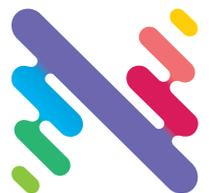




# Newcastle Climate Action Plan

2021 – 2025

[newcastle.nsw.gov.au](http://newcastle.nsw.gov.au)



City of  
Newcastle

# Acknowledgement

City of Newcastle acknowledges that we operate on the grounds of the traditional country of the Awabakal and Worimi peoples. We recognise and respect their cultural heritage, beliefs and continuing relationship with the land and waters, and that they are the proud survivors of more than two hundred years of dispossession. City of Newcastle reiterates its commitment to address disadvantages and attain justice for Aboriginal and Torres Strait Islander peoples of this community.



We are committed to contributing towards achievement of the United Nations' Sustainable Development Goals (SDGs). We have adopted the SDGs and New Urban Agenda as cornerstones for our planning.

In September 2015, Australia was one of 193 countries, to commit to the SDGs. These goals provide a global roadmap for all countries to work towards a better world for current and future generations.

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## Message from the Lord Mayor **Nuatali Nelmes**

City of Newcastle is a proudly forward thinking and progressive Council that has long led the way, by working in partnerships to develop and implement strategies and initiatives to tackle climate change head on.

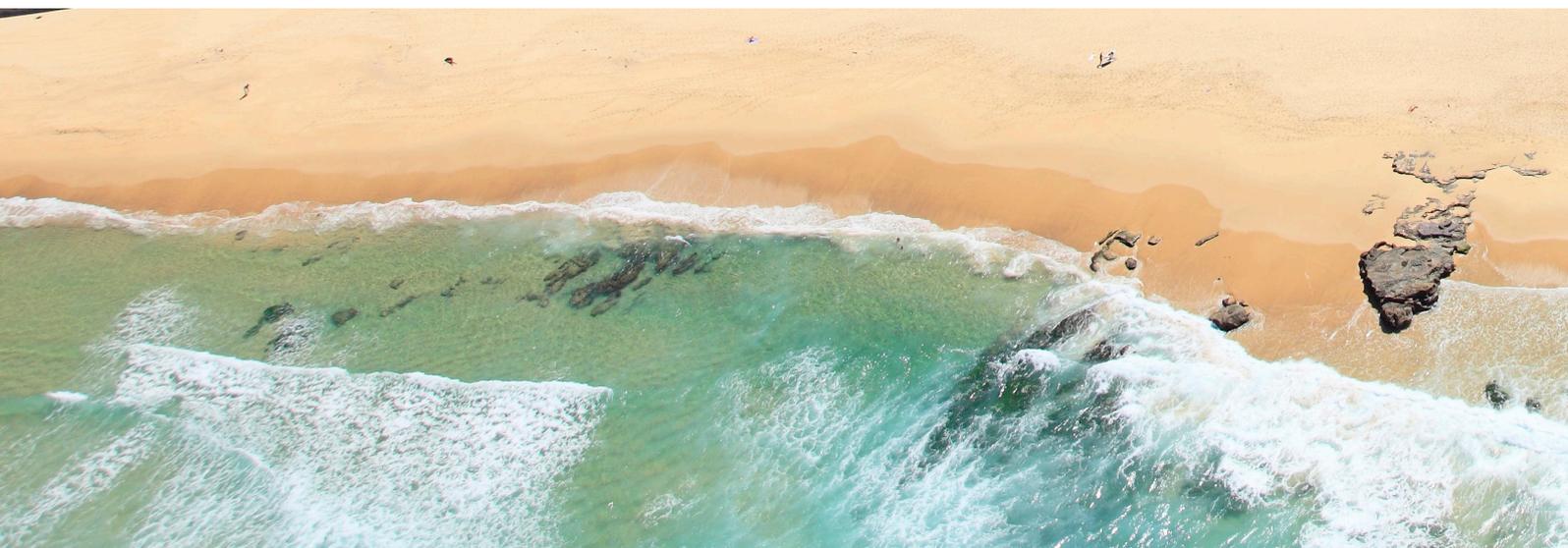
In January 2020, we delivered on the commitments of our 2011 Carbon and Water Management Action Plan and became the first NSW Council to be powered by 100 per cent renewable electricity. Our transformation to a sustainable city will continue under this new Climate Action Plan. Over the course of the last decade, the City has made significant and sustained progress in limiting its carbon emissions and working with the community on mitigating and adapting to the effects of climate change.

City of Newcastle recognises that there is a global climate emergency and an urgent need for real action on climate change. As a City, we have formally committed to the principles and targets of the Paris Climate Agreement. It is a major challenge to develop and maintain resilient and liveable cities in the face of climate change, global economic shifts and technological change. Cities must deliver and manage the infrastructure, industries and actions required, to successfully make their low carbon transition while ensuring that those most impacted by this change are supported, retrained and provided opportunities for a just transition in a new economy.

Our guiding principles include considering the long term and cumulative effects of actions on future generations, embedding the principles of ecologically sustainable development and incorporating the United Nations Sustainable Development Goals (SDGs) as a cornerstone of our planning. Focusing on continuous evaluation and improvement and through strong and consistent actions to reduce our emissions, City of Newcastle is now recognised as a leading local government authority when it comes to implementing initiatives to address climate change.

Having successfully navigated previous economic transformations, Newcastle must position itself to take full advantage of an emerging low carbon economy. Through supporting areas such as low emissions technologies, zero emission industries, renewable hydrogen and ammonia export hubs, green metal and minerals processing and large-scale renewables, Newcastle has the opportunity to be a leading global centre for clean technology innovation.

By supporting residents, business and industry to act more sustainably, encourage local resilience and build a circular economy based on local sourcing, production, manufacturing and consumption of materials, the City can continue to build a prosperous, healthy, equitable and sustainable community and propel Newcastle towards a net zero emissions future.





## Message from the CEO

### Jeremy Bath

Cities are responsible for the vast majority of global emissions and also provide the biggest opportunity for action to mitigate the effects of climate change. While there is much focus on the actions of international, federal and state governments, there is a significant amount that can be done to tackle climate change at the local government level. Through urban planning and advocacy, councils have the power to reduce the impact of carbon-intensive operations on our communities.

In Newcastle, we're doing things smarter and more sustainably. As a vulnerable coastal community, addressing the challenges of a changing climate is vital for the future wellbeing of our residents and economy.

Over the past ten years, City of Newcastle has delivered innovative and award winning education programs, a Hunter-wide business energy efficiency program, made our buildings more energy efficient, installed solar PV and battery storage, upgraded thousands of street lights to LED, planted thousands of new street and park trees to address urban flooding and urban heat island, and built a five megawatt solar farm on a closed landfill site. We are also building an advanced organics processing facility to revolutionise food and garden waste treatment. These actions not only save millions of dollars in operational costs but also significantly reduce our carbon emissions.

In developing this new Climate Action Plan, City of Newcastle has looked to global best practice examples and reshaped them for our local context, engaging with the community and focusing on action to lead Newcastle through complex but unavoidable challenges.

