 Recycled Crushed Rock	Consider options for recycled crush and rock for use as part of infrastructure works.
 Environmental certifications	Preferencing products and materials that have Environmental Product Declarations (EPDs) and environmental certifications (GECA, Green Tag, etc.) to prioritise lower impact materials and improve data capture.

4.7 Emissions reduction summary

A summary of the recommended emissions reduction initiatives for City of Port Lincoln’s corporate emissions is provided below:

Energy use

- Leisure Centre electrification with heat pump systems to replace gas boilers
- Leisure Centre additional 150kW of solar PV
- Leisure Centre monitoring and tuning process to optimise energy use and avoid peak tariffs
- Energy efficiency program for other high energy using buildings, including the Civic Centre and Nautilus Arts Centre. Energy efficiency program may include:
 - LED lighting, HVAC and hot water replacement program, insulation/glazing upgrades, optimising shading, and specifying high-efficiency appliances.
 - Increase solar PV on high-energy consuming sites and review opportunities for energy storage (batteries).
- Complete LED streetlighting rollout program (75% completed in 2020).
- Allow for increased energy use due to fleet transition towards battery powered electric vehicles (BEVs).
- Monitor opportunities for 100% renewable energy contracts / PPA’s.

Transport

- Fleet optimisation review, procuring appropriately sized vehicles for the role/position, and setting emissions intensity requirements.
- Light passenger vehicle transition to BEVs in the next replacement cycle.
- Medium and heavy vehicles transition to more fuel efficient options.
- Medium and heavy vehicles transition to BEVs, hybrid electric vehicles (HEVs), or plug-in hybrid electric vehicles (PHEVs), as the industry develops and vehicle availability increases and costs reduce.
- Reduce private vehicle fuel use for commuting by providing end-of-trip facilities, EV charging infrastructure, WFH policies, and incentives for staff using active transport modes.

Supply chain

- Water use audit and efficiency program to reduce water supply, in particular for the Leisure Centre
- Allow for increase in machinery and vehicle costs from electric/hybrid fleet transition.
- Continue waste audits to identify opportunities for diverting further waste from landfill and reducing contamination rates in waste bins (i.e. landfill waste in recycling bins or vice versa).
- Develop Sustainable Procurement plan/policy and preference low carbon/carbon neutral products and services.

Supply chain (embodied emissions)

- Implement robust data collection for quantities and costs of materials used in capital works to allow for embodied emissions calculations and guide decision making.
- Optimising designs to reduce the use of high embodied emissions materials.
- Mandating a minimum embodied emissions reduction or recycled content in materials as part of major capital works projects. Embed in procurement policies and tender response requirements.

