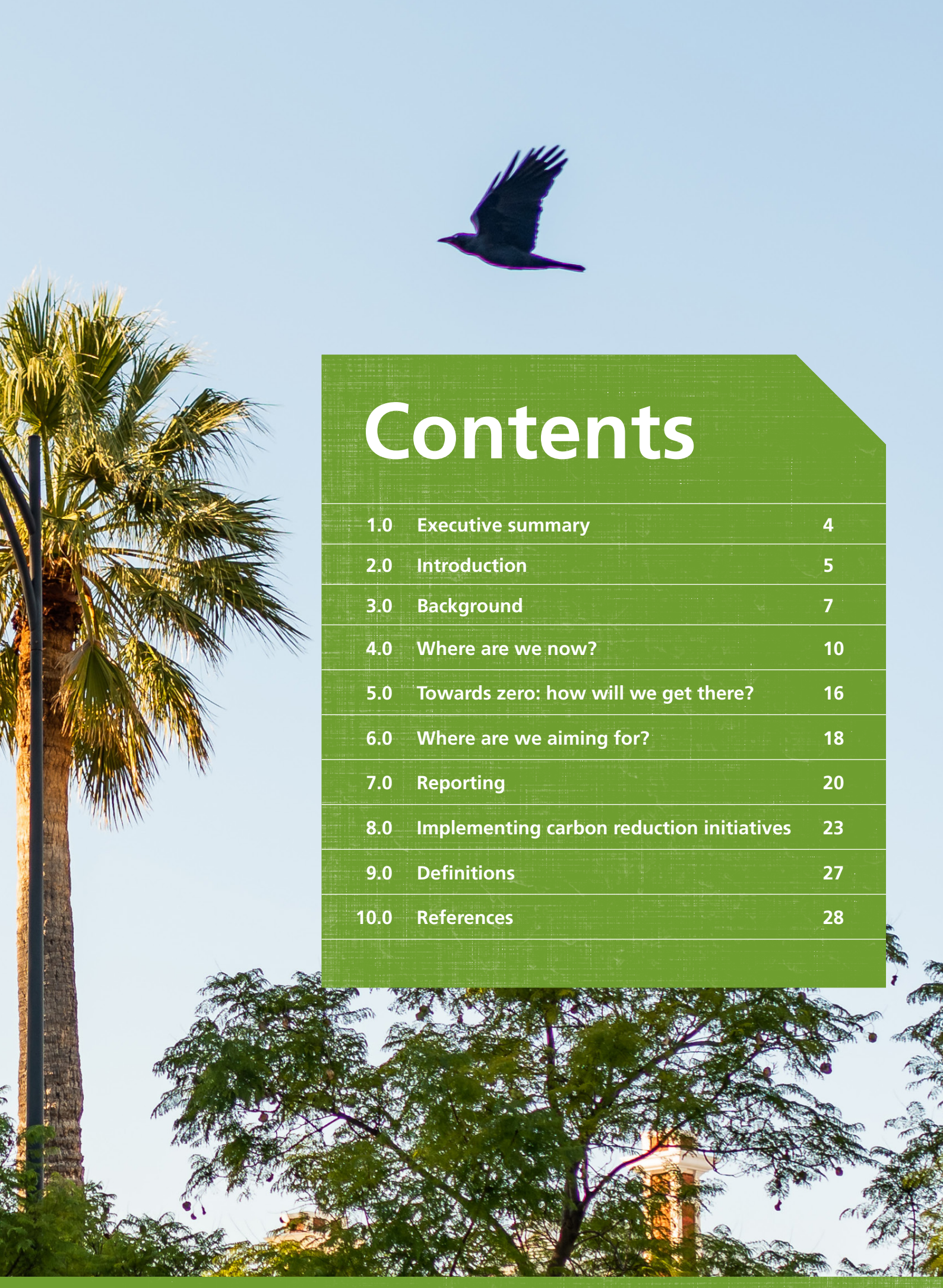
CITY OF SUBIACO

Corporate Carbon Reduction Plan

2020 – 2030



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Executive summary

As a signatory of the Western Australian Local Government Association's (WALGA) *Climate Change Declaration*, the City of Subiaco acknowledges that climate change is occurring, and that greenhouse gas emissions from human activity are the cause. The City recognises that urgent action is needed to halt the worst effects of climate change on the environment and our community, and that local government has an important part to play in reducing greenhouse gas emissions.

The City's *Strategic Community Plan 2017–2027* (SCP) commits the council and the community to working towards a sustainable future by taking proactive and innovative steps in its approach to climate change, particularly regarding resource conservation, recycling, and green energy. The SCP states that:

"...sustainability, in all its forms, is at the core of the community and underpins the City's operations".

In 2016, Council endorsed the City's *Sustainability and Resilience Strategy 2016–2021* (SARS). The *Corporate Carbon Reduction Plan 2020–2030* (CCRP) is a key action of the SARS, with the primary purpose of providing targets and actions to reduce greenhouse gas emissions from the City's operations.

Though this is the first corporate carbon reduction plan produced by the City of Subiaco, the City has already begun its transition to low carbon operations through the installation of solar panels and energy efficient systems, improvements in fleet procurement, a staff sustainable travel allowance, and increased efficiencies in water use and waste. By following the actions outlined in this plan, the City can expect to steadily reduce its emissions over the next ten years.

The City is dedicated to meeting the following six targets in pursuit of reducing the greenhouse gas emissions from its operations:

- **Target 1:** Obtain and maintain certified carbon neutral status 2020–2030
- **Target 2:** 100 per cent renewable energy by 2025
- **Target 3:** Energy consumption reduced by 20 per cent by 2025
- **Target 4:** Fleet vehicles meet Climate Change Authority's standard by 2025
- **Target 5:** Reduce operational greenhouse gas emissions by 45 per cent by 2030
- **Target 6:** Transparency and reporting

The *Corporate Carbon Reduction Plan is consistent with the National Carbon Offset Standard for Organisations* (NCOS-O)[1], and will provide a basis for the City to be certified as carbon neutral by June 2020. Through rigorous annual reporting, the City will maintain this status while increasing efficiencies and reducing the need for carbon offsets to 2030. It incorporates an annual reporting framework that allows for updates to be made to carbon reduction actions in order to reflect current City priorities, completed targets, and changes in the energy sector and policy context.

