ATTACHMENTS: AGENDA NO. 11/22
COUNCIL MEETING

Meeting Date: **Tuesday 23 August 2022**
Location: **Council Chambers, Level 1A, 1 Pope Street, Ryde and Online**
Time: **6.00pm**

ATTACHMENTS FOR COUNCIL MEETING

Item

7 CITY OF RYDE - NET ZERO EMISSIONS PATHWAY - REMODELLING TO 2030 TARGET

Attachment 1 Net Zero Emissions Pathway Draft

City of Ryde

Lifestyle and opportunity
at your doorstep

NET ZERO EMISSIONS

PATHWAY FOR THE CITY OF RYDE AND COMMUNITY

4 AUGUST 2022

ACKNOWLEDGEMENTS

The development of the Net Zero Emissions Strategic Plan was led by a project team from the City of Ryde Environment Department. The project team greatly appreciates the input provided by the many internal council representatives and external community stakeholders.

Special thanks is provided to Council's Councils Executive Team, Chief Financial Officer and Departments representing Procurement, Technology, Business Strategy and Innovation, Parks, Buildings, Operations, Ryde Aquatic Leisure Centre (RALC), Transport, Project Development, Community Services, Libraries, Business Infrastructure/Waste/Fleet, Strategic Property, Communications & Engagement, Health & Buildings, Urban Strategy/Planning and Assets and Infrastructure Services, Legal, Governance who have met and informed the development of the Plan and content towards supporting its future delivery.

City of Ryde Environment Department

The Environment Department manages strategic, city-wide delivery across a variety of complex service delivery and management programs in the specialist areas of environmental sustainability, natural areas and resilience.

We will do this by targeting protection of the local built and natural environments and the application of ecologically sustainable development decision-making and responsible use of non-renewable resources across the organisation and community building resilience to impacts of climate change, reducing our ecological footprint, increasing liveability and in the conservation of our natural environment.

Other key areas of responsibility include delivery of corporate and community environmental awareness and education, environmental monitoring and carbon footprint reporting and promoting of sustainable transport and waterway health programs.

Publication and contact details

More information on Net Zero Emissions can be found at **www.ryde.nsw.gov.au/netzero**, or by contacting City of Ryde Customer Service Centre, 1 Pope Street, Ryde NSW 2112. Phone (02) 9952 8222 or email cityofryde@ryde.nsw.gov.au.

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1 MAYOR'S FORWARD

The Net Zero Emissions Pathway is the latest step in the City of Ryde's journey to reduce emissions and plan for a more sustainable future for our community.

This landmark document sets out how the City of Ryde and the community will proactively work towards our goal of net zero emissions through a measured, practical and responsible approach.

It outlines the steps we will have to take to reach this goal and when it can be realistically met, recognising that while we have already achieved a great deal to date there is still much more work to be done.

By developing this Pathway we are prioritising critical action to limit detrimental temperature increases and the associated impacts that those increases have on us all.

In addition, by taking action now we limit exposure to uncertainty and future economic impacts related to inaction on climate and emissions. I am confident that through investing in cleaner and more sustainable technologies, we can actually create new economic opportunities and deliver savings for both Council's operations and our ratepayers.

As is clear in this document, we cannot achieve net zero emissions on our own. We will need the continued support from residents, businesses, employees as well as other councils and the Federal and State governments to hit our targets and reach our ultimate goal.

The community in the City of Ryde have long voiced a desire to do more to address climate change, and it is this proactive attitude that will guarantee success for the benefit of generations to come.

I look forward to engaging with all stakeholders as we embark on the pathway to net zero emissions.

Clr Jordan Lane
Mayor

The Net Zero Emissions Pathway is the latest step in our journey to reduce emissions and plan for a more sustainable future for our community.

Acknowledgement of Country

The City of Ryde would like to acknowledge the Traditional Custodians of this land, the Wallumedegal (or Wattamattagal) clan of the Darug nation.

The City of Ryde would also like to pay respect to Elders both past, present and emerging and extend that respect to other Aboriginal and Torres Strait Islander people.


NO PARKING
ELECTRIC VEHICLES
EXCEPTED
ONLY WHILE CHARGING
2P
MON - SUN
PUBLIC HOLIDAYS
THE NORTH FACE

2 EXECUTIVE SUMMARY

This report outlines the City of Ryde's strategy for achieving Net Zero emissions for the City of Ryde and its community. Net Zero emissions are reached when human-generated emissions of greenhouse gases are reduced as far as possible with any remaining emissions balanced by removals (or carbon offsetting). This report has been prepared in response to the City of Ryde's declaration of a Climate Emergency in 2019 together with the NSW Government's commitment to achieving Net Zero Emissions by 2050 (as translated into the Northern District Plan, Council's Local Strategic Planning Statement and the Ryde Resilience Plan 2030).

The City of Ryde has already undertaken numerous actions to reduce greenhouse gas (GHG) emissions from its own operations, including adopting an 100% Renewable Energy Target by 2030 for electricity, and procurement of 100% Renewable Electricity from 1 July 2022 onwards, introduction of Electric Vehicles to Council's fleet, retrofitting LED streetlighting for residential roads, undertaking various energy efficiency initiatives and installing onsite renewable energy at various sites.

The City of Ryde has already undertaken various actions to reduce GHG emissions from the Ryde Community including; installation of electric vehicle charging stations, increasing and improving bike path connections and pedestrian paths, promotion of active transport, planting trees in open space, provision of the residential Home Waste and Sustainability Advisory Service and Green waste collection service, sustainable planning controls such as the Energy Smart Water Wise DCP, and advocacy to the State Government for improved public and active transport infrastructure and services.

This report outlines the urgent need for progress towards net zero emissions and summarises some of the key climate impacts at various temperature rises, with projected impacts increasing considerably if temperature rises above 1.5°C to 2°C.

This plan was developed following extensive community consultation, which found widespread support for Net Zero targets for both Council operations and the Ryde community.

This plan has identified a number of key corporate emission reduction and offsetting opportunities towards Net Zero for example:

- Continuing to install solar systems on our buildings
- Further implementing energy efficiency projects
- Increasing planting opportunities in the City
- Reviewing and updating Council's policies and plans
- Undertaking electrification of fleet and assets
- Purchasing low/zero-carbon embodied materials and products
- Ensuring sustainable funding is available
- Offset where we cannot reduce emissions further.

This plan has identified a number of key Community emissions reduction opportunities towards Net Zero for example:

- Updating current planning controls
- Expanding current sustainability advisory services
- Renewable energy plans for high emitting areas and community programs
- Supporting further electric vehicle charging infrastructure and shifting the transport mode to more active transport
- Improving food waste recovery
- Education programs
- Working with our businesses
- Advocacy to State agencies
- Increasing community partnerships

Implementation of identified emission reduction opportunities will need to be incorporated into Council's existing Integrated Planning and Reporting Framework with consideration of available funding under Council's Resourcing Strategy.

By implementing feasible Net Zero emission reduction opportunities (including those currently listed in the Net Zero plan together with any additional opportunities identified in the future), it is possible to achieve the following Net Zero targets for Council and the community:

- Council Net Zero Target: Commit to Net Zero emission by 2035 with interim emission reduction targets of 70% reduction on 2018/19 emission by 2029/30
- Community Net Zero Target: Support the community to meet Net Zero Emissions by no later than 2040 or as soon as possible, with interim emission targets of 76% reduction on 2018/19 emissions by 2029/30.

While Council can largely meet its interim corporate targets to 2030with minimal additional emission reductions required beyond business as usual projections (as a result of existing actions and commitments by Council), a higher level of additional emission reductions are required post-2030.

Community GHG emissions are predicted to reduce more over time under a business as usual scenario (2021 Policy Settings scenario), meaning greater efforts need to be focused particularly upon short term emission reductions in order to achieve interim emission reduction targets.

It is acknowledged that some of the key opportunities within the community sector lie outside the direct 'sphere of influence' by Council and are subject to policy and program settings at a State and Federal level or other organisations. Acknowledging these limitations, Council's role will be to directly support community emission reduction opportunities within its own control (such as through planning controls which are supportive of a transition towards low emission transport modes such as electric vehicles and requirements for Net Zero Emissions commercial buildings etc) and advocate for supportive policies and programs in areas outside of the City of Ryde's direct control. We are inviting everyone within the community to plan and act – within their sphere of control and influence – to reduce carbon emissions and join the campaign to demand action for a safe climate.

4 STRATEGIC CONTEXT

4.1 WHAT IS THE CLIMATE EMERGENCY?

The peak scientific body on climate change, the Intergovernmental Panel on Climate Change (IPCC) states that,

"Climate change represents an urgent and potentially irreversible threat to human societies and the planet" *IPCC, 2018*

Climate projections indicate the world faces large scale collapse and loss of entire ecosystems; severe impacts to human health - from stronger heatwaves, lower air quality, and extreme loss of food and water security; increased extent of extreme weather and climate events – flooding, drought, severe storms, wildfire (IPCC, 2018) and severe economic loss due to aggregated and compounding impacts (Steffen et al, 2019.)

The most recent IPCC Working Group I report found that current atmospheric concentrations of carbon dioxide (CO_2) are higher than at any time in the last two million years. It is "unequivocal" that this human interference has warmed the atmosphere, ocean and land. Global surface temperature was 1.09°C higher over the last decade (2011-2020) than the 1850-1900 average, with larger increases over land (1.59°C). Almost all of that increase can be attributed to humans (IPCC, 2021).

"With every additional increment of global warming, changes in extremes continue to become larger" *IPCC, 2021*

Even at 1.5°C, there will be an increasing occurrence of extreme weather events that have no precedent in our observational record. Every additional 0.5°C of warming causes clearly discernible increases in the intensity and frequency of heatwaves, damaging rainfall, and droughts (Climate Council, 2021).

In response to the Climate Emergency, the City of Ryde passed a resolution on 28 May 2019, "acknowledging that we are in a state of climate emergency that requires urgent action by all levels of government; that human induced climate change represents one of the greatest threats to humanity, civilisation and other species; and that it is still possible to prevent the most catastrophic outcomes if societies, including local councils, take emergency action". This declaration also required that "a report be brought back to Council which examines how Council plans, policies and works programs can address the climate emergency, and ensure this is embedded into future Council strategic plans". The report was provided to Council outlining the proactive measures undertaken towards reducing impacts from climate and carbon mitigation works to date and was supported by an introduced Renewable Energy Target of 100% by 2030 to continue this commitment.

There is a narrow path to avoiding climate catastrophe, but only through immediate, deep and sustained emissions reductions.

4.2 WHAT IS NET ZERO?

Net-zero emissions are reached when anthropogenic (human-generated) emissions of greenhouse gases (GHG) released or 'added' into the atmosphere are balanced by anthropogenic emission removals to create a 'Net Zero' emissions outcome.

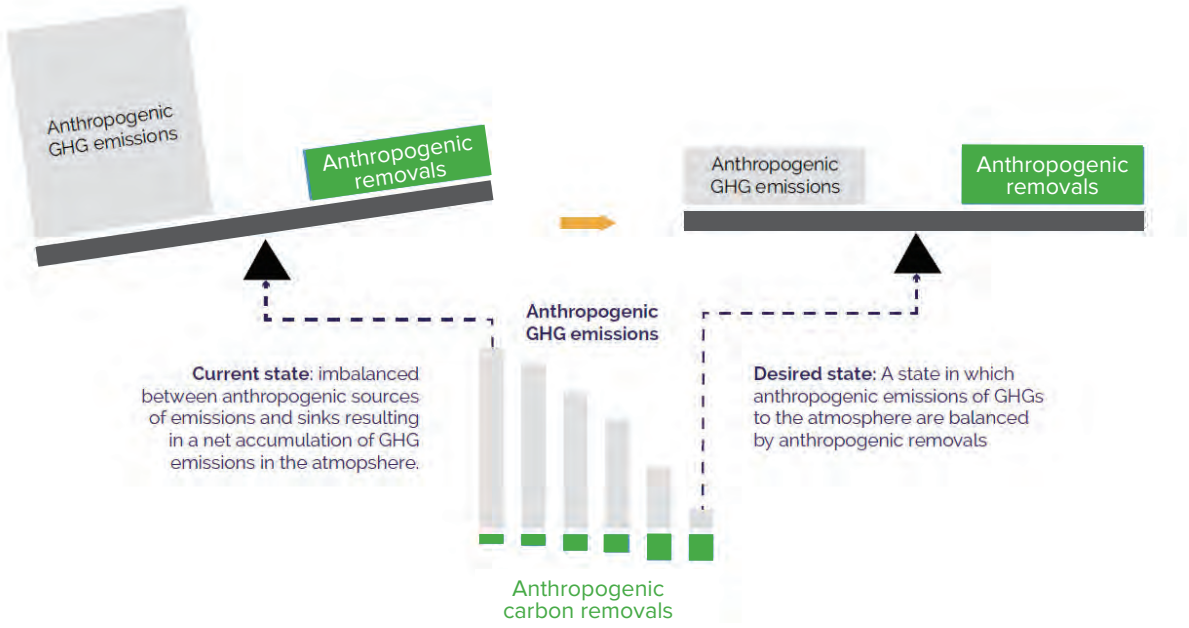


Figure 1: Net Zero Emissions (Pineda et al, 2020)

In order to reach Net Zero, both Council and the community must undertake the following steps:

Step 1) Actively reduce GHG emissions as far as possible in line with 1.5°C pathways through measures such as energy efficiency measures, installation of rooftop PV or purchase of renewable energy, switching to clean energy sources such as electrify both energy and transport sectors, and other emission reduction opportunities as outlined later in this report.

Step 2) Purchase carbon offsets equivalent to any remaining residual GHG emissions (which are not feasible to reduce). These carbon offsets represent the removal of GHG emissions from the atmosphere and can occur through projects such as carbon sequestration through tree planting, land use management and energy efficiency.

4.3 CLIMATE CHANGE IMPACTS

Global

The difference between a few degrees of heating has incredibly significant impacts not only on human health and biodiversity but the ecosystems that support them. The Intergovernmental Panel on Climate Change (IPCC) strongly recommends limiting the global temperature increase to 1.5°C, to avoid the impacts of climate change steeply escalating. Even at 1.5°C of global heating, there will be significant impacts. But the impacts amplify rapidly between just 1.5°C and 2°C of temperature increase, as visible in the following graphic (Climate Council, 2021b) with species extinction as great as 50% loss between the 1.5 – 2C change.

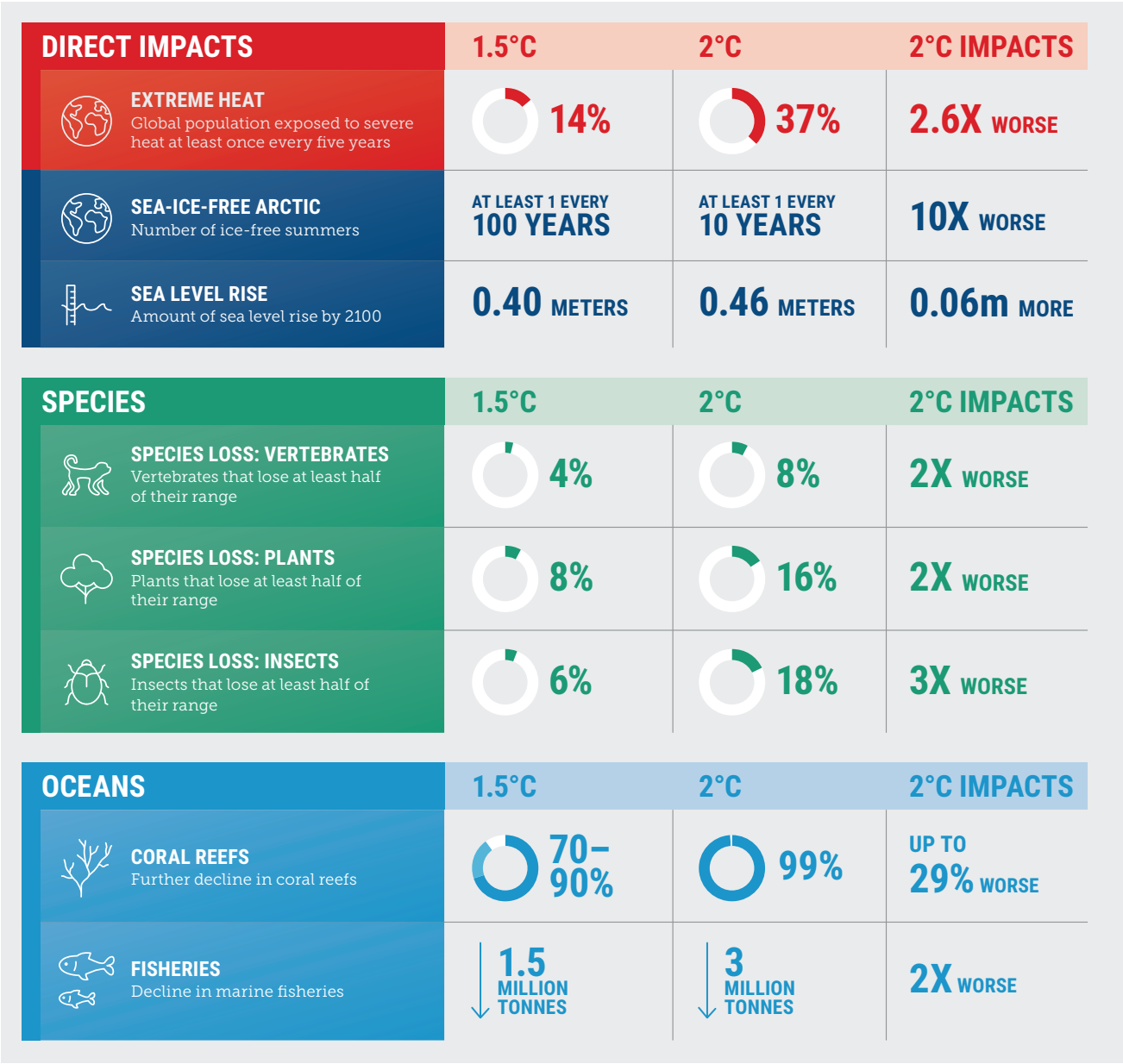


Figure 2: Climate change impacts at 1.5 or 2°C (Steffen et al, 2021)

The latest IPCC report suggest the temperature rise will reach 1.5°C in the near term (2021-2040) for all five emission scenarios modelled. The report shows that limiting warming to 1.5 C by the end of the century, while extremely challenging, is possible with only a small and temporary overshoot (IPCC, 2021). However, this demands immediate, deep and sustained emissions reductions. All but the very lowest scenario for greenhouse gas emissions are inconsistent with limiting warming to 1.5°C (Climate Council, 2021).

Australia

The most recent IPCC report (IPCC, 2021) found that the following Climate Change impacts have already occurred or are projected to occur for Australia:

- Australian land areas have warmed by around 1.4°C between ~1910 and 2020.
- Heat extremes have increased, cold extremes have decreased, and these trends are projected to continue.
- Relative sea level rose at a rate higher than the global average in recent decades; sandy shorelines have retreated in many locations; relative sea level rise is projected to continue in the 21st century and beyond, contributing to increased coastal flooding and shoreline retreat along sandy coasts throughout Australasia.
- Snow cover and depth have decreased and are projected to decrease further.
- Frequency of extreme fire weather days has increased, and the fire season has become longer since 1950 at many locations. The intensity, frequency and duration of fire weather events are projected to increase throughout Australia.
- Heavy rainfall and river floods are projected to increase.
- Sand-storms and dust storms are projected to increase throughout Australia.
- Changes in several climatic impact-drivers (e.g., heatwaves, droughts, floods would be more widespread at 2°C compared to 1.5°C global warming and even more widespread and/or pronounced for higher warming levels.
- Eastern Australia is projected to face a decrease in mean cool season rainfall, but more extreme rainfall events.
- Eastern Australia is projected to face an increase in agricultural and ecological droughts at 2°C global warming and above.

Three billion animals were killed or displaced during the 2019-20 Black Summer fires. Not long after, the Great Barrier Reef suffered its third mass bleaching event in just five years, causing catastrophic, irreversible damage.

Climate Council, 2021a

Image: https://www.aims.gov.au/docs/research/climate-change/coral-bleaching/bleaching-events.html

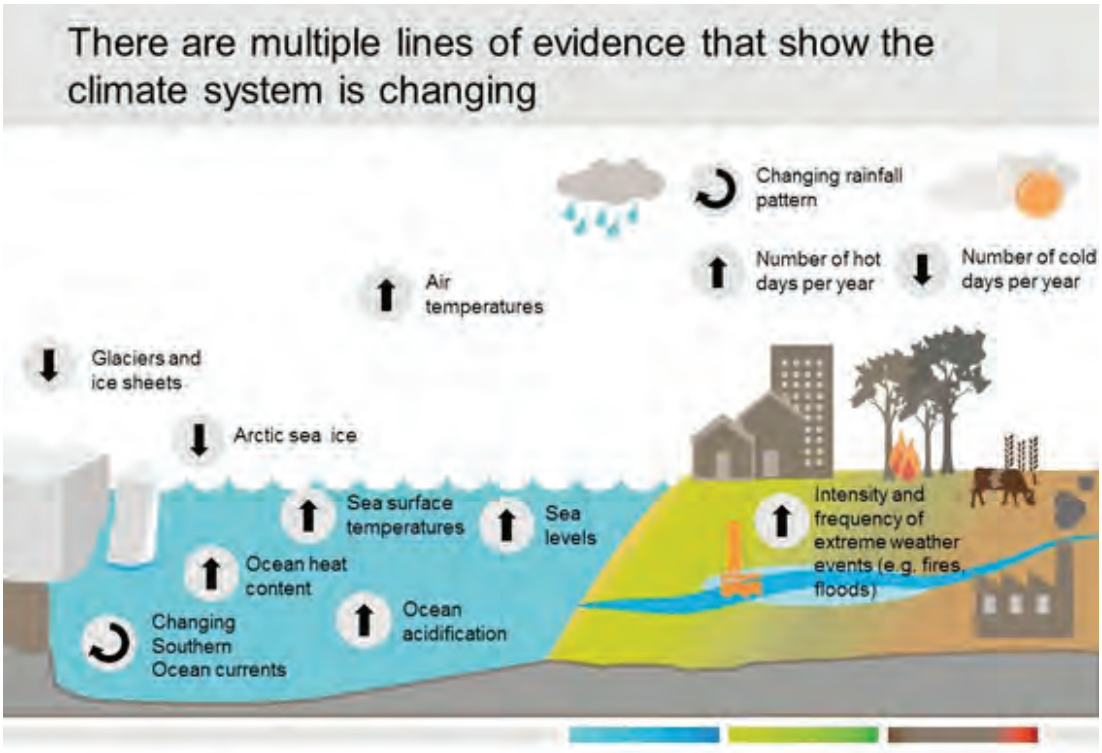


Figure 3: Climate System changes (DCCEEW, 2022).

NSW

The long-term temperature trend indicates that temperatures in NSW have been increasing since approximately 1950, with the largest and consistently sustained, increases in temperature in the most recent decades. Maximum temperatures are projected to increase in the near future (by 2030) by 1.0°C and in the future (2070) by about 2.6°C. (AdaptNSW, 2022).

NSW is expected to experience more hot days (over 35°C) in the future. Across most of NSW there will be more days over 40°C (OEH, 2014). Heatwaves are projected to occur more often and last longer, up to 3.5 days more on average. By 2030, there is projected to be up to 10 more heat wave days per year and by 2070 up to 33 more in the north of NSW. In the south, there is projected to be up to seven more days. Climate change is projected to increase heat-related mortality and morbidity (OEH, 2016).

Rainfall is projected to decrease in spring and to increase in autumn (NSW Office of Environment and Heritage, 2014a). Rainfall extremes that can cause riverine and flash flooding are also projected to increase both in frequency and intensity (OEH, 2016).

NSW is projected to experience an increase in average and severe fire weather in the future (NSW Office of Environment and Heritage, 2014a). Increases in average and severe fire weather are projected to occur mainly in summer and spring, with the largest increases by 2070 to occur in spring (OEH, 2016).

Climate change is emerging as a serious threat to native species and ecosystems and is expected to be an ongoing challenge to their effective conservation especially if immediate action on carbon emissions is not taken to limit temperature rises to 1.5°C. Rising temperatures and sea levels, as well as climate-induced changes in fire regimes, water quality and ocean chemistry, will have wide-ranging impacts on biodiversity and will intensify existing threats such as habitat loss, weeds, pest animals and drought (OEH, 2016).

City of Ryde

Key climate change related impacts and risks for the City of Ryde are outlined in the Ryde Resilience Plan 2030 and in Council's (internal) operational Climate Risk and Resilience Assessment Report (2020).

Urban heat represents the highest risk of climate change related impacts to the broader community across the City of Ryde and especially to vulnerable members of the community who may live in poorly constructed dwellings, not have adequate cooling devices or financially unable to run them. This is a critical risk due to the potential of illness or death for those less mobile, socially isolated, chronically ill, elderly or economically supported with less ability to adapt or withstand such events or stresses.

The hazards from bushfires and flood events, are considered to be the second highest risk to the community in the City of Ryde of all the weather related events influenced strongly by climate change and atmospheric carbon levels. Geographically placed bordering the Lane Cove National Park means that extended fire weather seasons from climate change, amplifies the need to act to reduce risk of these fire opportunities that threaten our communities and biodiversity.

More frequent and intense rainfall events due to Climate Change will place some locations in our city at more risk from flooding.

Climate change related sea level rise is projected to impact upon certain private and Council infrastructure, particularly along Parramatta River and at some locations along Lane Cove River.

