File: CST-080.12.004 Doc: IC20/96

ITEM 4 PUBLIC EXHIBITION - DRAFT CLIMATE CHANGE MITIGATION PLAN

Wollongong City Council is one of 26 Councils in Australia to commit to greenhouse gas reduction through the Global Covenant of Mayors for Climate and Energy (GCoM). Under the GCoM initiative Council is required to undertake a series of actions to respond to the risks and opportunities presented by climate change. These actions include adoption of a science-derived emissions reduction target on behalf of the City of Wollongong and development of a Climate Change Mitigation (emissions reduction) Action Plan.

At its meeting on 9 December 2019, Council considered a report on proposed emission reduction targets, following engagement with the community, businesses and industry about the proposed target and what can be done to reduce emissions. Council adopted an emissions reduction target for the City of Wollongong of net zero emissions by 2050, and a target of net zero emissions by 2030 for Council operations.

A draft Climate Change Mitigation Plan (draft Plan) has been prepared to guide delivery of actions for the next two years in achieving the emissions reduction targets. The draft plan proposes actions to establish partnerships with government, business, industry and community groups and undertake research and pilot projects within our community, all of which will help to reduce emissions and inform actions in subsequent plans. The draft Plan also includes the roll out some key projects to reduce emissions of Council's own operations.

RECOMMENDATION

1 The draft Climate Change Mitigation Action Plan be placed on public exhibition for a period of 42 days.

2 Following public exhibition, a further report be provided to Council on the submissions received and any amendments proposed, seeking adoption of the plan.

REPORT AUTHORISATIONS

Report of: Chris Stewart, Manager City Strategy
Authorised by: Linda Davis, Director Planning + Environment - Future City + Neighbourhoods

ATTACHMENTS

1 Draft Climate Change Mitigation Plan 2020

BACKGROUND

In August 2017, Council became a signatory to the GCoM initiative. GCoM is an international alliance of cities and local governments with a shared long-term vision of promoting and supporting voluntary action to combat climate change and move to a low emission, resilient society.

GCoM commits Council to respond to the risks and opportunities presented by climate change and provides a structured framework for compliance. The required commitments relating to emissions reduction include completing an emissions inventory, adopting a science-derived emissions reduction target for the LGA and developing a Climate Change Mitigation (emissions reduction) Action Plan.

In determining an emission reduction target, Council undertook extensive consultation with the community and key stakeholders. It was made apparent through this process that the community supports setting of emission reduction targets for the Wollongong LGA and Council operations and wants Council to demonstrate leadership on climate change. The community desires a move towards renewable energy sources, making transport more sustainable, planting more trees and reducing waste to landfill.

At its meeting on 9 December 2019, Council considered a report on the emissions reduction target and resolved that -

1 *A science-derived greenhouse gas emissions reduction target of net zero emissions by 2050 for the City of Wollongong be submitted to the Global Covenant of Mayors secretariat. Noting that Council is submitting this target on behalf of the community, for the benefit of the entire community and that Council is not solely responsible for the implementation of actions to achieve this target. This target is to be reviewed in five (5) years with a view to reduce the timeline from 2050 to 2030 in line with Council's target.*

2 *Council work towards an aspirational greenhouse gas emissions reduction target of net zero emissions by 2030 for organisational operations and that this commitment be reviewed in five (5) years to enable consideration of progress towards the target.*

3 *Council develop a Climate Change Mitigation Action Plan in collaboration with key stakeholders to assist all sectors of the community achieve the emissions reduction target for the Wollongong local government area.*

4 *Council join the Cities Power Partnership Program.*

Council joined the Cities Power Partnership Program (CPP) in January 2020. At its meeting on 16 March 2020, Council resolved to commit to the following five pledges -

- Install renewable energy (solar PV) on Council buildings
- Implement landfill gas methane flaring or capture for electricity generation
- Encourage sustainable transport use such as public transport, walking and cycling through Council transport planning and design
- Set city-level renewable energy or emissions reduction targets
- Adopt best practice energy efficiency measures across Council buildings, and support community facilities to adopt these measures.

Council staff have been working to prepare a draft Mitigation Plan to guide Council's efforts towards achieving the emissions reduction targets. The draft Plan will also facilitate attainment of Council's pledges under the CPP.

PROPOSAL

This initial draft Plan is provided in Attachment 1 and is targeted for delivery over the next two years. Whilst it is acknowledged that this is a short timeframe, the plan will set the scene for how Council intends to move forward with meeting the emissions reduction target and supporting the city to meet its target. It sets out preliminary actions that will provide information and establish strong relationships for continued success. Strong foundations for collaboration are necessary to give Council and the city the best chance of achieving the emissions reduction targets. Moreover, technology associated with emissions reduction and industrial efficiency is rapidly evolving, it is therefore important that Council is able to respond to these opportunities and update/ produce new plans as required.

The draft Plan sets out 92 actions for Council for the next two years to reduce its emissions and to support the community to reduce their emissions. It includes actions to establish partnerships with government, business, industry and community groups, undertake required research and pilot projects within our community and to roll out some key projects to reduce Council's emissions.

The draft Plan prescribes actions under six themes as follow -

1 **Climate change leadership and planning**: actions for Council to demonstrate leadership in considering climate change in all areas of operations and service, advocate to other levels of Government for our community, foster innovation, collaborate regionally and monitor our performance.

2 **Energy efficiency and renewable energy**: including energy efficiency and renewable energy projects for buildings, facilities and streetlights.

3 **Transport**: addressing options for lowering emissions from Council fleet, supporting the uptake of electric vehicles and public and active transport.

4 **Waste**: including capture of landfill gas, rolling out Food Organics Garden Organics (FOGO) across the city, additional recycling services, waste wise events and expanding educational programs to further address food waste.

5 **Trees and vegetation**: covering biodiversity conservation projects and urban greening to cool our city.

6 **Working with our community**: actions to partner with business and industry to promote their emissions reduction successes and encourage and support more sustainable practices, engage with and educate our community to support emissions reduction.

The actions proposed in the draft Plan are classified as either -

- Actions to directly reduce emissions (e.g. installing solar panels, diverting organic waste from landfill), or
- Enabling actions, such as implementing strategies, policy change, collaboration or education, to provide support and frameworks for Council and the community to reduce emissions.

Where adequate data was available, actions predicted to achieve direct emissions reduction have included projected annual emissions reduction calculations. Delivery of these actions alone, is expected to reduce the annual emissions of Council operations by 25% (~35,200 tonnes CO2-e p.a). In addition, there is a significant number of direct actions where projected emissions reductions are unable to be calculated at present but once implemented and operating, savings will be more easily calculated. There is a vast array of enabling actions, all of which will contribute to achieving Council and the Wollongong LGA's emissions reduction targets.

In accordance with the GCoM requirements, Council will undertake a new inventory of emissions for the Wollongong LGA every two years. These inventories will compile up-to-date information on emissions from energy use, transport, waste and wastewater from all sources across the city. Council will also continue to monitor its own emissions data for its electricity and gas consumption for Council buildings and facilities, fuel consumption from its fleet and emissions from waste to landfill. These emissions profiles will be re-calculated next in 2021 to track how the city and Council are changing and progressing towards the emissions reduction targets.

A subsequent Mitigation Plan will be prepared which is informed by the updated emissions profiles, project status, the availability and feasibility of new technologies, any new opportunities or threats, and ongoing collaboration with the community of Wollongong.

It is therefore recommended that Council endorse the draft Plan as attached to this report for public exhibition and a further report be provided to Council following this process for adoption.

CONSULTATION AND COMMUNICATION

The Wollongong community has contributed to the development of actions within the draft Plan through engagement processes that were undertaken in 2019. During May-July 2019, the community was asked to provide input into the review of the Environmental Sustainability Policy and the Environmental Sustainability Strategy. The engagement process involved an online ideas tool on Council's Engagement HQ website, feedback form, nine workshops/sessions with schools and interested community members, Aboriginal groups, and the Walking, Cycling and Mobility Reference Group. The community was asked what was important to them in terms of sustainability, why it was important and what action Council could take.

During October-November 2019, feedback was sought on the proposed emissions reduction target of net zero emissions by 2050 for the City of Wollongong. The engagement process involved an online ideas tool on Council's Engagement HQ website, feedback form and direct contact with key business

groups. The community were asked to provide feedback on the proposed target and suggest actions to reduce emissions within the city.

A large number of ideas for actions to reduce emissions were provided through these processes, broadly focusing on -

- Renewable energy sources for Council operations, businesses and the community
- Sustainable transport options
- Management and reduction of waste and expansion of the FOGO program
- Planting more trees
- Council demonstrating leadership in relation to climate change.

These suggestions were then presented to Council staff from across the organisation in February 2020 to determine the feasibility and priority of actions. This resulted in a range of actions, either new or already planned, being incorporated into the draft Plan.

A 'Climate Emergency' update was shared with the community in March via social media, Council's website and direct email contact with participants of the community engagement on the emissions reduction target. This update provided an overview of the scope and timing of this plan and included information about the GCoM and CPP programs.

It is proposed that during public exhibition, engagement activities will occur with specific stakeholder groups and broad community engagement through online engagement tools, to be promoted through newspapers, social media and radio.

PLANNING AND POLICY IMPACT

This report contributes to the delivery of Wollongong 2028 Goal 1 – 'We value and protect our natural environment' and Goal 2 – 'We have an innovative and sustainable economy'. Under these goals the draft plan delivers on the following objectives -

Objective 1.1 - Our natural environment, waterways and terrestrial areas are protected, managed and improved

Objective 1.2 - We practice sustainable living and reduce our ecological footprint

Objective 1.5 - Set targets and reduce our greenhouse gas emissions through our participation in the Global Covenant of Mayors for Climate and Energy.

Objective 2.2 - The regions industry base is diversified

It specifically delivers on the following Strategies and Actions as shown in Table 1.

Table 1: Relevant Strategies and Actions

Community Strategic Plan	Delivery Program 2018-2021	Operational Plan 2019-20
Strategy	3 Year Action	Operational Plan Actions
1.2.1 Reduce our ecological footprint, working together to minimise the impacts of climate change and reduce waste going to landfill	1.2.1.1 Develop and implement a range of programs that encourage community participation in reducing Wollongong's ecological footprint	1.2.1.1.1 Coordinate community environmental programs including: Rise and Shine, Clean Up Australia Day, World Environment Day, National Recycling Week, International Composting Week and other waste education activities
	1.2.1.3 Methods to reduce emissions are investigated and utilised	1.2.1.3.3 Monitor and report on organisational water, energy and greenhouse gas emissions trends
		1.2.1.3.4 Implement and review annual water and energy saving actions
1.2.2 Government and community work together to mitigate the impacts of climate change on our environment and future generations	1.2.2.1 Our community is proactively engaged in a range of initiatives that improve the sustainability of our environments	1.2.2.1.3 Develop a project and work with partners to further explore the United Nations Sustainable Development Goals and how they align to the community's goals with funding to be considered through the business proposal process
		1.2.2.1.4 Implement resourced priority actions from the Environmental Sustainability Strategy 2014-22

Table 1 (cont'd): Relevant Strategies and Actions

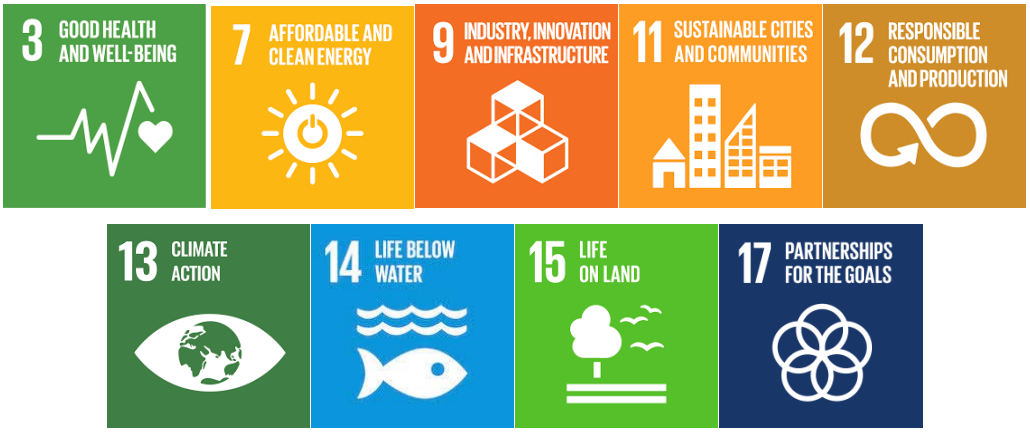
Community Strategic Plan	Delivery Program 2018-2021	Operational Plan 2019-20
Strategy	3 Year Action	Operational Plan Actions
1.5.1 Participate in the Global Covenant of Mayors and set emissions reduction targets for the City	1.5.1.1 Set an emissions reduction target and carry out actions to reduce greenhouse gas emissions through the Global Covenant of Mayors	1.5.1.1.2 Set an emissions reduction target that is in alignment with the Global Covenant of Mayors compliance requirements
		1.5.1.1.3 Develop a Climate Change Adaptation Action Plan and an Emissions Reduction Action Plan
2.2.1 Further diversify the region's economy through a focus on new and disruptive industries and green technology	2.2.1.1 The development of renewable energy products and services is supported	2.2.1.1.1 Seek out opportunities to incorporate green technologies in Council's projects and contracts

This draft Plan falls within the suite of documents that underpin and are informed by the draft *Sustainable Wollongong: A Climate Healthy City Strategy*. The actions within this draft Plan aim to deliver on the following goals of the draft Strategy -

- Environmental and climate leadership underpins Council decision-making and service delivery, and inspire the same in others

- Together we protect our environment, reduce emissions and increase resilience to climate change
- We will achieve net zero emissions by 2030 for Council operations, and together we will achieve net zero emissions by 2050 for the city
- Our ecosystems and waterways are enhanced, our urban areas are cooler and greener and our community is connected to our natural environment
- Our community only take what they need, reuse and recycle what they can and are aware of the resources that they consume

The adoption of an emissions reduction target and Climate Change Mitigation Plan will support the achievement of the following United Nations Sustainable Development Goals –



SUSTAINABILITY IMPLICATIONS

The impacts of climate change will significantly affect vulnerable communities, infrastructure and asset viability and management, biodiversity and water availability. Implementation of the actions in the draft Plan will mean that Council and the City of Wollongong is reducing emissions and contributing to avert and reduce the impacts of climate change.

The draft Plan will directly support Council's August 2019 Climate Emergency Declaration, adopted of emissions reduction targets on December 2019 and commitments under the GCoM program.

RISK MANAGEMENT

There will be significant environmental and social risks associated with not addressing climate change. Council is the owner of significant assets including roads, bridges, coastal infrastructure, buildings and facilities that will be affected by the impacts of climate change and the health and wellbeing of our community, and future generations, will also be affected by the impacts of climate change.

There is a reputational risk if Council does not adopt a plan to reduce emissions following the recent Climate Emergency Declaration and the adoption of emissions reduction targets. Council will also be non-compliant with the GCoM requirements and will need to reconsider its commitment to the GCoM and CPP.

FINANCIAL IMPLICATIONS

The majority of actions that are identified as requiring budgetary provision are either projects already planned for implementation through the current Infrastructure Delivery Program, or existing operational programs already planned and budgeted for. However, some funds will be required to deliver on actions in the two-year Plan, identified as new projects. These projects include expanded community education

programs, pilot projects for improving energy efficiency and support uptake of renewable energy in our schools and community and a trial of waste timber separation and recycling. This additional funding will be sought through grant applications as well as the annual budgeting and business proposal process. The amounts are shown in Table 2.

Table 2: Existing and new funding outline

Type of Project	Examples of Projects	Already Budgeted Amount	New Funding Required
Capital actions within IDP	Energy efficiency upgrades, solar PV installation	$22,428,000	
Existing operational programs	Waste management, community environmental programs, natural area management, urban greening	$1,317,000 pa	
Other planned projects	FOGO, streetlight upgrade	$6,474,836	
New ongoing operational actions proposed	Expanded community education programs, targeting adults and including more food waste focus		$30,000 pa
New projects proposed	Pilot projects for improving energy efficiency and support uptake of renewable energy in our schools and community and a trial of timber separation and recycling		$279,000
Sub-totals (for two-year plan)		**$31,536,936**	**$339,000**
Total (for two-year plan)		**$31,875,836**	

Actions adopted within this plan may also be eligible for grant funding from a range of NSW and Commonwealth grant programs.

These actions are likely to result in cost and efficiency savings to the organisation associated with reduced energy consumption and there is the opportunity to reinvest these savings into further emission reduction actions.

