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**ANNUAL CARBON  
EMISSIONS REPORT**

Image: Solar Panels in Gloucester



## Executive Summary

MidCoast Council adopted its Climate Change Strategy in June 2021 which includes targets to achieve net zero emissions by 2040 and 100% renewable energy by 2040. Council has also adopted an updated Waste Management Strategy which includes a revised target to divert 70% of waste (including 50% organic waste) from landfill by 2030 in order to reach net zero emissions.

This report presents the carbon emissions that were generated from Council's operations during 2022-23 and summarises the key initiatives that are currently being implemented by Council to lower its emissions.

## Background

MidCoast Council adopted its Climate Change Strategy in June 2021 which includes targets to achieve net zero emissions by 2040 and 100% renewable energy by 2040. Council has also adopted an updated Waste Management Strategy which includes a revised target to divert 70% of waste (including 50% organic waste) from landfill by 2030 in order to reach net zero emissions.

The Climate Change Strategy (June 2021) analyses Council's carbon footprint and identifies the actions Council can undertake to reduce its greenhouse emissions and adapt its practices and infrastructure to become more resilient to the impacts of climate change. These actions include:

- investing in renewable energy
- buying clean energy
- becoming more energy efficient
- sequestering carbon and offsetting
- sustainable procurement
- transitioning to more sustainable transport options; and
- reducing our waste to landfill.

In adopting the Strategy, Council committed to achieving net zero emissions from its operations (including electricity, fleet and waste) and 100% renewable energy for its operations by 2040.

Over 150 actions are proposed in the Strategy to meet these targets and Council will offset those emissions that can't be mitigated by purchasing renewable energy and investing in local carbon sequestration initiatives such as tree planting programs and the restoration of degraded coastal wetlands (Blue Carbon).

Specifically, the Strategy focuses Council's efforts on increasing the uptake of on-site solar photovoltaic (PV) systems and batteries (particularly for its water and sewer assets), energy efficiency, and purchasing renewable energy in the short to medium term, to progressively increasing its renewable energy supply as batteries and electric vehicles become more cost effective over time.

This report provides a summary of Council's resource consumption and associated carbon emissions during the 2022-23 financial year to show how we are tracking towards our net zero emissions target. It also provides a summary of the major initiatives undertaken by Council during this period to reduce its carbon footprint.

Greenhouse gas emissions are expressed as carbon dioxide equivalent (CO<sub>2</sub>-e). CO<sub>2</sub>-e expresses the warming effect of different greenhouse gases as an equivalent amount of carbon dioxide. It is the amount of carbon dioxide that would give the same warming effect as each greenhouse gas that is emitted or stored by an activity. For example, methane (CH<sub>4</sub>) has a global warming potential (GWP) of 25, which means 1 tonne of CH<sub>4</sub> is 25 tonnes of CO<sub>2</sub>-e.

## Discussion

Council staff are currently modelling future carbon emissions to project how expected changes to waste management, a cleaner electricity grid and expected uptake of electric vehicles will impact our emissions profile. Major changes include:

- the trial and implementation of landfill gas flaring,
- implementation of Food Organics & Garden Organics (FOGO) in waste management,
- increased uptake of behind-the-meter solar at Council owned sites,
- increased grid-scale renewable energy,
- planned closures of coal fired power stations and
- projected uptake of electric vehicles.

## Council's 2022-23 Carbon Emissions

Council currently subscribes to Azility's energy efficiency software platform to help monitor its water, electricity and fuel consumption, waste to landfill, and the associated costs and carbon emissions.

