



Emissions Reduction Options Paper

June 2021

Executive Summary

Greater Shepparton City Council (GSCC) has declared a climate emergency which seeks to mobilise and take action towards tackling climate change, including a rapid transition to zero emissions. As such, GSCC has set a net zero target to be achieved by 2030. This project forms the first step in assisting Council achieve its target by conducting a robust assessment of its baseline emissions, identifying opportunities for emissions reduction and trajectories to net zero.

GSCC's financial year 2019 (1 July 2018 – 30 June 2019) baseline emissions profile was in the order of **38,472 tCO₂-e**. The largest emissions sources include Goods and Services (30%), Landfill (16%) and Electricity (16%). Further detail on GSCC's emissions is provided in Section 3. Based on the baseline assessment and projected population growth, GSCC's emissions are expected to be in the order of 44,184 tCO₂-e by 2030.

Considering GSCC's emissions profile and identified emissions reduction opportunities, 3 scenarios are proposed for Council to achieve its net zero emissions target by 2030: Do Nothing, Do Planned Activities, Do All Recommended. If no action is taken to reduce emissions, it is predicted Council will need to purchase 44,184 tCO₂-e in offsets to reach net zero at FY2030, costing approximately between \$800,000 to \$1.6 million per annum from 2030. The second option is estimated to reduce FY30 emissions by 22%, requiring 33,707 tCO₂-e to be offset, costing approximately between \$600,000 to \$1.2 million per annum from 2030. Doing all emissions reduction opportunities if feasible, could potentially reduce emissions by 97%, requiring 1,299 tCO₂-e to be offset, costing approximately between \$25,000 to \$46,000 per annum from 2030.

Implementing emissions reduction opportunities will reduce GSCC's emissions profile, reduce the cost of offsetting and will most likely result in operational cost savings after the payback period. Therefore, funding would be better spent towards emissions reduction efforts which could potentially result in long-term operational cost savings, reduce carbon liability and mitigate financial risks associated with carbon pricing in the future. A non-exhaustive list of actions considered in this Paper is summarised below.

Scope 1 & 2 Actions

- 100% of electricity through PPA
- Electrification of natural gas systems
- Hydrogen feasibility study and implementation to replace diesel/petrol
- Microgrid for remote assets
- Transition passenger pool fleet to electric by 2030
- Transition private passenger vehicles to electric or hydrogen by 2030
- Transition 50% of Light Commercial Vehicle (LCV) fleet to alternative technologies (electric/hydrogen) by 2030
- Adherence to the Victorian Government's Recycling Victoria Policy

Scope 3 Actions

- Flexible work arrangements
- Incentivise public/active transport
- Replace all outstanding public lighting with LED lights
- Sustainable Procurement Policy and stakeholder engagement

General

- Data improvements
- Ongoing monitoring of emissions
- Feasibility and business case studies first
- Climate Active certification

Emissions Reduction Options Paper

Contents

1	Introduction	1
2	Strategic Context	2
2.1	Federal Government	2
2.2	State Government	3
2.3	Local Government	3
3	Greater Shepparton City Council	5
3.1	Climate Emergency	5
3.2	Net Zero	5
3.3	Carbon Assessment	6
3.3.1	Emissions Boundary	6
3.3.2	FY19 Baseline	7
3.4	Gap Analysis	8
4	Emissions Reduction Opportunities	11
4.1	Overview	11
4.2	Energy	12
4.2.1	About Emission Source	12
4.2.2	External Influences & Considerations	12
4.2.3	Reduction Opportunities	13
4.2.4	High-level Quantification	15
4.3	Company Vehicles	17
4.3.1	About Emission Source	17
4.3.2	External Influences	17
4.3.3	Reduction Opportunities	17
4.3.4	High-level Quantification	18
4.4	Landfill & Waste	21
4.4.1	About Emission Source	21
4.4.2	External Influences	22
4.4.3	Reduction Opportunities	23
4.4.4	High-level Quantification	25
4.5	Streetlighting	26
4.5.1	About Emission Source	26
4.5.2	External Influences	26
4.5.3	Reduction Opportunities	26
4.5.4	High-level Quantification	26
4.6	Staff Commuting	27
4.6.1	About Emission Source	27
4.6.2	External Influences	27
4.6.3	Reduction Opportunities	28
4.6.4	High-level Quantification	28
4.7	Goods and Services	29
4.7.1	About Emission Source	29
4.7.2	External Influences	30
4.7.3	Reduction Opportunities	30
4.7.4	High-level Quantification	31
4.8	Building Construction	32

4.8.1	About Emission Source	32
4.8.2	Reduction Opportunities	32
4.8.3	High-level Quantification	32
4.9	Downstream Assets	34
4.9.1	About Emission Source	34
4.9.2	External Influences	34
4.9.3	Reduction Opportunities	34
4.9.4	High-level Quantification	34
4.10	Water	35
4.10.1	About Emission Source	35
4.10.2	Reduction Opportunities	35
5	Climate Active Certification	37
5.1	Climate Active Process	37
6	Action Plan Options	40
6.1	Do Nothing	40
6.2	Do Planned Activities	41
6.3	Do All Recommended	42
6.4	Further Options Discussions	42
7	Recommendations and Next Steps	43
7.1	Proposed Timeline	44
7.2	Governance	47
7.3	On-going Monitoring Considerations	48
7.4	Net Zero Action Plan	48
8	Appendices	50
8.1	Appendix A: Federal and State Funding	50
8.2	Appendix B: Carbon Offsets	51
8.3	Appendix C: Fleet Efficiency	52
8.3.1	Overview	52
8.3.2	Electric Vehicles	52
8.3.3	EV Charging	54
8.4	Appendix D: Procurement Policy and Procedures	56
8.4.1	Sustainable Procurement Guidelines	56
8.4.2	Tender Evaluation	56
8.4.3	Supplier Engagement	58
8.5	Appendix E: Climate Active Public Disclosure Statement Summary	59

Emissions Reduction Options Paper

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VERSION CONTROL RECORD

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Final vA.0	2/06/2021	Juliana Bedggood	Jacinta Young	Incorporating Council feedback
Final vB.0	24/06/2021	Juliana Bedggood		Finalising



1 Introduction

Greater Shepparton City Council (GSCC, Council) has declared a Climate Emergency and committed to a Net Zero Target for Council's internal operations by 2030. To achieve this target and best respond to the climate emergency, Council has resolved to develop a Zero Emissions and Climate Emergency Plan. This report constitutes the evidence base for the 10-year Zero Emissions Plan.

The objective of this project was to conduct an emissions assessment to establish a baseline, identify gaps and investigate abatement options to achieve Council's goal of net zero greenhouse gas emissions from council operations and services.

GSCC engaged Ndevr Environmental to conduct a comprehensive emissions assessment for all of Council's services and operations, and to identify emissions reduction opportunities to reach the 2030 net zero target.

To do this, a carbon assessment aligned with the GHG Protocol and Australian Government's Climate Active standard was undertaken, to ensure sufficient rigour and robustness that will withstand public scrutiny. The emissions inventory was developed in an editable excel spreadsheet to enable GSCC to monitor its emissions each year and track its progress to zero emissions.

In collaboration with Council, emissions reduction opportunities were identified for GSCC's most relevant emissions sources, and potential abatement and costs were estimated to enable prioritisation.

This **Options Paper** presents the findings from the baseline carbon assessment and details the options which will inform Council's development of a 10-year Action Plan that will guide GSCC on its journey to net zero. This Paper is structured as follows:

- **Strategic context** provides an overview of government commitments.
- **Greater Shepparton City Council** provides an overview of Council's commitments and presents the findings from the carbon assessment and gap analysis.
- **Emissions Reduction Opportunities** details the opportunities identified and discussed during the stakeholder workshop as in progress or a new concept, or as recommendations from Ndevr Environmental. Potential abatement and costs have been estimated for each opportunity.
- **Action Plan Options** provides an overview of 3 scenarios for GSCC to consider for its Action Plan: do nothing, do planned activities, do all recommended.
- **Recommendations and Next Steps** outlines Ndevr Environmental's final recommendation for action and key items to consider as GSCC progresses to the Action Plan.
- **Appendices** have been included with additional detail for GSCC's reference.

2 Strategic Context

This section provides an overview of the current national and state commitments and targets, and the directions that the Victorian local governments have taken

2.1 Federal Government

The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) which seeks to avoid a global temperature increase of more than 2°C above pre-industrial levels, and ideally keep them below 1.5°C. Under the Paris Agreement, countries must set climate change targets. Australia currently has a target to achieve between 26-28% emissions reduction on 2005 levels by 2030. This target is ranked in line with a <3°C temperature increase¹.

The Australian Government has expressed confidence that it will meet the Paris targets. However, Ndevr Environmental has been tracking Australia's performance against its commitments under the Paris Agreement. Ndevr Environmental's quarterly emissions projections show that overall, Australia is not on track to meet the Paris targets that were set, with the exception of emissions trends during COVID-19. COVID-19 cannot and should not be viewed as a climate change mitigation strategy and trends during COVID-19 are expected to be temporary only.

This analysis indicates that the Australian Government may need to impose additional policies to ensure commitments are reached. The *Climate Change (National Framework for Adaptation and Mitigation) Bill* introduced by Independent MP Zali Steggall in November 2020, which if passed, would legislate a 2050 target of net-zero emissions and provide for five-yearly emissions reduction budgets, has been gaining support, with some submissions calling for stronger commitments including a net-zero by 2040 target to improve the chance of limiting global temperature rise to 1.5 degrees. In the interim, state and local governments have made stronger commitments, as detailed in the sections that follow.

Nonetheless, Federal recovery plans, as well as State budgets announced in 2020, include various allocations and plans for cleantech and renewable initiatives. These are summarised in a non-exhaustive table in Appendix A: Federal and State Funding. Further, the Australian Government is rolling out its Technology Investment Roadmap which is a strategy to accelerate development and commercialisation of low emissions technologies. Annual low emissions statements are key milestones of the roadmap process. These statements prioritise low emissions technologies with potential to deliver the strongest economic and emissions reduction outcomes for Australia. The first Low Emissions Technology Statement prioritises clean hydrogen, energy storage, low carbon materials (steel and aluminium), carbon capture and storage, and soil carbon. Federal and State government investments will help to drive a low carbon economy which GSCC could harness for its own agenda.

Given the increasing momentum towards taking positive climate action, and the likelihood of stronger policy, Greater Shepparton City Council is wise to be taking steps towards better understanding and reducing its carbon footprint.

¹ Climate Action Tracker. (2020). <https://climateactiontracker.org/countries/australia/>

2.2 State Government

The Victorian Government has pledged the following emissions reduction targets in the *Climate Change Act 2017 (Vic)* and embedded renewable energy targets in the *Renewable Energy (Jobs and Investment) Act 2017 (Vic)*:

1. Net zero emissions target by 2050
2. Commitment to 25% renewable energy by 2020
3. Commitment to 40% renewable energy by 2025

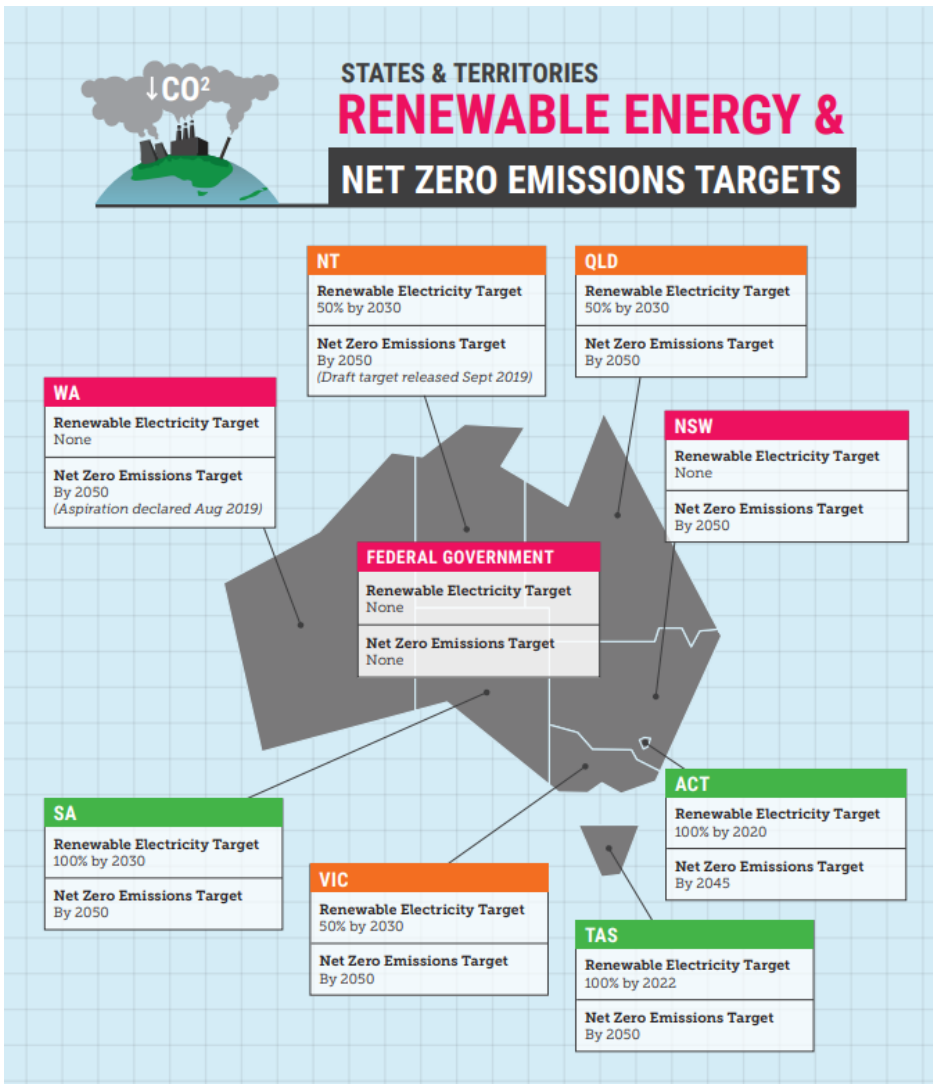


Figure 1: State and Territory renewable energy and net zero emission targets (Climate Council, 2019).

Similar to Victoria, Queensland, South Australia and the Australian Capital Territory (ACT) have set net zero emissions targets to be achieved by 2050, with ACT aiming to reach its target by 2045. Moreover, South Australia and the ACT have set 100% renewable energy targets to be achieved within the next 10 years, while Tasmania has achieved its 100% renewable electricity target and set a revised target of 200% renewable electricity by 2040.

In addition, the Victorian Government has initiated the Take 2 program, which is an initiative to reduce carbon emissions. The program includes a voluntary commitment to reduce carbon emissions,

has a low barrier for entry, and provides participants with suggestions for reducing their carbon emissions. Local governments can make voluntary emissions reduction pledges under the Take 2 program or make a formal pledge in line with the *Climate Change Act 2017 (Vic)*.

2.3 Local Government

In addition to state and territory governments, local governments have taken ambitious climate action and made commitments. Councils have a long history of environmental action through: leading by example to implement change within their own operations and practices; advocate to, and collaborate with, state and federal governments; and support and engage with communities, businesses and other municipalities. These roles are captured in Figure 2 below.



Figure 2: Key roles of local government

Below is a sample of Victorian councils' renewable energy and carbon actions and commitments:

- Bayside City Council: Carbon Neutral since 2020
- Brimbank City Council: 50% reduction in corporate greenhouse emissions by 2023
- City of Ballarat: 100% Renewable by 2025; Zero Emissions by 2025
- City of Darebin: Carbon Neutral since 2020 for both operations and the community (finalising its certification as of March 2021)
- City of Greater Geelong: 100% renewable electricity supply for all city owned and operated buildings and streetlights by 2025; City-managed operations to be Carbon Neutral by 2025; City-owned light fleet vehicles to be powered by zero-emission sources by 2030
- City of Melbourne: 100% renewable energy from 2019; Carbon Neutral since 2012 for council operations
- City of Port Phillip: Zero net emissions by 2020
- City of Yarra: Carbon Neutral since 2012; 100% Renewable electricity since 2019
- Frankston City Council: Zero net emissions by 2025
- Glen Eira City Council: Net zero emissions from operations by 2025
- Hepburn Council: Carbon Neutral by 2021
- Hobsons Bay: Zero net GHG emissions from Council's activities by 2020
- Manningham: 100% Carbon Neutral by 2020
- Maribyrnong City Council: Net zero corporate emissions since 2015
- Moonee Valley: Zero net emissions by 2020
- Moreland City Council: 100% renewable energy since 2019; Carbon Neutral for council's operations since 2012
- Mornington Peninsula Council: Carbon Neutral by 2021
- Mount Alexander Shire: Carbon Neutral by 2025
- Strathbogie Shire: Zero net emissions by 2025

3 Greater Shepparton City Council

This section outlines GSCC's commitments, the baseline carbon assessment and gap analysis. The accompanying excel tool provides additional detail on the carbon footprint.

3.1 Climate Emergency

The climate emergency *situation* refers to catastrophic changes to the world's climate caused by human activity and resulting in a loss of a safe climate, which threatens all life on earth. The climate emergency *response* refers to a specific approach to tackling climate change, which seeks to mobilise and take action at a scale and speed that will restore a safe climate, with the least possible loss and damage during the transition back to a safe climate. This includes a **rapid transition to zero emissions** across all sectors, as well as the drawdown of all the excess greenhouse gases in the air.

A climate emergency *declaration* is a starting point in the response to the climate emergency situation. Currently, 1,855 government jurisdictions in 33 countries have declared a climate emergency². To date, 97 local governments in Australia have made the declaration with Victorian councils representing 33% of those. **GSCC declared a Climate emergency** in March 2020.

As part of this declaration, Council will develop a Climate Emergency Plan and Net Zero Plan. The Climate Emergency Plan will ultimately act as an umbrella plan for most other Council strategy and policy. This Options Paper will contribute to the Net Zero Plan.

3.2 Net Zero

GSCC has set a target to achieve net zero emissions by 2030. Achieving net zero emissions follows the process illustrated in Figure 3. Net zero emissions is achieved through balancing a measured amount of carbon emissions released with an equivalent amount sequestered or offset or buying enough carbon credits to make up the difference.

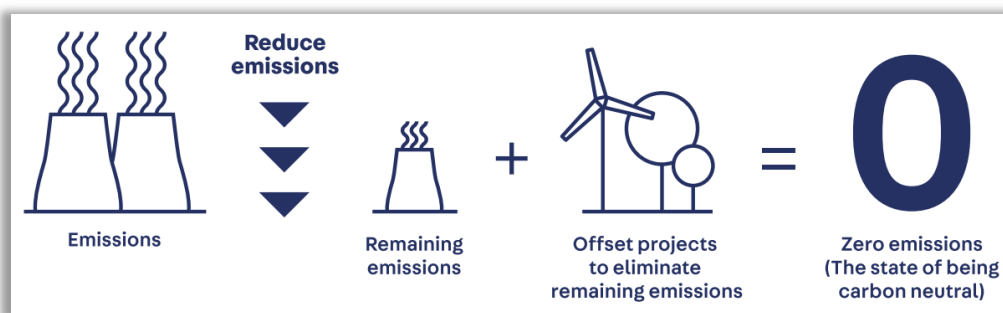


Figure 3: Process to achieving zero emissions (source: Climate Active Guide).

The following section provides an overview of Council's baseline emissions, the first step to achieving zero emissions. An editable excel tool has been provided to enable GSCC to measure and monitor its emissions annually. This Paper also details opportunities for GSCC to reduce its emissions and considers 3 scenarios to achieve net zero. Information on offsets is provided in Appendix B: Carbon Offsets. Finally, if GSCC wish to achieve carbon neutral certification under the Australian Government's Climate Active Standard, information has been provided in Section 5.

² Climate Emergency Declaration. (2020). <https://climateemergencydeclaration.org>

3.3 Carbon Assessment

3.3.1 Emissions Boundary

In accordance with the Greenhouse Gas (GHG) Protocol and Climate Active Organisational Standard, the different sources of emissions across GSCC’s operations were considered to ensure all scope 1, scope 2 and relevant scope 3 emission sources were identified for inclusion (Figure 4). The different 'scopes' can be defined as follows:

- Scope 1 – **direct** emissions from sources which the company owns or controls
- Scope 2 – **indirect** emissions from electricity consumption
- Scope 3 – all other indirect emissions that occur in the organisation's value chain but within its sphere of **influence**

All scope 1 and 2 emission sources are deemed 'relevant' and must be included. Scope 3 emission sources are deemed 'relevant' if they satisfy 2 out of the following 5 criteria:

- The emissions from a particular source are likely to be large relative to the organisation's electricity, stationary energy and fuel emissions.
- The emissions from a particular source contribute to the organisation's greenhouse gas risk exposure.
- Key stakeholders deem the emissions from a particular source are relevant.
- The responsible entity has the potential to influence the reduction of emissions from a particular source.
- The emissions are from outsourced activities previously undertaken within the organisation's boundary, or from outsourced activities typically undertaken within the boundary for comparable organisations.

