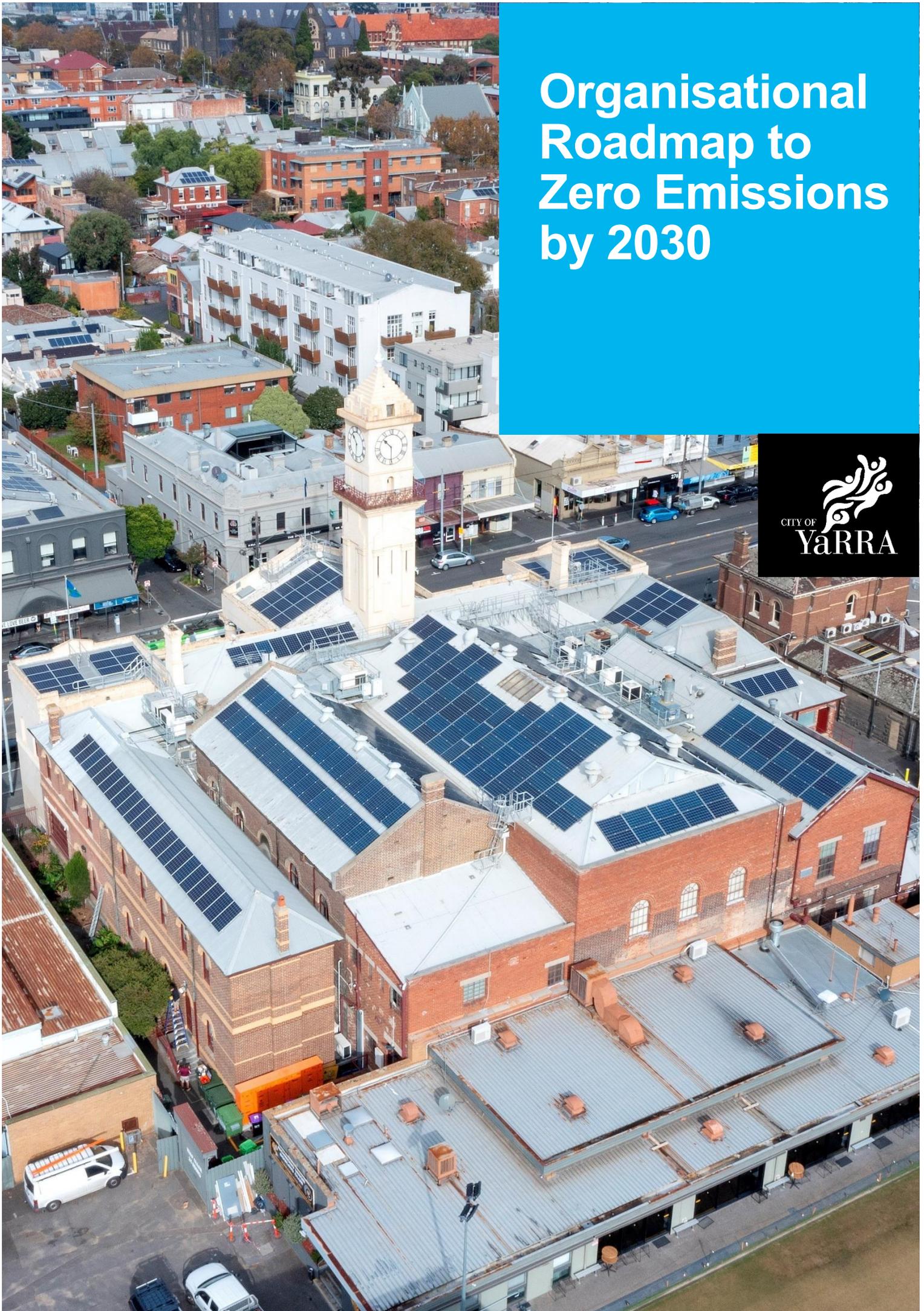


Organisational Roadmap to Zero Emissions by 2030



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1 Introduction

Council has declared a Climate Emergency, and in June 2020 developed our first Climate Emergency Plan (CEP). The CEP recognises that the climate emergency presents an unprecedented challenge both globally and locally. Our planet's climate is already too hot, with dangerous heatwaves, droughts, storms and flooding becoming more intense and destructive. Global heating is now considered by the world's leading climate scientists and many others to be a 'climate emergency'.

The key objective of the endorsed Climate Emergency Plan is to: *achieve zero-net emissions across the entire Yarra community by 2030 and accelerate the removal of excess carbon emissions.*

Included in '*emission across the entire Yarra community*' are those from Council's activities such as from operating our buildings, vehicle fleet and the products and services we purchase. Whilst we have minimal direct control to reduce the emissions from the wider community, we do have significant control over the emissions from our organisational activities. By taking strong actions on our organisational emissions, we will show leadership, gain skills and understanding to support community action, and directly play our part in achieving the key objective of the Climate Emergency Plan.

Yarra has long been a leader in taking climate action and has already reduced organisational emissions by 72% since 2001. Since 2012 Yarra has been a certified Carbon Neutral Organisation, and in 2019 we began sourcing 100% renewable electricity for our own operations through the award-winning Melbourne Renewable Energy Project (MREP). This means that our electricity is now accounted for as zero emissions.

Since Council has such a high level of control over its own organisational emissions, we will seek to achieve gross zero emissions from Council operations by 2030 - without the need for carbon offsets where practical and within our sphere of control and influence. This contrasts with the current organisational, and the community-wide target, of zero 'net' emissions (including offsets).

Whilst we recognise that it will be very challenging to reach zero gross emissions in some of our activities, the purpose of this roadmap is to ensure we apply critical and creative thinking to all that we do, to push the boundaries of emissions reduction and innovation and do absolutely everything we can to push towards zero.

Our objective for gross zero emissions by 2030 will be based on the most up to date inventory methodology provided by *Climate Active*, or applicable carbon neutral certifier at that time. If we miss the goal of zero emissions by 2030 due to methodology developments and/or emissions sources changing over time, this will be noted and explained, including in relation to impacts on achieving zero gross emissions (without offsets) from our organisation by 2030.

Note that achieving gross zero emissions in all aspects of our operations will be dependent on development of technical solutions which are not currently market ready. As such, we will need to assess each initiative to understand the added value, capital and operational costs, current infrastructure and market availability, projected future cost drop, and any other relevant data to determine the feasibility and cost benefit ratio of the proposed action. This will ensure funding is directed to most impactful projects and avoids unnecessary costs of prematurely rolling out initiatives ahead of the market and industry.

The key priority highlighted throughout this plan is for Council is to accelerate to zero-emissions operations, phasing out use of gas in buildings and conventional vehicle fuels, whilst also reducing all energy use.

Emissions from gas and vehicle fuels represent 82% (2019/20) of our currently quantified organisational emissions. Phasing out these fossil fuels is critical to demonstrate strong action towards our aim of gross zero emissions (without offsets) from Council operations by 2030.

If we are able to reduce our emissions in line with the pathway presented in this Roadmap, by 2025/26 could achieve a further 40% reduction in organisational emissions, based on the 2019/20 emissions inventory.

With our history of demonstrating we can deliver strong emissions reductions, we have the expertise to make significant progress towards gross zero emissions by 2030. With many 'low-hanging fruit' energy and greenhouse actions already implemented, achieving our goal of being a 'gross zero emissions Council' will require significant investments, strengthened asset management, development of implementation plans and trials of cutting-edge technology, and new and creative ways of thinking.

2 Key objective of our organisational action

The key objective of our organisational emissions reduction efforts will be maximising progress towards achieving gross zero emissions (without offsets) from Council operations by 2030, where practical and within our sphere of control and influence.

This Roadmap will support Yarra to maintain focus on prioritising the right types of projects to reduce our greenhouse gas emissions as quickly as practical whilst ensuring operational requirements and value for money objectives are acceptable.

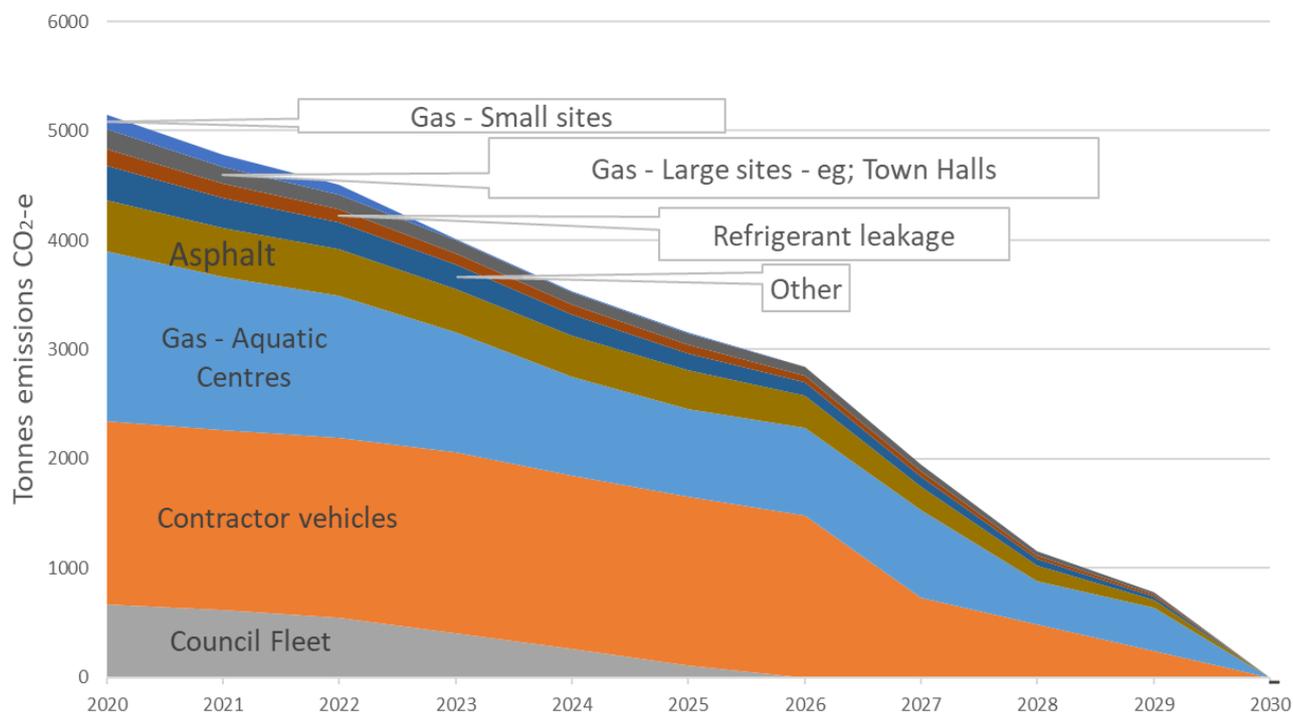
Council will continue to maintain our status as a carbon neutral organisation ('net' zero emissions with offsets) as we accelerate our transition towards achieving gross zero emissions (without offsets).

This Roadmap varies significantly from the traditional approach to reduce organisational emissions because we now purchase 100% renewable electricity (which is zero emissions). In the past, our primary focus for climate action was on reducing electricity usage, as standard electricity (black power) is very emissions intensive. Since 2019, emissions from electricity have reduced from a high of 60% of our organisational emissions, down to zero.

We are now taking this a step further to transition the Organisation away from the use of any fossil fuels to move towards zero-emissions operations. Whilst energy-efficient equipment and management principles will still be core to our work, this next stage of our action will involve significant infrastructure changes in equipment to transition buildings away from gas to electric alternatives for heating and hot water and transitioning to a zero-emissions vehicle fleet. These projects require complex engineering, technical feasibility analysis and modelling to ensure alternatives are practical, reliable and able to maintain Council's operational performance and service standards.

Figure 1 shows the potential pathway towards achieving gross zero emissions operations by 2030 and highlights the key emissions reduction opportunities on this journey. The deployment of initiatives is dependent on budget and developments in technology, such as zero emissions vehicles and charging infrastructure, and the complexity of electrification of complex building systems.

Figure 1 - Organisational emissions reduction opportunities and potential pathway to gross zero emissions by 2030*.



***‘Other’ includes emissions from paper manufacture (70), disposal of waste (67) and water (165).**

By 2030, even with bold action, it is expected that we may still have some greenhouse gas emissions as some sources may be impractical to fully reach zero by 2030. For these actions, we will demonstrate that we have done all we can where practical and within our sphere of control and influence, through applying critical thinking, innovation and driving sectoral change.

2.1 Delivering on Climate Emergency Plan commitments

Our Climate Emergency Plan (CEP), adopted in June 2020, aspires to *achieve zero-net emissions across the entire Yarra community by 2030, and accelerate the removal of excess carbon emissions*. The emissions from Council's operations are a subset of the 'entire' community's emissions. It is important to note that the CEP strives for 'net' zero emissions, meaning this includes consideration of carbon offsets. As well as addressing community initiatives, the Climate Emergency Plan details specific commitments in relation to Council's own organisational emissions and energy use. Since Council has significantly more control over its own organisational emissions compared to community emissions, this Organisational Roadmap seeks to work towards achieving gross zero emissions (i.e. without offsets) by 2030.

This '*Organisational Zero Emissions by 2030 Roadmap*' provides more background and detail on how we plan to achieve the organisational actions included in the Climate Emergency Plan. This includes key focus areas, timing, expected financial impacts and which teams are likely to be involved in delivering these actions.

The key action themes in the Climate Emergency Plan which relate to organisational emissions, as opposed to community-focused actions, are:

- Ensure all new Yarra Council buildings are zero-net emissions in construction and operation – CEP Actions 2.4 / 2.6 / 3.6
- Carbon drawdown – CEP Action 3.4
- Engaging staff in Climate Action – CEP Action 3.7

- Support the transition of Council's and contractor's vehicle fleets to zero and low emissions vehicles – CEP Action 4.5
- Apply circular economy in Council business - Action 5.4

Where actions in this Roadmap relate to committed Climate Emergency Plan actions, this will be noted in the action tables. *Appendix 1* details the actions in the Climate Emergency Plan which relate to our organisational activities.

3 Background: Our carbon reduction journey

As an organisation, we have been recognised as leaders in reducing emissions for two decades. We have demonstrated sector-leading reductions in gross emissions (i.e. before considering purchase of offsets) and have been certified as a carbon neutral organisation since 2012.