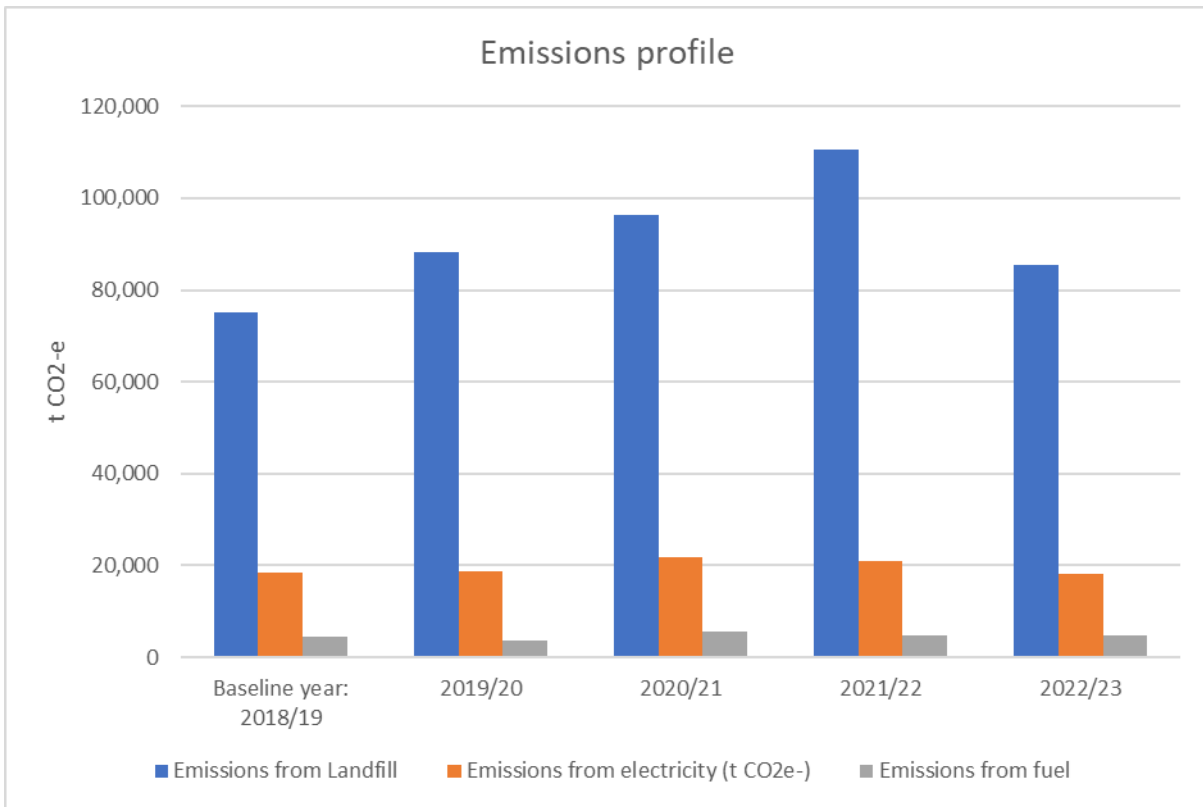
Council's total carbon emissions for 2022-23 was 108,138 t CO<sub>2</sub>-e, these are presented in the tables and graphs below, which was a decrease of 21% on the previous year.

Council's annual carbon emissions since the baseline year of 2018-19 are also included below which show Council's overall emissions have increased by 4% over this time. This is a direct result of an increase in waste to landfill since 2018-19. Waste is the biggest contributor to Council's carbon emissions footprint representing approximately 80% of Council's total emissions.

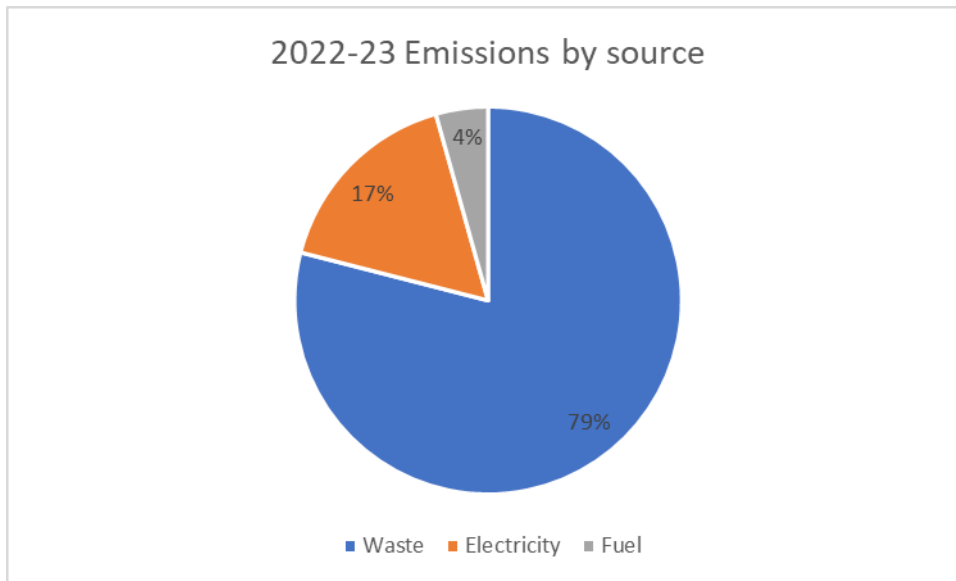
It is important to note that fugitive emissions from sewage treatment plants are not included in the figures below. Fugitive emissions from sewage treatment have proven difficult to reliably calculate and Water & Systems staff are working on this. Current calculations for fugitive emissions from wastewater treatment range from an additional 2 – 20% of our total annual emissions profile.