Climate change is already having an impact in the City of Ryde. Hazards from heat stress, bushfires, flooding and sea level rise will increase for every tonne of CO_2 emitted.

Image: West Ryde circa 1984

4.4 RESPONDING TO THE CLIMATE EMERGENCY

Global

To address climate change at an international level, signatory countries adopted the Paris Agreement at the Conference of Parties 21 (COP21) in Paris on 12 December 2015. The Agreement entered into force less than a year later with signatory countries agreeing to work to limit global warming to well below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C and given the grave risks, to strive for 1.5°C.

With the inconsistency of current pledges and policies made by various countries globally (some countries are adopting targets in line with Paris Agreement 1.5 °C limit and others adopting insufficient targets to meet this limit), the world is on a trajectory towards a catastrophic temperature rise of between 2.7 to 3.1°C this century (The Climate Action Tracker, 2022). This figure is far beyond the Paris Agreement goals of limiting global warming to well below 2°C and pursuing 1.5°C (UNEP, 2020) with detrimental and irreversible impacts on ecosystems, biodiversity and human health.

Australia

At a national level, the Australian Government is committed to reduce greenhouse gas emission by 43% below 2005 levels by 2030 and will put Australia on track to achieve net zero emissions by 2050. The Government proposed comprehensive set of policies include:

- Investment in electricity grid to accelerate the decarbonisation of the grid
- Delivery more community batteries and solar banks across Australia
- Investment on renewable manufacturing and low emission technologies
- Support the development of new clean energy industries and decarbonisation priorities of existing industry
- Introduction of declining emission baselines for Australia's major emitter, under the existing Safeguard Mechanism
- Introduce National Electric Vehicle Strategy to reduce emissions and accelerate the uptake of EV
- Investment in electric vehicle charging and hydrogen refuelling infrastructure
- A commitment to reduce the GHG emissions of Commonwealth Government Agencies to net zero by 2030.

NSW

In the NSW Climate Change Policy Framework (2016), the NSW Government committed to achieving net zero GHG emissions by 2050. This goal has been translated into strategic planning frameworks, the 2050 Greater Sydney Regional Plan, North District Plan and other district plans for all councils which include an objective for "a low-carbon city contributes to net-zero emissions by 2050 and mitigates climate change".

The NSW Government has developed the following plans in support of its Net Zero 2050 target:

- Net Zero Plan Stage 1: 2020–2030 and Implementation Update (2021) which set out how the NSW Government intends to achieve an updated 50% emission reduction goal by 2030 compared to 2005, provides an overview of actions taken to date by the NSW Government, together with the following supporting targets:
  - Net zero emissions from organic waste by 2030.
  - An aspirational target of up to 10% hydrogen in the gas network by 2030.
- NSW Waste and Sustainable Materials Strategy 2041, which includes various strategies targets for waste, and reaffirms the NSW Government's commitment to the goal of net zero emissions from organic waste by 2030.
- NSW Electric Vehicle Strategy (2021) which includes policies and initiatives to incentivise the uptake of zero-emissions vehicles and ensure that more than 50% of new car sales are electric vehicles (EVs) by 2030
- The Electricity Infrastructure Roadmap (2020) presents a coordinated approach to deliver a modern energy system, reduce electricity prices and unlock investment in renewable energy.
- Net Zero Industry and Innovation Program which focuses on Clean Technology Innovation, New Low Carbon Industry Foundations and High Emitting Industries.

City of Ryde

Key strategic directives which the City of Ryde has already provided to guide its response to climate change include:

- Climate Emergency Declaration resolution passed on 28 May 2019.
- Fossil Fuel Divestment. On 28 November 2017, the City of Ryde passed a motion to divest from fossil fuel aligned investments in Council's portfolio and are currently at 21.1% as at August 2021 of our total portfolio. This directive is being implemented via Council's updated Investments Policy adopted October 2021.

- 100% Renewable Energy Target. On 14 April 2020, the City of Ryde adopted an 100% Renewable Energy Target (RET) for all of Council's electricity using assets by 30 June 2030. In support of the RET, Resource Efficiency Targets for certain categories of new buildings, equipment and appliance were also adopted.
- City of Ryde Climate Risk and Resilience Assessment 2020. This plan was adopted by Council's Executive Team on 10 June 2020 and provides an updated Climate Risk assessment for Council's own operations and proposes adaptation plans to respond to key risks.
- Ryde Resilience Plan 2030. The Ryde Resilience Plan aims to strengthen the community and Council to become more resilient to chronic stresses and acute shocks including from Climate Change.
- Local Strategic Planning Statement - To align with the NSW Government's Net Zero Emissions goal by 2050, Council committed to achieving Net Zero Emissions at a minimum by 2050 and to align actions and works towards achieving this.
- Council joined the Cities Power Partnership in 2018 and the Resilient Sydney program in 2015 as part of its commitment towards climate action and building resilience to climate change related shocks and stresses.

City of Ryde Community

Within the City of Ryde community, many businesses, organisations and residents have already set Net Zero targets, committed to 100% renewable electricity or taken other steps to reduce greenhouse gas emissions.

Organisations and businesses within the City of Ryde with Net Zero (or carbon neutral) targets include Goodman, AMP Capital, Stockland, Frasers, ISPT, Dexus, Macquarie University. Further details of Net Zero commitments and actions by businesses and organisations within the City of Ryde can be found at **www.ryde.nsw.gov.au/netzero**

Actions to reduce emissions are a win-win-win because they benefit our health, our economy and the climate.

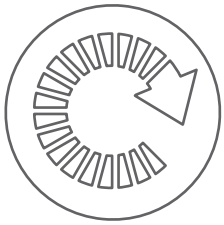
Every choice and every fraction of a degree of avoided warming matters.

5 NET ZERO ACTIONS ALREADY UNDERTAKEN

5.1 CORPORATE NET ZERO ACTIONS ALREADY UNDERTAKEN

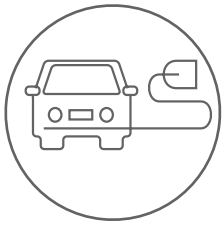
Council has already undertaken a range of actions to reduce emissions in their own operations.

This includes:

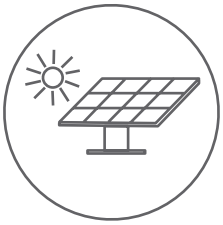


100% Renewable Energy Target by 2030 for electricity used in Council property and assets

Roll-out of LED streetlights in residential roads and **LED sports lights** at several parks



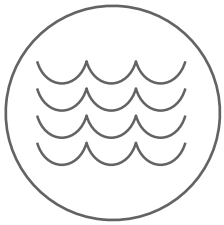
Three 100% electric vehicles and charging stations introduced to Council's fleet



Solar systems installed across 7 community buildings

Adopted Sydney wide joint tender to **prioritise recycled materials in civil works**

Corporate Resource Efficiency targets for new building fit-outs, equipment and appiiances



Solar hot water and heat pump hot water systems installed at various parks and community facilities

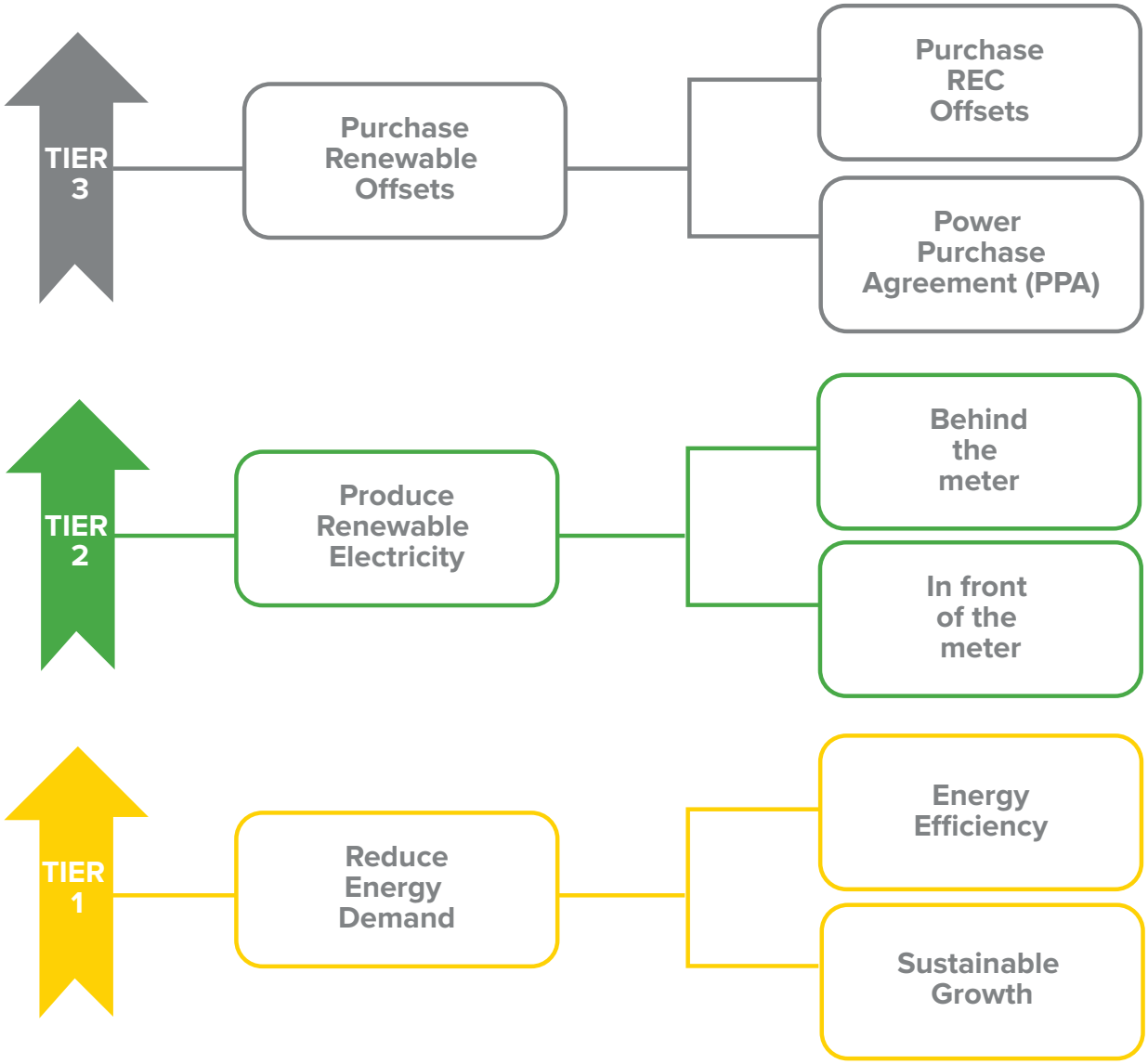
Commenced implementation of **Ryde Resillience Plan 2030 a**ddressing climate risks and stresses

5.1 CORPORATE NET ZERO ACTIONS ALREADY UNDERTAKEN... CONTINUED

Renewable Energy Target

On 14 April 2020, the City of Ryde adopted an 100% Renewable Energy Target (RET) for all of Council's electricity using assets by 30 June 2030. In support of this RET, Resource Efficiency Targets for certain categories of new buildings, equipment and appliances were also adopted to assist with reduce energy consumption and emissions through efficiency (City of Ryde, April 2020).

The RET identified 3 different Tiers for achieving an 100% RET.



Adapted from 100% Renewables (100% Renewables, 2019).

5.1 CORPORATE NET ZERO ACTIONS ALREADY UNDERTAKEN... CONTINUED

Climate Risk and Resilience Assessment

This operational plan was adopted by Council's Executive Team on 10 June 2020 and provides an updated Climate Risk assessment for Council's own assets and operations and proposes adaptation plan actions to respond to key climate related risks.

Energy and Resource Efficiency

Since 2003/04, numerous Energy Efficiency Measures have been undertaken at various Council buildings and operations as identified in Council's Energy Saving Action Plan and other programs. Key energy efficiency measures already undertaken include:

- Light Emitting Diode (LED) lighting and other energy efficient lighting retrofits
- Variable Speed Drives for Air Handling units.
- Cogeneration plant installation at Ryde Aquatic Leisure Centre (RALC)
- Installed Solar Hot Water/Heat Pump Hot Water Systems at RALC and parks
- Upgraded Building Management Systems
- Installed UltraViolet (UV) Water Treatment System at Ryde Aquatic Leisure Centre, (RALC) to replace Ozone system.
- Lighting The Way Proposal to Replace Residential Street Lights with LED's (Ausgrid owned). As part of SSROC's Streetlighting Improvement Program, 2443 Ausgrid owned Category P residential streetlights have recently been replaced with LEDs.
- Undertook a revised Energy Audit of 18 Council owned sites to inform future efficiency and renewable energy projects. This audit will be incorporated into a future update to Council's existing Energy Savings Action Plan.

Renewable Energy onsite

Solar Hot Water

In 2014, electric-boosted Solar Hot Water systems were installed in amenity buildings in Magdala, Christie, Morrison Bay, Eastwood, ELS Hall, Meadowbank, Ryde and Marsfield Parks.

In 2014, five gas boosted Solar Hot Water systems were installed at the Ryde Aquatic Leisure Centre.

Solar PV

From 2016 to 2020, 7 Solar PVs systems have been installed by Council including:

- A 32.76kW Solar PV system was installed at North Ryde Library and Community Centre.
- A 7.5 kW Solar PV system was installed at Eastwood Community Hall.
- A 300.33kW Solar PV system was installed at Ryde Aquatic Leisure Centre.
- A 26.15kW Solar PV system was installed at West Ryde Community Centre.
- A 16.7kW Solar PV system was installed at the Operations Centre.
- A 8kW solar PV system was installed at the Trafalgar Hall.

For 2019/20, Solar PV already installed will have generated enough renewable energy to offset around 284,433 kWh of grid electricity per year. However it should be noted that until January 2021, any Large Generation Certificates (LGCs) generated from the RALC Solar plant were not able to be counted as an emissions reduction as they were sold to market in accordance with the delivering outcomes under the original project business case to offset some initial capital expenditure. Council has since resolved to voluntarily surrender LGCs associated with RALC and any future large solar projects enabling the related emission reductions to be accounted for by the City of Ryde.

Renewable Energy procurement

SSROC Power Purchase Agreement

In 2018, Council joined the Southern Sydney Region of Councils (SSROC) Program for Energy and Environmental Risk Solutions (PEERS)1 tender, as part of a 19 council bulk electricity purchasing contract which has provided cost savings and environmental benefit as compared to standard market pricing. This contract includes a renewable Power Purchase Agreement (PPA), under which the City of Ryde is sourcing renewable energy and associated Large Scale Generation Certificates (LGCs) (from the Moree Solar Farm project equivalent to approximately 20% of its large site load until the end of 2030) with the balance of Council's large site electricity needs being supplied as regular grid electricity from retailer Origin Energy from 2018/19-2020/21.

Council is also currently participating in the PEERS3 tender process and has agreed to purchase 100% renewable energy share in our electricity contracts from 2022/23 and to voluntarily surrender all LGCs generated under PEERS3.

5.1 CORPORATE NET ZERO ACTIONS ALREADY UNDERTAKEN... CONTINUED

Sustainable Transport

Sustainable Transport has always been a key focus in reducing carbon emissions from vehicular use, towards improving overall air quality and health of residents, and in reducing congestion by providing connections and alternatives to emission intensive internal combustion vehicles. Council has already undertaken a range of actions to reduce emissions from its transport including:

- The purchase of three Electric Vehicles for use under Council's pool vehicle and leaseback arrangements.
- Increasing numbers of included hybrid and leaseback options on the staff vehicle leaseback list.
- Undertaken staff transport surveys and provided bicycle parking and end of trip facilities for staff using active transport.
- Continuous improvement works to shared user pathways to enable all abilities in community to walk, run and cycle over using cars through improving our connections across the city.
- Undertook a partnership project with Macquarie University and Transport for NSW (TFNSW) trialling personal mobility devices to bridge short connection trips from transport hubs to places such as malls and the university campus.
- Continue to provide the 'Shop Ryder' community bus service linking five key town centres to reduce single car passenger trips and connect under serviced public transport areas in the southern area of the city.

Sustainable Materials/Products

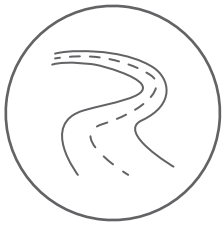
Council has already undertaken a range of actions to reduce emissions from materials and products including:

- Participated in SSROC's Joint Procurement of Recycled Civil Works Materials program (2020). This has developed a 'Paving the Way' tender which is looking to incorporate recycled crushed glass into asphalt, pipe bedding and non-structural concrete. It is part of a 15 council partnership with the NSW Government, TfNSW and EPA and seeks to divert over 70 million glass bottles from landfill annually, create local (and sustainable) manufacturing and investment opportunities to assist in minimising waste processing and landfill issues.
- Disposing of electronic items (PCs/Servers/Phones/Printers) using environmentally safe methods with recycling of components where possible though Council's existing electronics disposal contract.
- Trialling a new process for procurement contract/ tenders seeking to engage with suppliers to encourage the use of recycled and sustainable products and services provided to Council towards reducing supply chain emissions in our services.

5.2 COMMUNITY NET ZERO ACTIONS ALREADY UNDERTAKEN

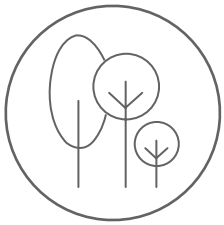
Council has already undertaken a range of actions to reduce emissions in the community.

This includes:



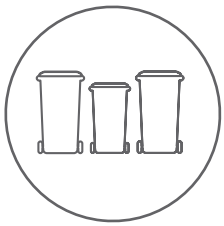
Sustainable transport infrastructure including bike paths, pedestrian paths and bus shelters

Public electric vehicle charging infrastructure with Council's first three charging locations installed



Street tree planting and bush regeneration programs

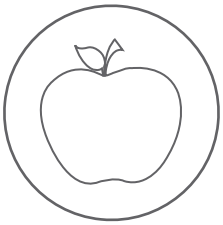
Home Waste and Sustainability Advisory Service



Green waste collection service and subsidised worm farms and compost bins

Sustainable planning controls such as Energy Smart Water Wise DCP, Travel Plan Guidelines

Community education programs providing advice on how to lower your carbon footprint



Our Common Ground sustainable food gardening for residents who live in apartments

Developed **Integrated Transport Strategy, Bicycle Strategy, Sustainable transport strategy**

Sustainable Transport Infrastructure

Council replaces or restores around 3,050m^2 of footpaths and cycleways each year and installs a further 2,900m^2 of new footpath and 4,200m^2 of new cycleways each year.

Street tree planting and bush regeneration programs

Council currently plants around 600 street trees per annum from its own funding, with a further 600 planted using matched funding sources.

Council's bush regeneration program manages over 103 hectares of bush regeneration areas using both professional bush regeneration contractors and over 136 volunteers to undertake bush regeneration.

Green waste collection and subsidised worm farms/compost bins.

Council currently collects over 10,000 tonnes of greenwaste each year and provides around 80 subsidised worm farms and compost bins each year which helps to reduce methane emissions from waste.

Community environmental education programs

Council runs a variety of environmental education programs which are promoted through its Smarter Cleaner Green Newsletter. Council's waste team provides various workshops on topics such as green cleaning, cloth nappies, composting and worm farming. Council's Environment team provides workshops on issues such as Electric Vehicles, Renewable Energy and Energy Efficiency, Bushcare and Environmental Weeds.

Public electric vehicle charging infrastructure

Council currently has three public electric vehicle charging stations and has developed Guidelines for Electric Vehicle (EV) Charging Infrastructure on Public Land.

Home Waste and Sustainability Advisory Service

Councils Home Waste and Sustainability Advisory Service offers free advice to Ryde residents to help understand how to reduce their home's running costs - and at the same time improve its comfort and environmental performance. In 2020, 113 individual tailored assessments were delivered with households saving on average over $500 / year on electricity, over $440 / year on gas and over $30 / year on water bills.

Sustainable Planning Controls

Council already has various Sustainable Planning Controls including an Energy Smart Water Wise DCP, Green Travel Plans and GBCA Green Star requirements for certain classes of development in certain areas, and Water Sensitive Urban Design guidelines.

Our Common Ground sustainable gardening program

Our Common Ground aims to engage with apartment complexes in the City of Ryde to establish apartment communities and "sustainable living" champions and empowering them with skills to reduce their waste and environmental impact This project engages and creates sustainable living" apartment communities establishing shared vegetable garden and provide specific knowledge on how to reduce their waste, energy and water consumption. Around five apartment building take part in the program each year.

6 NET ZERO TARGETS FOR COMMUNITY AND CORPORATE EMISSIONS

6.1 SETTING NET ZERO TARGETS

Targets adopted by organisations to reduce carbon emissions are considered "science-based" if they are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement—to limit global warming to well below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C.

There are a number of guidance documents available from various organisations to guide the City of Ryde in setting appropriate targets. Some of these include The Intergovernmental Panel on Climate Change (IPCC), Science Based Targets Initiative (SBTi), C40- Deadline 2020, World Wide Fund for Nature (WWF)- One Planet City Challenge (OPCC) and Climate Targets Panel and have been reviewed to inform the development of this Plan. (Further information on these can be found in Appendix D).

The City of Ryde also compared proposed Net Zero targets against the targets set by other councils within NSW.

6.2 SETTING A BASELINE FOR GHG EMISSIONS

On the pathway towards achieving a long-term Net Zero target, organisations or communities may wish to also establish interim Net Zero targets. Interim Net Zero targets are assessed against a predetermined 'baseline level' to measure progress.

In the case of this Plan, Council has determined to use the baseline year of 2018/2019. This level was determined as it provides the most recent year for which complete and representative emissions data is available for both community and operational emissions profile data (without any COVID-19 related shutdown effects) and will provide a holistic view to track and measure against towards a Net Zero target.

6.3 CORPORATE EMISSION REDUCTION TARGET

The following Corporate emission reduction target has been adopted by Council at its 23 November 2021 meeting:

- Commit to Net Zero Emissions by 2035 with interim emission reduction targets of 50% reduction on 2018/19 emissions by 2024/25, 76% reduction on 2018/19 emissions by 2029/30.

This Net Zero target aligns with Climate Targets Panel/Climate Council/Deadline 2020/OPCC/SBTI guidance.

6.4 COMMUNITY EMISSION REDUCTION TARGET

The following Community emission reduction target has been adopted by Council at its 23 November 2021 meeting:

- Support the Community to meet Net Zero Emissions by no later than 2040 or as soon as possible, with interim emission targets of 76% reduction on 2018/19 emissions by 2029/30.

This aligns with Deadline 2020/ OPCC/SBTI guidance and strives to align with Climate Targets Panel/ Climate Council guidance.

Note: Given Council's limited sphere of influence, Council has limited control over some areas of community-based emissions and will be reliant upon State/ Federal supported interventions and broader Community action to achieve targets.

7 PATHWAYS TOWARDS NET ZERO EMISSIONS FOR CITY OF RYDE COUNCIL

7.1 BUSINESS AS USUAL BASELINE AND TRAJECTORY

Business as Usual Projection

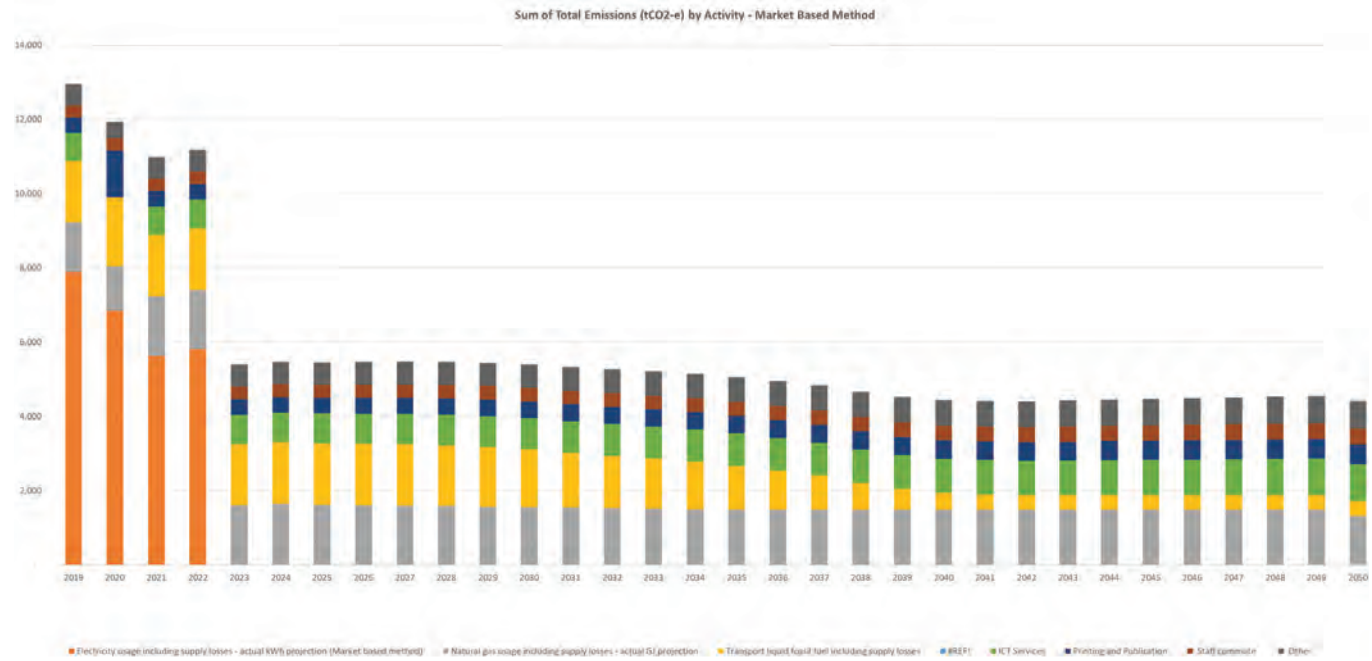


Figure 4: Council's Business as usual emissions trajectory

This BAU projection was developed using the Climate Active methodology described in Appendix C. A baseline of 2018/19 was selected as it was the most recent year for which typical energy usage patterns could be obtained (excluding COVID19 related shutdowns).