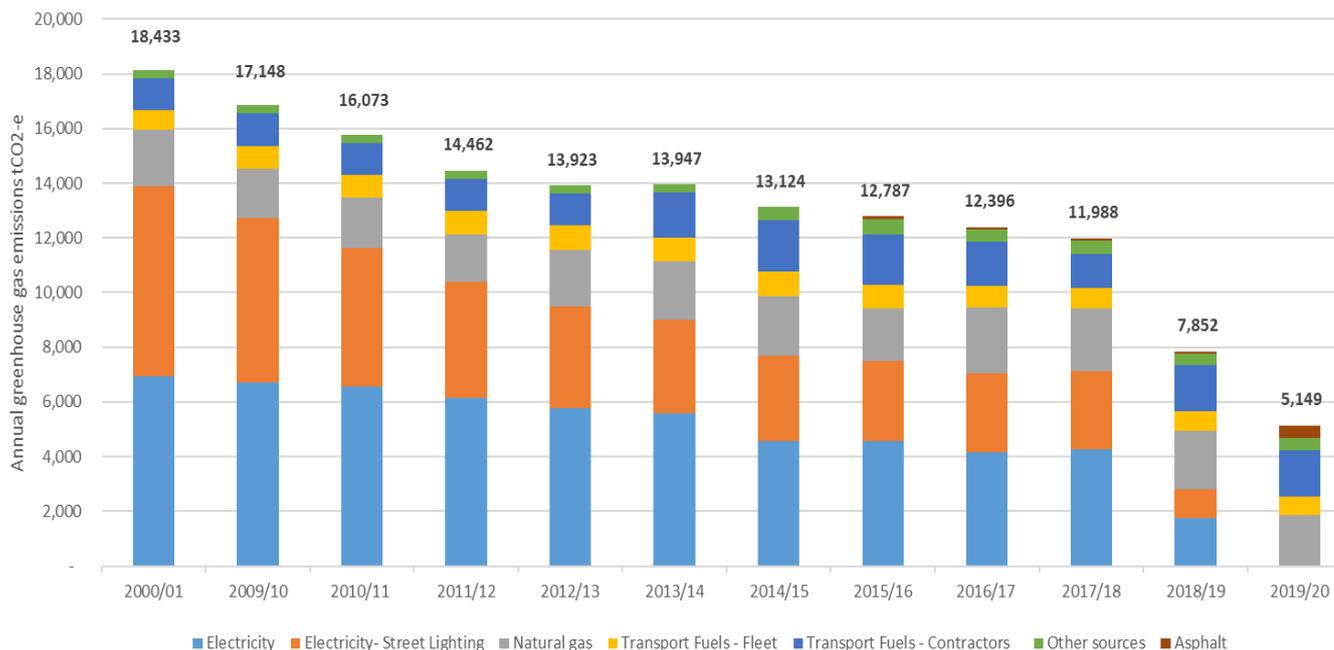
Carbon Neutral Certification

In 2012, we became one of the first Council's in Australia to be certified as a carbon-neutral organisation. We are certified through the Federal Government's 'Climate Active' program, formally known as the 'National Carbon Offset Standard' (NCOS). To achieve certification, we identify and quantify as many of our emissions sources as practical and as stipulated by Climate Active. We then purchase the equivalent tonnage of accredited carbon offsets to bring our emission to 'net' zero. Our over-arching aim is to continually reduce the quantity of offsets we need to purchase to reach net zero. To do this, we need to continue to reduce our gross emissions (emissions before offsets).dem.

From 2001 to 2020, we reduced our emissions (before offsets), by 72% (See Figure 2). The single most impactful action we have taken to reduce emissions was to move to our 100% renewable electricity contract. This 10-year contract commenced in January 2019. This is shown in Figure 2 with the rapid drop in electricity emissions in 2018/19 (only half year on renewable electricity) and then to zero emissions for electricity in 2019/20. This change results in most of our currently quantified emissions coming from gas used in buildings and vehicle fuel for our own fleet and by our contractors - primarily heavy fleet for kerbside collection services.

Figure 2 - Council emissions from 2001 – 2020*

***Years prior to 2012 include backdated emissions sources added in 2012 to align all years with Climate Active methodology.**



Since 2001, Council has invested over \$5 million in energy efficiency and carbon reduction initiatives and are now realising in excess of \$1 million a year in avoided costs for utility bills and maintenance, providing a simple payback in the order of 5 years.

In 2012, we were one of the first Council’s in Australia to implement a large-scale energy efficient streetlight upgrade. We replaced around 4,500 mercury vapour lights which use nearly 100 watts of energy each, with high efficiency T5 fluorescent technology which use only around 30 watts each. This resulted in saving over 1,100 tonnes of CO2-e each year. This represented more than a 6% reduction with just this one action. Savings are in the order of \$200,000 per year with payback in the order of 5 years.

At our three aquatic centres (our highest energy-using buildings) we successfully implemented onsite energy generation in the form of gas cogeneration systems. As of 2021, these had been operating for between 6 to 9 years and have reduced greenhouse gas emissions by over 13,000 tonnes. This is equivalent to more than two years of our current total organisational emissions. Strategically, cogeneration systems were installed as a transitional measure to reduce greenhouse gas emissions from grid-electricity consumption, mostly generated from brown coal in Victoria, until renewable electricity was accessible.

We have installed 730kW of solar panels on 43 buildings which generate in the order of 940MWh of electricity per annum. This means that 13% of the electricity we use, we generate on our own buildings. This reduced emissions by around 1,000 tonnes per annum prior to moving to our 100% renewable energy contract in January 2019. This investment continues to deliver a payback to Council under 10 years from ongoing savings in electricity costs of around \$200,000 per year and continues to reduce reliance on the electricity grid.

In 2014, we were the first local Council in Victoria to implement an integrated multi-site Energy Performance Contract (EPC) across a range of our buildings including aquatic centres, town halls and smaller sites such as community and childcare centres. Council invested \$2.6 million into this project, with the unique element of an EPC being that savings were guaranteed to Council from the work undertaken by the contractor. As a result, we continue to see reduced emissions around 2,000 tonnes per annum. This represented a 15% reduction in organisational greenhouse gas emissions and avoidance of over \$300,000 per year in operational costs.

With the advent of electric vehicles, timed with Council moving to our 100% renewable energy contract, Yarra has been a leader in shifting to all-electric zero emission vehicles. We were one of the first Councils in Australia to have an electric vehicle and the first Council to have an Australian-engineered electric tipper truck. As at December 2021, our electric vehicle fleet included:

- 7 electric fleet passenger vehicles
- 1 hydrogen fleet passenger vehicles (on loan from Toyota)
- over 40 hybrid fleet passenger vehicles
- 4 electric tipper trucks
- 1 electric excavator
- 1 electric forklift
- 3 electric mowers
- 13 electric bikes

Whilst the above examples highlight several specific large initiatives, we have also continually invested in energy efficiency across all our buildings, either through specific targeted actions, or through business as usual works on sites such as repairs and asset renewals. Examples of other works we have undertaken include:

- High efficiency boilers for pool heating
- LED lighting upgrades
- Building management systems and smart pool controls
- Draught sealing and double glazing
- Voltage optimisation systems

Importantly, the achievements in our energy and greenhouse gas reduction have only been possible due to investment in Council staff with suitable expertise to identify, drive and manage these initiatives. The wealth of experience and expertise we have with over two decades of successful energy action, places us in a strong position to successfully navigate our way towards gross zero emissions by 2030 and continue to be recognised as a leader in climate action.

4 Organisational Emissions Profile

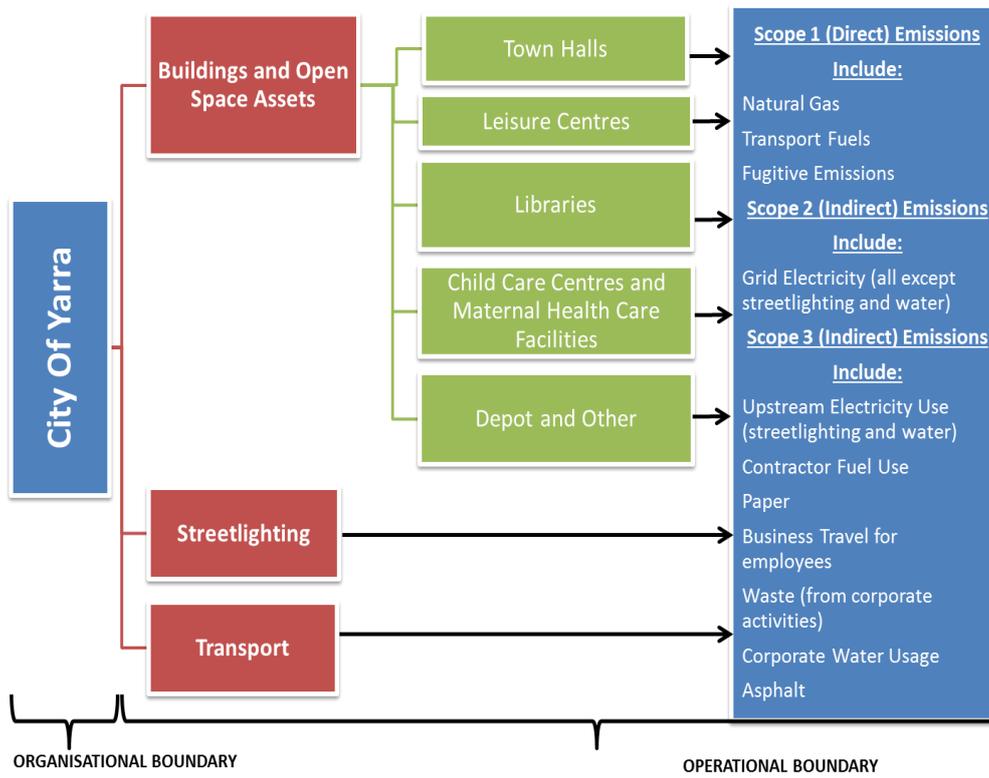
The starting point of taking effective action on organisational emissions, is to quantify our emissions, known as an 'emissions inventory', based on our organisational 'emissions boundary'. An emissions boundary clearly outlines which emissions sources are included in our emissions 'inventory' and what is excluded (see Figure 3).

Council's carbon neutral certification and methodology to calculate emissions is undertaken in alignment with the Federal Government's Climate Active program; formerly the National Carbon Offset Standard (NCOS). This is a nationally recognised, robust, measurement, reporting and certification framework which supports Council to be branded as a carbon neutral organisation.

Council's carbon emissions profile is shown in Figure 4.

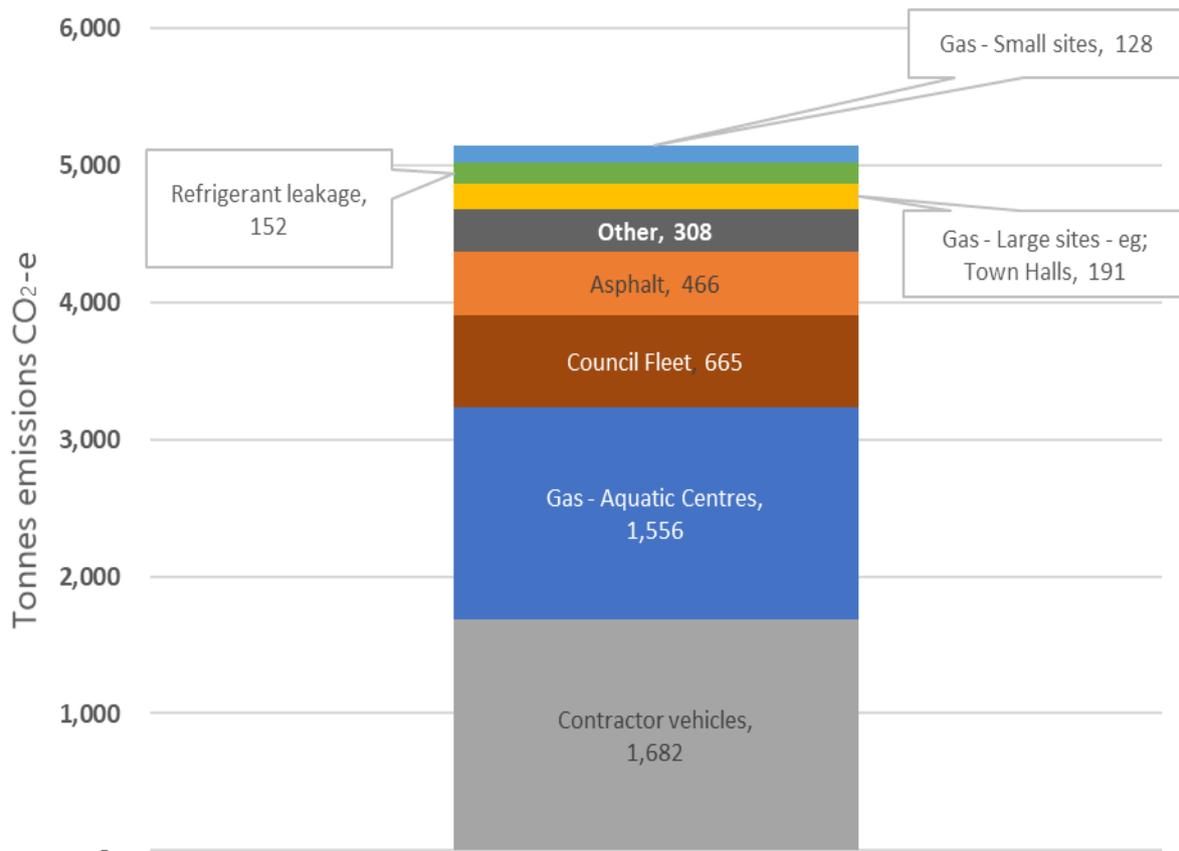
Prior to Council joining Climate Active, Council used an emissions boundary largely based on the *Cities for Climate Protection* program. Our previous organisational emissions reduction targets aligned with this previous methodology. Going forward, for simplicity and accuracy, Council will be following the requirements set by *Climate Active*, or other certification scheme if deemed more appropriate in the future. This means that for the years prior to using the Climate Active methodology (2001 – 2011), we will back date the additional emissions which are included in the 2012 Climate Active inventory to the earlier years. Although this is not be completely accurate, it provides a meaningful and consistent representation of our emissions journey. The change in total emissions and annual breakdown over time is provided in Figure 2 above.

Figure 1 - Council's organisational emissions boundary



Scope 3 Non-quantified & Excluded Emissions - Purchased Goods and Services, including Capital Goods/Expenditure, Oils and Lubricants purchased via third parties, Redevelopments, Outdoor Events, Contractor Energy, Employee Commuting, Downstream Leased Assets, Investments, Municipal Waste, Community Emissions

Figure 4 - Council's carbon emissions 2019-20 – total 5,149 tCO₂-e. *'Other' Includes paper manufacture (70), disposal of waste (67) and water (165).