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1 National Carbon Offset Standard for Organisations: *http:*//environment.gov.au/system/files/resources/d24bb1e1-3c93-4a78-98b0-61a8e506821c/files/ncos-organisations.pdf

Introduction

The City of Subiaco recognises its obligations to the community of Subiaco, and beyond, to do what it can to take action on climate change. The City owns and operates 39 buildings and 30 parks and reserves; maintains 113 kilometres of roads and 140 kilometres of footpaths and bikepaths; hosts a year-round schedule of community events; provides weekly waste collections for residents; and employs 308 staff. The impact of all these operations is significant, producing the equivalent of over 3,000 tonnes of carbon dioxide each year.

The City is dedicated to reducing the emissions from its corporate operations, and has already taken action to improve the efficiency of buildings, install onsite renewable energy generation and transition to more fuel efficient fleet vehicles. By implementing the *Corporate Carbon Reduction Plan 2020–2030*, the City will continue to improve the efficiency of its operations, reducing emissions wherever possible and offsetting the remainder. In this way, the City will obtain and maintain certified carbon neutral status from 2020.

Background

The greenhouse effect is the term used for the earth's atmosphere retaining a level of heat energy, mostly derived from the sun. This effect is crucial for life on Earth, but the amount of heat energy needs to remain within a narrow band to maintain a climate that is conducive to a healthy ecosystem and sufficiently benign weather patterns for human settlements to flourish as we have known them.

For several decades, the scientific community has been issuing warnings that the earth is heating up at an unprecedented rate, with the additional energy causing the climate to change. This is increasing both the rate and scale of extreme weather events. Overwhelming scientific consensus considers the greenhouse gases released through human activity to be responsible for this climatic change. Scientists now warn that the system is tipping into a phase of dramatic variation, with damaging weather events and serious impacts on agriculture and the global ecosystem. Reducing the amount of greenhouse gases released by human activities could, however, slow and even reverse climate change.

Context

The Paris Agreement, which was ratified by Australia in November 2016, sits within the United Nations Framework Convention on Climate Change[2]. The Agreement commits signatories to significantly reduce their greenhouse gas emissions by 2030 in order to keep global temperatures to less than two degrees above pre-industrial levels. For Australia to meet its commitments under this agreement, local governments must show leadership in the communities that they serve by actively working to reduce emissions.

What are other cities doing?

Local governments across Australia are using emission reductions plans such as this one to greatly reduce the carbon footprint of their operations.

Currently, Australian cities that are certified carbon neutral include:

- City of Melbourne
- City of Sydney
- City of Yarra
- Moreland City Council

The City of Fremantle has been carbon neutral since 2009, however does not maintain certification.

2 The Paris Agreement: *https://unfccc.int/process/the-paris-agreement/what-is-the-paris-agreement*

What is changing in the energy sector?

There are new opportunities that mean that ideas that may have seemed impractical even in recent years, now merit review. For example:

- Reductions in the cost of solar panels have made electricity generated onsite the cheapest option in most cases, even allowing for the initial capital cost.
- Large renewable energy projects are making competitively priced green electricity available through the grid. Several of the City's facilities are large enough electricity users that suppliers can be sought on the electricity market, allowing contracts to be negotiated to be more cost effective, allow for changes in energy usage profile, and include renewable energy.
- Electrical appliances have become cost effective in many situations where gas was once considered the cheaper option.
- Energy auditing and efficiency upgrades have matured as services within the facility management sector and can be used to provide effective, site-specific advice.

Given these changes in the energy sector, significant reductions in carbon emissions are now possible without increasing operational costs and, in some cases, while achieving savings.

Benefits

There are clear environmental, economic and social benefits to reducing the carbon footprint of the City of Subiaco's corporate operations.

Street lighting	A 70% reduction in carbon emissions in upgraded lamps.
Vehicle fleet	30% reduction in light vehicle and 10% reduction in heavy vehicle emissions.
Utilities	A reduction of 20% in electricity and gas usage from the base line year.
Renewable energy	An additional 56.2 MWh per year of onsite renewable energy.

Figure 1: Benefits of reducing carbon emissions

Environmental

The City recognises the importance of showing leadership wherever possible to support action on climate change, and endorsed the WALGA[3] Local Government Climate Change Declaration[4]. While the impact of the City's efforts to reduce its emissions may be small on a global level, there are nevertheless local environmental benefits of implementing the actions outlined in this plan, including reductions in:

- Local pollution from vehicle exhausts and power generation;
- Water use within our buildings, parks and reserves; and
- Electricity and gas used in the City's facilities.

3 Western Australian Local Government Association: *https://walga.asn.au/*
4 WALGA Climate Change Declaration: *https://walga.asn.au/Policy-Advice-and-Advocacy/Environment/Climate-Change*

Economic

The economic benefits from working to reduce the carbon footprint of the City's operations include:

- Cost savings through increased efficiencies from improved processes, equipment, machinery and fleet vehicles;
- Protecting the City against price increases for utilities and fuel; and
- Preparing the City for a price on carbon, either via regulatory or market mechanisms.

Social

The social benefits stemming from this plan include:

- Supporting staff to use healthy, active modes of transport for work-related travel and commuting, with associated financial benefits; and
- Contributing to a healthier local environment by reducing emissions from vehicles and energy production.

Strategic alignment

This plan aligns with several important City documents, including the *Strategic Community Plan 2017–2027*, *Corporate Business Plan 2015–2019* and *Sustainability and Resilience Strategy 2016–2021*. The plan also complements the *Urban Forest Strategy 2018–2022* and the *Environmental Plan 2019–2023*.

Where are we now?

This section explains the current state of the City's emissions profile. The efforts made by the City to increase the efficiency of its operations and reduce emissions at the same time are also documented, and reflect the successful implementation of the *Sustainability and Resilience Strategy 2016–2021*, as well as the other key strategic documents mentioned earlier.

Scope and measurement

This *Corporate Carbon Reduction Plan* uses the NCOS-O to identify which sources will be included in the emissions boundary as well as the strategy for reducing and offsetting those emissions.

Organisations that wish to reduce their greenhouse impacts first need to identify the gases that their operations are responsible for emitting and therefore the focus for their emissions reductions efforts. In this plan, the City of Subiaco takes into account a standard set of greenhouse gases, as shown below in Figure 2.