CONCLUSION

The draft Climate Change Mitigation Action Plan confirms Council's commitment to reducing emissions in line with its Climate Emergency Declaration and GCoM initiative. The draft Plan outlines actions for the next two years to set the scene for ongoing emissions reduction and demonstrates commitment to work with all sectors of the community. Actions focus on establishing partnerships, undertaking research and monitoring, piloting projects within our community as well as continuing to roll out planned projects to reduce emissions from Council's operations. Implementation of these actions will help Council and the community to work towards achievement of the emissions reduction targets.

The Mitigation Plan will be reviewed and actions updated to progress emission reduction beyond the initial implementation period. The review will be informed by re-inventories of Council and community emissions to track our progress, strong collaboration with community stakeholders, project status and learnings and new technological advances.

This report recommends that the draft Plan be placed on public exhibition to provide the opportunity for community feedback prior to the draft document being finalised and adopted by Council.


Wollongong City Council
DRAFT
CLIMATE CHANGE MITIGATION PLAN
2020
Working together to reduce our emissions
wollongong
city of innovation

Wollongong City Council **Draft Climate Change Mitigation Plan 2020**

Acknowledgment of Country

Wollongong City Council would like to acknowledge and pay respect to the Traditional Custodians of the Land, to Elders past and present, and extend that respect to the Aboriginal and Torres Strait Islander people residing within the Wollongong Local Government area.

Glossary of terms and acronyms

CPP Cities Power Partnership

CO_2 Carbon Dioxide

CO_2-e Equivalent tonnes of Carbon Dioxide. The universal unit of measurement to indicate the global warming potential (GWP) of each GHG, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate the climate impact of releasing (or avoiding releasing) different GHGs on a common basis

DCP Development Control Plan

ESD Ecologically Sustainable Development

EV Electric vehicles

FCEVs Fuel Cell Electric Vehicles

FOGO Food Organics Garden Organics

GHG Greenhouse Gas

Gt Gigatonne is a unit of measure equal to 1,000,000 tonnes

HVAC Heating, Ventilation and Air Conditioning

IPCC Intergovernmental Panel on Climate Change

kL Kilolitre is a unit of measurement equal to 1,000 litres.

kt Kilotonne is a unit of measure equal to 1,000 tonnes

kWh Kilowatt hours is a unit of energy equal to 1000 watt hours or 3.6 megajoules.

LED Light Emitting Diode

LEP Local Environmental Plan

LGA Local Government Area

LPG Low Pressure Gas

LSPS Local Strategy Planning Statement

Mt Megatonne is a unit of measure equal to a million tonnes

MW Megawatt is a unit of measure equal to a million watts

PPA Power Purchase Agreement

PV Photo-voltaic

SEPP State Environmental Planning Policy

W Watt

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Executive Summary

Wollongong City Council is committed to reducing greenhouse gas emissions in the Wollongong Local Government Area. Council will lead the community of Wollongong by both implementing and supporting effective action. Council is part of a vast group of local governments around the world taking the initiative to act on climate change at a local level. Council has joined the international Global Covenant of Mayors for Climate and Energy and the national Cities Power Partnership Program, both of which support local government to move towards lower emissions. In 2019, Council declared we are in a state of climate emergency that requires urgent action by all levels of government. As part of the Global Covenant of Mayors for Climate and Energy program, Council has a target of net zero emissions by 2050 for the City of Wollongong. Council also recognised the significance of its own contribution to the city's emissions and the need to demonstrate leadership, and so set a target of net zero emissions by 2030 for its own operations.

The community of Wollongong have provided feedback to Council that it supports setting the emissions reduction targets and wants Council to demonstrate leadership on climate change. The community desires a move towards renewable energy sources, making transport more sustainable, planting more trees and reducing waste to landfill.

This Climate Change Mitigation Plan is for 2020-2022 and sets the initial scene for how Council intends to move forward on the journey to meeting the emissions reduction targets. It sets out preliminary actions that will provide information and establish strong relationships for continued success. There are 92 actions for Council to reduce its own emissions and to support the community and businesses to reduce theirs. This plan does not allocate actions to external organisations, groups or individuals, however future plans may include a more holistic range of actions developed in partnership for the whole local government area. The actions are set out under the themes of:

- Climate Change Leadership and Planning
- Energy Efficiency and Renewable Energy
- Transport
- Waste
- Trees and Vegetation
- Working with our Community.

Where adequate information was available, actions aimed at directly reducing emissions from Councils buildings, facilities and landfill were subject to a calculation of the expected emissions reduction. From these actions alone, it is expected that the annual emissions of Council operations will be reduced by 25% in the next two years, many attributed to management of waste. There are also a vast array of enabling actions, which will indirectly contribute to Council's and the City of Wollongong emissions reduction targets through supporting strategies, education, monitoring and reporting.

The value of all the actions in this Plan over two years is approximately $32,000,000, over and above staff time, including all operational and capital projects that include emissions reductions aspects.

This is the first of many plans that will be prepared, and these will be informed by regular re-inventories of Council and City emissions to track our progress and will benefit from previous success stories, learnings and new technological advances. The next emissions inventories will be undertaken in 2021 and a new plan will be developed for 2022-26.

1 Introduction

Climate change is a global problem, with a variety of impacts currently being felt around the world. The primary cause of climate change is the release of greenhouse gas emissions primarily from human activities, such as the burning of fossil fuels (coal, oil and natural gas), agriculture and land clearing. Global temperatures have been increasing in the last century. In New South Wales (NSW), natural hazards such as heat waves, heavy rainfall and severe bushfire conditions have occurred more often and have been more intense.

The likely impacts of climate change on the Illawarra region have been projected by the NSW Government. The region is projected to continue to warm in the near future (2020–39) on average by about 0.6°C and far future (2060–79) on average by about 1.9°C, compared to recent years (1990–2009). The number of hot days above 35°C is projected to increase, and cold nights below 2°C will decrease. Rainfall is projected to decrease in winter and increase in summer and autumn. The region is also projected to experience an increase in average and severe fire weather (Office of Environment and Heritage, 2014).

Keeping global temperature rise below 1.5°C above pre-industrial levels is considered a critical limit to protect lives and livelihoods (Climate Council, 2018). The Intergovernmental Panel on Climate Change report on *Global Warming of 1.5°C* found that limiting global warming to 1.5°C would require "rapid and far-reaching" changes to the management of land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide (CO_2) would need to reach 'net zero' by around 2050 (IPCC, 2018).

Wollongong City Council is committed to reducing greenhouse gas emissions. Council joined the Global Covenant of Mayors for Climate and Energy (GCoM) program, has completed an emissions inventory and set emissions reduction targets. The targets are net zero emissions by 2030 for its own operations and for the City of Wollongong by 2050. The development of this plan is the next step in the GCoM program.

Net zero emissions broadly refer to a state where any emissions of greenhouse gases generated are counterbalanced by removal of greenhouse gases from the atmosphere. In practice this means reducing emissions as far as possible, then offsetting the remainder. Offsetting refers to any 'residual emissions' that remain after undertaking actions to achieve net zero emissions can be addressed by purchasing and retiring an equivalent number of carbon offsets. For local councils, achieving a net zero at a Local Government Area (LGA) level will mean first avoiding and reducing emissions in a way that balances the economic, social and environmental needs of the LGA.

This Climate Change Mitigation Plan (the Plan) sets the scene for how Council intends to move forward with meeting the emissions reduction targets. It is the first of many plans to strive to meet the targets, with each new plan being informed by regular re-inventories of Council and City of Wollongong emissions to track our progress and benefitting from previous success stories, learnings and new technological advances.

This Plan prescribes actions for delivery for the next two years and focuses on important preliminary actions that will provide information and establish strong relationships for continued success. It includes actions to establish partnerships with government, business, industry and community groups, undertake required research and pilot projects within our community and to roll out some key projects to reduce Council's emissions.

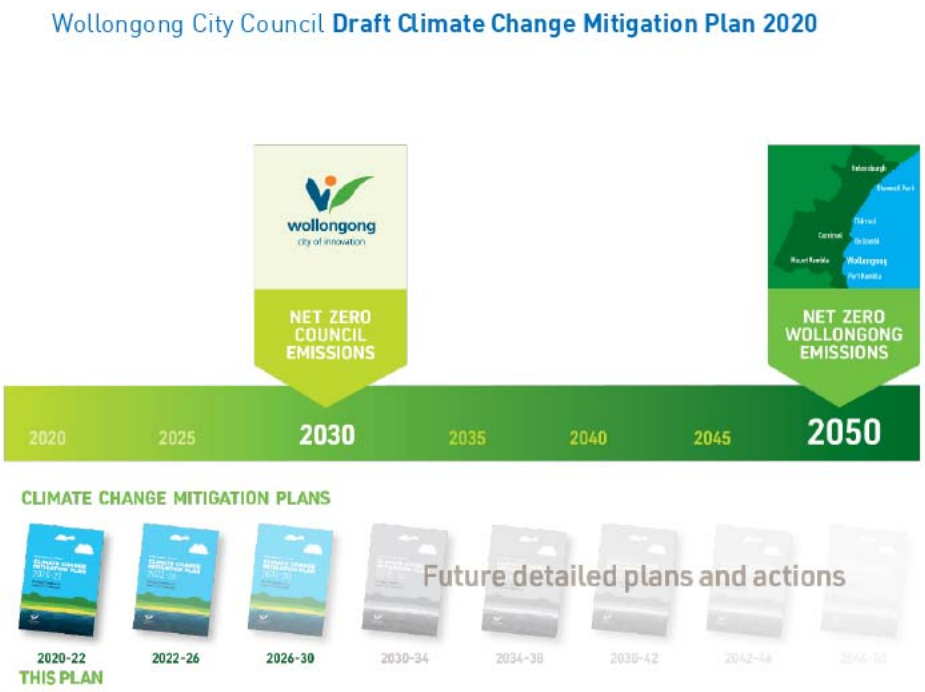

Figure 1: The role of this Plan in moving towards the emission reduction targets

1.1 Scope of the Plan

1.1.1 Mitigation vs Adaptation

Responding to climate change involves both reducing greenhouse gas emissions (mitigation) and being prepared to adapt to any unavoidable impacts of climate change as they are realised (adaptation). This plan is focusing on mitigation of emissions. A separate 'Adaptation' plan will be prepared to address how Council and the community can adapt to projected changes in climate. There are often synergies and co-benefits of actions for both mitigation of and adaptation to climate change. As Council continues to review and advance it's planning and activities these synergies will be identified and pursued.

1.1.2 Role of local government

Climate change adaptation and mitigation is the responsibility of all spheres of government as well as businesses, the community and individuals. While Council recognises that local government has an important role in both mitigation and adaptation, it is also important to recognise that many strategies for mitigation are outside of the statutory responsibility or influence of local government.

Council's responsibilities relate to reducing its own emissions and encouraging and supporting the community to reduce their emissions through education and engagement, behaviour change programs and planning and development processes. Council has varying influences on reducing emissions, such as having a direct influence on assets it owns or builds to having an advocacy or supporting role to encourage other to reduce their emissions. Some aspects of emissions reduction such as carbon pricing are outside the direct scope and influence of local government. A more detailed summary of the Council's role in climate change mitigation is provided in Table 1.

Table 1: Scope of Council's mitigation responsibilities

Within Scope (direct influence)	
Council's buildings and facilities	Council owns approximately 740 buildings and facilities and are responsible for the maintenance and construction of buildings and facilities. Council aims to integrate principles of environmental sustainability into the construction, refurbishment, fit-out and operation of buildings through implementing best practice sustainable building design and performance standards.
Energy source and use in Council buildings and facilities	Council is responsible for and has direct control over the amount and source of energy used within its buildings.
Council's fleet system	Council is responsible for and has direct control over the size and type of vehicles that comprise its vehicle fleet as well as the fuel sources used.
Urban planning	Council has a regulatory role through the Council's Local Environmental Plan (LEP) and Development Control Plan (DCP). The LEP and DCP sets out the provisions for how the LGA is developed which may then influence energy and transport use. The DCP has controls for development building and design, but is limited by its non-legislative status.
Waste management	Council is responsible for collecting and managing waste produced by households and operates the Wollongong Waste and Resource Recovery Park at Whyte's Gully. Effective waste management (i.e. recycling, organics composting and diversion from landfill) can reduce greenhouse gas emissions.
Community infrastructure	Provision of public walking and cycling infrastructure, priority parking systems and electric vehicle charging stations on public land can encourage sustainable transport choices.
Community transport	Provision of community transport programs and support of the Wollongong free shuttle bus service.
Within scope (indirect influence)	
Household energy use	Council can encourage and support energy savings and efficiency, use of renewable energy, and the use of sustainable transport by individuals and businesses through education or incentives but cannot directly control it.
Building and development	Minimum energy requirements are set out in Section J of the National Construction Code. The State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 mandates provisions relating to reduced consumption of mains-supplied potable water, reduction of greenhouse gases emissions and improved thermal comfort for all residential development. Council can encourage and support energy efficient and environmentally sustainable buildings and development to go beyond the minimum BASIX requirements.
Waste production	Council can support and encourage residents and businesses to avoid, reduce, reuse and recycle their waste production but cannot directly control it.
Street lights	Street lights are owned, operated and maintained by the electricity distributor Endeavour Energy within the Wollongong LGA. Council pays the electricity costs, as well as the maintenance and replacement costs for these lights and therefore has a stake in and can influence street light replacements.

Outside Scope	
Carbon pricing	Responsibility of the Federal Government. Council has an advocacy role only.
Energy regulation and supply	Responsibility of the State Government. Council has an advocacy role only.
Public transport	Responsibility of the State Government and private operators. Council has an advocacy role only.
Regional planning	Responsibility of the State Government.

1.2 Objectives of the Plan

The overarching objectives of the Plan are to:

1. Lead to the community in emissions reduction and climate change action
2. Reduce Council's greenhouse gas emissions through effective energy management and improving energy efficiency
3. Reduce Council's greenhouse gas emissions through the increased use of renewable energy and alternative fuels
4. Reduce Council's greenhouse gas emissions from landfill through resource recovery and gas capture
5. Support the community and businesses to reduce their greenhouse gas emissions.

2 Context

2.1 International, Australia and New South Wales context

Climate change was formally recognised globally at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. In 2015, a global commitment by countries was agreed at the 21st Conference of the Parties in Paris. The Paris Agreement includes a global commitment to limit global temperature rise to below 2°C above pre-industrial levels and pursue efforts to limit the rise to 1.5 degrees and a commitment to achieve net-zero emissions, globally, by the second half of the century.

The Sustainable Development Goals is a global strategy agreed by the United Nations General Assembly, and contains 17 goals for 2015-2030, including the following goals directly relevant to climate change mitigation and adaptation (United Nations, 2020) (Figure 2).

Figure 2: Sustainable Development Goals directly relevant to climate change

Source: United Nations 2020

In response to ratifying the Paris Agreement, Australia set a target to reduce emissions by 26-28% below 2005 levels by 2030 (Commonwealth of Australia, 2020). The range of Australian policies relating to climate change can be found at https://www.environment.gov.au/climate-change

The NSW Government endorses the Paris Agreement and has committed in its Climate Change Policy Framework to take action that is consistent with the level of effort to achieve Australia's commitments to the Paris Agreement. The Framework includes an objective to achieve net zero emissions by 2050 (State of NSW and Office of Environment and Heritage, 2016). The range of NSW polices relating to climate change can be found at https://climatechange.environment.nsw.gov.au/About-climate-change-in-NSW/NSW-Government-action-on-climate-change.

The *Net Zero Plan Stage 1: 2020–2030* is the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050 (Department of Planning, Industry and Science, 2020). The plan aims to deliver a 35% cut in emissions by 2030 compared to 2005, and will support a range of initiatives targeting electricity and energy efficiency, electric vehicles, hydrogen, primary industries, coal innovation, organic waste and carbon financing. The plan details the establishment of a $450 million

Emissions Intensity Reduction Program to support businesses to transition plant, equipment and processes to low emissions alternatives. This program will be complemented by the Commonwealth's $450 million commitment to New South Wales from the Climate Solutions Fund. Furthermore, the NSW and Commonwealth Governments will commit a further $1.07 billion over 10 years under a Bilateral Memorandum of Understanding, to the Energy Efficiency, Electric Vehicle Infrastructure and Model Availability, Primary Industries Productivity and Abatement, Coal Innovation, Clean Technology and Hydrogen programs described *Net Zero Plan Stage 1: 2020–2030* (Department of Planning, Industry and Science, 2020). These programs will potentially provide significant support to Council, businesses and residents to reduce emissions.

The NSW Government has also looked at climate change at a regional level for the Shoalhaven and Illawarra region, in the Shoalhaven Illawarra Enabling Regional Adaptation Project. While the project focussed on the region vulnerabilities to climate change and actions to minimise the impacts of climate change, there are synergies with climate change mitigation actions. This includes transition models for energy, transport and industrial systems (State of NSW and Office and Environmental and Heritage, 2019).