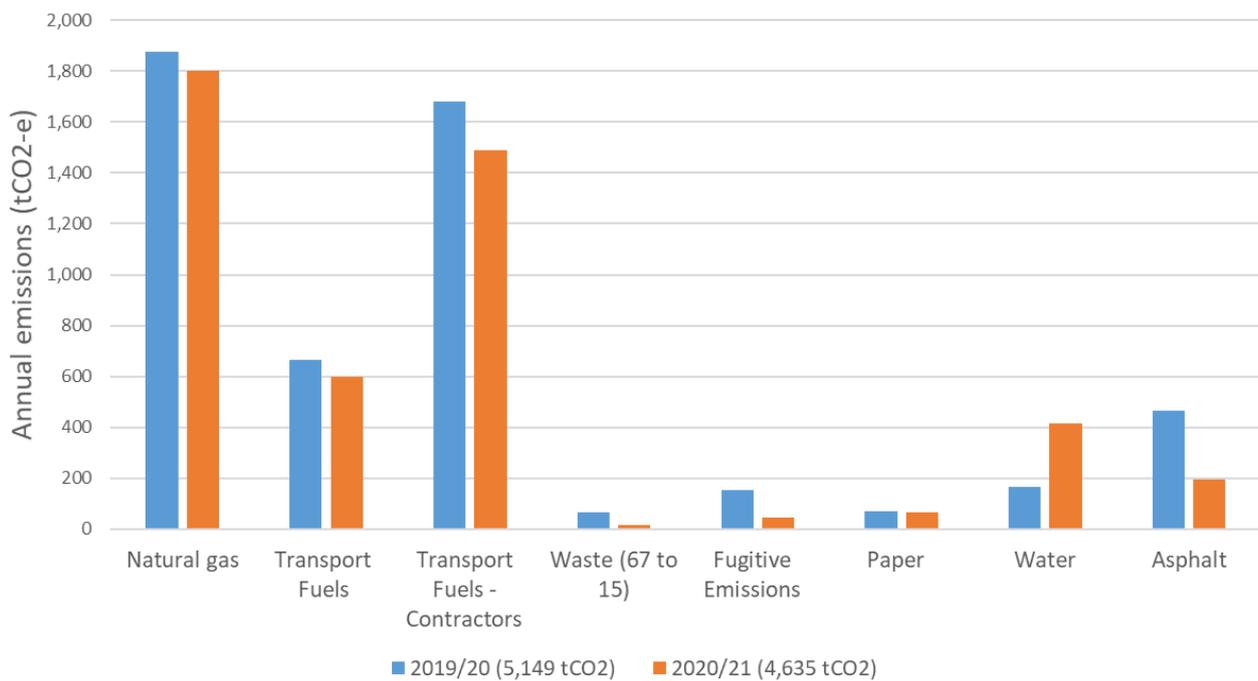
Provisional Council emissions inventory for 2020–21

At the time of preparing this Roadmap, Council’s provisional emissions for 2020-21 were calculated and in the process of assessment and certification by *Climate Active*. The provisional emissions for 2020-21 are 4,635 tCO₂-e versus 5,149 tCO₂-e for 2019-20 (Figure 5). Note that a large proportion of this emissions reduction can be attributed to COVID-19 site shutdowns. This Roadmap uses the 2019-20 data as the 2020-21 emissions were not formally approved at time of writing, and the 2019-20 data is less impacted by the COVID-19 shutdowns and therefore more representative of usual operations.

Apart from the expected reduction in emissions from less Council activity due to the COVID-19 restrictions, a key development in the 2020-21 provisional update is the updated emissions factors from *Climate Active* related to the energy/emissions for supply and disposal of water. Whilst water accounted for 165 tCO₂-e (3.2% of total) in 2019-20, the provisional 2020-21 water emissions increased to 417 tCO₂-e (9% of 2021 total). This was primarily due to significant emissions factor increase rather than usage increase (see Figure 5).

Figure 5 - Comparison of emissions sources 2019-20 versus 2020-21

***2020-21 data provisional at time of writing.**



4.1 Direct versus indirect and Scope 1, 2 and 3 emissions

Of the emissions within our boundary, there is a varying level to which the emissions from each source are directly related to Council’s activities.

The blue box on the right of Figure 3 categorises our emissions as Scope 1, 2 and 3 emissions, with examples of which emissions fall into which category.

Figure 6 below summarises the definitions of each of these emissions categories and highlights, in bold, the role Council can play in reducing each emissions source.

Figure 6 - Description of Scope 1, 2 and 3 emissions

Scope 1 (Direct)	Scope 2 (Indirect)	Scope 3 (Indirect)
<ul style="list-style-type: none"> • Emissions which occur directly at the source of use and from assets owned and controlled by Council. • We can take direct action 	<ul style="list-style-type: none"> • Emissions from electricity purchased and used by Council (zero if renewable energy purchased) • We will continue to purchase 100% renewable electricity 	<ul style="list-style-type: none"> • Emissions from Council-initiated activities but occurring from sources we do not own or directly control. • We can influence

Table 1 below provides a comparison of the scope 1 and 3 emissions from different areas of our inventory. This highlights that our annual direct (Scope 1) and our indirect (Scope 3) emissions are currently very similar.

Table 1 - Breakdown of direct (Scope 1) and indirect (Scope 3) emissions

Direct versus indirect emissions (tCO ₂ -e)			
Emissions source type	Specific activity (Scope 1 marked in bold)	Direct (Scope 1)	Indirect (Scope 3)
Vehicles	Contractor vehicles		1,682
Buildings	Gas - Aquatic Centres	1,556	
Vehicles	Council Fleet	665	
Civil works	Asphalt		466
Buildings	Gas - Large sites - e.g. Town Halls	191	
Water	Water (supply and waste treatment)		165
Fugitive emissions	Refrigerant leakage	152	
Buildings	Gas - Small sites	128	
Paper	Paper		70
Waste	Waste		67
Travel	Business Travel of Employees		6
Total		2,692	2,456

Our emissions inventory will likely change and evolve towards 2030

Council emissions inventory is best practice and based on the guidelines for compliance set by *Climate Active*. It should be noted that what is included or not has changed over time, with numerous sources of emissions still currently excluded or not quantified – see notes in Figure 3.

- **Excluded emissions** are those not caused by Council's organisational operations and therefore are not relevant to organisational emissions. These include municipal waste and community emissions such as household and business energy use.
- **Non-quantified emissions** include emissions currently not quantified but which are caused by Council's activities. Refer to Table 2 - Examples of emissions sources currently not quantified
- For example, the inventory as at 2020/21 does not include embodied (Scope 3) emissions from the majority of goods and services which we purchase, as to date there has not been reliable data and methodology for this. The Climate Active program may progressively require further quantification of Scope 3 emissions.

Table 2 - Examples of emissions sources currently not quantified

Examples of currently 'non-quantified' emissions sources (all Scope 3)	
Currently non-quantified activity	Emissions source/s
New vehicles and plant purchased	Embodied emissions from manufacture and delivery
Concrete	Manufacture and transport
Leased buildings	Operational emissions
General construction	Embodied emissions from manufacture and delivery
Non-direct emissions from contractors	Electricity, gas, water, lubricants and oils used
Employee Commuting	Direct emissions of travel
Office equipment / IT	Embodied energy and delivery

Our objective for gross zero emissions by 2030 will be based on the most up to date inventory methodology provided by *Climate Active*, or applicable carbon neutral certifier at that time.

As we reduce the emissions from our Scope 1 activities, such as gas in buildings and fuel from vehicles, the proportion of our emissions from Scope 3 emissions will become greater. This is because Scope 3 emissions will likely be much slower to reduce compared to Scope 1 emissions due to the lesser ability we have to control Scope 3 emissions. There is also the potential that more Scope 3 emissions will be quantified in our inventory over time as we, and the wider sector, become more sophisticated in identifying and measuring Scope 3 emissions.

4.2 Emissions from buildings – Direct (Scope 1) - 1,875 tCO2-e

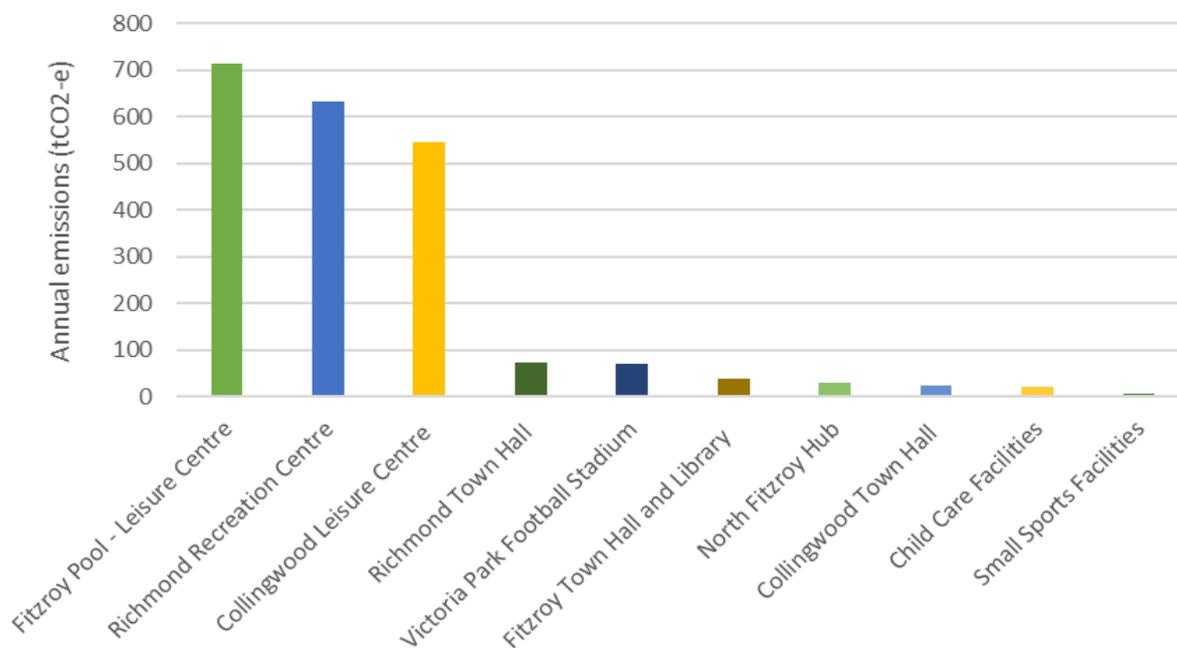
Most of our direct emissions are generated from our buildings, including:

- aquatic centres (1,556 tCO2-e)
- large sites such as town halls and Council offices (191 tCO2-e), and
- small sites such as child-care centres, community halls and sports pavilions (128 tCO2-e).

In total, our buildings emit 1,875 tCO2-e, which is 36% of our total emissions of 5,149 tCO2-e.

Figure 7 highlights our Top 10 highest greenhouse gas emitting buildings or class of buildings. This demonstrates that each of our three aquatic centres are several magnitudes higher in emissions than the nearest non-aquatic building or class of buildings. Note for Figure 7, our numerous sports facilities and childcare centres have been combined into an aggregated 'building type' for each, to highlight the combined impact of these sites. Whilst our aquatic centres are our largest emitters, we still have many smaller buildings which together still add up to a material quantity of emissions.

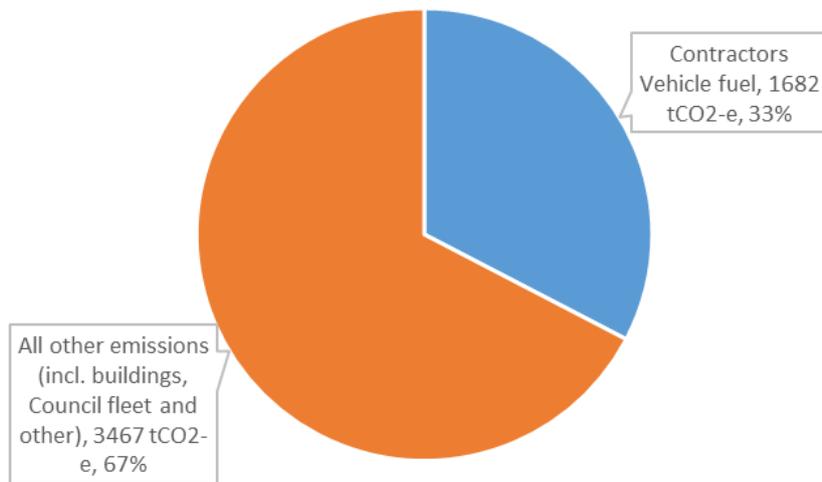
Figure 7 - Top 10 buildings with highest emissions (2018/19 inventory)



4.3 Emissions from vehicles – (Scope 1 & 3) - 1,682 tCO2-e

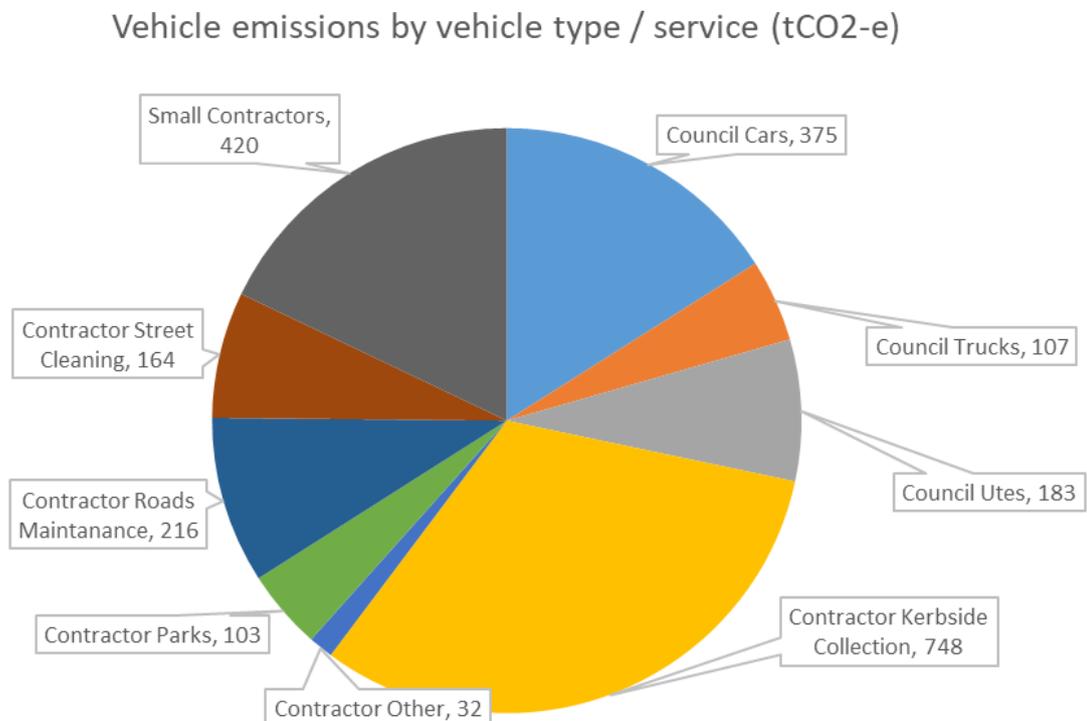
After our buildings, the largest source of emissions comes from Council fleet vehicles (665 tCO2-e), and contractor vehicles (1,682 tCO2-e). *Contractor vehicle* emissions account for around ~33% of our annual organisational emissions – Figure 8.