**Table 1: Annual CO<sub>2</sub>-e emissions by source**

Source (t CO <sub>2</sub> -e)	2018/19	2019/20	2020/21	2021/22	2022/23
Fuel	4,383	3,729	5,574	4,741	4,708
Electricity	25,037	22,737	24,224	22,503	18,008
Waste	75,228	88,326	96,258	110,469	85,423
<b>Total</b>	<b>104,649*</b>	<b>114,792</b>	<b>126,058</b>	<b>137,714</b>	<b>108,138</b>



**Figure 1: Annual CO2-e emissions by source.**



**Figure 2: 2022-23 Emissions breakdown**

## Landfill emissions

Council continues to improve our understanding of landfill emissions, which are very difficult to calculate and lead to fluctuations in our emissions year on year. Although there is a level of uncertainty with the exact quantity of our landfill emissions, we know that emissions from landfill are significant and need to be reduced. While Council pursues emissions reduction projects, we are also striving to better understand and measure the emissions from landfill.

Approximately 80% of Council's carbon emissions are a direct result of waste sent to landfill. Although the waste is generated by the community, Council is the owner of the landfill sites where the emissions are produced. Council's adopted Waste Strategy and Climate Change Strategy outline a range of projects and objectives to decrease the emissions generated by waste, as well as identify opportunities to offset the emissions that cannot be reduced.

When organic material enters a landfill, it is compacted and buried. The landfill site is compacted to reduce the space required to store waste and maximise how much waste can fit into the cell. When organic material breaks down in the presence of oxygen, it releases the carbon dioxide that was stored within the material. But when organic material breaks down in an anaerobic (without oxygen) environment such as a landfill site, methane is produced rather than carbon dioxide. Methane is 25 times more potent as a greenhouse gas compared to carbon dioxide.

The Waste Strategy has set an ambitious target of diverting 70% of waste from landfill. This target requires a multi-pronged approach to change the composition of what the community sends to landfill, how Council processes this waste and how we deal with the emissions from the landfill sites. Council staff are participating in a Hunter Joint Organisation (JO) program to improve measurements and reporting of landfill gas emissions and expect to see improvements in our understanding of these emissions in the coming months.

### **Landfill gas flaring**

Council will be implementing a trial of landfill gas flaring in the 2023-24 financial year. This trial will determine the commercial viability of gas flaring and guide how Council should structure future contracts for this service. The trial will also inform how much gas can be captured for flaring and the quantity of carbon-offsets that can be generated by this process. Flaring methane at a landfill site can generate Australian Carbon Credit Units (ACCUs) that can be sold, traded or retired depending on volume, price and business needs.

Organic materials have embodied carbon that has been absorbed from the environment while the organism was living. When organic material breaks down in a natural aerobic environment, it releases the stored carbon back into the atmosphere. This short-term carbon cycle operates in a 1-for-1 exchange and is therefore carbon-neutral. When organic material breaks down in an anaerobic setting, methane is produced instead of carbon dioxide, increasing the potency of the gas exchange by 25 times. By flaring (burning) the methane gas, the methane is turned back into carbon dioxide and 'corrects' the carbon exchange.

### **FOGO**

Council already has a successful green waste program for garden organic material and will be implementing Food Organics & Garden Organics (FOGO) to further divert organic material from entering the landfill sites. FOGO will mean that residents will be able to place their kitchen scraps into their green bin rather than the red bin. The contents of the green bin will then be composted in a new purpose-built facility that treats the organic material to reduce the production of methane and produce a rich organic material that can be used as a soil conditioner. For every tonne of organic material that is diverted from landfill, it is expected that 1.9 tonnes of CO<sub>2</sub>-e is avoided.