2.2 Wollongong City Council context

2.2.1 Council's Planning Framework

Our Wollongong 2028 is the Council's Community Strategic Plan. *Our Wollongong 2028* includes a community vision and goals and guides Council's work. Climate change is highlighted as a key challenge for our future. This Plan contributes to multiple goals, objectives, strategies and actions from the *Our Wollongong 2028*, and specifically addresses the Strategy 1.5.1 'Participate in the Global Covenant of Mayors and set emissions reduction targets for the City'.

Figure 3: Council's planning framework

This Plan will be a 'supporting document', which is a direction setting document to support the development and implementation of the Community Strategic Plan, Council's Resourcing Strategy, Delivery Program and Operational Plans (Figure 3). However, until the actions are enabled through resourcing and included in the Delivery Program and Operational Plan, they remain aspirational.

2.2.2 Sustainable Wollongong: A Climate Healthy City Strategy

The draft *Sustainable Wollongong: A Climate Healthy City Strategy* is the guiding document for all environmental and sustainability programs. It outlines Council's commitment to environmental sustainability for both Council operations and our community and identifies pathways to create a sustainable, greener, healthier, cooler and more liveable City. The Strategy is an overarching document which brings together the many environmental programs that we are implementing across our City and Council's operations. The priority areas and goals of the Strategy are:

- Priority Area: A city whose council shows leadership
  Goal: Environmental and climate leadership underpins Council decision-making and service delivery, and inspire the same in others
- Priority Area: A city that works together
  Goal: Together protect our environment, reduce emissions and increase resilience to climate change
- Priority Area: A low emissions city
  Goal: We will achieve net zero emissions by 2030 for Council operations, and together we will achieve net zero emissions by 2050 for the city
- Priority Area: A city in harmony with our environment
  Goal: Our ecosystems and waterways are enhanced, our urban areas are cooler and greener and our community is connected to our natural environment
- Priority Area: A low waste city
  Goal: Our community only take what they need, reuse and recycle what they can and are aware of the resources that they consume
- Priority Area: A climate and water resilient city
  Goal: Our infrastructure and community can adapt to the impacts of a changing climate and water is valued as a vital natural resource

This Plan falls within the suite of documents that underpin the Strategy, and the actions within this Plan aim to deliver on many of the goals of the Strategy. These links are detailed in Section 5: Action to reduce our emissions.

2.2.3 Complementary and Supporting Council Strategies and Policies

There are also several other complementary and supporting Council strategies and policies that relate to climate change issues (Table 2). Further work will be done on integrating Council's climate change response through an organisational review, which will include these policies and strategies (see actions under Theme 1). This also includes a range of plans that relate to climate change adaptation, which will be considered when preparing the Climate Change Adaptation Plan.

Table 2: Complementary and supporting strategies and policies

Plans and Policies		Mitigation or Adaptation
Wollongong Waste and Resource Recovery Strategy 2022		Mitigation
Economic Development Strategy 2019-2029		Mitigation
Bike Plan 2014-2018 (being updated to Wollongong Cycling Strategy 2030)		Mitigation
Pedestrian Plan 2017-2021		Mitigation
Community and Crown Land Plans of Management		Mitigation and Adaptation
Planning and Development strategies and policies	• **Local Environmental Plan and Development Control Plans** • **Town Centre and Village Plans** • **Neighbourhood Plans** • **West Dapto Vision**	Mitigation and Adaptation
Social plans	• **Ageing Plan 2018-2022** • **Beach and Foreshore Access Strategy 2019-2028** • **Community Safety Plan 2016-2020** • **Disability Inclusion Action Plan 2016-2020** • **People for Places Wollongong Social Infrastructure Planning Framework 2018-2028**	Mitigation and Adaptation
Sustainable Procurement Policy and Procedures		Mitigation
Sustainable Events Guidelines (under development)		Mitigation
Wollongong Coastal Zone Management Plan 2017		Adaptation
Wollongong Dune Management Strategy 2014		Adaptation
Lake Illawarra Coastal Management Program (draft)		Mitigation and Adaptation
Illawarra Regional Food Strategy 2013		Mitigation and Adaptation
Illawarra Biodiversity Strategy 2011		Mitigation and Adaptation
Illawarra Escarpment Strategy Management Plan 2015		Mitigation and Adaptation
Urban Greening Strategy 2017-2037		Mitigation and Adaptation
Floodplain Risk Management Plans		Adaptation
Stormwater Management Plans		Adaptation
Asset Management Plans		Adaptation
Illawarra Local Emergency Management Plan 2017		Adaptation
Illawarra Region Bushfire Risk Management Plan 2016		Adaptation
Wollongong City Local Flood Plan 2010		Adaptation

2.3 Climate Emergency Declaration

In August 2019, Council declared we are in a state of climate emergency that requires urgent action by all levels of government. In doing so, it joins close to 100 other Australian local councils that have declared a climate emergency since 2016.

By declaring we are in a state of climate emergency, Council acknowledges that climate changes pose a serious risk to life as we know it and that current measures being implemented are not enough to limit human caused climatic changes. This declaration means that Council needs to ensure that the climate emergency response is considered as a high level of importance in all Council decision making. This includes taking all actions possible to reduce emissions through advocacy, partnerships with other councils, supporting local community action and reducing Council's own emissions.

2.4 Global Covenant of Mayors for Climate and Energy

Council joined the Global Covenant of Mayors for Climate and Energy in August 2017. This is an international group of more than 9,200 cities and local governments that support voluntary action to combat climate change and with a long-term vision to moving to a low emission, climate resilient future. The key objectives of this program are to mobilise city level action, raise the bar on standards of practice and facilitate cities working together better.

Councils are required to meet certain milestones in two streams: climate change mitigation (emissions reduction) and climate change adaptation (Table 3). Council has completed the emissions inventory and set targets for the Wollongong LGA, which are informing this plan.

Table 3: Global Covenant of Mayors milestones and status

Milestone	Status
Register commitment	Completed August 2017
Complete an LGA-wide emissions inventory	Completed August 2018
Complete a climate change hazards assessment	Completed August 2018
Adopt a science-derived emissions reduction target for the LGA	Completed December 2019
Complete a climate change vulnerability assessment	Underway
Develop a climate change mitigation plan	Underway - this document
Develop a climate change adaptation plan	Underway

2.5 Cities Power Partnership Program

Council joined the Cities Power Partnership Program in January 2020. The Climate Council launched this program to support and accelerate the climate action taking place in Australian local governments. Councils are supported to increase renewable energy, energy efficiency and sustainable transport and are encouraged to collaborate and share knowledge with other participant Councils. Councils are required to commit to climate action by submitting five pledges to increase renewable energy, energy efficiency and sustainable transport and collaboration.

Council has committed to the following pledges:

- Install renewable energy (solar PV) on Council buildings
- Implement landfill gas methane flaring or capture for electricity generation
- Encourage sustainable transport use such as public transport, walking and cycling through Council transport planning and design
- Set city-level renewable energy or emissions reduction targets
- Adopt best practice energy efficiency measures across Council buildings, and support community facilities to adopt these measures.

Delivery on the actions within this Plan will assist to achieve the pledges. In turn, it is envisaged that Council's CPP membership and associated collaborative partnerships and access to information will assist Council with action delivery.

3 Wollongong's emissions profile and reduction targets

3.1 Defining the greenhouse gas emission profile

As a signatory to the Global Covenant of Mayors for Climate & Energy, Council is required to develop an emissions profile compliant with the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories. This means that the emissions are reported by sector, greenhouse gas type and scope (Figure 4).

As activities taking place within Wollongong LGA can generate GHG emissions inside and outside the LGA boundary, the following categories are used to describe where they occur:

- Scope 1: GHG emissions from sources located within the city boundary
- Scope 2: GHG emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the city boundary
- Scope 3: All other GHG emissions that occur outside the city boundary as a result of activities taking place within the boundary (Ironbark Sustainability, 2018).

The emissions profile for Wollongong LGA was prepared to cover the geographic boundary of the City of Wollongong LGA, for the financial year of 2016-17 and includes Scopes 1-3 emissions.

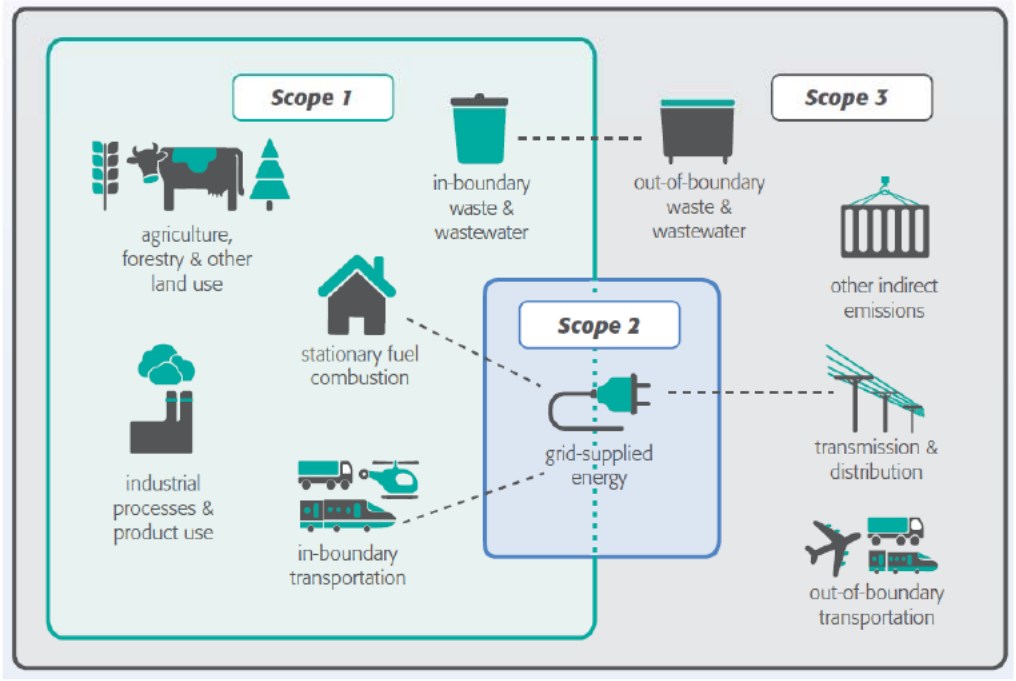

Figure 4: Emission scopes and boundaries

(Source: Global Protocol for Community-Scale Greenhouse Gas Emission Inventories)

It is important to note that the City of Wollongong emissions profile for this Plan is a snapshot only and where necessary for completeness, state or national data scaled down to the LGA level is used.

The methodology will improve over time as data becomes more readily available (Ironbark Sustainability, 2018). This differs from the emissions profile for Council operations, which uses actual energy consumption and landfill data, and hence accounts for any small differences between the two emissions profiles.

3.2 Emissions profile for Wollongong Local Government Area

The total emissions summary is provided in Figure 5. The City of Wollongong's total annual emissions have been calculated as 3,091,346 kt CO_2-e. This is a snapshot of the emissions profile for 2016-17 and this profile will vary from year to year. The majority of Wollongong's emissions (78%) are from the stationary energy sector, which is mainly electricity consumed by residential, commercial and institutional facilities and manufacturing and construction activities. Transportation is the next largest sector at 19% (Table 4 and Figure 5).

Table 4: Emissions profile for the Wollongong Local Government Area (2016-17)

Category	Emissions (t CO_2-e)	Percentage
Stationary Energy	2,406,496	78%
Transport	584,545	19%
Waste	75,558	2%
Wastewater	24,747	1%
Total	**3,091,346**	**100%**

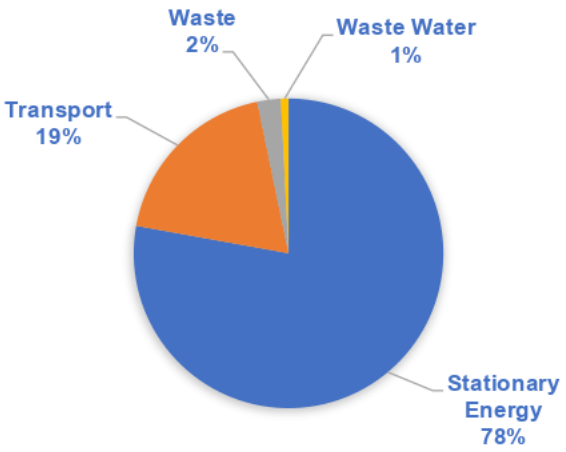

Figure 5: Emissions profile for the Wollongong Local Government Area (2016-17)

The majority of the City of Wollongong's emissions are Scope 2, which refers to emissions released as a result of grid-supplied energy, generally from outside of the municipal boundary to heat, steam and/or cool within the city boundary. The use of electricity in buildings, facilities and manufacturing is the primary source of Scope 2 emissions (Ironbark Sustainability, 2018). Figure 6 shows the emissions categorised by scopes, according to source, with the stationary energy category broken down into three subcategories: residential, commercial and manufacturing (Ironbark Sustainability, 2018).

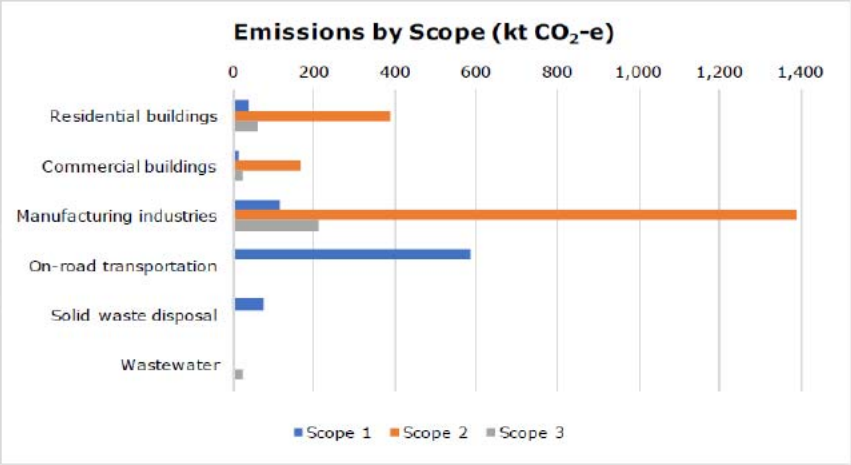

Figure 6: City of Wollongong total emissions categorised by scope, according to source (2016-17)

3.3 Emissions profile for Wollongong Council operations

To determine Council's emission profile, a variety of source data has been collated including waste to landfill and fleet information (Scope 1) and electricity and gas use (Scope 2). This measure is an important step in better understanding the different aspects of Council's operations which can be made more efficient in terms of greenhouse related emissions. Additionally, these efficiency improvements often lead to reduced operational costs. Council operations account for approximately 5% of the LGA emissions. Table 5 and Figure 7 show the emissions profile for Council operations for 2017-18.

Table 5: Emissions profile for Wollongong City Council operations (2017-18)

Category	Emissions (t CO_2-e)	Percentage
Landfill	118,580	85%
Streetlights	8,432	6%
Electricity	7,994	6%
Fuel	3,543	2%
Gas	855	1%
Total	**139,404**	**100%**

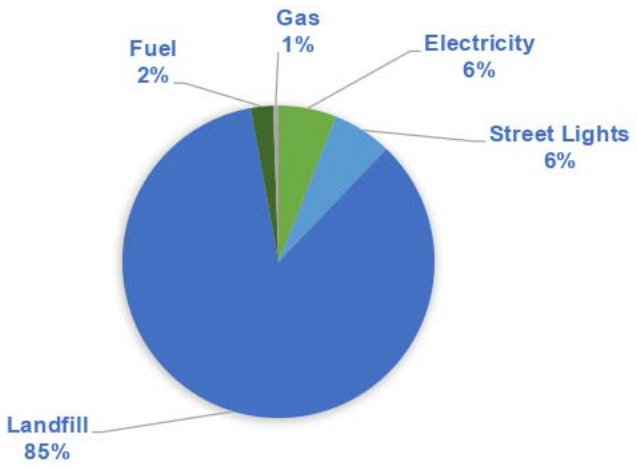

Figure 7: Emissions profile for Wollongong City Council operations (2017-18)

As Council manages the landfill at Whyte's Gully, where waste is received from the wider community, the emissions from waste disposed of at this facility is included in the Council operations emissions profile. With the exception of its own waste, Council does not have full control over the amount of waste taken to the landfill but has a role in encouraging and supporting waste minimisation, reuse and recycling in the community and can reduce the amount of emissions through gas capture and flaring.