Figure 8 - Contractor's fuel emissions compared to overall organisational emissions (2018/19 inventory)



Contractor emissions are included within our emissions inventory since the vehicles, although neither owned by Council nor driven by Council staff, are being used specifically to service our needs. In the absence of contractors, we would operate these vehicles in-house as some other Councils do. As shown in Figure 9, by far our largest source of emissions from vehicles is from our *kerbside collection* contractors (748 tCO2-e), followed by a numerous aggregated small contractors (420 tCO2-e), then cars which are owned by Council (375 tCO2-e).

Figure 9 - Emissions from vehicles (based on 2018/19 inventory)



4.4 Asphalt – Indirect (Scope 3) - 466 tCO2-e

Emissions associated with the asphalt we use in our roadworks totals 466 tCO2-e annually, representing 9% of our annual emissions. These emissions are associated with the manufacturing process of the asphalt, as opposed to any direct activity or energy used by Council.

In the past, asphalt has only represented around 2% of our emissions, and therefore was not a primary focus. Since we have moved to renewable electricity, the proportion of our emissions represented by the remaining sources, including asphalt, have increased. In addition to this proportional change in emissions sources, for the 2019/20 financial year, the emissions factor for asphalt (Scope 3) were updated by *Climate Active*. This resulted in a three-fold increase in the greenhouse gas emissions deemed to apply to every tonne of asphalt - from 170 kg of CO2-e for every tonne of asphalt in 2018/19 to 510 kg of CO2-e for every tonne of asphalt used in 2019/20.

Council is already using recycled material where possible in every asphalt product utilised as part of a maintenance or capital projects. The recycled material that is incorporated into the different asphalt mixes range from reclaimed asphalt products (RAP) to post-consumer plastics (e.g. glass, HDPE, plastic bottles, printer cartridges, plastic bags and packaging etc.). On average, each tonne of asphalt used contains 250kg of RAP, 400 x glass bottles and 25 x 2L milk bottles, 18 printer cartridges and 800 plastic bags and packaging.

4.5 Refrigerant leakage – Indirect (Scope 1) - 152 tCO2-e

Refrigerant leakage totals 152 tCO2-e (3% of our emissions) annually – Table 3. Refrigerant leakage is the leakage of refrigerant gases from appliances such as air-conditioning systems in buildings and vehicles, and refrigerators. The quantification of this leakage is based on the quantity of refrigerant supplied to us from our service contractors. Although the quantity of leakage is very small at 77 kgs, the impact on climate change is relatively significant with some gases having more impact than others, known as the Global Warming Potential (GWP). For example, our highest quantity of leakage is from R438A gas which has a GWP of 2,265¹. This means that the impact of this gas, per unit, is 2,265 times greater than for the equivalent volume of CO2 emitted.

Table 3 - Breakdown of refrigerant leakage emissions by refrigerant type - 2019/20

Refrigerant type	Kg leakage (2019/20)	Global Warming Potential (GWP)	Tonnes CO2-e
HFC134-a (Vehicle)	22.87	1,430	32.70
R438A (Buildings)	38	2,265	86.07
R410A (Buildings)	16	2,088	33.41
TOTAL	77		152.2

¹ <https://www.environment.gov.au/protection/ozone/rac/global-warming-potential-values-hfc-refrigerants>

4.6 'Other' emissions – Indirect (Scope 3) - 308 tCO2-e

'Other' emissions, totalling 308 tCO2-e annually, are made up of sources including water supply and wastewater treatment (165 tCO2-e), emissions from production of the paper we use (70 tCO2-e) and our waste to landfill (67 tCO2-e).

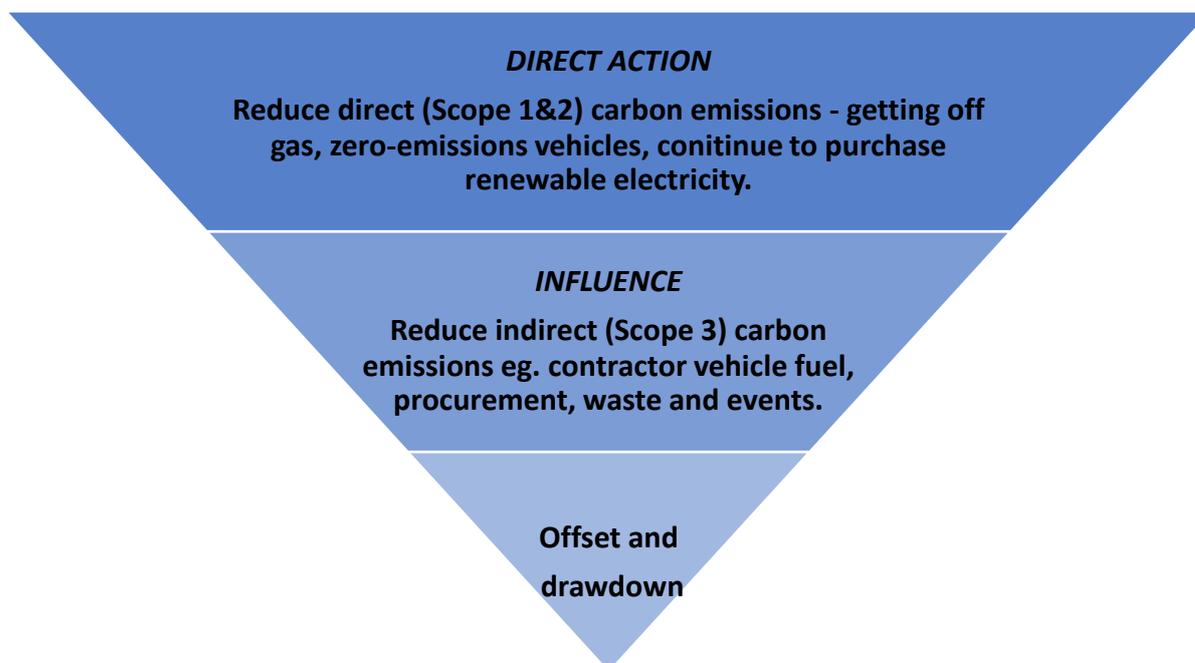
These scope 3 emissions are not directly emitted from Council operations but are the result of the production (paper) or the disposal (waste and water) of resources we use. Scope 3 emissions will likely become a much greater focus as we continue to reduce our Scope 1 emissions and potentially quantify more Scope 3 emissions.

5 Taking Action: Implementation Roadmap

Council's endorsement of our Climate Emergency Plan signals a strengthened commitment to climate action. In order to ensure our actions are prioritised to achieve greenhouse gas reductions as fast as practical, we will use the *Climate Action Hierarchy* (Figure 10), to guide us in identifying and implementing projects.

The *Climate Action Hierarchy* illustrates that initiatives will be prioritised (top to bottom) based on the impact and influence we have to achieve emissions reductions. Council will consider actions relating to all the elements of the Climate Action Hierarchy, however where there is a choice between one project and another, the hierarchy will provide prioritisation guidance.

Figure 10 – Climate Action Hierarchy



Actions to address Scope 1 emissions are our highest priority as these activities make up 52% of our emissions and we can take *direct action* in implementing emissions reductions strategies for these activities. Scope 3 actions represent a significant portion of our emissions however are much harder to reduce since we do not directly control the emissions from these activities, nor own the assets which produce these emissions. For Scope 3 emissions, our role will be to *influence* suppliers.

Whilst the previous *Carbon Neutral Action Plan* focused on energy reduction, including electricity, and generating renewable energy, this Roadmap focuses most strongly on shifting off remaining fossil fuels towards zero emissions operations by 2030.

As we now purchase 100% renewable electricity for all our operations, any action which uses electricity rather than a fossil fuel, become zero emissions. For this reason, from a greenhouse gas reduction perspective, going off gas to all electric is a high priority. This work involves unprecedented changes to the infrastructure of buildings to shift off gas for heating air and water (especially at our large and complex sites) and accessing suitable vehicles (including heavy fleet) and upgrading the electricity supply to charge these vehicles.

Actions to reduce electricity will still be important for a multitude of reasons including cost savings, maintenance, or other benefits. Reducing our electricity use is however still important in reducing demand on the electricity supply network and maximising local on-site renewable electricity production and self-consumption of this energy.

Many future actions will take time and require detailed feasibility and options and pathway analysis and when implemented, require significant infrastructure upgrades, specialised project management, stakeholder engagement and creative and innovative thinking. A sustained commitment until at least the end of this decade is likely to be required to see the full shift off fossil fuels.

To achieve this paradigm shift towards zero emissions successfully, we will need to ensure that our teams are suitably resourced, driving leadership and change across our sector and the wider associated industries which we rely on to support our work. We will need to ensure our budgets reflect the scale and timing of the work which needs to be done.

Within the three levels of the Climate Action Hierarchy, there are eight key priority activities where we will focus our work to reduce emissions and further improve our knowledge and quantification of emissions sources. These are:

- **Buildings** - transition from gas to all-electric - Scope 1
- **Council vehicle fleet** to all-electric (or other zero emissions) - Scope 1
- **Contractor fleet** to all-electric (or other zero emissions) - Scope 3
- **Reduce other Scope 3** emissions, especially asphalt
- **Low carbon design** and operation of our buildings - (Scope 1 & 3)
- **Increase number of Scope 3 emissions** which are quantified
- **Events** - Develop guidelines and implement initiatives to reduce emissions - (Scope 1 & 3)
- Consider the increased uptake of **Nature Based Offsets**.

The sections below discuss our approach and further background to each level of the Climate Action Hierarchy and priority activities.

5.1 Reduce direct (Scope 1) carbon emissions

Scope 1 emissions activities are:

- Buildings – gas
- Fleet vehicle fuel, and
- Refrigerant leakage

Reducing our direct (Scope 1) carbon emissions (level one of the *Hierarchy*) is the key focus of Council's roadmap to gross zero emissions by 2030 since we can take direct action on these activities, and it represents our largest source of emissions (see Table 1).

The key priority of our work to reduce our emissions is to transition away from the use of fossil fuels. This shift to be an 'all-electric' Council will involve significant work in two key areas:

- Transitioning our buildings to all-electric, getting off gas, and

- Transition our vehicle fleet to electric or other zero-emissions technology, such as hydrogen and therefore avoiding the use of conventional vehicle fuels.

These two approaches are discussed in more detail below.

5.1.1 Transition to zero emissions operations

With Council's 100% renewable electricity contract, any shift from using fossil fuels to electric alternatives, will result in zero-emissions. The order of actions to transition off gas and vehicle fuels will be largely influenced by the complexity and cost of specific actions. We will not necessarily implement the projects with the greatest emissions reductions first, as these may be highly complex, expensive, multi-year projects. The simpler projects can be implemented whilst design works are underway on the more complex projects (See Figure 11 and Figure 12).

All-electric and low energy buildings (Actions 1.1 to 1.7)

Gas used in our buildings is now Council's single largest source of greenhouse gas emissions (36%). Going all-electric will need a staged approach due to differing levels of complexities at various sites and equipment, and the availability of appropriate electrical alternatives for each building type.

Our aim is to reduce emissions from gas from the 1,875 tonnes CO₂-e (2019/20), to below 910 tonnes CO₂-e (51% reduction) by 2024/25 and zero by 2030 (See Figure 11 and Figure 12).

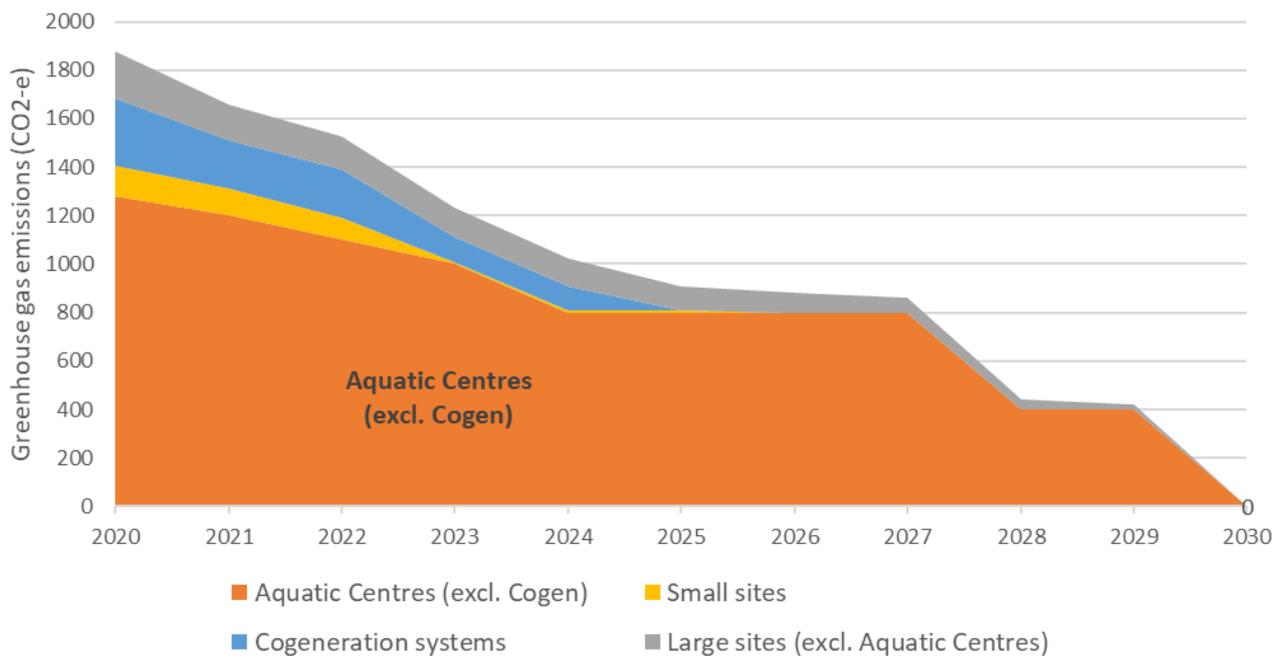


Figure 11 - Emissions projection to 2030 for moving building off gas to all-electric