As such, GSCC’s organisation emissions boundary in line with Climate Active and the Greenhouse Gas Protocol is depicted in two ways in Figure 5, with the left hand side depicting emission sources and the right hand side depicting the physical boundary (i.e., assets).

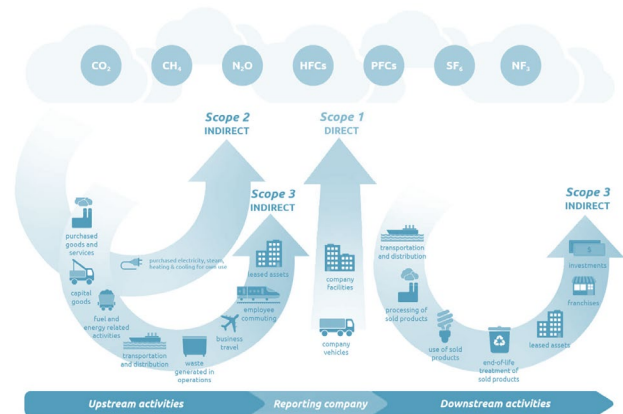


Figure 4: GHG Protocol diagram of scope 1, 2 and 3 emission sources

Included	Excluded
Quantified <ul style="list-style-type: none"> • Company Vehicles • Stationary Fuel • Natural Gas • LPG • Dry Ice, CO₂ • Landfill • Electricity • Waste (recycling, organics) • Staff Commuting • Consultants • Contractors • Water • Printing & Stationary • Food & Catering • ICT • Business Travel • Capital Goods Not Quantified (estimated) <ul style="list-style-type: none"> • Refrigerants • Tradewaste • Downstream Assets (electricity, natural gas) • Postage and couriers 	



Figure 5: GSCC Organisational Emissions Boundary

3.3.2 FY19 Baseline

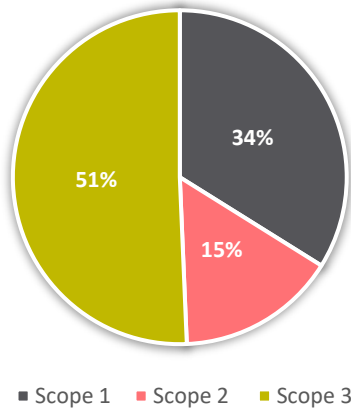


Figure 6: GSCC FY19 Emissions Breakdown by Scope

GSCC selected financial year 2019 (1 July 2018 – 30 June 2019) as its baseline year due to a complete data set and more reflective of business as usual. For FY19, GSCC’s emissions were in the order of **38,472 tCO₂-e**. With 593 full-time equivalent (FTE) staff employed within GSCC, this equates to approximately 65 tCO₂-e/FTE.

Just less than half of GSCC’s emissions are scope 3 emissions, with Goods and Services representing the largest portion at 30% of the overall share of the emissions profile. Goods and Services is made up of concrete, asphalt/bitumen, pest control, building maintenance, parks services, roads, waste (contractor fuel), ICT, food and catering, printing and stationery, consultants, and postage and courier. While scope 3 emissions are associated with sources which Council has less control over, there are still opportunities which Council can use to influence emissions reductions.

Electricity, the scope 2 emission source, and landfill, a scope 1 emission source, each represent the next largest contribution to GSCC’s emissions profile.

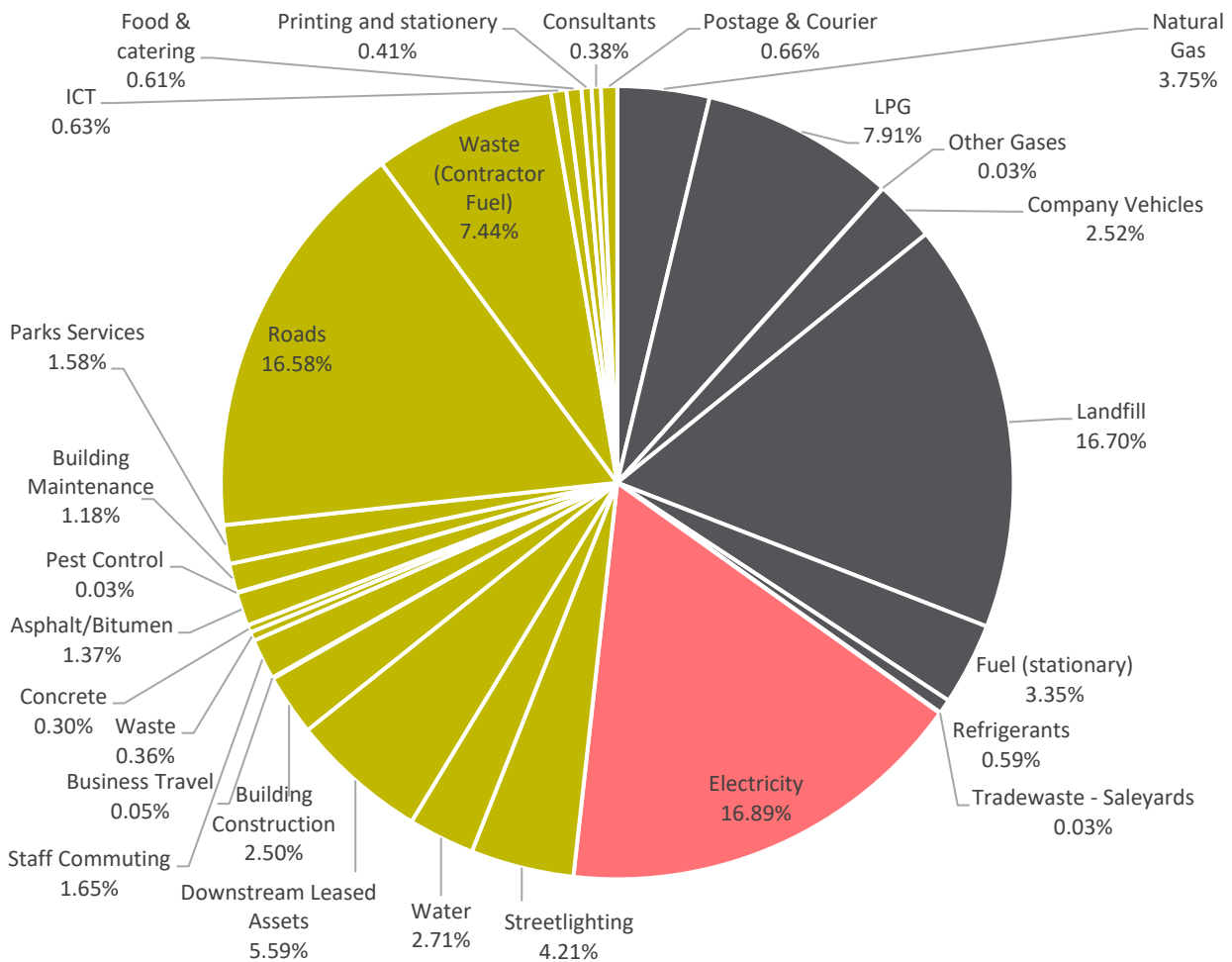


Figure 7: GSCC FY19 Emissions Breakdown by Source. Each emission source has been colour coded corresponding to scope. Note that the breakdown of stationary energy, transport fuel and electricity includes scope 3 emissions from fuel extraction and transmission losses.

3.4 Gap Analysis

Estimating emissions requires ‘activity data’ which can come in different forms and may vary in level of accuracy. The ‘Data Collection’ tab of the excel inventory tool identifies each emission source and the desired unit of measurement compared with the one used. References for the data have been provided in the ‘Data Collection’ tab and each of the white data input tabs.

Data improvement recommendations are based on the Climate Active Standard for data accuracy (Figure 8). Actual data of usage quantities (e.g., kWh of electricity, litres of fuel) is the most accurate data, while uplift factors (i.e., percentages attributing a portion of the overall emissions profile to a particular emissions source) is the least accurate.

Data improvement recommendations are summarised in the table below.

Table 1: Data Improvement Recommendations

Emission Source	Data Accuracy Level	Improvement Opportunity
Refrigerants	Uplift factor (%)	Estimated – By collecting invoices for the replacement of refrigerants (kg), the emissions can be estimated by using standard leakage rates for air-conditioning and/or refrigeration.
Trade waste	Uplift factor (%)	Actual – GSCC can monitor the kL of input and output of the tradewaste system.
Landfill	Actual	The waste team provided the actual quantity of waste deposited to the landfill. The emissions are calculated using the NGERs Solid Waste Calculator, using assumed % composition of waste at the landfill (i.e., MCW, commercial, construction). GSCC can more accurately determine the correct % composition of the different waste streams to improve emissions accuracy.
Fuel (stationary) & Fuel (transport)	Actual (assumption)	Fuel consumption is currently captured in Azility as transport fuel broken down by fuel type with data coming from fuel cards or bulk fuel consumption from on-site pumps. It has been assumed that fuel consumed from the pumps is mostly for plant equipment, and thus actually stationary fuel, while the remaining fuel data is assumed to be from fleet vehicles. It is recommended that, if possible, GSCC track fuel consumption for each vehicle and plant by fuel type and enter this as separate data into Azility (i.e., transport fuel for vehicles and stationary fuel for plant). This more accurate depiction of emissions source will help to better identify and prioritise emissions reduction actions. Ensure stationary fuel also

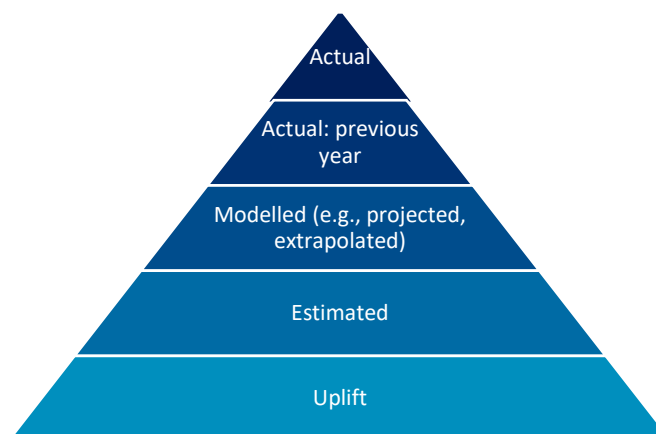


Figure 8: Data Accuracy Hierarchy

Emission Source	Data Accuracy Level	Improvement Opportunity
		includes generators, currently assumed to be captured in Azility bulk fuel.
Postage and Courier	Uplift factor (%)	Actual – Typically, emissions from using postage and courier services are calculated based on dollar spend. GSCC can track spend data and multiply by the relevant emission factor.
Contractors - Waste	Modelled	Actual – Emissions from waste trucks used for Council’s kerbside collection service comes from combustion of diesel. Currently, dollar spend is extrapolated to estimate the quantity of fuel consumed. Update contract to require provider to report quantity of fuel consumed and attributable to GSCC’s service.
Asphalt and Concrete	Actual	Emissions from construction materials are calculated based on dollar spend, but improved accuracy may result from calculating emissions based on the total quantity (tonnes) used.
Business Travel	Estimate	Actual – Separate business travel costs (taxi, accommodation, flights) by obtaining from invoices or corporate travel system. Collect data on distance travelled and nights stayed in hotels per person.
Waste	Estimate	Modelled/Actual – Currently, data for Council waste is not collected separately from community waste, so a portion of the total kerbside waste collected is attributed to Council operations. Update contract to require provider to differentiate between Council and community waste. Otherwise GSCC improve the estimate by knowing the quantity and size of bins, frequency of emptying and assumed capacity.
Downstream Assets	Uplift factor (%)	Actual – Request annual electricity consumed from tenants through email or at least one bill (contains electricity use for one year).



4 Emissions Reduction Opportunities

This section presents different opportunities for emissions reduction by emission source, estimated potential abatement and costs, and any external influences that may impact reduction measures.

4.1 Overview

This section is structured by different groups of emissions sources, providing an overview of the factors contributing to the source and external influences which will contribute to it in future. Various opportunities for emissions reduction are then provided including potential abatement between 2021 to 2030 and cost estimates. The abatement potential has been estimated at a higher level based on the year commenced, the portion of the emission source that it will impact and the likely emissions reduction (additional detail on these assumptions is provided in the accompanying model). Note that the estimations do not include the potential impact from other initiatives (i.e., initiatives have been treated as mutually exclusive but policies and tools may increase the abatement of other initiatives or cost savings from one initiative may be used to help fund another), which will need to be a consideration when preparing the Net Zero Plan.

Opportunities have been classified as either: underway by GSCC (i.e., 'In Progress'), planned or (i.e., 'Concept'), or 'recommended' as additional suggestions from Ndevr Environmental. Current and planned opportunities were identified and discussed in a workshop held with the broad project team on the 3rd of March 2021. The virtual post-it board created in the meeting is provided in Figure 9.

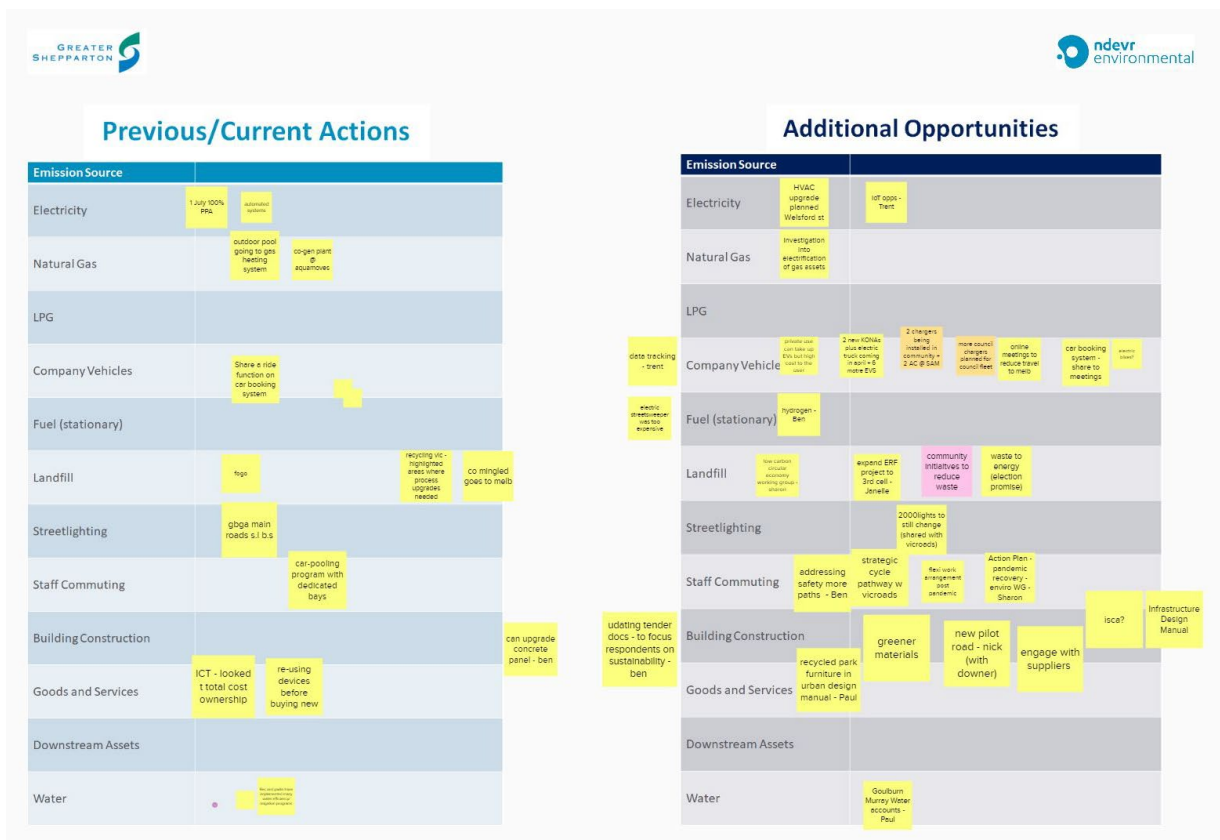


Figure 9: Mural Excerpt

Case studies of relevant initiatives undertaken by other councils or organisations have been included for initiatives that were not raised during the workshop.

4.2 Energy

4.2.1 About Emission Source

Emissions from Energy were in the order of **12,775 tCO₂-e** for FY19. GSCC's energy use comes from:

- Natural gas for heating and cooking in Council owned and/or operated assets (scope 1). The highest gas consuming sites include Aquamoves (over 22k GJ in FY19) and Welsford Street Offices (almost 2k GJ in FY19). Other sites were under 1,000 GJ and most under 100 GJ.
- Liquefied petroleum gas (LPG), which is typically used for heating and cooking purposes for assets which are remote and cannot connect to natural gas (scope 1).
- Stationary fuel (petrol and diesel) used for generators and plant equipment (scope 1).
- Electricity (scope 2). The largest electricity consuming site is the Welsford Street offices, representing 23% of GSCC's overall electricity consumption, followed by Aquamoves and DRC offices (see Table 2). The contribution of Aquamoves to electricity emissions varies based on the operation of the cogeneration equipment.
- All energy sources also have scope 3 emissions due to activities occurring upstream to GSCC's usage (i.e., fuel extraction and transmission losses), which represent 7% of the total energy emissions.

The breakdown of emissions (including scope 1, 2 and 3) by energy source is illustrated in Figure 10.

Table 2: Top 8 electricity consumers

Facility	Address	FY19 Consumption (MWh)
Council Office Eastbank and Library	Marungi St, SHEPPARTON	1,207
Aquamoves	Tom Collins Dr, SHEPPARTON	854
DRC (Council offices)	315 Doyles Rd, SHEPPARTON	360
Caravan Park (3-4 meters)	FITZJOHN STREET SHEPPARTON	171
SGROUND & REC RESERVE	11 HASTIE STREET TATURA	149
SALESYARD	NEW DOOKIE ROAD SHEPPARTON	141
Mooroopna Hub	9 Morrell St, MOOROOPNA	135
Shepparton Sports Stadium	Numurkah Rd, SHEPPARTON	123

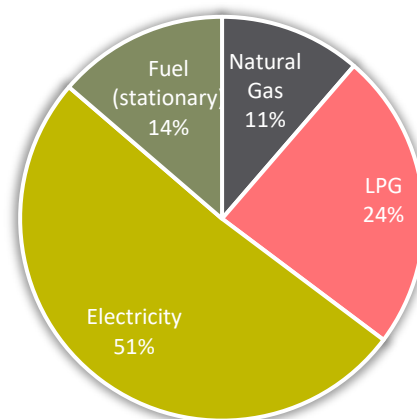


Figure 10: Energy Emissions Breakdown by Energy Source

4.2.2 External Influences & Considerations

- Victoria's renewable energy target of 40% by 2030 means that the electricity grid will gradually become less emissions intensive as more renewables are installed.
- The Victorian Budget has allocated \$3.72M to enable the development of a Gas Roadmap to support more efficient use of gas and support opportunities for electrification and alternative fuels, and \$108M for innovative renewable energy and hydrogen projects.
- The Federal Government has proposed the Grid Reliability Fund legislation (not yet passed through Parliament), allocating \$1B to the Clean Energy Finance Corporation (CEFC) to invest in grid augmentation, transmissions, interconnectors, renewables, hydro, grid scale battery storage and hydrogen.

4.2.3 Reduction Opportunities

Reducing emissions from Energy should follow the hierarchy depicted in Figure 11. First, it is important to remove all unnecessary energy usage – the cheapest unit of energy is the one you do not need to buy – then, ensure all usage is as efficient as possible, and finally investigate renewables for remaining energy demand.

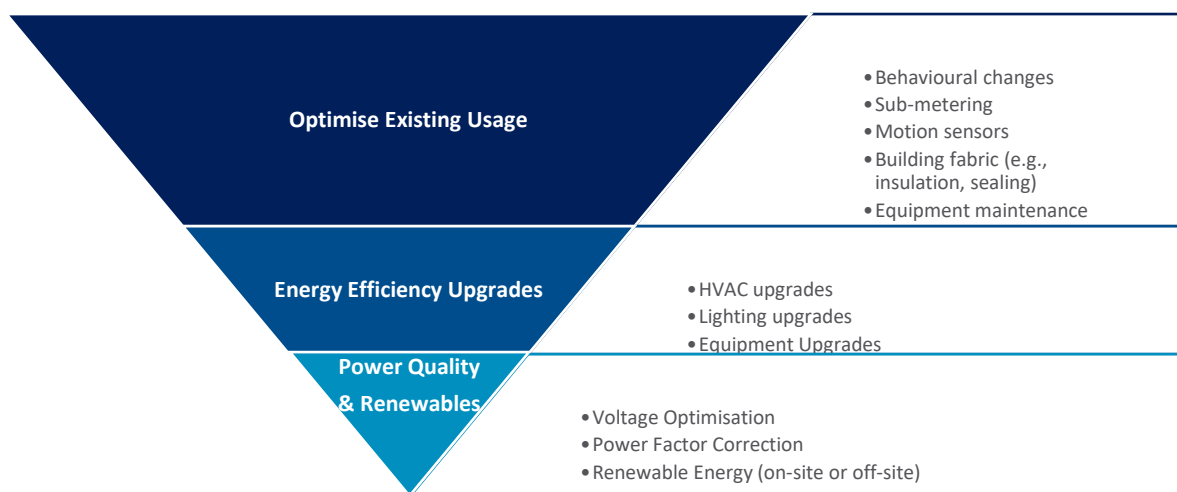


Figure 11: Energy Efficiency Hierarchy

It is good practice to investigate the ‘what’ and ‘how’ of energy consumption on site, to identify measures to optimise usage or upgrade equipment. GSCC has previously implemented an energy auditing programming that began to systematically audit Council buildings and identify improvements.