The management of streetlights is a complicated issue. Streetlights are owned, operated and maintained by the electricity distributor Endeavour Energy within the Wollongong LGA and have operational control under the *National Greenhouse and Energy Reporting Act 2007*. Council pays the electricity costs, as well as the maintenance and replacement costs for these lights and therefore has a stake in and can influence street light replacements.

Council has full control over the emissions from its consumption of fuel from its fleet operations and gas and electricity in its buildings and facilities, with the exception of those operated by others under a lease or licence.

3.4 Determining City of Wollongong's carbon budget and science-derived target

Under the Paris Agreement, a global carbon budget allocation of 1040 Gt CO_2-e was determined by the Intergovernmental Panel on Climate Change (IPCC). This is based on the amount of carbon emissions that can be produced globally (indefinitely) to keep global temperature rise below 2°C compared to pre-industrial temperatures. This is the level that has been determined to avoid catastrophic climate change. Carbon budgets were then derived for individual countries across the world based on populations, socio-economic factors and growth projections.

A 'science-derived target' is aligned with this broader emissions reduction required to keep global temperature increase to below 2°C compared to pre-industrial temperatures.

City of Wollongong's carbon budget of 49, 185 kt CO_2-e has been determined based on the carbon budget allocation for Australia, as the limit that we cannot exceed in order for Wollongong to play its role in avoiding catastrophic climate change. In developing a science-derived target for the Wollongong LGA the following were considered:

1. Australia's current carbon budget at September 2018 is calculated at 7.26Gt CO_2-e. This is the Australian Climate Change Authority national carbon budget minus all the emissions that have occurred since the budget was derived, per the National Greenhouse Gas Inventory.
2. The carbon budget is adjusted to account for the sources considered in Wollongong's emissions profile (stationary energy, transport, agriculture, solid waste and wastewater). This is done by applying the proportion of each sector from the most recent National Greenhouse gas inventory. This means that sectors which have not yet been modelled (land use change and forestry, industrial processes and product use) are not included in the budget but can be easily added as the data becomes available.
3. The adjusted national carbon budget is then scaled down to the municipal-level based on the percentage of emissions for the included sector that occurred in Wollongong according to the most recent data (Ironbark Sustainability, 2019).

Further scaling factors were applied once the total carbon budget was calculated. These included the Socio-Economic Index for Areas (SIEFA) and projected population growth (Ironbark Sustainability, 2019).

Table 6 below shows the scaled science-derived target for the City of Wollongong, as calculated in October 2018.

Table 6: Scaled science-derived target for Wollongong LGA (Ironbark Sustainability, 2019)

Remaining budget for Wollongong (kt CO_2-e)	49,185
Remaining years without change (years)	18.2
Linear annual reduction (kt CO_2-e)	74.251
Linear rate of reduction (p.a)	2.7%

The *remaining years without change* (18.2 years) calculates how long this carbon budget would last, based on the emissions released in 2017-18 financial year. The *required annual reduction* and *required rate of reduction* indicates Wollongong's need to reduce emissions by 74 kt CO_2-e (2.7%) per year until 2050, assuming the carbon budget is used in a linear fashion over this time period (Ironbark Sustainability, 2019).

The remaining budget in t CO_2e- will change each year due to reductions in the overall budget available based on the emissions released nationally drawing from the Australian carbon budget. However,

while numbers for the carbon budget can change, the remaining years without change and the % reduction required are similar. This is because the updates that have been applied to the calculation of the science-derived target also apply to the calculation of the City of Wollongong emissions profile (Ironbark Sustainability, 2019).

In December 2019, Council adopted a science-derived greenhouse gas emissions reduction target of net zero emissions by 2050 for the City of Wollongong, which has been submitted to the Global Covenant of Mayors secretariat. Noting that Council is submitting this target on behalf of the community, for the benefit of the entire community and that Council is not solely responsible for the implementation of actions to achieve this target. This target is to be reviewed in five years with a view to reduce the timeline from 2050 to 2030 in line with Council's target.

Council also adopted that it will work towards an aspirational greenhouse gas emissions reduction target of net zero emissions by 2030 for organisational operations and that this commitment be reviewed in five years to enable consideration of progress towards the target.

Council will be preparing a new inventory of emissions for the City of Wollongong every two years, to compile up to date information on the GHG emissions from energy use, transport, waste and wastewater from all sources. Council will also continue to compile its own emissions data for its electricity and gas consumption for Council buildings and facilities, fuel consumption from its fleet and emissions from waste to landfill.

3.5 Identifying opportunities to reduce emissions

Emissions reductions can be considered according to a hierarchy of Avoid, Reduce, Replace and Offset, as shown on Figure 8, and examples of actions related to each category are detailed below. Wollongong City Council will consider offsetting as a last possible step, after opportunities for emissions reduction have been implemented. The process of identifying actions and opportunities to reduce emissions will be an ongoing process, will be expanded over time through further scoping works, and as new technologies become available or affordable.

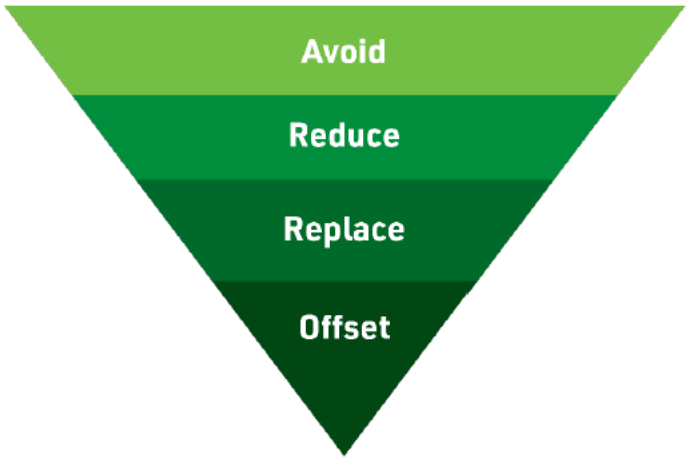

Figure 8: Hierarchy of emissions reduction

Avoid- The best way to reduce emissions is to not create them in the first place. Examples include turning off electrical devices when not in use, avoid travel by instead using video-conferencing or encouraging active transport in the city rather than driving.

Reduce- This relates to making activities less emission intensive by introducing more efficient technologies, such as LED lighting, undertaking energy efficiency improvements to buildings, fuel-efficient vehicles and reducing waste to landfill.

Replace- This typically refers to transitioning to low emission sources of energy instead of traditional fossil fuel sources. Examples of replacing high emission sources include installing solar PV systems on buildings, buying renewable energy and switching to electric vehicles powered by renewable energy.

Offsetting- Offsetting is usually considered a transitional measure or a last resort when implementing a net zero strategy. To achieve net zero emissions, any 'residual emissions' that remain after undertaking actions can be addressed by purchasing and retiring an equivalent number of carbon offsets. This is usually achieved through planting trees, soil sequestration or investing in renewable energy elsewhere.

4 Community engagement

4.1 Engagement campaigns

Our community has contributed to the development of actions within this plan through two engagement processes that were undertaken in 2019.

In May to July 2019, the community was asked to provide input into the review of the Environmental Sustainability Policy and the Environmental Sustainability Strategy. The engagement process involved an online ideas tool on Council's Engagement HQ website, feedback form, opportunities to peer vote on suggested ideas, and nine workshops/sessions with schools and interested community members, Aboriginal groups, and the Walking, Cycling and Mobility Reference Group (Figure 9). The community was asked what was important to them in terms of sustainability, why it was important and what Council could do.

Figure 9: Community engagement participation for the Environmental Sustainability Strategy

In October to November 2019, feedback was sought on the proposed emissions reduction target of net zero emissions by 2050 for the City of Wollongong. The engagement process involved an online ideas tool on Council's Engagement HQ website, feedback form and direct contact with key business

groups. The community were asked to provide feedback on the proposed target and suggest actions to reduce emissions within the city (Figure 10).

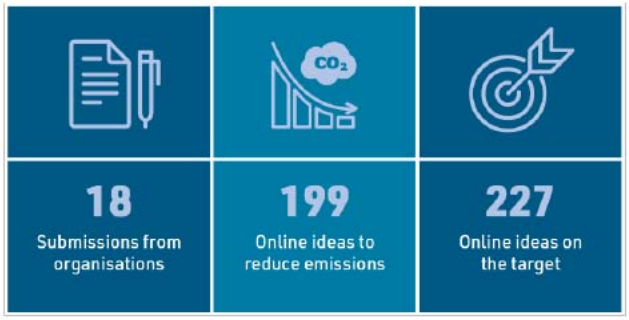

Figure 10: Community engagement participation for the emissions reduction target

The suggestions for reducing emissions from both of these engagement processes have been used to inform the development of this Plan.

4.2 What did the community say?

There was strong community support for moving to renewable energy sources, including:

- installation of solar panels on all Council facilities
- Council purchase green power or participate in a Power Purchase Agreement
- Council replace current streetlights with LEDs
- installation of solar panels on residential, government and commercial buildings
- requiring minimum solar power systems for new developments
- leveraging the uptake of renewables by the community, schools and businesses, including rebates, subsidies or low interest payment plans
- investigating opportunities for the development of green industry and green jobs, including the installation of community batteries.

The community also clearly favoured actions to make both private and public transport more sustainable. Suggestions include:

- installation of electric vehicle (EV) infrastructure to support the uptake of electric vehicles
- connectivity and better access to wide cycle paths and shareways around the city
- providing access and adequate facilities in the central business district (CBD) to complement public and active transport
- improvements to public transport access, timetables and infrastructure (including expansion of the Gong Shuttle) to reduce cars in the CBD
- expand and allocate parking for ride/car share schemes in the city.

Actions around increasing tree and vegetation cover were also consistently suggested, including:

- planting trees to sequester carbon
- revegetating pocket parks and unused land to reduce emissions and improve the quality of urban environments
- accelerating implementation of the Urban Greening Strategy
- additional funding for coastal wetland activities
- encouraging planting and support for community-based gardening programs, including increasing stock and access to Green Plan and community gardens.

Implementing a Food Organics Garden Organics program (FOGO) and other actions to reduce waste to landfill and improve recycling services were recommended, as well as installing a system to capture gas from landfill.

Our Aboriginal community told us that their traditional culture has been about living in harmony with their environment, using the principles of low consumption, low waste, eating sustainably and locally sourced food and protecting native vegetation and wildlife.

Requests for leadership from Council was a common theme, including reducing its own emissions, stronger planning and development controls and education and marketing programs. There was strong support for Council setting an emission reduction target, developing this Plan and prioritising consideration of climate change issues so that every section of Council is operating and planning in the context of a climate crisis.

5 Actions to reduce our emissions

Council aspires to be a leader in response to this critical intergenerational issue and supports bold, ambitious and effective action. Council will continue to lead in its actions, support and advocacy in response to the Climate Emergency Declaration.

The specific actions to be undertaken are outlined in the following sections, organised under six themes:

1. **Climate change leadership and planning**
   Council will demonstrate leadership and improve planning processes to encourage reduction of greenhouse gas emissions

2. **Energy efficiency and renewable energy**
   Council will reduce greenhouse gas emissions by using renewable energy and improving energy efficiency of its buildings, facilities and streetlights

3. **Transport**
   Council will reduce greenhouse gas emissions from its fleet and support the community to reduce emissions through their transport choices

4. **Waste**
   Council will reduce greenhouse gas emissions from waste in landfill through waste avoidance, minimisation, diversion and gas capture

5. **Trees and vegetation**
   Council will protect and enhance vegetation to cool our city and increase absorption of greenhouse gases

6. **Working with our community**
   Council will support the community of Wollongong to reduce emissions

Each of these themes are related to one or more of the goals from the draft *Sustainable Wollongong: A Climate Healthy City Strategy*, which is the guiding document for all environmental and sustainability programs. The relevant Strategy goals are identified within each theme.

Funding for the actions in this Plan are either within Council's existing budget over the duration of the Plan or will require further analysis and consideration through Council's annual budgeting process. Some future actions may require additional feasibility assessments, or attract external funding, particularly where community benefits or partnerships can be established.

5.1 Theme 1: Climate change leadership and planning

This theme is related to achieving *Sustainable Wollongong: A Climate Healthy City Strategy* Goals:

- **Environmental and climate leadership underpins Council decision-making and service delivery, and inspire the same in others**
- **We will achieve net zero emissions by 2030 for Council operations, and together we will achieve net zero emissions by 2050 for the city**

5.1.1 Leadership

Council will demonstrate leadership and improve planning processes to encourage reduction of greenhouse gas emissions. At the time our net zero emissions targets were set, it was recognised that all levels of government would need to work collaboratively to reduce emissions. Council will continue to aim for net zero greenhouse gas emissions for our Council and community. We will also take the action required to draw down Wollongong's share of the greenhouse gas emissions already in the atmosphere. We recognise that we will not achieve this without urgent leadership and action from other levels of government. Council will, over the next two years, develop a more detailed carbon management plan for Council's own operations.

Council's operations contribute only a small percentage of the emissions for the LGA, but it is important Council sets an example and take actions where possible. While we are still aiming for net zero emissions for the whole LGA by 2050. A review of this target will occur in 2024-25.

A key platform of this Plan is creating and building the capacity, awareness and commitment to energy management and the reduction of greenhouse gas emissions within Council and the community. Council has an opportunity and a responsibility to be a leader in the community by demonstrating and advocating for clean energy technologies, sustainable practices and reducing emissions.

Advocacy will be a key part for Wollongong Council to help reduce the city's greenhouse emissions, along with State and Federal Government policy, legislation and funding. Council will continue to campaign for conducive legislative and policy frameworks, and support and funding from Federal and State Governments. These include renewable energy targets, emission trading schemes, planning policy changes and minimum energy standards for homes, commercial buildings and vehicles. Wollongong is unique with respect to its higher proportion of emissions from industry; however, this also presents opportunities for the city in transitioning to cleaner technology. Collaborative campaigns involving partners such as other Councils, educational institutions, industry groups, community organisations and our community will also be vital to effect real change.

Progress to date

- Wollongong City Council joined the Global Covenant of Mayors Program in 2017. See Section 2.4 for more information.
- Wollongong City Council declared Climate Change Emergency in 2019. See Section 2.3 for more information.
- Wollongong City Council joined Cities Power Partnership program in 2020. See Section 2.5 for more information.
- Wollongong City Council *Sustainable Procurement Policy* supports sustainable practices and minimises environmental impact in the procurement of goods and services. Council also has a Procurement Procedure Management Policy which states Council staff must follow the

waste hierarchy of avoid, reduce, reuse and recycle to endeavour to minimise the volumes of goods and services procured. When undertaking procurement activities environmental considerations should be part of the overall assessment including, but not limited to: only purchase goods or services when necessary, where available purchase goods with recycled content, are recyclable, have minimal and recyclable packaging, are energy and/or water efficient, minimise greenhouse gas emissions, are sustainably produced (for example food, timber, paper etc), and minimise transport impacts.

- Council's Local Roads Program has a long history of innovation with materials and processes that have social, economic and environmental benefits. This has resulted in the majority of local roads achieving a life far exceeding their design life as well as reducing emissions and waste to landfill. This has included in-situ pavement recycling, and use of recycled materials in different road components, reducing reliance on quarried natural resources and diverting materials that would otherwise go to landfill. Council has updated its procurement specifications for asphalt road base and concrete to permit appropriate use of recycled materials when providers are set up to supply. When comparing full depth asphalt to in-situ recycling Pavement Recyclers have calculated in-situ recycling saves 50% reduction in greenhouse emissions, 69% reduction in truck movements and 65% reduction in fuel consumption of construction vehicles.

5.1.2 Land use planning

Council plays an important role in guiding economic, environmental and socially sustainable communities. The way we live, where we work and how we move around Wollongong is critical to our impact on carbon emissions.

The way we plan and design our local places, our City Centre, town centres and suburbs, presents an opportunity to encourage a more sustainable lifestyle. Making streets comfortable for cycling or walking rather than driving, having access to local employment rather than commuting long distances, and working to deliver the right housing density to protect important natural areas are all very important elements in guiding sustainable communities.

Local government land use planning is part of a NSW framework including the Environmental Planning and Assessment Act 1979, Government Architect NSW policies and the Illawarra Shoalhaven Regional Plan.

The role of land use planning is varied. The areas of Council influence are outlined below:

Local Strategic Planning Statement - The Local Strategic Planning Statement (LSPS) will set out the 20-year vision for land-use in the local area, the special character and values that are to be preserved and how change will be managed into the future. The statement must identify the planning priorities for an area and explain how these are to be delivered. They must also show how the council will monitor and report on how the priorities will be implemented. Climate change is a key theme of the Wollongong LSPS.

Local Environmental Plans - The Wollongong Local Environment Plan (LEP) describes the different land zones in an area, such as residential, commercial or industrial land, and explain what development is allowed on each type of land zone.