A 2021 audit of Council's kerbside waste collection scheme indicated that approximately 50% of red bin contents could be collected and recycled by the FOGO service if sorted correctly at the household. This would significantly decrease the quantity of organic matter breaking down in landfill and reduce our landfill emissions. In the lead up to FOGO being implemented, Council will increase community engagement to help residents understand how to use the new services.

## Energy emissions

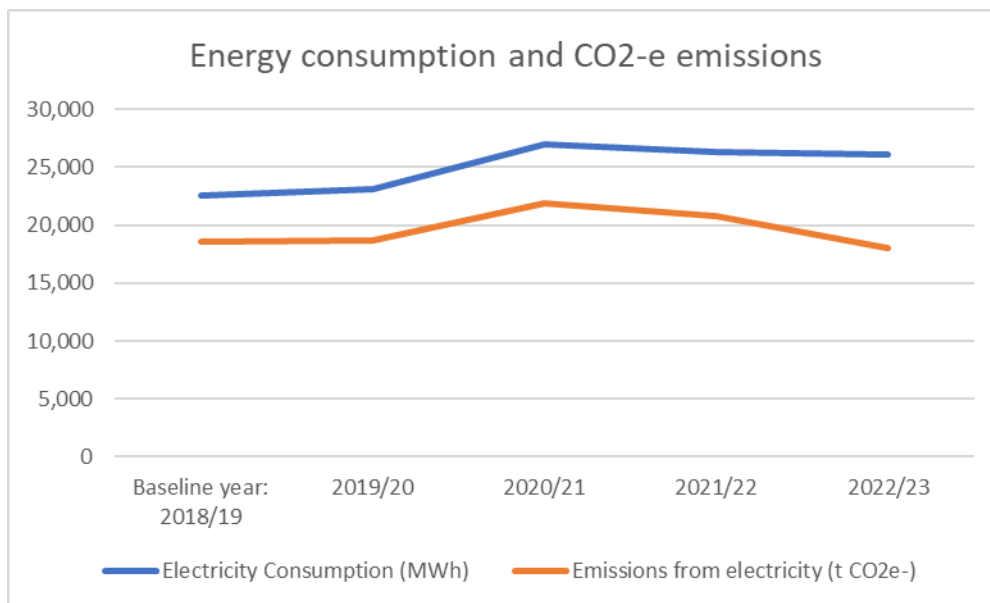
In 2022-23 Council consumed 26,056 MWh of electricity from the grid. This figure has been relatively consistent for the last three years. Water & Systems consume approximately 70% of Council's electricity use for water and sewer. Electricity consumption contributes approximately 17% of Council's total emissions with a total of 18,008 t CO<sub>2</sub>-e from electricity emissions.

Water treatment and pumping requirements do not tend to change significantly from year to year. Sewage treatment energy needs also remain consistent, even as the population grows, the treatment plants tend to operate relatively consistently.

The National Energy Market (NEM) continues to become cleaner, meaning more and more of the grid electricity that we consume is coming from renewable energy sources.

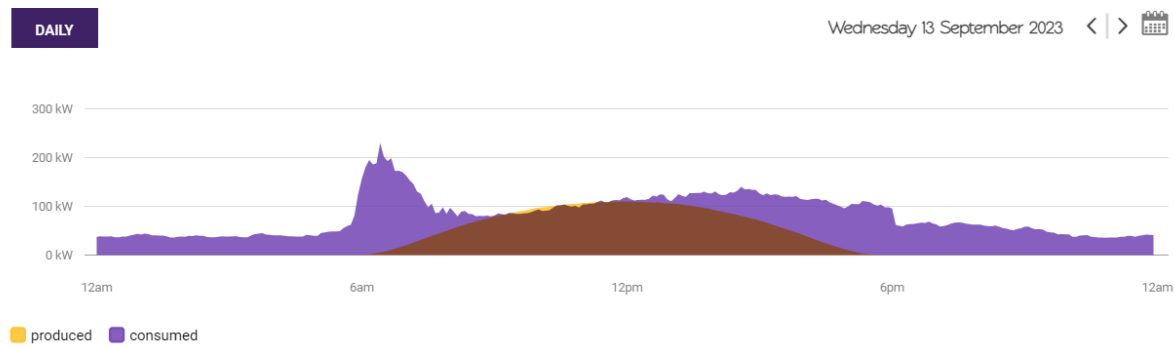
In the 2022-23 financial year, Council installed 102 kW of roof top solar at four Water & Systems sites, plus 86 kW of solar and 70 kW of battery storage at Waste Management Facilities sites. The Water & Systems team also began purchasing 100% renewable energy for the Water & Systems small site contract accounts.