While we still have much to do in reducing emissions in our own operations, we also need to work closely with Newcastle businesses, industry and the community to help drive change and transition to a net zero emissions city.

Rapid decarbonisation will require leading by example and using every lever available to us, such as encouraging sustainable transport options (including active and public transport), accelerating the uptake of electric transport and continuing the rollout of public electric vehicle charging stations. We will also focus on smarter use of energy and other resources using the best available technology, helping to build new markets for low emissions products and materials and demonstrating both the environmental and local economic benefits of acting more sustainably.

City of Newcastle is committed to creating a safe climate future, working collaboratively, sharing knowledge and experience and advocating for new sustainable economic opportunities.

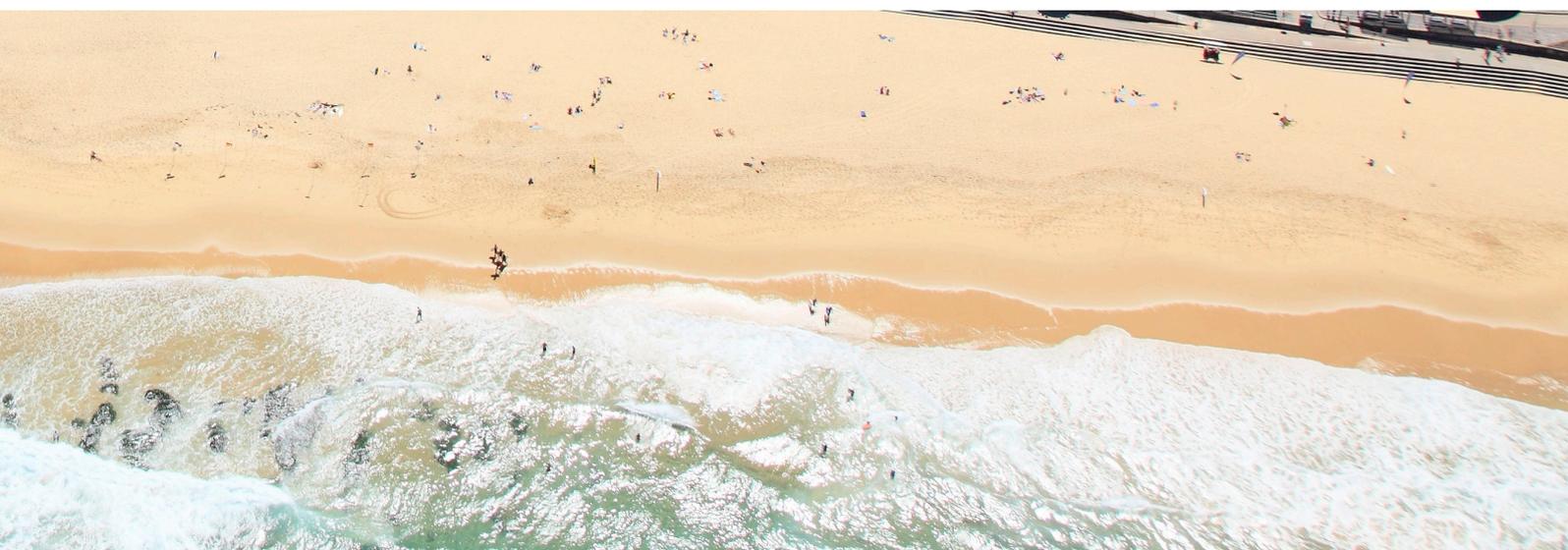


Image:  
City of Newcastle Smart Lighting,  
Hunter Street



# Addressing the Challenge

As we enter a critical decade for action on climate change, we are already beginning to glimpse the impacts that a changing climate may have on our everyday lives. Likely major consequences of climate change will include more frequent and widespread bushfires, flooding, extreme heat and increased occurrences of pandemics<sup>1</sup>. The increase of these events will have far-reaching and unprecedented changes in all aspects of society and this clearly highlights the vulnerabilities that Australians will face. Globally, 2019 was the second hottest year on record, (after 2016) with average temperature records for the decade 2010–2019 the highest on record<sup>2</sup> and each decade since the 1980s warmer than the previous one.

At a global level, the Paris Climate Agreement committed international governments, including Australia, to take and encourage action to address climate change through reducing greenhouse gas emissions and undertaking climate change adaptation<sup>3</sup>. To limit global warming to below 2°C above preindustrial levels and as close to 1.5°C as possible, the Intergovernmental Panel on Climate Change (IPCC) states that the world needs to reach carbon neutrality no later than 2050 and even then, it is a 50/50 chance whether warming can be kept within 1.5°C<sup>4</sup>. With temperatures having already increased by 1.1 degrees celsius, according to the United Nations, emissions globally will have to fall 7.6% year on year for the next decade to stay on track to meet the 1.5°C temperature goal of the Paris Agreement<sup>5</sup>.

To meet this challenge, governments, business and industry all need to adopt 'science-based' targets that are aligned with the latest climate science<sup>6</sup>.

In Australia, targets to reach net zero emissions have been set by every State and Territory, with New South Wales committing to taking decisive and responsible action on climate change through a Net Zero Plan (2020–2030) and a goal of net zero emissions for the entire state by 2050<sup>7</sup>.

The NSW Government has also undertaken detailed work to look at the benefits and competitive advantages that decarbonisation can have in generating economic development, prosperity and jobs growth in NSW, positioning the State as a global leader in innovative technologies and services<sup>8</sup>.

Cities are at the forefront of responding to a changing climate and the systematic shocks that will be faced in the future. At the City of Newcastle (CN), reducing emissions and mitigating the effects of climate change has been a focus area for more than 25 years. During this time, CN has delivered strong cuts in emissions across its operations making significant financial savings in the process. It has led by example and formed strong partnerships, in helping the City shift towards a low-carbon future and transition to an economy of greater self-sufficiency and resilience.

Continuing the work of reducing emissions in the City, this Climate Action Plan (CAP) is separated into two parts – an action plan to reduce CN's operational emissions and an action plan to reduce emissions from the City as a whole. The CAP sits under the City of Newcastle's 2030 Community Strategic Plan (CSP) and environmental strategy. Although it's key goal is in the mitigation of climate change and reducing emissions, it also complements other strategies and plans that are focused on climate adaptation, an equally crucial area for the City to address.

To meet the challenges of a climate emergency, take advantage of the economic opportunities from meeting emissions targets and create a net zero emission City, it will take collective action, commitment and leadership from all sectors of the community. Sharing knowledge, research and experience to drive down emissions in Newcastle and beyond will help deliver the community's vision for a smart, liveable and sustainable global city.

# 2008/09

## Our Baseline Emissions Data

In development of the preceding 2020 Carbon and Water Management Action Plan (CWMAP) adopted in 2011, City of Newcastle (CN) undertook a detailed carbon footprint analysis for its Operations in accordance with the National Greenhouse and Energy Reporting (NGER) guidelines and emissions factors stipulated in the Australian Government's National Greenhouse Account Factors. This set a baseline year of 2008/09 and this remains as our baseline data that CN tracks its progress against. As operational emissions continue to decrease and the opportunity to reach net zero emissions approaches, further detailed carbon footprinting will need to be undertaken if independent verification of carbon neutral or net zero emission status is to be attained.