5 Emission reduction modelling

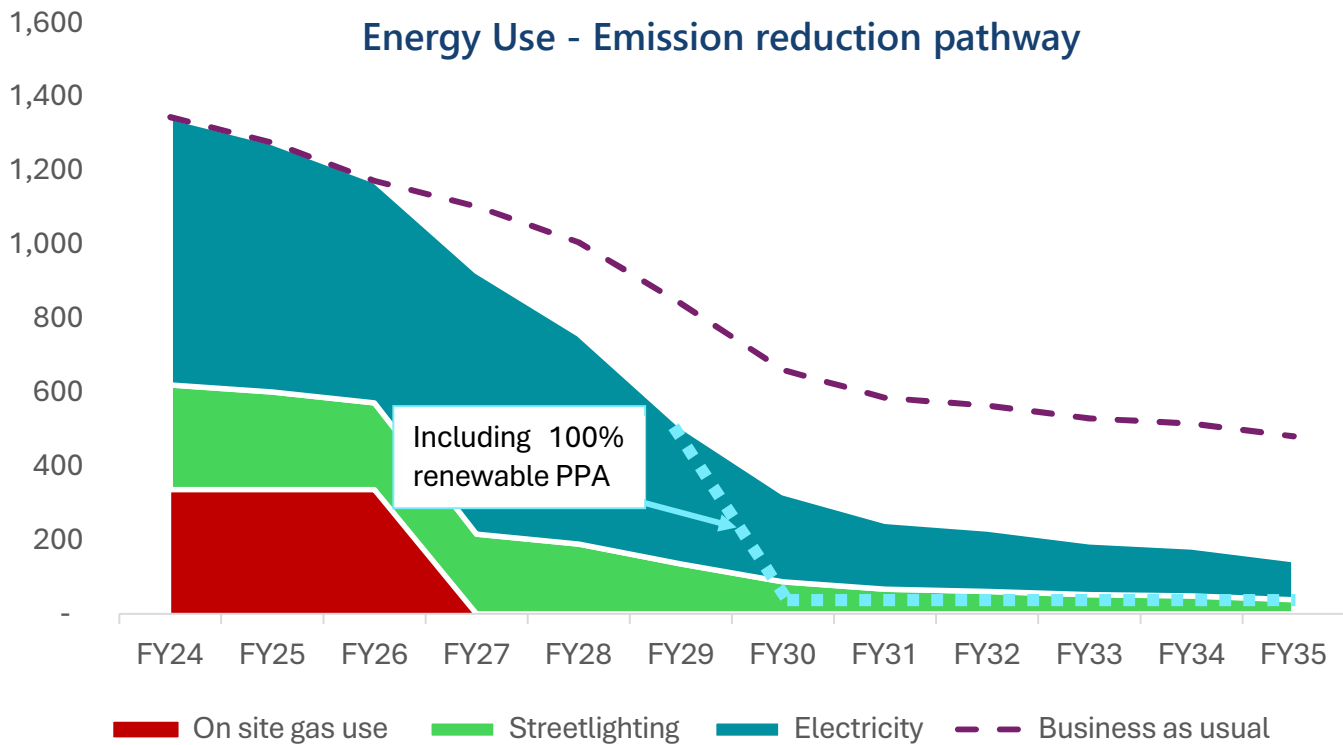
Based on the emissions reduction opportunities identified, illustrative emission modelling has been developed for the three main emissions categories: **Energy use, Transport, and Supply chain.**

This modelling uses the market based approach to calculate electricity emissions. The emissions reduction modelling is illustrative only and would need to be refined once Council selects emissions reduction initiatives and timelines.

5.1 Energy use emissions modelling

Inputs for energy use emission reduction modelling:

Emission reduction initiative	Implemented by
Leisure Centre transition to heat pumps plus additional 150kW solar PV leading to a reduction in total energy use of 47%.	FY28
Solar PV and energy efficiency upgrades (roof insulation and VRF air-conditioning) are proposed to Civic Centre/Nautilus Arts Centre (NAC), leading to a reduction in energy use of 20%.	Civic FY27 NAC FY29
Energy efficiency program and solar PV rollout for other facilities leading to a 5% reduction in total council energy use.	FY29
Complete LED streetlighting rollout leading to a 5% reduction in total streetlighting energy use.	FY29
100% renewable energy purchase (i.e. PPA) leading to a 100% reduction in energy use emissions (separate Pathway).	FY30