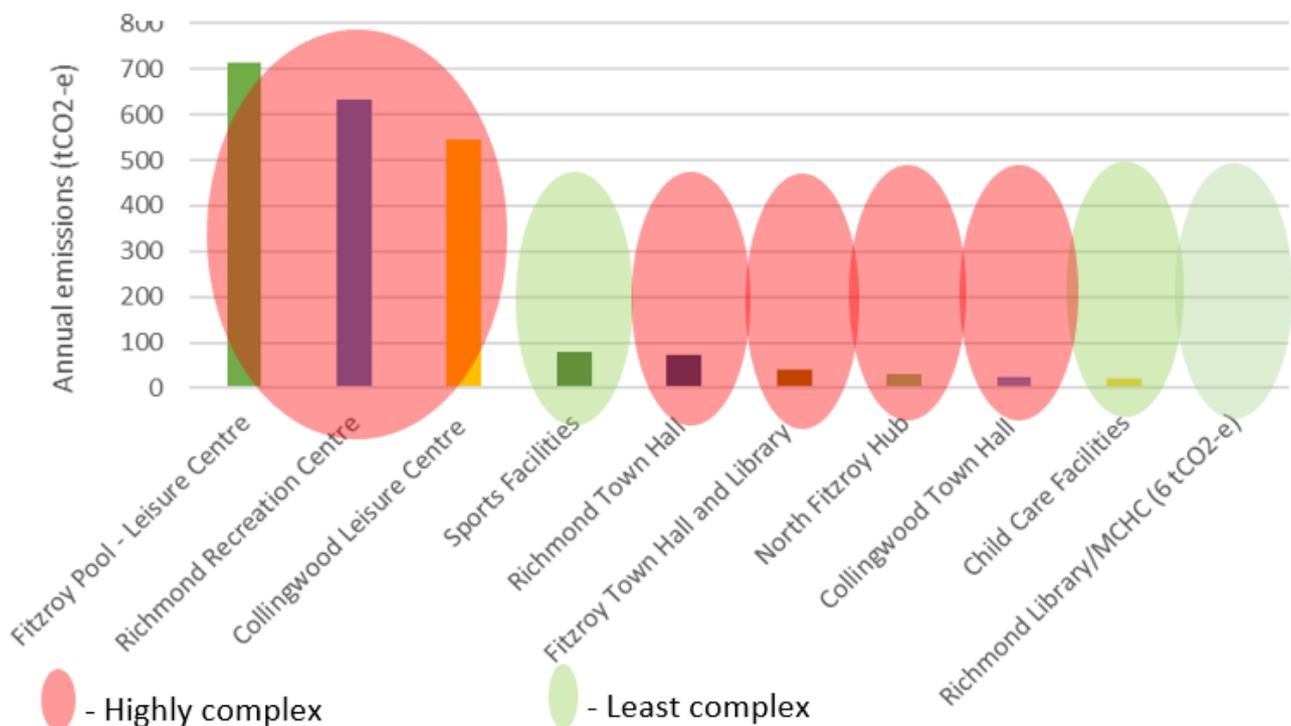


Figure 12 - Complexity of going all-electric per building / building types.

The types of projects we will implement to support the transition off gas to 'all-electric', and reduce emissions where we still have gas, are:

- Going all-electric at aquatic centres by
 - Phasing out gas cogeneration systems – Action 1.1
 - Convert aquatic centres to 'all-electric' – Action 1.2
- Going 'all-electric' at our small sites – Action 1.3
- Going 'all-electric' at our larger sites – Action 1.4
- Advocate to State and Federal Government to support the transition off gas to all-electric – Action 1.5
- Innovation in energy storage and trading – Action 1.6
- Leading edge sustainable building design and operations (Actions 1.7 to 1.8)

Phasing out gas Cogeneration systems – Action 1.1

Cogeneration systems generate electricity onsite using gas and capture the 'waste' engine heat to contribute to pool heating. Where gas was less greenhouse intensive than electricity in the past, this resulted in reduced greenhouse gas emissions and cost savings. However, now we are using 100% renewable electricity this is increasing emissions.

The two cogeneration systems, at Collingwood and Richmond pools, will run until the current maintenance contracts expire, and then be phased off in 2022 for Collingwood and 2024 for Richmond. This will reduce emissions by around 276 tCO2-e annually.

Convert aquatic centres to 'all-electric' – Action 1.2

The most complex stage to transition aquatic centres off gas involves transitioning the high-demand gas heating systems for air and pool water. There is now equipment available (electric heat pumps) which could meet pool heating needs and would be powered by Council's 100% renewable electricity.

There is potential for overall running costs to be reduced from the transition to high efficiency, integrated, heat pumps, and a potential payback within the expected asset life of the all-electric equipment. This technology could deliver a more streamlined, centralised system, which could reduce overall site maintenance by reducing the number of separate air-conditioning plants throughout each centre.

A key potential benefit beyond reduced greenhouse gas emissions, is the potential for heat pump systems to also provide cooling to the pool halls during summer. This would improve occupational health and safety, user comfort and protect the building structure by reducing humidity and the resultant corrosion.

This innovative action will be crucial to meeting the goals of this Roadmap but it is also highly complex, will likely take several years in planning, and has a high upfront cost.

Going 'all-electric' at our small sites – Action 1.3

Reducing gas used in our smaller buildings is expected to be relatively simple, compared to larger buildings with more complex systems. Smaller buildings will generally require replacement of stand-alone systems such as hot water units, domestic-type heating systems, and gas used for cooking which can all be readily replaced with electric alternatives (see Figure 13).

When gas equipment is due for replacement, this will always be replaced with an electric alternative as part of the standard asset renewal / maintenance process (where practical). Where there is gas equipment that is not due for renewal, replacing these items will be dependent on budget allocation through the discretionary budget process.

Figure 13 - Example of an action towards going all electric at our smaller sites - replacement of a gas stove to electric induction at the Richmond Senior Citizens Centre (April 2021)



Currently we have many sites which are operated by community and where they pay the bills directly. These are Scope 3 emissions and to date have not been included in our inventory since we do not have reliable data on energy use from these sites nor direct control. In the future there is the potential that these sites could be added to our inventory as Scope 3 emissions.

Going 'all-electric' at our larger sites - Action 1.4

Two of Council's large town halls, Fitzroy and Richmond, are scheduled for major air-conditioning system upgrades in the coming 5 years or so. We will take this opportunity to ensure we prioritise removing gas boilers and using high efficiency electric-powered heat pumps as part of asset renewal where practical.

The shift from gas to electric systems is expected to be a complex process as there are many elements which need to be modified to accommodate the electric systems. Considerations such as space and weight of heat pumps versus gas boilers, pipe runs, and electrical switchboards and supply capacity need to be assessed. These projects are likely to be a significant cost, but due to their innovative nature could receive grant funding to support the implementation. These once-off transitions will set these buildings up for the future decades to run efficiently on 100% renewable electricity.

In addition to these two specific sites, all works that are undertaken in our large sites will be designed in a way to support the future full electrification. This commitment will be detailed within the planned update to our *Environmentally Sustainable Design (ESD) Buildings Policy* (see Action 1.7).

Advocate to governments to support the transition off gas to all-electric – Action 1.5

The shift to all-electric operations will in some cases be relatively simple such as for small buildings, however most of the actions to go all-electric are highly complex, once in lifetime retrofits. This work will incur high up-front costs in design and infrastructure and will also have a significant impact on the wider electrical network due to the increased peak demand. The transition of Councils, businesses and households to all-electric will be a key activity to support the State Government to achieve its reduction targets of 28 to 33 per cent by 2025 and 45 to 50 per cent by 2030, to achieve its goal of net zero emissions by 2050.

Where appropriate opportunities arise, we will advocate to State and Federal Governments to implement initiatives to support Council's transition to all-electric operations; particularly for our complex and high gas-using aquatic centres.

Innovation in energy storage and trading – Action 1.6

With the shift to going all-electric, this will place increased electrical load on our buildings and the wider electrical network. Battery storage systems and other emerging technologies are recognised as an essential element to support a zero emissions future. Batteries for example could support increased use of onsite power generation, smoothing fluctuations or peak demand. Intertwined with solar and batteries, are the developments around local energy trading and virtual power plants. Trailing such new and innovative technologies will benefit Council and support the wider community transition to an all-electric future.

With our commitment to transition our fleet vehicles to zero emissions, there is a significant opportunity for us to play a leading role in trialling innovative approaches to using vehicle batteries to support our buildings, and the wider electricity grid. Vehicle to Building (V2B) and Vehicle to Grid (V2G) technology will allow far greater use of the energy storage resource in an electric vehicle. The large battery can be used to supply power to a building or could be controlled by the network operator (Citipower / Jemena) to support the wider grid when needed.

We will monitor and seek to develop opportunities in these fields and seek to trial and implement innovative approaches which could support our corporate and community aspirations to maximise the efficiency and reliability of an all-electric future.

Leading edge sustainable building design and operations – Actions 1.7 to 1.8

To ensure that we minimise gas usage, and transition to all-electric, in a strong and consistent manner, we will update our ESD Buildings Policy to reflect the key focus for the coming years, which is to reduce gas usage in our buildings.

Council's existing ESD Buildings Policy has been very successful in ensuring our new buildings are built to a high standard. The recently constructed Bargoonga Nganjin (North Fitzroy Community Hub) is a high-profile demonstration of this. This project achieved a 6-Star Greenstar rated design with rooftop garden and innovative under-decking water-catchment system. The updated ESD Policy will ensure the next generation of developments and works are aligned with evolving best practice standards and support our primary focus to go all-electric.

Whilst the ESD Buildings Policy will detail how we undertake works to our buildings, we will also continue to ensure our buildings are operating as efficiently as possible through continued management and potential enhancement of our building management system (BMS).

Reducing Council-owned vehicle fleet emissions

After our buildings, the largest source of direct (Scope1) emissions comes from fuels used to power our own vehicles.

The key actions we will work towards to reduce our vehicle emissions are:

- Transition Council's vehicles towards zero-emissions by 2025 (Action 1.9)
- Implement initiatives to reduce fuel and vehicle usage (Actions 1.10 to 1.12)

These actions are discussed in more detail below.

Transition Council's vehicles towards zero-emissions by 2025 (Action 1.9)

Council Plan 2021-25 sets the initiative to *Transition Council's vehicles and equipment, where practical and available, to be low or zero emissions, and towards all electric vehicles by 2025*. Whilst there are many electric vehicles alternative currently available (such as many passenger vehicles and some tipper trucks), the range is still limited such as utes currently available. Availability and price are expected to considerably reduce during the implementation period of this Roadmap.

Converting our vehicle fleet to electric or other zero-emissions vehicles, would reduce our emissions by 665 tCO₂-e per annum, which is 13% of our total 2020-21 annual emissions of 5,149 tCO₂-e.

What is a Zero-emissions vehicle?

In the context of electric vehicles, 'all-electric' includes 'battery' electric vehicles which can be plugged in to charge, as well as other emerging zero emission configurations such as 'hydrogen fuel-cell' powered electric vehicles.

- Electric vehicles are only considered zero emissions were powered by 100% renewable electricity
- Hydrogen fuel-cell vehicles are only be considered zero-emissions if the energy source to generate the hydrogen is verified as being 100% renewable.
- Non-plug in 'hybrid' vehicles are not considered 'electric vehicles' as the primary drive system is a conventional internal combustion engine (ICE), with the electric side only providing supplementary power.

Whilst passenger vehicles have the widest range of electric alternatives, the issues needing to be addressed around charging will vary depending on where they are garaged. Vehicles parked on Council property, such as the basement carpark at 345 Bridge Road, will be the easiest to provide charging. Power supply also needs to be assessed and upgraded as required to cater for the additional demand of electric vehicles, and this could require significant budget by the organisation to do so. Most passenger vehicles are 'take home' vehicles which will require investigation into how we charge these vehicles and what mechanisms and structure could be implemented to support staff to charge at home.

We will undertake research and develop a pathway and issues paper to guide the implementation of our whole fleet to towards zero-emissions by 2025, or as soon as practical.

Implement initiatives to reduce fuel and vehicle usage (Actions 1.10 to 1.12)

The simplest way to reduce emissions from vehicles is to minimise and avoid using vehicles at all. With Council's new telematics and vehicle booking system, we will investigate opportunities to actively support our drivers to improve driving performance and gather data to optimise vehicle utilisation.

With the planned meeting room IT upgrades to enable a hybrid working model, this will support reduced vehicle usage between Council offices for meetings. We will also continue to implement and strengthen initiatives to support council staff to travel by sustainable and active travel modes, both for work trips and their commute to and from work.

Reduce emissions from refrigerant gas leakage (Action 1.13)

There is no practical way to reduce the quantity of gas leakage. To reduce our emissions from refrigerant gas leakage (152 tCO₂-e in 2020), we will, where practical, ensure that all equipment purchased which contains refrigerants have the lowest Global Warming Potential refrigerant.

To support these outcomes, we will include considerations around refrigerant gas selection in our updated *ESD Buildings Policy*. This will strengthen the consideration of refrigerants in projects ranging from large new builds, to smaller renovations, end of life and reactive maintenance and replacements.

5.2 Reduce Scope 2 emissions – electricity generation – Action 1.14

Scope 2 emissions relate to the electricity used by Council. Since Council is currently purchasing 100% renewable electricity, our Scope 2 emissions are zero. Council's current electricity contract expires on 31 December 2028. To ensure we maintain zero Scope 2 emissions in 2030, and beyond, we will ensure that the new electricity contract from January 2029 will continue to be 100% renewable electricity

5.3 Reduce indirect (Scope 3) carbon emissions

Our indirect (Scope 3) emissions are significant, making up 48% of our overall emissions of 5,149 tCO₂-e (see Table 1). Scope 3 emissions are more difficult for us to reduce than Scope 1 emissions, since we do not directly create these emissions, nor do we own or control the assets which create the emissions. Despite these barriers, as the 'buyer' of the goods and services which create the emissions, we can, over time, have an influence to reduce the emissions associated with these products and services and drive innovation and change. Our five key Scope 3 emissions are:

- Contractor vehicle fuel (1,682 tCO₂-e)
- Asphalt (466 tCO₂-e)
- Paper (70 tCO₂-e)
- Waste to landfill and water use/disposal from our buildings (67 tCO₂-e)
- Emissions from events (yet to be quantified).