Development Controls Plans - The Wollongong Development Control Plan (DCP) is a set of Council policies that explain how developments need to be designed to meet the conditions of the Local Environmental Plan (LEP) and State-wide rules. This Plan is important to guiding many areas of sustainable building design.

Planning Proposal Policy - Rezoning requests must be justified, having regard to Council's strategic plans and policies, and the NSW Department of Planning Regional Strategy, The Illawarra Shoalhaven Regional Plan 2015. Merit based assessment must consider adequacy of public infrastructure (e.g. proximity to public transport etc), impact on critical habitat or threatened species, social and economic effects, and opportunity to provide an improved environmental outcome. Proposals must also be consistent with State Environment Planning Policies (SEPPs) and Ministerial Directions.

Town and Village Plans - The role of town and village plans is to work with the community to outline clear strategies and actions to meet the current and future needs of the people who live, work and visit. These projects are focussed around business zones and seek to inform how we create liveable places that are safe, healthy, lively, sustainable and attractive. These plans identify key actions around planning policy change, infrastructure investment and community initiatives. Visions for each place are defined in partnership with the community, with relevant technical investigations informing built form, and infrastructure including improve the existing pedestrian and cyclists access and mobility facilities.

Wollongong City Centre - 'A City for People' was endorsed by Council in May 2016. This work sets the vision for the City Centre. Council is committed to creating a City Centre that is people orientated, sustainable and liveable.

Progress to date

- Wollongong City Council has a DCP Chapter A2: Ecologically Sustainable Development, in which Council encourages ecologically sustainable development (ESD) for all development in the Wollongong LGA. This includes objectives relating to greenhouse gas emissions, waste minimisations and recycling of waste, renewable and low carbon energy, the environmental impacts from building materials and biodiversity values. Council also encourages the application of an environmental building rating tool e.g. Green Star or the National Australian Built Environment Rating Scheme (NABERS) to document and demonstrate the environmental performance of a proposed development.
- Warrawong Town Centre and Master Plan, Corrimal Town Centre and Master Plan 2015-25, Unanderra Town Centre and Master Plan, Dapto Town Centre Plan 2017-27, and Port Kembla Revitalisation Plan 2018-43 have been completed. The draft Helensburgh Town Centre Plan 2020-2045 is currently under development.
- The most recent component of 'A City for People' is the development of the draft Wollongong City Centre Urban Design Framework, which presents recommendations on which changes to the existing Wollongong City Centre Planning Controls will be made (including Wollongong Local Environmental Plan 2009 and Wollongong Development Control Plan 2009 (Chapter D13)). One of the key objectives of the framework is *Public domain and connections: a green and walkable city*. The three directions recommended to achieve this are:
  - Strengthen the structure of the City through a permeable grid that prioritises pedestrians
  - Create a green network of open spaces for a sustainable, healthy and attractive city
  - Protect sunlight to key public spaces.

- The LSPS was prepared in 2020 and includes 'Climate Action and Resilience' as once of its six themes, recognises emissions reduction targets for Wollongong City Council operations and the community, and identifies this draft Plan as a key strategy.

Future actions

Table 7 details the actions Council will undertake in the next two years to demonstrate leadership and consider climate change in all aspects of Council operations.

Table 7: Climate change leadership and planning actions

Strategies	Timeframe	Actions
Demonstrate leadership	2019	➢ **L1** Set emissions reduction targets for the City of Wollongong and Council operations (completed December 2019)
	2020-21	➢ **L2** Establish a Steering Committee with representation from senior management across all divisions of Council to have responsibility for the implementation of climate change actions
	Ongoing	➢ **L3** Ensure adequate resourcing for implementation of climate change mitigation actions
	Ongoing	➢ **L4** Initiate an organisational review of Council decision making processes. policies and operational practices to ensure alignment with the Climate Emergency Declaration and net zero emissions targets
	Ongoing	➢ **L5** Continue commitments and actions for the Global Covenant of Mayors for Climate and Energy
	Ongoing	➢ **L6** Implement pledges from Cities Power Partnership Program
	Ongoing	➢ **L7** Council will share key emissions reduction projects and achievements to our community
	2020-21	➢ **L8** Develop a Sustainable Events Guideline for event managers and stallholders to improve the sustainability of events such as minimisation of waste and reducing water and energy consumption
	2020-21	➢ **L9** Strengthen the sustainability provisions and procedures in the Sustainable Procurement Policy, such as utilising low emissions products
	Ongoing	➢ **L10** Continue to innovate and trial all viable road maintenance and construction options to reduce emissions and waste to landfill while providing the best outcomes for roads performance, including: • Continue to research ways to in-situ recycle old road pavements to eliminate landfill • Minimise waste to landfill during full road reconstruction by exploring materials requiring least excavation and ways to recycle excavated materials • Work with local suppliers to move towards provision of asphalt, road base and concrete that complies

		with Council specifications to permit appropriate use of recycled materials
	2020-22	➢ **L11** Review the Wollongong Development Control Plan Chapter A2 – Ecologically Sustainable Development to ensure alignment with the Climate Emergency Declaration commitment and net zero emissions targets
	2021-22	➢ **L12** Amend the Wollongong Development Control Plan to ensure it supports any future updates to the energy efficiency requirements within the National Construction Code
	2020-22	➢ **L13** Commence an investigation into how to encourage sustainable development outcomes, including but not limited to community education, broad ranging incentives, and property marketing tools
Advocacy	Ongoing	➢ **L14** Undertake and collaborate on strong advocacy programs to State and Federal Governments to declare and act on the climate emergency
	Ongoing	➢ **L15** Advocate to the State and Federal Governments to consider climate change impacts when developing new and revised planning instruments, guidelines and legislation, including increased thresholds and standards in NSW BASIX and National Construction Code
	2020-21	➢ **L16** Advocate to the Federal Government to expand and improve the Commercial Building Disclosure program
	2020-21	➢ **L17** Advocate to the Federal Government to expand and improve the Australian Government Equipment Energy Efficiency program, which determines the minimum energy performance standards of appliances
Foster innovation	2020-22	➢ **L18** Investigate opportunities to work with the University of Wollongong to showcase sustainable building design
	2020-22	➢ **L19** Pursue the inclusion of a sustainable home in an urban release display village
Regional collaboration	Ongoing	➢ **L20** Continue to work with Illawarra Shoalhaven Joint Organisation on regional collaborative grants and projects, including the Cities Powers Partnership Program
	Ongoing	➢ **L21** Continue to work with other agencies including Local and State Government, universities, industry and community organisations to network, learn and share information on low carbon strategies

Grant funding opportunities	Ongoing	➢ **L22** Continue to apply for external grant funding for climate change mitigation projects through NSW State Government and Commonwealth funding programs
Internal capacity building	2020-22	➢ **L23** Raise awareness to ensure that climate change mitigation actions can be embedded into policies, strategies and service delivery
	2020-22	➢ **L24** Educate Council staff on waste reduction, resource recovery and energy savings behaviours within the workplace
Monitoring performance	Ongoing	= ➢ **L25** Maintain and monitor an energy and emissions data management system for Council's greenhouse gas emissions. This data will inform decision making & help track on individual projects and towards corporate goals

5.2 Theme 2: Energy efficiency and renewable energy

This theme is related to achieving *Sustainable Wollongong: A Climate Healthy City Strategy* Goal:

- **We will achieve net zero emissions by 2030 for Council operations, and together we will achieve net zero emissions by 2050 for the city**

Council will reduce greenhouse gas emissions by improving energy efficiency of its buildings, facilities and streetlights and using renewable energy, and encourage businesses and residents to improve their building's environmental performance.

5.2.1 Energy efficiency of buildings

Energy efficiency includes implementing actions to reduce energy usage or energy demand, as well as the monitoring, measurement and verification of energy and various saving measures. Many factors affect the efficiency of energy use in buildings. Improved base building design, facade changes, or retrofitting/replacing energy consuming plant and equipment and building tuning/commissioning can all reduce losses and increase useful outputs. Occupant behaviours are also a factor that impacts on a building's emissions intensity.

Existing standards, policies and incentive programs will make a substantial contribution to reducing energy and emissions in the future for the community, businesses and manufacturing (Table 8). Council will work with other levels of government and key stakeholders to ensure these initiatives are maintained, improved or extended, and support and encourage uptake within the community (refer to Theme 1: Climate Change Leadership and Planning and 6: Working with our Community).

Table 8: List of performance standards and incentive programs available to improve business and building energy efficiency

Minimum performance standards	Information and incentive programs
• **Minimum Energy Performance Standards (MEPS)** • **NSW Building Sustainability Index (BASIX)** • **National Construction Code (NCC) Section J**	• Commercial Building Disclosure • Green Star program • Well Rating • National Australian Built Environment Rating Scheme (NABERS) • NSW Energy Savings Scheme – financial incentives for businesses and households to be more energy efficient • NSW Manufacturing Efficiency funding • NSW Environmental Upgrade Agreements • NSW Sustainable Advantage

5.2.2 Renewable energy

Clean renewable electrical energy generation systems are becoming increasingly accessible to the average homeowner either installed at home and connected to the grid or purchased as GreenPower.

Renewable power systems use renewable energy sources, such as the sun, wind and water, to produce electricity with very low greenhouse gas emissions. Photovoltaic (solar energy) systems have become the dominant renewable energy technology installed for domestic systems and commercial buildings in Australia.

These energy systems usually operate with low running costs but can be expensive to install, although equipment costs are generally declining. Maintenance can also be a cost issue for systems reliant on batteries. The design and installation of these systems is a complex task requiring specialist knowledge. The Clean Energy Council register at www.solaraccreditation.com.au lists accredited designers and installers who can ensure systems comply with the appropriate Australian Standards.

5.2.3 Energy efficiency measures for Council

For Council energy efficiency and renewable energy encompasses two main focus areas:

- Buildings and facilities
- Street and sports field lighting

5.2.3.1 Council buildings and facilities

Council owns approximately 740 facilities and buildings ranging in size from public toilets, community halls to our larger facilities such as seven libraries, central administration building, and three work depots. Council also owns and manages three tourist parks, two leisure centres and 18 public swimming pools.

To reduce emissions from its buildings and facilities Council has identified and implemented a number of energy efficiency and renewable energy initiatives that will reduce Council's energy usage and costs, and future proof Council from rising energy prices. Energy efficiency in buildings still remains one of the best cost-effective measures to reduce energy use and eliminate carbon emissions, and is the first priority for Council in reducing emissions from its buildings and facilities. Heating, ventilation and air conditioning (HVAC) contributes significantly to business energy use and operating costs and HVAC systems are the biggest energy consumers. Council has implemented a number of HVAC upgrades in our buildings and will continue to do so to reduce emissions from energy use.

Investment in renewable energy on Council buildings is also an opportunity to save on energy costs, refresh infrastructure and continue Council's work to reduce emissions. Council has already installed 327kW of solar capacity on a number of Council buildings and will continue to investigate the feasibility of solar systems on our buildings and facilities.

Council has been involved in the Green Star program, which is an internationally recognised sustainability rating system for the certification of design, construction and operation of buildings, fit outs and communities, and a partnership with the Green Building Council of Australia.

Progress to date

A large number of energy efficient and renewable energy measures have already been completed by Wollongong City Council for its own operations:

- Council's Administration Building was the first 5 Star Green Star Performance rated building in the Country and was recertified as a 6 Star building in 2018. This was a significant achievement as the building was 32 years old when it received the rating. This achievement was again a first for the rating tool as the building is the only building to have been recertified under the new tool. Some of the key things Council achieved within the building include:
  - reducing the energy consumption by 64%, due to building tuning, smart lighting and efficient systems to heat and cool the building
  - reducing water use by 75% through a mix of improvements like low-flow taps and toilet flushing, rain water storage tanks, and reusing clean water
  - diverting more than 60% of our waste generated within the building from landfill through recycling, composting organics and reducing the amount of waste staff generate in the first place.

- Installation of 327kW Photovoltaic systems has already occurred on a number of Council buildings. This includes the:
  - Beaton Park Ted Tobin Hall
  - Corrimal Tourist Park
  - Bulli Tourist Park
  - Windang Tourist Park
  - Dapto Pool
  - Ribbonwood Community Centre.

Future actions

Table 9 details the actions Council will undertake in the next two years to reduce greenhouse emissions through energy efficiency improvements in our buildings and facilities and renewable energy projects.

Table 9: Energy efficiency and renewable energy actions

Strategies	Timeframe	Actions
Implement sustainable building design and performance standards	2020-22	➢ **E1** Commence review of sustainable building design and performance standards to apply to all new and refurbished Council buildings and facilities.
	Ongoing	➢ **E2** Incorporate the adopted sustainable building design and performance standards in all new and refurbished Council buildings and facilities
Continue energy efficiency program for Council buildings and facilities	2020-25	➢ **E3** HVAC upgrade for Town Hall and Art Gallery with combined plant
	2020-25	➢ **E4** HVAC upgrade for Corrimal Library, Ribbonwood Community Centre, IPAC and Integral Energy buildings
	2020-25	➢ **E5** Complete roll-out of the Administration building lighting upgrade program to the Library
	2020-21	➢ **E6** Warrawong Community Centre & Library and Helensburgh Community Centre & Library new builds will

		aim to be designed, constructed and maintained to sustainable building design and performance principles
	2020-22	➢ **E7** Beaton Park Leisure Centre Master Plan developed including Stage One Aquatics Design with sustainable building design and performance principles
	2020-22	➢ **E8** Upgrade of treated pool filtration systems to reduce energy and water use
Renewable energy program for Council buildings and facilities	2020-21	➢ **E9** Implementation of Solar on Council Buildings project
	2020-25	➢ **E10** Pursue the feasibility of a Whytes Gully Renewable Energy Facility with a 1MW Power station
Pursue Power Purchase Agreement (PPA)	2020-22	➢ **E11** Pursue the potential to establish a PPA utilising the energy generated from Whyte's gully landfill gas to offset Council's highest energy consuming buildings
	2020-22	➢ **E12** Pursue the potential for opportunity to establish a regional PPA
Monitoring performance	Ongoing	➢ **E13** Continual monitoring of the efficiency of solar systems allows to track the performance of the systems and undertake further cost-benefit analysis for other buildings

5.2.3.2 Street and sports field lighting

Streetlighting has three main purposes - improved pedestrian and vehicle safety, reduced street crime, and providing night amenity in community spaces. Approximately 19,191 streetlights are owned, operated and maintained by the electricity distributor Endeavour Energy within the Wollongong LGA. Council pays the electricity costs, as well as the maintenance and replacement costs for these lights and therefore has a stake in and can indirectly influence street light replacements. At this stage Council is including the emissions from streetlights within the Council emissions profile in this Plan due to this considerable level of influence.

As such, with streetlights included in Council's emission profile, it is the second largest greenhouse gas emission contributor for Council, generating 8921 tCO_2-e, which accounted for 6% of Council's emissions in 2017-18 through the use of electricity (Figure 7). The challenge to reduce energy consumption and emissions associated with it can require large upfront costs.

Current streetlights vary in type, age, intensity and energy efficiency depending on the historical time of installation and the site location throughout the LGA. Standard residential streetlights are commonly 80-watt (W) mercury luminaries. Other types of lighting are termed larger main street lighting, which consists of streetlights for main roads, highways and sport fields, which can range from 150-400W.

It is important to note that the number of streetlights will increase for the Wollongong LGA, largely as a result of the West Dapto development, new subdivisions and the creation of new sports fields.

Progress to date

- Council entered into an agreement with Endeavour Energy in 2019 to change all available mercury vapour residential class streetlights to energy efficient LED technology. The proposal offers Council a fixed price subsidy and has a significant environmental benefit.
- Council has already installed 7,089 LED lights when globes reached the end of their life or in new subdivisions.
- Sport field lighting has been progressively replaced with LED technology, for example the synthetic turf field, the natural turf field, and the junior natural turf field at Ian McLennan Park. All future installations are required to utilise LED fittings.

Future actions

Table 10 details the actions Council will undertake in the next two years to reduce greenhouse emissions from street and sports field lighting.

Table 10: Energy efficiency actions for street and sports field lighting

Strategies	Timeframe	Actions
Energy efficient lighting	2020-22	➢ **E14** Continue the upgrade program of residential streetlights (80W mercury vapour) to LED
	2020-22	➢ **E15** Pursue investigation into installation of converting higher wattage main streetlights to LED, once the technology becomes feasible
	Ongoing	➢ **E16** All new and replacement sport field lighting installations will utilise LED fittings
Monitoring performance	2020-22	➢ **E17** Continue the monitoring and review of quarterly energy consumption data from energy providers to track growth and energy use over time

5.3 Theme 3: Transport

This theme is related to achieving *Sustainable Wollongong: A Climate Healthy City Strategy* Goal:

- **We will achieve net zero emissions by 2030 for Council operations, and together we will achieve net zero emissions by 2050 for the city**

Council will reduce greenhouse gas emissions from its fleet and support the community to reduce emissions through their transport choices. The transport systems for Wollongong have been defined as the management of journeys for business, freight and commuters and of the region's road networks (OEH 2019). Wollongong City Centre is the hub of the Illawarra Region, providing higher order regional services and facilities such as medical, education, commercial services as well as cultural and entertainment facilities.