Our baseline data or starting point, identified our emissions (in tonnes of Carbon Dioxide equivalent or t CO<sub>2</sub>-e) under three categories or 'scopes' based on their source.

### Scope 1 Emissions:

43,339 t CO<sub>2</sub>-e in 2008/09

Are the direct emissions from combustion of fuels used by CN Operations, fossil-based gas, liquid petroleum gas (LPG), refrigerants in air conditioning equipment and vehicles. This figure also includes landfill emissions from Summerhill Waste Management Centre (WMC), although these could be considered a community emission as they include waste received from residents and commercial/ industrial sources both within the Local Government Area and outside of Newcastle. Estimating these emissions is a difficult task requiring detailed data modelling and assumptions. Further detailed work is required to update assumptions including the impact that landfill gas capture and generation has had on reducing this emission source.

### Scope 2 Emissions:

7,982 t CO<sub>2</sub>-e in 2008/09

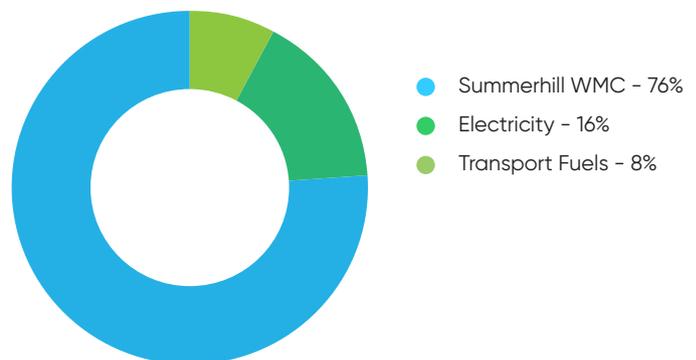
Are indirect emissions associated with the purchase of electricity to operate lighting, buildings and other CN infrastructure.

### Scope 3 Emissions:

10,242 t CO<sub>2</sub>-e in 2008/09

Are CN activities that generate indirect emissions from sources not owned or operated by CN including full lifecycle emission from the extraction and production of fuels, emissions from transport not owned by CN (such as air travel) and emissions associated with the manufacture of products and services used by CN. Water and wastewater is also included in Scope 3. Although the best available data is used, this is another area where more detailed work is required to measure emissions from construction activities and other Scope 3 sources. Included in this Scope 3 data is the electricity used in Public Street lighting, however this may be counted as a Scope 2 emission in future, given CN's operational control and accelerated program to upgrading lights to LED.

**Chart 1 - City of Newcastle 2008/09  
Baseline Scope 1 and 2 Emissions  
(Including Summerhill WMC)**



**Chart 2 - City of Newcastle 2008/09  
Baseline Scope 1, 2 and 3 Emissions  
(excluding Summerhill WMC)**

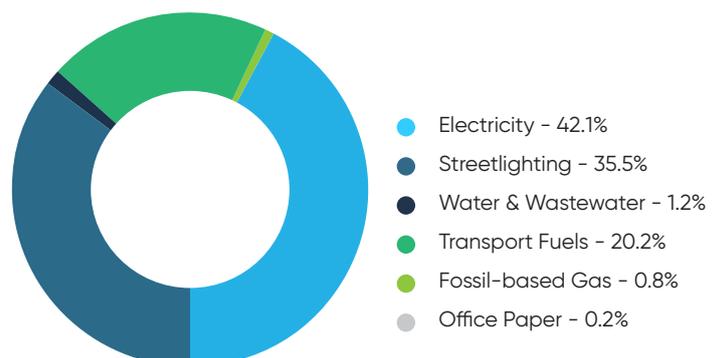


Image:  
Rooftop solar PV install at  
Newcastle Regional Museum



# A Decade of Progress

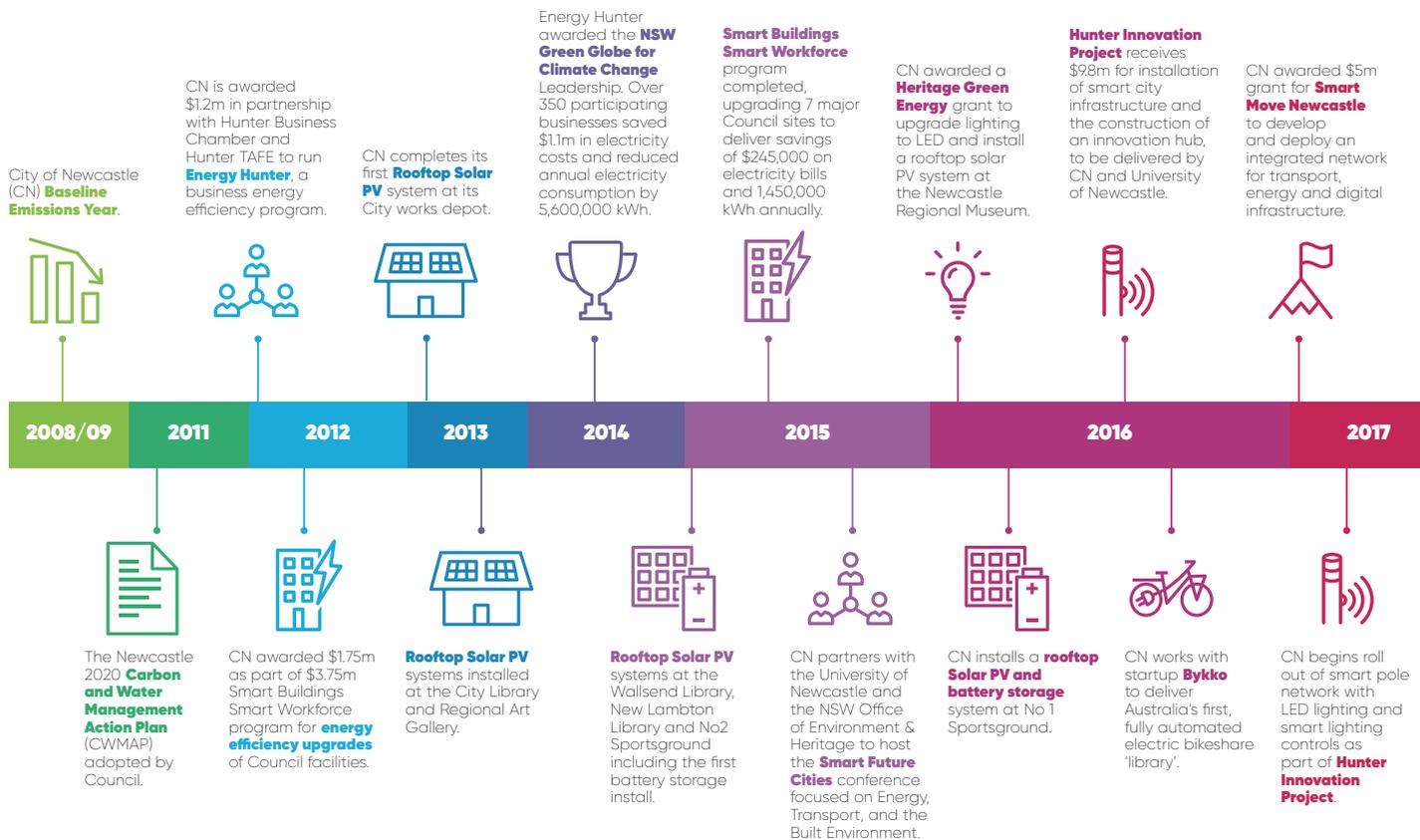
With the adoption of the 2020 Carbon and Water Management Action Plan in 2011, City of Newcastle (CN) has been actively working towards reducing its operational emissions, leading by example and sharing knowledge and experience with the community to drive down emissions across the City.