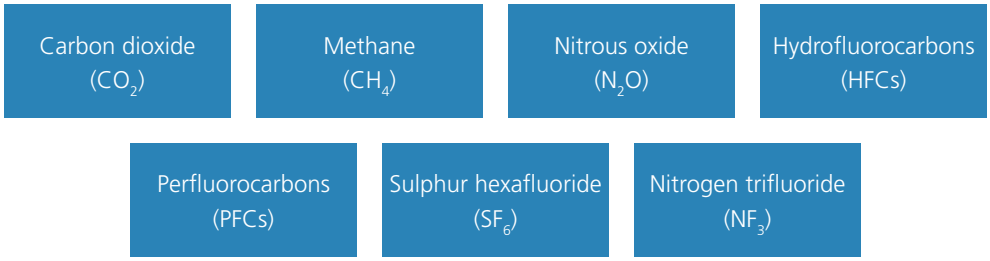

Figure 2: Greenhouse gases taken into consideration by this plan

For ease of measuring the progress of emissions reductions, the included gases are resolved to a CO_2 equivalent emission (CO_2e). This combines the potency of each gas in terms of its impact on the greenhouse effect with the longevity of its presence in the atmosphere.

Emissions boundary

The emissions boundary determines the sources of greenhouse gases that this plan takes into consideration, and therefore what will be reported upon annually by the City. As per the NCOS-O, the emissions sources that define the emissions boundary are split into three categories, based on the level of control an organisation has over their production.

- **Scope 1:** emissions that are owned or controlled by the reporting organisation.
- **Scope 2:** emissions from energy purchased by the organisation.
- **Scope 3:** emissions that indirectly result from organisational activities.

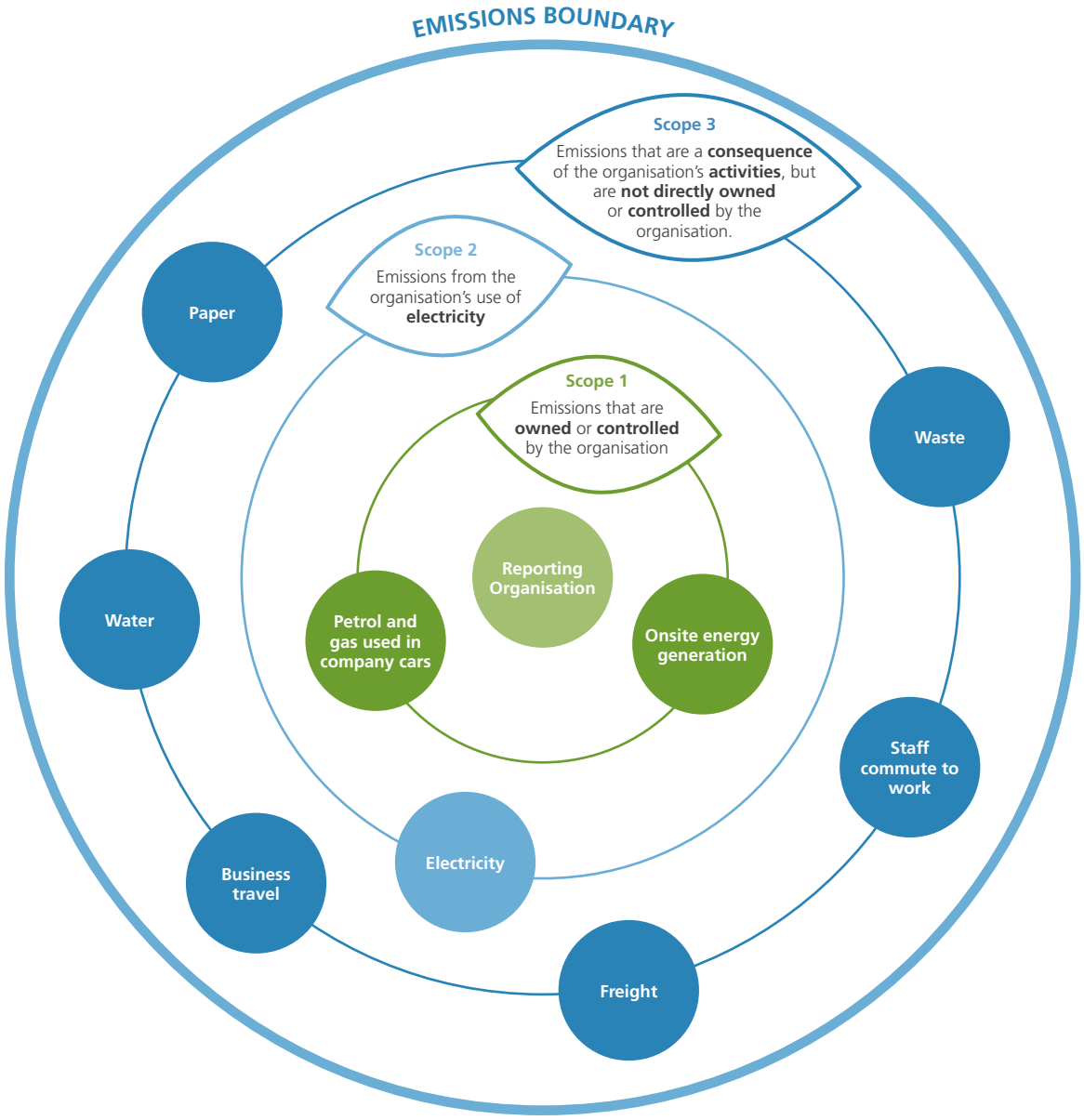

Figure 3: Typical examples of Scope 1, Scope 2 and Scope 3 emissions[5]

For this plan, the City's emissions boundary covers:

All Scope 1 emissions, including:

- Gas, reticulated or bottled, consumed in City operated facilities.
- Fuel use in City fleet vehicles, as well as sub-contractor vehicles where the City has direct operational control.
- Fugitive emissions from refrigerated cooling systems.

5 Diagram from *National Carbon Offset Standard for Organisations* (Commonwealth of Australia, 2017, p. 12)

All scope 2 emissions, including:

- Electricity use in City facilities.
- Electricity use for City-owned public lighting.
- Electricity use for pumps and other infrastructure.
- Electricity use in Western Power operated street lighting that is charged to the City.