The transport system in Wollongong is under pressure from a growing population, and the fact it is reliant on north-south connectivity due to the area's geographical features. The area is also characterised by a large number of small suburbs that are not focused around a central city centre. Residents largely use private cars as the primary form of transport for commuting for work within the areas and for services, with 72.5% of people in Wollongong saying they travel to work in a motor vehicle (ABS Census Data 2016). A significant proportion of residents commute by rail or private car to Sydney for employment, and there is growing pressure for more passenger services due to limited seating capacity (too few carriages per set) and large sections of single line south of Unanderra. In terms of freight capacity there is sufficient rail capacity in the short to medium term, but the freight rail access to Port Kembla is expected to grow, placing further pressure on the rail line (OEH 2019).

Reducing emissions from transport is therefore a high priority and presents one of the biggest challenges in achieving net zero emissions in the longer term. For the Wollongong local government area, transport emissions represent 19% of the City of Wollongong emissions profile (Figure 5). Responding to this challenge will require fundamental changes in how we plan and deliver transport networks and how people in Wollongong choose to travel. There will be a continued need in Wollongong to develop 'live-work-play' places through improved land use planning and companies/state agencies developing regional offices and 'work at home' policies to reduce the need for long distance commuting.

5.3.1 Sustainable transport

Sustainable and integrated transport planning aims to ensure there is a suitable, safe and interconnected transport infrastructure for different modes such as private vehicles, public transport, walking and cycling. The NSW State Government is responsible for planning and delivering public transport in our local area, supported by private operators. It plans and delivers metropolitan road projects that impact traffic and also has responsibility for many roads in our LGA. Within a local government context, transport services and responsibilities extend mainly to the consideration of roads, road safety, improved and interconnected public transport, and increasing active transport options through walking and cycling path networks. The delivery of these services and responsibilities is also shared with external stakeholders such as Transport for NSW, and Council will continue to work these agencies to deliver sustainable transport options for the city. Council also contributes to the free shuttle bus and provides a number of community transport programs.

5.3.2 Electric, hybrid and hydrogen vehicles

It is important for Council to stay up-to-date with electric, hybrid and hydrogen vehicle technology, infrastructure needs, and opportunities to support the transition from non-renewable fossil fuels. Alternative fuels will benefit the environment, improve energy security and lower costs. This would have several benefits including lower running costs for users, reduced air pollution and lower greenhouse gas emissions, health benefits from air quality improvements, and reduced noise which will improve liveability. It will also contribute to improved energy security through reduced reliance on imported, non-renewable fuels.

Unlike petrol and diesel vehicles, fully electric vehicles (EV) produce no dangerous pollutants such as carbon monoxide and nitrous oxide. Their emissions are primarily determined by the upstream emissions; that is, from the production and distribution of the energy to charge them. Australia has a low uptake of EV in comparison with other developed nations. This reflects current challenges with limited model choice, lack of affordable models (with no current government subsidies or benefit) and limited public charging infrastructure in the Australian market. This is expected to change as the range of EV models increases and prices continue to trend downwards, along with the development of supportive infrastructure such as charging stations and battery technology. In Australia, electric vehicle charging stations have been primarily located in capital cities, however there have been various initiatives that have seen the number of EV chargers in regional areas grow and these are now comparable in numbers to those located within cities.

Fuel Cell Electric Vehicles (FCEVs) powered by renewable hydrogen have high range and quick refuelling times. Combining the use of EVs and FCEVs across all motorised vehicles could present an emissions-free solution at point of vehicle use. Hydrogen refuelling infrastructure, not currently available, is necessary though to support commercialisation of this potential market.

5.3.3 Council fleet

Transport emissions represent 2% of Council's own emissions profile through the use of fuels such as diesel, LPG and petrol in Council's owned and operated car and plant fleet (Figure 7). Council's fleet consists of a variety of vehicles from passenger vehicles, light commercial vehicles, trailers, loaders, utes, ride-on mowers, 4WDs and a variety of trucks. Road travel is essential for undertaking many Council duties, and a number of actions will be taken in order to ensure the efficient selection and operation of Council's fleet. Wollongong City Council has a 'Vehicle Acquisition Strategy Management Policy' that states Council will address environmental considerations in the performance of the fleet, and will consider alternatively powered vehicles, including those that are petrol hybrid powered, electric vehicles, and alternate fuel powered as markets mature.

Progress to date

Integrated transport planning and sustainable transport options have been the subject of key Council Strategies and Plans, each containing a series of actions that are complementary to the aim of reducing emissions. These include:

- The City of Wollongong Bike Plan 2014-18 outlines a multifaceted approach for sustainable, affordable and accessible transport that consists of a range of elements comprising infrastructure provision and renewal, promotion, education and advocacy.
- The City of Wollongong Pedestrian Plan 2017-21 sets out a vision and goals to support a more walkable and connected Wollongong.

- West Dapto Vision 2018 and West Dapto Integrated Transport Plan aim to create sustainable and resilient communities with active and passive open space accessible by walkways, cycleways and public transport.
- Wollongong City Centre Access and Movement Strategy 2013 is a multi-modal strategy that addresses the city centre road network, in addition to a wide range of complementary measures to reduce the impacts of travel demand on the city centre. This includes walking and cycling actions and strategies, public transport improvements, car parking strategies, and policies and consideration of land use policies which will affect demand for travel and parking.
- Grand Pacific Walk Vision and Master Plan, this major project will create a walking and cycling pathway along the coastline from the Royal National Park to Lake Illawarra.
- Port Kembla 2505 Revitalisation Plan 2018-43, a part of this Plan is to improve active transport infrastructure and opportunities, and the public transport network to and within the suburb.
- Wollongong City Council DCP contains objectives and controls designed to provide suitable bicycle parking facilities and for commercial office/business premises and retail centres, suitable bicycle parking facilities should be provided for both tenants/workers as well as bicycle couriers. The DCP also states that showers, change facilities and personal lockers shall also be provided.
- Council will continue to implement our Town Centre and Village Plans to improve the existing pedestrian and cyclists access and mobility facilities, such as:
  - Warrawong Town Centre and Master Plan
  - Corrimal Town Centre and Master Plan 2015-25
  - Unanderra Town Centre and Master Plan
  - Dapto Town Centre Plan 2017-27
  - West Dapto Integrated Transport Plan
  - Port Kembla Revitalisation Plan 2018-43.

Future actions

Table 11 details actions Council will undertake in the next two years to reduce Councils emissions from its fleet and actions to support the community's transport choices.

Table 11: Sustainable transport actions

Strategies	Timeframe	Actions
Council Fleet	2020-22	➢ **T1** Council will prioritise low emissions and fuel-efficiency when purchasing vehicles, and will include hybrid and/or electric vehicles as part of their fleet
	2020-22	➢ **T2** Investigate feasibility of low-emissions vehicle standards for plant fleet
Electric vehicles	2020-22	➢ **T3** Develop and adopt an Electric Vehicle Charging Stations on Public Land Council Policy, addressing public access and range anxiety
	2020-22	➢ **T4** Pursue the installation of public EV charging stations at a number of accessible locations across the City. This

		will consider partnerships with the State Government, charging companies, car companies or other sponsors to establish electric vehicle charging stations
Council supported public transport	2020-23 2020-23	➢ **T5** Continue the Wollongong Free Shuttle Bus ➢ **T6** Work with Transport NSW to explore opportunities to enhance the free shuttle bus route to other areas
Active transport	2020-22 2020-22 2021-22	➢ **T7** Finalisation and adoption of the Wollongong Cycling Strategy 2030, to increase cycling participation at all levels across the city through improved planning, convenient, safe and connected cycling infrastructure and encouragement through improved education and events ➢ **T8** Review Wollongong City Centre Access and Movement Strategy 2013 to deliver a new integrated traffic and transport strategy, with a priority on an efficient road network, better traffic management, reliable bus services and pedestrian and cycle networks ➢ **T9** Commence the review of the City of Wollongong Pedestrian Plan 2017-2021
NSW Government managed public transport	Ongoing Ongoing	➢ **T10** Continue to pursue State Government investment in improved public transport services, in particular: • Improved efficiency of current train system and commute to Sydney • Increase number of trains, commuter parking and faster rail • Improved accessibility of all public transport services, for people of all abilities • Better connectivity between different modes of public transport • Increase funding provided to local Councils for active transport and public transport projects ➢ **T11** Lobby NSW Government to implement actions from *Future Transport Strategy 2056* and NSW Transport Master Plan to guide investment, policy and reform and service provision. It provides a framework for planning and investment aimed at harnessing rapid change and innovation to support a modern, innovative transport network, including electric and hybrid vehicles, autonomous and connected vehicles and planning for freight and ports

5.4 Theme 4: Waste

This theme is related to achieving *Sustainable Wollongong: A Climate Healthy City Strategy* Goals:

- **We will achieve net zero emissions by 2030 for Council operations, and together we will achieve net zero emissions by 2050 for the city**
- **Our community only take what they need, reuse and recycle what they can and are aware of the resources that they consume**

Council will reduce greenhouse gas emissions from waste in landfill through waste minimisation, diversion and gas capture/flaring. Council manages the household waste collection service within the LGA, with the waste going to the Wollongong Waste and Recovery Park at Whytes Gully. Businesses can also request commercial recycling and waste collection. The Recovery Park is also home to the Community Recycling Centre where problem household waste can be recycled, and the Revolve Centre where unwanted items that are in good shape, like homewares, sporting goods, tools, furniture, toys and building materials can be dropped off to be re-sold.

Waste management is a significant issue for the city, with almost 40,000 tonnes of residential waste going to landfill each year.

The methane emissions associated with the breakdown of organic materials (garden and food waste) in landfill sites are a significant contribution to the Council's GHG emissions profile. Methane is 25 times more powerful as a greenhouse gas than carbon dioxide as it has a higher heat trapping ability, and levels are growing with increased methane emissions from landfill and other forms of waste.

As shown in Figure 7, 85% of Council's GHG emissions in 2017-18 were from the waste in the landfill at Wollongong Waste and Recovery Park. Whilst Council is responsible for the management of the landfill, the overwhelming majority of materials contained therein, are sourced from the community. Actions to reduce the amount of waste, primarily organic waste, going to landfill will reduce Council's emissions profile significantly.

Council will work with the city's residents and businesses to encourage waste re-use, recycling, composting and recovery of energy from the waste we generate, and Council will continue to focus on improved management of waste within its own operations.

Progress to date

- The Wollongong Waste and Resource Recovery Strategy 2022 and associated Action Plan outlines the actions for Council and the community to work towards sustainable waste management. The plan includes actions relating to management of the landfill, including landfill gas extraction, and actions to encourage residents and businesses to reduce waste to landfill.
- A landfill gas (methane) capture system is currently operating at Whytes Gully. An expansion of this system will be dependent on further testing and analysis.
- A trial of a Food Organics Garden Organics (FOGO) program to explore ways of keeping organic matter out of landfill was implemented in 1,600 homes throughout Austinmer, Cordeaux Heights and Warrawong. During the trial residents were asked to collect their food scraps such as raw and cooked meat, fruit and vegetable scraps and bread into the provided kitchen caddy and empty into their green-lidded bin for normal organics collection. Following a

comprehensive engagement program, the trial is seeing high levels of participation and low levels of contamination. Results are being used to inform potential expansion of the program.

- Council runs educational programs to encourage the community to reduce the amount of organic waste going to landfill. Composting, worm farming, bokashi, keeping chickens and programs to reduce household food waste are encouraged through workshops, events, promotions and marketing messaging.
- Council has a 'Waste Wise Events' program that encourages Event Organisers to increase resource recovery (recycling and organics) and promote waste minimisation at public events.
- Implementation of the Illawarra Regional Food Strategy 2013-18 has resulted in linking food waste education with food aid provision with dual benefits of reducing food waste to landfill and assisting vulnerable communities.
- Wollongong City Council has an internal organics collection of kitchen waste in the central administration building that is taken to Greenhouse Park for composting, thereby reducing GHG emissions from staff waste.

Future actions

Table 12 details actions Council will undertake in the next two years to reduce emissions from waste in landfill. There are further actions within Theme 6: Working with our Community that encourage reduced consumption which will have waste minimisation benefits.

Table 12: Waste actions

Strategies	Timeframe	Actions
Wollongong Waste and Resource Recovery Strategy 2022	Ongoing	➢ **W1** Continue to implement the Wollongong Waste and Resource Recovery Strategy 2022 and associated Action Plan
	2020-22	➢ **W2** Review of the Wollongong Waste and Resource Recovery Strategy 2022
Landfill gas capture & energy generation	2020-22	➢ **W3** Expand current landfill gas capture system at Whytes Gully
Food Organics Garden Organics (FOGO) program	2020-22	➢ **W4** Implementation of the FOGO program across the Wollongong LGA, accompanied by an extensive educational program, to divert household organic waste from landfill and reduce emissions from Council's landfill
Green waste removal and services	2020-22	➢ **W5** Increase green waste removal from fortnightly to weekly collection to divert more green waste to landfill
	2020-22	➢ **W6** Implement a free drop off service for garden waste in preparation for or following natural disasters (including events such as storms, floods and bushfire preparation)

Waste education programs	Ongoing	**W7** Continue to design and deliver community education and behaviour change initiatives to maximise diversion of food, other organics, general household waste and nappies from landfill and to educate the broader community in waste avoidance, raise awareness of alternatives and work towards a litter free Wollongong
	2020-22	**W8** Design and deliver a 'War Against Food Waste' campaign that focuses on known behaviours and limited knowledge on food waste. The program will focus on how best to reduce the amount of food waste households generate using an array of activities and tools to engage with the key target audiences such as families, 18–34 years, and culturally and linguistically diverse communities
Waste wise events	2020-22	**W9** Continue the 'Waste Wise Events' program to increase resource recovery and waste minimisation at public events
Recycling services	2020-22	**W10** Develop a waste management plan for each of the four major charities to assist separation of waste
	2020-22	**W11** Enhance kerbside collection service to concession holders to assist with increased separation of waste
	2020-22	**W12** Pursue the feasibility of a timber separation and recycling program
Council operations	2020-22	**W13** Ensuring Council events and facilities are 'waste-wise'
	2020-22	**W14** Increasing use of local and environmentally friendly caterers for Council meetings and events, avoiding packaging waste and prioritising seasonal and vegetarian selections
	2020-22	**W15** Continue the organic waste composting program within Council administration building and expand to other Council facilities where feasible
Monitoring performance	2020-22	**W16** Develop a central reporting framework for waste from the city's operations and properties to improve our confidence in waste data, and identify and implement opportunities to reduce waste to landfill

5.5 Theme 5: Trees and vegetation

This theme is related to achieving *Sustainable Wollongong: A Climate Healthy City Strategy* Goal:

- **Our ecosystems and waterways are enhanced, our urban areas are cooler and greener and our community is connected to our natural environment**

Council will protect and enhance vegetation to cool our city and increase absorption of greenhouse gases. By retaining and increasing our natural vegetation, green space and tree canopy, carbon can be drawn out of the atmosphere and into plants and soil. Research has shown that coastal wetlands (mangrove, tidal marsh and seagrass) have the highest rates of carbon sequestration per unit area of all natural systems primarily because of their comparatively high productivity and preservation of organic carbon within their sediments. Preservation of coastal wetlands is critical if they are to play a role in sequestering carbon and mitigating climate change (Rogers et al, 2019).

There are also benefits of vegetation in reducing energy consumption, for example cooling of our streets and city and town centres, leading to less energy being used for cooling cars and buildings. Shady areas also encourage more active communities, providing shelter, amenity and increasing comfort outdoors.

Vegetation also has a key role in helping our community adapt to the predicted changes in climate through reducing flooding impacts and reducing heat stress in urban areas, as well as providing biodiversity benefits. This will be explored further in the Climate Change Adaptation Plan.

Council is committed to protecting, managing and improving our natural environment, through biodiversity conservation projects on public land and urban greening across the city. There are further actions within Theme 6: Working with our Community, that encourage the protection and planting of trees and vegetation on private land.

Progress to date

Increasing vegetation cover and encouraging sustainable food management have been the subjects of key strategic documents, each containing a series of actions that are complementary to the aim of reducing emissions.