Focus on the largest energy usage areas first to maximise benefit. HVAC systems usually account for 40% of energy use, hot water usually accounts for 25%, appliance usually accounts for 30%, and lighting usually accounts for between 8% and 15% (<https://www.energy.gov.au/households/quick-wins>). Specific emissions reduction opportunities related to energy consuming equipment and assets can be found through the Sustainability Victoria website (<https://www.sustainability.vic.gov.au/Business/>) and the NSW Energy Saver website (<https://energysaver.nsw.gov.au/business/>).

Details of opportunities implemented by GSCC to-date are as follows:

- **Energy Audits.** An Energy Auditing Tool was developed to monitor and manage energy audits conducted on Council assets. Some assets to undergo audits include Aquamoves, Welsford St Offices/Eastbank/Library, Shepparton Saleyards, Shepparton Sports Stadium, Doyles Road Complex (Council Depot), North Shepparton Community Hub and Council operated childcare centres. Actions which were identified to have a payback of less than seven years were implemented. The tool has not been in use for some time.
- **Lighting and Switches.** Several efficiency opportunities were implemented, including: replacing halogen and Mercury lights with efficient alternatives; timers on selected lights and switches; daylight controls on recommended lighting circuits and switch off behavioural practices.
- **Equipment Upgrades and Operations.** HVAC is typically one of the largest energy consuming sources. Previously, Council has programmed temperature ranges into air-conditioners. Council should continue to program temperature ranges, with the optimal ranges being 18-20°C for heating and 25-27°C for cooling. Similarly, Council has also lowered hot water temperatures. Other actions include re-configuring air-conditioners, replacing water pumps with smaller motors, upgrading appliances such as washing machines, etc.

- **On-site Renewable Energy.** GSCC has installed almost 500kW of solar across the following assets: Shepparton Sports Stadium, DRC, Mooroopna Community Hub, Welsford Street, Aquamoves, saleyards, North Shepparton Community Hub, and Shepparton Community Centre. In FY19, Council's solar generated 1,947,391 kW of energy. Council has also installed a co-generation plant at Aquamoves pool as well as solar.
- **Off-site Renewable Energy.** GSCC and partner councils have successfully finalised the Victorian Energy Collaboration, whereby GSCC has committed 100% of its electricity to be sourced through the Power Purchase Agreement (PPA).



Figure 12: Solar panels installed at Council's Welsford Street offices in 2018

Other opportunities for GSCC to consider includes:

- **Microgrids.** Small-scale, localised renewable energy systems that can operate independently of the electricity grid, making it an ideal option for remote locations which have to rely on LPG.

Case Study – Microgrids

An additional opportunity to be explored by GSCC is renewable energy microgrids. These are suitable for remote areas which rely on LPG and stationary fuel. Not only could microgrids eliminate LPG and stationary fuel emissions, but they could also provide energy security. A \$1.6M microgrid consisting of solar and battery technology has already been established in Euroa as part of the Victorian Government's series of commercial ready, smart, microgrid demonstration projects.

- **Fuel Switching.** Assets using gas or fuel can be converted to other forms of energy (e.g., electric or hydrogen). The electrification of assets will benefit from zero emissions associated with the PPA, while hydrogen energy will produce low to no emissions. The case study below illustrates how entire facilities can be converted from natural gas to electric. The case study would be applicable to GSCC's Aquamoves as the highest natural gas consuming facility. However, Aquamoves' outdoor pool was recently upgraded to gas, meaning that Council may have to wait to convert it to electric. Aquamoves was responsible for 87% and 84% of GSCC's natural gas consumption in FY19 and FY20, respectively. Additionally, plant equipment using stationary fuels can be converted to lower emission alternatives. The GSCC waste team highlighted electric waste compactors as a future option to replace the conventional fuelled ones currently in operation.

Case Study – Darebin Council Northcote Aquatic and Recreation Centre Electrification

The renewal of Darebin City Council’s Northcote Aquatic and Recreation Centre (NARC) is part of the Darebin Council Plan 2017-2021. After more than half a century of service to the community with growing maintenance costs (projected to cost council around \$3 million annually), the centre is being designed and re-built as an all-electric aquatic centre, aiming for a 6 Star Green Star rating under the new Green Star Buildings rating tool. Back in 2016, Darebin City Council established a new ESD policy which mandates that developments of more than \$10M have to have a Green Star certification.

This is an ambitious project, given that aquatic centres are energy and water intensive. A business case analysis showed that although the capital costs for all-electric construction and operations are higher now, over time the reduction in energy bills and carbon emissions will make it worthwhile. The new centre is expected to be completed in 2023 and has become a cornerstone of Darebin City Councils’ sustainability strategy and net-zero commitment. The community consultation process gathered over 400 responses.



4.2.4 High-level Quantification

Table 3: High level quantification of energy emission reduction opportunities

Emission Source	Carbon Reduction Initiative	Commencement Year	Potential abatement (%)	Estimated potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Electricity	100% of electricity through PPA	2022	100%	64,107	No additional cost	In progress
Electricity	HVAC upgrade for Welsford Street	2022	New systems can be 20-40% more efficient	1,769	Refer to Council quote	In progress
All Energy	Internet of Things (IoT) – automation and control	2021	1%	708	Not quantified	Concept

Emission Source	Carbon Reduction Initiative	Commencement Year	Potential abatement (%)	Estimated potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Natural Gas	Feasibility study and implementation of electrifying natural gas	Study: 2022 Roll-out: gradual from 2022	100% by 2028	13,787	Feasibility study \$30k Implementation assumed high cost of retrofit. Operational savings expected from electricity v gas price.	Recommend feasibility & business case on high use gas sites.
Stationary Fuel	Hydrogen feasibility study and pilot trial	Study: 2023 Roll-out from 2025	50% by 2030	2,257	Feasibility study ~\$30k pilot high cost- investigate government subsidies with feasibility	Recommend feasibility study in future
Stationary Fuel	Zero emission waste compactors	Feasibility Study 2026	Potential for 100%	Not quantified	Unavailable	Concept
All Energy	Re-integrate the energy auditing tool and energy audits for remaining assets	2021	7%	6,055	Not quantified	Recommended
LPG	Feasibility study and implementation of microgrid for remote assets	2025	100%	If all LPG use was removed at 2025 potential abatement of 20,375	High cost ~\$1M	Recommend for consideration

4.3 Company Vehicles

4.3.1 About Emission Source

The Company Vehicles emission source relates to direct (tailpipe) and indirect (fuel extraction) emissions from GSCC's fleet vehicles. Company Vehicle emissions were in the order of **969 tCO₂-e** for FY19, with diesel fuel representing the majority of those emissions (66%), followed by petrol (31%), then LPG (3%) and ethanol (<1%) as illustrated in Figure 13. GSCC changed its fleet policy from requiring hybrid vehicles to being flexible to any vehicle option, which increased diesel.

Tailpipe emissions from the combustion of fuel is a scope 1 emission source and directly within the control of GSCC. Fuel extraction emissions is a scope 3 emission source which occurs upstream of GSCC's operation of the vehicle and not within GSCC's direct control and represents <1% of Company Vehicle emissions.

4.3.2 External Influences

Globally, the rest of the world is heading towards improved vehicle efficiency standards, incentivising original engine manufacturers (OEMs) to manufacture lower emission vehicles, which are increasingly becoming available in Australia. Further, countries and cities around the world are announcing fuel bans, (a detailed list is provided in Appendix C: Fleet Efficiency). This provides added incentives to manufacturers to produce electric vehicles (EVs) to cater for those markets, and the majority of OEM's have announced their plans, which will provide additional choice to Council for low emission vehicle options.

Further, there is momentum towards the increased uptake of EVs in Australia, and hydrogen vehicles are already in development and expected to be on the market by 2022-2023. The Federal and Victorian Governments have allocated funding for alternative vehicle and fuel technologies. ARENA received \$1.6B in new funding, with \$16.5M made available for Round 1 of the [Future Fuels Fund](#) to fund battery electric vehicle (BEV) public fast charging infrastructure in capital cities and regional centres; and the Victorian Budget has allocated \$25M to accelerate the uptake of zero-emissions vehicles.

4.3.3 Reduction Opportunities

Reducing emissions from fleet vehicles should follow the hierarchy depicted in Figure 14. Improvements should first focus on avoiding travel or travel by car, then reduction measures, followed by technology switching before offsetting the remaining emissions. Examples of initiatives for each objective is provided in the figure but more information can be found in Appendix C: Fleet Efficiency.

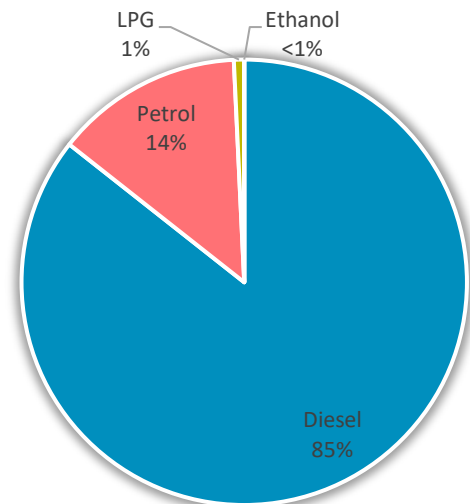


Figure 13: FY19 Company Vehicle Emissions Breakdown by Fuel Type

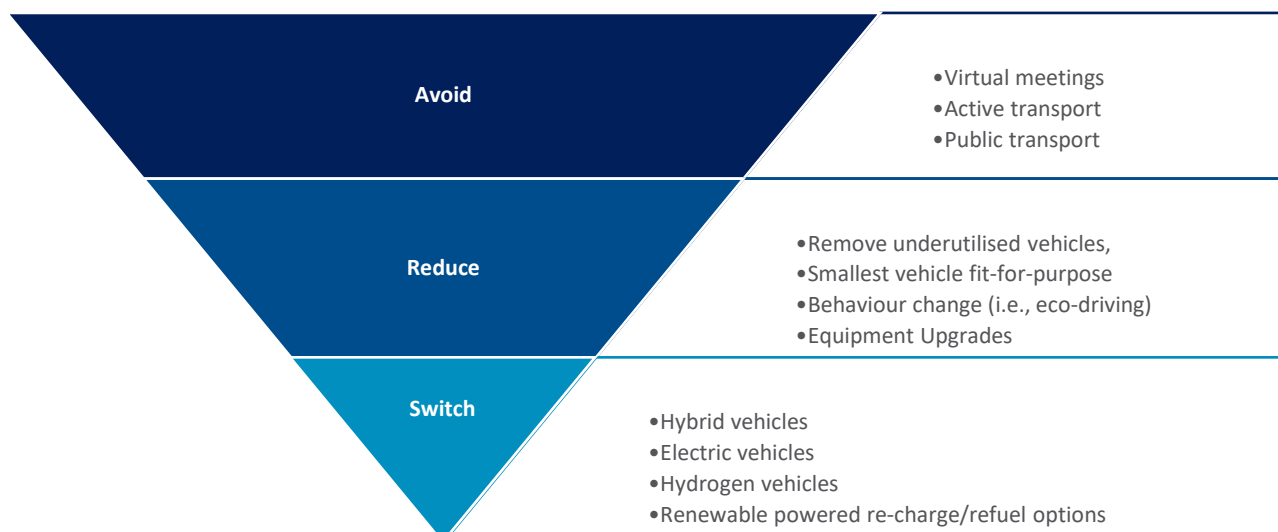


Figure 14: Fleet Emissions Reduction Hierarchy

GSCC has already implemented various initiatives which contribute to the reduction of Company Vehicle emissions, including:

- **Ride Share.** Ride share functionality in the Smartrak fleet booking system. Utilisation has not been, but should be, monitored and continued uptake will need to consider COVID-19 requirements.
- **Feasibility Study.** Participated in the GBGA EV Feasibility Study and Business Case. This included an assessment of Council's fleet, identification of opportunities for fleet optimisation as well as the feasibility and business case to switch suitable fleet vehicles to electric alternatives.
- **Fleet Policy.** The current Fleet Policy allows flexibility with vehicle selection which has led to an increase in emissions-intensive vehicles and an increase to the company vehicles emission source. Revising the Fleet Policy to ensure preference is given to fit-for-purpose low emission alternatives (e.g., electric, hydrogen) during vehicle selection when those alternatives have reached price parity with conventional vehicles, will support the transition of the fleet proposed below.
- **EV Switch.** GSCC has already begun its transition to an electric fleet by purchasing 2x Nissan Leaf and 2x Hyundai Kona EVs in the passenger pool fleet, and with the remainder of the pool fleet consisting of fuel efficient, hybrid vehicles. 6 additional EVs will be procured in FY22 to replace the hybrids. In addition, an electric truck is set to arrive during FY21. Solar powered chargers at Welsford and DRC are responsible for charging the EVs. GSCC also participated in the CVGA Charging the Regions project and is participating in the second phase involving installation of community EV charging with 2x AC chargers to be installed at the Shepparton Arts Museum.

4.3.4 High-level Quantification

Table 4: High level quantification of fleet emission reduction opportunities

Carbon Reduction Initiative	Commencement Year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Transition passenger pool fleet to electric by 2030	2021	Passenger pool vehicles currently represent 3% of fleet	60	\$43,000* Ioniq \$54,965* Kona \$44,540* Leaf	In progress

Carbon Reduction Initiative	Commencement Year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Data Tracking - Work with IT to better track vehicle utilisation	2021	1%	20	Not quantified Internal resource cost	Concept
Transition private passenger vehicles to electric or hydrogen by 2030	2024	Private passenger vehicles currently represent 10% of fleet	753	EV prices as above ~\$78,000 Hyundai Nexo Refuelling infrastructure will cost millions	Recommended
Continue to install chargers at Council offices to support EV transition	2021	Not quantified	Not quantified	~\$5k 22kW AC hardware ~\$35k 50kW DC hardware	In progress
Transition 50% of Light Commercial Vehicle fleet to alternative technologies (electric/ hydrogen) by 2030	2023	LCVs currently represent 56% of the fleet	1,305	\$48,765* Renault Kangoo E Hydrogen costs as above	Recommended
Transition 50% of fleet trucks to alternative technologies (electric/ hydrogen) by 2030	2022	Trucks currently represent 30% of fleet	566	GSCC is trialling an e-truck and will have costs Current Isuzu trucks range between \$26-52,000*	In progress
Continuous driver education of efficient use of vehicles, especially with changing technology	2021	5%	528	~\$385 pp	Recommended
Revisit Ride Share functionality with COVID-19 recovery and monitor use	2022	10%	956	No cost	Recommended

Carbon Reduction Initiative	Commencement Year	Potential abatement (%)	Potential abatement 2021-30 (tCO2-e)	Cost	Status
Utilisation of Internet of Things to reduce travel needs between council offices and landfill site	2020	10%	Assuming 10% of waste teams vehicle travel is reduced as a result ~100	Already implemented – operational cost savings	In progress
Fleet Policy Review to support Company Vehicle transition actions	2022	Not quantified	Not quantified	Cost of wages	Recommended

*Recommended government fleet contracted price excluding GST and delivery fee.

^Recommended retail price

4.4 Landfill & Waste

4.4.1 About Emission Source

Council own and operate the Cosgrove Landfill, which is the only landfill in the Greater Shepparton region and is licensed by the EPA. The landfill receives waste from commercial customers only, including kerbside collections for all Greater Shepparton. Recently, it was expanded to a third site, Cosgrove 3, which will be developed as a regional landfill hub to cater for the needs of Greater Shepparton and other Victorian municipalities for the next 30-40 years.

Emissions from the Cosgrove landfill is a scope 1 source and directly within GSCC’s control. Landfill accounts for 16% of GSCC’s FY19 emissions profile, generating **6,423 tCO₂-e** in FY19). The emissions coming from Shepparton’s landfill include legacy and non-legacy waste and is calculated using the National Greenhouse and Energy Reporting scheme Solid Waste Calculator. Calculations also take the landfill gas captured and flared through the Emissions Reduction Fund (ERF) projects into consideration.

When waste is treated outside of an organisation’s control (i.e., at a third-party landfill) it is a scope 3 emission source. However, since Council own and operate the Cosgrove site, all of Council’s operational waste that is generated is treated there and captured in the scope 1 source. This is with the exception of recyclables and food organic garden organic (FOGO) waste, which is collected at Council operated facilities and processed at a third-party facility. Recycling does not contribute to GSCC’s emissions profile, but the processing of organic waste does. Organic waste makes up less than 1% of GSCC’s total emissions profile at **139 tCO₂-e**.

It is estimated that GSCC generates approximately 130 tonnes of general waste which goes to landfill, resulting in 183 tCO₂-e. Council generates 100 tonnes of FOGO waste and 44 tonnes of recyclables. The portions of waste generated across each of the three waste streams (general, organics and recycling) is shown in Figure 16.



Figure 15: Cosgrove Landfill

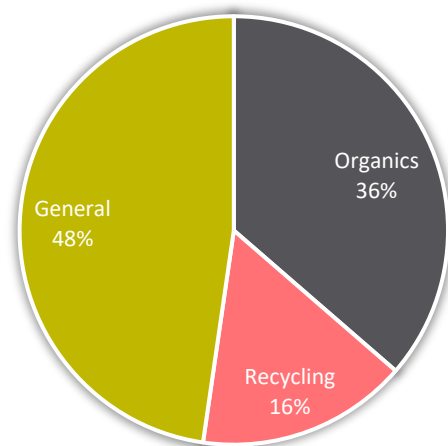


Figure 16: Portion of Waste Types for Tonnes of Waste Generated by Council

4.4.2 External Influences

The Victorian Government’s Recycling Victoria Policy places mandatory waste and recycling requirements on GSCC, and all councils in Victoria. This 10-year policy aims to reduce waste and to transform the recycling sector toward a circular economy by 2030.

The Recycling Victoria Policy aligns with the United Nations Sustainable Development Goals (Goal 8: Promote sustained, inclusive, and sustainable economic growth) and (Goal 12: Ensure sustainable consumption and production patterns) and sets four key goals shown adjacent.

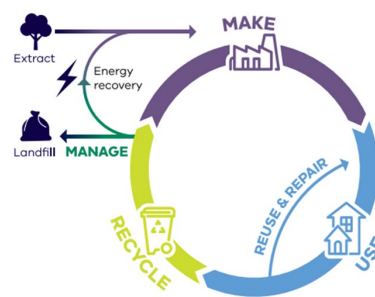


Figure 17: Circular Economy Graph taken from the Recycling Victoria Council.

Goals

- 1 MAKE**
Design to last, repair and recycle
- 2 USE**
Use products to create more value
- 3 RECYCLE**
Recycle more resources
- 4 MANAGE**
Reduce harm from waste and pollution

Relevant targets imposed on council, and actions expected to be taken are listed in Table 5.

Table 5: Recycling Victoria Policy Targets 2025 and 2030 and expected actions

Targets	By 2025	By 2030	Actions expected by the Councils
Divert waste from landfill	Divert 72 % waste	Divert 80 %	<ul style="list-style-type: none"> • Promote education and behaviour change programs. • Address plastic pollution promoting the replacement with alternative durable products. • Changing the way of collecting waste. • Promote recycling markets acceleration, changes in the recycling infrastructure and setting landfill levies. • Improve councils' regulation and planning
Cut total waste generation by 15 per cent per capita	No target	15% reduction	
Halve the volume of organic material going to landfill	With an interim target of 20 % reduction	50% reduction	
Ensure households have access to a separate food and organics recovery services or local composting	No target	100% of the households	

GSCC identified an additional external influence on its landfill emissions is that changes to the EPA licensing for new landfills could mean that the planned extension of Cosgrove will need to accommodate waste from neighbouring areas when their landfills are at end of life.