Following successful completion of the Greenhouse Action In Newcastle (GAIN) 2001-08 Plan, that saw a 13.6% reduction below 1995 levels, CN has continued its strong focus on energy efficiency, delivering the multi-year roll out of the Smart Buildings Smart Workforce program between 2013-2015, where CN upgraded seven of its major sites to deliver an annual reduction in electricity use of 1.45 gigawatt hours (GWh) and saving over \$245,000 a year in electricity costs. The \$3.75m program received \$1.75m in grant funding from the Australian government

and targeted upgrades and improvements to air-conditioning, lighting and thermal performance in buildings.

A Heritage Green Energy Grant from the State Government saw significant energy efficiency upgrades to the Newcastle Regional Museum, with the project winning the Energy Efficiency Award at the National Cities Power Partnership awards.

As one of the largest energy users across CN operations, street lighting was also targeted for accelerated replacement to LED lighting. Replacing five thousand lights on residential roads reduced total electricity consumption by 1.38 GWh annually or nearly ten percent of total energy consumption. A further 4,500 street lights on main roads are also scheduled for replacement.

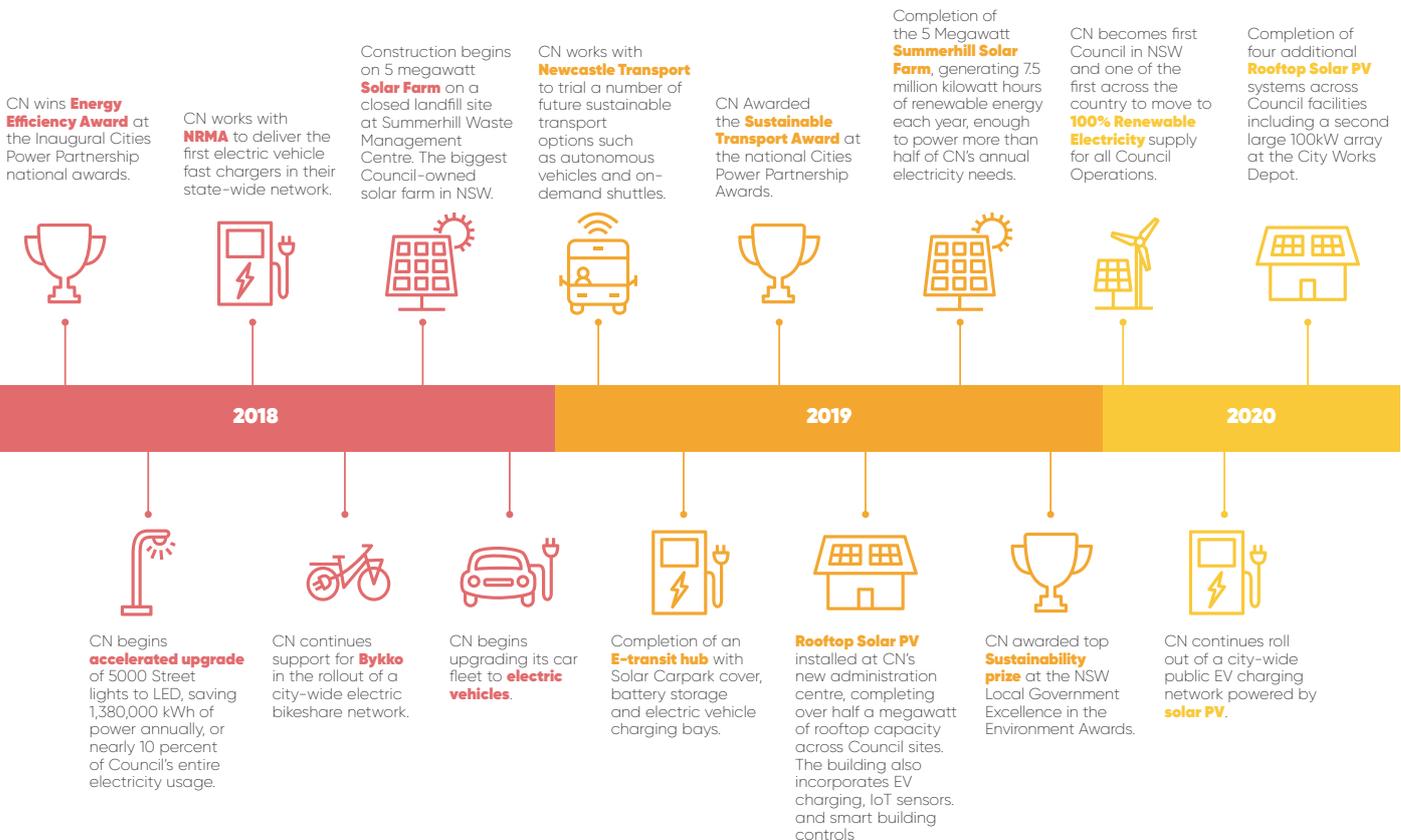


CN also continued to run highly successful engagement programs, based on its 14-Step ClimateCam Framework. In collaboration with the Hunter Business Chamber and Hunter TAFE, CN delivered the Energy Hunter program to over 350 businesses across the Hunter Region, providing real-time electricity monitoring, energy audits, workshops and assistance in developing energy efficiency projects.

The program, which helped businesses reduce electricity use by 5.6 GWh and save over \$1.1m in electricity savings each year, won the prestigious Climate Change Leadership Award at the NSW Government's Green Globe Awards.

Embracing renewable energy, CN started with the first rooftop Solar PV install at the City Works Depot in 2012/13 and has gone on to complete a further eleven rooftop or carpark Solar PV systems, totalling over 675kW and generating approximately one gigawatt hour of renewable energy each year, used directly onsite by CN buildings and facilities.

Building on this success, a 5 megawatt Solar Farm was constructed on a closed landfill site at Summerhill Waste Management Centre. On 1 January 2020, CN also became the first Council in NSW to move to 100% renewable electricity supply, signing a Power Purchase Agreement to receive renewable energy from Sapphire Wind Farm.