- The Natural Area Management Program involves active management of approximately 150 Council-owned and Council-managed sites including remnant bushland, wetlands, creek lines, dunes and urban reserves. These areas are often connected to other open space such as parks or sportsgrounds. Specialist bush regeneration contractors and over 60 Bushcare/Dunecare groups work to conserve biodiversity through removing weeds, encouraging natural regeneration and planting appropriate native vegetation. Specific activities to protect wetlands include maintaining designated walking paths and reducing foot and vehicle traffic and fencing of sensitive areas.
- The Illawarra Biodiversity Strategy was prepared in 2011 to assist in developing policy, inform strategic planning and to define a program of 'on-ground' actions for the Illawarra Councils to work towards to protect biodiversity. This strategy recognised the pressures that climate change will have on biodiversity and included actions relating to managing natural areas, land use planning, knowledge, data and monitoring and community participation. The achievements of this Strategy are currently being reviewed, and a new Strategy for Wollongong City Council will be prepared in 2021.

- The Urban Greening Strategy was adopted in 2017 and sets out goals to strategically increase the quality and quantity of all vegetation and open green space on all land types in an urban setting. Climate change was a key driver for the Strategy, for both mitigation and adaptation purposes. Key achievements to date include:
  - online inventory of tree assessment data to better understand the condition of our existing trees
  - development of the draft Tree Management Technical Guidelines
  - upskilling of staff for improved tree installation and establishment
  - planting of more than 2,553 advanced trees in high priority urban areas with identified low canopy cover across the LGA, replacing those removed at a ratio of 2:1
  - implementation of tree planting aligned with Council's capital works program in projects such as car parks, footpath renewals, and accessible pathways providing shaded accessible pathways to parks infrastructure including BBQ's and picnic shelters.
- The draft Lake Illawarra Coastal Management Program recognises the importance of estuarine vegetation such as saltmarsh, seagrass and mangroves and sets out specific actions to conserve these wetlands around Lake Illawarra.
- The Illawarra Regional Food Strategy 2013-18 outlined actions that encouraged production and consumption of locally grown food that will have emissions reduction benefits through reducing food miles (Kiama Municipal Council, Shellharbour City Council and Wollongong City Council, 2013).

Future actions

Table 13 details actions Council will undertake in the next two years to protect and increase cover of trees and vegetation on public land.

Table 13: Trees and vegetation actions

Strategies	Timeframe	Actions
Natural area management	Ongoing	➢ **V1** Continue to implement and plan to expand the Natural Area Management Program to ensure conservation of remnant bushland, wetlands and riparian areas, in accordance with the Illawarra Biodiversity Strategy, Lake Illawarra Coastal Management Program and relevant vegetation management plans
	Ongoing	➢ **V2** Continue to actively protect and enhance wetlands including reducing unauthorised access and mowing
	2020-22	➢ **V3** At appropriate locations, undertaken pilot projects to improve the interface between natural areas and open space, through planting of native grasses and meadows, and open specimen trees to reduce mowing and increase biodiversity

Urban Greening	Ongoing	➢ **V4** Continue to implement the Urban Greening Strategy 2017-37 across the LGA, particularly actions around promoting an increase in canopy cover, managing, protecting and maintaining urban vegetation, and development of guidelines for green roofs, green walls and facades, rain gardens and other structural vegetation
	2020-22	➢ **V5** Develop a Tree Selector tool that ensures physical, environmental, and predicted climate constraints are determined to ensure the largest possible trees species in the right places are selected for Council plantings
Biodiversity management and planning	2020-21	➢ **V6** Prepare an update of the Illawarra Biodiversity Strategy for the Wollongong LGA and use it to guide future programs and works

5.6 Theme 6: Working with our community

This theme is related to achieving *Sustainable Wollongong: A Climate Healthy City Strategy* Goals:

- **Together protect our environment, reduce emissions and increase resilience to climate change**
- **We will achieve net zero emissions by 2030 for Council operations, and together we will achieve net zero emissions by 2050 for the city**
- **Our ecosystems and waterways are enhanced, our urban areas are cooler and greener and our community is connected to our natural environment**
- **Our community only take what they need, reuse and recycle what they can and are aware of the resources that they consume**

Council has a role in facilitating the community of Wollongong to reduce their emissions. Council is well-placed to advocate for its community, share information and foster collective solutions for emissions reduction. Council will work to raise awareness and work in collaboration with the residential, business and industrial sectors to all move towards the target of net zero emissions by 2050, taking in account social, economic and environmental considerations.

Council has listened to the feedback from our community and has a range of focus areas that will be pursued - partnerships, engagement and education. In addition to this, some pilot projects targeting particular communities will be initiated.

This initial two-year Plan has vital and necessary actions relating to establishing partnerships and engaging with our communities on climate change and support each other to reduce emissions. Implementation of these actions will result in a strong foundation for Council and the community to work together to formulate actions that will be included in future Plans.

Progress to date

Council has implemented a range of programs to promote sustainable living practices:

- Workshops and community events to help residents learn more about topics like reducing waste, keeping chickens, cooking, exploring natural areas and cleaning up our local environment.
- Local schools can participate in activities at the Botanic Garden Discovery Centre, Greenhouse Park and from the Green Team about composting, waste education, no-dig gardening and natural areas.
- Our community is invited to become involved in programs such as Bushcare, Dunecare, Clean Up Australia Day and National Tree Day.
- The Green Plan Nursery at the Botanic Garden sells indigenous plants to the public and plants are donated to local schools and community centres each year.
- The Sustainable Wollongong Newsletter shares information about issues, events and projects on a range of sustainability matters.

Council also has a number of established networks effective at collaborating with the community, for example the Lake Illawarra Estuary Management Committee and the Aboriginal Reference Group, and with the business community, such as BlueScope Consultative Committee, Port Kembla Environment Group, i3 Net, Illawarra Business Chamber, Urban Development Institute of Australia (UDIA), and the

Property Council of Australia, and we will continue to work with these groups on climate change mitigation action.

Future actions

Table 14 details actions Council will undertake in the next two years to support our community to reduce GHG emissions.

Table 14: Working with our community actions

Strategies	Timeframe	Actions
Partnerships with business and industry	2020-21	➢ **C1** Partner with BlueScope to support the positive environmental actions being implemented to reduce emissions of their operations
	2020-21	➢ **C2** Work collaboratively with i3 Net to assist their members to adopt more sustainable practices and promote positives outcomes
	2020-21	➢ **C3** Work collaboratively with Illawarra Business Chamber to assist their members to adopt more sustainable practices and promote positives outcomes
	2020-21	➢ **C4** Work collaboratively with NSW Government's Sustainability Advantage Program to support small businesses
	Ongoing	➢ **C5** Encourage business and manufacturing to apply for funding through the NSW Energy Savings Scheme and NSW Manufacturing efficiency program to upgrade energy monitoring systems, replace or retrofit old and inefficient systems, install new energy efficient equipment and improve manufacturing processes
Engagement with community organisations/groups	2020-21	➢ **C6** Design and implement a community engagement program to determine how to best assist them in emissions reduction, including determining needs, barriers and knowledge gaps
	Ongoing	➢ **C7** Continue to engage with members of Aboriginal communities to learn from their sustainable living practices and integrate these stories into our community sustainable living programs
	2020-21 then ongoing	➢ **C8** Establish connections with community groups and help support connections of those within our community with shared values about climate change action. Facilitate a network to share information and work together

Community education programs	Ongoing	➢ **C9** Continue to deliver sustainable living education and engagement activities (e.g. Green Team, Discovery Centre, Bushcare, Dunecare, Clean Up Australia Day, National Tree Day, Green Plan, and Sustainable Wollongong Newsletter)
	2021-22 then ongoing	➢ **C10** Design and deliver a sustainability and environmental education plan to expand the existing education programs. Increase the focus on increasing the capacity of adults to take practical action. Provide guidance to households about how to reduce emissions, including accessing renewable energy, becoming more energy efficient, alternative transport options, waste minimisation, growing food, reducing consumption and sustainable purchasing
Urban greening	2020-22	➢ **C11** Investigate the feasibility of expanding the Green Plan program to specifically assist homeowners in Urban Release Areas through provision of guidance and appropriate indigenous species
Encourage community gardens	Ongoing	➢ **C12** Continue to support the establishment and operation of community gardens on public land
	2021-22	➢ **C13** Review the Community Gardens Policy and procedures
Implement pilot projects	2021-22	➢ **C14** Partner with the NSW Department of Education to pilot an Eco Schools program in the Warrawong Precinct to reduce their environmental impact by reducing waste to landfill, improving energy efficiency and investigating opportunities to install solar panels
	2021-22	➢ **C15** Pursue the feasibility of piloting innovative energy efficiency programs in the community to improve the energy efficiency of homes, reduce peak demand from the grid, reduce emissions and increase the uptake of renewable energy generation in the community
	2021-22	➢ **C16** Partner with state agencies to ensure that vulnerable communities have access to services and programs to reduce their energy consumption and adapt their homes to increasing temperatures and weather extremes
Monitoring performance and information sharing	Ongoing	➢ **C17** Continue to monitor the emissions of the Wollongong LGA and share it with the community

6 Implementation

Achieving real emissions reduction will require commitment from Council and the community of Wollongong. Implementation of the actions in this Plan will place Council in a strong position to continue to reduce its own emissions and to better influence and advocate for climate action across the city.

It is important to acknowledge that this is a two-year plan 2020-22 only. Actions will be prioritised and will inform Council's Delivery Program each year, flowing on to Divisional Business Plans.

The actions in this Plan aim to either directly reduce emissions (e.g. installing solar panels, diverting organic waste from landfill) or are enabling actions for Council and the community to reduce emissions (e.g. implement a strategy, policy change, collaboration or education). Where adequate information was available, actions aimed at directly reducing emissions from Council buildings, facilities and landfill were subject to a calculation of the expected emissions reduction.

From these actions detailed in this Plan alone, it is expected that the annual emissions of Council operations will be reduced by 25% (35,200 tonnes CO_2-e). In addition to these actions, there are other direct emissions reduction actions that were not able to be calculated at this time, and a vast array of enabling actions, both of which will contribute to Council's and the Wollongong LGA emissions reduction targets. Actions in subsequent plans will further reduce the annual emissions.

Effective and coordinated implementation of the Plan is critical to achieving its objectives. Implementation of the Plan will be coordinated by setting up processes for monitoring and review, improving knowledge and understanding, and relevant training and development for staff. This plan does not allocate actions to external organisations, groups or individuals, however future plans may include a more holistic range of actions, developed collaboratively, for the whole local government area.

Funding for new actions are either within Council's existing budget over the duration of the Plan or will require further analysis and consideration through Council's annual budgeting process, where project funding is competitively sought via business proposals. Some future actions may require additional feasibility assessments, or attract external funding, particularly where community benefits or partnerships can be established.

7 Monitoring and reporting

Meaningful monitoring of both emissions and performance in implementing emissions reduction projects is required to effectively inform future planning for climate change mitigation. Technology and policy are constantly changing and will be drivers for future opportunities and barriers to which Council must respond.

As part of Council's Integrated Monitoring and Reporting Framework, Council will report to the community against the actions within its Quarterly and Annual Reports.

Council will be preparing a new inventory of emissions for the Wollongong LGA every two years, to compile up to date information on the GHG emissions from energy use, transport, waste and wastewater from all sources. Council will also continue to compile its own emissions data for its electricity and gas consumption for Council buildings and facilities, fuel consumption from its fleet and emissions from waste to landfill. These emissions profiles will be re-calculated next in 2021 to track how the City of Wollongong and Council's own profiles are changing and show progress towards the emissions reduction targets.

A new plan will be prepared for the period 2022-26 and will be informed by the updated emissions profiles, project success stories, the availability and feasibility of new technologies, any new opportunities or threats, and ongoing collaboration with the community of Wollongong.

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Appendix 1: Implementation Plan

The Implementation Plan provides more detail for each action including in Section 5, including responsible Council Divisions, funding arrangements and expected greenhouse gas emission reductions

Responsibilities

- **CCED** Community Cultural and Economic Development (including Economic Development, Community and Cultural Development, and Public Relations teams)
- **CST** City Strategy (including Environmental Planning, Land Use Planning, and Urban Release)
- **CW** City Works (including Building, Facilities and Workshop team)
- **GCS** Governance and Customer Service (including Supply Chain and Logistics team)
- **FI** Finance
- **INI** Information and Improvement (including Executive Strategy team)
- **ISP** Infrastructure Strategy and Planning (including Building and Facilities Planning and Transport and Stormwater Services teams)
- **OSES** Open Space and Environmental Services (including Environment and Conservation Services, Parks and Open Space and Waste Services teams)
- **PD** Project Delivery (including Major Projects team)

Resourcing

Actions have been categorised as being implemented through staff time only or as needing operational or capital funding. Where funding is required for implementation, it has been identified as existing operational or capital budgets or that it requires new funding to be sought through Council's annual budgeting processes.

Expected GHG emissions reduced

Where actions are able to be quantified, an expected reduction is emissions figure is included. Many actions are not able to be readily quantified at this time and more technical investigations and data are required. A large proportion of actions are strategies, education, monitoring and reporting which are considered enabling actions, meaning they will indirectly influence emissions.

Strategies	Timeframe	Action No.	Actions	Division/s	Resourcing	Resourcing timeframe	Resourcing type	Expected GHG emissions reduced
Climate Change Leadership and Planning								
Demonstrate leadership	2019	L1	Set emissions reduction targets for the City of Wollongong and Council operations (completed December 2019)	All			N/A	Enabling action
	2020-21	L2	Establish a Steering Committee with representation from senior management across all divisions of Council to have responsibility for the implementation of the climate change actions	All			Staff time only	Enabling action
	Ongoing	L3	Ensure adequate resourcing for implementation of climate change mitigation actions	All			Staff time only	Enabling action
	Ongoing	L4	Initiate an organisational review of Council decision making processes, policies and operational practices to ensure alignment with the Climate Emergency Declaration and net zero emissions targets	CST, INI			Staff time only	Enabling action
	Ongoing	L5	Continue commitments and actions for the Global Covenant of Mayors for Climate and Energy	CST			Staff time only	Enabling action
	Ongoing	L6	Implement pledges from Cities Power Partnership Program	CST			See individual pledge actions	Enabling action
	Ongoing	L7	Council will share key emissions reduction projects and achievements to our community	CCED			Staff time only	Enabling action
	2020-21	L8	Develop a Sustainable Events Guideline for event managers and stallholders to improve the sustainability of events such as minimisation of waste and reducing water and energy consumption	CST			Staff time only	Enabling action
	2020-21	L9	Strengthen the sustainability provisions and procedures in the Sustainable Procurement Policy, such as utilising low emissions products	GCS			Staff time only	Enabling action
	Ongoing	L10	Continue to innovate and trial all viable road maintenance and construction options to reduce emissions and waste to landfill while providing the best outcomes for roads performance, including: • Continue to research ways to in-situ recycle old road pavements to eliminate landfill • Minimise waste to landfill during full road reconstruction by exploring materials requiring least excavation and ways to recycle excavated materials • Work with local suppliers to move towards provision of asphalt, road base and concrete that complies with Council specifications to permit appropriate use of recycled materials	PD			Staff time only	Enabling action
	2020-22	L11	Review the Wollongong Development Control Plan Chapter A2 – Ecologically Sustainable Development to ensure alignment with the Climate Emergency Declaration and net zero emissions targets	CST			Staff time only	Enabling action
	2021-22	L12	Amend the Wollongong Development Control Plan to ensure it supports any future updates to the energy efficiency requirements within the National Construction Code	CST			Staff time only	Enabling action
	2020-22	L13	Commence an investigation into how to encourage sustainable development outcomes, including but not limited to community education, broad ranging incentives, and property marketing tools.	CST			Staff time only	Enabling action
Advocacy	Ongoing	L14	Undertake and collaborate on strong advocacy programs to State and Federal Governments to declare and act on the climate emergency	CST			Staff time only	Enabling action