Scope 3 emissions from electricity consumption and fuel use, including:

- Indirect emissions from the extraction, production and transport of fuel burned at generation.
- Indirect emissions attributable to the electricity lost in delivery in the transmission and distribution network.

Other Scope 3 emissions, including:

- Emissions from corporate travel including flights, public transport and taxis, rental vehicles and accommodation.
- Emissions from corporate waste.
- Emissions from the consumption of office paper.
- Emissions from corporate consumption of water.
- Emissions due to operations where the City occupies space as a tenant.

The following diagram shows the breakdown of emissions sources for the City of Subiaco.

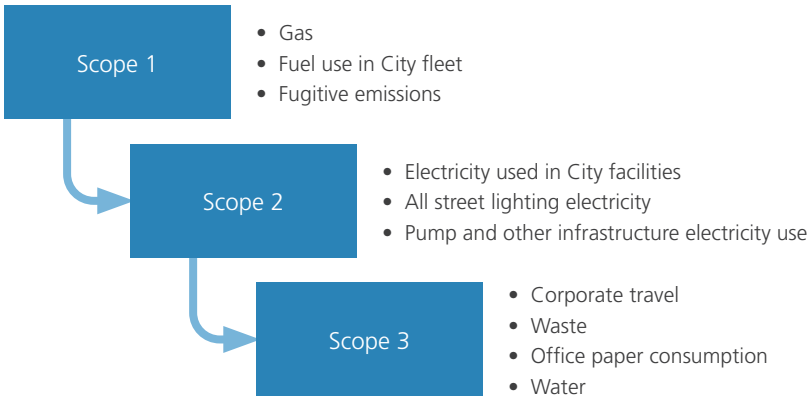

Figure 4: Sources of greenhouse gases included in City of Subiaco emissions boundary

Broader emissions

The NCOS-O states that emissions sources should only be included if they are relevant. The relevance of emissions to an organisation's carbon footprint includes factors such as the scale of the emissions source, the ability of the organisation to control the source, and whether the source is from an activity that is typically undertaken by an organisation of that type. Under the NCOS-O, emissions sources can be excluded if they are not material[6], even if they are relevant, as this generally indicates their impact is very small relative to the overall footprint.

Examples of emissions sources that will **not** be included in the City's carbon account are:

- Staff commuting.
- Food and catering.
- Postage and freight.
- Stationery (beyond office paper).
- IT and telecommunication services.
- Buildings owned by but not occupied by the City.

The City acknowledges that there is a wider set of emissions that result from its operations, but which is in the operational control of other organisations. The City will seek to show leadership and influence these organisations as opportunities arise, such as through procurement supply chains, banking and investment, as per its commitments under the *Sustainability and Resilience Strategy 2016–2021*.

Current emissions profile

The City of Subiaco has established the 2018–19 Financial Year as the reference year for this Plan. Carbon emissions in this year were dominated by use of electricity from the grid.

NOTE: Data and measurement of some emissions sources is a work-in-progress. The emissions for 'Flights' and 'Other' in the chart below are based on typical figures from other cities and will be updated as data collection is finalised.

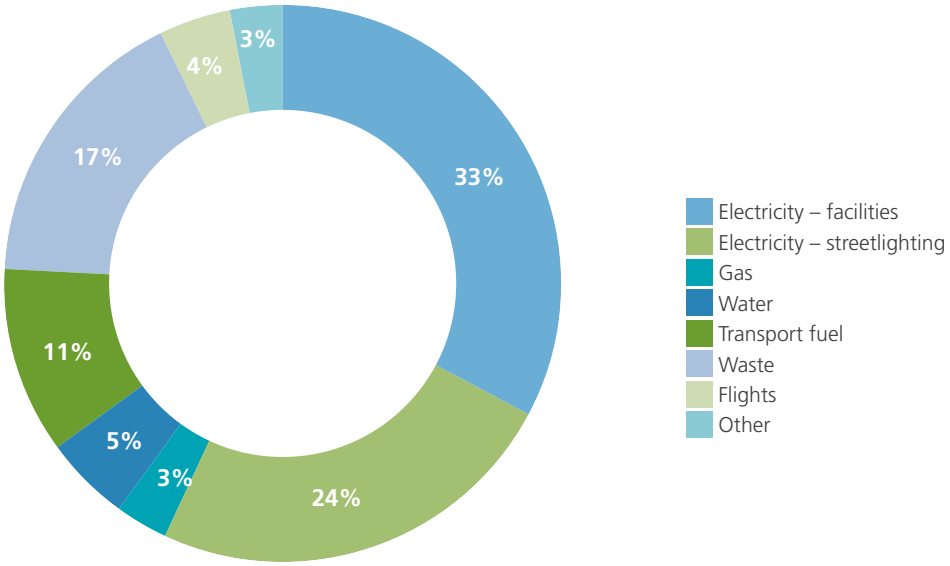

Figure 5: City of Subiaco emissions profile (2018–19 financial year)

6 Materiality refers to "[a]n emissions source that constitutes 1 per cent or more of the total carbon account…" - *National Carbon Offset Standard for Organisations*, (Commonwealth of Australia, 2017, p. 10)

City corporate emissions were already tending downwards from 2015–16 to 2018–19 financial years. This is partly due to installation of solar photovoltaic systems on City facilities, and partly because electricity from the grid in WA has become slightly less carbon intensive due to the national Renewable Energy target (RET) requiring the electricity retailers to include a minimum percentage of renewable energy in the grid supply.