A further external influence is that federal legislation was passed to formally ban the export of unprocessed waste overseas, and all waste is required to be processed on shore. Many councils as a result have upped their recycling offerings, adding extra bins at the curbside so that households can better separate products and increase the chance that they’ll be recycled. The remaining challenge is to develop the market for the use of the recycled products to ensure that it does not still end up in landfill.

4.4.3 Reduction Opportunities

The waste reduction hierarchy is shown in Figure 18. Potential initiatives for reducing landfill emissions according to the hierarchy are listed below:

- Removal of organic waste from landfill.** GSCC has rolled out a FOGO kerbside collection service which diverts food and garden waste from landfill when the FOGO bins are used. GSCC raised concern that not all residents were provided with the 3 bins with regional areas needing to opt-in, and that an additional opportunity was to increase the uptake. An alternative/ additional option for residents, is the provision of composting products for at-home use. The 'Compost Revolution program has been utilised by a number of councils including Maroondah, Waverly, Randwick, Woollahra, City of Port Phillip. The program is designed to educate and equip residents to cut their waste through home composting and worm farming. It comes with online tutorials and digital materials to teach residents about composting and worm farms and includes a bin-to-door delivery service via Australia Post, to ensure residents receive the equipment. The premise is that council subsidises the residents purchase, and in turn the residents waste is reduced.

- Emissions Reduction Fund (ERF).** The ERF is a voluntary scheme created by the Australian Government to provide incentives for organisations and individuals to adopt new practices and technologies to reduce their emissions. Participants can earn Australian carbon credit units (ACCUs) for emissions reductions. One ACCU is earned for each tonne of carbon dioxide equivalent (tCO₂-e) stored or avoided by a project. ACCUs can be sold to generate income, either to the government through a carbon abatement contract, or in the secondary market. Currently, GSCC's landfill gas capture ERF project, captures and flares gas from 2 landfill cells. Recently (2020), the landfill opened up a 3rd cell which Council intends to expand the ERF project to include. To-date, the ERF project has been able to almost halve the emissions of the landfill. It also converts gas captured to electricity. These reductions have already been incorporated into the carbon assessment. The ERF is to not be confused with Energy Recovery Facilities used to convert waste to energy – another reduction opportunity identified below.

- Behaviour Change Programs** to raise awareness and educate the community on reducing waste, appropriate bin-use to avoid contamination of recycling, and to compost organics. GSCC's waste team has been leading community engagement initiatives and is keen to continue focusing on the behaviour change opportunities and mechanisms to incentivise residents to sort their waste curbside.

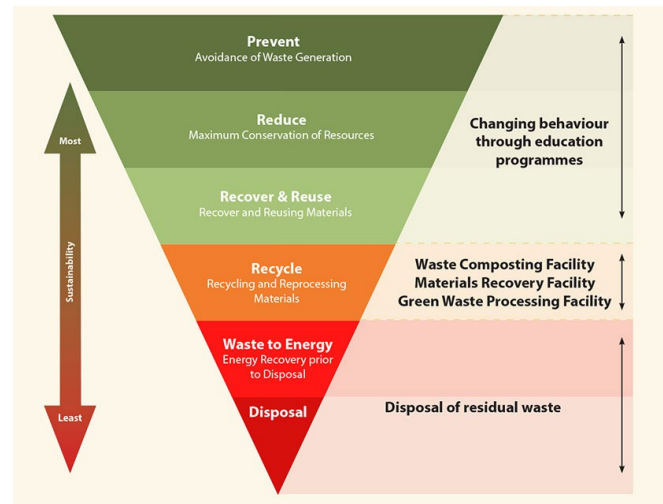


Figure 18: Waste emissions reduction hierarchy and recommendations (Source: The National Food Waste Strategy)



Figure 20: World Recycling Day March 18th



Figure 19: Transparent wheelie bins to encourage consumers to take responsibility for their waste

- Creating a market for recycled/ re-used waste.** One of the biggest challenges facing the success of the recycling market is ensuring the demand for the end product. Several companies use recycling materials coming from paper, plastic, and glass to produce new final products. These companies have partnerships with collectors and recycling initiatives already established in regional area. Council is in a position to create demand and stimulate market development through its procurement policies (discussed in Section 4.7). This will have the added benefit to council of waste reduction, demonstrating leadership and supporting innovation.

Table 6: Recyclable materials and their use in new products

Recycle Material & Waste	New Products
Recycle tyres and rubber	Use in asphalt for road construction
Recycled glass	For roads and gravel base construction
Soft plastic	To produce bench, table, footpaths
Steel manufacturing waste	To produce cement



Figure 23: Recycled plastic electric bollards, Grammar Park Gardens Estate in Shepparton



Figure 22: Park bench made from soft plastics

- Soft Plastic Recycling.** Soft plastics can be recycled through the RED Cycle program, which aims to close the loop for a circular economy (e.g., creating roadside furniture). RED Cycle has specific bins available for residents to drop off their soft plastic at Coles and Woolworths in Australia, including regional Victoria. There are Red Cycle bins located at Coles and Woolworths stores in Shepparton and Mooroopna. GSCC identified an opportunity to create additional drop off sites/ collection points.



Figure 21: RED Cycle bins

- Container Deposit Schemes in Victoria.** The Container Deposit Scheme in Victoria will be introduced by 2022-2023 to encourage and increase beverage container recycling and reduce waste in Victoria. Empty aluminium cans and plastic bottles, and glass bottles will be returned to a refund collection point, which will be exchanged for money. GSCC must decide between drop-off points or kerbside collection, taking into consideration existing facilities and infrastructure to collect and process. GSCC should consider alliances with private sectors to transform the recycled material into new products as mentioned above.



Figure 24: Container Deposit Scheme

- Waste to Energy.** Energy from waste offers recovery of energy by conversion of landfill waste through various processes, including thermal (e.g., depolymerisation, pyrolysis, gasification) and non-thermal technologies (e.g., fermentation, anaerobic digestion). This will reduce the amount of landfill as well as reduce carbon emissions. The method to convert waste to energy should be 'clean' of fossil fuels as well. GSCC is currently investigating this as an option for Council.

4.4.4 High-level Quantification

Table 7: High level quantification of landfill and waste emission reduction opportunities

Emission Source	Carbon Reduction Initiative	Commencement Year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Landfill	Expand ERF landfill gas capture project	2022	50%	Has already been incorporated into emissions calculations	GSCC can add costs from previous project	Concept
Landfill	Investigation into waste to energy	Investigate 2025 and assumed roll-out	100%	43,002	GSCC to add from received quotes	Concept
Landfill	Soft plastic recycling service	2024	72% 2025 80% 2030	34,809	Consider partnering with other councils	Recommended
Landfill	Container Deposit Scheme (CDS)	2023			Utilise existing infrastructure to reduce costs	Required
Landfill	Encourage recycle/reuse market – Circular Economy	2026			No cost	Recommended
Landfill	Behaviour change programs	2021	15%	10,493	Community engagement costs	Recommended
Waste	Audits and reduction measures	2022	15%	206	\$20k for audit	Recommended

4.5 Streetlighting

4.5.1 About Emission Source

Streetlighting is a scope 3 emissions source, which represents 4% of GSCC's FY19 emissions profile at 1,619 tCO₂-e.

4.5.2 External Influences

The Minamata Convention on Mercury is an international treaty that seeks to protect human health and the environment from anthropogenic (caused by humans) emissions and releases of mercury and mercury compounds. This will result in a cessation of the production of mercury containing lamps. Australia signed the Minamata Convention on 10 October 2013. In December 2020, the Australian Government finalised a Regulation Impact Statement considering the costs and benefits of ratifying the Minamata Convention on Mercury. Ratifying the Convention restricts the manufacture, import and export of mercury lamps from 31 December 2020, with a proposed ban on importing mercury lamps into Australia from 31 December 2023, requiring GSCC to ensure any remaining mercury containing lights are transitioned. Converting mercury lamps to LEDs will provide considerable energy and carbon emissions savings.



4.5.3 Reduction Opportunities

GSCC led the Watts Working Better program which involved the replacement of high-energy using streetlight globes with low-energy globes. Between 2013 and 2016, almost 4,000 lights were changed over.

More recently in 2019, GSCC was one of 10 councils which participated in the GBGA LED Streetlighting Business Case project. This study found that there are approximately 6,000 Category V and Category P streetlights remaining, including lights shared with VicRoads. Key findings of the business case are summarised in the table below.

Table 8: GBGA LED Streetlighting Business Case Project Findings Summary

Type of Streetlight	Number	Potential Abatement	Total Cumulative Project Cost	Payback Period
Category V	1,679	535 tCO ₂ -e/year	\$1,365,623	7.7 years
Category P - Mercury	366	99 tCO ₂ -e/year	\$198,141	6.6 years
Category P – Fluorescent	4,077	244 tCO ₂ -e/year	\$1,694,153	14.5 years

In addition, GSCC's commitment to sourcing 100% of its electricity through the Local Government Power Purchase Agreement (PPA), will extend to include all metered streetlights.

4.5.4 High-level Quantification

Table 9: High level quantification of streetlighting emission reduction opportunities

Emission Source	Carbon Reduction Initiative	Commencement Year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Streetlighting	100% of electricity through PPA	2022	100%	6,070	No additional cost	In progress

Emission Source	Carbon Reduction Initiative	Commencement Year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Streetlighting	Replace all outstanding public lighting with LED lights	2022	27%	4,313	\$3,257,917	Required

4.6 Staff Commuting

4.6.1 About Emission Source

Emissions from staff commuting are a scope 3 source and generated **637 tCO₂-e** in FY19, contributing less than 2% to GSCC's total emissions profile. These emissions were estimated by an employee survey and were found to be primarily attributable to car travel. Of the over 3.6 million kilometres travelled by staff to commute to and from work, less than 1% travelled by bicycle or walking and the rest travelled by car.

As shown in Figure 24, almost a 100% of the respondents to GSCC's commuting survey drive in a car, with 81.7% driving alone, 11% driving with one other passenger, and 7.2% driving with multiple other passengers.

4.6.2 External Influences

The Victorian Cycling Strategy 2019-2028 prioritises Strategic Cycling Corridors (SCC) for investment to deliver safer, more direct cycling into and across Melbourne and Victoria. The SCC network links up important destinations for commuters to work, education, activity centres and areas of regional significance.

The key principles of SCCs should result in an increased uptake of active transport and a shift away from short trips made by vehicles. The five principles are:

- **Destination focused:** supports continuous cycling routes linking up significant destinations across suburbs and municipalities.
- **Safe:** encourages greater cycling for transport through the provision of safer, lower stress cycle environments.
- **Direct:** provides cyclists with better travel time routes, often this is the shortest and most direct route.
- **Connected:** SCCs are supported and strengthened by municipal and local cycling links that provide for end-to-end cycling trips.
- **Integrated:** SCCs are integrated with broader transport network and are located on transport routes where cycling is a priority.

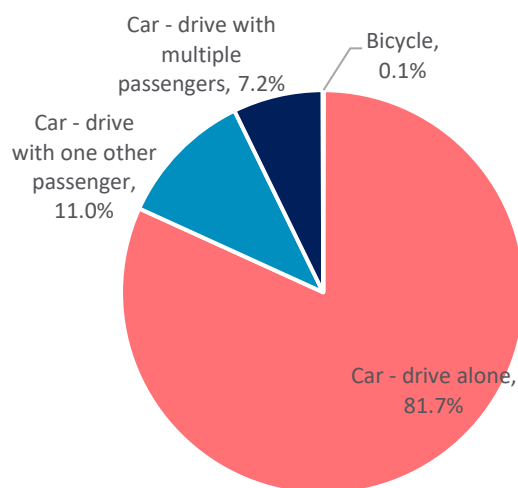


Figure 25: GSCC Survey Responses by Mode of Transport

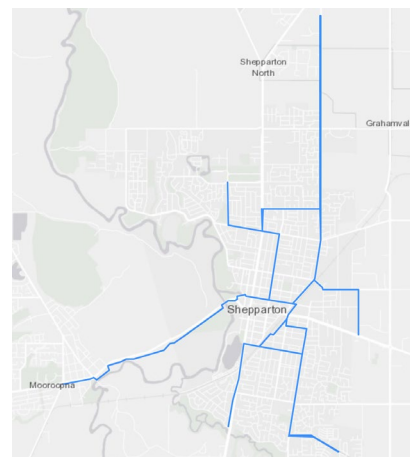


Figure 26: Strategic Cycle Corridor in the Shepparton Municipality (source: <https://transport.vic.gov.au/getting-around/walking-and-cycling/strategic-cycling-corridors>)

There is a SCC planned for Shepparton which is in the early design phases and will be rolled out according to funding allocations. The planned Shepparton SCC is shown in Figure 26. This may encourage/enable additional staff to utilise active travel modes for commuting.

4.6.3 Reduction Opportunities

Previously, GSCC has implemented a carpooling program which encouraged workers to commute together. As an incentive to this program, Council arranged dedicated parking bays for carpool vehicles which was monitored by ticket inspectors. However, this may present a challenge post-COVID.

Other emissions reduction opportunities include:

- Flexible working arrangements.** GSCC is working to resume to pre-COVID 'normal'. It is recommended that in the near future, GSCC revise the Flexibility in the Workplace Policy with COVID learnings. The current policy is dated from 2016 and is reviewed annually. The potential abatement in the table below assumes 50% of staff will be working from home from 2023 onward. Note that Council may need to update its boundary and emissions profile in the future to include emissions associated with staff working from home. Council should provide tips (e.g., energy savings) for staff.
- Incentivise Active Transport.** Consider introducing incentives for staff using alternative transport modes. The most common bike-to-work incentives include onsite bicycle storage, locker rooms and showers, bike-to-work subsidies, bike paths around the workplace, and bike-share memberships. Council can ensure that the SCCs delivered with the Victorian Government connect with Council offices and ensure that there are appropriate amenities to accommodate active transport users. Council should promote the benefits (e.g., safety) of new SCCs and incentivise use through programs (e.g., step count competitions, 'Ride to Work' days).
- Incentivise Public Transport.** GSCC's Environmental Working Group has highlighted that it will work with Goulburn Regional Partnerships and Infrastructure Victoria to increase options, access and affordability of public transport throughout the municipality. These developments may increase uptake of public transport services by GSCC staff or present an opportunity for Council to incentivise its use (e.g., subsidised tickets).

4.6.4 High-level Quantification

Table 10: High level quantification of staff commuting emission reduction opportunities

Emission source	Carbon Reduction Initiative	Commencement year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Staff Commuting	Flexible working arrangements	2023	50%	2,808	No additional costs	Recommended
Staff Commuting	Provision of amenities	2023	1%	56	Not quantified	Recommended
Staff Commuting	Bicycle/public transport subsidies	2023	1%	56	Not quantified	Recommended
Staff Commuting	Staff awareness and programs	2021	1%	69	No cost	Recommended

4.7 Goods and Services

4.7.1 About Emission Source

Goods and Services is a scope 3 emission source attributable to emissions occurring upstream of GSCC use of goods and services and thus outside of Councils direct control. Providers with carbon neutral products and/or services will not contribute to GSCC's emissions profile. Emissions are calculated based on dollar spend in the general ledger using emissions factors from Climate Active. Goods and Services contribute 30% to GSCC's total emissions, generating **12,001 tCO₂-e** in FY19. The breakdown of items included in Goods and Services is provided in the graph below.

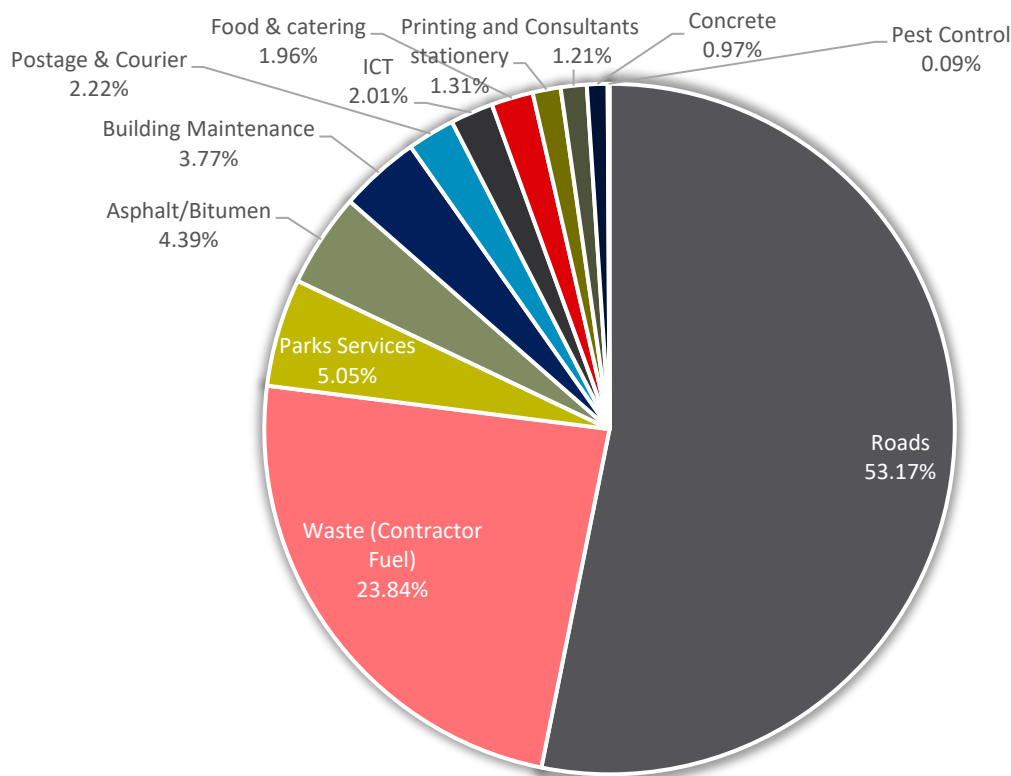


Figure 27: Portion of items contributing to Goods and Services category

Embodied emissions from the construction and maintenance of roads represents the majority (53%) of emissions from the Goods and Services category. In addition, asphalt and bitumen, and concrete was estimated separately and represent 5% of the Goods and Services emissions. The next highest (24%) contributor to the Goods and Services category was the fuel used by waste collection contractors, followed by contractors delivering parks and public space services (5%).

The printing and stationery emission source were calculated based on dollar spend from the general ledger which does not capture itemised expenses (e.g., from paper). Paper data was not available for the whole of FY19 because the printers and software were replaced, deleting previous records. However, for FY20 over 1.1 million sheets of paper weighing over 5.5 tonnes was used, which is estimated at generating 12 tCO₂-e upstream. Comparing available data between FY19 and FY20 for the same period, emissions from paper use reduced by 25%.

4.7.2 External Influences

The Victorian Government introduced its Recycled First policy in March 2020, committing to optimise the use of recycled and reused materials across all rail and road projects. The Ecologiq program is running alongside the roll out of this policy across the \$70 million Big Build program of works.

Materials must still meet existing standards and specifications for infrastructure construction and maintenance, but contractors will be encouraged to prioritise the optimisation of recycled aggregates, glass, plastic, timber, steel, ballast, crushed brick, crumb rubber, reclaimed asphalt pavement and organics, instead of virgin materials. While there are no set performance targets, bidders must demonstrate how they will optimise the use of recycled and reused materials in tender submissions and contractors must report on the types and volumes of recycled and reused products they used.

Through the Recycled First Policy, the Victorian Government and industry have committed to working to address barriers and raise awareness and support for the use of waste materials. Education and training will also be provided for the use of recycled materials and help build a sustainable market for this content. These state requirements and engagement initiatives will likely increase the availability of low carbon materials and technologies at lower costs. GSCC, can add to the demand through a sustainable procurement policy, and draw on the benefits.

4.7.3 Reduction Opportunities

Since Goods and Services is a scope 3 emission source and thus not within Council's direct control, options are limited. However, there are options which GSCC can harness to influence these emissions.

GSCC has already implemented various initiatives which contribute to the reduction of Goods and Services emissions, including:

- **Reusing/repurposing.** Council has been prioritising reusing or repurposing devices before purchasing newer models.
- **Recycled materials.** Concrete is collected at Council transfer stations and recycled into crushed concrete for use in roads and maintenance.
- **Infrastructure Sustainability Council of Australia (ISCA).** Council has internal ISCA Infrastructure Sustainability Accredited Professionals (ISAPs) and has previously held an ISCA membership to use ISCA standards on road projects. The membership has since lapsed as GSCC found the certification process to be onerous and resource intensive. However, ISCA is developing a 'Lite' version to alleviate these resource burdens for smaller projects and it is recommended that council revisit this.
- **Infrastructure Design Manual (IDM).** GSCC is a member of IDM. In March 2020, IDM released its Sustainable Infrastructure Guidelines and relevant resources. Projects following the guidelines can benefit from emissions reductions. For example, the Steam Packet Place (City of Greater Geelong) and Grant Street Footpath (Colac Otway Shire) achieved 5 tCO₂-e and 8 tCO₂-e emissions reductions for less than a 10% increase on conventional costs. Another case study, Pavement Rehabilitations at Grange Park Drive and Townsend Road (City of Greater Geelong), resulted in 22 tCO₂-e emissions reductions and saved almost \$200,000.