Strategies	Timeframe	Action No.	Actions	Division/s	Resourcing	Resourcing timeframe	Resourcing type	Expected GHG emissions reduced
	Ongoing	L15	Advocate to the State and Federal Governments to consider climate change impacts when developing new and revised planning instruments, guidelines and legislation, including increased thresholds and standards in NSW BASIX and National Construction Code	CST			Staff time only	Enabling action
	Ongoing	L16	Advocate to the Federal government to expand and improve the Commercial Building Disclosure program	CST			Staff time only	Enabling action
	Ongoing	L17	Advocate to the Federal Government to expand and improve the Australian Government Equipment Energy Efficiency program, which determines the minimum energy performance standards of appliances	CST			Staff time only	Enabling action
Foster innovation	2020-22	L18	Investigate opportunities to work with the University of Wollongong to showcase sustainable building design	CST, ISP			Staff time only	Enabling action
	2020-22	L19	Pursue the inclusion of a sustainable home in an urban release display village	CST			Staff time only	Enabling action
Regional collaboration	Ongoing	L20	Continue to work with Illawarra Shoalhaven Joint Organisation on regional collaborative grants and projects, including the Cities Powers Partnership Program	CST			Staff time only	Enabling action
	Ongoing	L21	Continue to work with other agencies including local and State Government, universities, industry and community organisations to network, learn and share information on low carbon strategies	CST			Staff time only	Enabling action
Grant funding opportunities	Ongoing	L22	Continue to apply for external grant funding for climate change mitigation projects through NSW State Government and Commonwealth funding programs	CST			Staff time only	Enabling action
Internal capacity building	2020-22	L23	Raise awareness to ensure that climate change mitigation actions can be embedded into policies, strategies and service delivery	CST			Staff time only	Enabling action
	2020-22	L24	Educate Council staff on waste reduction, resource recovery and energy savings behaviours within the workplace	CST			Staff time only	Enabling action
Monitoring performance	Ongoing	L25	Maintain and monitor an energy and emissions data management system for Council's greenhouse gas emissions. This data will inform decision making & help track on individual projects and towards corporate goals	CST, ISP, OSES, GCS, FI			TBD	Enabling action
Energy Efficiency and Renewable Energy								
Implement sustainable building design and performance standards	2020-22	E1	Commence review of sustainable building design and performance standards to apply to all new and refurbished Council buildings and facilities	ISP			Staff time only	Enabling action
	Ongoing	E2	Incorporate the adopted sustainable building design and performance standards in all new and refurbished Council buildings and facilities	ISP			Staff time only	Enabling action

Strategies	Timeframe	Action No.	Actions	Division/s	Resourcing	Resourcing timeframe	Resourcing type	Expected GHG emissions reduced
Continue energy efficiency program for Council buildings and facilities	2020-25	E3	HVAC upgrade for Town Hall and Art Gallery with combined plant	ISP	$6,250,000	project cost	Existing funding - in IDP	TBD
		E4	HVAC upgrade for Corrimal Library, Ribbonwood Community Centre, IPAC and Integral Energy buildings	ISP	$7,200,000	project cost	Existing funding- in IDP	TBD
	2020-22	E5	Complete roll-out of the Administration building lighting upgrade program to the Library	ISP	$478,000	project cost	Existing funding- in IDP	TBD
	2020-25	E6	Warrawong Community Centre & Library and Helensburgh Community Centre & Library new builds will aim to be designed, constructed and maintained to sustainable building design and performance principles	ISP			TBD- in planning stage	TBD
	2020-22	E7	Beaton Park Leisure Centre Master Plan developed including Stage One Aquatics Design with sustainable building design and performance principles	ISP			Staff time only	TBD
	2020-22	E8	Upgrade of treated pool filtration systems to reduce energy use	ISP	$4,500,000	project cost	Existing funding- in IDP	TBD
Renewable energy program for Council buildings and facilities	2020-21	E9	Implementation of Solar on Council Buildings project	ISP	$1,000,000	project cost	Existing funding - in IDP	TBD
	2020-25	E10	Pursue the feasibility of the construction of a Whytes Gully Renewable Energy Facility with a 1MW Power station	OSES			Staff time only	Enabling action
Pursue Power Purchase Agreement (PPA)	2020-22	E11	Pursue the potential to establish a PPA utilising the energy generated from Whyte's gully landfill gas to offset Council's highest energy consuming buildings	CST, GCS, OSES			Staff time only	Enabling action
	2020-22	E12	Pursue the potential for opportunity to establish a regional PPA	CST, GCS, ISP			Staff time only	Enabling action
Monitoring performance	2020-22	E13	Continual monitoring of the efficiency of solar systems allows to track the performance of the systems and undertake further cost-benefit analysis for other buildings	ISP			Staff time only	Enabling action
Energy efficient lighting	2020-22	E14	Continue the upgrade of residential streetlights (80 W mercury vapour) to LED	PD	$1,554,836	project cost	Existing funding	1622 tonnes/annum CO_2-e
	2020-22	E15	Pursue investigation into installation of converting higher wattage main streetlights to LED, once the technology becomes feasible	PD			Staff time only	Enabling action
	Ongoing	E16	All new and replacement sport field lighting installations will utilise LED fittings	ISP	$3,000,000	project cost	Existing funding - in IDP, total cost of lighting upgrades	TBD - variable depending on site
Monitoring performance	2020-22	E17	Continue the monitoring and review of quarterly energy consumption data from energy providers to track growth and energy use over time	CST, ISP, GCS, FI			Staff time only	Enabling action
Transport								

Strategies	Timeframe	Action No.	Actions	Division/s	Resourcing	Resourcing timeframe	Resourcing type	Expected GHG emissions reduced
Council Fleet	2020-22	T1	Council will prioritise low emissions and fuel-efficiency when purchasing vehicles, and will include hybrid, and/or electric vehicles or other low emission technology as part of their fleet	GCS			Staff time only. Further investigation will be performed on all low emission alternatives to identify budget implications	TBD
	2020-22	T2	Investigate feasibility of low-emissions vehicle standards for plant fleet	CW			Staff time only	TBD
Electric Vehicles	2020-22	T3	Develop and adopt an Electric Vehicle Charging Stations on Public Land Council Policy, addressing public access and range anxiety	CST, GCS, ISP			Staff time only	Enabling action
	2020-22	T4	Pursue the installation of public EV charging stations at a number of accessible locations across the City. This will consider partnerships with State government, charging companies, car companies or other sponsors to establish electric vehicle charging stations	CST, GCS, ISP			Staff time only	Enabling action
Council supported public transport	2020-22	T5	Continue the Wollongong Free Shuttle Bus	ISP	To be determined in negotiation with Transport for NSW		Existing budget	TBD
		T6	Work with Transport NSW to explore opportunities to enhance the free shuttle bus route to other areas	ISP			Staff time only	Enabling action
Active Transport	2020-22	T7	Finalisation and adoption of the Wollongong Cycling Strategy 2030, to increase cycling participation at all levels across the city through improved planning, convenient, safe and connected cycling infrastructure and encouragement through improved education and events	ISP			Staff time only	Enabling action
	2020-22	T8	Review Wollongong City Centre Access and Movement Strategy 2013 to deliver a new integrated traffic and transport strategy, with a priority on an efficient road network, better traffic management, reliable bus services and pedestrian and cycle networks	ISP			Staff time only	Enabling action
	2021-22	T9	Commence the review of the City of Wollongong Pedestrian Plan 2017-2021	ISP			Staff time only	Enabling action
NSW Government managed public transport	Ongoing	T10	Continue to pursue State government investment in improved public transport services, in particular: • Improved efficiency of current train system and commute to Sydney • Increase number of trains, commuter parking and faster rail • Improved accessibility of all public transport services, for people of all abilities • Better connectivity between different modes of public transport • Increase funding provided to local councils for active transport and public transport projects	ISP			Staff time only	Enabling action
	Ongoing	T11	Lobby NSW Government to implement actions from Future Transport Strategy 2056 and NSW Transport Master Plan to guide investment, policy and reform and service provision. It provides a framework for planning and	ISP			Staff time only	Enabling action

Strategies	Timeframe	Action No.	Actions	Division/s	Resourcing	Resourcing timeframe	Resourcing type	Expected GHG emissions reduced
			investment aimed at harnessing rapid change and innovation to support a modern, innovative transport network, including electric and hybrid vehicles, autonomous and connected vehicles and planning for freight and ports					
Waste								
Wollongong Waste and Resource Recovery Strategy 2022	Ongoing	W1	Continue to implement the Wollongong Waste and Resource Recovery Strategy 2022 and associated Action Plan	OSES	See specific relevant actions below			Enabling action
	2020-22	W2	Review of the Wollongong Waste and Resource Recovery Strategy 2022	OSES			Staff time only	Enabling action
Landfill Gas Capture & Energy Generation	2020-22?	W3	Expand current landfill gas capture system at Whytes Gully	OSES			Build Own Operate Transfer (BOOT) Venture	17,000 tonnes/annum CO2-e
Food Organics Garden Organics (FOGO) program	2020-22	W4	Implementation of the FOGO program across the Wollongong LGA, accompanied by an extensive educational program, to divert household organic waste from landfill and reduce emissions from Council's landfill	OSES	$2,400,000	pa over two years	Existing funding	12,750 tonnes/annum CO2-e
Green waste removal and services	2020-22	W5	Increase green waste removal from fortnightly to weekly collection to divert more green waste to landfill	OSES		Included in FOGO project above	Existing funding	Included in FOGO project above
	Ongoing	W6	Implement a free drop off service for garden waste in preparation for or following natural disasters (including events such as storms, floods and bushfire preparation)	OSES	$25,000	pa	Existing funding	75 tonnes/annum CO2-e
Waste education programs	Ongoing	W7	Continue to design and deliver community education and behaviour change initiatives to maximise diversion of food, other organics, general household waste and nappies from landfill and to educate the broader community in waste avoidance, raise awareness of alternatives and work towards a litter free Wollongong	OSES	$20,000	pa	Existing funding	Enabling action
	2021-22	W8	Design and deliver a 'War Against Food Waste' campaign that focuses on known behaviours and limited knowledge on food waste. The program will focus on how best to reduce the amount of food waste households generate using an array of activities and tools to engage with the key target audiences such as families, 18–34 years, and culturally and linguistically diverse (CALD) communities	OSES	$30,000	pa	New funding required	Enabling action
Waste Wise Events	Ongoing	W9	Continue the Waste Wise Events program to increase resource recovery and waste minimisation at public events	OSES	$70,000	pa	Existing funding (Better Waste Recycling funding)	TBD
Recycling Services	2021-22	W10	Develop a waste management plan for each of the four major charities to assist separation of waste	OSES			Staff time only	880 tonnes/annum CO2-e

Strategies	Timeframe	Action No.	Actions	Division/s	Resourcing	Resourcing timeframe	Resourcing type	Expected GHG emissions reduced
	2020-22?	W11	Enhance kerbside collection service to concession holders to assist with increased separation of waste	OSES			Staff time only	223.3 tonnes/annum CO2-e
	2020-22	W12	Pursue the feasibility of a timber and MDF product separation and recycling program	OSES	$209,000	project cost for six month trial	New funding required	2,650 tonnes/annum CO2-e
Council operations	Ongoing	W13	Ensure Council events and facilities are 'waste-wise'	OSES	Part of Action W9	pa	Existing funding	TBD
		W14	Increase use of local and environmentally-friendly caterers for Council meetings and events, avoiding packaging waste and prioritising seasonal and vegetarian selections	ALL			Staff time only	TBD
		W15	Continue the organic waste composting program within Council administration building and expand to other Council facilities where feasible	ALL			Staff time only	TBD
Monitoring performance	2020-22	W16	Develop a central reporting framework for waste from the City's operations and properties to improve our confidence in waste data, and identify and implement opportunities to reduce waste to landfill	OSES			Staff time only	Enabling action
Trees and Vegetation								
Natural Area Management	Ongoing	V1	Continue to implement and plan to expand the Natural Area Management Program to ensure conservation of remnant bushland, wetlands and riparian areas, in accordance with the Illawarra Biodiversity Strategy, Lake Illawarra Coastal Management Program and relevant vegetation management plans	OSES	$600,000 + stormwater levy + grants additional each year - variable	pa	Existing funding	TBD
	Ongoing	V2	Continue to actively protect and enhance wetlands including reducing unauthorised access and mowing	OSES	Part of Action V1	pa	Existing funding	part of above
	2020-22	V3	At appropriate locations, undertake pilot projects to improve the interface between natural areas and open space, through planting of native grasses and meadows, and open specimen trees to reduce mowing and increase biodiversity	OSES	$10,000	pa	Existing funding	TBD
Urban Greening	Ongoing	V4	Continue to implement the Urban Greening Strategy 2017-37 across the LGA, particularly actions around promoting an increase in canopy cover managing, protecting and maintaining urban vegetation, and development of guidelines for green roofs, green walls and facades, rain gardens and other structural vegetation	OSES	$512,000	pa	Existing funding	TBD
	2020-22	V5	Develop a Tree Selector tool that ensures physical, environmental, and predicted climate constraints are determined to ensure the largest possible trees species are selected for Council plantings	OSES	Part of Action V4	pa	Existing funding	Enabling action

Strategies	Timeframe	Action No.	Actions	Division/s	Resourcing	Resourcing timeframe	Resourcing type	Expected GHG emissions reduced
Biodiversity Strategy	2020-21	V6	Prepare an update of the Illawarra Biodiversity Strategy for the Wollongong LGA and use it to guide future programs and works	CST	$90,000	project cost	Existing funding	Enabling action
Working with our Community								
Partnerships with business and industry	2020-21	C1	Partner with BlueScope to support the positive environmental actions being implemented to reduce emissions of their operations	CST, CCED			Staff time only	Enabling action
	2020-21	C2	Pursue a partnership with i3 Net to assist their members to adopt more sustainable practices and promote positives outcomes	CST, CCED			Staff time only	Enabling action
	2020-21	C3	Pursue a partnership with Illawarra Business Chamber to assist their members to adopt more sustainable practices and promote positives outcomes	CST, CCED			Staff time only	Enabling action
	2020-21	C4	Pursue partnership with NSW Government's Sustainability Advantage Program to support small businesses	CST			Staff time only	Enabling action
	Ongoing	C5	Encourage business and manufacturing to apply for funding through the NSW Energy Savings Scheme and NSW Manufacturing efficiency program to upgrade energy monitoring systems, replace or retrofit old and inefficient systems, install new energy efficient equipment and improve manufacturing processes	CST			Staff time only	Enabling action
Engagement with community organisations/groups	2020-21	C6	Design and implement a community engagement program to determine how to best assist them in emissions reduction, including determining needs, barriers and knowledge gaps	CST, CCED, OSES			Staff time only	Enabling action
	Ongoing	C7	Continue to engage with members of Aboriginal communities to learn from their sustainable living practices and integrate these stories into our community sustainable living programs	CST, CCED, OSES			Staff time only	Enabling action
	2020-21, then ongoing	C8	Establish connections with community groups and help support connections of those within our community with shared values about climate change action. Facilitate a network to share information and work together	CST, CCED			Staff time only	Enabling action
Community education	Ongoing	C9	Continue to deliver sustainable living education and engagement activities (e.g. Green Team, Discovery Centre, Bushcare, Dunecare, Clean Up Australia Day, National Tree Day, Green Plan, and Sustainable Wollongong Newsletter)	OSES	$70,000	pa	Existing funding	Enabling action
	2020-22	C10	Design and deliver a sustainability and environmental education plan to expand the existing education programs. Increase the focus on increasing the capacity of adults to take practical action. Provide guidance to households about how to reduce emissions, including accessing renewable energy, becoming more energy efficient, alternative transport options, waste minimisation, growing food, reducing consumption and sustainable purchasing	CST, OSES	$30,000	project cost	Existing funding	Enabling action

Strategies	Timeframe	Action No.	Actions	Division/s	Resourcing	Resourcing timeframe	Resourcing type	Expected GHG emissions reduced
Urban greening	2020-22	C11	Investigate the feasibility of expanding the Greenplan program to specifically assist homeowners in Urban Release Areas through provision of guidance and appropriate indigenous species	OSES, CST			Staff time to investigate/trial	Enabling action
Encourage community gardens	Ongoing	C12	Continue to support the establishment and operation of community gardens on public land	CST			Staff time only	Enabling action
	2021-22	C13	Review the Community Gardens Policy and procedures	CST			Staff time only	Enabling action
Implement pilot projects	2021-22	C14	Partner with the NW Department of Education to pilot an Eco Schools program in the Warrawong Precinct to reduce their environmental impact by reducing waste to landfill, improving energy efficiency and investigating opportunities to install solar panels	CST	$20,000	project cost	New funding, plus staff time	Enabling action
	2021-22	C15	Pursue the feasibility of piloting innovative energy efficiency programs in the community to improve the energy efficiency of homes, reduce peak demand from the grid, reduce emissions and increase the uptake of renewable energy generation in the community	CST	$50,000	project cost	New funding, plus staff time	Enabling action
	2021-22	C16	Partner with state agencies to ensure that vulnerable communities have access to services and programs to reduce their energy consumption and adapt their homes to increasing temperatures and weather extremes	CST			Staff time only	Enabling action
Monitoring performance and information sharing	Ongoing	C17	Continue to monitor the emissions Wollongong LGA and share it with the community	CST	$10,000	pa	Existing funding	Enabling action
TOTALS				One-off Projects: $24,381,836 Annual programs (per annum): $3,747,000 **Two year (2021-22) plan total: $31,875,836**				**35,200.3 tonnes CO2-e (per annum)**