# Shifting Focus

At the beginning of delivery for the 2020 Carbon and Water Management Action Plan (CWMAP), City of Newcastle's (CN) emissions profile (excluding Summerhill Waste Management Centre (WMC) showed that electricity use accounted for nearly 80% of total operational emissions. Considerable focus on energy efficiency and renewable energy development, concluding with a 100% Renewable Power Purchase Agreement, has resulted in significant reductions in carbon emissions and removed electricity as CN's main emission source, as the CWMAP reaches completion.

Table 1  
Progress against key targets

30% Reduction in CN's electricity usage	<b>17.4%</b>	 Decrease (behind target)
80% of Newcastle's street lights using best practice technology	<b>31%</b>	 Increase (behind target)
30% of CN's electricity generated from low carbon sources	<b>100%</b>	 Increase (ahead of target)
30% reduction in CN's potable water usage	<b>13.9%</b>	 Decrease (behind target)
30% reduction in CN's Carbon footprint	<b>77%*</b>	 Decrease (ahead of target)
20% reduction in CN's fossil-based liquid fuel usage	<b>6.8%</b>	 Decrease (behind target)

\*Excluding emissions from SWMC

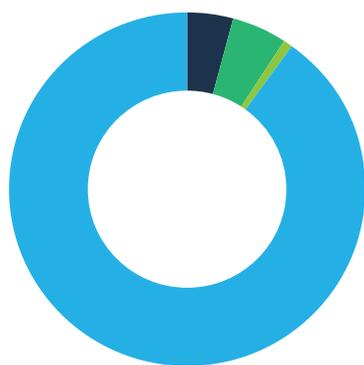
Analysis showed (using best available data) that CN has exceeded its renewable energy target and carbon emission reduction targets while also making good progress against other key goals such as reducing use of electricity, water and fossil-based liquid fuels. Energy efficiency and renewable energy generation will continue as important goals in this Climate Action Plan, both from a cost saving perspective and emission reduction activity, with a focus on upgrading existing legacy street lights, increasing onsite solar PV and battery storage and unlocking further opportunities through smart energy management and demand response capabilities.

In the area of reducing transport emissions, CN has made good early progress through beginning the transition of its passenger fleet to electric vehicles and installing Electric Vehicle charging stations both within CN facilities and for public access use.

The use of fossil-based liquid fuels such as diesel and unleaded petrol in CN cars, trucks, waste fleet, plant and equipment now account for over 90% of CN's remaining operational emissions. This is produced from more than 1.6 million litres of fuel used annually across CN's operations.

Technology and costs have improved rapidly and in many cases electric options are already more cost-effective than traditional internal combustion engine (ICE) alternatives in a total cost of ownership (TCO) assessment. Electric options are available, or coming soon, for most fleet and equipment types. This presents an opportunity to minimise exposure to fuel price spikes and supply vulnerabilities, promote greater self-sufficiency and resilience and reduce carbon emissions. It can also greatly improve air quality and create significant health benefits from reduced exposure to diesel particulates and other traffic pollutants. For these reasons, the electrification of CN's fleet, plant and equipment will be a key focus areas in this Climate Action Plan.

**Chart 3 -  
City of Newcastle 2020 Snapshot  
Scope 1, 2 and 3 Emissions  
(Excluding Summerhill WMC)**



- Transport Fuels - 90%
- Fossil-based Gas and LPG - 4.0%
- Water & Wastewater - 5.0%
- Office Paper - 1.0%

Emissions from the Summerhill Waste Management Centre have been excluded from analysis due to the limited operational control CN has over the placement of waste and the complexity in accurately modelling fugitive emissions. However, in order to achieve net zero emissions, it remains a crucially important area for CN to undertake further detailed assessment, including the positive benefits from landfill gas generation and emission reductions that will accrue from construction of the Organics processing facility. Building circular economies and reducing supply chain emissions also form a key part of this plan and as such, further work is required in understanding CN's Scope 3 emissions.





Image: City of Newcastle Electric Vehicle Charging Hub

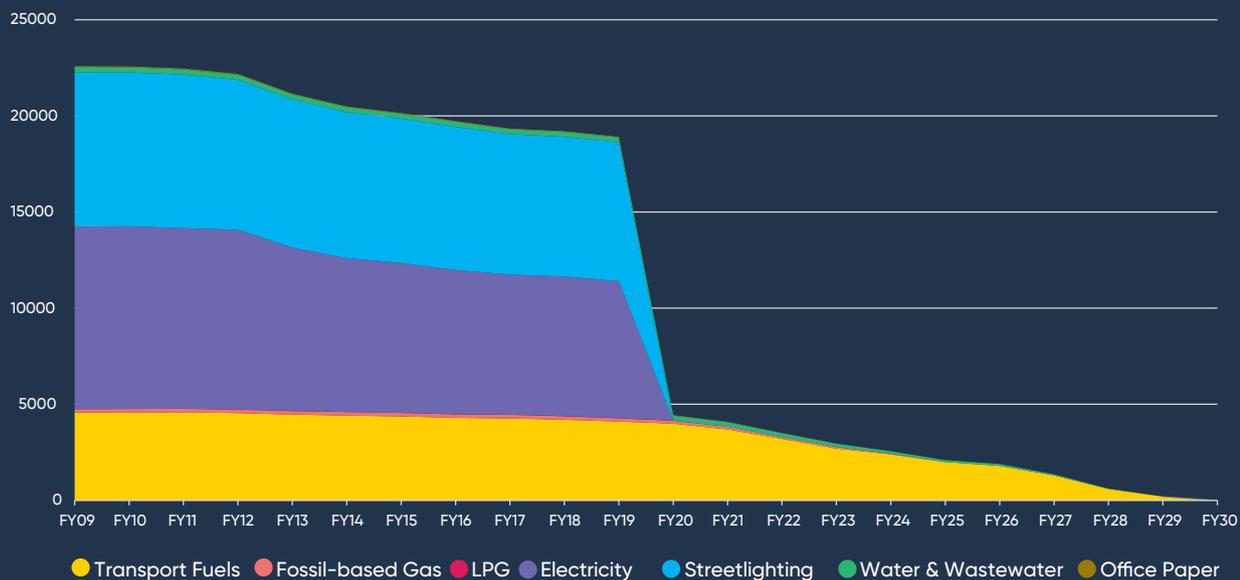
# The Pathway to Net Zero

City of Newcastle (CN) operates a large number of buildings, facilities, vehicles, plant and equipment which all contribute to greenhouse gas emissions across its operations. Achieving net zero emissions is both technologically and economically feasible, with much of the required technology and solutions readily available. It will however, take a sustained, strategic approach to ensure that while emissions reduction activities are undertaken, CN uses the best information available to make choices that lead and manage this transition without increasing its footprint in other areas.

