



05

ANNUAL CARBON
EMISSIONS REPORT

Executive Summary

This report is the annual emissions report to track actions and progress in line with the Climate Change Strategy. Council produces an update report every 6 months to track and report progress.

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 2023-24 and summarises the key initiatives that are currently being implemented by Council to lower its emissions. Council continues to invest in projects that will decrease our operational costs, lower carbon emissions and improve our environmental performance.

Emissions from landfill gas and electricity use have decreased in 2023/24 compared to 2022/23, while fuel emissions have remained stable. Although the addition of sewage treatment emissions to our annual report has resulted in an overall increase in our reported total emissions, sewage treatment emissions have not actually increased, they were previously not included in the annual report.

Background

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 2023-24 financial year to show how Council is tracking towards the net zero emissions target. It also provides a summary of the major initiatives undertaken by Council during this period to reduce its carbon footprint.

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 2023-24 Carbon Emissions

Council currently subscribes to Azility's energy efficiency software platform to help monitor its water, electricity and fuel consumption and the associated costs, waste to landfill, and carbon emissions. Council continues to improve its understanding of sources of emissions and is improving the methodologies for calculating emissions from the landfill sites and sewage treatment plants.

Greenhouse gas emissions are expressed as carbon dioxide equivalent (CO²-e). CO²-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 (CH₄) has a global warming potential (GWP) of 25, which means 1 tonne of CH₄ is 25 tonnes of CO²-e.

Council is now using the Clean Energy Regulator (CER) approved National Greenhouse and Energy Reporting (NGER) Solid Waste calculator. Previously, Council have relied on the NGER scope 3 method for calculating landfill emissions. The change in methodology has not resulted in a significant change in the total emissions reported by Council, however, changing the calculation method allows Council to more accurately track and report landfill emissions, especially as we prepare for landfill gas flaring which will reduce landfill emissions.

Council's total carbon emissions for 2023/24 was 117,056 t CO²-e and are presented in the table 1 and figure 1 and 2 below. Council's annual carbon emissions since the baseline year of 2018/19 are also included in Table 1 below. 2023/24 is the first year where sewage treatment emissions are included in the annual total.

Emissions from sewage treatment have previously been excluded from the annual emissions report, despite being included in the Climate Change Strategy. There has previously been an inconsistency in the methodology for calculating sewage treatment emissions, as such the total emissions from sewage treatment increased from 202/21 to 2021/22. For consistency with previous reporting, annual have not been changed from 2018/19 – 2022/23.

Council will continue to implement improvements in reporting of emissions to ensure that the most accurate and transparent calculation methods are used in alignment with the CER and NGER guidelines.

Table 1: Annual CO2-e emissions by source

Source (t CO2-e)	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Fuel	4,383	3,729	5,574	4,741	4,708	4,668
Electricity	25,037	22,737	24,224	22,503	18,008	15,494
Landfill	75,228	88,326	96,258	110,469	85,423	80,126
Waste Water treatment	1628	1,649	2,344	20,217	19,475	16,768
Total	104,649*	114,792	126,058	137,714	108,138	117,056

*note, Waste water emissions are included in the Climate Change Strategy but have previously been excluded from the annual emissions reporting (previously excluded data is displayed in red).