Guidance developed by the Science Based Targets initiative, Navigant and the Gold Standard for best practices in Scope 3 GHG management identify the **procurement policy** and **stakeholder engagement** as the most significant levers for emissions reduction for Goods and Services (and other scope 3 emission sources). A procurement policy that explicitly preferences low emission goods and services, and suppliers that are

actively engaged in measuring and reducing their carbon footprint should lead to positive outcomes. For more information see Appendix D: Procurement Policy and Procedures.

While some low carbon goods and services may come at a price premium, others will provide cost savings; they may even cancel each other out. Further to this, there may be other costs and benefits over the life of the product or service. Hence, the option with the lowest up-front cost may not offer the lowest cost option over the life of the good or service. Following the Australian Government's Sustainable Procurement Guide, whole of life cycle costs considering economic, environmental and social costs and benefits should be assessed.

In addition, tender evaluation should include environmental criteria relevant to the good/service being procured. This will ensure prioritisation for low carbon options over more emissions intensive alternatives, even in the instance that low carbon options are not available locally and/or are relatively new and thus associated with a higher cost. Public procurement represents a large share of the market and can generate the demand necessary to improve supply and competitive advantage.

The procurement policy can set out stepped emissions reduction targets for procured goods and services (including capital goods like new builds). To help providers and suppliers meet these targets, standard requirements in tender documentation could be for bidders to include detail on environmental sustainability (e.g., Environmental Management Plans, certification of carbon neutrality, adherence to a best practice standard like Green Star or ISCA), and not just a 'tick box' exercise. Another standard requirement should be for bidders to provide a bill of quantity (where applicable) for fuel and materials (e.g., chemicals, construction materials, etc.) so Council can improve accuracy of emissions calculations. Adherence to these requirements can be encouraged through performance reviews.

4.7.4 High-level Quantification

Table 11: High level quantification of Goods & Services emission reduction opportunities

Emission source	Carbon Reduction Initiative	Commencement year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Goods & Services	Green Product Trials	2022	Not quantified	Not quantified	No additional cost	Recommended
Goods & Services	Sustainable Procurement Policy – 50% by 2030	2022	10%-50%	35,989	No additional cost	Recommended

DAREBIN CITY COUNCIL

As one of the first councils in Australia to declare a climate emergency, Darebin has been leading the way for other Australian councils through sharing of learnings and resources. One of the steps in Darebin's journey was to review all its policies through a climate emergency lens. As such, Darebin has developed its [Social and Sustainable Procurement Policy](#). Darebin has recognised that it can enter procurement contracts that will contribute to creating a fair, inclusive community that is both environmentally and

Emission source	Carbon Reduction Initiative	Commencement year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Goods & Services	Stakeholder Engagement – initial and ongoing collaboration	2022	Not quantified	Not quantified	No additional cost	Concept
Goods & Services	Utilising the Circular Economy	2026	39%	26,266	Not quantified	Recommended

4.8 Building Construction

4.8.1 About Emission Source

Emissions from the construction of new buildings in **FY19** was in the order of **961 tCO₂-e**, representing 2% of GSCC's total emissions. This increased significantly to **8,774 tCO₂-e** in **FY20** due to the construction works for the Shepparton Arts Museum (SAM), and is expected to vary year on year depending on the capital works program. Building Construction is a scope 3 emission source due to the embodied emissions of contractors and materials used.

Similar to other scope 3 emission sources, Building Construction emissions has been estimated based on the general ledger reported expenditure and these estimations can be improved in future by requesting more detail from third parties.

4.8.2 Reduction Opportunities

Reducing emissions associated with the construction of buildings will need to target embodied emissions of materials, fuel and electricity consumed (assuming construction waste is captured in landfill emissions).

Emissions reduction opportunities for this emission source align with the circular economy opportunity for waste/landfill and the procurement policy opportunities for goods and services. Another opportunity would be to up-date current panels and pre-qualified suppliers. For example, currently there is a concrete panel locked into agreed rates. GSCC can induct a new panel in line with new procurement policies and pre-qualification criteria when the panel is due to be reviewed.

4.8.3 High-level Quantification

Table 12: High level quantification of Building Construction emission reduction opportunities

Carbon Reduction Initiative	Commencement year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Review Concrete Panel	2022	12%	1,137	Resource costs associated with submission review	Concept

Carbon Reduction Initiative	Commencement year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Sustainable Procurement Policy – 50% by 2030	2022	10%-50%	2,881	No additional cost	Recommended
Stakeholder Engagement – initial and ongoing collaboration	2022	Not quantified	Not quantified	No additional cost	Recommended
Utilising the Circular Economy	2026	39%	2,103	Not quantified	Recommended

4.9 Downstream Assets

4.9.1 About Emission Source

Downstream Assets are assets which are owned by Council but leased to a third party which generates emissions through the use of energy (i.e., natural gas and electricity). Council owns and is able to make upgrades to the assets but not control how the tenant uses the energy. Hence, Downstream Assets is a scope 3 source because energy consumption at these sites is not in Council's direct control. Downstream Assets is estimated to represent 6% of GSCC's total emissions and generated **2,259 tCO₂-e** in FY19. Emissions can be calculated more accurately following the improvement recommendations in section 3.4.

4.9.2 External Influences

The energy sector pledge released in the Victorian Climate Change Strategy is for 50% of electricity to come from renewable energy by 2030. As part of this pledge, the Victorian Government has committed to a series of funding packages, including \$14 million to expand the [Victorian Energy Upgrades](#) program.

4.9.3 Reduction Opportunities

Opportunities to reduce emissions from Downstream Assets will be similar to those implemented to reduce Energy emissions from Council assets, that is following the energy reduction hierarchy. Some assets may even benefit from microgrids as identified previously for the Energy emissions source. The first step would be collecting energy bills of the assets, determining the highest consuming sites and conducting audits to best understand the most feasible and economic reduction measures.

4.9.4 High-level Quantification

Table 13: High level quantification of Downstream Asset emission reduction opportunities

Carbon Reduction Initiative	Commencement year	Potential abatement (%)	Potential abatement 2021-30 (tCO ₂ -e)	Cost	Status
Highest consumers incorporated in energy auditing tool and energy audits	2023	Not quantified	Will only achieve abatement if audit recommendations implemented	Not quantified	Recommended
Engage with tenants to share energy efficiency best practice	2022	10%	2,224	Resource cost for knowledge sharing	Recommended
Extending PPA participation to leased assets	2024	100% of electricity	14,004	Pass cost on to tenants	Recommended

4.10 Water

4.10.1 About Emission Source

Water is a scope 3 emission source associated with the pumping of water for GSCC use. While not within its direct control, Council can influence emissions from water by reducing consumption. Water constitutes 3% of GSCC's total emissions at **1,042 tCO₂-e**.

Emissions from water is higher than other councils because GSCC has included water use from its owned and operated buildings as well as parks and open spaces. However, monitoring water use across all assets and targeting water reduction initiatives towards parks and open spaces will provide awareness and education for the community as well reducing water security risks.

4.10.2 Reduction Opportunities

GSCC has achieved the following emissions reduction opportunities to-date:

- Recreation and Parks has implemented many water efficiency/ irrigation programs and should continue to keep track of water use and identify improvements.
- Water audits conducted on outdoor pools to fix leaks. An additional method to improve water efficiency in pools is to ensure appropriate covering when not in use to avoid evaporation.
- Centralised irrigation
- Water Sensitive Urban Design (WSUD). Council should continue to use WSUD systems (i.e., rain gardens, green roofs and infiltration systems) where feasible. WSUD has other co-benefits such as improving biodiversity.
- Planting drought resistant vegetation.
- Use of water tanks and bore water (e.g., Saleyard).

GREAT OCEAN ROAD COASTAL COMMITTEE

- Uses mulch in gardens across all sites, including coastal reserves, as a method of conserving water and limiting evaporation
- Torquay Caravan Park's amenity blocks include push button timed showers and sink tap faucets, dual flush toilets and large rainwater tanks

Additional emissions reduction opportunities for water include:

- **Awareness campaigns** for staff, caretakers of public space or other Council assets (e.g., sportsgrounds).
- **Equipment upgrades.** Upgrade to more efficient water appliances and equipment (e.g., dual flush toilets, efficient shower hose heads, timed faucets) and specify WELS minimum standard rating (e.g., 4+ stars).
- **Gardening practices.** Mulched gardens to reduce need for watering or rain gardens. Mulch can be a part of the circular economy process, closing the loop on FOGO waste.

These reduction opportunities could be linked to the Sustainable Procurement Policy opportunity to ensure they are incorporated into any future developments or maintenance.

Irrigation requirements for new developments will fall under the responsibility of GSCC once operational; hence, GSCC can and should influence sustainable water management in new developments. New irrigation developments, or significant redevelopments, in Victoria, are managed through regional Irrigation Development Guidelines (IDGs). IDGs guide irrigation developments in meeting best practice standards to avoid or minimise the off-site impacts of irrigation water use. IDGs require consideration of natural resource management issues in the catchment, particularly those issues identified in Regional Catchment Strategies, Land and Water Management Plans and other relevant plans.

There is an opportunity for GSCC to work collaboratively with water corporations and catchment management authorities within the region (e.g., Goulburn Broken CMA) to develop strategies and plans for sustainable and alternative irrigation methods (e.g., promote WSUD) for the Greater Shepparton region. This is known as Integrated Water Management. More information can be found in DELWP's [Integrated Water Management Framework for Victoria](#). In addition, GSCC may wish to explore the opportunity for a research and development project in this space.

GSCC can include water management in strategic planning and build relevant requirements into the planning scheme at a high level in an ESD policy (e.g., CASBE guidelines) as well as in overlays. To ensure the successful delivery of sustainable irrigation in new developments, any requirements should bring the community and developers along on the journey. In addition, consultations with planning applicants throughout the process (e.g., at pre-application, design, etc) has also proven useful to councils in achieving sustainable outcomes in private developments.

Case Study – Mt Alexander Shire Council

- **Integrated Water Management.** Council has recently commissioned an IWM plan for Castlemaine to assist with the protection of waterways, to gain advice regarding climate resilient water supply and assess options for water sensitive urban design in future developments within Castlemaine.
- **Planning Scheme.** The Mount Alexander Planning Scheme outlines strategies to increase the shire's resilience to the adverse effects of climate change by discouraging certain land use and development activities that would place society at greater risk, and encouraging developments that capture and re-use water. The scheme also seeks to minimise risks such as flooding, soil degradation and bushfire risk through a range of targeted strategies, guidelines and strategic work specific to our region.

5 Climate Active Certification

This section details the steps required for Council to achieve certification under the Federal Government’s Climate Active Carbon Neutral Standard.

5.1 Climate Active Process

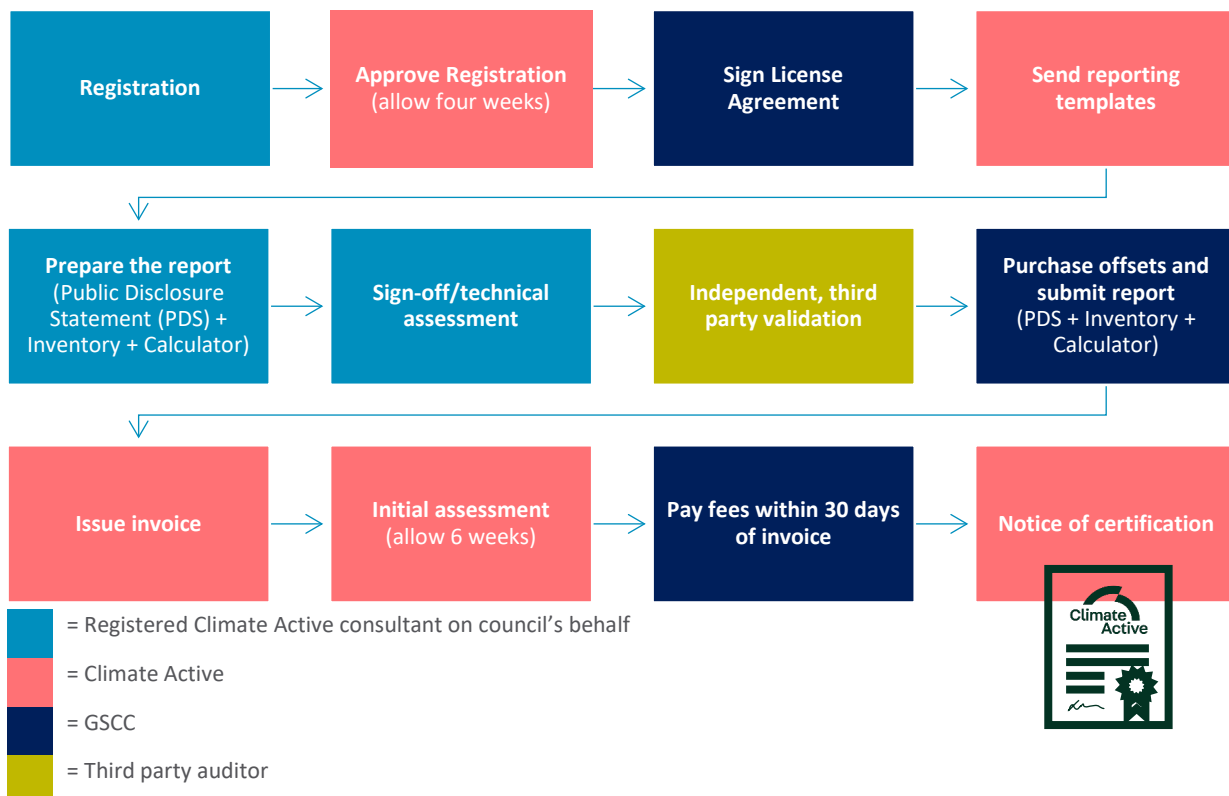
The Australian [Climate Active Carbon Neutral Standard](#) (the Standard), is a voluntary standard based on the international [GHG Protocol](#). It provides best-practice guidance on how to measure, reduce, offset, report and audit emissions for organisations such as local councils, and underpins the Federal Government’s Climate Active certification scheme. Certifying as carbon neutral through the Climate Active scheme provides a credible, third-party verified and Government certified commitment to sustainability—and is a recognisable guarantee that an organisation will not contribute to the carbon footprint of a supply chain and will meet the procurement requirements of both the private and public sectors. Examples of local councils that have achieved certification include:

- City of Melbourne
- City of Sydney
- City of Adelaide
- Moreland City Council
- Brisbane City Council
- Randwick City Council
- Moreland City Council
- Bayside City Council
- City of Yarra
- Maroondah City Council



Figure 28: Why join Climate Active?

The following steps are necessary to achieve carbon neutrality under Climate Active:



Detail of work required for a Climate Active certification is outlined below in Table 14.

The work completed under this current engagement with GSCC is able to form the basis of GSCC's Climate Active certification should it chose to pursue certification. The approach is in line with the Climate Active standard, and as such, the emissions boundary, inventory and emission reduction plan all feed into a carbon neutral certification. The Ndevr Environmental project team are registered consultants under the scheme so are able to sign off on a Technical Assessment. What remains is the management of the carbon neutral certification with Climate Active, including:

- registration with Climate Active and signing their licensing agreement;
- input of data into Climate Active inventory templates and calculators pictured in Figure 29 (including the attachment Appendix E: Climate Active Public Disclosure Statement Summary), and Technical Assessment; and an
- Independent, third party verification audit.

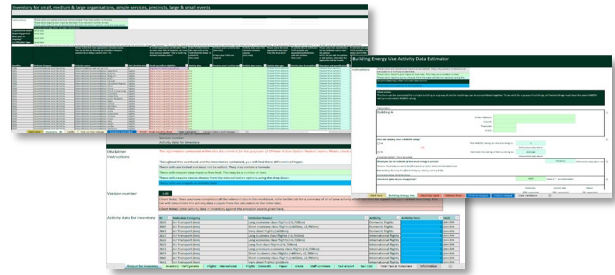


Figure 29: : Latest Climate Active inventory template and calculators (as of 26/03/2021, subject to update by Department)

Table 14: Overview of Climate Active certification tasks, time frames and costs (with tasks already completed noted)

Task	Time frame/ frequency	Approximate Fee (Exc. GST)
1. Boundary and Scope Definition Define the goals, scope and the emissions boundary of the system to be investigated.	n/a, already completed with current engagement	n/a, already completed with current engagement <input checked="" type="checkbox"/>
2. Carbon Account Development Set up GHG inventory (as excel workbook) including calculations, logical elements, assumptions, input data such as emission factors, and display data as per Climate Active requirements (per scopes, sources, and operational activities).	n/a, already completed with current engagement	n/a, already completed with current engagement <input checked="" type="checkbox"/>
3. Carbon Account Development and Assessment Develop, test and validate the carbon account and finalise system emissions profile.	n/a, already completed with current engagement	n/a, already completed with current engagement <input checked="" type="checkbox"/>
4. Carbon Reduction Advice Preparation of high-level advice for emissions reductions.	n/a, already completed with current engagement	n/a, already completed with current engagement <input checked="" type="checkbox"/>
5. Carbon Neutral Certification Management Liaison with the Climate Active Administrator and third-party auditor, preparation of all required documentation including public disclosure statement, clarification of questions.	6-8 weeks*	~\$4,900* *approximate pricing. Noting that an independent registered consultant may need additional time/fees as they were not the ones who prepared the account.
Third Party Validation Third party validation requirements vary based on organisation size, total emissions and certification type.	First year and then every three years	Approx. \$2,000 – \$4,000 for organisational certifications

Task	Time frame/ frequency	Approximate Fee (Exc. GST)
<p>Carbon Neutral Certification Annual Fee Certification fees vary based on total emissions: fee for organisation emissions 10,000 ≤ 80,000t CO₂-e shown.</p>	Annually	10,000 ≤ 80,000t CO ₂ -e: \$13,238* *(GST Inclusive, subject to change by Climate Active)
<p>Offsets Purchase and Retirement We assist with sourcing offsets meeting the strict international Verified Carbon Standard and the Gold Standard.</p>	Annually	Between \$5 - \$25 per tonne CO ₂ -e* *Offset prices and project types are subject to volume and market fluctuations.

6 Action Plan Options

This section presents options for achieving net zero emissions by 2030 for Council to consider based on the emissions reduction opportunities discussed in Section 4.

Three scenarios are presented of increasing levels of ambition for Council's consideration:

- **Do Nothing.** This is not a recommended option and is included to demonstrate the baseline and potential cost of leaving achieving the target to 2030.
- **Do Planned.** This scenario is more in line with Council's current business as usual of implementing the initiatives that have been discussed and are in pipeline for works.
- **Do All.** The most ambitious scenario it includes considering and implementing all of the initiatives discussed in this paper.

These scenario options are intended to show the range of potential abatement and the scale of offsets potentially required by 2030 under different scenarios. Due to the higher-level quantifications these projections are indicative only and as noted in Section 4 and many will require further analysis if selected for inclusion in the development of the final emission reduction plan.

6.1 Do Nothing

This option is the 'inaction' approach, and the baseline for if Council did nothing to reduce its emissions and continued as per the current emissions intensity by population of Greater Shepparton. In this scenario GSCC's carbon inventory is likely to be in the order of 44,184 tCO₂-e by FY30, and for Council to meet its net zero target by 2030, it would have to offset all emissions at once, costing between \$800,000 to \$1.6 million per annum from 2030 (based on 2030 price predictions).