Having effectively dealt with emissions from electricity sources, detailed analysis of CN's operational emissions profile was undertaken, combined with

best practice actions from around the world and strong local engagement. This has created a Climate Action Plan with a series of focused, practical actions that can achieve a Net Zero Emissions organisation. While reducing the use of liquid fuels will be the main requirement in reaching Net Zero Emissions, many other opportunities exist through better use and management of resources, advancing options for a circular economy and setting clear expectations with suppliers about the preference for low carbon products and materials. Although CN's carbon footprint is not large compared to the rest of the City, the sooner CN reaches Net Zero Emissions, the bigger the cumulative impact of this achievement and the greater the opportunity to encourage change in the City from a position of leadership.

Pathway to Net Zero Operational Emissions



The above analysis is focused on emissions created from operations undertaken by CN, while excluding landfill emissions from the Summerhill Waste Management Centre (SWMC). The baseline data from 2008/09 estimated emissions from SWMC to be 38,973 t CO<sub>2</sub>-e, making it the largest source of CN's emissions. Considerable work is required in updating

these estimates and accounting for changes that have occurred in the last decade, including landfill gas generation and new landfill cells. This process will need to be undertaken in parallel to reducing CN's other emission sources and continuing projects that will further reduce this impact such as construction of the organics processing facility.



# Alignment with Newcastle 2030 Community Strategic Plan

High level alignment with the Community Strategic Plan is essential to the long-term implementation of the Climate Action Plan. The Actions of this plan have been designed to clearly integrate with the Community Objectives and Strategies of the CSP across five of the seven Strategic Directions and the UN SDGs. This alignment is essential for delivering on our community's vision of a smart liveable and sustainable global city.



Protected  
Environment



Liveable Built  
Environment



Open and Collaborative  
Leadership



Smart and  
Innovative



Integrated and Accessible Transport



# Reducing our Corporate Emissions

The City of Newcastle has long recognised the importance of its role as a City leader and the value of sharing its experiences with others, so that they too, may utilise this knowledge to improve sustainability in their own operations. CN's leadership is illustrated by acting as a first-mover to deploy and demonstrate new and emerging technologies and policies. This leadership draws on our commitment to innovation and using technology to solve environmental issues in a local context.

Setting a goal for Net Zero Emissions, CN has built upon previous achievements, identified a detailed and achievable pathway to reduce our corporate emissions and set targets in line with the urgent action that the science is telling us must be undertaken to achieve rapid decarbonisation.

This section of the plan will focus on emissions as a result of CN operations and will be updated as required, to ensure actions and policy response to climate change remain current and reflect community needs.

*By no later than 2030, City of Newcastle will reach **Net Zero Emissions for its Operations***

**To Achieve this goal, this Climate Action Plan is structured around four key themes for reducing emissions across City of Newcastle Operations:**



**By 2025 City of Newcastle will aim for:**



- A **20% reduction in electricity use**, based on FY2019/20 consumption
- **100% of all installed lighting to be LED** or best practice equivalent
- A **50% reduction in liquid fuel use**, based on FY2019/20 consumption
- A **50% reduction in carbon emissions** from Operations



# 100% Renewable Energy Supply

Objective:

**To utilise 100% renewable energy supply for City of Newcastle Operations**

- 1.1** Continue to source 100% renewable electricity through a combination of onsite generation, battery storage and renewable electricity power purchasing agreements (PPAs).
- 1.2** Transition all plant and equipment to electric and battery powered options or other zero-emission alternatives.
- 1.3** Eliminate the use of fossil-based gas across CN operations. Where electric alternatives are unavailable, investigate the use of renewable gas.
- 1.4** Implement alternatives to reduce and remove the use of fossil-based liquid fuels across CN operations.
- 1.5** Investigate and install megawatt scale battery storage options to firm renewable supply and build resilience across CN operations.





# Best Practice Energy Water and Waste Efficiency

Objective:

**Ensure Best Practice use of resources across all CN facilities and operations**

- 2.1** Develop and implement a demand response program and increase battery storage across CN sites to reduce peak electricity use and provide grid support.
- 2.2** Ensure all installed building, facility, public and street lighting is LED or best practice equivalent.
- 2.3** Implement ongoing energy efficiency improvements across CN assets and aim for negative emission buildings.
- 2.4** Undertake audit of recycled materials collected and processed at Summerhill Waste Management Centre and identify opportunities for their utilisation within CN operations.
- 2.5** Establish organics processing, materials recovery and other processing facilities at Summerhill Waste Management Centre to provide best practice waste diversion and recovery.
- 2.6** Collect and analyse data on CN operational waste going to landfill and implement strategies to reduce and divert waste going to landfill.
- 2.7** Identify and implement opportunities for utilising water efficient technologies and recycled water.
- 2.8** Investigate opportunities for trialling and demonstrating vehicle-to-grid (V2G) and other emerging technologies.



# Sustainable Supply Chain

Objective:

**Identify and implement actions to reduce emissions in products and procedures across CN Operations.**

- 3.1** Set targets and policies for the use of sustainable and recycled materials in procurement, civil and construction works.
- 3.2** Identify and implement opportunities to utilise green concrete and other low emissions materials in CN civil and construction works.
- 3.3** Utilise recycled glass, aggregate and other recovered materials in CN operations.
- 3.4** Identify and implement opportunities to utilise recycled plastics in street furniture, posts, playgrounds and other CN infrastructure.
- 3.5** Remove all single use plastics from operational activities.
- 3.6** Work with local businesses to trial, develop and implement low emissions materials and technologies.
- 3.7** Prioritise low emissions building materials in design and construction of CN assets.
- 3.8** Improve data capture on supply chain emissions, measure embodied energy in materials and develop metrics to improve circularity in CN's supply chain.





# Zero Emissions Transport

Objective:

**Supporting the transition to clean, efficient, emissions-free transport across City of Newcastle**

- 4.1** Support cycling through provision of adequate cycle lanes, bike parking and end-of-ride facilities.
- 4.2** Provide publicly accessible electric vehicle charging infrastructure at key locations throughout the city, powered by onsite renewables where possible.
- 4.3** Procure electric vehicles for all passenger fleet replacements where options are available and identify opportunities to accelerate removal of fossil-fuel based vehicles from operations.
- 4.4** Transition all CN light trucks to electric options where available and monitor and trial improvements.
- 4.5** Transition all CN heavy trucks including waste collection vehicles to electric options where available and monitor and trial improvements in technology.
- 4.6** Encourage sustainable transport options for all staff travel and offset emissions where options are not available.





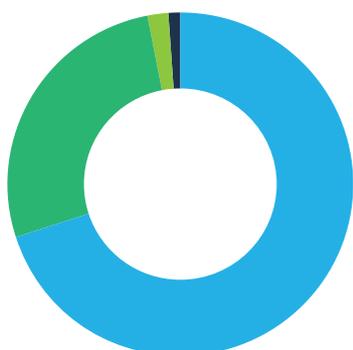
# Community Emission Reduction

The second part of this Climate Action Plan is focused on how Newcastle as a whole, can track towards Net Zero Emissions in a practical way. It is also focused on taking advantage of the considerable economic opportunities that arise from a clean energy and low-emissions industry landscape. It is imperative that the City accelerates this low carbon journey as soon as possible, given the scale of emissions associated with all sectors of the community. The City can address areas such as electricity and transport use where decarbonisation is already achievable, while beginning the groundwork and supporting emerging areas such as renewable hydrogen and zero-emission industries. This will pave the way for a resilient and thriving Net Zero Emission City.