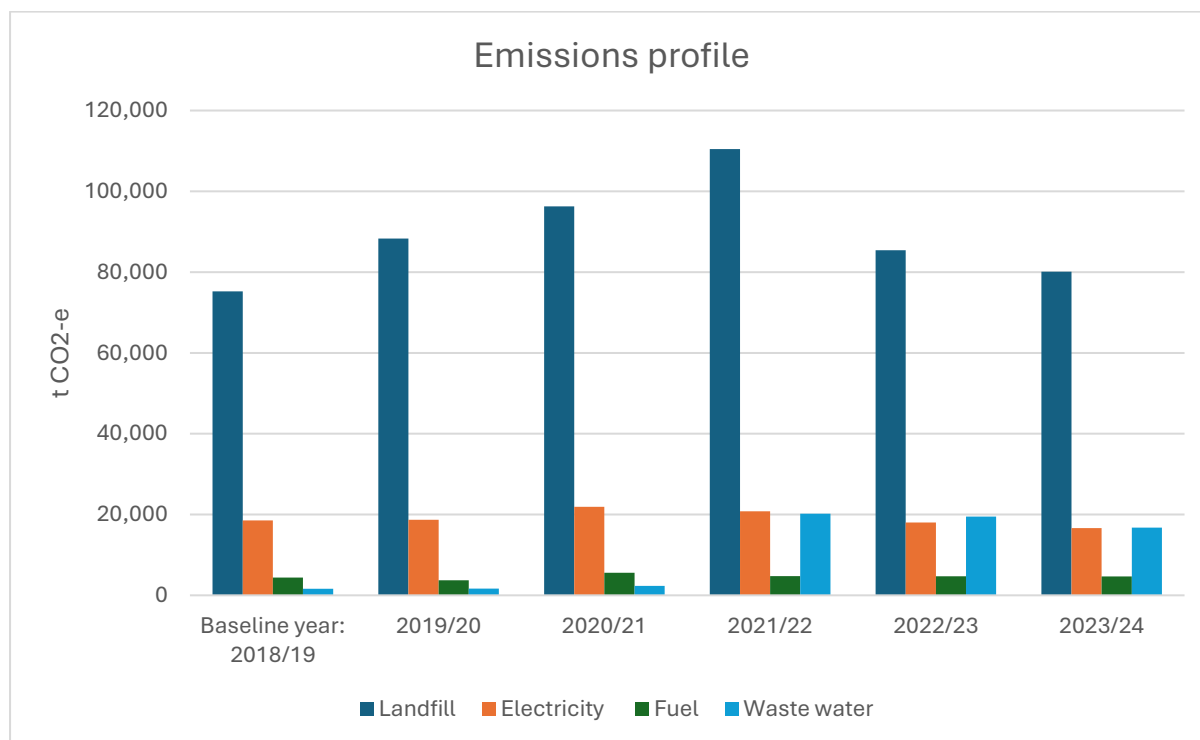


Figure 1: Annual CO2-e emissions by source.

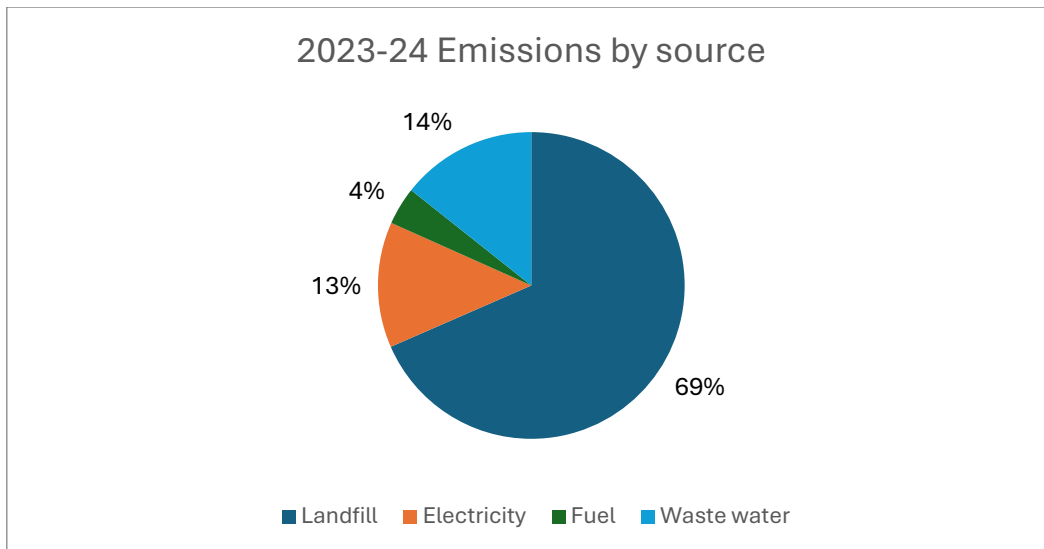


Figure 2: 2023/24 Emissions breakdown

Landfill emissions

Approximately 69% 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 it deals with the emissions from the landfill sites.

Landfill gas flaring

Council will be implementing a trial of landfill gas flaring. This trial will determine the commercial viability of gas flaring. 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 CO₂-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 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.

Sustainability Centre

MidCoast Council has recently completed the construction of the MidCoast Sustainability Centre, jointly funded through the Bushfire Local Economic Recovery Fund and MidCoast Council Waste Services. Located at Tuncurry Waste Management Facility, the building showcases sustainable architecture principles including solar passive design, recycled brick, timber and low emissions concrete. The landscape has been planted with bushfire resilient species and will act as a living plant library, complete with plant identification plaques, for visitors to view.