The purchase of 100% renewable energy for Water & Systems small contract accounts has decreased the emissions by 1,000 t CO<sub>2</sub>-e in the first 6 months of the contract. In the graph below we can see that the gap between electricity consumption and the associated emissions is growing. This gap will increase as the grid gets cleaner and Council purchases more renewable electricity.



**Figure 3: Electricity consumption data measured by our electricity retailers and associated CO<sub>2</sub>-e emissions.**

What is not shown in our electricity consumption data is the electricity that Council produces with solar panels onsite and consumes. An example of Council self-consuming renewable energy onsite can be found at Yalawanyi Ganya.



**Figure 4: Yalawanyi Ganya energy consumption and solar production.**

The purple data shows total energy consumption on site at Yalawanyi Ganya. The ‘brown’ data is solar electricity that Council is self-consuming. There are brief moments throughout the day when the solar panels are producing more power than the building needs (displayed in yellow), this energy is being exported to the grid to be consumed elsewhere. In the late morning through to the middle of the day Yalawanyi Ganya is producing and consuming its own renewable energy.

Not all sites have suitable roof space and appropriate energy load profiles to produce their own renewable electricity, but where it is possible, Council will seek to install solar to be less reliant on the grid. Behind the meter solar energy is the cheapest form of electricity available. Producing and consuming renewable energy on site avoids transmission losses and fees, retailer margins, environmental levies and other charges that grid electricity has built into the costs. Consuming renewable energy that is produced on site is helping Council reduce our emissions and costs.