This is an estimate only and is subject to variation based on future changes in Federal or State Government policy and has been developed to account for service changes required to meet the needs of a growing population.

Table 1: Council's Business as usual emissions trajectory

	2019	2020	2021	2025	2030	2035	2040	2045	2050
Total Business as Usual Emissions (tCO_2e)	13,513	12,915	11,714	5,455	5,398	5,051	4,435	4,472	4,411
Reduction in emissions compared to 2018/19 baseline		4.4%	13.3%	59.6%	60.1%	62.6%	67.2%	66.9%	67.4%

7.2 FUTURE EMISSION REDUCTION OPPORTUNITIES

A range of potential emission reduction opportunities for Council's own operations are presented in Appendix A. Additional emission reduction opportunities will continue to be investigated and identified in future revisions of the Net Zero Plan.

Key emission reduction opportunities towards Net Zero include:

- CONTINUING to install onsite renewable energy where feasible
- IMPROVING streetlighting energy efficiency with potential Ausgrid Main Roads LED Retrofit.
- UNDERTAKING building energy retrofits and implementing adopted Resource Efficiency Targets
- INCREASING street tree/ park planting programs.
- INVESTIGATE further reductions in embodied emissions from materials through contracts/ tenders and other initiatives (particularly for asphalt/ concrete/steel)
- INTEGRATING sustainability considerations into Procurement
- DEVELOPING AND IMPLEMENTING Fleet Low Emission Vehicle Transition Plan/Plant Emission Transition Plan.
- INVESTIGATING further electrification of diesel/ gas plant & stationary equipment
- REPLACING or retrofitting equipment with refrigerants to lower Global Warming Potential alternatives
- DEVELOPING AND PROMOTING employee Workplace Travel Plan and lower emission commuting and working from home arrangements
- INVESTIGATING an Energy Revolving fund to support efficiency and carbon reduction projects

Specific opportunities under these areas are described below and detailed further in Appendix A. In general, opportunities are only presented below if they are not within current business as usual service delivery.

Energy

Energy usage is responsible for 59% of Council's emissions in 2018/19 but will reduce to 20% in 2030, largely as a result of Council's 100% Renewable Energy Target by 2030 (for electricity) under which Council is currently purchasing 100% renewable electricity for all sites from 2022/23 onwards. The remaining sources of energy emissions are largely related to natural gas usage from equipment at Ryde Aquatic Leisure Centre and other large buildings, for which there are potential opportunities for electrification of this equipment upon replacement.

Key emission reduction opportunities related to energy include.

- Continuing to participate in SSROC Streetlighting program LED replacement program for main road lighting.
- Undertaking energy efficiency measures as detailed in Identification of Energy Saving Measures Report 2020.
- Installing Solar PV at ELS Hall Park Community Sports Centre and installing a battery on the existing Solar PV system at North Ryde Library and Community Centre.
- Undertaking feasible energy efficiency measures detailed in RALC Energy Optimisation Study.
- Undertaking an energy efficiency audit for remaining Council buildings and properties not yet investigated and implementing efficiency measures.
- Phasing in a requirement for minimum energy ratings for appliances by seasonal hirers of canteens/clubrooms in park buildings as a condition of hire. Providing links to grants/sources of funding for clubs to upgrade equipment and dispose of less efficient equipment.
- Replacing Ryde Aquatic Leisure Centre cogeneration system with efficient Electric Heat Pump system
- Replacing Ryde Aquatic Leisure Centre gas boosted solar hot water system with heat pump boosted solar hot water system
- Replacing Ryde Central Gas Boilers with Heat Pump Systems
- Replacing Ryde Central Gas Domestic Hot Water Systems with Heat Pumps
- Investigating new renewable energy/energy efficient technologies for design and construction methods of new buildings and infrastructure.
- Identifying a "sustainability" thought leader in the Project Development team tasked with ongoing research and sharing of best practice in renewable energy and sustainable construction/design practices.

Water

The pumping and treatment of portable water results in GHG emissions. However, this is fairly small source of emissions at around 1% of corporate GHG emissions.

Key emission reduction opportunities for water include:

- Developing and implementing an updated Water Saving Action Plan for whole of Council that demonstrates alignment with the Planning Ryde Local Strategic Planning Statement 2020 water target. This action plan will incorporate audits of selected Council building assets and findings from the Parks Water Strategy, to include costed water saving initiatives.

Resource Efficiency/Waste

Corporate waste and purchase of good and services contribute significantly to the overall corporate emissions.

Key emission reduction opportunities for resource efficiency/waste include:

- Exploring the option of a food only (FO) or combined food organics and garden organics (known as FOGO) commercial collection service and other resource recovery options.
- Investigate provision of worm farms at all Council properties where feasible.
- Undertake continuing waste minimisation and education program at Council properties
- Develop Green Lease and Licence clauses for tenancies in Council owned properties.
- Replacing upon failure (or retrofit by 2030) equipment containing higher global warming potential refrigerants.

Photo by Edward Howell on Unsplash

- Explore further opportunities for using recycled/reused materials where appropriate such as crushed concrete/brick/ asphalt as backfill in drainage lines etc and fly ash in concrete pavements for local roads/ footpaths.

Procurement

Procurement related actions can cover a range of emission sources.

Key emission reduction opportunities for procurement include:

- Develop and implement a Sustainable Procurement plan to update Council's procurement policy and processes.
- Continue to participate in SSROC's Joint Procurement of Recycled Civil Works Materials under which a Paving the Way tender has been undertaken which incorporates recycled crushed glass into asphalt, pipe bedding and non-structural concrete.
- Explore the use of Warm Mix asphalt as part of SSROC and NSROC tenders (subject to updates of Transport for NSW asphalt specifications).
- Investigating and implementing options for lower emission concrete in updated minor works and other contract specifications
- Investigate and implement options for specifying recycled/ lower carbon/ carbon neutral steel in purchasing specifications.
- Preference (or where appropriate given the scale of potential competitors and other procurement policy considerations, require) for the following suppliers to have Net Zero Plans/Targets or Carbon Neutral Accreditation by dates in alignment with Council's Net Zero targets:
  - ICT suppliers
  - postal suppliers
  - printing and stationery suppliers
  - food and catering suppliers
- Advocate for specifications enabling further lowering of greenhouse emissions from products and services in the following major panel contracts:
  - SSROC (for civil works)
  - NSROC contracts (for ssphalt)
  - LGP panel contracts (for IT)
  - NSW Government contracts (for construction/IT/motor vehicles etc)

Transport and Plant

Council's fleet and mobile plant vehicles were responsible for about 10% of corporate GHG emissions in 2018/19, with staff commute responsible for around 2% of corporate GHG emissions.

Vehicle fleet includes light passenger vehicles, utes, vans and heavy vehicles (such as trucks, garbage compactors, streetsweepers). Plant includes equipment such as excavators, loaders, mowers and other mobile plant.

By 2029/30, transport will be responsible for 41% of Council's BAU emissions. Some staff commute is accounted for in Council's fleet as a number of staff members have access to fleet vehicles under Council's leaseback and packaged vehicle arrangements.

Key emission reduction opportunities for transport and plant include:

- Develop and implement a Low Emission Vehicle Transition Plan for Council's fleet (in line with adopted Net Zero target). This Plan shall include:
  - A proposed fleet procurement model which provides a pathway for gradual replacement of Internal Combustion Engines to Electric Vehicles (EV/PHEV/HEV) to achieve required emission outcomes against target, whilst updating Council's budget as required to minimise total cost of ownership.
  - continue to annually revise the vehicle list for leaseback/ packaged and other.
  - Vehicle provision to consider current market availability of fit for purpose vehicles which support lowest total cost of ownership.
  - Policy changes to support the switch to lower emission vehicles.
  - Ongoing monitoring of Council's low emission vehicle performance.
  - Early trials of EV heavy vehicles for selected categories.
  - Installation of EV charging stations in various sites for EV fleet.

- Develop and implement a Low Emission Transition Plan for Council's plant.
- Investigate the costs and greenhouse emissions associated with in home electric charging of Council vehicles and consider options for remuneration/business use incentive where applicable.
- Develop and implement employee workplace travel plan for Council offices/workplaces and undertake annual staff commute survey.
- For staff who need to commute via private vehicles, encourage the use of lower emission vehicles including electric vehicles.
- Implement City of Ryde Sustainable Transport Strategy (for both community and Council operations).
- Investigate opportunities for providing other financial incentives to staff eligible for leaseback/packaged vehicles who elect not to use the vehicle offered with a position and take public or active transport to work instead.
- Continue to enable flexible working and working from home arrangements.

Land Use and Natural Systems

Council is responsible for the management of large natural areas such as bushland within the City of Ryde, together with street verges and parks. While land use related GHG emissions have not been included in this corporate inventory these areas represent opportunities for potential future emission offsetting via expanded tree planting programs.

7.3 POTENTIAL EMISSION OFFSETTING OPPORTUNITIES

After existing and any additional future feasible emission reduction opportunities have been undertaken as a first priority, offsetting can be used for any remaining residual GHG emissions in accordance with Council's adopted Net Zero targets and a draft Carbon Offset procedure to be developed.

Different types of offsets can have various co-benefits beyond the greenhouse gas emission offset, such as environmental, social, educational, and economic co-benefits.

The quantity of offsets required for the City of Ryde to meet various Net Zero targets will vary depending on the target adopted and scale of emission reduction opportunities implemented by various timeframes. Note that these offset estimates are indicative only and are based on scale of actual emission reduction opportunities realised by a particular date.

Table 2: Indicative quantity of offsets required to meet Net Zero by 2035

	2025	2030	2035	2040	2045	2050
Offsets for residual emissions to meet Net Zero by 2035 and interim targets (tCO2e)	0	964	3,120	2,340	2,171	2,012

7.4 POTENTIAL EMISSION PATHWAY WITH IMPLEMENTATION OF FUTURE EMISSION REDUCTION OPPORTUNITIES

The following graph shows a pathway to Net Zero emissions with implementation of existing quantifiable Net Zero opportunities, together with additional net zero opportunities (which need to be developed in the future or are in current plan yet currently unquantifiable), followed by offsetting of any residual emissions.

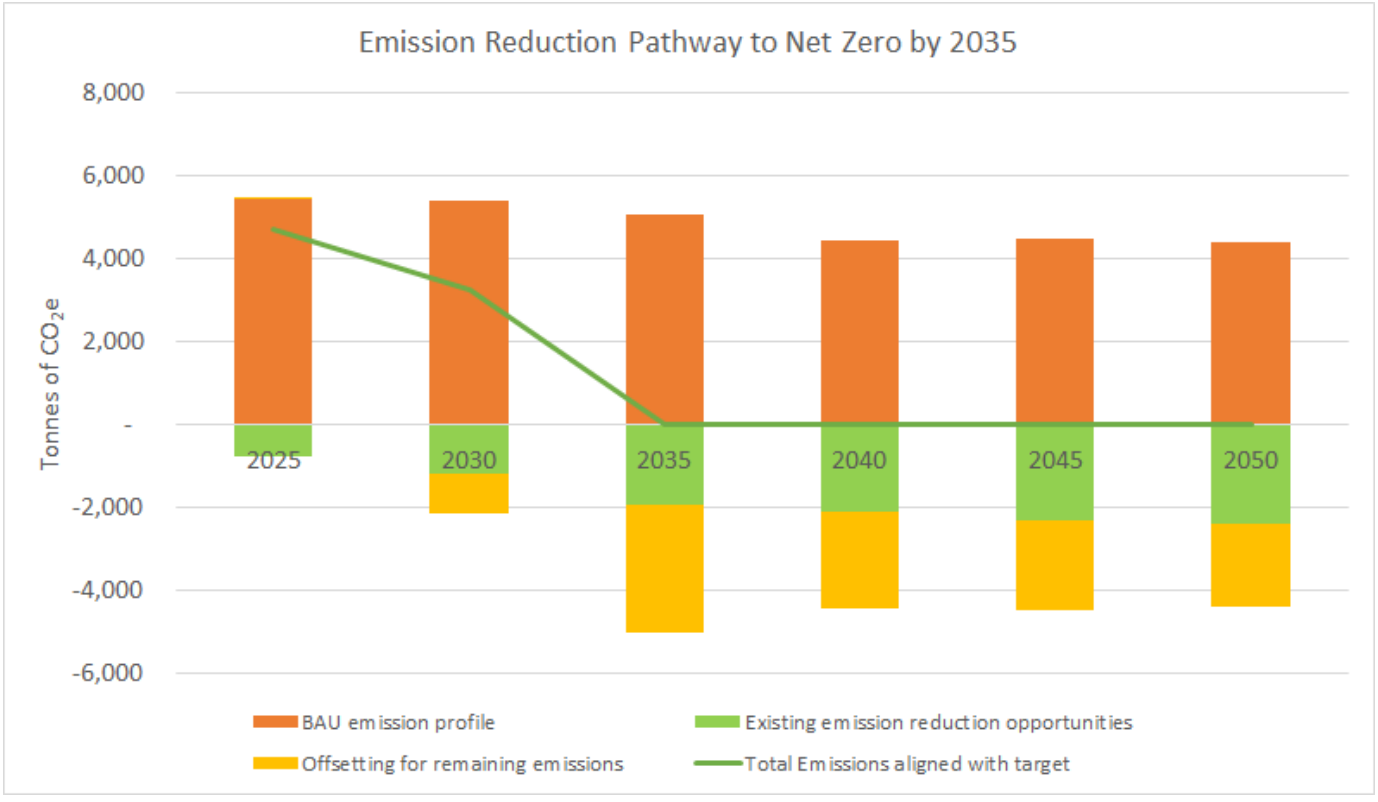


Figure 5: Emission Reduction Pathway for City of Ryde corporate emissions

8 PATHWAYS TOWARDS NET ZERO EMISSIONS FOR CITY OF RYDE COMMUNITY

8.1 BASELINE EMISSIONS

Total baseline community emissions in 2018/19 were 1.54 million tonnes of CO_2e using the Resilient Sydney Metropolitan Carbon Reporting Tool developed by Kinesis in partnership with other councils. See Appendix C for further information regarding modelling methodology.

The following graphs present the contribution towards community baseline emissions for 2018/19 from various sources/sectors and areas.

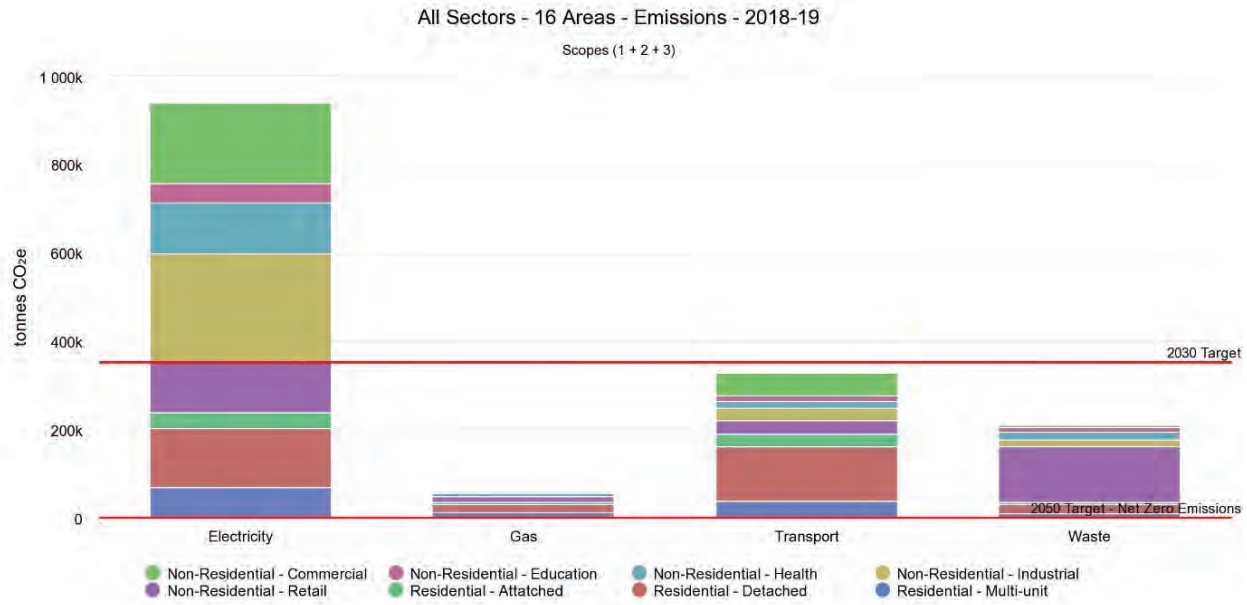


Figure 6: End Use and Subsector breakdown of 2018/19 Community emissions (Kinesis, 2021)

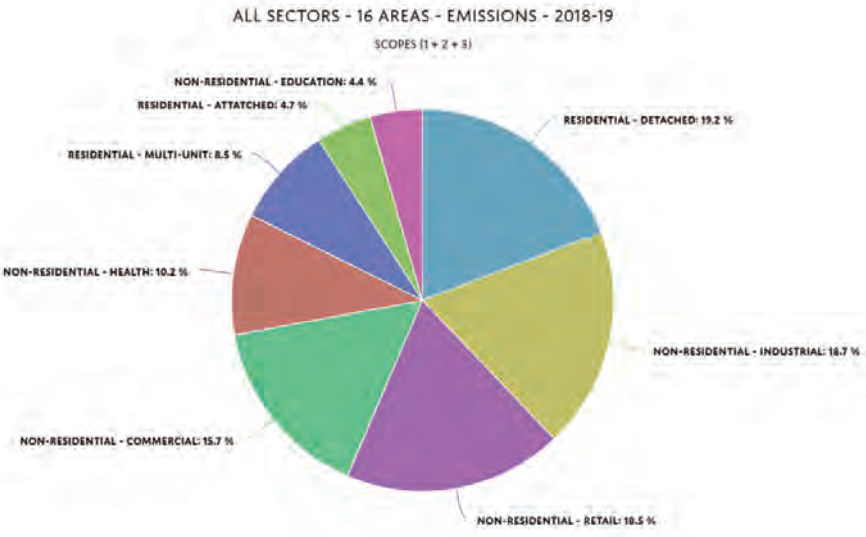


Figure 7: Sub-Sector breakdown of 2018/19 Community emissions (Kinesis, 2021)

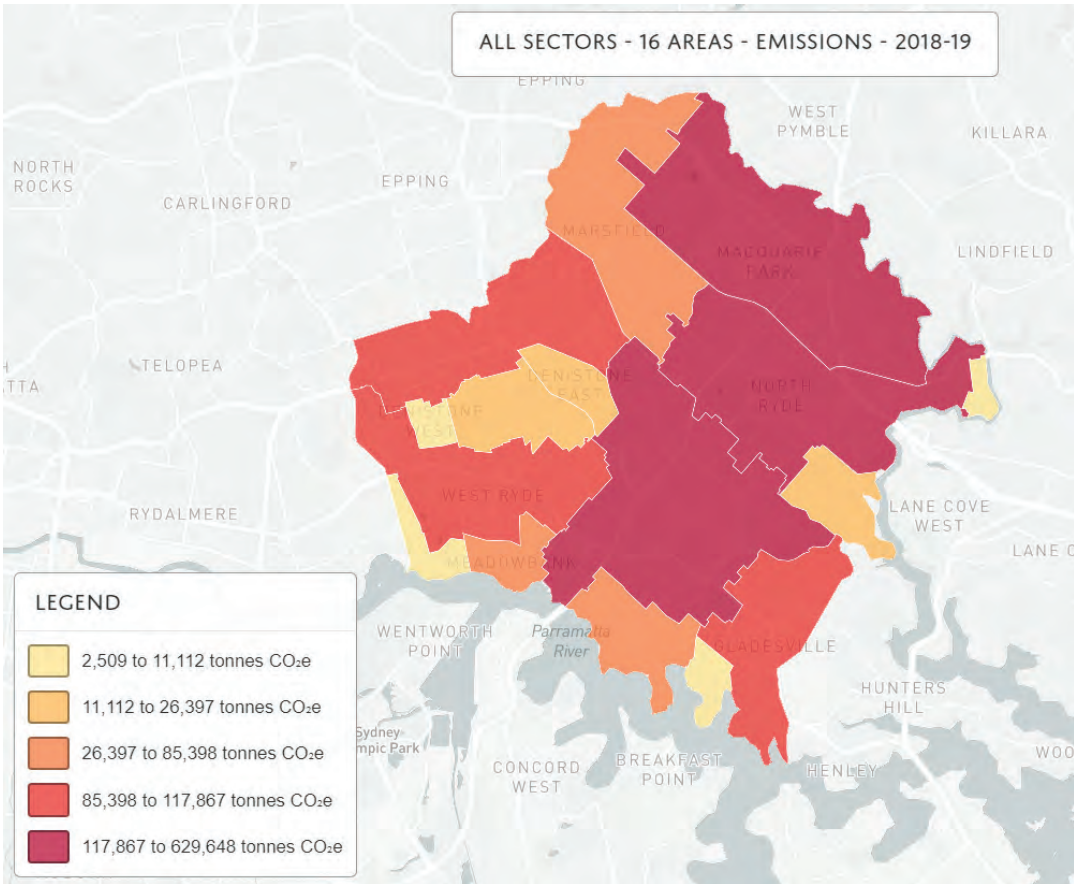


Figure 8: Ryde community emission quantities by suburb (2018/2019) (Kinesis, 2021)

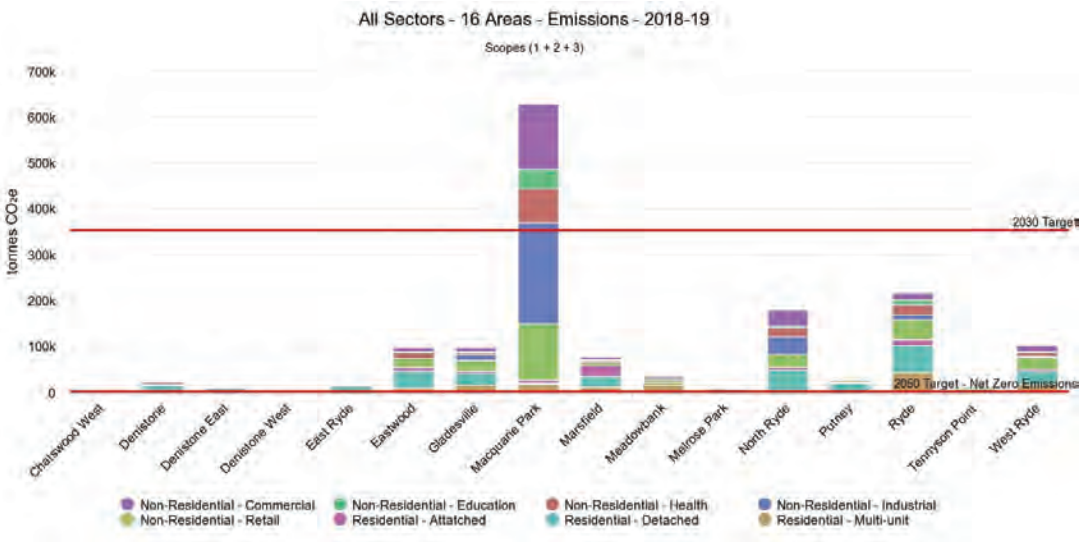


Figure 9: Ryde community emission quantities by suburb (2018/2019) (Kinesis, 2021)

As the data on the previous page shows, GHG emissions are concentrated in certain geographic areas (namely Macquarie Park/North Ryde/Ryde/part of Gladesville) and within certain subsectors (industrial, retail, residential).

For waste, the retail subsector is a major source of emissions. For transport, the residential and commercial sector are the major sources of emissions. For electricity, the industrial, commercial and residential sectors are the major source of emissions.

8.2 BUSINESS AS USUAL TRAJECTORY

The following figures provide the business as usual trajectory for the City of Ryde community (developed by consultant) using the existing Resilient Sydney Metropolitan Carbon Reporting Tool.