The purpose of the facility is to provide education to the community aligned with sustainability initiatives, circular economies, waste reduction and recycling. The facility has three workshop spaces where information sessions will be held. The Sustainability Centre also has a small office for MCC staff and a food safe kitchen for catering.

The centre is due to open officially open on Monday the 11th of November in alignment with commencement of National Recycling Week. On Saturday the 16th of November, a community open day will be held. During this event the Sustainability Centre will be used to run a series of workshops for the community including composting and permaculture, DIY bees wax wraps and Insects and ecosystems. There will also be waste facility tours, activities and a showcase of information and pop-up stalls.

Community waste engagement

Community consultation and engagement is essential to improving recycling practices and identifying areas for improvement in waste diversion. Current data indicates that approximately 9% of materials in kerbside red landfill bins are recyclable, while kerbside yellow recycling bins contain about 12% contamination. Contamination rates hinder recycling efforts and threaten MidCoast Council's 2030 target to reduce waste to landfill by 70%.

Envirocom has been engaged to support the Waste Team to deliver a strategic community engagement plan designed to both improve the recovery rate of recyclables and prepare the

community for the future transition to FOGO. This plan includes a broad range of actions from waste audits, surveys, improved educational material, business waste reduction plans, school education and media campaigns.

Waste and recycling pop-up stalls will continue across the LGA, led by the Waste Team. These stalls are designed to educate the community on waste management and improve recycling practices. The stalls also serve as a platform to address community inquiries regarding waste collection services, such as bulky waste disposal, bin collection schedules, and navigation of the MidCoast Council website for waste-related information. Over 2,633 people have been engaged over six months with the intent to continue to improve and adapt to community needs.

Energy emissions

In 2023/24 Council consumed 26,056 MWh of electricity from the grid. This figure has been relatively consistent for the last four years. Water & Systems consume approximately 70% of Council's electricity use for water and sewer. Electricity consumption contributes approximately 13% of Council's total emissions with a total of 15,494 t CO₂-e from electricity consumption.

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 Council consumes is coming from renewable energy sources.

In the 2023/24 financial year, Council installed 84.4 kW of roof top solar at two Water & Systems sites and a Waste Management Facilities sites. The Water & Systems team also continued 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 1,951 t CO₂-e this financial year. In the graph below we can see that the gap between the electricity consumption and the associated emissions is growing. This gap will increase as the grid gets cleaner and Council purchases more renewable electricity.

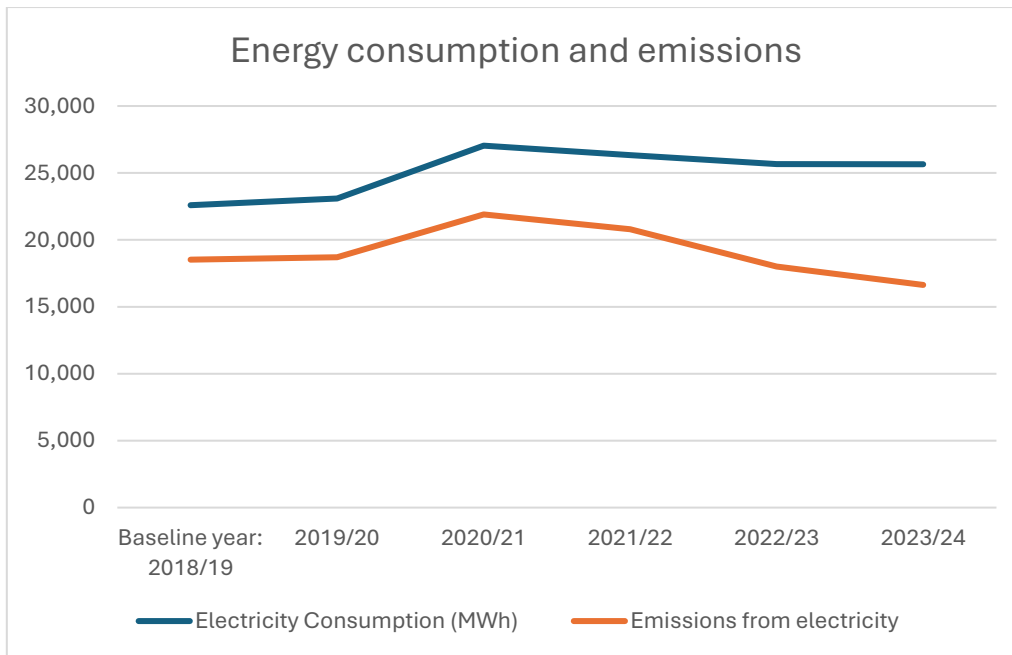


Figure 3: Electricity consumption data measured by our electricity retailers and associated CO₂-e emissions, the gap between consumption (measured in MWh) and emissions (measured in CO₂-e) will continue to grow as the grid becomes cleaner and Council purchases more renewable electricity.