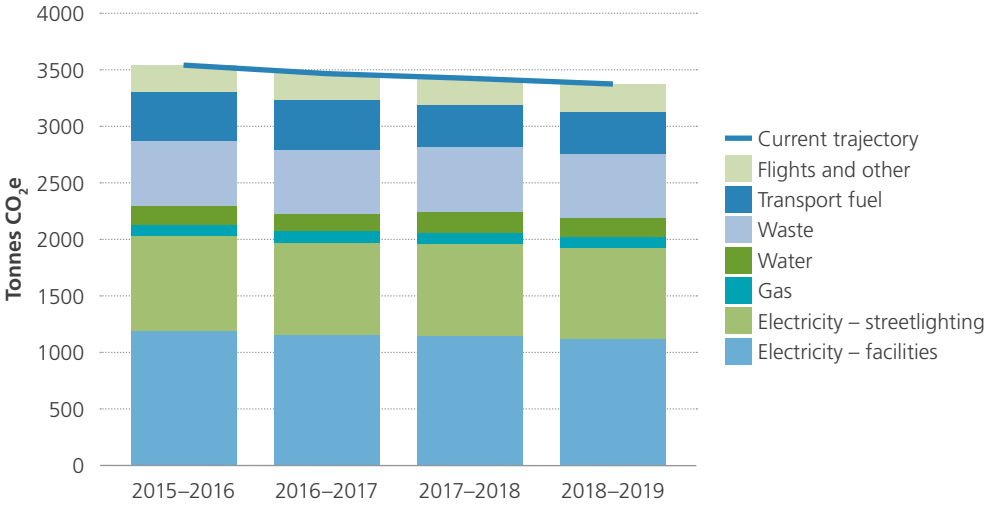

Figure 6: City of Subiaco – Recent emissions trend

Completed and ongoing city programs

While this is the first carbon reduction plan the City has produced, action to reduce energy use and associated carbon emissions has been ongoing for several years. Included below are some recent initiatives by the City.

Electricity and lighting

- Since January 2019, emissions from the City's largest electricity using sites have been offset as part of a new supply contract, equating to around 30 per cent of the City's total emissions.
- 160 LED street lights have been installed across the City since 2015.
- LED lighting upgrades to halogen downlights in Administration Centre were completed in October 2015.
- LED lighting in the pool area at Lords Recreation Centre was completed in November 2017.
- 135 LEDs lights were installed to replace halogen lights on Lords sports courts one to ten in April 2017.
- LED lighting for the Lords carpark was completed in January 2015.
- Solar heating of the pool and hot water system at Lords was completed in January 2015.
- An energy monitoring system giving real-time electricity use and generation updates was installed at Lords in 2012.

Solar

The City now has a total solar power generation capacity of 162.78kW spread across several sites, as outlined below.

Table 1: Current solar installations on City of Subiaco facilities

City site	PV System Size (kW)	Installation date
Lords Recreation Centre	100	June 2017
Subiaco Library	31.9	20kW installed in 2012, 11.9kW added in 2017
Rosalie Park Store room	10.88	June 2017
Subiaco Community Centre	10	May 2015
Tom Dadour Community Centre	10	June 2015
Total	162.78	

Transport and fleet

- From 2016–17 to 2017–18 the City has reduced its fleet by eight vehicles and lowered diesel usage by 16,706L or 14 per cent.
- In 2017, three e-bikes were purchased by the City for the use of staff as an alternative to fleet vehicles for City business.
- Transperth SmartRider cards are available to staff for off-site meetings.

Paper consumption

Several changes to IT systems were made in 2017–18 that resulted in reductions in paper consumption:

- Online lodgement of building and development applications.
- Staff printing requiring a swipe card.
- Use of tablet devices for executive and management staff to reduce printing of agendas and reports.
- Use of tablet devices for asset management data collection in the field.
- Digitising staff leave approval processes.

Water

- The City of Subiaco has been endorsed as a Waterwise Council by the Department of Water and the Water Corporation since August 2010, achieving Gold status in 2019.

Towards zero: how will we get there?

The City will become certified carbon neutral in the 2019-20 financial year by purchasing certified carbon offsets equivalent to the emissions calculated for that year and undertaking the external auditing process required for certification. The City will then work through this plan to reduce total emissions so that the amount requiring offsetting in 2029–30 is 40 per cent less than in the 2018–19 financial year.

The largest impacts on total emissions produced will come from street lighting upgrades and the procurement of zero-carbon, renewable energy through the grid. All emissions sources that are in the City's control will be addressed directly, while the City will also use its influence to encourage suppliers and other organisations to seek to reduce their emissions.

Changing the city's emissions profile

The following chart (Figure 7) shows the forecast City of Subiaco emissions profile over the term of the plan. The target dates for carbon neutral certification and 100 per cent renewable energy in City occupied facilities are labelled, and the chart shows a trajectory based on the current emissions trend, slowly reducing, contrasted against the emissions predicted as the plan is implemented. The quantity of offsets required for carbon neutral status is also shown, reducing in line with the progress of the plan.

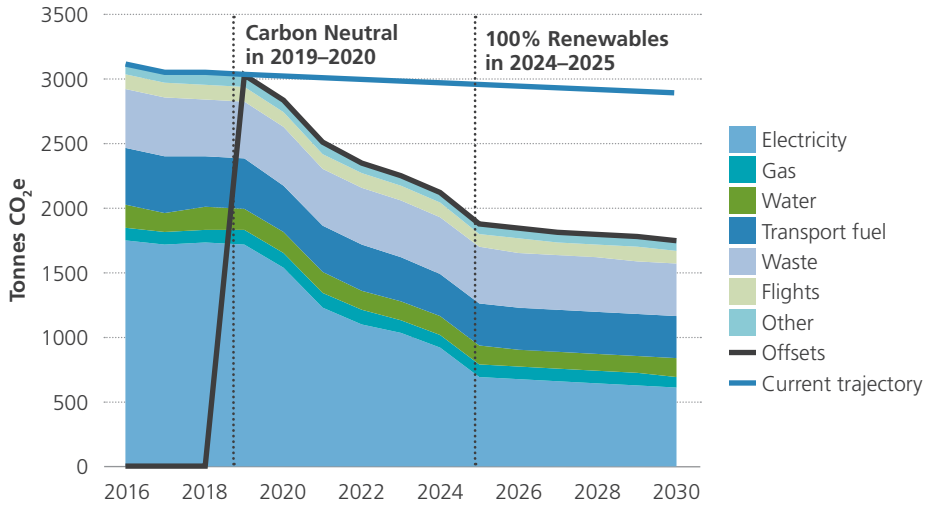

Figure 7: Forecast emissions profile – *Corporate Carbon Reduction Plan* targets versus current trajectory


17520
EMERGENCY EXIT
2580
Transperth

Where are we aiming for?

Targets

The City has set the following targets to reduce its emissions over the course of this plan:

Target 1: Obtain and maintain certified carbon neutral status 2020–2030

The City of Subiaco will show its commitment to emissions reduction by purchasing carbon offsets equivalent to all operational emissions, ongoing from the 2020–21 financial year. In doing so, the City will achieve zero net corporate greenhouse gas emissions and through assessment against the NCOS-O, become formally accredited under the Australian Government's Carbon Neutral program. In addition to recognition that the City is offsetting its carbon footprint, carbon neutral status commits the City to continuing its efforts to actively minimise emissions. This means that as the City's emissions profile improves, fewer funds will be needed to offset its remaining emissions.