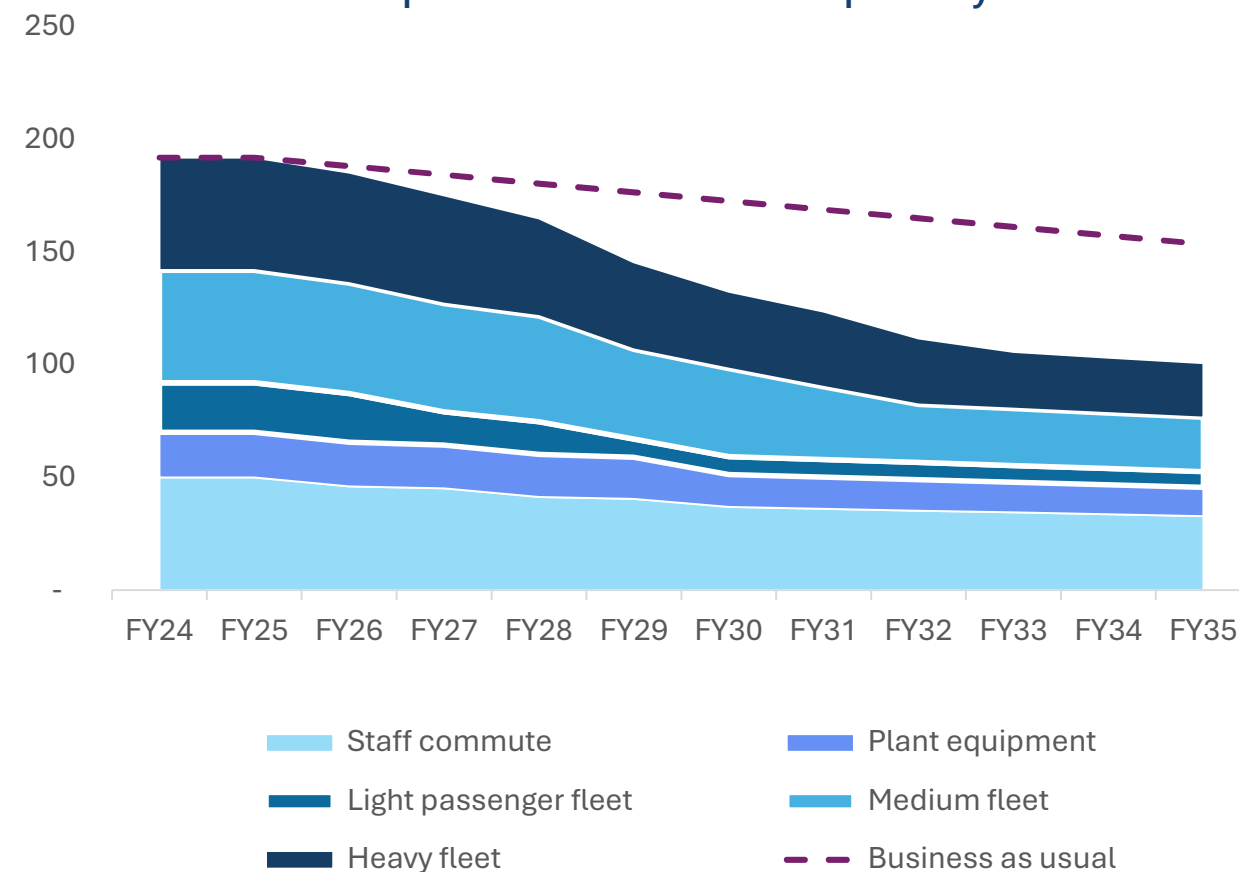


5.2 Transport emissions modelling

Inputs for transport emissions modelling:

Emission reduction initiative	Implemented by
Fleet vehicle optimisation and efficiency	FY27
70% of light passenger vehicles transition to battery electric or hybrid electric.	FY30
50% of medium & heavy vehicles transition to battery electric or hybrid electric.	FY32
Staff commuting reduces by 15% through incentive programs and EOT facilities	FY34