There are several actions that we will seek to take to drive the downwards trend in Scope 3 emissions, including:

- Quantifying the associated emissions of further relevant Scope 3 activities so we have a reasonable basis to act and measure our progress
- Assessing if we can reduce the quantity of the product or service we purchase
- Advocate to and support our suppliers to source lower emissions products and reduce emissions of their services, including becoming certified carbon neutral
- Ensure procurement processes value suppliers with lower carbon credentials, and
- Create momentum with peak bodies and State and Federal Government to drive progress to lower emissions solutions for goods and services we buy, including joining and forming key alliances and advocacy groups.

5.3.1 Support supply chain to work towards carbon neutrality – Action 2.1

Scope 3 emissions are predominantly from our supply chain - emissions relating to the manufacture and operations by third parties, of goods and services we purchase. As leaders in the climate action and being certified carbon neutral since 2012, we can leverage this experience and reputation, to encourage and support our supply chain to move towards carbon neutral operations and being certified carbon neutral.

Where a supplier was to become carbon neutral, the *Climate Active* methodology is to consider the emissions for all relevant goods and services from that supplier to be treated as zero carbon for our organisational emissions inventory.

It is important to note that whilst a supplier achieving carbon neutrality would most likely include the purchase of carbon offsets, we would have confidence that suppliers are not 'green washing' since being granted carbon neutral certification also requires a credible and documented pathway and strategy to drive down gross emissions. As such, we will engage with our supply chain to support them to transition to become carbon neutral organisations, prioritising our largest emitters and working with other councils who might use the same suppliers to amplify our voice and to better support these organisations to take action.

5.3.2 Moving to zero-emissions contractor vehicles – Action 2.2

The most significant opportunity to reduce indirect (Scope 3) emissions, and indeed our overall emissions, is from supporting the transition of contractor vehicles to transition to low and zero emissions vehicles. Zero emissions alternatives are now emerging in the market and it is expected that within the time frame of this plan, there will be a rapid increase in availability of zero-emissions heavy vehicles.

Key actions we will take to support the transition to zero-emissions contractor vehicles include:

- Ensuring new contracts include an option for suppliers to offer electric or other zero-emissions vehicles
- Continuing to work with existing contractors to understand the options for, and potentially trial of, zero-emissions vehicles.

The primary large contracts which are due for renewal or tender preparation within the timeline of this plan, are street sweeping services (2023) and Kerbside waste collection services (2026). We will work proactively with these providers to ensure full consideration of options to transition these services to zero-emissions alternatives.

5.3.3 Reducing emissions from asphalt and concrete – Action 2.3

The emissions from asphalt and concrete are 'embodied' emissions, meaning they are the emissions from the mining of raw materials, manufacturing and other associated processes. The emissions from asphalt accounts for 20% (466 tCO₂-e) of Yarra's quantified indirect emissions. Currently the emissions associated with concrete are not quantified but we expect this is likely to occur soon. It is important therefore to work to reduce emissions associated with both asphalt and concrete.

Reducing emissions will primarily be reliant on the manufacturers and suppliers implementing significant changes to the way materials are manufactured and most likely, developing a totally new non-fossil fuel replacement. Whilst this is largely out of our control, we will seek to undertake advocacy, trial more sustainable asphalt and other construction materials, and monitor performance overtime. A key objective of our monitoring will be to better understand and compare these lower-emissions materials against current Australian Standards, VicRoads Mix Requirements and other relevant standards, for materials which have constraints in relation to recycled content due to not having long term data available.

There is growing interest from Councils to demonstrate leadership in this space now that many Councils have made significant reductions in their direct emissions, like Yarra. For example, the City of Melbourne Emissions Reduction Plan 2021 – 26² commits to leadership in research, knowledge and showcasing implementation of low carbon materials and construction. We will look for opportunities to partner with others, such as the City of Melbourne, to strengthen and accelerate this work.

We will assess opportunities to reduce the usage of higher-emissions materials and where possible and consider substituting with alternative lower emissions materials whilst still complying with design standards.

5.3.4 Reduce emissions from Council and public events – Actions 2.4 and 2.5

To date we have not quantified the emissions associated with events. Whilst emissions from events are not likely to overly high, we will still need to attempt to reduce these to zero by 2030.

² [Emissions Reduction Plan for Council Operations 2021-26](#)

Additionally, there is a significant opportunity to deepen engagement with Council staff, and the wider municipality, by demonstrating our commitment to low-carbon initiatives in the events we run and have influence over.

We have the most control over internal events such as staff meetings, workshops, consultations and Council meetings and public events which we directly run such as the Leaps and Bounds festival. Other large public events such as the Johnston Street festival, are not directly run by Council but we can have a role in supporting these events to be more sustainable and potentially have minimum operational emissions and other sustainability requirements.

At both internal and public events, we can demonstrate leadership through consideration of initiatives such as:

- appropriate signage to highlight low carbon initiatives
- separated waste bins
- minimising packaging, single-use plastics and ensuring packaging is compostable, and
- minimising or complete avoidance of meat products.

For public events additionally we will consider:

- utilising onsite solar power instead of diesel generators and purchase or offsite renewable electricity
- ensuring public transport and cycling is promoted as the preferred mode to reach the event; and
- offering carbon offsets for consumers to offset their event related emissions.

We will develop guidelines and policies for internal and external events to ensure consistent guidance.

5.3.5 Reducing emissions from waste, paper and water – Actions 2.6 and 2.7

Emissions from waste and office paper manufacturing (~1.4% each) are relatively small. We will continue to revisit the options available to reduce our emissions from these sectors.

Reduced emissions from waste will focus on reducing the amount of waste we create and by diverting as much as possible from landfill by reusing, repairing, composting or recycling. A key activity we will undertake to reduce waste will be to embed and strengthen a circular economy approach to our operations, with the first step being to develop a 'circular economy' policy framework and resources.

Likewise with paper, we already have taken steps to minimise wasted printing but need to continue on this journey – especially focused on paperless processes. Additionally, we will also continue to review the environmental credentials of the paper - such as recycled content and carbon neutrality – and purchase accordingly.

Water supply and waste-water treatment emissions are included in our inventory as we are responsible for the volume of water consumed and wastewater which subsequently needs to be treated (by others) and the resultant emissions. Initiatives to reduce our water consumption and disposal are encompassed in other Council policies and plans such as Yarra's Integrated Water Management Plan. Melbourne Water, which manages all of Melbourne's water supply and treatment, has a commitment to be carbon neutral by 2030³, aligning with our own Roadmap to zero. This means we are currently projecting that no direct action is required by Council through this plan to drive water-associated emissions to zero by 2030.

5.4 Offsets and drawdown (Level 3 of hierarchy) – Actions 3.1 to 3.3

5.4.1 Offsets purchased by Council

Since 2012 Yarra Council has been operating as a certified carbon neutral organisation (under Federal Government's *Climate Active* program). Our annual emissions have reduced over this time (see Figure 2), with certified carbon offsets purchased to cover Council's annual emissions and bring overall net emissions

³ <https://www.melbournewater.com.au/water-data-and-education/environmental-issues/our-path-net-zero>

to zero. We aim to continue this trend of annual emission reductions and by 2030 we no longer have any emissions or need to for offsets (or be very close to this point).

There are a large variety of *Climate Active* accredited offsets from across the globe, all of which carry third party accreditation and are additional to activities which would otherwise have occurred. Purchasing offsets supports the financial viability of external projects which were likely not to occur otherwise and can support social, economic, biodiversity and health benefits to local communities, particularly so in developing countries.

However, whilst meeting *Climate Active* accreditation, offsets can vary greatly in price, age of production, and social, environmental, and economic co-benefits.

Historically offsets have needed to be purchased from outside Australia – linked to the Kyoto Protocol additionality requirements. Whilst there are now some local offsets, these are only from specific types of projects (generally land based such as tree planting, avoided deforestation, and soil carbon), and have had some additionality concerns as well as being significantly higher cost than overseas projects. To date Council has thus only purchased overseas generated offsets such as renewable energy generation or industrial projects which reduce emissions such as wastewater treatment and using waste agricultural materials to produce lower-emissions building materials and energy in developing countries.

Globally an emerging offset market is that of Nature Based Solution (NBS) offsets, and the additionally and co-benefits of these projects are improving. NBS offsets enhance or protect high value carbon ‘sinks’ such as wetlands, mangroves and forests. These types of projects are recognised by peak global bodies such as the Inter-governmental Panel on Climate Change (IPCC) and United Nations⁴, as urgently needing to be incorporated into climate change mitigation actions to achieve safe climate goals and limit global warming. Whilst in the past, the adage of ‘a tonne is a tonne’ of emissions reduction, it is now evident that a tonne of emissions reduction from NBS can potentially have a far greater impact on climate and adaptation. Natural features such as forests and wetlands, have a direct impact on the local climate, land degradation, temperatures and rainfall for example, as well as providing valuable bio systems to support human and other life. A key question around NBS offsets is around additionality and assurance that the native environment will remain stable for many decades and in particular, is not susceptible to fire which would then release the stored carbon.

Moving forward, Council will consider and assess the merits of nature-based solutions where appropriate, whilst continuing to place a high value on social co-benefits and overall value for money.

In the decade to 2030 it is widely forecast that there will be a significant increase in global demand for offsets due to the rapid take up of net zero commitments by cities, states, countries and large organisations^{5,6,7}. Together with this increase in demand, is a forecast limited opportunity to increase supply, especially of higher quality offsets which are likely to be required by these sectors to avoid perceptions of ‘green-washing’. As such, if Yarra is to maintain carbon neutral status through purchase of offsets, it is likely that we will incur a significantly higher cost over the coming decade.

With this in mind, we will need to revisit how we invest in and purchase offsets, including opportunities to support locally generated offsets and opportunities for Council to work directly in partnership with other Councils to stimulate the local market or even generate our own offsets. Supporting higher quality offsets, especially innovative, local projects, could also be a way for Council to lead the community and potentially provide an avenue to use this experience and knowledge to inform community offset purchases and work on shared-procurement projects.

Progressively transitioning to ‘higher quality’ offsets will likely be an essential element of maintaining our reputation as leaders in climate action, and officers will review this accordingly over the life of this plan. The higher cost of carbon abatement increases the avoided costs we achieve from reducing our gross emissions thereby improving the financial savings from emissions reductions activities.

⁴ <https://files.wri.org/d8/s3fs-public/consideration-nature-based-solutions-offsets-corporate-climate-change-mitigation-strategies.pdf> (see page 2, ‘Background’)

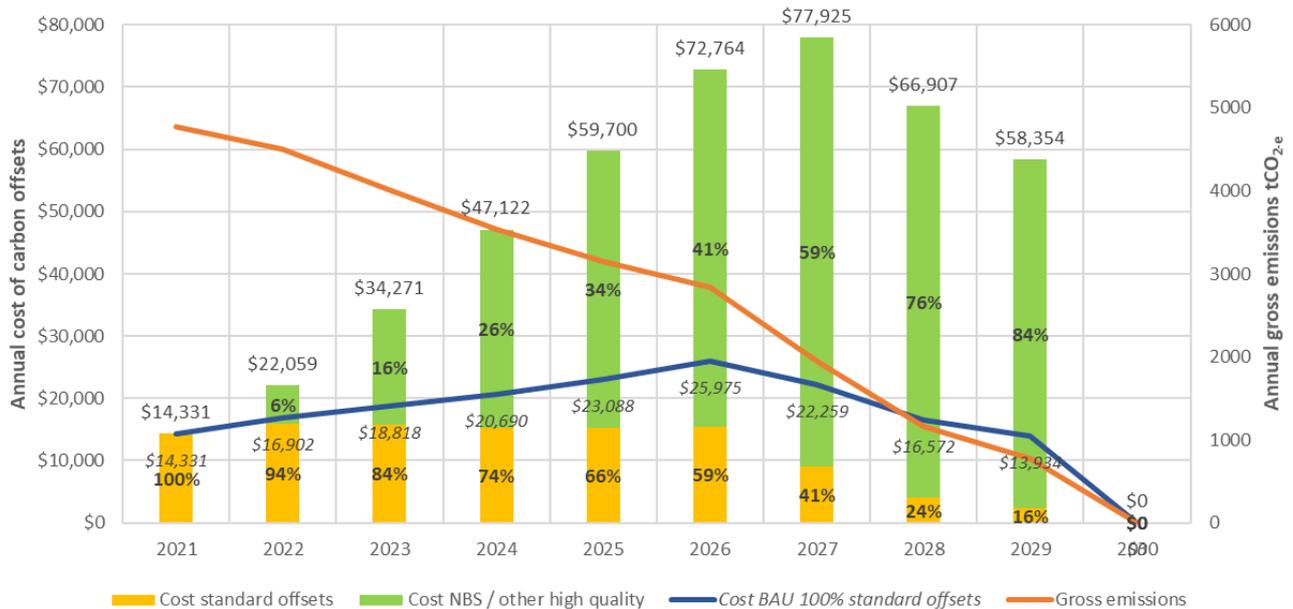
⁵ [Future Demand, Supply and Prices for Voluntary Carbon Credits – Keeping the Balance](#)

⁶ [Carbon offset prices set to increase tenfold by 2030](#)

⁷ [Carbon offsets prove risky business for net zero targets](#)

Figure 14 highlights a *potential* pathway and cost implications if Council was to choose to progressively increase the proportion of ‘higher quality’ offsets over the period to 2030. Currently higher quality offsets are in the order of three times more expensive than traditional offsets on the market, at around \$10-\$15 per tCO₂-e versus ~\$5 per tCO₂-e respectively. Under this pathway, the annual cost of shifting to higher quality offsets could cost in the region of \$50,000 extra over BAU per year through the middle part of the decade and higher if a higher proportion of new / emerging offsets are purchased.

Figure 14 - Projected costs of purchasing offsets to 2030 under a *potential* staged transition to ‘higher quality’ offsets



5.4.2 Drawdown – Action 3.3

Carbon emissions from past human activity continue to have a destructive impact on our planet by trapping heat in the atmosphere and creating climate conditions that are unsafe for humans, other species and ecological systems. In order to restore a safe climate, excess emissions need to be removed (or drawn down) from the atmosphere, such as through storing carbon in soils, vegetation, trees, oceans and via other biological or technological processes.

Many carbon removal techniques are not currently deployable at the scale needed, may be unproven, and/or have other implications for land and natural resource use. There is a need to rapidly reduce emissions while also supporting action that contributes to carbon drawdown and storage, such as tree planting and vegetation management.

Within Yarra, there is limited scope for meaningful drawdown projects however we will seek opportunities to be involved with others in larger initiatives and consider the purchase of *Nature Based Solution* offsets which can support drawdown as detailed in Section 5.4.1, and will include the potential to support community buy-in to strong projects.