Target 2: 100 per cent renewable energy by 2025

The City of Subiaco will use renewable energy for all electricity in City facilities by 2025 [7], with sources to be prioritised as follows:

1. Renewable energy produced and used on a City site.
2. Renewable energy produced on and then shared between City sites.
3. Renewable energy from a nearby project that is in part enabled by the City being a customer.
4. Renewable energy from an accredited source.

The following chart (Figure 8) shows the City's 'fuel mix' – the sources of energy to power City facilities that will change over the term of this plan. Energy use is trending slightly up, while, as seen in the previous charts, total emissions have been trending down. This difference is mainly due to the reduction in carbon intensity of WA grid electricity as more renewable energy systems are connected, as well as the impact of the City's own PV systems having been installed.

7 This target has been set in response to the action "Adopt progressive targets for renewable energy generation" on page 14 of the City's *Sustainability and Resilience Action Plan 2016–2021*

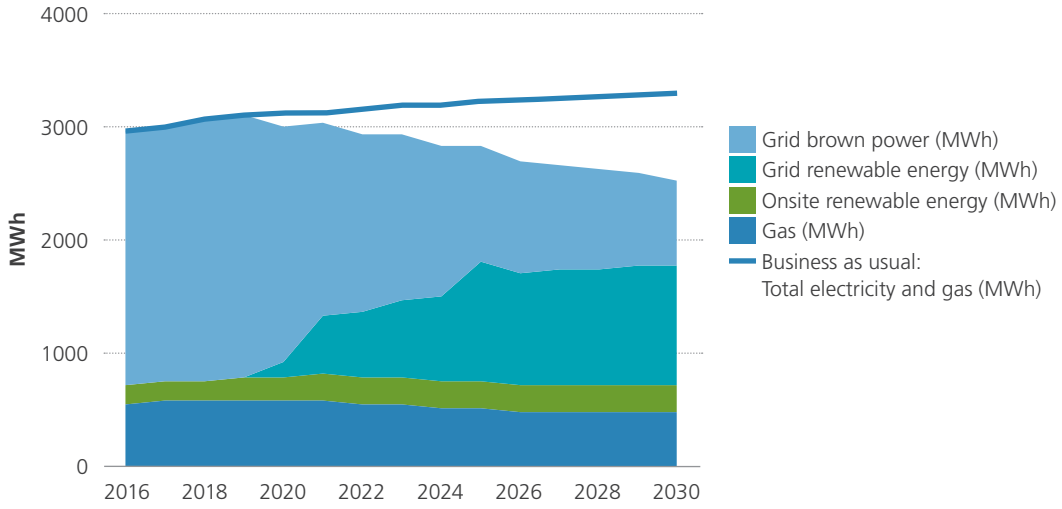

Figure 8: City of Subiaco – electricity and gas profile 2016 to 2030 following this plan

Target 3: Energy consumption reduced by 20 per cent by 2025

The City of Subiaco aims to reduce energy consumption in its facilities by 20 per cent by 2025[8] through:

- Efficiency: reducing energy consumed in City systems and services.
- Conservation: understanding how behaviour change and planning can reduce energy consumption.

Target 4: Fleet vehicles meet Climate Change Authority's standard by 2025

The City will pursue the Climate Change Authority's standard that new light vehicles be required to achieve carbon dioxide emissions of 105 g/km in 2025 [9] as an average for the light vehicle fleet.

Target 5: Reduce operational greenhouse gas emissions by 45 per cent by 2030

The City of Subiaco aims to reduce corporate greenhouse emissions by 45 per cent by 2030. This plan provides the pathway for the City to achieve best practice in reducing energy and emissions to 2030.[10]

This target covers emissions from all major sources including:

- Stationary energy use, such as electricity and gas use in city facilities.
- Electricity use for street lighting.
- Transport fuel use, such as in the city fleet vehicles.
- Disposal of waste from city operations.
- Water consumption.

Target 6: Transparency and reporting

The City will report annually to the City of Subiaco Council on progress towards the above targets, and maintain records in such a way that they are easily accessible for auditing and accreditation as carbon neutral from 2020.

8 Target set based on achieving the recommendations of the Australian Government's 2015 Commercial Building Disclosure program review: *http://cbd.gov.au/sites/prod.cbd/files/CBD%20program%20review%20final%20report.pdf*

9 Climate Change Authority targets standard: *http://www.climatechangeauthority.gov.au/reviews/light-vehicle-emissions-standards-australia*

10 As per City of Subiaco *Sustainability and Resilience Action Plan 2016–2021*

Reporting

Internal processes to accurately capture data relating to emissions generation will be developed, allowing the City, community and external auditors to easily track emissions reduction progress. To facilitate this, a custom-made reporting tool will be used to record and track progress, forming the basis of reports to Council on the City's progress towards carbon neutral status to 2030.

Accreditation

Carbon neutral certification against the NCOS-O will be sought through the Australian Government's Carbon Neutral Program [11]. The following diagram (Figure 10) from the NCOS-O illustrates the process.

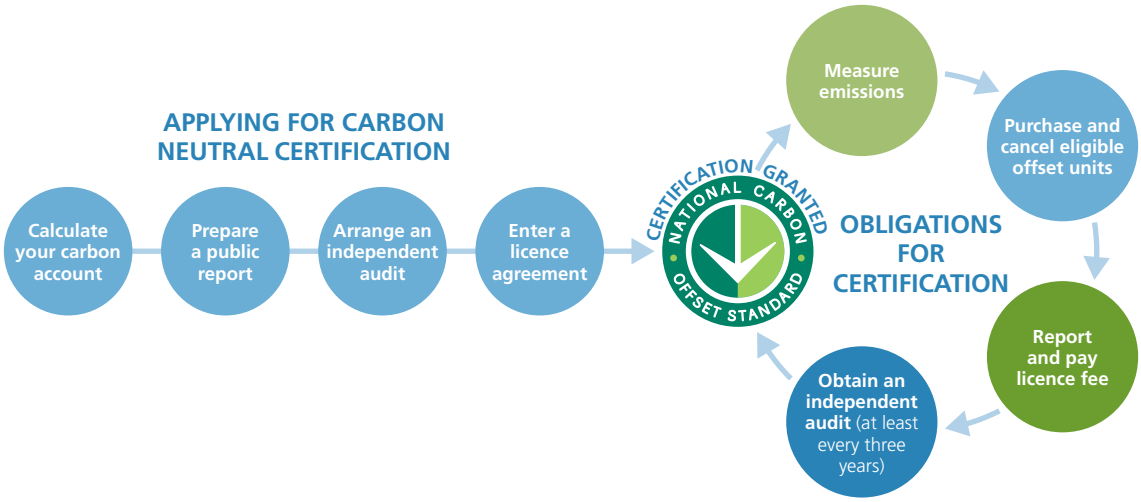

Figure 9: Applying for and maintaining Carbon Neutral certification[12]