Transport- Emission reduction pathway

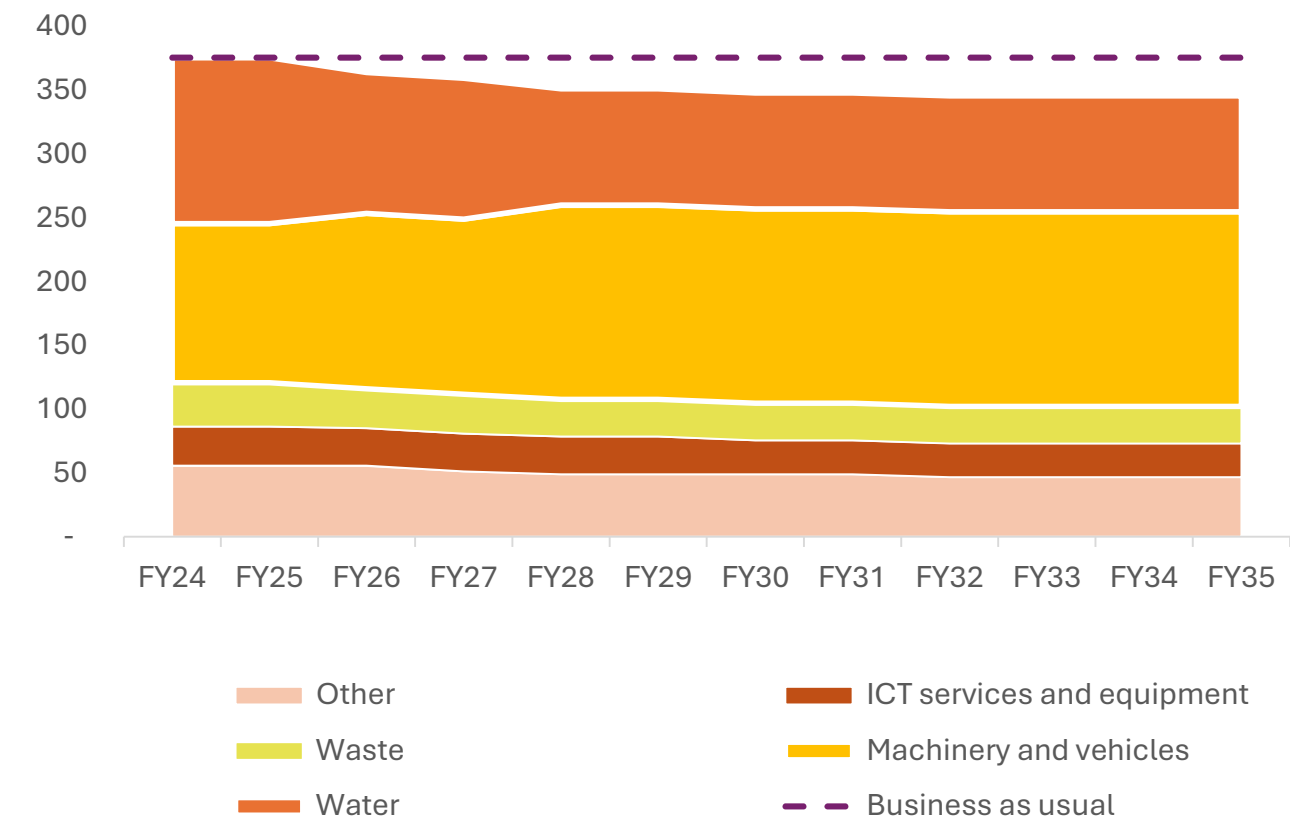


5.3 Supply chain emissions modelling

Inputs for supply chain emissions modelling:

Emission reduction initiative	Implemented by
Improved waste practices reduce waste to landfill by 15%	FY27
Reduced water use from Leisure Centre and other high water users- reducing water use by 30%	FY28
Increase expenditure and associated emissions from investment in electric vehicle fleet	FY30
Developing a sustainable procurement plan and selecting low carbon/carbon neutral products to reduce supply chain emissions by 10%	FY32

Supply chain- Emission reduction pathway



6 Net Zero Pathway

The Net Zero Pathway combines the emissions reduction initiatives and illustrative modelling under the three primary emissions categories: Energy Use, Transport, and Supply Chain.