6 Taking action: Action Plan summary tables

Council is committed to rapid and strong action to address the Climate Emergency. This action plan details specific actions, with projected funding and timelines, which Council will implement, to reduce organisational carbon emissions towards our objective of zero emissions (without offsets), by 2030.

The action tables are broken into 3 sections in alignment with the Climate Action Hierarchy (Figure 10):

- Priority 1 Hierarchy actions - Reducing direct (Scope 1 & 2) greenhouse gas emissions
- Priority 2 Hierarchy actions - Reduce indirect (Scope 3) emissions such as from purchased goods and services, waste and events
- Priority 3 Hierarchy actions - Carbon Offsets and Drawdown

6.1 Priority 1 Actions: Reducing direct (Scope 1) greenhouse gas emissions

Priority 1 Actions: Reducing direct greenhouse gas emissions (Scope 1 & 2)				
No	Action Description	Benefit	Cost/timeline	Who
Electrification of Council buildings				
Gas systems such as heating, hot water and pool heating, can be replaced with high efficiency electric systems. Smaller sites, with relatively low gas usage are fairly simple to transition to all-electric. Larger sites with high use such as aquatic centres and town halls are highly complex with significant design and infrastructure works required. These larger sites will also have a significant impact on the wider electrical supply from the added loads. Whilst planning and design is underway for the larger sites, we will implement upgrades on our smaller, more simple sites.				
1.1	<p>Transition remaining aquatic centres off gas cogeneration systems by end 2024.</p> <ul style="list-style-type: none"> • Collingwood Leisure Centre - 2022 • Richmond – 2024 <p>Cogeneration generates electricity onsite using gas as a fuel. Turning off these systems reduces gas usage and shifts that electricity demand to our 100% renewable electricity.</p> <p>There are no technical barriers to this action. Timing is aligned with end of maintenance contracts and practical 'end of life' for systems to operate reliably.</p> <p><i>Supports Climate Emergency Plan Action 2.6</i></p>	290 tCO ₂ -e annual reduction	<p>Operational costs increase each year.</p> <p>\$3,500 (2022/23)</p> <p>\$10,400 (2024/25)</p>	<p>Lead: Buildings and Assets Management (BAM)</p> <p>Support: Sustainability Leisure</p>

Priority 1 Actions: Reducing direct greenhouse gas emissions (Scope 1 & 2)

1.2	<p>Undertake design works to support 'All electric' aquatic centres by 2030.</p> <p>This includes systems for heating air, hot water for showers and pool water heating. Significant design works and infrastructure upgrades are required to achieve this.</p> <p>Council will aim to achieve one fully electrified aquatic centre by 2025 – most likely Collingwood.</p> <ul style="list-style-type: none"> • Ensure works in buildings are compatible with future full electrification for most cost-efficient transition, • Early years will involve complex multi-year design works to better understand feasibility and realistic cost. • Be shovel ready to seek grant funding (related to Action 1.5) <p>As of Dec 2021, no existing aquatic centre in Victoria had been retrofitted from gas to 'all-electric'. Yarra's in-house expertise to lead the process and engage with other Councils and sector experts will be crucial to implementing this innovative action successfully.</p> <p><i>Supports Climate Emergency Plan Action 2.6</i></p>	530 tCO ₂ -e p.a. (CLC), or 1,556 tCO ₂ (all sites)	<p>Potential cost in the order of \$5million+ per site.</p> <p>Potential savings in operation and maintenance through having centralised system.</p>	<p>Lead: BAM</p> <p>Support: Sustainability Leisure Services</p>
1.3	<p>Going 'all-electric' at small sites with simple gas systems, such as pavilions, childcare centres and senior citizen's centres and halls, by end 2022. Around 20 of 30 sites are planned for transition in 21/22 and a number of other sites will be upgraded during planned redevelopments. In the order of 5 sites will require additional funding to transition off gas.</p> <p>Note: This action refers to sites under Council's operational control /where Council pays the bills and the emissions included within Councils organisational emissions inventory.</p> <p><i>Supports Climate Emergency Plan Action 2.6</i></p>	128 tCO ₂ -e annual reduction	<p>\$100,000</p> <p>2023/24</p> <p>No change in operational costs.</p>	<p>Lead: BAM</p> <p>Support: Sustainability</p>
1.4	<p>Going all-electric at large sites such as town halls and Council administration buildings.</p> <p>These sites are mostly complex to convert from gas to electric systems. With some of our key large sites such as Richmond (RTH) and Fitzroy Town Hall (FTH) due for major air-conditioning replacements in the coming years, Council will integrate electrification with planned asset renewal works. We will aim to transition these large sites off gas by 2025 where practical.</p> <p><i>Supports Climate Emergency Plan Action 2.6</i></p>	73 tCO ₂ -e (RTH) 40 tCO ₂ -e (FTH)	Potential cost in the order of \$5million+ per site.	<p>Lead: BAM</p> <p>Support: Sustainability</p>

Priority 1 Actions: Reducing direct greenhouse gas emissions (Scope 1 & 2)

1.5	<p>Advocate to State and Federal Governments to support transition to all-electric operations.</p> <p>Transitioning from gas to all-electric buildings and vehicles involves significant up-front costs, infrastructure and design and is reliant upon, the wider electricity system being able to support this increased demand. To ensure an efficient, reliable and cost-effective transition to all-electric, we will advocate to State and Federal Government's to develop a comprehensive roadmap and support mechanisms, including funding, design and policy aspects to transition off gas.</p> <p><i>Supports Climate Emergency Plan Action 2.6</i></p>	Reduced costs – dependent on funding and support. More efficient and reliable transition.	Within existing budgets	<p>Lead: Sustainability</p> <p>Support: BAM, Fleet</p>
1.6	<p>Innovate with energy storage and trading.</p> <p>Investigate opportunities to trial innovative energy storage solutions such as load shifting, off peak charging and using electric vehicles to support the electrical demands of buildings and the wider grid (V2B and V2G).</p> <p>Identify and implement opportunities to trial energy trading either within Council assets or with external parties including emerging approaches such as virtual power plants or Virtual Energy Networks.</p>	Leadership. Improved power supply reliability. Foundation for wider community initiatives.	Potentially in the order of \$100,000+. Dependent on future investigations.	<p>Lead: Sustainability</p> <p>Support: BAM, Fleet</p>

Update Environmentally Sustainable Design Policy (ESD Policy)

Updating our existing ESD Policy is essential to ensure have clear guidance to deliver building maintenance, works and new constructions which are at the leading edge of sustainability.

1.7	<p>Update Council's Environmentally Sustainable Design (ESD) Buildings Policy to further support and embed zero carbon buildings. Applicable for Council construction projects (new builds, renovations, significant repairs) to ensure our new buildings contribute to our zero-carbon future and we show leadership for the sector.</p> <p><i>Supports Climate Emergency Plan Action 2.5</i></p>	Dependent on projects impacted.	<p>May 2022</p> <p>Within existing resources</p> <p>2020/21</p>	<p>Lead: Sustainability</p> <p>Support: Statutory Planning, BAM</p>
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Optimise operations of our buildings

Whilst the bulk of our building emissions will be achieved by getting off gas and electrifying operations, we will also achieve emissions and financial savings through optimising the operations of our buildings.

Priority 1 Actions: Reducing direct greenhouse gas emissions (Scope 1 & 2)

1.8	<p>Improve the efficiency optimisation of sites through initiatives such as:</p> <ul style="list-style-type: none"> • Enhancement of building automation and monitoring systems (BMS). This includes opportunities to improve existing systems at large sites and installing appropriate technology at smaller sites • Increasing the sophistication and efficacy of our management techniques of BMS systems • Maintain subscription to utility data management system to ensure we have the analytics and information at hand identify anomalies and provide reporting • Increased engagement and support for staff who manage sites to help them better identify and implement gas reduction initiatives, such as via: • Induction, training and provision of energy reports to key staff to ensure awareness of key areas for potential emissions reductions • Training key staff to be aware and engaged of the need for urgent action on climate change and understand our Council commitments and goals, especially the Climate Emergency Plan • Signage / educational materials at Council's major buildings with sustainability features (e.g. solar PV, rainwater tanks) to engage staff, building users and visitors. <p><i>Supports Climate Emergency Plan Action 2.5</i></p>	40 t-CO ₂ -e+ emissions reductions (assume 2% impact on buildings emissions).	Ongoing. Within existing resources.	<p>Lead: BAM (for BMS & induction / training contractors)</p> <p>Sustainability (for staff training and engagement and signage).</p>
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Priority 1 Actions: Reducing direct Greenhouse Gas Emissions (Scope 1 & 2)

Reduce vehicle fleet emissions

We will seek to work towards a transition to a zero-emissions vehicle fleet by 2025.

<p>1.9</p>	<p>Our aim is to seek to transition to a zero-emissions vehicle fleet by 2025, subject to practicality, value for money and availability of suitable vehicles and charging infrastructure/capability.</p> <p>‘All-electric’ vehicles includes vehicles with pure electric drive systems, which are most likely powered by batteries, but may also include Hydrogen power which is an emerging technology - if hydrogen is produced as zero emissions.</p> <p>The actions we will take include:</p> <ul style="list-style-type: none"> • Develop a practical pathway via a ‘Zero emissions fleet in Yarra by 2025’ strategy to demonstrate we have a clear plan and can inform financial requirements within the Long-Term Financial Strategy. • Phase out non-hybrid petrol driven passenger vehicles by 2022 • Use hybrid petrol-electric options (e.g. Yaris hybrid) until 2025, as a transitional technology where zero emissions vehicles and charging infrastructure are not practical. • Progressively switch passenger vehicles to electric or other zero emissions vehicles at the time of renewal where possible, utilising full-life cycle cost budgeting rather than just the purchase price • Convert Council’s diesel fleet (i.e. tipper trucks) to electric technology as soon as possible • Convert Council bus fleet to electric by 2023 • Cease purchase of new fossil fuel-powered utes until practical electric options enter the market. • Installation of required vehicle charging infrastructure. • When appropriate opportunities arise, advocating to State and Federal Governments to implement an incentive program to accelerate the uptake of electric vehicles by corporate fleets, including Councils, by Reducing the up-front cost of vehicles and charging infrastructure, and Increasing the range of models available. <p><i>Supports Climate Emergency Plan Action 4.5</i></p>	<p>665 tCO₂-e in 2025/26</p>	<p>Development of ‘pathway’ document - Funding within existing budgets. (End 2022)</p> <p>Upgrades ~\$10 million (progressively to 2025)</p>	<p>Lead: Fleet Support: Sustainability</p>
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Priority 1 Actions: Reducing direct Greenhouse Gas Emissions (Scope 1 & 2)

1.10	<p>Use vehicle telematics data analytics to support drivers to improve driving habits and reduce fuel usage.</p> <p><i>Supports Climate Emergency Plan Action 4.5</i></p>	30 tCO ₂ -e Reduce wear and tear and fuel usage	Within existing resources.	Lead: Fleet
1.11	<p>Upgrade online meeting technology at Council's key sites.</p> <p>Council has four administration centres spread across the municipality, plus three leisure centres and many other small sites. In order to support the new 'COVID-normal' hybrid working model, ICT is implementing the ability for staff to remotely join meetings, with effective visual and audio. This initiative will significantly reduce the need for staff to travel for internal meetings as well as allowing more staff to work from home.</p> <p>As other Councils and organisations also offer similar online meeting technology this will further reduce the need for staff to travel for meetings.</p> <p><i>Supports Climate Emergency Plan Action 4.5</i></p>	15 tCO ₂ -e Reduced vehicle use (assume 2.5% emissions savings)	Within ICT Hybrid work model roll out – subject to future budget approval. 2022 - 24	Lead: ICT
1.12	<p>Increase active travel instead of car use for staff commuting and work trips.</p> <p>Review and implement initiatives to support increased active travel as opposed to car use via:</p> <ul style="list-style-type: none"> • Update staff e-bike training e.g. include an online bicycle safety course and an e-bike induction by a Yarra Bicycle User Group (BUG) champion. (2022-23) • Better understand barriers to staff purchasing and/or using a bike / e-bike and consider implementing initiatives such as incentives for staff to purchase and ride to / at work (e.g. free bike maintenance / tune ups, subsidised Bicycle Network membership, loan finance schemes etc). (Ongoing) • Audit staff bicycle parking / end of trip facilities at all Council sites to identify improvements. Develop a program for future upgrades. (2022-23) • Review, and where appropriate, increase Council's fleet of e-bikes, based on e-bike usage and demand. (Ongoing) • Promote Council e-bike fleet and training, and share resources and incentives to support staff to ride to work via a page on the Intranet and comms to all staff (via emails or notices) (Ongoing) 	35 tCO ₂ -e annual emissions reductions (assuming 5% less car use in work trips). Reduced emissions from staff commute - currently not quantified or reported as Council emissions. Healthier, active staff.	See timelines against each dot point. Capital costs of new bikes and end of trip facility upgrades to be determined after review processes and subject to future budget bids.	Lead: Sustainable Transport Support: Fleet, BAM

Priority 1 Actions: Reducing direct Greenhouse Gas Emissions (Scope 1 & 2)

	<ul style="list-style-type: none"> Support the Yarra Staff BUG, to connect the cycling community at Yarra Council through social events, establishing a platform to share ideas to encourage, and enable more staff to start riding e.g. a Yarra BUG buddy ride to work scheme. (Ongoing) 			
1.13	<p>Reduce refrigerant emissions</p> <p>Ensure that air-conditioning and other plant which contains refrigerant, uses the refrigerant gas with the lowest global warming potential (GWP) where fit for purpose. Depending on the gas used, the impact on global warming could be more than three times higher from a high GWP gas to a lower GWP gas.</p> <p>Considerations around refrigerant GWP to be included within the update of Council ESD Buildings Policy (Action 1.7).</p>	152 tCO2-e	Within existing budgets as assets replaced	<p>Lead: BAM</p> <p>Support: Sustainability</p>
1.14	<p>Purchase 100% renewable electricity (Scope 2)</p> <p>We will continue to purchase 100% renewable electricity beyond the current contract which expires on 31 December 2028. Renewable electricity is likely to be cost comparative with standard 'black' power.</p>	7,000 tCO2-e annually	<p>2029 (new contract)</p> <p>Expected to be within existing budgets</p>	<p>Lead: Sustainability</p>

6.2 Priority 2 Actions: Reducing indirect (Scope 3) greenhouse gas emissions

Priority 2 Actions: : Reduce indirect emissions such as from purchased goods and services, waste and events.				
No	Action Description	Benefit	Cost/timeline	Who
2.1	<p>Support our supply chain to work towards carbon neutral certification.</p> <p>Using our experience and credibility as a certified carbon neutral certified organisation, we will actively engage with our supply partners to advocate and support them, to achieve carbon neutral certification. Supplies of goods and services from those organisations would then be considered zero carbon for our inventory. Carbon neutral certification provides confidence that the supply partner is not 'green washing' by just purchasing carbon offsets as they must also demonstrate credible action and strategies to reduce gross emissions.</p>	290 tCO ₂ -e annual reduction	Operational costs increase each year. \$3,500 (2022/23) \$10,400 (2024/25)	<p>Lead: Buildings and Assets Management (BAM)</p> <p>Support: Sustainability, Leisure</p>
2.2	<p>Transition contractor vehicle fleet to reduce emissions.</p> <p>Work with Council's service delivery contractors to transition their vehicles to zero emissions technology. The most likely time this can be achieved is at time of contract renewal. The following two contracts will be tendered during the timeline of this plan and will include options for electric / zero emissions vehicles.</p> <ul style="list-style-type: none"> • 2023 – Street cleaning • 2026 – Kerbside collection <p><i>Supports Climate Emergency Plan Action 4.5</i></p>	164 tCO ₂ -e (street sweeping) 748 tCO ₂ -e (kerbside collection) annual reduction	Dependent on tender submissions. Potentially minimal additional cost due to maintenance savings.	<p>Lead: Fleet</p> <p>Support: Sustainability</p>
2.3	<p>Seek to reduce emissions from roadworks and construction where this is fit for purpose, practical and represents value for money.</p> <ul style="list-style-type: none"> • Consider options for minimising usage and using lower emissions products and processes where fit-for-purpose products are available • Showcase leadership projects in low carbon materials • Work with suppliers to encourage lower carbon products • Seek to participate in projects with other Councils to trial and further develop innovative low carbon solutions. 	117 tCO ₂ -e annual reduction (by 2025) – Assuming 25% reduction	Dependent on future technology, options and budget bids.	<p>New materials and lower usage:</p> <p>Lead: ITCE</p> <p>Support: Sustainability</p> <p>Quantifying new emissions</p>

Priority 2 Actions: : Reduce indirect emissions such as from purchased goods and services, waste and events.