Council is preparing to install rooftop solar at the Manning Aquatic & Leisure Centre as well as the Great Lakes Aquatic Centre. The new rooftop systems will provide most of the energy required to operate the centres during the middle of the day. Aquatic Centres consume significant amounts of electricity for pumping, filtering and heating water. Detailed system designs have been developed for the installation of these systems and work is expected to be completed in the 2024/25 financial year.

The Water & Systems Team have also undertaken a study on an improved filter cleaning process at Tea Gardens Water Treatment Plant. The study resulted in an improved pumping efficiency of 23% and will result in 38.9 MWh per year in energy savings when one filter has been cleaned. A second filter onsite is due to be cleaned in coming months and will further improve efficiency and energy savings.

It is likely that despite energy efficiency and behind the meter renewable energy projects, Council's total electricity consumption will increase in the medium and long term. Electrification of vehicles and an increase in population will continue to drive energy consumption up. Purchasing renewable electricity will mean that even if Council's electricity consumption grows, the emissions from electricity will not grow.

Fugitive emissions from sewage treatment

The treatment of sewage at Council's sewage treatment plants results in greenhouse gas emissions. During the process of treating sewage, nitrous oxides, methane and carbon dioxide are released as gases. The term Fugitive Emissions is used to describe emissions that 'leak' from a site, rather than as a result on burning a fossil fuel. (landfill gas emissions are also a fugitive emission). These gases are released into the atmosphere and contribute to the enhanced greenhouse gas effect. Due to the nature of Council's sewage treatment network, most of the treatment plants are relatively small in scale and greenhouse gas reduction technologies are not technically or financially viable. Council will continue to monitor the

industry for new and improved technologies that could assist in the future to reduce greenhouse gas emissions from these sites.

Fuel emissions

The CO₂-e emissions from Council's fleet (including passenger vehicles, light commercial vehicles [LCVs] and trucks) has remained steady over the last 12 months. The Fleet Team is continuing to consider CO₂-e emissions in fleet asset procurement decisions. Currently there is a very limited range of lower emission options for LCVs and trucks with none considered suitable for Council. Electric and hydrogen trucks are not considered to be practical at this stage.

There is continued development of vehicle technology to support fleet emissions reduction. Ongoing industry monitoring by Council including involvement in relevant industry associations will help identify suitable opportunities. This includes trialling EVs that could replace ICE vehicles.

In the passenger vehicle fleet there has been an increase in the selection of hybrid vehicles. The proportion of the passenger fleet comprised of BEV, HEV and PHEV vehicles has more than doubled (from 6% to 14% in the last reporting period) and work is in progress to support the ongoing increase of this metric through improved staff awareness and appropriate policy changes. This transition will contribute to reduced fuel use and emissions.

Council's operational staff are increasingly using battery powered electric power tools. These tools do not rely on petrol for power and as such, are quieter, safer and easier to use. Battery technology continues to improve and become available in more and more commercial applications. Some of the benefits to staff include no fumes, less vibration, less noise, easier to start, no need to carry fuels, reduced disturbance to residents and businesses and the ability for the batteries to be used on multiple tools.

The batteries for these tools are charged overnight and last the full day while staff work. Chainsaws, leaf blowers, hedgers, pole pruners and whipper snippers are all being used with very positive feedback from the staff who are using them.

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 through a decrease in irrigation requirements and reduced evaporation. Council has also increased smart metering which helps detect leaks and prevent wastage. Although the 2023/24 financial year saw an increase from 2022/23, the overall trend is still decreasing.