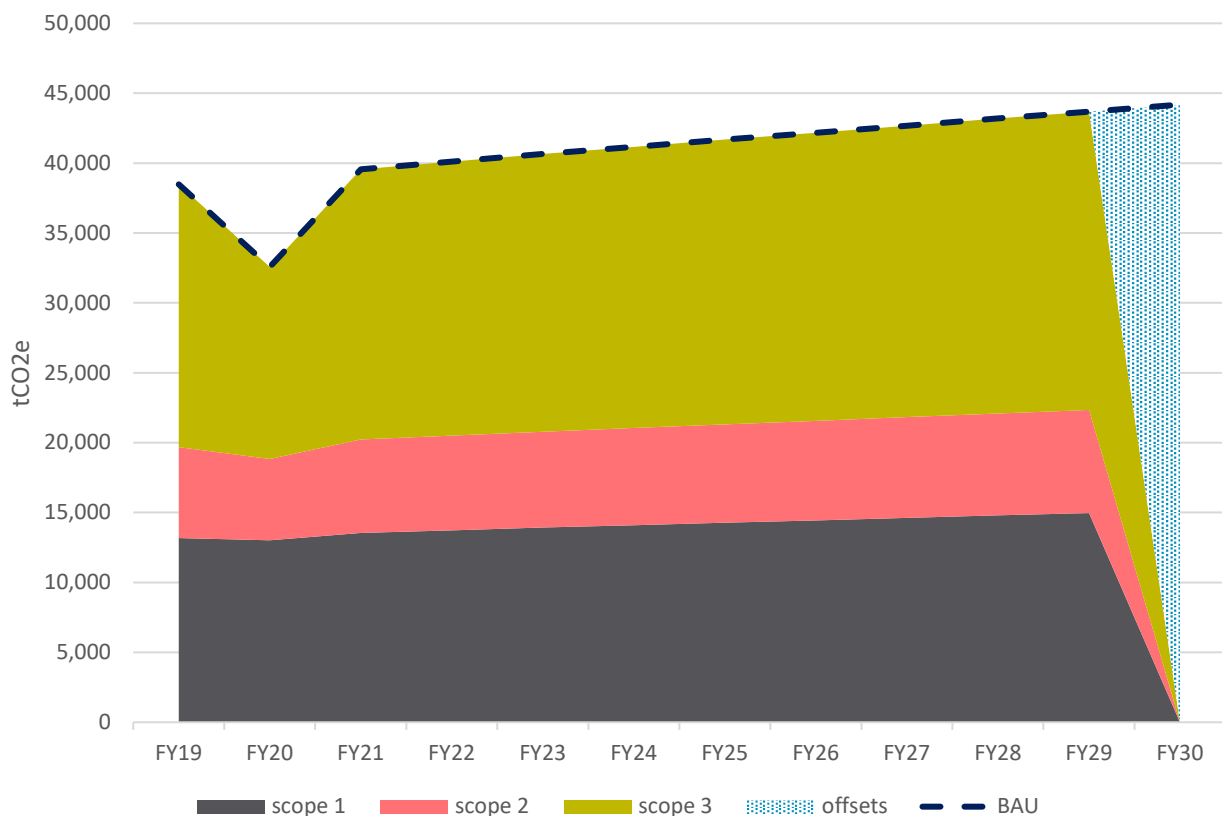


Figure 30: Do nothing scenario and purchase offsets in 2030. Note the dip in FY20 is due to incomplete data.

6.2 Do Planned Activities

This option refers to the implementation of all ‘planned’ and ‘in progress’ emissions reduction opportunities outlined in Section 4 as identified with GSCC . This is estimated to lead to a 22% reduction in emissions in FY30, requiring the remaining emissions (33,707 tCO₂-e) to be offset to reach the net zero target. The purchasing of this quantity of offsets is estimated to cost between \$600,000 to \$1.2 million per annum from 2030 (based on 2030 price predictions).

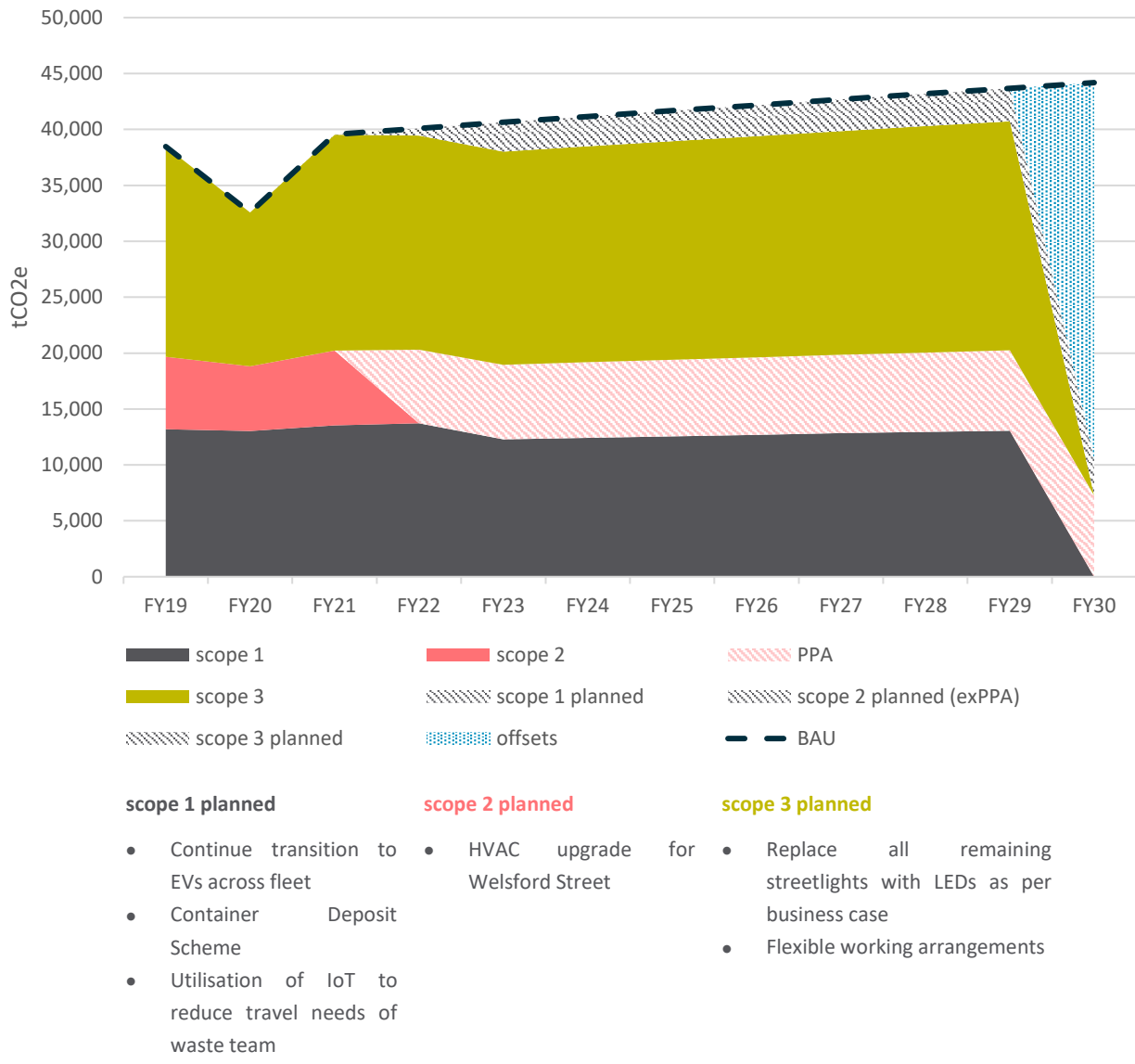


Figure 31: Abatement potential of already in progress or planned initiatives as detailed in Section 4. Note the dip in FY20 is due to incomplete data.

6.3 Do All Recommended

This option refers to the implementation of all ‘concept’, ‘in progress’ and ‘recommended’ emissions reduction opportunities outlined in Section 4. If all these initiatives are deemed feasible and implemented, this could potentially lead to a 97% reduction in emissions in FY30, requiring the remaining emissions (1,299 tCO₂-e) to be offset to reach the net zero target. The purchasing of this quantity of offsets is estimated to cost between \$25,000 to \$46,000 per annum from 2030 (based on 2030 price predictions).

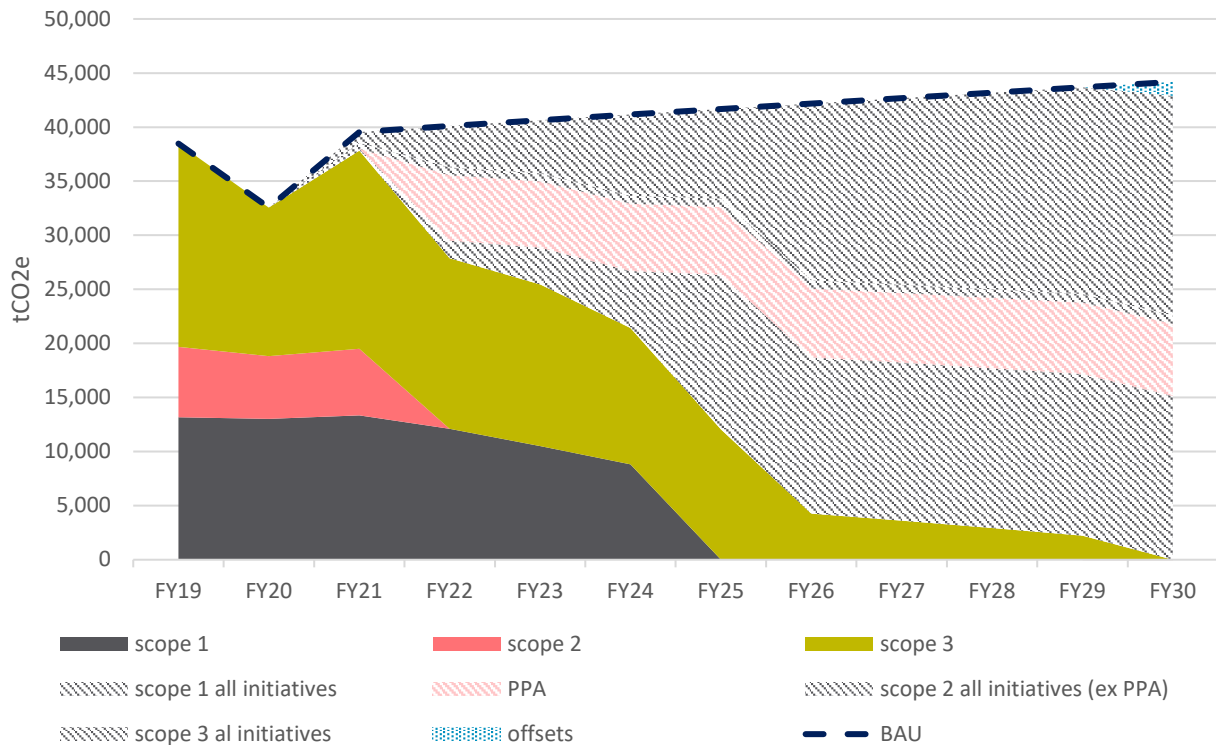


Figure 32: Abatement potential of all initiatives included in Section 4. Note the dip in FY20 is due to incomplete data.

6.4 Further Options Discussions

Council expressed interest in understanding the flexibility of the boundary of emission sources included, particularly with reference to the landfill. If Council chooses to exclude landfill emissions from its profile and only estimate emissions generated from its corporate general waste, GSCC’s emissions profile will reduce by 6,240 tCO₂-e. However, GSCC will no longer align with global GHG accounting protocol or meet Climate Active certification requirements because all scope 1 emission sources are deemed relevant.

The commitment to net zero made by GSCC is for Council operations. The boundary set in this paper is in line with Climate Active and the GHG protocol and is recommended to ensure that council aligns with best practice, peers and withstands public scrutiny. While, Council in setting its target does not have to certify and can choose to state that it is not aligning with best practice, it will pose a risk to Council as the inclusion of the landfill will also be important for the climate emergency response.

Emissions and abatement from land use, land-use change, and forestry (LULUCF) are not included in the Climate Active or GHG Protocol standards for organisations and have thus been excluded from GSCC’s boundary.

GSCC has expressed interest in developing vegetation projects to generate abatement. This can be done through the Federal Government’s Emissions Reduction Fund. For this to be a viable option, a minimum of 100ha would be necessary for plantings. If GSCC has access to land of this scale it may wish to undertake a feasibility study.

7 Recommendations and Next Steps

This section summarises the recommendations and next steps for consideration of the options paper for Council's Net Zero Plan.

Council has committed to net zero emissions by 2030 and to achieve this in the most cost-effective manner it is recommended that Council follows the prioritisation framework in Figure 33. This is to focus on the emission sources that will have the biggest impact that GSCC is able to influence, which have the lower cost of abatement (considering whole of life costs), and align strategically with Council's other objectives (i.e., climate emergency response). The timeline in the following section is based on the prioritisation framework (as well as technology availability). GSCC may wish to review the proposed timeline in line with budget.

The largest emission sources are the landfill, electricity consumption, and goods & services.

If GSCC's plans to commit 100% of its electricity consumption to the renewable energy Local Government Power Purchase Agreement by 1 July 2021, scope 2 emissions will be zero.

Some of the emissions reduction opportunities may lead to increased electricity use and an increase in scope 2 emissions (e.g., converting natural gas systems to electric ones, transitioning the fleet to EVs). Therefore, it is important to continue to improve energy and fuel efficiency to ensure operational cost savings.

In addition, scope 1 emission sources (i.e., natural gas, LPG, fuel, refrigerants and landfill) are within Council's direct control and thus should be a priority for emissions reduction.

Scope 3 emissions occur outside of GSCC's direct control. However, improvements in procurement procedures can influence the majority of scope 3 emission sources.

In addition to the emissions reductions associated with the different initiatives included in this paper, implementation of them will have additional benefits:

- Mitigating climate risk of reduced exposure to future carbon pricing signals
- Supporting innovation, creating jobs
- Operational financial savings
- Demonstrating leadership
- Social benefits (e.g., health, energy security)

Considerations for compiling the Net Zero Plan:

- That by 2030 there will be an increased demand for offsets and the price will have increased due to limited supply
- Opportunities for innovation and climate risk mitigation
- Increased price pressures from energy sources

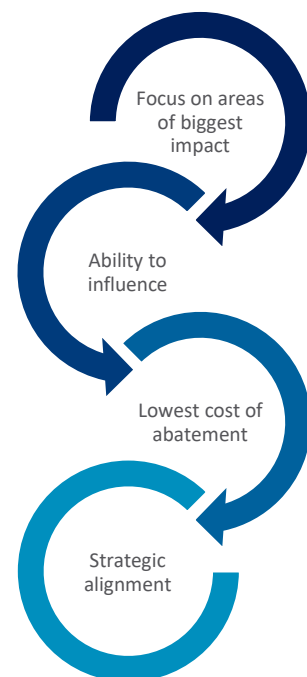


Figure 33: prioritisation

7.1 Proposed Timeline

A Gantt chart of steps recommended for inclusion is presented below to indicate the timeline of tasks. The associated emission source and accountable person is also identified. To be confirmed with GSCC

Opportunity	Responsibility	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
General												
<i>Project management</i>	All responsible	[Task bar]										
<i>Form guiding coalition</i>	Project Team	[Task bar]										
<i>Ongoing data collection & carbon assessment</i>	Environment & Data Owners	[Task bar]										
<i>Data improvements</i>	Data Owners	[Task bar]										
<i>Communication - reporting & celebrate wins</i>	Communications & Engagement, Environment	[Task bar]										
<i>Review - review Action Plan against new technologies</i>	Environment	[Task bar]										
<i>Consider formal participation in Climate Active</i>	Environment	[Task bar]										
Energy												
<i>100% of electricity through PPA</i>	Strategic Assets	[Task bar]										
<i>HVAC upgrade for Welsford Street</i>	ICT	[Task bar]										
<i>IoT – automation and control</i>	Infrastructure	[Task bar]										
<i>Feasibility study and implementation of electrifying natural gas</i>	Infrastructure	[Task bar]										
<i>Hydrogen feasibility study and implementation to replace diesel/petrol</i>	Infrastructure	[Task bar]										
<i>Zero emission waste compactors</i>	Infrastructure	[Task bar]										
<i>Re-integrate the energy auditing tool and energy audits for remaining assets</i>	Environment	[Task bar]										
<i>Feasibility study and implementation of microgrid for remote assets</i>	Infrastructure	[Task bar]										
Company Vehicles												
<i>Transition passenger pool fleet to electric by 2030</i>	Strategic Assets	[Task bar]										
<i>Data Tracking - Work with IT to better track vehicle utilisation</i>	Strategic Assets	[Task bar]										
<i>Transition private passenger vehicles to electric or hydrogen by 2030</i>	Strategic Assets	[Task bar]										
<i>Continue to install chargers at Council offices to support EV transition</i>	Strategic Assets	[Task bar]										

Opportunity	Responsibility	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<i>Transition 50% of LCV fleet vehicles to alternative technologies (electric/ hydrogen) by 2030</i>	Strategic Assets										
<i>Continuous driver education of efficient use of vehicles, especially with changing technology</i>	Strategic Assets										
<i>Revisit Ride Share functionality with COVID-19 recovery and monitor use</i>	Strategic Assets, Corporate Governance										
<i>Utilisation of IoT to reduce travel needs between council offices and landfill site</i>	ICT										
<i>Transition to 50% zero emission trucks</i>	Strategic Assets										
<i>Fleet Policy</i>	Strategic Assets										
Landfill & Waste											
<i>Expand ERF landfill gas capture project</i>	Works & Waste										
<i>Waste to energy</i>	Works & Waste										
<i>Soft plastic recycling service</i>	Works & Waste										
<i>CDS</i>	Works & Waste										
<i>Encourage recycle/reuse market</i>	Works & Waste										
<i>Behaviour change programs</i>	Works & Waste, Community										
<i>Audits and reduction measures</i>	Works & Waste										
Streetlighting											
<i>100% of electricity through PPA</i>											
<i>Replace all outstanding public lighting with LED lights</i>	Infrastructure										
Staff Commuting											
<i>Flexible working arrangements</i>	Corporate Governance										
<i>Provision of amenities</i>	Infrastructure										
<i>Bicycle/public transport subsidies</i>	Corporate Governance, Finance & Rates										
<i>Staff awareness and programs</i>	Communications & Engagement										
Goods & Services											
<i>Green Product Trials</i>	Infrastructure										
<i>Sustainable Procurement Policy – 50% by 2030</i>	Corporate Governance										
<i>Stakeholder Engagement – initial and ongoing collaboration</i>	Corporate Governance										
<i>Utilising the Circular Economy</i>	Infrastructure										
Building Construction											

Opportunity	Responsibility	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<i>Review Concrete Panel</i>	Infrastructure										
<i>Sustainable Procurement Policy – 50% by 2030</i>	Corporate Governance										
<i>Stakeholder Engagement – initial and ongoing collaboration</i>	Corporate Governance										
<i>Utilising the Circular Economy</i>	Infrastructure										
Downstream Assets											
<i>Highest consumers incorporated in energy auditing tool and energy audits</i>	Infrastructure										
<i>Engage with tenants to share energy efficiency best practice</i>	Infrastructure										
<i>Extending PPA participation to leased assets</i>	Infrastructure										

7.2 Governance

The successful implementation of emissions reduction opportunities requires effective change management to bring all stakeholders on the journey. It provides a structure for GSCC to be guided by to bring about change. Key steps to change management are outlined in Table 2. The second item, the guiding coalition, will form the governance structure for the Action Plan. Further, the responsibility for the delivery of each opportunity should be designated to a team (and their manager).

Table 15: Key change management principles and associated actions (Kotter 1995)

Change Management Principle	GSCC Actions
Establish a sense of urgency	Council has already declared a climate emergency and set a target for net zero emissions.
Form Guiding Coalition (i.e., sustainability working group)	Council's team for the current project can act as the guiding coalition, with senior and management positions present, which will assume responsibility over actions.
Create Vision	Council is developing a Climate Emergency Plan which should provide direction for other Council strategies, plans and policies. This Options Paper will inform the Net Zero Action Plan.
Communicate the Vision	Deliver the message of the Action Plan early and often via multiple channels to all stakeholders (internal and external). Signage, websites, in discussions, and constant reminders can help to communicate the vision.
Empower Others to Act	Bring stakeholders along on the journey and provide them with a platform to raise ideas (e.g., suggestion boxes, agenda item on internal working groups, online feedback form); and support the implementation of improvement ideas. There have already been 2 internal stakeholder workshops held for this project.
Generate Short Terms Wins	This project has identified many opportunities. The first opportunities implemented should be easy to implement, highly visible, have a big impact, and preferably low cost.
Consolidate, use Momentum for Next Projects	Measure the results of the opportunities and communicate the achievements. It is critical to celebrate success to build the momentum and credibility to undertake the next projects, and to further engage with stakeholders. One method by which this will be achieved is through the ongoing carbon footprinting exercise.
Lock Changes into the Process	Embed the process of identifying and implementing emissions reduction initiatives into the way things are done through incorporation into written procedure (i.e., policies and guidelines) and embed in the organisational culture.

7.3 On-going Monitoring Considerations

The ongoing monitoring of GSCC's emissions is important to track progress towards the net zero target and reduce costs of inaction. Improved accuracy of data and estimations will also assist with this. Hence, it is recommended that GSCC continue its subscription to the Azility platform and follow the guidance for improved data management.

The accompanying spreadsheet tool will allow GSCC to update its year on year footprint and track progress towards the net zero target and assist in prioritising future opportunities. The process to achieve net zero emissions will be a continual improvement journey as illustrated in Figure 34.



Figure 34: Continuous improvement journey

7.4 Net Zero Action Plan

Once GSCC has been provided with and approves the final Options Paper, it can be used to inform the development of the Net Zero Action Plan. The Plan should undergo consistent reporting and review as depicted in Figure 35.