Although CN does not itself account for a large portion of Newcastle's emissions, it has an important role to play in demonstrating how to operate more sustainably, share knowledge, enable action and encourage innovation and new industries. CN can also work collaboratively with other levels of government, business and industry to ensure a managed transition that supports the community along the way and provides new and meaningful opportunities for work.

**Chart 5 - Newcastle LGA 2008 Scope 1 and 2 Carbon Emissions by sector**

(Excluding industrial fossil-based gas use)



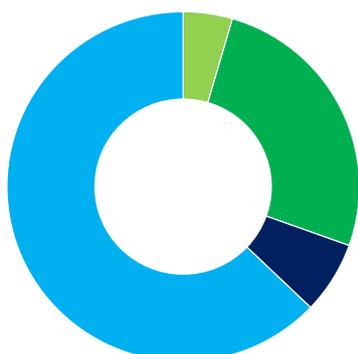
● Business - 70.0%      ● Residential - 27.0%  
 ● Council - 1.0%      ● Education - 2.0%

Analysis undertaken for the baseline year of 2008 estimated Newcastle Local Government Area emissions at approximately 2.4 million t CO<sub>2</sub>-e annually. This carbon footprint showed that the vast majority of emissions in Newcastle come from the business sector, (even when excluding industrial fossil-based gas use, which was estimated to account for an additional 1.44 million tonnes of CO<sub>2</sub>-e). Business and Industry is therefore a key focus area for achieving substantial emission reductions.

It is important though, that there is a focus on enabling actions in every sector of the community, particularly as some areas are easier to address than others.

As demonstrated with CN's own operations, the cumulative and compounding impact of reducing all emission areas as early as possible, will help to slow the depletion of the City's remaining carbon budget and ensure the goals of the Paris Climate Agreement are achieved.

**Chart 6 - Newcastle LGA 2017 Emissions Snapshot (source BZE and Ironbark)**



● Electricity - 63%      ● Transport - 26%  
 ● Gas - 6.5%      ● Waste - 4.5%

Accurately assessing the emissions profile of a City is a difficult task and relies on the best data sources available at the time, some of which may not be accessible at all. More recent analysis (Chart 6) has shown a carbon footprint broadly in line with the work undertaken for the previous 2020 Carbon and Water Management Action Plan.

As expected, the main differences are a decrease in the percentage of emissions from electricity, due to grid decarbonisation, energy efficiency and the uptake of rooftop solar, while there has been an increase in emissions from transport. These remain two critical areas in which big emission reduction opportunities already exist.

# Community Emission Reduction

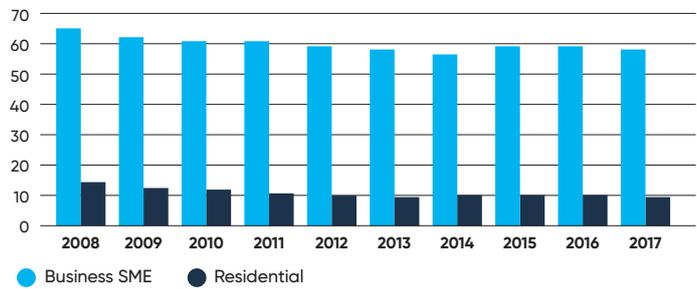
Electricity reduction through energy efficiency initiatives and switching to renewable electricity for stationary energy use in homes, businesses and industry can reduce emissions from within the Newcastle LGA by nearly two-thirds.

The technology to achieve this is already well-proven and commercially available and there are immediate and cost-effective opportunities across all sectors.

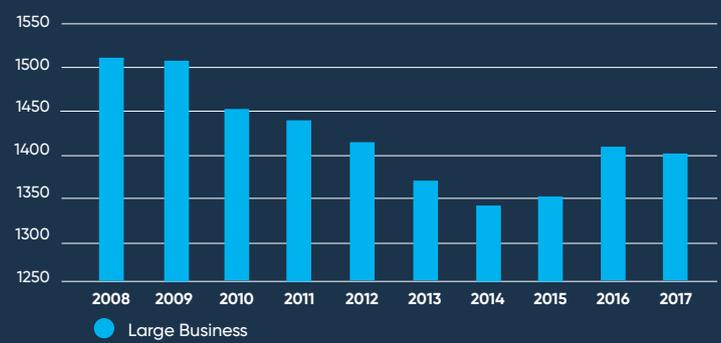
Data from the network operator Ausgrid, shows a steady decline in average electricity usage across residential, Small and Medium Enterprises (SME) businesses and large businesses between 2008 to 2013/14, before an increase in the following years. During this period there was also a 7% increase in residential customers. At the same time, the increase in solar customers and amount of installed capacity has increased dramatically and it is important to accelerate this uptake even further, to achieve significant emission reduction and continue to support a local clean tech market.

A study of emission reduction pathways to 2040 shows that through grid decarbonisation, increased use of onsite renewable energy and transitioning transport to electric options, a Net Zero Emissions Newcastle is within reach.

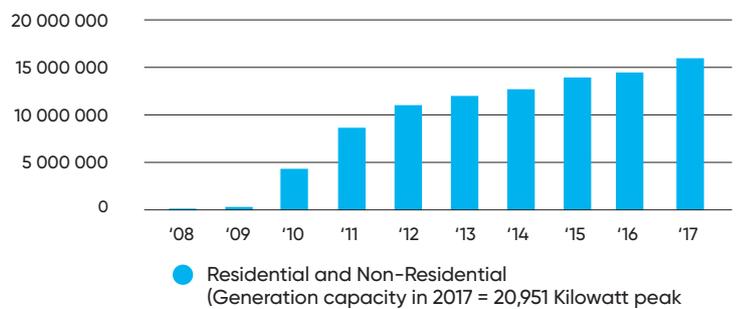
**Chart 7 - Average Electricity Usage Residential and SME Business (kWh - Source Ausgrid)**