An application for carbon neutral certification will be made by contacting the Department of the Environment and Energy (DEE). Each year, the application will include:

- Carbon account for the base year.
- Public report.
- Independent audit report of the above documents.

Details of the certification, including the public report, will be published on the DEE website.

11 Australian Government's Carbon neutral Program: *http://www.environment.gov.au/climate-change/government/carbon-neutral/*

12 Diagram from *National Carbon Offset Standard for Organisations*, Commonwealth of Australia, 2017, p. 21

Review and opportunities

This plan will be updated in 2025 and will include a review of emissions sources to ensure they remain appropriate, and a summary report on progress since the last review.

Revising the plan will allow the City to adapt to the dynamics of the energy sector and reflect changes in City priorities. Opportunities for further reductions over the course of this plan include the following avenues.

Energy storage

Battery systems have the potential to greatly increase the value of a photovoltaic (PV) system. At the current cost of storage systems, however, they are generally not financially viable for buildings that have high daytime loads, such as the office buildings utilised by the City of Subiaco that use the majority of their PV system output as it is produced.

City facilities with large PV systems installed will be monitored for a minimum of two years to produce interval energy use data. This information can be used to model the viability of an energy storage system at that location.

Electric vehicles

Electric vehicles (EV) are an emerging option that, combined with green electricity sources, achieve dramatically lower emissions compared with traditional internal combustion engine vehicles. The City will continue to take a pro-active stance on EVs through identifying opportunities for inclusion in its fleet, including heavy vehicles and plant machinery. For example, EV rubbish trucks are being adopted in Europe and New Zealand and may soon be cost effective in Australia. Increased availability of charging stations will further support EV uptake.

Alternatives to fossil fuels

Hydrogen has been on the edge of the renewable energy expansion and may be the answer to powering heavy vehicles where batteries cannot achieve suitable energy density.

Bio-fuels that were once regarded as the solution for more sustainable transport fuels have lost favour as the economics have been better understood, and as the need for using arable land for food production has regained its primacy.

Microgrids and energy sharing

Microgrids allow for groups of small-scale energy users and producers to trade or share. The approach is slowly gaining some traction in new, largely self-contained developments that include renewable energy systems on site.

The City will monitor developments in this area. Procuring renewable energy from such groups of users may prove cost effective, while also supporting community-based sharing schemes.

Community grants

The intention of this plan is to show leadership in the community regarding action on climate change and to encourage others to take steps toward reducing their carbon footprint. In that spirit the City will explore the possibility of using cost savings from energy efficiency actions to directly support community driven emissions reductions projects in Subiaco.

Regulatory changes

The State Government has been engaged in a review of the Western Australian electricity sector. A possible outcome of this review is opening the electricity market to competition, particularly to smaller electricity users who currently are required to connect to Synergy or, in regional locations, Horizon Power.

The City will monitor these changes and look for opportunities that may arise to increase renewable energy supplies to more City sites. Bundling more accounts into a single contract may enable the City to attract more cost-effective renewable energy tariffs.

Embodied energy and emissions

Embodied energy and emissions are those that resulted from the production of an object or provision of a service. For example, a building has operational emissions from energy use and the other sources covered in this plan, but emissions also result from both the production of the materials that form the building as well as the construction process.

While the NCOS-O does not currently require embodied emissions to be accounted for directly, the City will explore methods to address embodied emissions in new projects as well as in maintenance activities.

Expression of Interest

The City is developing an EOI to test the market for the best mix of renewable energy systems, energy storage, and energy sharing through microgrids that may be physical or virtual. If a feasible proposal is received, this may address a number of the objectives of this Plan to a greater or lesser extent and will impact the review process if implemented.

Implementing carbon reduction initiatives

There are two aspects of implementation of this plan:

1. Actions that directly reduce emissions from City operations.
2. Governance initiatives that will provide a framework within the organisation to support ongoing emissions reductions across all areas.

Both sets of actions and initiatives will work together to meet the targets outlined in this plan.

The following table (Table 2) contains the main tangible actions relating to the implementation of the plan; more detail is provided in an internal working document. The emissions trajectory is shown at four points from the 2018-19 financial year reference over the duration of the plan. Indicative budgets represent total annual expenditure for each project. These will be refined by City project managers as required. Some items do not necessarily require an additional budget as they are proposed changes to process and objectives, rather than new projects.

The governance initiatives described in Table 3 are strategic in nature and will facilitate the emissions reduction actions covered in Table 2. These initiatives create rigorous and transparent systems that will ensure opportunities are not missed to capture emissions reductions and associated co-benefits such as cost savings.

Table 2: Actions to directly reduce greenhouse gas emissions resulting from City of Subiaco operations