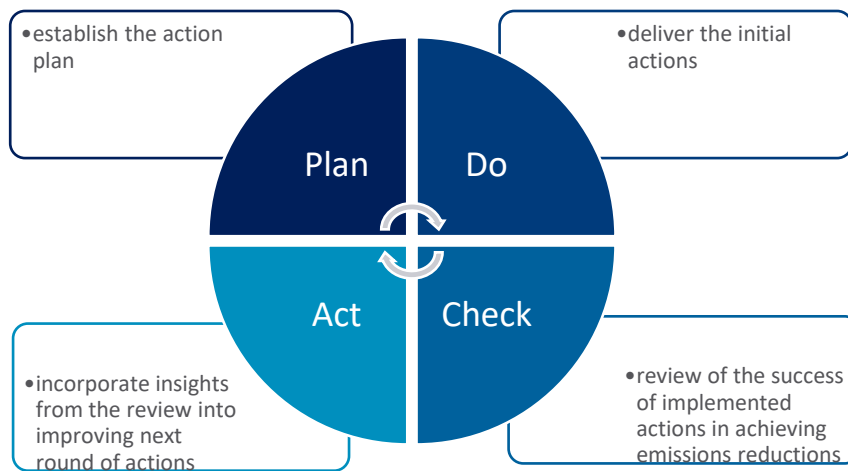


Figure 35: Continuous Action Monitoring Process



8 Appendices

8.1 Appendix A: Federal and State Funding

Table 16: Federal and Victorian planned initiatives summary (Ndevr Environmental, 2021)

Budget allocations and plans	Timing
Federal	
<p>ARENA received \$1.6B in new funding. In addition to accelerating the development of new and emerging technologies to reduce emissions from agriculture, manufacturing and transport, they are now also a clean technology grants hub for future fuels and micro-grids. \$16.5M has been made available for Round 1 of the Future Fuels Fund to fund battery electric vehicle (BEV) public fast charging infrastructure in capital cities and regional centres. For more information visit: https://arena.gov.au/funding/future-fuels-fund/</p>	Applications open until 6 April 2021
<p>\$50M investment in Carbon Capture Use and Storage Development Fund. For more information visit: https://www.business.gov.au/grants-and-programs/carbon-capture-use-and-storage-development-fund</p>	Available for 3 years to businesses, researchers and governments. Applications are open until 29 March 2021 .
<p>Grid Reliability Fund legislation (not yet passed through Parliament), \$1B to be allocated to CEFC to invest in grid augmentation, transmissions, interconnectors, renewables, hydro, grid scale battery storage and hydrogen.</p>	TBC
<p>\$21.4M funding from 2018-19 to 2021-22 for Australian Heritage Grants. Stay up to date: https://www.business.gov.au/grants-and-programs/australian-heritage-grants</p>	FY21 applications closed. FY22 is the final round.
Victoria	
<p>The Victorian Budget has allocated \$1.6B to improve energy efficiency and accelerate clean energy investment including:</p> <ul style="list-style-type: none"> • \$540M to establish six Renewable Energy Zones across Victoria • \$108M for innovative renewable energy and hydrogen projects • \$12.6M to bring more than 600MW of new, clean energy online through the second Victorian Renewable Energy Target auction • \$31M for the Business Recovery Energy Efficiency Fund (BREEF) to provide grants to help large energy users to introduce energy efficiency and demand management technologies to reduce costs • \$25M to accelerate the uptake of zero-emissions vehicles • \$20M to investigate a zero-emission bus fleet • \$3.72M to enable the development of a Gas Roadmap to support more efficient use of gas and support opportunities for electrification and alternative fuels. • \$812.1M to help Victorians with their energy bills and solar installation 	
<p>Recycling Victoria Council Fund is a 4-year program which supports local government and alpine resort management boards to reduce waste to landfill and transition towards a circular economy. There are 2 streams: feasibility and implementation. Feasibility projects can expect grants between \$20k - \$80k, implementation projects can expect grants between \$80 - \$500k. For more information visit: https://www.sustainability.vic.gov.au/grants-and-investment/grants/recycling-victoria-councils-fund</p> <p>There is also a Recycling Victoria Communities Fund which Council can encourage community organisations to undertake.</p>	Applications open until 19 March 2021
<p>The Regional Jobs Fund looks to support projects which result in the retention and creation of new jobs, development of business innovation and productivity, as well as the provision of utilities and infrastructure. This includes projects which aim to introduce new technologies, plant and equipment and systems or focus on water and energy savings, among others. This may present an opportunity for GSCC to consider water recycling in its trade waste process. For more information visit: https://www.rdv.vic.gov.au/grants-and-programs/regional-jobs-fund</p>	Applications may be made at any time

8.2 Appendix B: Carbon Offsets

Offset units (or carbon credits) can be used to compensate for emissions you cannot reduce and to bring your carbon footprint down to zero. Offset units are generated from an activity that prevents, reduces, or removes greenhouse gas emissions from being released into the atmosphere. These offset units are sold based on a dollar amount per tonne of carbon dioxide equivalents to organisations which need to bring their remaining emissions profile to zero. There are a variety of offset projects ranging from revegetation to renewable energy, or local to international and may include other environmental or social co-benefits. Different types of projects vary in the cost of their credits. For example:

Local Projects with Environmental & Social Co-benefits	International Projects with Environmental & Social Co-benefits	International Emission Reductions (e.g., VCUs or VERs)
Indigenous Fire Projects Australia	Efficient Cookstoves Project Cambodia	Wind Power Project India
<p>The North East Arnhem Land Project is owned exclusively by Aboriginal people with custodial responsibility for those parts of Arnhem Land under active bushfire management.</p> <ul style="list-style-type: none"> • New employment and training opportunities • Supporting Aboriginal people in returning to, remaining on and managing their country • Preservation and transfer of traditional knowledge 	<p>The New Lao Stove Project has introduced a healthier, more efficient cook stove that reduces the combustion of wood by 22% while reducing exposure to airborne pollutants.</p> <ul style="list-style-type: none"> • Jobs created in manufacturing, distribution and sales • Improved living conditions and indoor air quality • Reduced costs and competition for firewood • Reduced burden placed upon women and children 	<p>In Tamil Nadu, India, a collective of farmers has sold small portions of their land for the installation of wind turbines coordinated by the Tamil Nadu Spinning Mills Association.</p> <ul style="list-style-type: none"> • 84 wind turbines installed • 48.1 MW wind energy generation • Saving approx. 837,722 tonnes of CO₂ every 10 years • 5% of project revenue invested into local community
\$20 - \$25 per tCO₂-e	\$10 - \$15 per tCO₂-e	\$4 - \$8 per tCO₂-e

International offset units are relatively inexpensive compared to Australian offsets. 2020 prices were approximately \$5/tCO₂-e and are expected to increase at a rate of \$1.50 per annum to reach \$20 by the year 2030. Australian offset units (ACCU) were around \$13-20 in 2020 and are expected to increase at a rate of \$1.80 per annum to reach \$35 by 2030.

8.3 Appendix C: Fleet Efficiency

8.3.1 Overview

General initiatives to improve the efficiency of fleet vehicles and reduce emissions include:

- **Reduce the need to drive.** Promote the use of video and teleconferencing over in-person meetings. Operation of business practices during the COVID-19 pandemic will have demonstrated the ability to conduct business virtually. Promote the use of bicycles (or electric bicycles) for shorter trips.
- **Downsize the fleet where feasible.** Every car in the fleet has an associated cost of ownership (i.e., registration, maintenance, insurance). Any opportunity to consolidate the number of vehicles will therefore reduce the overall costs of operating the fleet. Downsizing can occur through removing underutilised vehicles or reducing vehicle size to ensure they are fit-for-purpose.
- **Improve the efficiency of trips:** Consider options to lighten the load carried by the commercial vehicles (e.g., tool sheds at strategic locations) and trip optimisation.
- **Use the lowest emission fit-for-purpose vehicle available.** Many low emission and electric vehicle alternatives are now available on the market with long ranges, cargo and towing capacity, and payloads rivalling those of ICE vehicles.
- **Ensure environmentally conscious driving.** Eco-driver training educates drivers on efficient driving practices. Training programs are available for light and heavy vehicles as well as machinery. Organisations which have completed such training have achieved significant emissions and cost reductions as a result. For example, participating councils in the Eastern Alliance for Greenhouse Action and South East Councils Climate Change Alliance eco-driver program achieved a 10% reduction in fuel consumption and expenditure.

For more information and guidance, see the Electric Vehicle Council's [Local Government Resource Pack](#) (2020).

8.3.2 Electric Vehicles

EVs refer to vehicles which are at least partially powered by electricity. Figure 28 illustrates the different propulsion schematics between an ICE vehicle, different hybrid variants and EVs. Parallel hybrids allow the engine to operate in both ICE and electric mode; while series hybrids utilise a smaller ICE engine to deliver electric energy to support wholesale use of the electric motor for motive force.

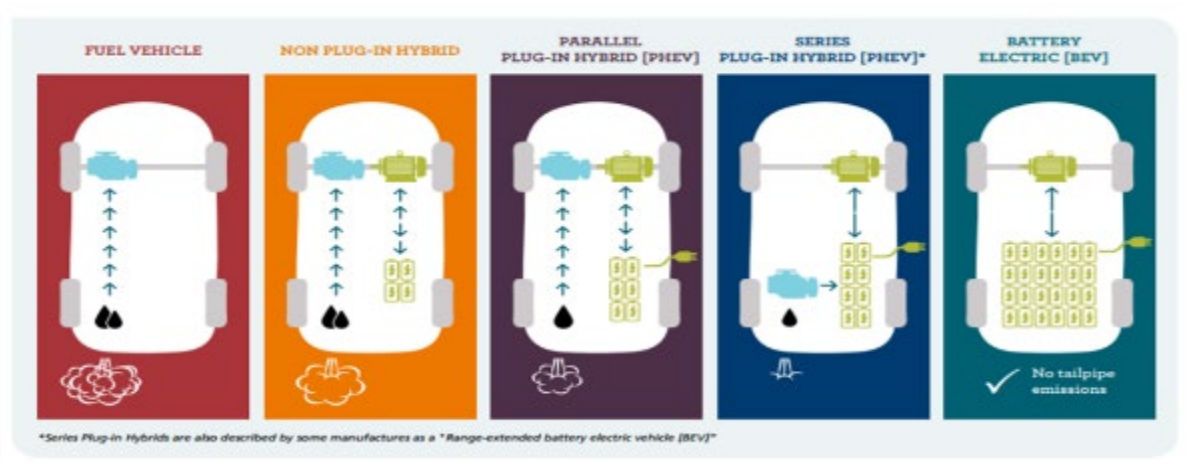


Figure 36: Different types of vehicles (left ICE vehicle to right full battery EV).

As shown in [Table 3](#), countries and cities around the world are announcing bans on ICE vehicles, providing added incentives to manufacturers to produce EVs to cater for those markets. Given the direction that the rest of the world is heading in terms of vehicle efficiency standards, original engine manufacturers (OEMs)

are incentivised to manufacture lower emission vehicles, which are increasingly becoming available in Australia.

Table 17: Global ICE bans.

Country/City	Ban Announced	Status and proposed commencement	Scope	Selectivity
Amsterdam, Netherlands	2019	2030	Gasoline or Diesel	All vehicles
Athens, Greece	2016	2025	Diesel	All vehicles
Auckland, New Zealand	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
Balearic Islands, Spain	2018	2025-2035	Gasoline or Diesel	All vehicles
Barcelona, Spain	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
Bristol, United Kingdom	2019	2021	Diesel	All private vehicles (city centre from 7 am to 3 pm)
British Columbia, Canada	2018	2025	Gasoline or Diesel	All vehicles by 2040, 10% ZEVs by 2025
Brussels, Belgium	2018	2030	Diesel	All vehicles
Cape Town, South Africa	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
China	2017	"researching a timetable"	Gasoline or diesel	New car sales
Copenhagen, Denmark	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
Costa Rica	2019	2050	Gasoline or diesel	New car sales
Denmark	2019	2030	Gasoline or diesel	New car sales
France	2017	2040	Gasoline or diesel	New car sales
Hainan, China	2018	2030	Gasoline or Diesel	All vehicles
Heidelberg, Germany	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
Iceland	2018	2030	Gasoline or diesel	New car sales
Ireland	2018	2030	Gasoline or diesel	New car sales
Israel	2018	2030	Gasoline or diesel (natural gas exempt)	New imported vehicles
London, United Kingdom	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
Los Angeles, United States	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
Madrid, Spain	2016	2025	Diesel	All vehicles
Mexico City, Mexico	2016	2025	Diesel	All vehicles
Milan, Italy	2017	2030	Diesel	All diesel vehicles, electric buses by 2025
Netherlands	2017	2030	Gasoline or diesel	All cars
Norway	2017	2025	Gasoline or diesel	Cars
Oxford, United Kingdom	2017	2020-2035	Gasoline or Diesel	All vehicles (initially during daytime hours on six streets)
Paris, France	2016	2025	Diesel	All vehicles
Quito, Ecuador	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
Rome, Italy	2018	2024	Diesel	All vehicles
Seattle, United States	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025
Singapore	2020	2040	Gasoline or diesel	All vehicles
Slovenia	2017	2030	Gasoline or diesel	New car sales
Sri Lanka	2017	2040	Gasoline or diesel	All vehicles
Sweden	2018	2030	Gasoline or diesel	New car sales
United Kingdom	2017	2032-2035	Gasoline or diesel	New car sales
Vancouver, Canada	2017	2030	Gasoline or Diesel	All vehicles, electric buses by 2025

EV adoption has a wide range of benefits, including fuel and operational cost savings. Operational savings result from the higher efficiency of the electric motor, which has a simpler technical structure and requires

fewer ongoing maintenance and repairs. Electric motors have an energy efficiency of around 85-90% (as high as 98% in newest proposed models), compared to 17-21% efficiency in ICE vehicles (Ruffo, 2019).

Broader EV benefits include environmental and public health benefits from the absence of tailpipe emissions. ICE vehicles emit a wide range of air pollutants, including carbon monoxide, nitrous oxides, particulate matter, benzene and volatile organic compounds, which are directly linked to a wide range of public health issues such as lung disease, respiratory disease, heart disease and strokes. Air pollution linked to ICE vehicle emissions was estimated to have been responsible for 1,715 deaths in Australia in 2015 – greater than the national road toll fatalities that same year (Parliament of Victoria 2018).

GSCC is currently transitioning its passenger pool vehicles to electric. Other EVs and hybrids currently available in Australia which GSCC can consider for transition can be found in the latest [State of Electric Vehicles Report](#).

8.3.3 EV Charging

There are three levels of charging available, varying in the output of voltage and amps and thus charging time:

- **Level 1 - trickle charging.** EVs can be charged from a wall power socket involving voltages of 240 volts and transfer rates in the order of 15 amps; this process takes approximately 8 hours and is best suited for a domestic environment.
- **Level 2 - fast charging.** This form of charging uses the same voltage as trickle charging but involves higher electric currents (typically 30 to 80 amps) and takes approximately 3 to 4 hours to fully charge.
- **Level 3 - rapid charging.** This form uses high voltage (around 400 volts) and high transfer rates (up to 600 amps) and can take in the order of 30 minutes to recharge. Tesla also offers its own superchargers which are reported to add 270 km of range to Tesla vehicles in only 30 minutes.

	2.3kW AC	7kW AC	11kW AC	22kW AC	25kW DC	50kW DC	100kW DC	350kW DC
Locations	General Power Point	Homes, Hotels, Council Offices	Shopping Centres, Car parks, Destinations		Destination	Transport Corridor	Transport Corridor / Highway	Super Highway
Electrical Inputs	Single Phase	Single Phase	Three Phase	Three Phase	Three Phase	Three Phase	Three Phase	Three Phase
For 100km	10A	32A	32A	32A	40A	80A		
EV Suitability	8.7h	2.7h	1.7h	55min	50min	24min	10min	5min
	All	All	Few models (<10) available in Australia*	Few models (<5) available in Australia*	Most BEVs	Most BEVs	Few models (<5) available in Australia*	None

Figure 37: Overview of charging infrastructure.

Increasing the power output of the charger increases the speed at which the EV can charge. However, this is limited by what the EV can actually take and as shown in the in the figure on the right, there are only a few models currently available that can charge at 11kW AC and above (BMW i3, Renault Zoe and Tesla Model X and S), and none that can charge at 350 kW DC. This does not mean EVs cannot use those chargers, only that they will not charge as fast as the rate at which that charger can provide.

Important to note is that EV charging behaviour is more similar to behaviour when charging a phone, rather than the behaviour of refuelling ICE vehicles. EV drivers will utilise charge when it is available and the average charge time for public stations is one hour. This is different to ICE vehicle refuelling where the behaviour is to let the vehicle get close to empty before charging.

Detailed public infrastructure costs are not widely disclosed, and installation costs can vary greatly. Figure 30 provides an

indication of installation costs (all inclusive). However, because of wide variability in the cost of nearly every element of charging infrastructure, as well as vendor concerns about protecting proprietary information, the figures provided should serve as a guide only. Unlike home chargers, where hardware is the dominant cost, **installation is often the major contributor to public station cost (in many cases 60-80% of total).**

Refer to the [Charging the Regions](#) project for more information on electric vehicle charging led by local governments.

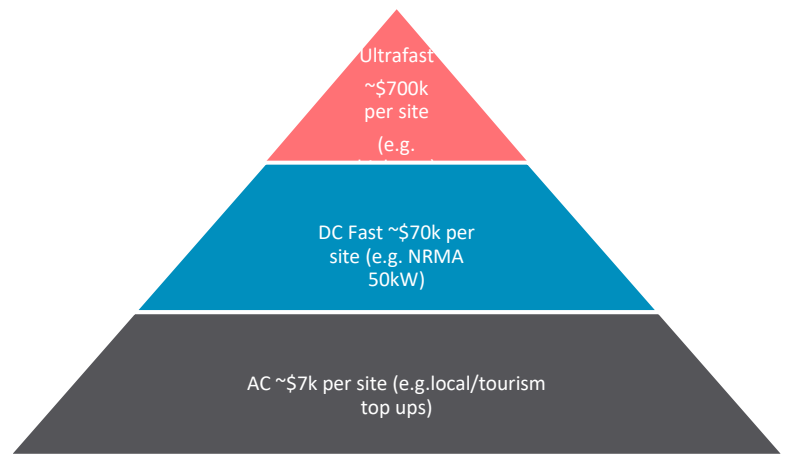


Figure 38: Indicative Cost hierarchy (source: suppliers)

8.4 Appendix D: Procurement Policy and Procedures

8.4.1 Sustainable Procurement Guidelines

The *Sustainable Procurement Guide* provides a framework for the Australian Government to build on efforts to improve sustainability outcomes and mainstream sustainability principles in future procurement. While the guide is for Commonwealth entities, it can serve as a best practice guide for other sectors. The latest version was released in November 2020, updated with a stronger focus on Circular Economy principles (Figure 24).

The guide lists the following principles for procuring sustainably:

- devising strategies that reduce demand and extend the life of the product
- planning what happens with a product at the end of the contract, how it will be re-used, recycled or disposed of, to encourage potential suppliers to address this from the beginning
- considering costs over the life of the good or service and policies in the planning process (such as potential increases in energy prices)
- encouraging sustainable solutions and innovation in tenders
- measuring and improving sustainability throughout the life of the procurement.

The guide lists the following procurement steps and recommended actions for each step of the procurement lifecycle:

No	Step	Recommended Action
1	Plan the procurement	Identify the need
		Identify sustainability outcomes
		Assess the risks and opportunities
		Undertake market research and engagement
2	Approach the market	Specify sustainability requirements
		Develop Key Performance Indicators (KPIs)
		Set sustainability evaluation criteria
3	Evaluate and engage	Assess tender responses (consider whole-of-life costs)
		Debrief unsuccessful tenderers
4	Report and manage	Monitor sustainable compliance, performance and disposal of goods
5	Review and learn	Identify opportunities to improve
		Monitor and track progress
		Share your experience

8.4.2 Tender Evaluation

There are three critical elements to effectively incorporate environmental sustainability into the procurement process:

- **Clear communication.** The requirement to deliver environmental sustainability must be clearly communicated to potential suppliers to facilitate a transparent comparative assessment of sustainability performance amongst supplier-applicants. As such, the procurement policy and any requests for tenders or quotations and the like should be aligned with GSCC's net zero commitment and it should be made clear that preference will be given to environmentally sustainable products and services, with a clear overview of the evaluation criteria and associated weightings.



Figure 39: Australian Government Sustainable Procurement Guide 2020

- **Evaluation Criteria.** Environmental criteria should be separately weighed from others, potentially with a similar weighing as price. Depending on the type of product or service being procured, environmental sub-categories could be considered if appropriate and relevant (examples in the table below).