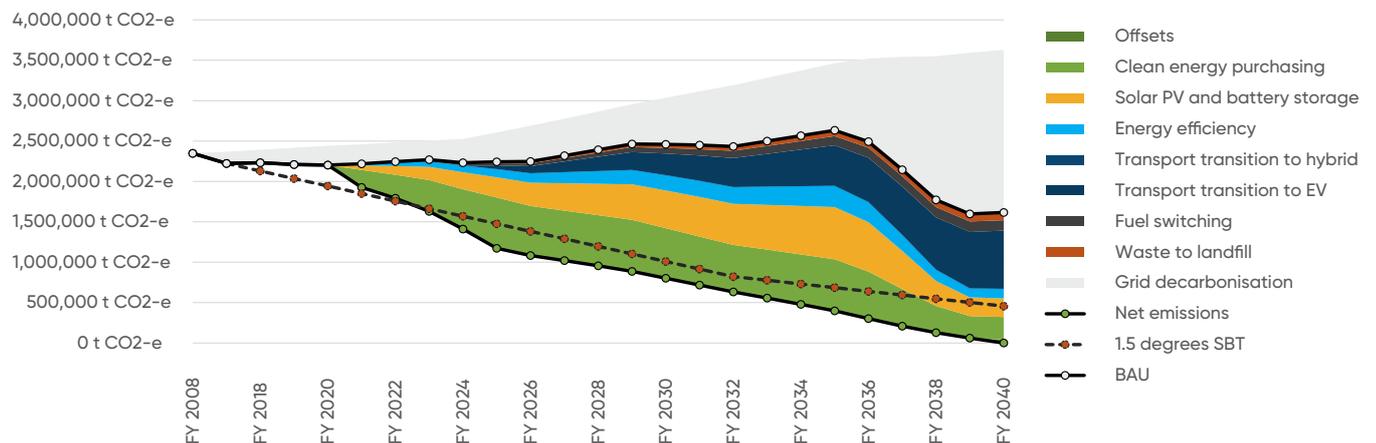
**Chart 8 - Average Electricity Usage Large Business (kWh - Source Ausgrid)**



**Chart 9 - Solar Exported to Grid (kWh - Source Ausgrid)**



## Targeting a Net Zero Newcastle by 2040



**Chart 10 - Decarbonisation Pathway (Source 100% Renewables)**

# Towards a Net Zero Emissions City

Objective:

**To create a resilient city that reduces its share of emissions to ensure a cleaner and more sustainable future**

## Low Emissions Development

- 5.1** Develop and adopt a set of low-carbon and low-water building performance enhancements for inclusion in the City's Development Control Plan (DCP) for all new buildings and major renovations, including encouraging the use of green roofs and solar panels.
- 5.2** Lobby the NSW Government for improvements to the Building Sustainability Index (BASIX) minimum performance requirements, through a combined approach from active Local Governments.
- 5.3** Work with the NSW State Government to identify neighbourhoods and catalyst areas suitable for establishing a low carbon precinct as a demonstration project.

## Encouraging Clean Technology

- 5.4** Support and share knowledge with residents, business and industry to encourage energy efficiency, the uptake of renewable energy and target 100% renewable electricity supply.
- 5.5** Support residents, business and industry in transitioning to low emissions technologies, including development of solar gardens, virtual microgrids, community renewable energy and battery storage initiatives.

- 5.6** Investigate and encourage the opportunity for Newcastle residents and businesses to buy and sell locally produced renewable energy and carbon offsets.

## Building a Low Carbon Circular Economy

- 5.7** Promote and encourage local resilience and a circular economy through sustainable procurement practices, and the local sourcing, production and consumption of materials.
- 5.8** Identify options to encourage and support waste avoidance opportunities for Newcastle residents, business and industry.
- 5.9** Identify and measure the carbon sequestration potential from street and park trees, bushland, wetland and other natural assets and promote the opportunities and multiple climate and resilience benefits of urban blue-green grids.





# Towards a Net Zero Emissions City

## Supporting an Electric Transport Future

- 5.10** Work with the NSW State Government, electricity network operator (Ausgrid), technology providers, neighbouring Councils and electricity retailers to provide suitable charging solutions for electric vehicle owners (both off street and on street parking).
- 5.11** Work with the NSW State Government, councils and other stakeholders to encourage and incentivise the uptake of electric vehicles and zero-emission transport.
- 5.12** Actively work with Newcastle Transport, Fleet and Freight operators to reduce transport emissions (including advocating for electric buses, ferries, taxis and delivery trucks in the City).

## Advancing New Zero Emission Industries

- 5.13** Advocate for Zero-emission Industries in Newcastle, the establishment of a low emissions technology development and commercialisation zone and support for a just transition for carbon workers.
- 5.14** Advocate for the creation of renewable hydrogen and ammonia export hubs, a regional bioenergy hub and green metal and mineral processing in Newcastle.
- 5.15** Actively promote Newcastle as a clean tech innovation hub and an international test laboratory for best practice carbon and water reduction technologies and services for the national and international markets.





# References and Research

## References

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- 2 **World Meteorological Organization** - 'WMO confirms 2019 as second hottest year on record' 15 January 2020  
<https://public.wmo.int/en/media/press-release/wmo-confirms-2019-second-hottest-year-record>
- 3 **The Paris Agreement**, opened for signature 16 February 2016 (entered into force 4 November 2016)  
<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
- 4 **Intergovernmental Panel on Climate Change (IPCC)** - 'Special Report, Global Warming of 1.5°C'  
[www.ipcc.ch/sr15/](http://www.ipcc.ch/sr15/)
- 5 **United Nations Framework Convention on Climate Change** - 'Cut Global Emissions by 7.6 Percent Every Year for Next Decade to Meet 1.5°C Paris Target'-UN Report 26 November 2019  
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- 6 **Science Based Targets (SBTi)** - 'What is a Science Based Target?'  
<https://sciencebasedtargets.org/what-is-a-science-based-target/>
- 7 **NSW Government Department of Planning, Industry and Environment** - 'Net Zero Plan Stage 1: 2020'  
[www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Climate-change/net-zero-plan-2020-2030-200057.pdf](http://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Climate-change/net-zero-plan-2020-2030-200057.pdf)
- 8 **NSW Government Chief Scientist and Engineer** - 'NSW Decarbonisation Innovation Study'  
[www.chiefscientist.nsw.gov.au/reports/nsw-decarbonisation-innovation-study](http://www.chiefscientist.nsw.gov.au/reports/nsw-decarbonisation-innovation-study)

## Tables and Charts

**Chart 1 to 5 - Newcastle 2020 Carbon and Water Management Action Plan**

**Chart 6 - Snapshot Climate** - Prepared by Beyond Zero Emissions and Ironbark Sustainability  
<https://snapshotclimate.com.au/locality/australia/new-south-wales/newcastle/>

**Chart 7 to 9 - Ausgrid** - Data to Share, Average Electricity Use  
<https://www.ausgrid.com.au/Industry/Our-Research/Data-to-share/Average-electricity-use>

**Chart 10 - 100% Renewables** - Decarbonisation Pathway for Newcastle

## Additional Research

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**ClimateWorks Australia** - 'Decarbonisation Futures: Solutions, actions and benchmarks for a net zero emissions Australia'  
[www.climateworksaustralia.org/resource/decarbonisation-futures-solutions-actions-and-benchmarks-for-a-net-zero-emissions-australia](http://www.climateworksaustralia.org/resource/decarbonisation-futures-solutions-actions-and-benchmarks-for-a-net-zero-emissions-australia)

**Garnaut, Ross** - 'Super Power - Australia's Low-Carbon Opportunity, Black Inc. Books 2019'

**Grattan Institute** - 'Start with steel: A Practical plan to support carbon workers and cut emissions'  
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