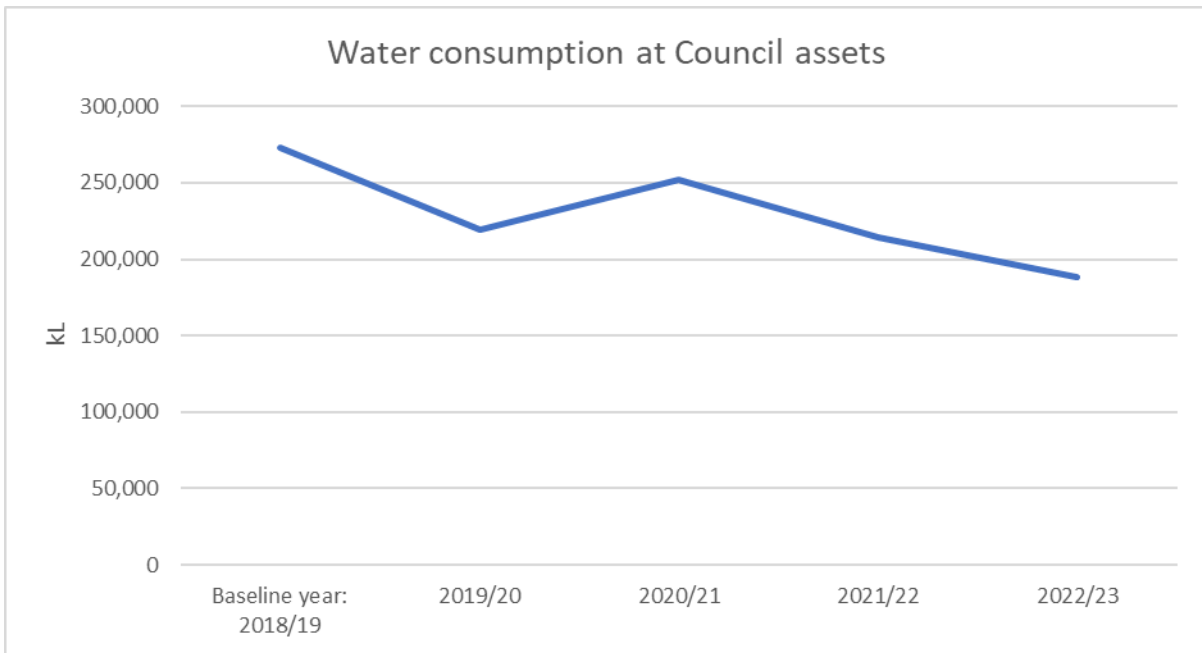
## Fleet emissions

Fuel consumption and subsequent carbon emissions have remained consistent over the past few years. Council’s Fleet Team continue to seek fuel efficiency with new plant and equipment. Council now has three fully electric vehicles that are based in Yalawanyi Ganya and are used as pool cars. These vehicles are reducing Council’s carbon emissions by avoiding the use of petrol or diesel vehicles that would otherwise be used. These electric vehicles are charged at Yalawanyi Ganya using 100% renewable electricity. Council’s fleet team have also increased the number of hybrid vehicles in the fleet with a total of 12 hybrid and 1 plug-in hybrid vehicle.

## Water Consumption

Water consumption at Council assets has been declining since the 2018-19 baseline. Weather conditions have contributed to a decrease in water consumption though a decrease in irrigation requirements and reduced evaporation. Council has also increased smart metering which helps detect leaks and prevent wastage.

MidCoast Council’s long-term water strategy, *Our Water Our Future 2050*, was adopted by Council in August 2023. The strategy outlines how Council will provide sustainable and affordable water and sewer services to the MidCoast community over the next 30 years. *Our Future Our Water 2050* sets a clear path for how we will navigate the challenges we face from climate change and population growth and proposes a range of solutions to make the region more resilient.



**Figure 5: Downward trend in water consumption driven by weather conditions and water efficiency measures.**

## Consultation

This report was prepared in consultation with the members of Council’s Climate Change Project Control Group.

## Community Impacts

While the Climate Change Strategy largely focuses on addressing Council’s carbon emissions and climate change risks, Council does recognise through its June 2019 resolution and declaration the important role of government in building the capacity of the community and households to take their own action. The first step in influencing the community to take action is for Council to lead by example which can be demonstrated by adopting emission reduction and renewable energy targets and undertaking measures to reduce its own carbon footprint.

Council will focus on supporting the community to reduce its own emissions as part of its Phase 2 work on the community’s climate change response. This will encompass action around strategic planning, education and capacity building, incentives and financial support, advocacy and collaboration, infrastructure development and land use planning.

Council’s newly appointed Senior Sustainability and Climate Change Officer has recently undertaken a community workshop with the University of the Third Age (U3A) Environmental Group. The workshop discussed climate change, the carbon cycle and actions that Council and the community can take to address the current carbon imbalance.



## Governance

Council has recently begun an Internal Audit process to review our response to climate change and climate risks. Outcomes of this process will help further guide our ongoing response to climate change and the risks posed to Council assets and the community.

During 2022-23 Council continued its participation in the NSW Government's Sustainability Advantage and Sustainable Choice Programs and the Climate Council's Cities Power Partnership to gain access to resources and support to enable local government to take meaningful action on climate change. Council has also been working closely with the Hunter JO on several sustainability working groups that will strengthen our sustainability performance.

The Climate Change Project Control Group (PCG) has been working within Council to better coordinate Council's response to climate change including the implementation of the Climate Change Strategy. The Climate Change PCG has recently completed a Management Diagnostics workshop through the Sustainability Advantage program that is designed to identify strengths and weaknesses in our approach to addressing climate change.

## Alignment with MidCoast Community Strategic Plan

Actions to reduce Council's carbon emissions align with the outcomes and strategies outlined in Council's Community Strategic Plan, specifically:

**Community Outcome 2:** *An integrated and considered approach to managing our natural and built environments.*

*Our natural environment is protected and enhanced while we maintain our growing town centres and manage our resources wisely.*

**Strategic Objective 2.3:** *Council works towards net zero emissions.*

**2.3.1** *Incorporate renewable energy and energy efficiency in future design and planning*

**2.3.2** *Promote energy and resource efficiency initiatives to our community*

**2.3.3** *Invest in renewable energy efficient measures, power purchasing agreements and carbon sequestration*

**2.3.4** *Minimise waste through education, reduction, reuse, recycling and repurposing*

Climate Change is also one of five key areas of importance that are addressed in the service statements throughout Council's current Delivery Program and Operational Plan, particularly in relation to waste, fleet, energy efficient streetlighting and the installation of renewable energy systems such as solar PV.