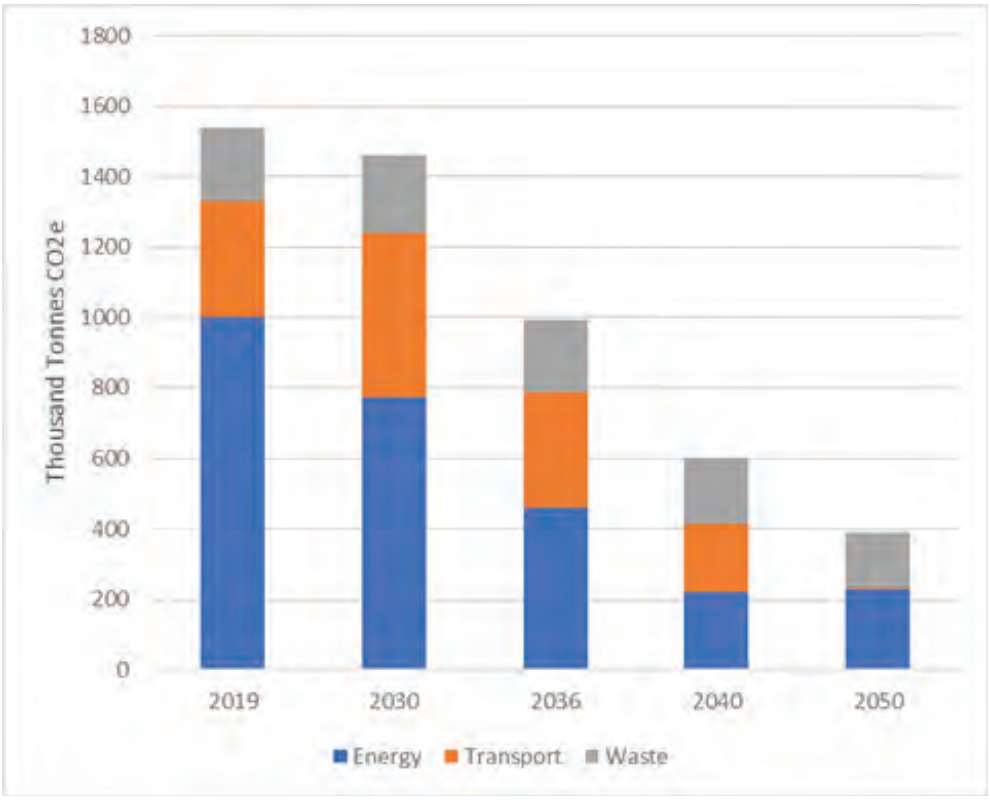


Figure 10: Business as Usual Trajectory for Ryde Community (Kinesis, 2021)

This business as usual (BAU) trajectory incorporates projected changes with a Greener Grid, current BASIX requirement uplifts, rooftop renewable projections, existing commercial new building standards, projected travel reductions and mode shifts to public transport under existing policy settings, Electric Vehicle uptake projections, public transport electrification and current waste policy settings.

Of these BAU related emissions reductions, the majority are related to projected improvements to the emissions performance of the energy grid with increased renewable energy contribution, followed by private vehicle and public transport electric vehicle uptake, and current waste policy settings.

As the following table demonstrates, for the business as usual scenario, the following percentage reductions in GHG emissions can be achieved compared to the 2018/2019 baseline.

Table 3: Percentage reduction in Community emissions compared to baseline under BAU

	2019	2030	2036	2040	2050
Total BAU emissions tCO_2e	1,540,117	1,462,099	992,125	603,214	388,962
Reduction in emissions compared to 2018/19 baseline		-5%	-36%	-61%	-75%

It should be noted that projections to 2036 are being used by Council to represent 2035, as 2036 emissions modelling had already been undertaken as part of the Resilient Sydney Metro Carbon Reporting tool.

Key assumptions

This is an estimate only and is subject to variation based on future changes in Federal or State Government policy as well as changes in how the City of Ryde delivers services to meet the needs of a growing population.

8.3 FUTURE EMISSION REDUCTION OPPORTUNITIES

From emissions data to date, Council has identified the need to focus actions and opportunities strongly within the built environment. Emissions from electricity, waste and transport, are key areas of Net Zero focus if the city is to achieve its Community Net Zero target.

Key emission reduction opportunities for community emissions include:

- REVIEW current City of Ryde planning controls for parking/energy/water/EV charging
- DEVELOP a business energy and sustainability advisory service
- EXPAND residential sustainability advisory service (HWSA and other opportunities)
- INVESTIGATE completing a renewable energy masterplan for high emitting areas of city
- SUPPORT local community renewable energy projects
- CONTINUE to investigate and implement enhanced food waste recovery (eg through potential FOGO/FO other composting technologies etc).
- DEVELOP new promotional and educational programs targeting specific sectors
- INVESTIGATE funding mechanisms for energy efficiency
- CONTINUE to develop infrastructure and promote active and sustainable transport modes
- IMPLEMENT options for environmental upgrade agreements for businesses
- ADVOCATE to Federal and State Government for policy changes
- PARTNER with community groups and organisations.

Specific opportunities under these areas are described below and detailed further in Appendix B.

Because Council cannot ‘control’ many of the sources of GHG emissions within the City, it is inviting everyone within the community to plan and act within their sphere of control and influence to reduce carbon emissions and join the campaign to demand action for a safe climate.

Future community emission reduction opportunities will rely on collective actions being undertaken by both Council, other external agencies and other levels of government. Council has a role to play in advocating for policies such as State Government support for low emission new and retrofit builds via supportive State planning policies and programs.

8.3 FUTURE EMISSION REDUCTION OPPORTUNITIES... CONTINUED

Energy

Energy was responsible for around 65% of community emissions in 2018/19, 53% of Community emissions in 2030 and 36% of emissions in 2040. This energy usage is highly focused upon certain major centres and sectors, with electricity usage in Macquarie Park responsible for 30% of all community emissions in 2018/19, and electricity usage from the industrial sector responsible for 17.5% of all community emissions in 2018/19, followed by the commercial sector with 10.7%, detached residential with 8.8% and retail with 7.5% of community emissions. Natural gas usage is responsible for a relatively small 3.8% of community emissions overall.

The key emission reduction opportunities for energy include:

- Developing a precinct Renewable Energy Masterplan for Macquarie Park/North Ryde in partnership with Macquarie University and other key stakeholders including Connect Macquarie Park & North Ryde, CSIRO, Macquarie Park Innovation District and local businesses. This masterplan could assess precinct wide opportunities for energy efficiency, onsite renewable energy and offsite renewable energy.
- Providing independent energy consultant advice for businesses together with a phone/internet-based energy advice service for residential and business customers.
- Council facilitation of a community bulk-buy scheme for renewable energy (solar PV/ batteries/heat pump hot water systems) and energy efficiency retrofits.
- Providing grants for residential swimming pool energy savings.

- Promoting existing grants and programs provided by other agencies and organisations, such as those to support low income households for energy efficiency retrofits or lower emission appliances.

Water

While water usage is not currently included in the City of Ryde community emissions reporting profile, the pumping and treatment of water does create greenhouse gas emissions. To be consistent with the corporate emissions profile, potential emission reduction opportunities related to water usage have also been identified for the Community sector, however the potential GHG emission reductions have not been quantified.

Key emission reduction opportunities for water include:

- Advocating with the Parramatta River Catchment Group to review the BASIX water targets for low to medium density housing and changes to the SEPP for high density residential, commercial, industrial and roads.
- Partnering with Sydney Water to promote its WaterFix Residential and WaterFix Strata programs.
- Collaborating with Sydney Water and other organisations to further investigate recycled water scheme for Macquarie Park precinct and other town centres.

Resource Efficiency and Waste

Of overall waste emissions, the largest source of emissions is retail waste (responsible for 8.1% of total community emissions in 2018/19), residential waste (2% of emissions), followed by health, industrial, education and commercial waste (combined total 3.2% of all community emissions). Looking at how we manage and divert organics from landfill will play a key role in emissions and in managing the approximately 40% organic matter that the average household bin contains.

Key emission reduction opportunities for the waste sector include:

- Continue to investigate and implement enhanced food waste recovery (eg through potential FOGO/FO other composting technologies etc).
- Update and implement a draft Waste Management Strategy for the City of Ryde.
- Expanding the number of households serviced by existing Home Waste and Sustainability Advisory Service to help residents reduce waste, energy and waste consumption, improve comfort and better manage waste.
- Expanding existing 'Our Common Ground' Sustainable Food Apartment Living program to increase the number of apartment buildings targeted and include common area energy and water audits.
- Continuing to deliver existing waste education engagement programs, including campaigns targeting food waste, composting, worm-farming locally grown foods.
- Continuing to work with businesses to reduce single use plastics in operations and seek solutions to transition to zero waste.

Transport

Transport is responsible for 21.3% of all community emissions, of which most emissions are due to the residential sector followed by the non-residential sector.

The electrification of vehicle fleets and future role of hydrogen will support significant emissions reductions from this sector.

Key emission reduction opportunities for the transport sector include:

- Developing updated Green Travel Plan guidelines for the city and updating existing requirements for Workplace Travel Plans in the next review of Council's Development Control Plan
- Implementing a Sustainable Transport Strategy (for both community and Council operations).
- Developing and implementing an updated Integrated Transport Strategy 2021. The strategy aims to reduce private transport trips, improving key infrastructure and encouraging the use of alternative forms of transport including car sharing, public transport, cycling and walking. The Strategy aims to accommodate future population growth and development.
- Continuing to develop infrastructure to support active and sustainable transport modes (via Council's updated Bicycle Strategy and Masterplan and operational plan for footpath works).
- Continuing to promote active and sustainable transport modes
- Increasing electric vehicle charging infrastructure across the city (to incorporate potential partnerships with third party charging providers and advocacy for other opportunities).

Land Use and Natural Systems

Whilst land use and natural systems are not included in the current Resilient Sydney Metro Carbon Footprint reporting tool used to develop community emissions footprint, these natural systems do represent a potential source of GHG emissions and offsets also.

As such, the following potential emission offset opportunities have been identified for land use and natural systems:

- Expanding Council's Free Tree Giveaway to provide a further 500 trees per annum
- Investigating opportunities for increasing community verge planting to expand canopy areas supported with educational program to promote walking and cycling.

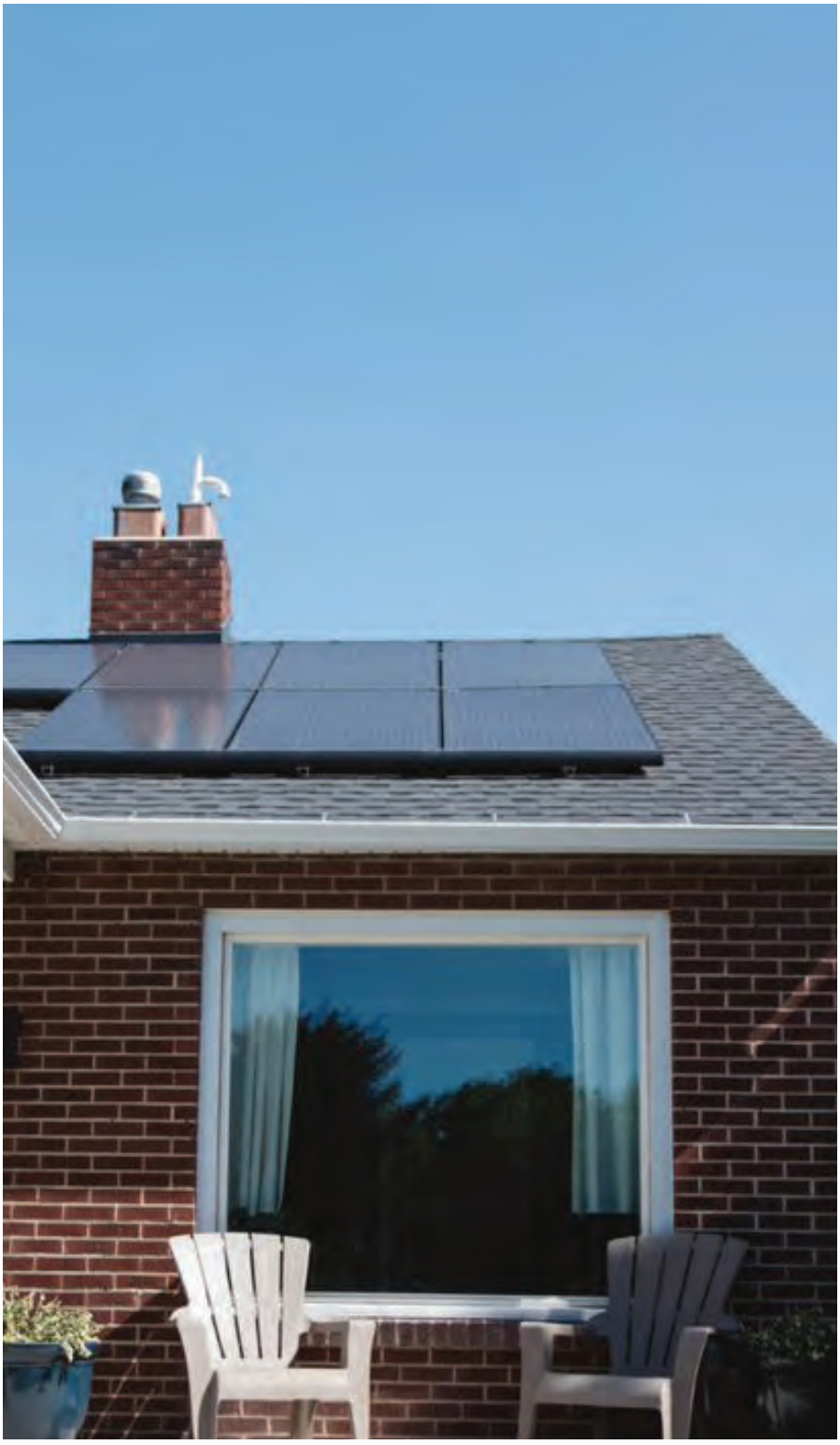
On the basis of community feedback, planting more trees was the highest priority action the community would like Council to prioritise to help achieve Net Zero emissions in the community.

Planning

Planning controls are one of the key levers which Council has over the emissions outcomes associated with new or renovated developments. The key emission outcomes which Council is able to influence through planning include parking controls, EV infrastructure, active transport, energy efficiency, renewable energy, water efficiency, and other sustainable building design standards. It is important that changes to planning controls occur as quickly as possible, as new developments can have long asset lives well within the timeframe required to meet Net Zero.

Key emission reduction opportunities for Planning include:

- Updating the City of Ryde Development Control Plan (DCP) to adopt performance standards for Net Zero Energy Buildings (recently developed by City of Sydney in partnership with stakeholders such as the Greater Sydney Commission and others) with adaptation for the City of Ryde based on specific stakeholder feedback and to apply only where they are more stringent than existing City of Ryde controls.
- Investigating the feasibility of providing reduced car parking space within major centres with good public transport accessibility in exchange for improved building environmental performance (beyond minimum standards).
- Updating parking controls for town centres in City of Ryde DCP Parking Controls in alignment with Macquarie Park Strategic Investigation/ Masterplan.
- Investigating the feasibility of providing reduced car parking space within major centres with good public transport accessibility in exchange for improved building environmental performance (beyond minimum standards).
- Updating the Energy Smart Water Wise DCP to reflect current best practice.
- Creating a Voluntary Guide for excellence in new building/ community facility/open space design or which may be considered when proponents are seeking to enter into a voluntary planning agreement with Council.



Finance/Governance

The finance related actions listed in this section are designed to facilitate community emission reductions across a range of areas.

Key emission reduction opportunities for finance include:

- Investigating the introduction of an Environmental Upgrade Agreement (EUA) process for non-residential buildings (either under a self-administered or third party administered model). An EUA is an innovative financing mechanism made under NSW legislation which allows building owners to repay a loan to a finance provider for sustainability related upgrades through a local council charge on the land (which Council then passes onto the finance provider). This financing mechanism can be used for a range of upgrade works that improve the environmental and sustainability performance of existing buildings.

Advocacy/Public Engagement

As Council's sphere of influence related to community emissions is limited, many Net Zero opportunities can only be achieved through advocacy and engagement.

Key emission reduction opportunities related to advocacy and engagement include:

- Advocating for higher sustainability targets in the new Design and Place SEPP and National Construction Code - Australia.
- Continuing to advocate for a commitment from Transport for NSW to major (visionary) public and active transport infrastructure as identified through the Ryde Integrated Transport Strategy.
- Establishing an annual Net Zero Challenge competition which rewards and recognises the various potential categories of achievement.
- Exploring and implementing options for an online mapping/ reporting tool to promote City of Ryde businesses/landowners/ residences at various stages on the journey to Net Zero.
- Developing further staff and community capacity building workshops and education for initiatives/technology to support transition to lowered carbon in areas of waste, renewable energy/ tech, transport, general living.
- Advocacy for infrastructure to support current/future electric vehicle charging in residential flat buildings in line with Design and Places SEPP Review.
- Advocacy on behalf of schools via the Ryde Environmental Education Network (REEN) program, to increase priority for Department of Education funding for solar, air conditioning and improving building standards for schools to reduce emissions.
- Developing a Climate Ambassadors program which builds upon existing City of Ryde initiatives.
- Advocacy with NSROC/ SSROC for new and updated programs to further support community and business to transition to low or zero emission solutions for home and business.
- Continuing to participate in the Resilient Sydney collaborative project with other councils in region together with DPE Environment, Energy and Science Group.
- For large events within the City of Ryde, encouraging 'carbon neutral certified events'.
- Engaging with the corporate and small business community on collaborative projects and events for transitioning to a low carbon economy.
- Promoting and supporting community "Climate Conversations".

Monitoring

While monitoring does not reduce emissions in itself, it is important to include monitoring actions to be able to track how the community is progressing along the journey to Net Zero.

It is proposed to continue participating in the Resilient Sydney platform for measuring and reporting carbon emissions for Ryde and Sydney region.

8.4 FUTURE EMISSION OFFSETTING OPPORTUNITIES

Residents, local businesses and organisations are encouraged to offset any remaining greenhouse gas emissions within their own carbon footprint once they have reduced their emissions as far as possible already.
This can be achieved through providing an online reporting tool to enable organisations and residences to report Net Zero pledges and achievements.

8.5 POTENTIAL EMISSION PATHWAY WITH IMPLEMENTATION OF FUTURE NET ZERO OPPORTUNITIES

The following graph presents potential Net Zero Emission Pathway to 2030, 2040 and 2050 for the City of Ryde based on the current policies from the Commonwealth and NSW Government. The largest GHG emission reduction is from the electricity grid with decarbonisation and increase in renewable energy supply at an early stage. GHG emission reduction from electric vehicle will have great impact at the later stage following the decarbonisation of the electricity grid.

Waste management including waste avoidance, recycling and resource recovery on organic waste also has substantial impact on the GHG emission reduction.

Carbon offset is required for the community in 2040 to deliver net zero emission. About 500 thousand tonnes of remaining GHG emission at 2040 can be offset by carbon sequestration through National Parks and native vegetation on rural and bushland areas. Tree planting is one of the most viable offsetting methods currently. This has the additional benefit of providing shade, preventing salinity and soil erosion and providing shelter, food and habitat to native animals.

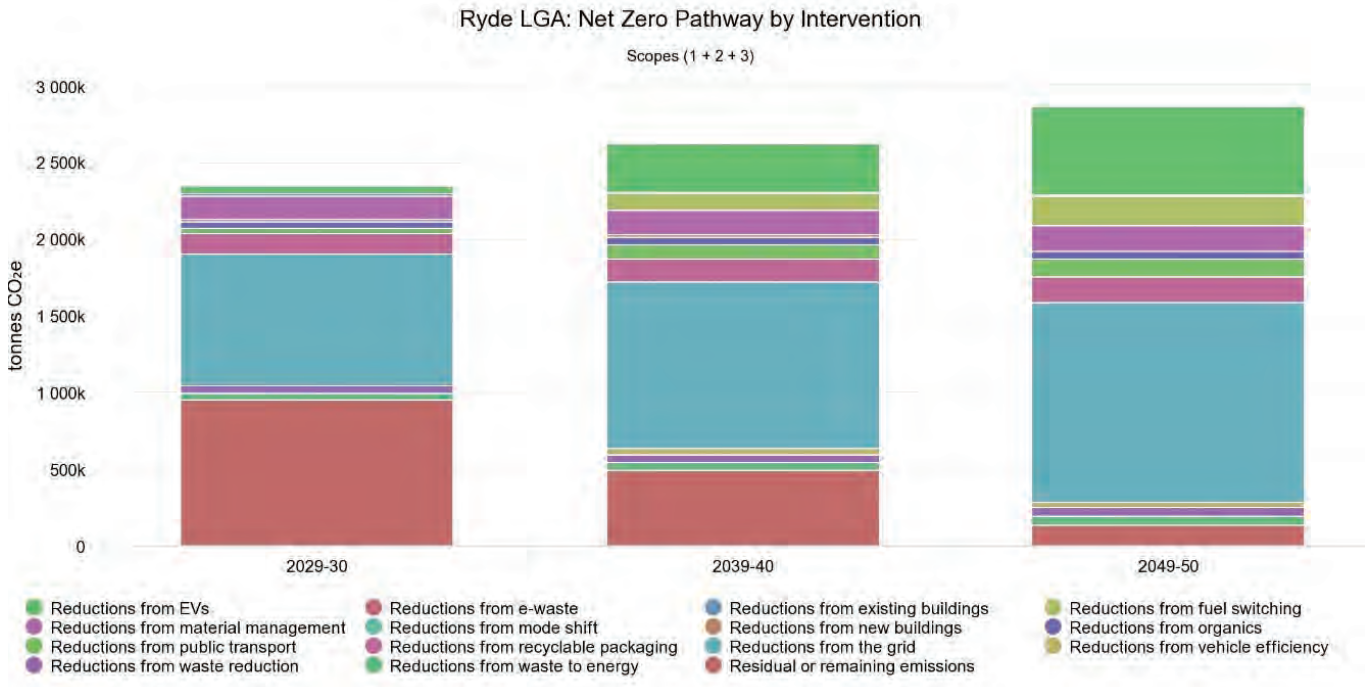


Figure 11: Net Zero Emissions Pathway for Community (Kinesis, 2022).

As the following table and figures demonstrates, after emission reduction opportunities have been implemented, the following residual emissions remain with comparison shown to the 2018 baseline.

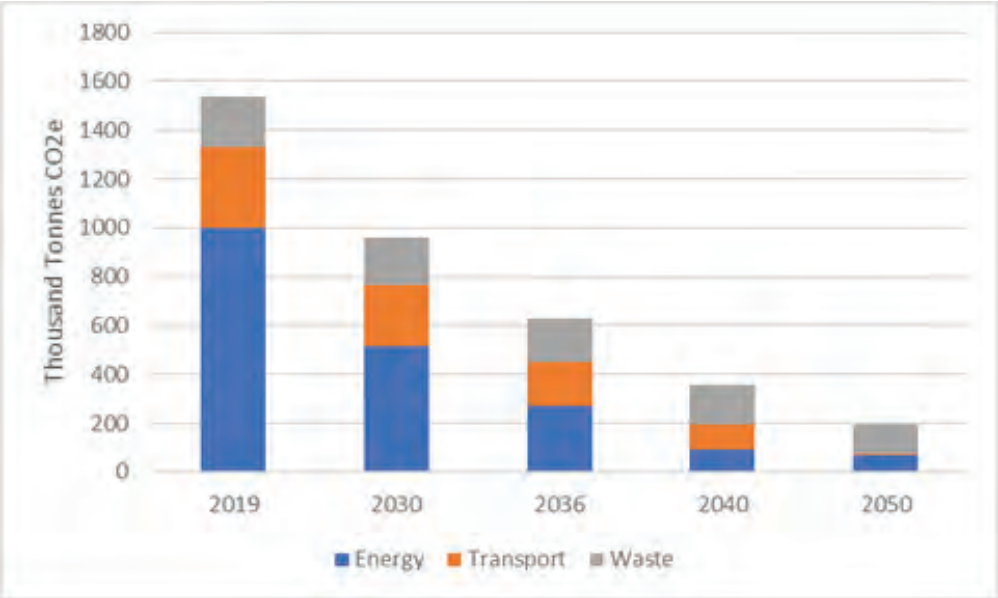


Figure 12: Residual emissions for Ryde Community with implementation of emission reduction opportunities

Table 4: Residual emissions after emission reduction opportunities implemented.

	2019	**2030**	**2036**	**2040**	**2050**
Total Residual emissions after implementation of opportunities (tCO_2e)	1,540,117	960,230	627,969	355,682	192,547
Reduction in emissions compared to 2018/19 baseline		-38%	-59%	-77%	-87%

Any residual emissions remaining would need to be offset by the community in order to meet Net Zero by a particular target date. As such, in order to reach Net Zero a further 627,969 tCO_2e would need to be offset by 2035 (as represented by 2036 modelling) or 355,682 tCO_2e would need to be offset by 2040.

9 IMPLEMENTATION OF THE PLAN

9.1 RESOURCING AND FUNDING OPPORTUNITIES

Green Revolving Fund

A green revolving fund uses the ongoing cost savings from the implementation of energy efficiency and renewable energy projects to reinvest into the upfront cost of further energy efficiency and renewable energy projects.

It is proposed that Council investigate adopting a green revolving fund for renewable energy and future efficiency projects. This is due to be reported back to Council in response to an earlier resolution dated 27 April 2021.

Grant funding

Council can continually review and apply for available grant funding where relevant to implement Net Zero projects and programs.

Investigate potential shadow carbon price

Shadow carbon pricing is a method of investment decision analysis that adds a hypothetical surcharge to the price of projects that involve the creation of carbon emissions. A shadow carbon price gives an edge to options that are more emission efficient when analysing investments and other strategic opportunities. A shadow price on carbon can help ensure investment decisions reflect all costs, including environmental costs, and reduce an organisation's carbon footprint cost effectively.

A shadow carbon price can be used in two ways:

1. To stress-test an organisation against future carbon price risks;

2. To be priced into major investment decisions.

It is proposed that Council investigate adopting a shadow carbon price for capital projects and certain operational emissions.

Net Zero Emissions Project Funding Reserve

The feasibility of establishing a Net Zero Emissions Project Funding Reserve (for implementation of Community and Corporate Net Zero actions not already covered under other funding mechanisms) will be investigated and implemented if practical.