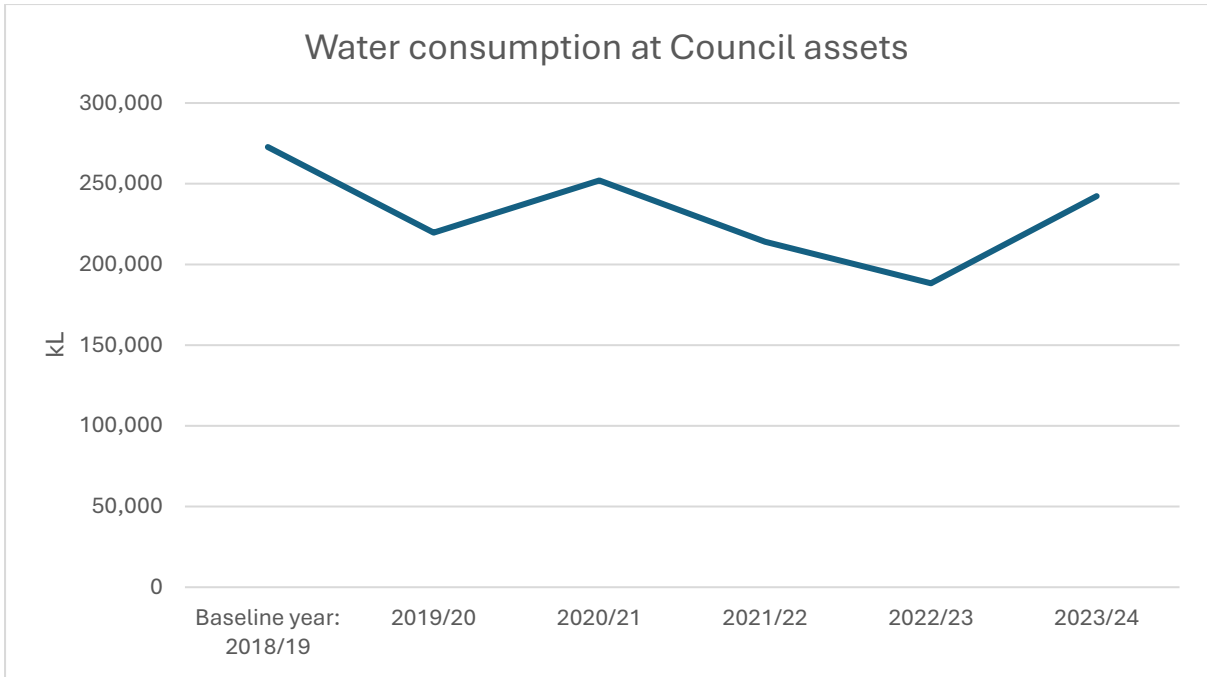


Figure 5: Downward trend in water consumption driven by weather conditions and water efficiency measures.

Water Conservation – Leak Detection

As part of the Department of Climate Change, Energy, the Environment and Water (DCCEE) Regional Leak Detection Program, Council completed its second annual review across approximately 500 km of mains assets. Theoretical system wide leaks in the magnitude of 7.4 ML / week were identified through the use of audible leak detection technology. As at the end of August 2024, 110 of 112 identified leaks had rectification works completed. Some 52 private leaks were also identified, with over half having been confirmed repaired by customers.

As part of the MidCoast Council Holiday Park Community of Practice, its 22 member parks are engaged with water conservation, efficiency and awareness programs. Leveraging data loggers to track their water consumption, they are also alerted of leaks; the average leak rate ending June 2023 was 4.6L / min / site from the high in January of 14.3 L / min / site. This significant reduction was largely achieved through two holiday parks finding and repairing several large leaks, alongside the continued incremental improvements in several other parks.

A reduction in water leaks indirectly results in a reduction in emissions as less potable water is required to be produced at the water treatment plants, saving energy at the treatment plant and pumping stations.

Consultation

This report was prepared in consultation with the members of Council’s Climate Change Project Control Group and Sustainability Working 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 climate emergency 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 has facilitated the installation of electric vehicle charging stations at Wynter Street, Taree. The 12 electric vehicle charging bays will attract travellers from the Pacific Highway to visit Taree. The location for these chargers was selected based on available space for the supporting transformers and proximity to shops.

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, advocacy and collaboration, infrastructure development and land use planning.

Council's Senior Sustainability and Climate Change Officer has recently undertaken a community workshop at the Taree University Campus. The workshop discussed climate change, the carbon cycle and actions that Council and the community can take to address the current carbon imbalance.

Governance

The Climate Change Project Control Group has been working within Council to better coordinate Council's response to climate change including the implementation of the Climate Change Strategy.

Council has recently undertaken an Internal Audit process to review our response to climate change and climate risks. Outcomes of this process are guiding our ongoing response to climate change and the risks posed to Council assets and the community.

During 2023-24 Council continued its participation in the NSW Government's Sustainability Advantage and Sustainable Choice Programs. Council has also been working closely with the Hunter JO on several sustainability working groups that will strengthen our sustainability performance.

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.