Source of emissions	Actions	Budget ($)	Implementation year (FYE)	Reference year 2018-19 (tonnes CO_2e)		Annual emissions (tonnes CO_2e) trajectory			Total Emissions reduction to 2030 (tonnes CO_2e)	Impacts and things to note	Main branch responsible
						2019–20	2024–25	2029–30			
Facilities – electricity	Tariff review Energy conservation Energy efficiency	$27,647	2020-21	1155		1053	853	725	429	Expected reduction of 20% in electricity and gas usage from the base line year.	Commercial Services and Property
Gas	Replacement of gas appliances with electrical where appropriate	Within appliance replacement budget	2020-21	100		104	93	87	13	Expected reduction of 20% in electricity and gas usage from the base line year.	Commercial Services and Property
Public lighting	60% of City owned street lights upgraded by 2030	$210,000 per annum	2020-21	814		817	754	692	122	Expected 70% reduction in carbon emissions in upgraded lamps.	Transport and Infrastructure Development
Water	10% reduction by 2025	Within City's ongoing Waterwise program	2020-21	154		162	145	137	17	Expected 10% reduction in emissions by 2030.	Transport and Infrastructure Development
Transport fuel	30% reduction in light vehicle and 10% reduction in heavy vehicle emissions	Within current fleet budget	2020-21	436		373	334	327	109	Expected 30% reduction in light vehicle and 10% reduction in heavy vehicle emissions. Note in 2020 the City has already acquired several hybrid and fully electric fleet vehicles.	Transport and Infrastructure Development
Waste	Focus on waste minimisation through the Strategic Waste Minimisation Plan	Internal audit from which new programs may be developed	2021-22	571		571	542	513	57	A 10% reduction in emissions by 2030.	Operations and Environment
Other (corporate travel, office paper)	Refer to *Sustainability and Resilience Strategy 2016 - 2021*	No additional cost	2021-22	236		234	215	213	24	A 10% reduction in emissions by 2030.	Transport and Infrastructure Development
Renewable energy – onsite*	Renewable energy systems on City facilities	$82,000	2020-21	141		187	184	170	29	These changes will provide an additional 56.2 MWh per year of onsite renewable energy.	Transport and Infrastructure Development
Renewable energy – from grid*	Allow a premium to source renewable energy from the grid	$21,587 per annum	2020-21	0		101	815	700	700	High consuming, 'contestable' sites are permitted to seek their own power supplier. Contestable sites represent 67% of the City's electricity consumption in non-investment facilities: as of January 2019, these are carbon offset. The State Government is looking to introduce contestability to all electricity connections, probably over the next 5 years.	Transport and Infrastructure Development
Offsets*	Purchase certified offsets equal to measured emissions	$18,050 per annum (in first year – lower costs expected as emissions reduce)	2020-21	0		3019	1891	1745	1745	The City will obtain and maintain carbon neutral status from 2020 through the purchase of carbon offsets, contributing to other social and ecological outcomes in the process. The quantity of offsets required, and the costs associated, will reduce over the life of the plan as operations become more efficient and produce less emissions.	Transport and Infrastructure Development

*These items (also shaded) may be impacted by an Expression of Interest (EOI) request that the City will issue in 2020 to find a more advanced solution that combines renewable energy systems, storage, and microgrids to achieve a zero carbon, green energy supply with the best value to the City.

Table 3: Governance initiatives for emissions reductions

Initiative	Description	Budget ($)	Implementation year (FYE)	Branch responsible
Carbon neutral certification	The City will achieve carbon neutral accreditation through purchasing carbon offsets for all emissions, and becoming certified under the NCOS.	$2,500 per annum	Annually 2020-2030	Transport and Infrastructure Development
Annual carbon emissions report	Annual energy and emissions reporting-based template in this plan, aligned to achieving carbon neutral status.	Within budget	2019/20	Transport and Infrastructure Development
Energy auditing in building audit process	Add energy auditing to the building audit process. Where efficiency projects are recommended, these should be added to the works program along with any other items from the overall Building Audit.	Within budget	2020/21 – 2024/25	Transport and Infrastructure Development / Operations and Environment Services
Investigate opportunities for energy sharing	Expressions of interest are to be sought to develop a feasibility study and business case for sharing onsite renewable energy across City assets.	$25,000	2019/20	Transport and Infrastructure Development / Operations and Environment Services
Subiaco energy check	Create a 'Subiaco Energy Check' process for tradespeople on City sites. Where an item is identified in an energy check, the information should go to the facility manager for further action, and to the sustainability officer for records as part of the Corporate Carbon Reduction Plan reporting.	Within budget	2019/20 – Ongoing	Transport and Infrastructure Development
Equipment energy audits	Energy audit program for pumps and other irrigation equipment.	Within budget	2019/20 – 2024/25	Operations and Environment Services
Develop energy and emissions benchmarks	Work with WALGA to develop energy and emissions benchmarks for City buildings and activities.	Within budget	2019/20	Transport and Infrastructure Development
Energy and sustainability requirements for new projects	For office buildings, or other building types amenable to the following frameworks: • Under $10M: a basic eTool assessment, or equivalent, that provides a benchmark for the project and suggestions for improving energy performance. Results to be reviewed by the project management group and designers. • Over $10M: Green Star 5-star Design and As Built certification, or equivalent such as One Planet Living recognition. • Infrastructure projects over $10M should use the Infrastructure Sustainability tool developed by the Infrastructure Sustainability Council of Australia (ISCA). • Lessons from larger projects will be communicated to City project managers to ensure that all City projects benefit from these processes.	Within budget; component of new project costs	2020/21	Transport and Infrastructure Development
Rewards for efficiency	Introduce energy efficiency and conservation competition between City management units – a reward system for improving efficiency.	Within budget	2020/21	Transport and Infrastructure Development
Corporate Emissions Reduction Plan four yearly reviews	A revision of this plan should be developed every four years to adapt to changing technologies and energy sector context, and to reflect up-to-date City priorities.	$ 10,000 each review	2022/21	Transport and Infrastructure Development
Emissions target for light vehicles	Set target for light vehicle emissions and adjust vehicle selection criteria to achieve target. Introduce based on existing replacement program.	Within budget	20120/21 – 2029/30	Transport and Infrastructure Development

Definitions

Carbon footprint: the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community.

Carbon neutral: reducing emissions where possible and compensating for the remainder by investing in carbon reduction projects (via offset units) to achieve net zero carbon emissions.

Carbon offsets: investments in projects such as tree planting that are calculated to consume carbon dioxide from the atmosphere.

Climate change: generally used to refer to changes to the Earth's climate resulting from an increase in global temperatures that is directly attributed to human activity.

Contestability: electricity use of a particular site is high enough (currently above 50kwh) to qualify for a choice of energy supplier beyond Synergy, allowing for the possibility of negotiating the energy supply contract.

Greenhouse effect: the process by which radiation from a planet's atmosphere warms the planet's surface to a temperature above what it would be without its atmosphere.

Greenhouse gases: gases that contribute to the greenhouse effect by absorbing infrared radiation.

Material: an emissions source that constitutes one per cent or more of the total carbon account.

Photovoltaic: refers to the materials used in solar panels to convert light into energy, generating onsite electricity.

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