9.2 INTEGRATION INTO COUNCIL STRATEGIC PLANS AND POLICIES

Within Council's Integrated Planning and Reporting framework outlined in Figure 14 below, the commitment to Net Zero Emissions targets represent a strategic plan contributing to the achievement of the outcomes expressed within the City of Ryde Community Strategic Plan.

As with all such strategic plans, the selection of specific actions (including required budget) to be undertaken in any given year is committed through the Four-Year Delivery Program and subsequent operational plans. The Delivery Program represents the current elected Council's decision for the priorities to be undertaken in responding to the range of Community Strategic Plan Outcomes over its term. This decision is informed by the range of possible actions contained within plans such as the Net Zero Emissions Plan and tempered by the constraints outlined in Council's Resource Strategy.

Accordingly, the proposed actions attached to this report represent an assessment of the keystone activities that need to be undertaken if we are to achieve the ambitious targets. Given the timescale involved in establishing these targets, there will be several iterations of delivery programs and elected councils that will have to decide to progress these actions. The report stands as both a guide for those directions and a check point for future councils to consider where those actions have landed and how much progress has been achieved.

The designation of possible actions as Within Service Delivery (WSD) means that the yearly deliverables from that responsible department will now include the required response defined in the Action Plan. Net Zero actions which are not within existing service delivery will need to be progressed as part of future Delivery Program/Operational Plans given consideration of available budgets and other strategic priorities.

As identified within this report, there are a raft of current actions that contribute to Net Zero targets that continue to be undertaken within the 2022/23 Operational Plan.

9.3 MONITORING AND EVALUATION

It is proposed that this Net Zero Pathway Report and proposed actions be monitored annually for implementation of actions and Council and the Community's GHG Inventory be calculated each year (noting that complete data for the community inventory is usually only available approximately a year after the end of each financial year).

Updates will be provided in Council's Annual Report and Smarter, Cleaner, Greener Achievements Annual Report to community to report progress.

It is proposed that the plan be reviewed and updated every four years to align with Council's Community Strategic Plan Review, Updated Resourcing Strategy, Four Year Delivery Plan and One Year Operational Plan. A yearly report will be provided in Council's Annual Report and Sustainability Achievements Annual Report.

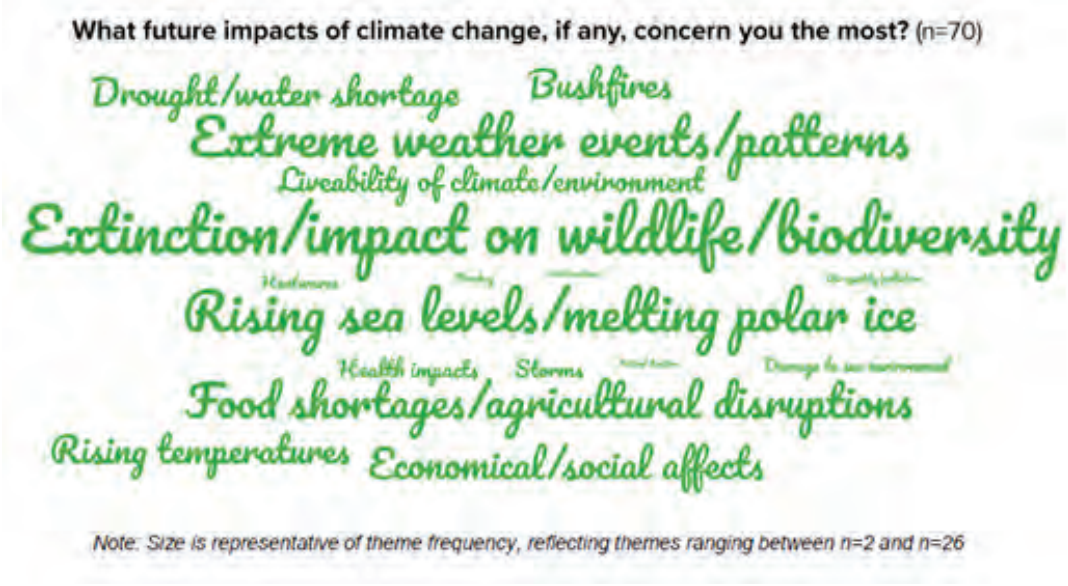
10 CONSULTATION TO DEVELOP THIS PLAN

In November 2020, Council undertook community consultation to seek input into the development of a city-wide plan for a Net Zero Emissions Pathway. Consultation was held via Council's 'Have Your Say' forum which invited feedback from the community to inform potential future emissions targets, interim targets and priority actions the community would like to see occur to reduce emissions in the City.

Community consultation was open from 11 November to 9 December 2020 with 84 responses received to either the online or paper survey. Feedback was invited via Council's 'Have Your Say' website and other media and targeted emails were also sent to selected community organisations including environmental and youth organisations, culturally and linguistically diverse organisations and council advisory and community groups.

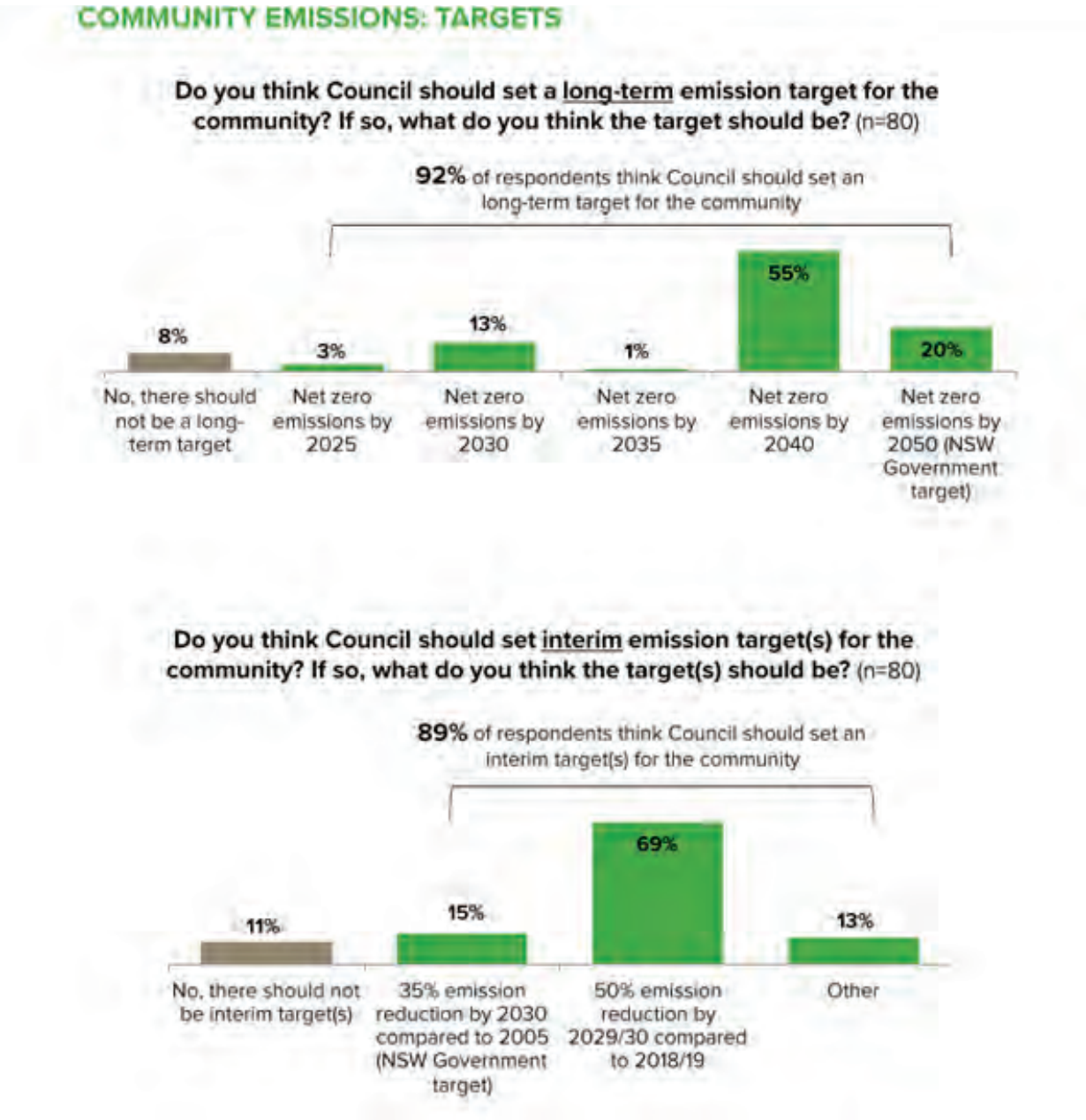
A report detailing community consultation undertaken can be found at
www.ryde.nsw.gov.au/haveyoursay/netzero

Some of the key findings of community consultation are outlined below.



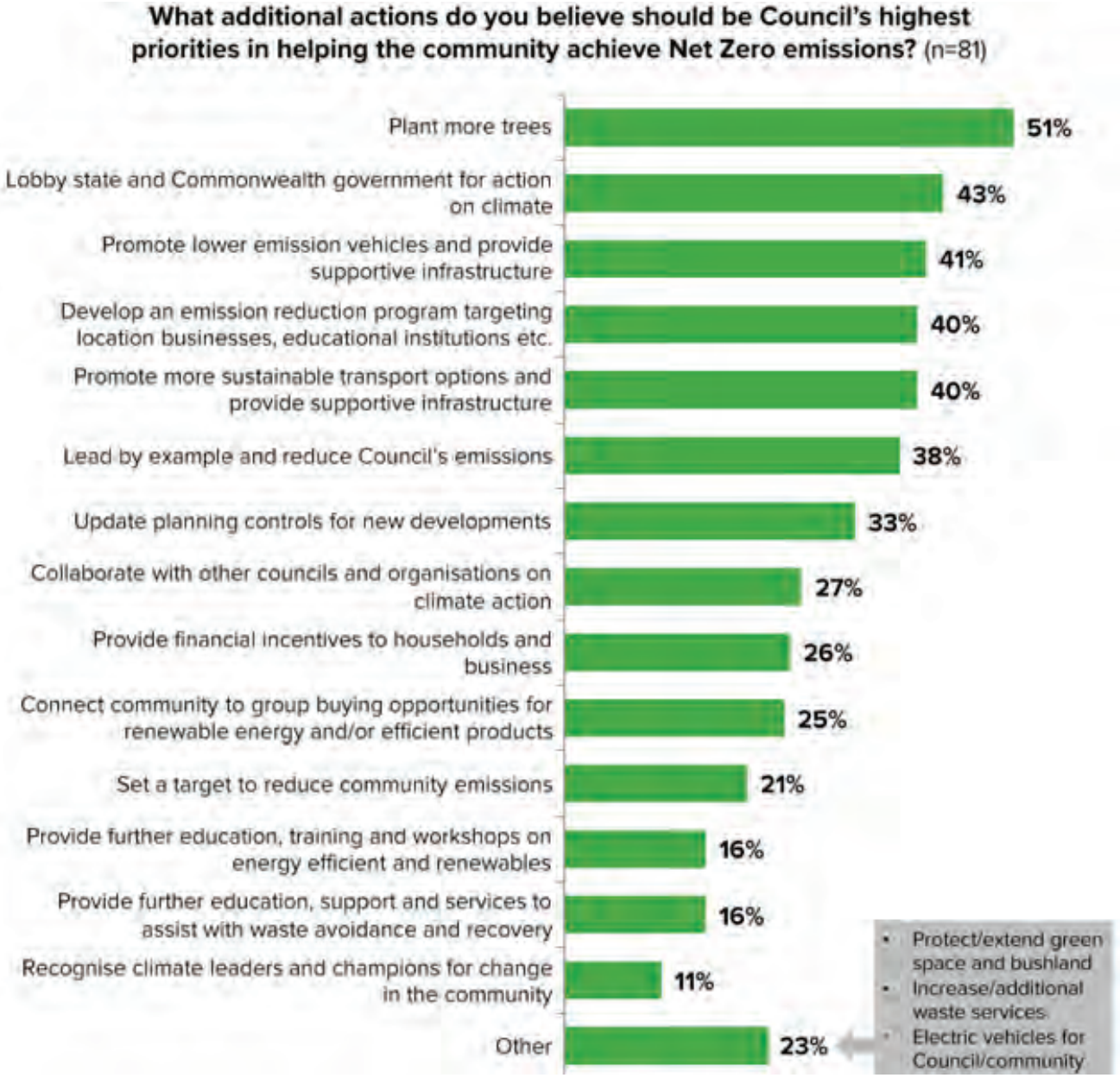
With regards to Community emissions, 55% of respondents thought 2040 should be the latest timeframe for setting a long term Community Net Zero target, with 17% of respondents supporting a Net Zero target prior to this 2040 (with 13% supporting Net Zero by 2030, 3% by 2025, and 1% by 2035). A total of 92% of respondents agreed in principle to Council setting a long-term target to reach Net Zero for community emissions.

A total of 89% of respondents also supported an interim Community Net Zero target (with 69% supporting a 50% reduction in emissions by 2029/30 compared to 2018/ 2019, 15% supporting a 35% emission reduction by 2030 compared to 2005 and 13% supporting another interim target).



Note that not all survey respondents answered each question.

The results of the 'Have your say' survey and priority actions that respondents would like to see Council prioritise for reducing Community emissions are as follows:

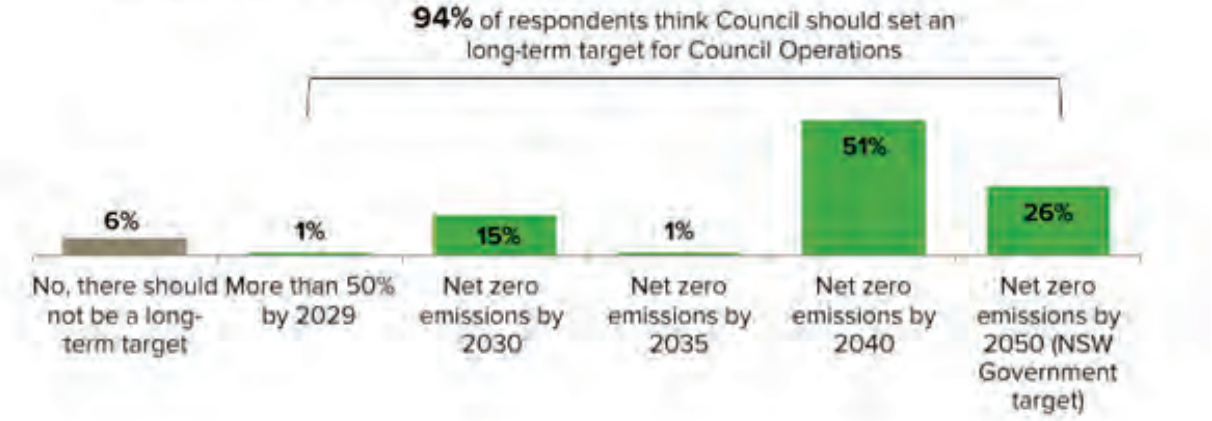


With regards to Council's corporate emissions, 51% of respondents thought 2040 should be the latest timeframe for setting a long term Corporate Net Zero target, with 17% of respondents supporting a Net Zero target prior to this 2040 (with 13% supporting Net Zero by 2030, 1% by 2025, and 1% by 2035). A total of 94% of respondents agreed in principle to Council setting a long-term target to reach Net Zero for corporate emissions.

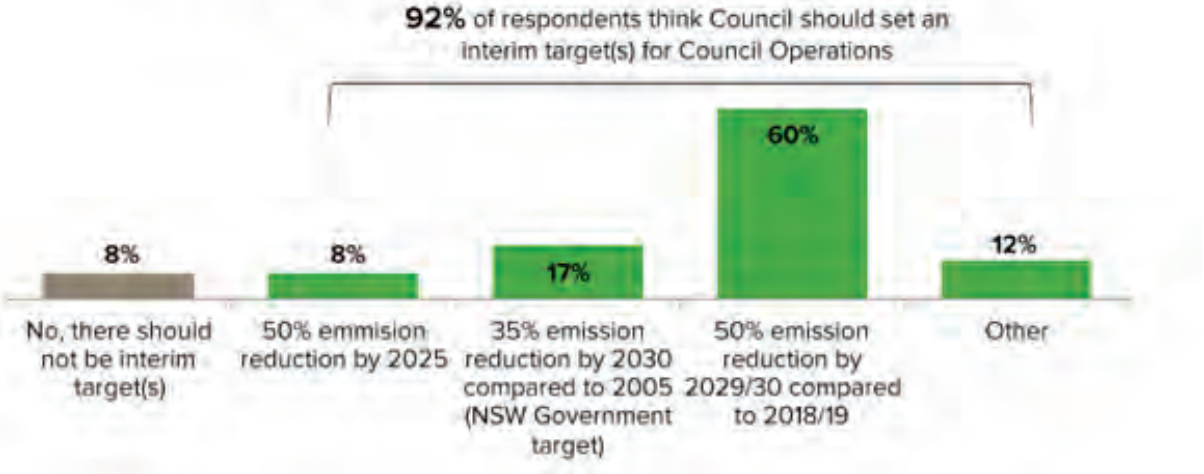
Support for an interim Corporate Net Zero target was provided by 92% of respondents (with 60% supporting a 50% reduction in emissions by 2029/30 compared to 2018/ 2019, 17% supporting a 35% emission reduction by 2030 compared to 2005 and 12% supporting another interim target).

COUNCIL OPERATIONAL EMISSIONS: TARGETS

Do you think Council should set a long-term emission target for Council Operations? If so, what do you think the target should be? (n=75)



Do you think Council should set interim emission target(s) for Council Operations? If so, what do you think the target(s) should be? (n=75)



Respondents provided clear guidance on what they saw as the priorities for action by the Council to achieve Net Zero emissions both within the Council and for the broader community. This feedback has been factored into the actions proposed as part of this Net Zero Plan.

Actions which the community would like to see Council prioritise to reduce Council's operational emissions include:

COUNCIL OPERATIONAL EMISSIONS: ACTIONS

What additional actions do you believe should be Council's highest priorities in helping Council's operations achieve Net Zero emissions? (n=76)

11 GLOSSARY

Australian Carbon Credit Unit (ACCU): 1 ACCU = 1 tonne of carbon stored. ACCUs are the central tradeable unit of the Commonwealth Emissions Reduction Fund. ACCUs are issued by the Clean Energy Regulator in accordance with *Carbon Credits (Carbon Farming Initiative) Act 2011*.

BASIX: Is a performance based regulatory scheme that delivers energy and water efficiency outcomes in line with the requirements of the Building Code of Australia. BASIX applies to all new residential buildings and to alterations and additions with a cost of works more than $50,000.

BAU: Business as Usual.

Carbon budget: The carbon budget is the estimated amount of carbon dioxide equivalent emissions the world can emit while limiting global temperature rise to either 1.5°C or 2°C above pre-industrial levels.

Carbon neutral (or Net zero CO_2 emissions): Net-zero CO_2 emissions are achieved when anthropogenic CO_2 emissions are balanced globally by anthropogenic CO_2 removals over a specified period.

CO_2e or carbon dioxide equivalent: The standard unit for measuring greenhouse gas emissions. The unit expresses the impact of each different greenhouse gas in terms of the comparable amount of CO_2 that would induce the same amount of atmospheric heating.

DCP: Refers to a local government's Development Control Plans.

Greenhouse gas (GHG): A gas that absorbs infrared radiation, thus contributing to the 'greenhouse effect', a phenomenon of sealing the sun's warmth in the Earth's lower atmosphere. This is what is driving man-made climate change.

Global warming potential (GWP): A measure of how much heat a greenhouse gas traps in the atmosphere, relative to carbon dioxide with a GWP of 1.

Intergovernmental Panel on Climate Change (IPCC): Established in 1998 for the purposes of assessing climate change based on the latest science.

Kyoto Protocol GHGs: The Kyoto Protocol (An international treaty adopted in 1997 and entered into force in February 2005) initially listed six gases driving the greenhouse effect: carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6). Nitrogen trifluoride (NF3) was more recently added to this list. Of these six gases, three are largely due to human activity. Carbon dioxide is the main contributor to climate change, primarily due to burning fossil fuels. Methane is produced naturally when vegetation is burned, digested or rotted in anaerobic conditions. Livestock farming, landfill, rice farming and oil and gas production activities all release methane. Nitrous oxide is released by chemical fertilisers and burning fossil fuels.

NABERS: Refers to National Australian Built Environmental Rating System which measures energy efficiency, carbon emissions and water consumed.

Net Zero Emissions: Net zero emissions are achieved when anthropogenic emissions of all GHGs to the atmosphere are balanced by anthropogenic removals over a specified period. Where multiple GHGs are involved, the quantification of net-zero emissions depends on the climate metric chosen to compare emissions of different gases (such as global warming potential, global temperature change potential, chosen time horizon, and others). For the purposes of this report, Net Zero Emissions refers to when total GHG emissions (expressed as CO_2e) have been reduced as far as possible and any remaining emissions offset to zero.

100% Renewable: Refers to instances where all electricity consumption is sourced from renewable sources (either directly via on-site renewables, via retailer GreenPower programs, Power Purchase Agreements, or through the purchase and retirement of renewable energy certificates).

Science-based targets (SBTs): Targets are considered 'science based' if they are consistent with the level of decarbonisation required to achieve the goals set in the Paris Agreement. SBTs provide a pathway for an organisation to future-proof growth by specifying how much and how quickly they need to reduce their greenhouse gas emissions.

Scopes 1, 2 and 3: The concept of scopes categorises emissions sources for the purposes of carbon accounting and reporting to improve transparency and avoid the double-counting of emissions. Three scopes are defined in carbon accounting:

- **Scope 1** emissions are direct emissions from sources located within a designated boundary (e.g. natural gas combusted in homes and factories within an LGA or stationary and mobile fuel consumption within an organisation's operational control)

- **Scope 2** emissions occur as a result of the use of grid-supplied electricity (or from heat, steam, and/or cooling) imported into the boundary area.

- **Scope 3** emissions occur outside the boundary as a result of activities taking place within the boundary (e.g. landfill gas emissions from tips outside the LGA caused by waste generated from households and businesses within the LGA).