	<p>Note: Whilst asphalt emissions are currently quantified, Council may have material Scope 3 emissions from other road and construction materials for which we currently do not have quantified emissions. We will seek to understand if there are other material embodied emissions sources, such as concrete and steel, quantify, and take similar actions as with asphalt to reduce emissions.</p>			<p>sources from roadworks:</p> <p>Lead: Sustainability</p> <p>Support: ITCE</p>
2.4	<p>Reduce emissions from significant community events</p> <p>Seek to make all our major events carbon neutral. This will be done by:</p> <ul style="list-style-type: none"> • Seeking to minimise use of diesel generators and instead use solar or other zero carbon power supply • Reducing waste materials i.e. from food vendor packaging • Maximising diversion of waste from landfill by offering recycle and compost bin options • Considering the purchase of carbon offsets equivalent to the estimated emissions. Note that this may be either done specifically for an event or potentially events could be included within Council’s emissions inventory. • Maximise community engagement in emissions reduction and offset purchase initiatives. 	<p><20 tCO2-e annual reduction (based on current inventory methodology)</p> <p>Primary benefit is significant public engagement in climate action.</p>	<p>Costs subject to future scoping of options and budget bids through annual bid processes.</p> <p>2022 - 2025</p>	<p>Lead: Arts and Culture</p> <p>Support: Sustainability</p>
2.5	<p>Reduce emissions from Council events and meetings</p> <p>Develop and roll out internal guidance and processes for sustainable events including:</p> <ul style="list-style-type: none"> • Reducing emissions through choosing local, seasonal food, where possible • Minimising waste including packaging and single use items • Choosing plant-based food as a default catering option 	<p><20 tCO2-e annual reduction.</p> <p>Significant leadership/ engagement initiative.</p>	<p>Within existing resources.</p> <p>2022-23</p>	<p>Lead: Sustainability</p>
2.6	<p>Reduce waste and resultant emissions</p> <p>Continue to implement waste strategies at Council sites and seek to achieve a 30% reduction in tonnes / EFT / week waste to landfill by 2025 based on baseline year of 2019</p>	<p>27 tCO2-e annual reduction</p>	<p>21/22 actions within existing budget.</p> <p>Future actions to be scoped and subject to budget bids</p>	<p>Lead: Waste Minimisation</p>

Priority 2 Actions: : Reduce indirect emissions such as from purchased goods and services, waste and events.

2.7	<p>Reduce paper usage and resultant emissions</p> <ul style="list-style-type: none"> • Reduce paper usage • Explore options to increase the proportion of carbon neutral paper, or other lower emissions options, which is purchased by Council. 	70 tCO2-e annual reduction	<p>Investigate 22/33</p> <p>Costs implications unknown.</p> <p>Subject to future budget approval if there is a cost increase.</p>	<p>Lead: Sustainability</p> <p>Support: ICT, Communications</p>
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6.3 Priority 3 Actions: Carbon offsets and drawdown

Priority 2 Actions: : Reduce indirect emissions such as from purchased goods and services, waste and events.				
No	Action Description	Benefit	Cost/timeline	Who
3.1	<p>Continue to buy offsets required to achieve carbon neutrality</p> <p>The quantity of offsets purchased each year will be reduced, subject to new Scope 3 emissions being added over time, reflecting Council's success in reducing 'gross' emissions reduction. Aim for 40% reduction by 2025 based on 2020 emissions.</p> <p>Seek to drive demand and consider purchasing 'higher quality' including nature-based offsets which will support drawdown, based on a well-researched and considered policy position to be considered by Council.</p>	<p>5,000 tCO₂-e net emissions.</p> <p>carbon neutral certification.</p> <p>Leadership and reputation demonstrating operational emissions reductions.</p>	<p>\$20,000 p.a. (2021).</p> <p>Potentially rising to up to \$100,000 p.a. for all 'highest quality' offsets</p> <p>Gradual reduction to zero by 2030.</p> <p>Likely higher cost if nature-based offsets purchased – subject to policy position and budget bids.</p>	<p>Lead: Sustainability</p>
3.2	<p>With global demand projected to increase significantly corresponding low additional supply of quality offsets, this is projected to lead to significant price increases. We will consider innovative opportunities to partner and lead local offsetting opportunities where the projects have additional co-benefits.</p> <p>Investigation to including mechanisms that could lead to contractor, local business, and broader community 'buy-in', and can support the goal of zero net emissions in the Yarra community by 2030.</p>	<p>Subject to future research.</p>	<p>Costs unknown - Subject to future research.</p> <p>Ongoing.</p>	<p>Lead: Sustainability</p>
3.3	<p>Explore the potential of carbon drawdown opportunities</p> <p>Council will increase engagement with other councils and organisations to ensure we are up to date with the latest drawdown opportunities within our municipality and at a regional level. We will seek out opportunities to participate in innovative trials and partner with others to accelerate implementation of larger scale projects.</p>	<p>Leadership. Reduced purchase of offsets.</p>	<p>Within existing resources.</p> <p>Future projects subject to research future budget bids.</p>	<p>Lead: Sustainability</p>

7 Monitoring and Evaluation

To ensure Council is tracking in line with the commitments documented within this Roadmap, the Sustainability Team will undertake an annual review of progress against actions and the Roadmap towards achieving zero emissions by 2030.

The annual review will be completed on a financial year basis with a monitoring and evaluation summary completed by September / October each year to include updated annual emissions inventory changes, and to support informing budget bids where this may be required.

Where actions are found to be slipping behind schedule or not delivered, these will be reviewed with key stakeholders to ensure these can be progressed as far as feasible.

A mid-point report update will occur in 2025-26 and will include full update of actions based on updated data and available technology and new and emerging issues.

8 Appendix 1 – Relevant Climate Emergency Plan Actions

CEP Action No.	Action Description in Climate Emergency Plan	Resourcing	Who
Strategic Priority 2: Accelerate renewable energy, zero carbon buildings and efficient operations			
2.5	<p>Ensure all new Yarra Council buildings are zero-net emissions in construction and operation by:</p> <ul style="list-style-type: none"> • Setting strong design standards in an updated ESD (Environmentally Sustainable Design) Buildings Policy to ensure new Council buildings demonstrate environmental sustainability and climate resilience principles throughout design, construction and operation • Eliminating the use of gas, maximising solar energy generation and battery storage, and powering buildings with 100% renewable energy • Incorporating natural cooling and insulation such as green walls, roofs and landscaping • Utilising partnerships and trialling new and emerging technologies 	Additional projects subject to annual capital budget processes.	Lead: Sustainability, BAM
2.6	<p>Ensure all existing Yarra Council buildings are highly efficient and zero emissions by:</p> <ul style="list-style-type: none"> • Progressively transitioning facilities off gas, focusing on: <ul style="list-style-type: none"> - All sites with relatively simple gas systems (i.e. hot water systems and domestic-type heating) being transitioned off gas by the end of 2022 (30 of 38 sites) - Sites with highly complex, building integrated gas systems (i.e. leisure centres and town halls) to be off gas by 2030 where feasible • Ensuring all Council buildings’ roof space is maximised with solar panels by the of end 2022, including: <ul style="list-style-type: none"> - Provision for solar capacity beyond site electricity usage (where roof space allows) to feed additional renewable electricity into the grid - Use of integrated battery storage where daytime electricity usage is low - Investigating the use of micro-grids or other innovative technologies 	<p>Actions are subject to budget processes. Indicative allocations would be: First stage of capital works: \$855,000. (\$355,000 for going off gas and \$500,000 for building upgrades)</p> <p>Second stage of capital works: \$320,000 for solar</p> <p>As above.</p>	Lead: Sustainability, BAM

CEP Action No.	Action Description in Climate Emergency Plan	Resourcing	Who
	<ul style="list-style-type: none"> - Provision of solar panels on community-used Council facilities • Implementing best-practice energy efficiency and building optimisation by: <ul style="list-style-type: none"> - Utilising smart control and monitoring technologies to operate buildings at the highest possible energy and building performance standards - Identifying and investing in priority building energy efficiency upgrades, and ensure energy efficiency outcomes are factored into all building project works. 		
Strategic Priority 3: Create a climate-adapted city			
3.4	<p>Ensure climate resilient and ecologically healthy parks, reserves and green spaces by:</p> <ul style="list-style-type: none"> • Adapting management practices and managing for diversity to ensure our landscapes, parks and reserves are resilient in the face of a changing climate • Partnering with other landholders and government agencies to enhance habitat, canopy cover, carbon drawdown potential, and connectivity between ecological communities • Engaging with and drawing from Indigenous cultures and traditional knowledge to assist in managing land as our climate continues to change 	Proposed resources in Nature Strategy.	<p>Partners: Open Space Services, Open Space Planning and Design, Biodiversity, Urban Design, Urban Agriculture</p>
3.6	<p>Improve the climate resilience of Council’s assets, such as buildings, roads and drainage through:</p> <ul style="list-style-type: none"> • Enhancing road design and construction for climate outcomes, including identifying opportunities for lower embodied energy and recycled content • Investigating and trialling smarter and integrated asset management technologies • Updating Council’s ESD Buildings Policy to ensure our buildings are adapted to future climate impacts (for example, withstand increased rainfall, back-up power for critical buildings) 	<p>New capital projects subject to annual budget processes.</p> <p>Council’s ESD Buildings policy will be updated in year 1 within existing resources.</p>	<p>Lead: City Works, BAM, City Lab, Traffic, Sustainability</p>

CEP Action No.	Action Description in Climate Emergency Plan	Resourcing	Who
	<ul style="list-style-type: none"> Partnering with neighbouring councils and regional alliances to improve cross-border issues, such as flooding and tree corridors 		
3.7	<p>Embed climate resilience into Council’s strategies, policies and decision-making processes:</p> <ul style="list-style-type: none"> Ensure new and updated policies, plans and strategies consider climate-related risks and plan for climate resilience Plan for intensifying climate impacts when reviewing key plans for heatwaves, extreme weather and emergency responses Continue to engage management and staff around the climate emergency and support staff to deliver climate responses as part of their roles Incorporate climate adaptation considerations into future Asset Management Plans and associated Project Implementation Plans for Council assets Continuing to ensure all new design works are assessed using climate adaptation considerations through our Green Infrastructure Guidelines, Climate Adaptation Guidance Tool and Quadruple Bottom-Line Tool (QBL) Stay abreast of adaptation information and technologies and periodically review our approaches to climate adaptation 	Within existing resources.	<p>Lead: Sustainability</p> <p>Support: Health Safety and Risk, Various units across Council</p>
Strategic Priority 4: Transition to zero emissions transport			
4.5	<p>Support the transition of Yarra Council’s fleet to zero emission vehicles and low emissions vehicles including:</p> <ul style="list-style-type: none"> Converting Council’s entire fleet to zero emissions by 2025, subject to availability of suitable vehicles and charging infrastructure/capability Converting Council’s diesel fleet (i.e. tipper trucks) to electric as soon as possible Converting Council’s bus fleet to electric by 2023 Ceasing purchase of new diesel-powered utes until practical electric vehicles enter the market 	Subject to annual budget processes.	<p>Lead: City Works</p> <p>Support: Procurement, Sustainability</p>

CEP Action No.	Action Description in Climate Emergency Plan	Resourcing	Who
	<ul style="list-style-type: none"> • Progressively switching to electric or other zero emissions vehicles at the time of renewal where possible, utilising full lifecycle cost budgeting rather than purchase price • Utilise hybrid options, such as the efficient Yaris hybrid, as a transitional technology where zero emissions vehicles and charging infrastructure are not practical. Phase out non-hybrid petrol driven passenger vehicles by 2022 • Reducing vehicles and their usage through a range of organisational and technical solutions including active transport, online meetings and remote monitoring. Use of telematics will allow Council to better understand the opportunities. • Ensuring Council's service delivery contractors transition to zero emissions vehicles as quickly as possible (aim for 2026), including street sweeping and kerbside waste collection vehicles • Participating in sector-leading pilots and trials for new vehicles or zero emissions fuel opportunities, such as using onsite solar and battery storage to power council and contractor electric vehicles • Being a community leader in staff travel planning and travel behaviour change. 		
Strategic Priority 5: Move towards zero waste and conscious consumption			
5.4	<p>Apply circular economy and lifecycle approaches in Council business</p> <ul style="list-style-type: none"> • Embed approaches into procurement and management of Council's assets, goods and services (for example, design-out resource use, minimise inputs, maximise resource recovery, reduce residual waste and carbon emissions and buy recycled products). 	Within existing resources.	<p>Lead: City Works</p> <p>Support: Advocacy and Engagement, Waste Minimisation, Sustainability</p>