Sub-Category	Evaluation Criteria	Evaluation Score (if applicable)
Energy	Optimises energy efficiency, includes a renewable energy component and/or has strong policies for maximising energy efficiency.	<input type="checkbox"/> / <input type="checkbox"/>
Water	Optimises water efficiency, includes a water reuse/recycle component and/or has strong policies for maximising water efficiency.	<input type="checkbox"/> / <input type="checkbox"/>
Waste	Optimises waste reduction, includes a recycling or reuse component and/or has strong policies for maximising waste reduction and recycling.	<input type="checkbox"/> / <input type="checkbox"/>
Paper	Minimises paper usage and/or has strong paper reduction policies.	<input type="checkbox"/> / <input type="checkbox"/>
Plastic use	Minimises the use of single-use plastics and/or has strong plastic reduction.	<input type="checkbox"/> / <input type="checkbox"/>
Transport	Minimises combustion of liquid fuels, promotes sustainable transport (EVs, hybrids or PHEVs) and/or has strong fleet improvement strategies.	<input type="checkbox"/> / <input type="checkbox"/>
Greenhouse gas emissions	Minimises greenhouse gas emissions, offsets carbon account, is certified carbon neutral and/or has strong emission reduction policies or targets.	<input type="checkbox"/> / <input type="checkbox"/>

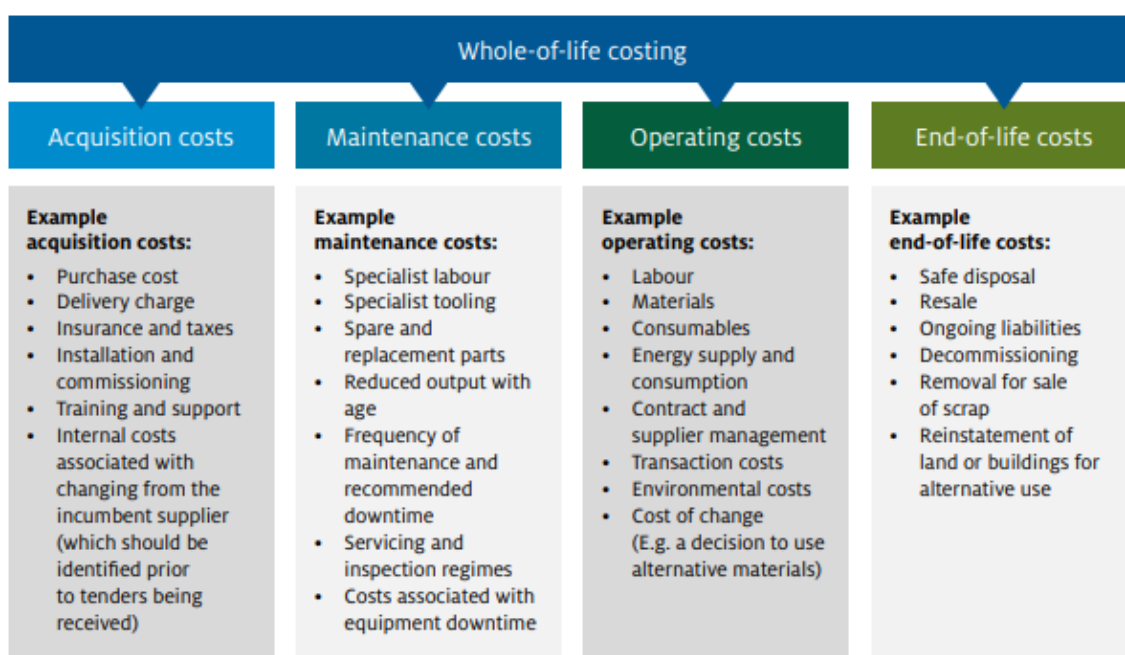


Figure 40: Whole-of-life cost considerations (Australian Government Sustainable Procurement Guide 2020)

In addition, the price criterion should be based on whole-of-life costs from the 'cradle-to-grave' of the good or service. This is because the option with the lowest up-front cost may not offer the lowest cost option over the life of the good or service. Other economic costs associated with the life of a good/service are illustrated in Figure 40. Whole-of-life costs should also consider other costs and benefits (i.e., environmental and social as well as economic). The International Standard ISO 20400:2017 Sustainable Procurement – Guidance identifies Life Cycle Costing (LCC) as the preferred method for calculating whole-of-life costs in sustainable public procurement. The LCC methodology is one tool available for practical support in calculating whole-of-life costs.

- **Incorporate within contracts.** Supply agreements and contracts must bind the supplier to the environmental sustainability commitments in their submission. Accordingly, GSCC should incorporate a contract clause which acknowledges relevant environmental sustainability criteria and requires adherence to plans/documents/responses.

8.4.3 Supplier Engagement

Collaboration and engagement with suppliers and providers should be maintained through a two-way communication channel. In this way, suppliers will understand GSCC's desires for emissions reduction and may feel comfortable to offer their knowledge and suggestions. In line with open communication, GSCC should advise incumbent suppliers of changes to the procurement policy upfront (e.g., via an information seminar and/or electronic update). To ensure ongoing compliance with environmental sustainability, progress towards objectives specified in the contracts should be monitored and communicated regularly, and incentives can be created for action (e.g., contract extension based on good performance outcomes).

8.5 Appendix E: Climate Active Public Disclosure Statement Summary



PUBLIC DISCLOSURE STATEMENT

BUSINESS NAME

CERTIFICATION TYPE

YEAR

PLEASE DO NOT CHANGE THE DESIGN OR FORMATTING OF THIS DOCUMENT

Australian Government
Climate Active
Public Disclosure Statement



Please delete blue guidance text before submitting document.

Please note there is a separate template for events as well as for products/services.

NAME OF CERTIFIED ENTITY:

REPORTING PERIOD: [Calendar year 1 January 20XX – 31 December 20XX] or [Financial year 1 July 20XX – 30 June 20XX]

Declaration

To the best of my knowledge, the information provided in this Public Disclosure Statement is true and correct and meets the requirements of the Climate Active Carbon Neutral Standard.

Signature

Date

Name of Signatory

Position of Signatory



Australian Government
**Department of Industry, Science,
 Energy and Resources**

Public Disclosure Statement documents are prepared by the submitting organisation. The material in Public Disclosure Statement documents represents the views of the organisation and do not necessarily reflect the views of the Commonwealth. The Commonwealth does not guarantee the accuracy of the contents of the Public Disclosure Statement documents and disclaims liability for any loss arising from the use of the document for any purpose.

Version number February 2021

1. CARBON NEUTRAL INFORMATION

Description of certification

Provide a description of what is certified carbon neutral.

Organisation description

(Delete this section if seeking precinct certification) Provide a description of the organisation being certified including a structural chart if relevant. Please describe all trading names and child companies and outline where offices and other core assets are located.

Precinct geographical boundary

(Delete this section if seeking organisation certification). Provide a diagram or description of the geographical boundary of the precinct.

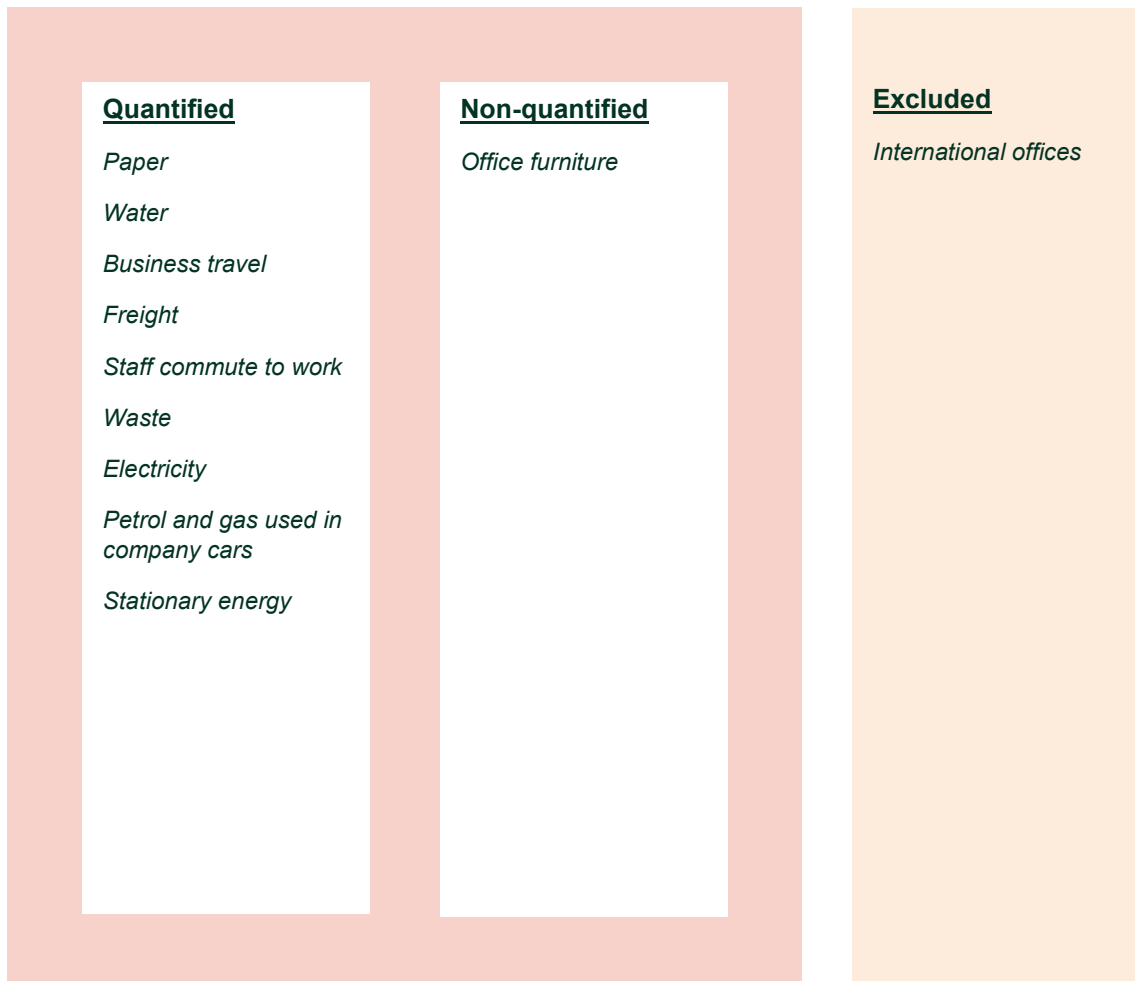
“Key message of why Climate Active is important to the Organisation.”

2. EMISSION BOUNDARY

Diagram of the certification boundary

Include a diagram of emission sources considered. The diagram must clearly depict quantified sources, non-quantified sources and excluded sources.

Delete following sentence if not relevant. This is a small organisation certification, which uses the standard Climate Active small organisation emissions boundary.



Non-quantified sources

- Provide justification for non-quantification in line with the relevant guidance for Emission boundaries for Organisation/precinct certification.
- For small organisations, the justification must be one of the following: immaterial, small in relation to stationary energy, fuel and electricity but uplift applied, data unavailable but uplift applied.
- For large organisations/precincts, the justification must be one of the following: immaterial, small in relation to scopes 1&2 but uplift applied, data unavailable but uplift applied, initial emissions non-quantified but repairs and replacements quantified.

*“Key message of why Climate Active is important to the Organisation.
Key message of why Climate Active is important to the Organisation.”*

Data management plan

For items listed a non-quantified due to “data unavailable” a data management plan should be detailed where this is a large or important emission source given the certification. The data management plan should have no greater than a five year timeframe.

Excluded sources (outside of certification boundary)

Provide a justification for exclusion that is consistent with the relevance test as applied to the description of certification outlined in section 1. For example:

- Emission [SOURCE] has been excluded as it has been assessed as not relevant according to the relevance test, or
- Although [SOURCE] is a deemed relevant emission under the small organisation certification, we do not use [SOURCE] and as such it has not been included in PDS or carbon inventory.

3. EMISSIONS SUMMARY

Emissions reduction strategy

Refer to section 2.4 of the Climate Active Carbon Neutral Standard for Organisations/Precincts.

Describe what measures will be taken in future years to reduce emissions and the timeframes that these reductions will be undertaken in. Given the current economic circumstances it is acceptable if an entity wish to commit to developing a detailed emission reduction strategy over the next two years rather than any other specific measures.

Emissions over time

This section compares emissions over time between the base year and current year. Reporting of in-between years is optional. Totals are reported as either gross total CO₂ -e

Provide a description about the nature of the changes, for example, are changes due to organisation changes or changes in emission sources. Where new emissions sources have been added over time, provide a description of the impacts and comparability of emissions over time.

(For initial applications, please delete this section)

Table 1

Emissions since base year			
	Base year: 20XX-XX	Year 1: 20XX-XX	Current year Year 2: 20XX-XX
<i>Total tCO₂e</i>			

Emissions reduction actions

(For initial applications, please delete this section)

Use this section to summarise the information in the three columns from your inventory ('% change from previous year activity data', 'reason for change', and 'detailed reason for change').

Emissions summary (inventory)

Please provide a summary of emissions by emission category:

- Summarise emissions in the carbon inventory template by emission category and convert kg to tonnes.
- Ensure you select the relevant electricity summary (market or location based) to include in your emission summary.

Table 2

Emission source category	tonnes CO ₂ -e
<i>Total Net Emissions</i>	

Uplift factors

Table 3

Reason for uplift factor	tonnes CO ₂ -e
e.g. 5% to account for immaterial items	
<i>Total footprint to offset (uplift factors + net emissions)</i>	

Carbon neutral products

List all Climate Active carbon neutral products used.

Electricity summary

Please insert both the market-based approach summary table and the location-based approach summary table provided in the 'Electricity inventory' tab of the 'Calculators' excel spreadsheet.

Electricity was calculated using a location/market-based approach. (Delete the inappropriate term)

Market-based approach summary

Market-based approach	Activity Data (kWh)	Emissions (kgCO ₂ e)	Renewable %
Behind the meter consumption of electricity generated	5,000	0	0.4%
Total non-grid electricity	5,000	0	0.4%
LGC Purchased and retired (kWh) (including PPAs)	100,000	0	7.8%
GreenPower	200,000	0	15.6%
Jurisdictional renewables	80,000	0	6.3%
Residual Electricity	653,260	701,303	0.0%
Large Scale Renewable Energy Target (applied to grid electricity only)	241,740	0	18.9%
Total grid electricity	1,275,000	701,303	48.6%
Total Electricity Consumed (grid + non grid)	1,280,000	701,303	49.0%
Electricity renewables	626,740	0	
Residual Electricity	653,260	701,303	
Exported on-site generated electricity	5,000	-3,900	
Emission Footprint (kgCO ₂ e)		697,403	
Emission Footprint (TCO₂e)	697		

LRET renewables	18.9%
Voluntary Renewable Electricity	30.1%
Total renewables	49.0%

Location-based approach summary

Location-based approach	Activity Data (kWh)	Emissions (kgCO2e)
ACT	80,000	72,000
NSW	1,000,000	900,000
SA	195,000	101,400
Vic	0	0
Qld	0	0
NT	0	0
WA	0	0
Tas	0	0
Grid electricity (scope 2 and 3)	1,275,000	1,073,400
ACT	0	0
NSW	0	0
SA	5,000	0
Vic	0	0
Qld	0	0
NT	0	0
WA	0	0
Tas	0	0
Non-grid electricity (Behind the meter)	5,000	0
Total Electricity Consumed	1,280,000	1,073,400

Emission Footprint (TCO2e)	1,073
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4. CARBON OFFSETS

Offsets strategy

Offset purchasing strategy:	
In arrears / Forward purchasing [select one]	
1. Total offsets previously forward purchased and banked for this report	<p><i>How many offsets were forward purchased and banked in previous report/s to cover this reporting period?</i></p> <p><i>This could be zero or a number.</i></p>
2. Total emissions liability to offset for this report	<p><i>Equals total emissions footprint to offset from the emissions summary table.</i></p>
3. Net offset balance for this reporting period	<p><i>Equals number of offsets to be retired to cover this reporting period.</i></p> <p><i>(Q2 - Q1).</i></p>
4. Total offsets to be forward purchased to offset the next reporting period	<p><i>If you are forward purchasing for the NEXT reporting period, you should be forward purchasing the same as this year's total emission footprint (Q2), unless justification can be provided for a difference. These offsets will be banked with Climate Active awaiting the true-up report.</i></p> <p><i>This could be zero or a number.</i></p>
5. Total offsets required for this report	<p><i>If forward purchasing, use Q3 + Q4 from forward offsetting table</i></p> <p><i>If purchasing in arrears, this equals the total footprint liability to offset Q2.</i></p>

Co-benefits

See [guidance](#) on page 68.

Offsets summary

Proof of cancellation of offset units

Offsets cancelled for Climate Active Carbon Neutral Certification										
Project description	Type of offset units	Registry	Date retired	Serial number (and hyperlink to registry transaction record)	Vintage	Eligible Quantity (TCO2-e)	Quantity used for previous reporting periods	Quantity banked for future reporting periods	Quantity used for this reporting period claim	Percentage of total (%)
Wind Grouped project by Hero Future Energies Private Limited, India	VCUs	APX	21 Mar 2018	5682-254921535-254932878-VCU-029-APX-IN-1-1582-29032016-31122016-0	2016	11,344	0	10,000	1,344	As a percentage = (Eligible offsets / eligible offsets total) *100 = %
Mudgee reforestation Project, NSW	ACCUs	ANREU	26 Sep 2017	3,750,123,000 – 3,750,126,234	2013	3,235				
Gold Standard-accredited Yarra Yarra Biodiversity Corridor, WA and CN-316 Renewable Energy Wind-farm Ningxia Helanshan	CDM-CER	GSR ANREU	21 Apr 2020 21 Apr 2020	GS1-1-AU-GS3039-21-2015-4699-7483-12803 (PERs) 1,010,994,209 – 1,010,999,529	2015 CP-2 (2013-2016)	0 5,321				

Project, China									
Total offsets retired this report and used in this report									
Total offsets retired this report and banked for future reports									
Additional offsets cancelled for purposes other than Climate Active Carbon Neutral certification									
Project description	Type of offset units	Registry	Date retired	Serial number (and hyperlink to registry transaction record)	Vintage	Eligible Quantity (TCO2-e)	Purpose of cancellation		

Type of offset units	Quantity (used for this reporting period claim)	Percentage of Total
Australian Carbon Credit Units (ACCUs)	Delete rows which aren't required	Total percentage from each unit type
Certified Emissions Reductions (CERs)	Delete rows which aren't required	Total percentage from each unit type
Removal Units (RMUs)	Delete rows which aren't required	Total percentage from each unit type
Verified Emissions Reductions (VERs)	Delete rows which aren't required	Total percentage from each unit type
Verified Carbon Units (VCUs)	Delete rows which aren't required	Total percentage from each unit type

5. USE OF TRADE MARK

Table 8

Description where trademark used	Logo type
[e.g. Sustainability report]	[Certified organisation]

6. ADDITIONAL INFORMATION

Additional information to go here

APPENDIX 1

Excluded emissions

Please detail any excluded emissions in the table below and indicate yes or no against each of the specific criteria.

To be deemed relevant an emission must meet two of the five relevance criteria. Excluded emissions are detailed below against each of the five criteria.

Table 9

Relevance test					
Excluded emission sources	<i>The emissions from a particular source are likely to be large relative to the organisation's electricity, stationary energy and fuel emissions</i>	<i>The emissions from a particular source contribute to the organisation's greenhouse gas risk exposure.</i>	<i>Key stakeholders deem the emissions from a particular source are relevant.</i>	<i>The responsible entity has the potential to influence the reduction of emissions from a particular source.</i>	<i>The emissions are from outsourced activities previously undertaken within the organisation's boundary, or from outsourced activities typically undertaken within the boundary for comparable organisations.</i>
List excluded emissions here	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Add more lines as required					

APPENDIX 2

Non-quantified emissions for organisations

Please advise which of the reasons applies to each of your non-quantified emissions. You may add rows if required.

For small organisations, the justification must be one of the following:

- immaterial,
- Quantification is not cost effective relative to the size of the emission (i.e. it is small in relation to stationary energy, fuel and electricity) but uplift applied
- data unavailable but uplift applied.

For large organisations/precincts, the justification must be one of the following:

- immaterial,
- Quantification is not cost effective relative to the size of the emission (i.e. it is small in relation to scopes 1&2) but uplift applied
- data unavailable but uplift applied,
- initial emissions non-quantified but repairs and replacements quantified.

Table 10

Non-quantification test				
Relevant-non-quantified emission sources	<i>Immaterial <1% for individual items and no more than 5% collectively</i>	<i>Quantification is not cost effective relative to the size of the emission but uplift applied.</i>	<i>Data unavailable but uplift applied. A data management plan must be put in place to provide data within 5 years.</i>	<i>Initial emissions non-quantified but repairs and replacements quantified</i>
List relevant-non-quantified emission sources here	Yes/No	Yes/No	Yes/No	Yes/No
Add more lines as required				



An Australian Government Initiative





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