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APPENDIX A- CORPORATE NET ZERO ACTIONS

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e/year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
ENERGY		**Objectives: To reduce greenhouse gas emissions from stationary electricity and other energy usage by reducing energy consumption and use of fossil fuel energy sources** **Targets: 100% Renewable Energy Target by 2030 for Council electricity usage and associated Resource Efficiency Targets**					
E1_O	Purchase 100% Renewable electricity under SSROC PEERS 3 electricity contract process for large and small sites from 2022/23 and surrender LGCs as per Council resolution dated 27 July 2021.	**Assets & Infrastructure** with Procurement, Environment	6,260 tCO_2-e per year	100% Renewable electricity for small and large sites from 2022/23 All LGCs voluntarily surrendered by Council	City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency Targets (adopted April 2020)	2022- 2030	No. Within Service Delivery for Assets & Infrastructure and other asset owners such as RALC/Libraries. Savings generated from the SSROC contract compared to existing electricity budget to be allocated to Council's Green Revolving Fund.
E2_O	Continue to participate in SSROC Streetlighting program- LED replacement program for main road lighting	**Assets & Infrastructure**	0 tCO_2-e 2024/25 as included in BAU projection 0 tCO_2-e 2029/30 as included in BAU projection*	Retrofit of approximately 2433 High Pressure Sodium and Mercury Vapour lamps with LED lighting by 2024/25 Approximately 1,456,180 kWh annual electricity savings	Assets and Infrastructure Business Plan- Base Budget	2022/23-2024/25 (TBC)	No. Within Service Delivery for Assets & Infrastructure (assuming that retrofit costs can be paid for under existing BAU operational budget -negotiations continuing with Ausgrid regarding public lighting tariff and retrofit costs). TBC subject to SSROC negotiations.
E3_O	Continue to replace existing council owned streetlighting upon failure with LED lights	**Assets & Infrastructure**	0 tCO_2-e as Incorporated into BAU emissions projection	206,774 kWh replace 400 Metal Halide lamps with LED lamps upon failure	Assets and Infrastructure Business Plan- Base Budget	Ongoing	No- Within Service Delivery for Assets & Infrastructure
E4_O	Ensure that any newly constructed or upgraded Council buildings/ fit outs comply with adopted Resource Efficiency Targets	**Project Development** with Libraries/Community Services/Strategic Property/Parks/RALC/Buildings/Procurement	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered	Individual Project Budgets and Specifications account for Resource Efficiency Targets	City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency Targets (adopted April 2020)	Ongoing	No- Within Service Delivery for Project Development/Libraries/ Community Services/Strategic Property/Parks/RALC/Buildings

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset ($tC0_2$-e/year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
E5_O	Newly purchased electrical or water using equipment/appliances complies with adopted Resource Efficiency Targets	**Buildings /** Libraries/Community Services/Strategic Property/Parks/ RALC/Procurement	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered	Newly purchased electrical or water using equipment/appliances complies with adopted Resource Efficiency Targets	City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency Targets (adopted April 2020)	Ongoing	No- Within Service Delivery for Buildings/Libraries/Community Services/Strategic Property/Parks
E6_O	Undertake energy efficiency measures as detailed in Identification of Energy Saving Measures Report 2020	**Project Development** with Environment/ Libraries/Community Services/Parks/ Buildings	0 tCO_2-e	Assume 172,000 kWh annual energy savings	Identification of Energy Saving Measures Report 2020	2023/24-2025/26	Yes- propose to fund via new Revolving Energy Fund for renewable energy and energy efficiency projects per Item F2_O
E7_O	Install Solar PV at the following sites: *ELS Hall Park Community Sports Centre *Trafalgar Hall/Marsfield ECHC *Install battery on existing Solar PV system at North Ryde Library and Community Centre (subject to confirmation of rooftop structural adequacy)	**Project Development** with Environment Libraries/Community Services/Parks/ Buildings	0 tCO_2-e	62,000 kWh	Identification of Energy Saving Measures Report 2020	2022/23-2024/25	Yes - propose to fund via new revolving energy fund for renewable energy and energy efficiency projects per Item F2_O
E8_O	Undertake feasible energy efficiency measures (RALC Energy Optimisation Study 2020)	**Environment** with RALC	0 tCO_2-e	154,000 kWh	RALC Energy Optimisation Study	2023/24 to 2024/25	Yes- propose to fund via new revolving energy fund for renewable energy and energy efficiency projects per Item F2_O
E9_O	Undertake energy efficiency audit for remaining Council buildings/properties not yet investigated with usage over 2500 kWh per year and implement efficiency measures with <7 year payback	**Environment** with Project Development	0 tCO_2-e	Energy Audit of 30 properties completed by 2024/25 Cost effective energy efficiency measures completed by 2029/30 Assume 70,000 kWh per year energy savings potential		2024/25-2026/27	Yes- propose to fund via new revolving energy fund for renewable energy and energy efficiency projects per Item F2_O
E10_O	Develop updated Energy Saving Plan for Council assets to summarise prioritised energy saving opportunities identified through various studies, smart metering and demand management initiatives, and include implementation plan	**Environment** with Buildings, Strategic Property, RALC, Community Services, Libraries	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered	Develop Updated Energy Saving Plan by 2023/24	Renewable Energy/ Resource Efficiency Target (2020)	2023/24	No, within Existing Service delivery for Environment section

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e/year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
E11_O	Phase in a requirement for minimum energy ratings for appliances (fridges/freezers etc) by seasonal hirers of canteens/clubrooms in Park buildings as a condition of hire. Provide links to grants/sources of funding for clubs to upgrade equipment and dispose of less efficient equipment.	**Parks** with Environment	0 tCO_2-e by 2025	Update Application form for Seasonal Use of Sporting Facilities to require hirer's appliances to meet or exceed Energy Star ratings in Council's adopted Resource Efficiency Targets. ~ 30,000 kWh per year reduction	Application form for Seasonal Use of Sporting Facilities Sportsground User Manual	2022/23 Investigate options for minimum energy star ratings 2022/23 Recommend minimum energy ratings to hirers 2023/24 Make minimum energy ratings mandatory for all hirers	No, within Existing Service delivery for Parks and Environment section
E12_O	Upon end of life (or by 2033/34) replacement of Ryde Aquatic Leisure Centre cogeneration system replacement with efficient Electric Heat Pump system	**RALC** with Project Development	935 tCO_2-e	Install replacement Heat Pump system by 2033/34		2034/35 or prior	No - Assuming can be catered for under either RALC Asset Renewal or Asset Replacement Reserve in future Delivery Plans
E13_O	Upon end of life (or by 2029/30) replacement of Ryde Aquatic Leisure Centre gas boosted solar hot water system with heat pump boosted solar hot water system	**RALC**	55 tCO_2-e	Install replacement Heat Pump system by 2029/30		2029/30 or prior	No-Assuming can be catered for under either RALC Asset Renewal or Asset Replacement Reserve in future Delivery Plans
E14_O	Upon end of life (or by 2038/39) replacement of Ryde Central Gas Boilers with Heat Pump Systems	**Strategic Property with Community Services,** Project Development, Buildings	43 tCO_2-e	740,000MJ total gas boiler usage replaced with approx. 195,000 MJ 100% renewable electricity usage		2038/39	No- assuming can be catered for under Asset Replacement Reserve in future Delivery Plans.
E15_O	Upon end of life (or by 2033/34) replace Ryde Central Gas Domestic Hot Water Systems with Heat Pumps	**Strategic Property with** Project Development, Buildings	3 tCO_2-e	51800 MJ total gas dhw usage replaced by 16000 MJ/4496Kwh 100% renewable electricity usage		2033/34	No- assuming can be catered for under Asset Replacement Reserve in future Delivery Plans.

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e/year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
E16_O	Develop a checklist to ensure new building compliance with National Construction Code 2019 Section J- Energy Efficiency requirements	**Project Development** with Environment	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered			2022/23	No, within Existing Service Delivery for Project Development section
E17_O	Investigate new renewable energy/energy efficient technologies for design and construction methods of new buildings and infrastructure. Identify a "sustainability" thought leader in the Project Development team tasked with ongoing research and sharing of best practice in renewable energy and sustainable construction/design practices. (For example investigate the potential for passive design and inclusion of efficient fittings in new buildings).	**Project Development** with Environment	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered			2022-ongoing	No, within Existing Service Delivery for Project Development and Environment section
E18_O	Replace existing council owned park pathway lighting upon failure with LED lights	**Parks**	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered			Ongoing	No, within Existing Service Delivery for Parks

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
WATER		**Objective: Reduce carbon emissions by minimising potable water usage where possible.** **Target: By 2030, there will have been no net increase of Council's annual potable water use based upon 2018 levels (as per Planning Ryde LSPS 2020)**					
W1_O	Develop and implement updated Water Saving Action Plan for whole of Council demonstrating alignment with the Planning Ryde LSPS 2020 Water Target. This action plan will incorporate audits of selected Council building assets and findings from the Parks Water Strategy below, to include costed water saving initiatives.	**Environment** with Buildings, Parks	14 tCO_2-e	2022/23 Develop Updated Water Saving Action Plan 2023/24-2025/26 Implement Updated Water Saving Action Plan By 2030, there will be no net increase in Council's annual potable water use, based on 2018 levels	Ryde Resilience Plan 2030 **Renewable Energy/ Resource Efficiency Target (2020)**	2022/2023-2025/2026	No- Staff time within Service Delivery for Environment and other sections No- for implementation of Plan. Potential for future business case funding if costs exceed base budget
W2_O	Develop and implement a Parks Water Strategy identifying options for non-potable sources of water for irrigation and water efficiency measures for irrigated/ landscaped areas	**Parks** with Environment	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered	2020/21 Develop Parks Water Strategy 2021/22 onwards Implement Parks Water Strategy	Ryde Resilience Plan 2030	2020/21-2034/35	No - staff time for development of Plan within service delivery for Parks and Environment sections Yes - for implementation of Plan from Parks section (however separate project with implementation to be led by Parks outside of Net Zero Strategy)

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
RESOURCE EFFICIENCY/WASTE		**Objective: Reduce carbon emissions by managing waste efficiently and reducing resource consumption.** **Target: By 2025, waste going to landfill will be reduced by at least 20 per cent (kg/capita) from 2018 levels** **Reduce carbon emissions and manage energy, water and waste efficiently**					
R1_O	Continue to investigate and implement technologies for enhanced food waste recovery to meet Net Zero emissions from organic waste goal by 2030 (e.g. through potential food only (FO) or combined food organics and garden organics (FOGO) or other technologies etc) for relevant Council properties (together with domestic waste as per action R6C)	**Waste** with Environment	250 tCO_2-e	NSROC FOGO/FO Trial completed by 2023 with Ryde undertaking FO MUD trial	Draft Waste Management Strategy for City of Ryde 2019-24 NSW Waste and Sustainable Materials Strategy 2041	2022-2023 NSROC Trial 2024-2025 New Contract to commence	Yes however included under Community FOGO action R6_C
R2_O	Investigate provision of worm farms at Council properties where feasible	**Waste** with Environment	40 tCO_2-e		Draft Waste Management Strategy for City of Ryde 2019-24	2021-2023	No
R3_O	Undertake continuing waste minimisation and education program at Council properties	**Waste**	35 tCO_2-e		Draft Waste Management Strategy for City of Ryde 2019-24	2021-2024	No, within current service delivery for waste team
R4_O	Develop standard Green Lease clauses for tenancies/lessees in Council owned properties to improve site consumption, increase efficiency measures and power independence targeting: *efficient energy/water/waste usage *installation of embedded renewable power systems on site where relevant *schedules for resource efficient capital upgrades/renewals	**Strategic property** with Environment, Community Services, Buildings, Parks and Legal	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered		Better Buildings Partnership Model Lease Clauses	2023-2024 Develop Green Lease Clauses 2025-ongoing incorporation of Green Leases clauses into new Leases	No for staff time- within Service delivery for Environment Unit Yes- service delivery change required for staff time from Strategic Property/Legal/ Community Services/Parks and Facilities Buildings Yes- Service delivery change required for any capital renewals/upgrades although these could potentially be made a requirement for commercial tenants under lease

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
R5_O	Develop Green Licence clauses for licensees in Council owned properties targeting: *efficient energy/water/waste usage	**Community Services** with Strategic Property, Buildings Environment and Legal	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered			2022/23	No staff time for Environment section within service delivery. Staff time from other sections within existing service delivery as Community Buildings had already planned for Community Building Licence Review.
R6_O	Replace upon failure or recharge when required equipment containing R22 refrigerant with lower global warming potential refrigerants (such as R448A etc)	**Buildings**	10 tCO_2-e		City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency Targets (adopted April 2020)	2022/23 - 2029/30	No- assuming under either maintenance budget, Asset Renewal or Asset Replacement Reserve in future Delivery Plans
R7_O	Replace upon failure or recharge when required equipment containing R407c with lower Global Warming Potential refrigerants (such as R32 or R444B etc)	**Buildings, RALC**	12 tCO_2-e		City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency Targets (adopted April 2020)	2022/23 - 2029/30	No- assuming under either maintenance budget, RALC Asset Renewal or Asset Replacement Reserve in future Delivery Plans
R8_O	Continue digitisation of all Council processes and achieving paperless target and any associated licenses to enable transition. IT to continue undertaking monitoring on use of printers and prepare reports to ensure optimisation.	**Information Technology,** Governance, Business Strategy & Innovation	2 tCO_2-e			2022/23-ongoing	No- within Existing Service Delivery for Information Technology and other teams
R9_O	Explore further opportunities for using recycled/reused materials where appropriate such as crushed concrete/brick/asphalt as backfill in drainage lines etc and fly ash in concrete pavements for local roads/footpaths.	**Project Development**	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered		Council adoption: 'Prioritise use of recycled materials in civil works' (June 2020)	2022/23-ongoing	No, within Service Delivery for Project Development

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
PROCUREMENT		**Objective: Reduce carbon emissions through procurement activities** **Targets: 100% Renewable Energy Target by 2030 for Council electricity usage and associated Resource Efficiency Targets**					
P1_O	Hiring of a Sustainable Procurement Office and development and implementation of a Sustainable Procurement plan to update Council's Procurement policy and processes, including: *Updated sustainability clauses and criteria for Council contracts/procurement documentation * Provide information/links to sustainable supplier databases and to sustainable procurement options under existing contracts * For key classes of materials and services, develop internal tracking to measure emissions performance (see P9_O to P11_O) *Preferencing (or where appropriate requiring) key suppliers/contractors/products with Net Zero Plans/Targets or Carbon Neutral Accreditation by dates in alignment with Council's Net Zero targets *Targeted actions for key materials procured by Council *Training of staff and promotion of sustainable procurement * Work with Council's stationery supplier to improve green purchasing for Council and database to assist staff	**Environment** with Procurement, Waste, Project Development, Civil Infrastructure, Asset Restoration/Driveways/Civil Maintenance, Assets & Infrastructure, Information Technology NSROC, SSROC, Procurement Australia, Local Government Procurement	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered	Sustainable Procurement plan developed by 2022/23 Implement Sustainable Procurement Plan 2023/24 - ongoing	City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency Targets (adopted April 2020) CoR Sustainable Procurement Policy (2020) CoR Procurement Policy (2020)	2022/23- ongoing	Yes, for additional staff time
P2_O	Participate in SSROC's Joint Procurement of Recycled Civil Works Materials. A Paving the Way tender has been undertaken which incorporates recycled crushed glass into asphalt, pipe bedding and non-structural concrete. Monitor contract reports under SSROC Paving the Way Tender for carbon reporting	**Assets & Infrastructure,** Asset Restoration / Driveways / Civil Maintenance / Procurement	~58 tCO_2-e	Paving the Way Tender to commence	CoR Procurement Policy (2020)	2021-2022 and ongoing	No, within Service Delivery for Assets & Infrastructure and other sections
P3_O	Explore the use of Warm Mix asphalt as part of SSROC and NSROC tenders (subject to updates of TfNSW asphalt specifications).	**Assets & Infrastructure**	~80 tCO_2-e			2024-25 and ongoing	No, within Service Delivery for Assets & Infrastructure

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
P4_O	Investigate and implement options for lower emission concrete in updated Minor Works and other Contract specifications and standard drawings including: *Fly Ash or other Portland cement replacements *Manufactured sand or aggregate replacements *Carbon Neutral concrete	**Project Development** with Works, Assets & Infrastructure, Procurement	145-868 tCO_2-e	Phase from 10% lower emission concrete in 2023 to 90% carbon neutral concrete by 2035		2023-2035	No, within Service Delivery for Project Development and other sections
P5_O	Specify 100% recycled rubber underlay content in purchasing specifications for parks rubber softfall (where cost differential is less than 10%)	**Parks** with Project Development	15 tCO_2-e	Specification for Rubber softfall developed	Sustainable Procurement Policy	2023-2024	No, within Service Delivery for Parks and other sections
P6_O	Investigate and implement options for specifying recycled/ lower carbon/ carbon neutral steel in purchasing specifications	**Project Development** with Civil Infrastructure and Procurement	66-775 tCO_2-e	Phase in from 10% lower emission steel in 2025 to 90% carbon neutral steel by 2035	Sustainable Procurement Policy	2025-2035	No, within Service Delivery for Project Development and other sections (Under Sustainable Procurement Policy up to a 10% price differential allowable for more sustainable goods and services)
P7_O	Preference (or where appropriate given the scale of potential competitors and other procurement policy considerations, require) the following suppliers to have Net Zero Plans/Targets or Carbon Neutral Accreditation by dates in alignment with Council's Net Zero targets: *ICT suppliers *postal suppliers *printing and stationery suppliers *food and catering suppliers	**Environment** with Procurement, Information Technology, other sections	137-1546 tCO_2-e	Phase in from 10% of suppliers in 2023 to 100% by adopted Net Zero target timeframe	Sustainable Procurement Policy	2023-2032	No, within service delivery for Environment and other sections (Under Sustainable Procurement Policy up to a 10% price differential allowable for more sustainable goods and services)
P8_O	Advocate for specifications enabling further lowering of greenhouse emissions from products and services in the following major panel contracts: *SSROC (for Civil Works) *NSROC contracts (for Asphalt) *LGP panel contracts (for IT etc) *NSW State Government Contracts (for construction/IT/motor vehicles etc)	**Environment** with Assets & Infrastructure, Civil Infrastructure, Asset Restoration/Driveways/Civil Maintenance, Information Technology, Fleet, Procurement NSROC, SSROC, Procurement Australia, Local Government Procurement, NSW Government	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered	Nominate a staff member from relevant areas to advocate for lower emission opportunities on new major contracts as they arise.	Sustainable Procurement Policy	2022-ongoing	No, within service delivery for Environment and other sections

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
P9_O	Develop methods to record quantities of key sustainable materials in Tech One Purchase Requisition process and train relevant staff in new methods.	**Procurement** and specialist contractors if required	0 tCO_2-e, however, supports improved reporting	Proposed Tech One process developed Proposed Tech One process implemented		2024/2025	Yes
P10_O	Investigate options for requiring project contractors to prepare a schedule of key materials supplied (concrete/asphalt/steel etc) at the completion of construction projects or with each invoice submission	**Project Development** with Civil Infrastructure, Asset Restoration/Driveways/Civil Maintenance, Environment and Procurement	0 tCO_2-e, however, supports improved reporting	Develop materials reporting schedule to be included in Request for Tenders/Quotations Develop construction emissions schedule to be included in Request for Tenders/Quotations		2023/24 for material quantities schedule 2025/26 for construction emissions	No, within Service Delivery for Project Development and other sections
P11_O	Continue to dispose of electronic items (PCs/Servers/Phones/Printers) using environmentally safe methods with recycling of components where possible though Council's existing electronics disposal contract.	**Information Technology**	Not included in corporate emissions inventory, however, supports broader state government targets			2022-ongoing	No, within service delivery for Information Technology
P12_O	Continue to procure Council's data hosting services from data centres which have a minimum NABERS 4.5 star energy rating in alignment with Council's Resource Efficiency Targets.	**Information Technology** and Procurement	To be determined	Continue existing data centre procurement processes with relation to NABERS rating and carbon neutral accreditation	Information Technology Infrastructure Modernisation Program	2021-Ongoing	No, within service delivery for Information Technology

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
TRANSPORT AND PLANT		**Objective: Reduce carbon emissions from the City of Ryde's Fleet, Mobile Plant and Staff Commute** **Target:** By 2030, 15% reduction in fleet emissions compared to 2018/19. By 2035 50% reduction in fleet emissions compared to 2018/19. By 2040, 100% reduction in fleet emissions compared to 2018/19.					
T1_O	Develop and implement Low Emission Vehicle Transition Plan for Council's Vehicle Fleet (in line with Net Zero 2035 target) This Plan shall include: *A proposed fleet procurement model which provides a pathway for gradual replacement of ICEs with EV/PHEV/HEV vehicles to achieve required emission outcomes against target, whilst updating Council's budget as required to minimise total cost of ownership * Continued annual revision of the vehicle list for leaseback/packaged and other vehicle provision to consider current market availability of fit for purpose vehicles which support lowest emission/ Total Cost of Ownership *Policy changes to support the switch to lower emission vehicles *Ongoing monitoring of Council's low emission vehicle performance *Early trials of EV heavy vehicles for selected categories	**Fleet** with Environment	864 tCO_2-e 2030 735 tCO_2-e 2035 346 tCO_2-e 2040	Low Emission Vehicle Transition Plan developed by 2023/24Heavy Vehicle Trial 2023/24-2024/25 (By 2030, a 75% reduction in fleet emissions compared to 2018/19. By 2035 an 95% reduction in fleet emissions compared to 2018/19. By 2040 an 100% reduction in fleet emissions compared to 2018/19. (Under BAU fleet emissions are expected to reduce by 15% by 2030, 44% by 2035, and 76% by 2040 when compared to 2018/19).	Motor Vehicle Policy, Sustainable Fleet and Hire Policy, Guide to Packaged and Leaseback Vehicle Selection	2022/23- ongoing	Yes
T2_O	Develop and implement Low Emission Transition Plan for Council's Plant (excavators/ loaders/ mowers etc)	**Fleet** with Environment	24 tCO_2-e 2030 47 tCO_2-e 2040 71 tCO_2-e 2050	Assume 75% reduction in Council Plant emissions by 2050, 50% reduction by 2040 and 25% reduction in plant emissions by 2030		2026-2030	No, within existing service delivery as expected that EV Plant will only be introduced when Total Cost of Ownership equivalent to ICE equivalent

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
T3_O	Investigate the costs and greenhouse emissions associated with in home electric charging of City of Ryde fleet vehicles and consider options for remuneration/business use incentive for staff where applicable	**Fleet** with Environment	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered			2023-2025	Yes
T4_O	Develop and implement employee workplace travel plan for Council offices/workplaces and undertake annual staff commute survey in conjunction with other People and Culture initiatives	**Environment** with Transport, Connect MPID and People and Culture	25 tCO_2-e 2025 49 - tCO_2-e 2030	Workplace travel plan developed Workplace travel plan implemented Annual staff commute survey undertaken in partnership with Connect	Sustainable Transport Strategy	2022-2023 2023-ongoing 2022-ongoing	No, staff time within service delivery for Environment and other sections Yes, TBC dependent on steps included in workplace travel plan No, within service delivery for Environment and other sections
T5_O	For staff who need to commute via private vehicles, encourage the use of lower emission vehicles including electric vehicles	**Environment** with People and Culture	4 tCO2e 2030 20 tCO2e 2040	Staff promotional material developed and distributed		2022-ongoing	No, within service delivery for Environment and other sections
T6_O	Implement City of Ryde Sustainable Transport Strategy (for both community and Council operations).	**Environment** with Transport, Planning and Parks	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered	Sustainable Transport Strategy developed by 2021/22 Sustainable Transport Strategy implemented from 2022/23 onwards	Integrated Transport Strategy Ryde Resilience Plan 2030	2022-ongoing	No, within service delivery for Environment and other sections
T7_O	Investigate opportunities for converting the Shop Ryder community buses to EV in line with Council's Low Emission Fleet Transition Plan as per T1_O	**Fleet** with Environment	Incorporated into T1_O	Buses converted to EV in accordance with Low Emission Fleet Transition Plan to be developed. Pricing/ technology to be confirmed		2025-2026 (TBC)	As per T1_O

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
T8_O	Investigate opportunities for incentivising eligible staff to uptake sustainable/ active transport options in place of council vehicles towards lowering staff emissions from transport.	**Environment** with Fleet, Finance	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as delivered	2023-2024 Opportunities for financial incentives investigated Financial incentives implemented by 2025-26		2023-2025 investigate opportunities 2025-2026 ongoing implement	No, staff time within service delivery for Environment and other sections Yes, for potential financial incentives
T9_O	Continue to support Flexible Working and Working from Home arrangements where appropriate in line with business requirements	**People and Culture**	58 tCO_2-e			Ongoing	No, within service delivery for People and Culture
LAND USE AND NATURAL SYSTEMS		**Objective: Reduce carbon emissions from land use planning and natural systems** **Target: LSPS target of 40% canopy coverage by 2030**					
L1_O	Expand the existing Tree Planting program to include a minimum further 450 trees per annum	**Parks** with Project Development	Approx. 4.5-9t CO2e per each additional 450 trees planted per annum (NB-target not currently eligible to be used to offset Corporate emissions as not accredited emission offsets)	Plant a further 450 street trees per annum	Tree Management Plan and Street Tree Masterplan	2023-2040	Yes
L2_O	Explore future potential opportunities to gain formal accreditation for carbon sequestration in Council's street/park trees should new methodologies they become available in the future	**Environment** with Parks	Not assessable at this stage			2024-ongoing	No, within existing service delivery
L3_O	Review current Street Tree Masterplan, Urban Forest Plan, Ryde Biodiversity Plan, and future Active Transport Plans against current tree canopy baseline across the city towards developing a city-wide strategy for increasing canopy and corridor planting and reducing urban heat opportunities across the city	**Environment** with Parks	Not assessable	LSPS target of 40% canopy by 2030 Consultancy to review / collate data for strategy	Tree Management Plan, Ryde Biodiversity Plan and Street Tree Masterplan	2022/23	No, within existing service delivery

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
PLANNING		**Objective: That planning controls support Net Zero outcomes**					

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
PL1_O	Update Council Voluntary Planning Agreement Template to incorporate Resource Efficiency Targets or Environmental Performance standards for buildings/assets handed over to Council	**Environment** with Strategic Planning, Legal	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Voluntary Planning Agreement Guidelines City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency Targets (adopted April 2020)	2023/24	No
FINANCE/GOVERNANCE		**Objective: Ensure adequate funding and governance mechanisms to implement required Net Zero actions for Council**					
F1_O	Investigate possible future use of an internal shadow carbon price for selected categories of capital work projects (via the project business case/feasibility assessment process) and for key material supplies.	**Finance** with Environment, Projects, Business Strategy, and various asset owners	None directly- however likely to reduce greenhouse gas emissions though consideration of shadow carbon pricing in decision making		Long Term Financial Plan/ Resourcing Strategy	2024/25 investigate internal shadow carbon price 2025/26- ongoing implement if feasible	Yes
F2_O	Investigate adopting a Green Revolving Fund for future energy efficiency and renewable energy projects as per Council Motion – April 2021	**Environment** with Finance	None directly- however enables implementation of energy actions E7-E11 above	Provide Council report on potential Revolving Fund framework by 2022/23 Implement Revolving Energy Fund from 2023/24-2028/29	Long Term Financial Plan/ Resourcing Strategy Council resolution for investigating a Green Revolving Fund (April 2021)	2022/23 for investigation 2023/24 ongoing for implementation	No, staff time within Service Delivery for Environment and Finance sections Yes, for initial seed funding and top up funding
F3_O	Investigate the feasibility of establishing a Net Zero Emissions Project Funding Reserve (for implementation of Community and Corporate Net Zero actions not already covered under another funding mechanism)	**Finance** with Environment, Business Strategy & Innovation	None directly- however enables implementation of various net zero actions delivering emissions reductions long term e.g. solar/ energy efficiency projects	Implement Net Zero Emissions Project Reserve projects from 2023/24 onwards	Long Term Financial Plan/ Resourcing Strategy	2022/23 investigate potential funding mechanisms for Net Zero Reserve 2023/24 – ongoing implementation of Net Zero Reserve	No, staff time within existing service delivery for Finance and other sections provided implementation not until 2024 Yes- for establishment of Net Zero Reserve and if staff time required prior to 2024
F4_O	Investigate and apply for grant funding where relevant (e.g. for energy efficiency projects/street tree planting)	**Parks** with Environment		Grants applied for within relevant timeframes		2022-ongoing	No, within existing service delivery