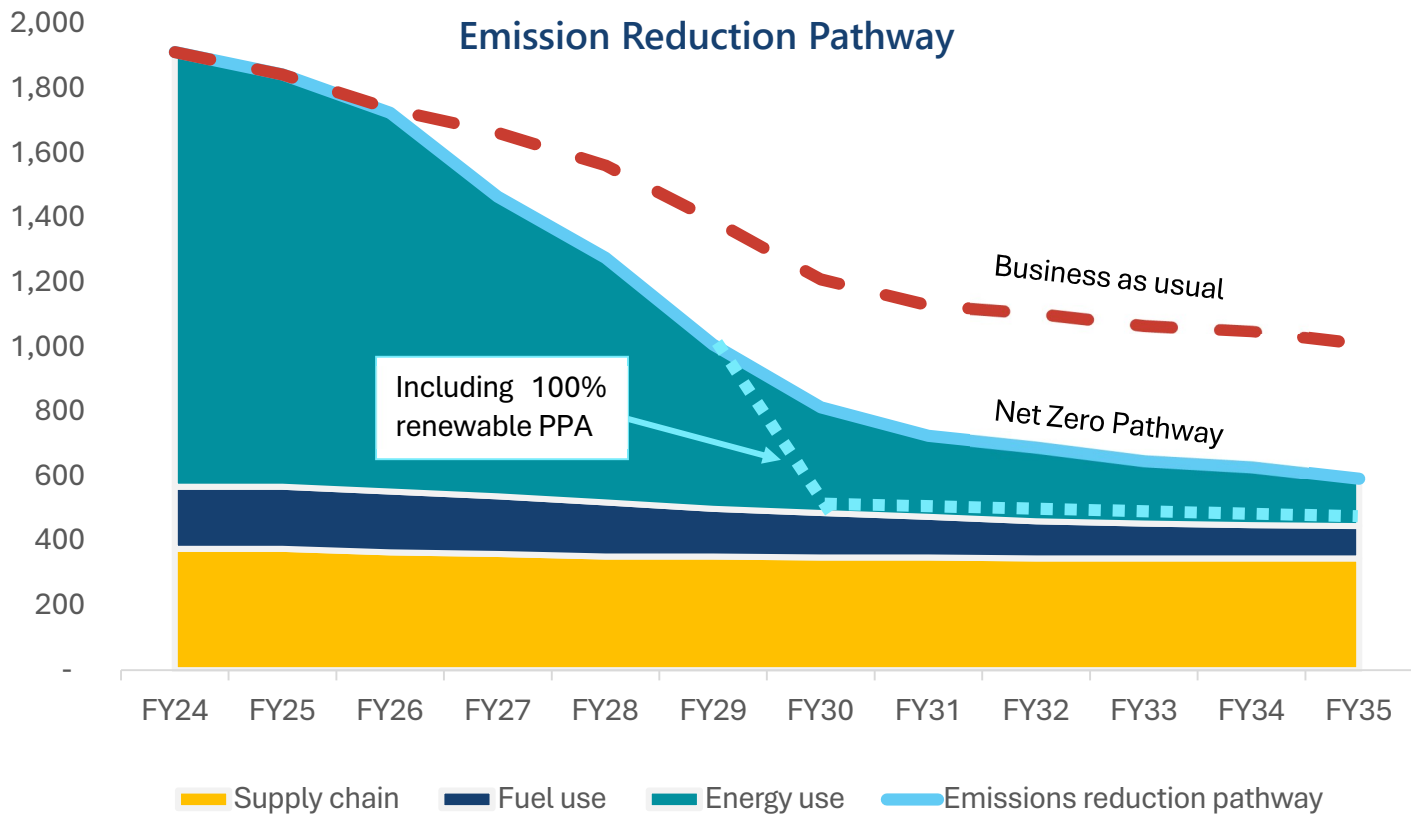
This modelling uses the market based approach to calculate electricity emissions.

The Net Zero Pathway starts with the baseline year of FY24, and based on the projections, it is estimated that Council could achieve a 70% reduction in emission by FY35.

By FY35, the Net Zero Pathway also achieves a 42% reduction compared to business as usual (i.e., no sustainability initiatives or investment).

To achieve this target Council must continue to investigate and implement emissions reduction programs in line with this Pathway, including monitoring emerging technologies and solutions to fast track the strategy as the broader economy decarbonises.

The recommendations in this Pathway should be assessed against Council’s broader strategic priorities, budgets and operational planning.



Emissions impact by category – To FY35

- 90% reduction in energy use emissions
- 48% reduction in transport emissions
- 8% reduction in supply chain emissions

Emissions impact combined – To FY35

- 70% reduction in total emissions
- 3,280 tCO2-e total emissions saved over 10 years compared to business as usual

7 Next steps

7.1 Set emissions reduction targets

It can be challenging to achieve total emissions reduction if a Council is experiencing growth and services are expanding. Therefore, the City of Port Lincoln should consider setting intensity based targets instead of total emissions targets. The following options could be considered:

- **Energy intensity (kWh / sqm):** If Council expands in population and area, the number of Council buildings and facilities will also increase. More facilities will lead to higher energy consumption. Therefore, Council could consider an energy intensity target, rather than total energy consumption. This approach would account for Council's expanding services while ensuring that buildings and facilities operate efficiently to minimise energy use and associated emissions.
- **Fleet fuel intensity (kg CO₂-e / km):** Establishing an emission intensity target per kilometre travelled is beneficial as it accounts for potential increases in the size and usage of Council fleet. Additionally, setting a fuel intensity target focuses on optimising fleet and fuel efficiency, rather than solely transitioning all fleet vehicles to electric options. For Council's medium and heavy fleet, it may be more practical to transition to efficient internal combustion engines (ICUs) for now, until more electric options become available and affordable.
- **Total emissions intensity (t CO₂-e / FTE):** Setting an emissions intensity target instead of a total emissions target would ensure Council is not penalised for expanding its community services. Council could use staff full-time equivalent (FTE) to calculate emissions intensity, as an increase in Council services is expected to lead to a rise in staff numbers. This approach would also reflect the benefits of the energy intensity and fleet fuel intensity targets mentioned above. Below is a comparison of total emissions and emissions intensity since FY21:

It is recommended the City of Port Lincoln evaluate the various available options for reducing emissions. By doing so, Council can identify and set specific emissions reduction targets that will effectively steer their decision-making processes. These targets are crucial for ensuring that Council remains on a clear and strategic path towards achieving net zero emissions.

7.2 Implement the Net Zero Pathway

Council is committed to demonstrating leadership in emissions management and implementing programs to support reducing emissions in line with the priorities identified in this Pathway.

The adjacent table provides a summary of the key actions and next steps to implement the Pathway.

Table 2: Emissions reduction - Next Steps

FY24 Baseline	The FY24 market based inventory developed for this Pathway should be used as a new baseline to monitor emissions reduction initiatives and set targets. This aligns with best practice approaches for emissions inventories and will enable Council to track its emissions and reduction measures moving forward.
Set targets	Review the emission reduction strategies in this Pathway and set specific emissions reduction targets that will effectively steer Council decision-making processes. Consider setting intensity based targets to ensure Council is not penalised for expanding its services to the community, while working towards overall emissions reduction targets. This will ensure Council remains on a clear and strategic path towards Net Zero emissions.
Emissions reduction initiatives	Implementing immediate emissions reduction initiatives targeting the largest emissions sources is recommended. The largest opportunities include energy use, transport, and supply chain emissions with opportunities to reduce consumption, costs and emissions.
Consider embodied Emissions	Although embodied emissions related to the construction of roads/pathways and other capital works projects within Council has not been included in this Pathway, it is estimated that this would contribute a significant source of emissions (estimated >60% share). Implementing strategies to capture and record material and cost data will enable this to be tracked against targets and emissions reduction initiatives in the future.
Monitoring the industry	This Pathway has identified that achieving Net Zero emissions is dependent on the broader economy decarbonising. However, Council should regularly be monitoring opportunities for reducing emissions as the market develops and low emission options become available and affordable. This includes electric vehicle options (BEVs, HEVs, and PHEVs) for Council's medium and heavy fleet. It also includes reviewing options for procuring low emission or carbon neutral products and services (including renewable energy contracts).
Publicly commit	It is recommended Council publicly commit to emissions reduction initiatives and targets to work towards, demonstrate leadership, and enable Council to celebrate achievements. Learnings from Council initiatives should also be shared to support community emissions reduction action.
Reporting	Considering a flexible and continual improvement model, the following approach to emissions reporting is recommended: • Undertake annual emissions reporting against the FY24 baseline. Notable emissions reduction is not expected to be achieved at shorter intervals, as building and infrastructure upgrades, fleet replacement programs, and sustainable procurement initiatives are implemented over longer periods of time. • Implement 6-monthly energy (electricity and gas) and fleet fuel (petrol and diesel) intensity reporting, demonstrating ongoing reductions in energy (kWh / sqm) and fuel (gCO₂-e / km). This will help verify energy/fuel efficiency programs and initiatives are working effectively to reduce total emissions/emissions intensity.