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
F5_O	Commence tracking annual quantities of major classes of purchased materials in Council construction projects and maintenance programs (where this is not already occurring for example under Projects or soon to commence under new contracts such as SSROC's Paving The Way tender). At a minimum, the following materials should be recorded for each project where applicable: *Asphalt *Bitumen *Ready mix concrete *Precast concrete products *Rubber softfall *Aggregate *Steel *Synthetic Grass	**Project Development,** Civil Infrastructure, Asset Restoration / Driveways / Civil Maintenance, Parks, Environment and Procurement	No reduction- however assists with reporting of emissions locally and regionally (SSROC/ LGNSW)	Material reporting schedules developed for construction contracts and works specifications	Procurement Policy	2023/24	Yes
F6_O	Continue to divest from Fossil Fuels in line with Council's Fossil Fuel Divestment resolution passed in 2017 with the approach outlined in Council's updated Investment Policy October 2021	**Finance**	Not included in Council's corporate Scope 3 emissions reporting, however, will assist with reducing global emissions.		Council's Fossil Fuel Divestment Resolution 2017 Council's Investment Policy 2021	2021-ongoing	No
F7_O	Update Councils corporate GHG inventory annually in line with Climate Active Carbon Neutral Reporting Standards. At the time when Council resolves to achieve carbon neutrality, submit verified corporate GHG inventory to Climate Active for certification.	**Environment**	No reduction- however assists with reporting of emissions locally and regionally (SSROC/ LGNSW)	Corporate GHG Inventory prepared for each financial year		Annually	No
F8_O	Employ a part time (1 FTE) specialised Net Zero Implementation Coordinator to be based within the Environment Section	**Environment** with Business Strategy and Innovation and Procurement	Not assessable at this time delivery of outcomes will provide emissions reductions from implementation as required to ensure the NZE Plan is delivered across Council and the City for Plan actions until target date	1 FTE staff member employed		2023 - ongoing	Yes

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
F9_O	Investigating and implementing carbon budget and allocation to individual department as a KPI to reduce overall corporate GHG emissions	**Environment**	Not assessable at this time	Carbon budget allocation to each department in tCO_2-e emission reduction per year.		2023/24	No
ADVOCACY/PARTNERSHIPS		**Objective: Reduce carbon emission by building partnerships with relevant organisations and educating staff.**					
A1_O	Investigate joining MECLA (the Materials & Embodied Carbon Leaders' Alliance) a collaboration of organisations to drive reductions in embodied carbon across the building and construction industry and capacity building. This could be joined by Council directly or via SSROC/NSROC.	**Project Development** with Civil Infrastructure, Asset Restoration/Driveways/Civil Maintenance, Assets & Infrastructure, Procurement	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2023/24	No, within existing service delivery for Project Development and other sections
A2_O	Build staff capacity and deliver education regarding Net Zero, plan implementation support and its relevance for the City of Ryde as an organisation, service and project delivery for reducing emissions	**Environment**	Not assessable	Deliver education and communicate annual reduction in emissions from council delivered operations, actions or projects	Draft Waste Management Strategy for City of Ryde 2019-24 Fleet Strategy City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency wats (adopted April 2020)	2021 - ongoing	No, within existing service delivery for Environment and other sections

No	Action	Responsibilities and partnerships	Potential GHG emission reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
OFFSETS		**Objective: Procurement of offsets to achieve Net Zero targets (once feasible emission reduction opportunities have first been undertaken)** **Targets: Procure required amount of carbon offset credits in accordance with linear progress towards Net Zero targets adopted**					
O1_O	Purchase carbon offsets for Council's residual corporate greenhouse emissions (once existing feasible emission reduction opportunities and any additional emission reduction opportunities have been undertaken) in order to ensure compliance with Council's adopted Net Zero 2035 target and interim targets timeline	**Finance** with Environment	To meet Net Zero Target would require an annual offset of ~1,351 tCO_2-e from 2034/35 to 2050	Carbon Offsets acceptable under the Climate Active standard are purchased for any residual GHG emissions remaining from the time which Council has chosen to adopt a Net Zero target	Long Term Financial Plan/ Resourcing Strategy	Not likely to be required until 2034/35 (dependent on scale of emission reduction opportunities realised)	Yes- will require additional resourcing to deliver. Dependent on future carbon offset pricing expected to range between $5-$20/tCO2e for current offset pricing to $50 in 2030.
O2_O	Develop Carbon Offsets Policy and Procedures	**Environment** with Finance	Not assessable however would enable offsetting as required to meet Council's Net Zero targets	Carbon Offsets Policy and Procedure developed		2024/25	No
MONITORING		**Objective: Undertake regular monitoring to ensure that Council tracks towards adopted Net Zero Targets** **Target: Undertake annual reporting on corporate greenhouse emissions**					
M1_O	Continue to report on Council's corporate greenhouse emissions using appropriate accounting software with methodology/sources to be expanded as per the Climate Active methodology under Action F7_O	**Environment**	Not assessable however enables reporting and tracking of Council's progress towards Net Zero emissions	Total tonnes CO_2-e per year from relevant sources	Community Strategic Plan 2028	2022-ongoing	No, within existing service delivery for Environment section and via IT platform

APPENDIX B- COMMUNITY NET ZERO ACTIONS

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
ENERGY		**Objectives: To reduce greenhouse gas emissions from stationary electricity and other energy usage by reducing energy consumption and use of fossil fuel energy sources**					
E1_C	Develop Precinct Renewable Energy Masterplan for Macquarie Park/North Ryde in partnership with Macquarie University and other key stakeholders including Connect Macquarie Park & North Ryde /CSIRO/MPID/local businesses The Masterplan could assess precinct wide opportunities for energy efficiency, onsite renewable energy (included distributed systems and options for embedded networks/microgrids/Virtual Power Plants), and offsite renewable energy. This masterplan can be used as a means of securing grant funding and to assist with meeting Net Zero precinct status as per the North District Plan.	**Environment with** City Activation, Macquarie University, Connect MPID, CSIRO North Ryde/MPID	155,000 tCO_2-e (Assuming approximately 25% of Macquarie Park and North Ryde's energy usage converted to renewable as a result of plan implementation)	Precinct Renewable Energy Masterplan developed by 2025. Precinct Renewable Energy Masterplan implemented in partnership with other stakeholders by 2035.	Macquarie Park Strategic Investigation/ Masterplan North District Plan Actions 75/78	2024/25 Development of Renewable Energy Masterplan 2026-2035 implementation	Yes

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
E2_C	Develop further educational/promotional materials specific to non-residential and residential subsectors including: *links to existing external resources that allow identification of relevant cost-effective renewable energy/energy efficiency and electrification options for each subsector. *links to available grants and subsidies from the NSW Government etc *links to existing green finance products (such as clean energy home loans through the CEFC) *links to City of Ryde energy efficiency/renewable energy programs and incentives etc where relevant Promote educational material, where appropriate, through various channels including council's existing programs and communications where relevant, such as: *Annual Fire Safety Statement Requests *Food safety inspections *Swimming Pool Inspections *Waste programs *Rates notices *Smarter Cleaner Greener Newsletter *Council's website and social media	**Environment** with Communications & Engagement to develop **Environment,** with Health & Building, Waste to promote	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2023 – ongoing	No
E3_C	Establish Residential Swimming Pool Energy Savings Program Grants for more efficient pool pumps/pool blankets/water heating etc. Distribute promotional materials, where appropriate, through regular swimming pool inspections and other channels.	**Environment** with Finance to develop **Environment,** with Health and Building, Community Services, Communications & Engagement to promote	2,299 tCO_2-e (Assuming 5kWh/day/per pool pump saving) (1000-4982 pools retrofitted)	200 pools per year targeted (total 2600 pools from 4982 pools in Ryde)	City of Ryde Community Grants Program Policy	2026-2039	Yes

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
E4_C	Provide a phone/internet-based energy advice service (via an outsourced subscription service) to residential and business customers to complement the more customised in-house Home Waste and Sustainability Advisory Service (HWSA) already offered by the City of Ryde. Small business customers to be forwarded to the existing free Business Australia- Business Energy Advice Program.	**Environment**	3,484 tCO_2-e 2030 1,775 tCO_2-e 2035 (650MWh per year Assuming 26MWh average electricity usage for participating businesses in Ryde and 25% reduction per business)	300 households / businesses per year via outsourced energy base advice service 100 businesses per year via outsourced custom energy review and report service		2024-2039	Yes
E5_C	Provide independent energy consultant Energy Advice/Energy Site Audit program for businesses targeting the highest emitting subsectors/areas of the City	**Environment**	14,774 tCO_2-e 2030, 10,419 tCO_2-e 2035 (Total 22,050MWh by 2030, 49,612 MWh by 2035. 5,512 MWh per year program run, assuming 735 MWH electricity usage per average business and 25% reduction per business)	30 businesses per year targeted (total of 270)		2026-2035	Yes
E6_C	Partner with local community organisations to promote existing rebates and support available to low income households for energy efficiency retrofits/lower emission appliances such as the: *NSW Government No Interest Loans Scheme (NILS) *NSW Government Solar for Low Income Households Trial	**Environment** with Community Services, Communications & Engagement with community organisations such as Christian Community Aid/ Mission Australia/Nature Conservation Council	320 tCO_2-e in 2026 4160 tCO_2-e in 2040	(Assume 200 of current approximately 4200 low income households targeted per year)		2026-2039	No
E7_C	Encourage renewable energy (Solar PV/batteries/heat pump hot water systems etc) and energy efficiency retrofits (draught proofing/insulation etc) within the community through Council facilitation of bulk-buy schemes	**Environment** with Procurement, Finance, Communications & Engagement, Legal, NSROC, SSROC, Local Community Power Groups	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2023/24-ongoing	No

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
E8_C	Support and promote local community renewable energy projects (such as community owned solar and community batteries when available for members of the City of Ryde community) and encourage investment in community energy.	**Environment** with Community Services**, Community Power Agency**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Ryde Resilience Plan 2030	2023-ongoing	No
E9_C	Work with local real estate agents to encourage landlords to offer energy efficient upgrades for tenants in rental properties and at point of sale of existing homes (in conjunction with NatHERS In Home existing home rating once fully integrated into NatHERS in 2022	**Finance** with Environment	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		National Trajectory Low Energy Buildings	2023-ongoing	No
E10_C	Promote the benefits of achieving higher energy efficiency and using sustainable building rating tools (Green Star/ NABERS etc) to development applicants through Council's Building and Development Advisory Service and on Council's Development webpage	**Business Improvement & Customer Relations** and **Environment**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2022-ongoing	No
WATER		**Objective: Reduce carbon emissions by minimising potable water usage where possible.** **Target: Reduce carbon emissions and manage energy, water, and waste efficiently**					
W1_C	Advocate with Parramatta River Catchment Group to review the BASIX water targets for low to medium density housing and changes to the SEPP for high density residential, commercial, industrial and roads.	**Environment** with Planning	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		PRCG Masterplan 2025	2021 - ongoing	No
W2_C	Partner with Sydney Water to promote its WaterFix Residential and WaterFix Strata programs	**Environment** with Communications & Engagement	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Greater Sydney Water Strategy2021	2022/23 - ongoing	No
W3_C	Collaborate with Sydney Water and other organisations to further investigate recycled water scheme for Macquarie Park precinct/other town centres	**Environment** with Planning	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Macquarie Park Strategic Investigation / Masterplan / Greater Sydney Water Strategy 2021	2022/23- ongoing	No

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
RESOURCE EFFICIENCY/WASTE		**Objective: Reduce carbon emissions by managing waste efficiently and reducing resource consumption.** **Target: By 2025, waste going to landfill will be reduced by at least 20 per cent (kg/capita) from 2018 levels** **Reduce carbon emissions and manage energy, water and waste efficiently**					
R1_C	Update and implement Waste Management Strategy for City of Ryde	**Waste** with **Communications & Engagement**	To be determined	Decrease waste to landfill by 20% by 2025 per capita (compared to 2019)	City of Ryde Draft Waste Management Strategy for 2019-2024	Ongoing	No
R2_C	Review existing program towards expanding the Home Waste and Sustainability Advisory Service (HWSA) to help residents reduce waste, energy and waste consumption, improve comfort, and better manage waste.	**Environment** in partnership with Waste	460 tCO_2-e per additional 100 households each year	Increase number of households targeted per year from 100 to 200 Continue to develop new resources / education materials	Draft Waste Management Strategy for City of Ryde 2019-24	2024-ongoing	Yes
R3_C	Expand existing 'Our Common Ground' Sustainable Food Apartment Living program to increase the number of apartment buildings targeted and include common area energy / water audits	**Waste i**n partnership with Environment	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered	Increase the number of apartment buildings supported each year to 10 (total 140 from 950 existing Multi unit dwellings	Draft Waste Management Strategy for City of Ryde 2019-24	2026-2040	Yes
R4_C	Continue to deliver existing waste education engagement programs, including campaigns targeting food waste, composting, worm-farming locally grown foods.	**Waste**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Draft Waste Management Strategy for City of Ryde 2019-24	Ongoing	No
R5_C	Continue to work with Businesses to reduce single use plastics in operations and seek solutions to transition to zero waste.	**Waste**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Draft Waste Management Strategy for City of Ryde 2019-24	Ongoing	No

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
R6_C	Continue to investigate and implement (where feasible) technologies for enhanced food waste recovery to meet Net Zero emissions from organic waste goal by 2030 (e.g. through potential food only (FO) or combined food organics and garden organics (FOGO) or other technologies etc) (in line with NSW Waste and Sustainable Materials Strategy 2041) for Council's domestic and commercial waste services	**Waste** with Procurement	38,000 tCO_2-e in 2030, 39,500 tCO_2-e in 2040	NSROC FOGO/FO Trial completed by 2023 with Ryde undertaking FO MUD trial	Draft Waste Management Strategy for City of Ryde 2019-24 NSW Waste and Sustainable Materials Strategy 2041	2022-2023 ongoing	Yes
R7_C	Encourage the provision of Electric collection fleet for domestic waste (operated by Contractors)	**Waste and Fleet**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2024-2025	No
TRANSPORT		**Objective: Reduce Transport related carbon emissions**					
T1_C	Develop updated Green Travel Plan Guidelines for the city. Update existing requirements for Workplace Travel Plans in the next review of Council's DCP.	**Environment** with Transport, Planning	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Ryde Resilience Plan 2030	2022-2023 Travel Plan Guidelines 2024-2025 for amendments to DCP	No- under Environment Base Budget Yes to complete DCP review prior to 25/26
T2_C	Implement a Sustainable Transport Strategy (for both community and Council operations).	**Environment** with Transport, Planning and Parks	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Ryde Resilience Plan 2030 Sustainable Transport Strategy 2021	2022-2030	No

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
T3_C	Develop and implement Integrated Transport Strategy 2041, addressing expected growth in population and development, The Strategy aims to reduce private transport trips by improving key infrastructure, while encouraging the use of alternative forms of transport including car sharing, public transport, cycling and walking.	**Transport** with Environment, Planning and Parks	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Community Strategic Plan, LSPS Bicycle Strategy, Draft Ryde Infrastructure Strategy	2021-22 Develop plan 2022-41 Implementation of Plan	No for development of plan Yes for implementation of plan (however separate project with implementation to be led by Transport outside of Net Zero Strategy)
T4_C	Continue to develop infrastructure to support active and sustainable transport modes, via Council's updated Bicycle Strategy and operational plan for footpaths. The Bicycle Strategy aims to provide a better connected, safer and more visible network. The Bicycle Strategy focuses on the provision of 'missing links' in the existing active transport network.	**Transport** with Asset & Infrastructure, Project Development	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Bicycle Strategy, Draft Ryde Infrastructure Strategy	2021-22 Develop updated Bicycle Strategy 2022-ongoing	No
T5_C	Undertake an Expression of Interest (EOI) process seeking potential partnerships with third party electric vehicle charging providers and other opportunities for delivery of additional public EV chargers across the City. Implement Electric Vehicle (EV) Charging Infrastructure on Public Land Guidelines to support increasing public charging infrastructure on Council owned land	**Environment** with Assets & Infrastructure, Transport, Procurement	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Sustainable Transport Strategy 2022 Draft Ryde Infrastructure Strategy Electric Vehicle (EV) Charging Infrastructure on Public Land Guidelines	2022/23 Undertake Expression of Interest 2022-2024 Implement EV charging partnerships	No
LAND USE AND NATURAL SYSTEMS		**Objective: Reduce carbon emissions from land use and natural systems**					
L1_C	Expand Council's Free Tree Giveaway to provide a further 500 trees per annum	**Environment**	Under current Climate Active Carbon Offset methods this sequestration can't be formally accredited	CoR 40% Canopy coverage target by 2030 (LSPS)	Ryde Biodiversity Plan Local Strategic Planning Statement CoR	2022-ongoing	No

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
L2_C	Investigate opportunities for increasing community verge planting (residential and RMS) to expand canopy areas supported with educational program to promote walking and cycling.	**Environment** with Assets & Infrastructure and Transport	Under current Climate Active Carbon Offset methods this sequestration can't be formally accredited	Prepare Verge Gardening Policy by 2021/22	Ryde Biodiversity Plan	**2021 - ongoing**	No
				CoR 40% Canopy coverage target by 2030 (LSPS)	Local Strategic Planning Statement CoR		
PLANNING		**Objective: That planning controls support Net Zero outcomes**					
P1_C	Create a Voluntary Guide for excellence in New Building/ Community Facility/ Open space Design or which may be considered when proponents are seeking to enter into a voluntary planning agreement with the City.	**Environment** with Planning, Parks, Strategic Property, Community Services, Legal	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered	Guide for excellence in New Building/Community Facility/Open Space Design developed		**2023-2024**	No
P2_C	Update City of Ryde DCP 2014 Section 7.1 (Energy Smart, Water Wise) to reflect current best practice and recent updates under the National Construction Code Section J	**Strategic Planning with Environment**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		City of Ryde Development Control Plan (2014)	**2022-2024 This timing would only be possible if additional budget for planning staff resources were provided. Otherwise the timing would be from 2025-2027**	No, for Environment Team input into DCP technical content. Yes- for Planning Team involvement in overarching DCP review.
P3_C	Investigate feasibility of providing reduced car parking space within major centres with good public and active transport accessibility, with further reductions in exchange for improved building environmental performance (beyond specified standards to be developed).	**Strategic Planning with Transport, Community and Ranger Services, Environment**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Macquarie Park Strategic Investigation/Masterplan, City of Ryde Development Control Plan (2014) Review, Integrated Parking Macquarie Park and Eastwood Town Centre, Integrated Transport Strategy 2021	**2022-2024 (Timing would only be possible if additional budget for planning staff resources were provided. Otherwise the timing would be from 2025-2027)**	Yes- Planning Team involvement in overarching DCP review No, Environment and Transport Team input into DCP technical content.

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
P4_C	Where more stringent than existing standards, update City of Ryde DCP to adopt Performance standards for Net Zero Energy Buildings (recently developed by City of Sydney in partnership with stakeholders such as the Greater Sydney Commission, Green Building Council of Australia, NABERS, ASBIC, Property Council of Australia and Planning Institute of Australia) with adaptation for CoR specific stakeholder feedback. These standards cover: *Office Buildings (Base Building) *Hotel Building (Whole Building) *Shopping Centre (Base Building) *Residential flat buildings (Whole Building) *Mixed use buildings The proposed Net Zero standards include staged increases in performance standards for development applications submitted in two Stages (Stage 1 between 1 January 2023 to 31 December 2025 and Stage 2 from 1 January 2026 onwards). In addition to the above Net Zero Energy Building standards to be developed by the City of Ryde for Industrial Buildings and other building categories. (This will expand upon the current City of Ryde DCP 2014 which requires Green Star ratings for Commercial buildings in Macquarie Park and North Ryde Station Precinct and residential flat buildings in North Ryde Station Precinct together with NATHERS/NABERS and other environmental performance requirements for certain areas/building types)	**Environment** with Planning, City of Sydney and other Net Zero Energy Building performance standard stakeholders, Macquarie Park Forum and other	19,319 tCO_2-e by 2030, 8,323 tCO_2-e by 2040,	Net Zero Energy Emissions for new building DAs submitted after 1 January 2026	City of Ryde Development Control Plan (2014), Macquarie Park Strategic Investigation/Masterplan	2022-2024 (For commencement of Stage 1 performance standards by 1 July 2024 and Stage 2 performance standards by 1 January 2026). 2024-2025 (if Stage 1 performance were not introduced and only Stage 2 standards were to commence by 1 January 2026). (These options possible if additional funding for planning staff resources are provided. Otherwise the timing would be from 2025-2027)	No, Environment Team assistance to input into DCP working technical content regarding energy performance standards. Yes- for Planning Team involvement in overarching DCP review.

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
P5_C	Update DCP settings for parking to encourage EV charging infrastructure in developments.	**Strategic Planning** with Transport, Environment	Not assessable at this time, delivery of outcomes from community transition to EV by this support will provide emissions reductions from implementation as delivered		City of Ryde Development Control Plan (2014)	2022-2024 (Timing would only be possible if additional budget for planning staff resources were provided.) Otherwise the timing would be from 2025-2027	No, Environment Team input into DCP technical content. Yes- Planning Team involvement in overarching DCP review
P6_C	Develop updated Energy Smart Water Wise DCP and Water Sensitive Urban Design Guidelines to include updated guidance on water efficiency, greywater usage, rainwater storage, wastewater recycling and WSUD (in line with Parramatta River Catchment Group 'Standardise the standards project')	**Environment** with Assets & Infrastructure, Planning, Sydney Water, Parramatta River Catchment Group	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		City of Ryde Development Control Plan (2014) Ryde Resilience Plan 2030	2022-2024 (Timing would only be possible if additional budget for planning staff resources were provided otherwise the timing would be require amending)	No, Environment Team, Infrastructure input into DCP technical content. Yes- Planning Team involvement in overarching DCP review.
P7_C	Update parking controls for Town Centres in City of Ryde DCP Parking Controls in alignment with Macquarie Park Strategic Investigation/Masterplan	**Strategic Planning** with Transport, Environment	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		City of Ryde Development Control Plan (2014)	2022-2024 (This timing would only be possible if additional budget for planning staff resources were provided otherwise the timing would be require amending)	No, Environment and Transport input into DCP technical content. Yes, Planning Team involvement in overarching DCP review.
P8_C	Update DCP settings to encourage Green Roofs/ Green Walls on developments where appropriate and develop Guidelines for Green Roofs/Walls.	**Strategic Planning** with Environment	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		City of Ryde Development Control Plan (2014)	2022-2024 (This timing would only be possible if additional budget for planning staff resources were provided otherwise the timing would be require amending)	No, Environment Team input into DCP technical content Yes- Planning Team involvement in overarching DCP review
FINANCE/GOVERNANCE		**Objective: Ensure adequate funding and governance mechanisms to implement required Net Zero actions for Community sector**					
F1_C	Review internal opportunities for reprioritisation of existing Council funding streams to support city wide emission reduction opportunities	**Finance** with Planning, Environment	Not assessable			2022/23	No

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
F2_C	Investigate introduction of Environmental Upgrade Agreement (EUA) process for non-residential Buildings (either under a self-administered or third party administered model).	**Environment** with Finance, Planning	Not assessable at this time, however delivery of outcomes by major commercial landowners will provide significant potential emissions reductions from implementation as delivered from program support	Environmental Upgrade Agreement proposal put forward to Council for adoption by 30 June 2024		2022/23 EUA proposal put to Council 2023/24 - ongoing Implementation of EUA	Yes
ADVOCACY/PUBLIC ENGAGEMENT		**Objective: Reduce carbon emission by building partnerships with relevant organisations, advocating for supportive policy changes and educating the community.**					
A1_C	Advocate to the NSW Government for higher sustainability targets in new Design and Place SEPP which will: *Replace the existing BASIX SEPP and include updated sustainability targets for residential buildings. *Replace SEPP 65 and include updated sustainability targets for apartment buildings via updated Apartment Design Guide. *Support current/future EV charging in residential flat dwellings	**Strategic Planning** with Environment, Local Government NSW.	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2023	No
A2_C	For large events within the City of Ryde, encourage 'carbon neutral certified events'	**Communications & Engagement** with Environment				2023-ongoing	Yes
A3_C	Develop further staff and community capacity building workshops and education for initiatives/technology to support transition to lowered carbon in areas of waste, renewable energy/ technology, transport, general living	**Environment** with Waste, Transport, IT and others	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered	Embedding of net zero considerations into planning and projects with annual overall emissions reduction noted from actions	Draft Waste Management Strategy for City of Ryde 2019-24 City of Ryde 100% Renewable Energy Target by 2030 and Resource Efficiency Targets	2022/23 Adopted April 2020	No

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
A4_C	Advocate on behalf of schools via the CoR REEN program, to increase priority for Department of Education funding for solar, air conditioning and improving building standards, efficient devices for schools to reduce emissions. Work with schools through established networks to identify grant opportunities.	**Environment**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2021-Ongoing	No
A5_C	Explore and implement options for developing an online mapping/reporting tool to promote City of Ryde businesses/landowners/residences which have either: Step 1) investigated feasible steps to reduce GHG emissions Step 2) started to reduce emissions (with the potential to record key steps undertaken) Step 3) purchased carbon offsets Step 4) achieved net zero emissions Link this to an annual City of Ryde Net Zero Challenge competition which rewards and recognises the various potential categories of achievement across various sectors (TBC in competition guidelines subject to feasibility)	**Environment** with LIS, Communications & Engagement, Finance	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2022/23- Explore options for mapping/reporting 2023/24- Implement proposed reporting tool (subject to project bid as not currently in delivery plan. Otherwise implementation after 2025) Net Zero Challenge Competition Guidelines developed by 2022/23 Implementation of Annual Net Zero Challenge from 2024/25 ongoing	Yes- For staff costs to explore options Yes- for implementation costs
A6_C	Develop a Climate Ambassadors program which builds upon existing Ryde initiatives to identify, develop, and promote: *Youth Climate Ambassadors (to build upon existing Youth Ambassadors program) *Business Climate Ambassadors *Neighbourhood Climate Ambassadors Provide links to existing resources to support community "Climate Conversations" by Climate Ambassadors	**Community Services, Communications and Engagement,** with Environment, together with various community organisations	Not assessable			2024-ongoing	Yes (however incorporated into F8_O above)

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
A7_C	Advocacy with NSROC/ SSROC for new/updated programs to further support community and business to transition to low/ zero emission solutions for home and business	**Environment**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2022-ongoing	No
A8_C	Continue to advocate for TFNSW commitment to major (visionary) public and active transport infrastructure as identified through the Ryde Integrated Transport Strategy to support lower transport emissions, reduced congestion, improved connections and improved air quality.	**Transport** with Urban Strategy	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered		Integrated Transport Strategy	2021- ongoing	No
A9_C	Continue to participate in the Resilient Sydney 'Sydney Metro Carbon' collaborative project and Resilient Program with other councils in region together with DPIE Environment, Energy and Science Group	**Environment**	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2021-ongoing	No
A10_C	Engage with the corporate and small business community on collaborative projects and events for transitioning to a low carbon economy	**Environment with** Communications & Engagement, together with corporate and business organisations including Macquarie University, Connect Macquarie Park & North Ryde, MPID and local chambers of commerce	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered	2022/23: Develop a strategy for engagement 2023-2030: Implement the Strategy		2021-ongoing	No
A11_C	Collaborate with others to advocate for to the Federal Government to: *To set a strong, long term, stable energy policy that accelerates the transition to renewables and provides certainty to the energy industry. *Introduce stringent minimum carbon dioxide vehicle emission standards. *Provide tax incentives for lowest emissions vehicles. *Prioritise and commit funding to significant public transport infrastructure over road infrastructure spending. *Develop a national electric and autonomous vehicle strategy.	**Environment with** Communications & Engagement, together with corporate and business organisations including Macquarie University, Connect Macquarie Park & North Ryde, MPID and local chambers of commerce	Not assessable at this time, delivery of outcomes will provide emissions reductions from implementation as delivered			2022-ongoing	No

No	Action	Responsibilities and partnerships	Potential CO2e reduction or offset (tCO_2-e /year) compared to BAU (within current and expected service delivery)	Target or metric	Related Plans/ strategies/ /reports	Indicative Timing	Service Delivery Change required?
	*Enhanced Minimum Energy Performance Standards.						
MONITORING		**Objective: Undertake regular monitoring to track Community progress towards adopted Net Zero Targets** **Target: Undertake annual reporting on community greenhouse emissions**					
M1_C	Continue to participate in the Resilient Sydney 'Sydney Metro Carbon Project' platform for measuring and reporting carbon emissions for Ryde and Sydney region.	**Environment**	Not assessable however will enable tracking and reporting of progress towards Community Net Zero emissions			2021-ongoing	No
M2_C	Further to action A7_C, investigate and if required implement alternative options for monitoring Carbon Offsets purchased by members of the Ryde Community.	**Environment**	Not assessable however will enable tracking and reporting of progress towards Community Net Zero emissions			2022-ongoing	No

APPENDIX C GREENHOUSE GAS ACCOUNTING METHODOLOGIES

13 MODELLING ASSUMPTIONS AND DATA SOURCES

13.1 GRID RENEWABLE ELECTRICITY PROJECTION

According to two recent reports from the Department of Industry, Science, Energy and Resources (DISER, 2021) and the Australian Energy Market Operator (AEMO, 2022), the baseline electricity emission factor of 0.84 kg CO2-e/kWh in 2018/19 is expected to reduce to 0.04 kg CO2-e/kWh in 2050 with Progressive Change Scenario, as the following table.

Table 5: National Energy Market Grid emission factor based on Progressive Change Scenario.

	2019	2020	2021	2022	2025	2030	2035	2040	2045	2050
NEM grid emission factors (kg CO2-e/kWh)	0.84	0.77	0.72	0.65	0.50	0.34	0.24	0.15	0.06	0.04

Note: years are in financial year.

Any residual emission remaining would need to be offset by the community (residents, business, and organisations) in order to meet Net Zero by particular target date. As such, to reach Net Zero in 2040 and 2050, a further 494,271 tCO2-e and 132,053 tCO2-e would need to be offset, respectively.

In order to calculate electricity emissions using a market-based method, an average residual mix factor (RMF) was calculated using Climate Active Electricity accounting methodology together with National Greenhouse Accounting Factors and AEMO or other projections where available. The RMF is used to allow for unique claims on the zero-emissions attribute of renewables without double-counting. An average annual Renewable Power Percentage (RPP) was also applied to calculations.

Population Growth

Population growth has been accounted for in corporate electricity usage projections by adding in known new planned facilities to service this anticipated demand. Community emission projections also factor in this population growth.

The City of Ryde's population is projected to grow from 121,270 residents in 2016 to 243,202 in 2050 as outlined shown right.

Population and dwelling numbers were derived from the City of Ryde Draft Housing Strategy and Addendum (Hill PDA, 2020), Transport for NSW population projections by local government area, City of Ryde community profile and ABS 2016,2021 Census data.

Year	Residential Population
2016	121,270
2019	134,757
2021	148,184
2026	171,394
2031	189,485
2036	205,275
2041	210,765
2046	223,481
2051	243,202

APPENDIX C... CONTINUED GREENHOUSE GAS ACCOUNTING METHODOLOGIES

14 CORPORATE EMISSIONS

14.1 HISTORICAL EMISSIONS USING EXISTING ENVIRONMENTAL REPORTING PLATFORM METHODOLOGIES

The City of Ryde has proactively been measuring and monitoring corporate greenhouse gas emissions and consumption since 2003 for the following sources of emissions under its Corporate reporting boundary:

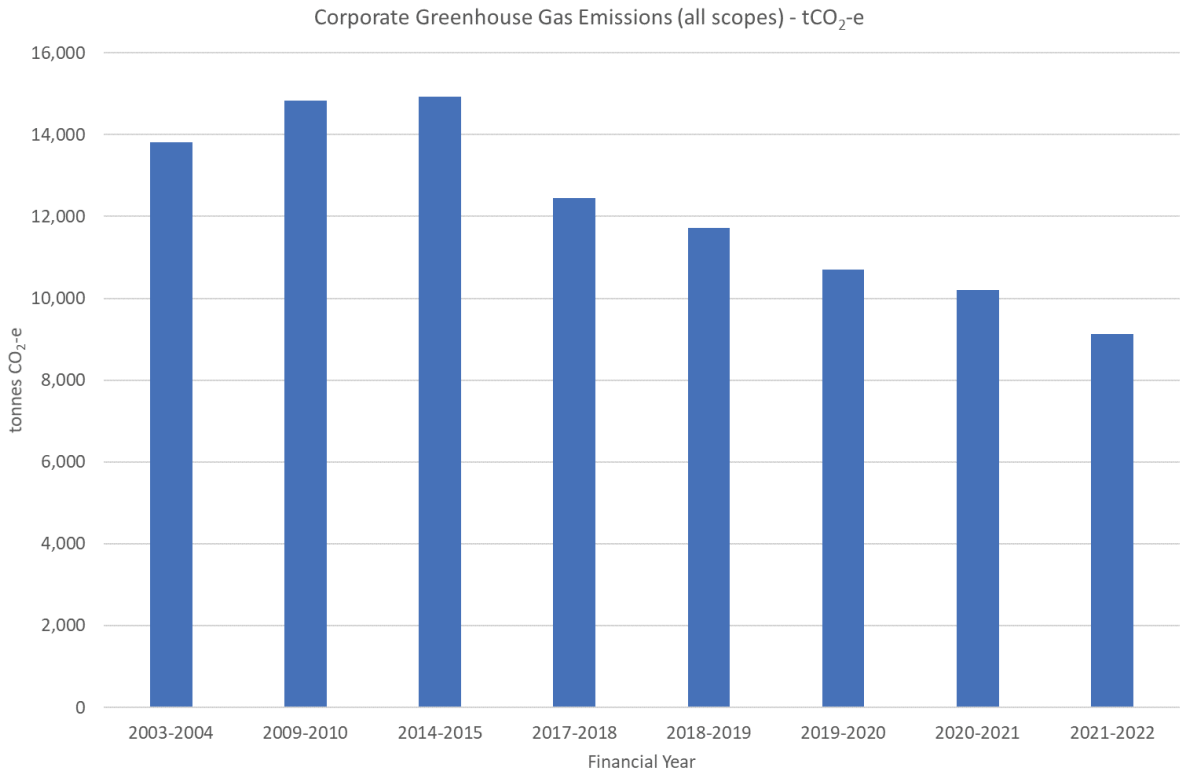
• Scope 1: Combustion of natural gas in buildings, and transport fuels by Council fleet/plant

• Scope 2: Emissions from purchased grid electricity in Council buildings/properties

• Scope 3: Emissions from upstream and downstream activities such as extraction, processing and transport of fuels/natural gas, and transmission and distribution loses for electricity.

Emissions from these sources were estimated using established National Greenhouse and Energy Reporting Scheme (NGERS) and other emissions factors in line with Council's environmental reporting platform methodology.

Using this boundary, Council's greenhouse gas emissions have followed the following trend since 2003/04.



Council has been undertaking continuous efficiency measures for lowering the carbon footprint of council's own operations.

14.2 UPDATED METHOD FOR EMISSIONS ACCOUNTING UNDER CLIMATE ACTIVE METHODOLOGY

As part of the process of developing this Net Zero Emissions Pathway report, City of Ryde has developed a Greenhouse Gas Inventory data and Method with advised from consultants and internal staff which provides a relevant, complete, consistent, transparent and accurate methodology for reporting. The methodology is based on Greenhouse Gas Protocol developed by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD). The methodology also be aligned with Climate Active Guidelines for future certification.

14.2.1 ORGANISATION BOUNDARY

Organisational boundary of City of Ryde is identified by a definition of Operational Control stated in the Corporate Standard (WRI and WBCSD, 2004, p.18).

14.2.2 EMISSION SCOPES AND SOURCES

After a comprehensive review of all CoR's operations and activities which includes direct activities, downstream and upstream of these direct activities, GHG emission sources are grouped into scope 1, 2 and 3 according to the Corporate Standard's approach for accounting and reporting using scopes in Figure 1. These three scopes are detailed in the below sections.

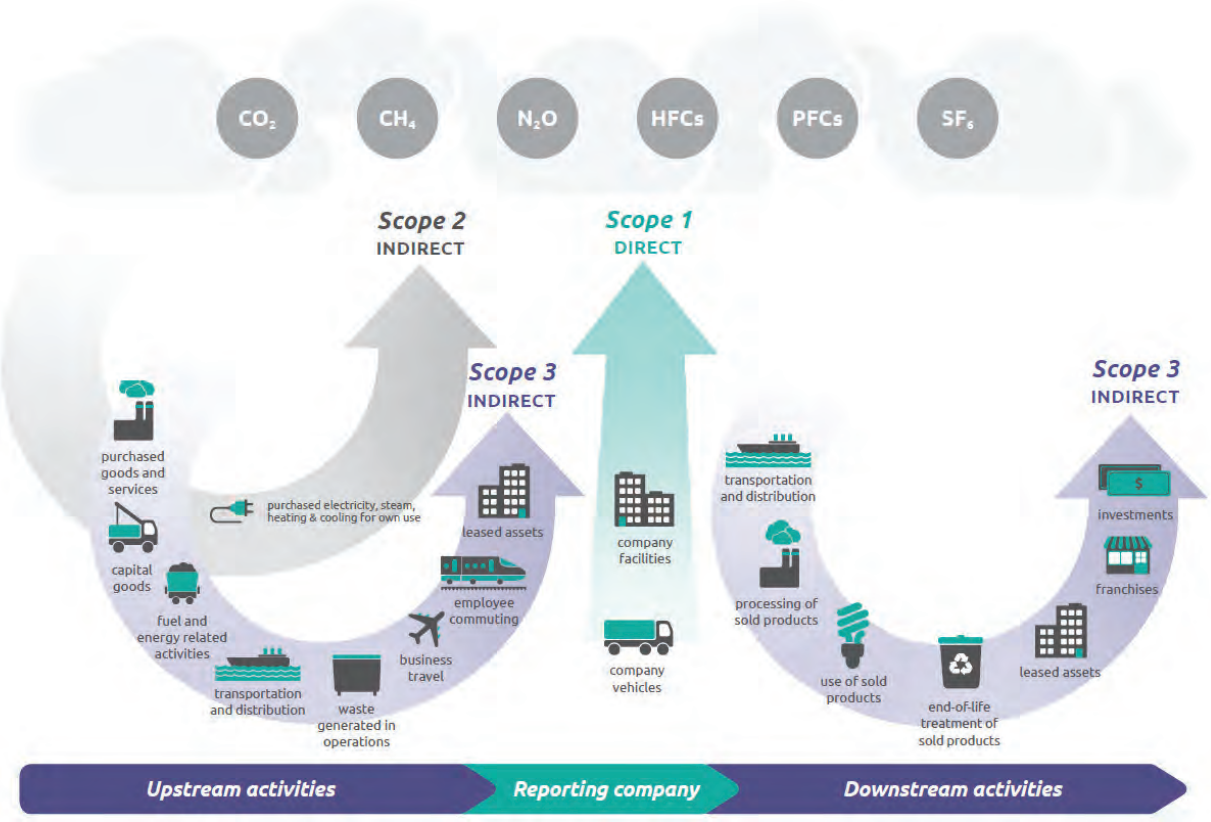


Figure 1: Overview of scopes and emissions across a value chain (WRI and WBCSD (2011a)).

14.2.3 EMISSION BOUNDARY

Quantified emissions

Emission sources	Scope
Cleaning Services	3
Computer equipment	3
Domestic wase collections	3
Electricity transmission and distribution losses	3
Hire of plant, buses and vehicle	3
ICT services	3
Liquid Fuel supply losses – Diesel	3
Liquid Fuel supply losses – Gasoline (ULP and E10)	3
Natural gas – tenant	1
Natural gas transmission and distribution losses	3
Office Paper usage (internal printing)	3
Professional Consultant services	3
Professional Legal services	3
Purchased electricity for CoR's operations	2
Refrigerants – building, kitchen, laboratory and vehicle refrigeration	1
Staff commuting (excluding commuting using CoR's fleet)	3
Telecommunication	3
Transport fuels – CoR's fleet vehicles	1
Water usage	3

Non-quantified emissions

- Air travel - Business
- Capital works/projects (asphalt, bitumen, concrete..)
- Chemical Supplies
- Office equipment and desk accessories (including furniture)
- Postal and Courier Services
- Printing and publication services (excluding internal printing)
- Restaurant and Hotel Catering Services
- Stationary expenses
- Taxi travel - Business
- Waste generation within Council’s buildings (This needs to create data management plan)
- Work from home (This needs to create data management plan).

Outside emission boundary

- Animal management
- Banking fees and services (including ETPOS fee, merchant fee, cash handling)
- Citywide (Non-CoR contract)
- Community emission
- Domestic waste disposal at third party facilities
- Legacy waste landfill – Porter Creek Landfill
- Employee's cost
- Insurance (general, vehicles and fleet, public liability and indemnity, and excess claims)
- Investment
- Other general expenses (including sundry, vehicle registration cost, donation, levies, membership fees...)
- Processing, use and end of life of sold products
- Real estate services (commission and fee).

There are also some differences with how electricity emissions under Scope 2 are treated under the Climate Active method using either a location or market-based approach.

The market-based method assesses electricity emissions of a business based on its investments in different electricity products and markets, including from voluntary purchases of renewable electricity and mandatory schemes like the Renewable Energy Target. Under the market-based method Large Scale Generation Certificates (LGCs) can be used to claim zero emissions for the related amount of electricity only if they are voluntarily surrendered to the Clean Energy Regulator's REC Registry. The percentage of electricity consumption attributable to the Large Scale Renewable Energy Target (LRET), as reflected by the Renewable Power Percentage, for a given reporting year, is assigned an emission factor of zero in the carbon account. Accredited Green Power usage is assigned an emission factor of zero in a carbon account. Behind the meter usage of electricity from large scale systems may be reported and assigned an emissions factor of zero in the carbon account, only if any LGCs associated with that generation are retired or none will be created. Behind the meter usage of electricity from small scale systems may be reported and assigned an emissions factor of zero in the carbon account, regardless of whether any Small scale technology certificates (STCs) associated with this generation have been created, transferred or sold.

The location-based method shows electricity emissions of a business in the context of its location. It shows the physical emissions from a business's electricity consumption, as it reflects the emissions intensity of the electricity grid(s) it relies on to operate. Under the location-based method, LGCs cannot be used to zero emissions for the related amount of electricity as this would result in double counting against the applicable grid emission factor. There is no separate accounting treatment for the LRET as it is already included in the state factors used to convert electricity into t CO2-e.

Green Power cannot be used to make zero emission electricity claims under the location-based method. Behind the meter usage of electricity from large scale systems may be reported and assigned an emissions factor of zero in the carbon account, provided any LGCs associated with that generation are retired or none will be created. Behind the meter usage of electricity from small-scale systems may be reported and assigned an emissions factor of zero in the carbon account, regardless of whether any STCs associated with this generation have been created, transferred, or sold.

Council's emissions for this report have been counted using a market-based approach. Should Council begin reporting under Climate Active methodology it would use the Market Based method as its primary electricity account method for assessing required offsets but would also need to report total emissions using the location-based approach.

As a result of additional sources of emissions, the emissions inventory calculated using the updated Climate Active methodology and the previous Azility reporting methodology differ and the Climate Active inventory is larger than using the Azility reporting inventory.

APPENDIX C... CONTINUED GREENHOUSE GAS ACCOUNTING METHODOLOGIES

15 COMMUNITY EMISSIONS

Prior to 2019, understanding emissions in the community space was difficult due to the availability and diversity of data sets to collate, track and measure this. In 2019, Ryde under the 33 metropolitan council Resilient Sydney network, commenced partnership for community GHG emission reporting under the 'Sydney Metro Carbon Project.'

The project aimed at providing a metropolitan wide review of community GHG emissions against each local government area. It obtained data across multiple agencies reviewing energy, transport, waste and water related emissions to enable councils to readily see and track community emissions for future reduction projects.

The Resilient Sydney reporting platform adopts the "city-induced" approach to report GHG emissions, with a focus on how business and residential activity and consumption within a defined geographic boundary leads to an increase or reduction in GHG emissions. For local governments engaging their community in climate mitigation efforts, this reporting method best highlights community opportunities to reduce emissions. This 'city-induced' approach is different with the NSW Government's approaches. The NSW Government uses 'territorial' approach for direct (scope 1) emission, and consumption-based approach for indirect (scope 2) emissions associated with electricity supply allocated to the local area where the electricity is used. Currently, there is no comprehensive inventory of indirect (scope 3) emissions across the value chain of products and services consumed and produced within the state.

The 'City-induced' and 'territorial' approaches are defined in the Global Protocol for Community-scale Greenhouse Gas Emission Inventories (GPC) published by the World Resources Institutes and World Business Council for Sustainable Development (WRI & WBCSD, 2021).

Council also engaged a consultancy to help develop a projected BAU baseline GHG emissions profile for the community and model the potential impact of various emission reduction opportunities.

APPENDIX D
GUIDANCE FOR SETTING A NET ZERO TARGET

The Intergovernmental Panel on Climate Change/ IPCC

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. The objective of the IPCC is to provide governments at all levels with the most authoritative scientific information that they can use to develop climate policies. IPCC Special Report 15 found that limiting global warming to 1.5°C would require global net human-caused emissions of carbon dioxide (CO_2) to fall by about 45 percent from 2010 levels by 2030, reaching 'net zero' around 2050. This means that any remaining emissions would need to be balanced by removing CO_2 from the air. Non CO_2 GHGs would also require deep reductions e.g. Methane emissions would need to reduce by at least 35% reduction on 2010 by 2050 (IPCC, 2018).

Science Based Targets Initiative (SBTi)

The Science Based Targets Initiative (SBTi) is a partnership between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). Science Based Targets Network brings together 45 NGOs, business associations and consultancies to define what is necessary to do "enough" to stay within Earth's limits and meet society's needs. The Science Based Targets initiative (SBTi) drives ambitious climate action in the private sector by enabling companies to set science-based emissions reduction targets. Targets are considered 'science-based' if they are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement – limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.

Under the SBTi Corporate Manual Absolute contraction method, companies (particularly those in developed countries) are strongly encouraged to adopt targets with a 4.2% annual linear reduction to be aligned with limiting warming to 1.5°C. In addition, SBTi has developed "Science Based Climate Targets- a guide for Cities" (Carrillo Pineda et al, 2020) which for a City such as Ryde allows use of either C40 Deadline 2020 or OPCC method for City emission targets.

C40- Deadline 2020

C40 is a network of the world's megacities committed to addressing climate change. C40 supports cities to collaborate effectively, share knowledge and drive meaningful, measurable and sustainable action on climate change. Deadline 2020 is the first significant road map for achieving the Paris Agreement, outlining the pace, scale and prioritization of action needed by C40 member cities over the next 5 years and beyond (C40, 2020).

Based on this GDP and emissions per capita, Ryde would be classified as a steep decline City. Using the Deadline 2020 method (with existing and projected population growth for the City of Ryde) would require the following reductions of CO_2e emissions compared to 2018/19, a 76% reduction by 2030, 94% reduction by 2035 and 98% reduction by 2040.

World Wide Fund for Nature (WWF)- One Planet City Challenge (OPCC)

The One Planet City Challenge (OPCC) is the Worldwide Fund for Nature's (WWF's) program which celebrates national and global frontrunners in creating cities that enable people to live in balance with nature now and in the future. OPCC review's cities' climate actions and ambitions, to assess whether they align with the goals set forth in the Paris Agreement (WWF, 2022). Using the One Planet City Challenge method gives a per capita reduction targets for 2030 and 2050 emissions, based on 2018 levels. Applying this methodology to the City of Ryde's current and projected population together with the Human Development Index score for Ryde would require a 49% reduction on CO_2e emissions by 2030 compared to 2018/19 and Net Zero emissions by 2050.

Climate Targets Panel

The Climate Targets Panel is an independent group of Australia's most senior climate scientists and policymakers who have come together for the purpose of ensuring that debate about Australia's emissions reductions targets are informed by sound science and policy. In their (January 2021) report "Australia's Paris Agreement Pathways: Updating the Climate Change Authority's 2014 Emission Reduction Targets" found that Australia would need to reach Net Zero emissions by 2035 with a 74% reduction on 2005 emission levels by 2030 (Hewson et al. 2021).

Climate Council

The Climate Council is Australia's leading climate change communications organisation. We provide authoritative, expert advice to the Australian public on climate change and solutions based on the most up-to-date science available.

Following the release of the IPCC Working Group I's (WGI) contribution to the IPCC's Sixth Assessment Report (6AR) in August 2021, the Climate Council provided the following guidance. "Based on the latest science, and taking into account Australia's national circumstances, the Climate Council has concluded that Australia should reduce its emissions by 75% below 2005 levels by 2030, and achieve net zero emissions by 2035." (Climate Council, 2021)

Net Zero Targets adopted by other Councils

Council	Council target	Community target
Bellingen Shire Council	45% reduction by 2030 compared to 2010. Net Zero by 2040	
Blue Mountains City Council	Carbon neutral by 2025	Net Zero by 2050
Byron Bay Council	Net Zero by 2025	Support community to achieve Net Zero 2025
City of Canada Bay	Net Zero by 2030	Net Zero 2050
City of Sydney	Became carbon neutral in 2007 (certified in 2011)	Net Zero emissions 2035
Georges River Council	Net Zero by 2025 (or as soon as practicable)	
Hawkesbury Council	Net Zero 2030 or earlier	25% reduction by 2028, 60% reduction 2036 compared 16/17. Net Zero Emissions by 2050
Hornsby Shire Council	32% below 2018 levels by 2025, 53% below 2018 levels by 2030 and net zero by 2050	Support the community to achieve Net Zero 2050, 31% reduction from 2017 levels by 2025 and 53% by 2030.
Inner West Council	Carbon Neutral 2025	75% reduction on 2017 levels by 2036. Net Zero by 2050 or earlier.
Ku-ring-gai Council	Net Zero 2040 or earlier and 50% reduction by 2030	Support a goal of reducing community GHG emissions to net zero by 2040.
Northern Beaches Council	Aspire to Net Zero 2030, committed to 60% reduction emissions by 2040 and Net Zero emissions 2045	Aspire to Net Zero by 2030, Committed to reducing community emissions by 50% by 2040 and Net Zero by 2050
Parramatta Council	carbon neutral by 2022. 60% reduction by 2038 (on 2015 levels)	
Randwick Council	Net Zero by 2030	
Sutherland Shire Council	Carbon neutral by 2030	
Tweed Shire Council	Strive for Net Zero 2030	Support the community to achieve Net Zero 2030
Upper Hunter Council	Carbon Neutral by 2030	
City of Wagga Wagga	Net Zero by 2040	Net Zero by 2050
Waverley Council	70% reduction 2003/04 by 2030, Net Zero by 2050	70% reduction 03/04 by 2030, Net Zero by 2050
Willoughby Council	By 2028 50% reduction to 2008/09, Net Zero by 2050 or sooner if viable	30% less emissions by 2028 compared with 2010/11.
Wollongong City Council	By 2030 Aspirational	Net Zero by 2050 to be reviewed in 5 years time to look at reducing to 2030 in line with Council's target