

THE CITY OF GREATER GEELONG

ENVIRONMENT STRATEGY 2020–30



Council acknowledges Wadawurrung
Traditional Owners of this land
and all Aboriginal and Torres Strait
Islander People who are part of the
Greater Geelong community today.

Artwork: Dr Jenny Murray-Jones



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- Deakin University
- Extinction Rebellion Geelong
- Friends of Buckley Falls
- Friends of Waurin Ponds Creek
- Geelong Environment Council
- Geelong Field Naturalists Club
- Persistent Presence
- Thrive for Future
- Wathaurung Aboriginal Corporation

Cover image: Community planting in new growth areas

Inside cover artwork: Corio, Dr Jenny Murray-Jones

EXECUTIVE SUMMARY

The purpose of *The City of Greater Geelong Environment Strategy 2020–30* is to define and communicate how the City of Greater Geelong will protect and improve our region's environment.

During the engagement for our 30-year clever and creative vision, our community told us the natural environment was one of the features they most valued about our region¹.

Our region features diverse urban, rural and coastal environments, with large areas dedicated to the conservation of remnant indigenous vegetation, and flora and fauna species of international, national, state and regional significance.

However, our environment is under pressure from a range of local and global challenges, including:

- **Climate change** – our planet is experiencing long-term increases in average temperatures due to human-induced greenhouse gases entering the Earth's atmosphere. This is expected to have significant impacts in the south-western region of Victoria over the coming decade, including higher average temperatures, more intense and frequent heatwaves, more extreme bushfires, declining rainfall and inundation from sea-level rise.
- **Population growth** – our population is expected to grow to 387,900 by 2036 – an increase of more than one third on our 2018 estimated resident population. This will have implications for both our built and natural environments.
- **Waste** – our local community is projected to generate up to 58,000 tonnes of household waste by 2026. This waste will pose a threat to our natural environment if not managed well, particularly plastic waste, which is already polluting our land, rivers, coasts and the oceans.
- **Water issues** – our drinking water supply and waterways will be impacted by the combined effects of climate change and population growth. Our stormwater and drainage infrastructure will also be affected by climate change, with more frequent and extreme weather potentially causing property damage and severe environmental impacts.

These challenges are significant, but we have more knowledge about the problems we're facing – as well as our options for addressing them – than we have in the past. Technology advances, proactive government policies and community mobilisation are creating opportunities for change.

The focus of this strategy is to improve the health of our local environment, while simultaneously striving to protect the lifestyle we all enjoy. It has been informed by what's happening both locally and internationally, as well as the knowledge and ideas of those who participated in our engagement processes.

There are five key goals we hope to achieve by implementing this strategy (see right).

Each goal has been assigned a series of directions and targets we're aiming to achieve between now and 2030.

These goals will influence planning and decision making across our organisation. They will also influence our actions, most directly through *The City of Greater Geelong Environment Strategy Action Plan*.

We'll use the Global Reporting Initiative Environmental Standards to report on these actions and progress towards our targets every two years.

1. City of Greater Geelong (2017) *Our Future, Have Your Say: Stage One Community Engagement Findings* (unpublished)

GOAL 1		BECOME A ZERO-EMISSION, CLIMATE-READY CITY AND REGION
Principle 1.1		Increase energy efficiency and renewable energy production.
Principle 1.2		Switch to renewable electricity and cleaner fuels.
Principle 1.3		Reduce non-energy emissions and increase carbon storage.
Principle 1.4		Increase awareness and understanding of climate change impacts.
Principle 1.5		Build climate change adaptation into decision-making.
Principle 1.6		Increase collaborative climate change responses.
GOAL 2		CREATE GREENER COMMUNITY SPACES
Principle 2.1		Increase amenity of community spaces and reduce urban heat risk.
Principle 2.2		Increase adoption of nature-based, green-blue infrastructure solutions.
Principle 2.3		Connect people to nature.
GOAL 3		CONTRIBUTE TO A CIRCULAR ECONOMY BY REDUCING WASTE
Principle 3.1		Avoid creating waste.
Principle 3.2		Recover more resources.
Principle 3.3		Protect the environment from waste impacts.
GOAL 4		PROTECT, ENHANCE AND RESTORE OUR REGION'S BIODIVERSITY
Principle 4.1		Collaborate with the Wadawurrung Traditional Owners to connect culture and biodiversity.
Principle 4.2		Protect and enhance indigenous biodiversity.
Principle 4.3		Restore biodiversity in modified urban landscapes.
Principle 4.4		Adaptive management approach to biodiversity conservation.
Principle 4.5		Build community knowledge, engagement and partnerships.
GOAL 5		ACHIEVE BETTER INTEGRATED WATER MANAGEMENT THROUGH PLANNING AND DESIGN
Principle 5.1		Support sustainable water use.
Principle 5.2		Sustainable management of drainage and stormwater asset networks.
Principle 5.3		Create ecologically healthy, accessible urban waterways.

INTRODUCTION

The purpose of *The City of Greater Geelong Environment Strategy 2020–30* is to define and communicate how the City of Greater Geelong will protect and improve our region's environment and reduce our environmental footprint.

Being close to the coast, rural areas and nature supports our relaxed lifestyle and our sense of community. During the engagement for our 30-year clever and creative vision, our community told us the natural environment was one of the features they most valued about our region². As a regulator, land-use planner, service provider and manager of both built and natural assets, we are uniquely placed to make positive changes that support the vitality of our natural environment.

Since we adopted our first environment management strategy in 1999, a number of globally-significant issues have increased pressure on the natural world. From climate change to habitat loss, the challenges are significant.

The City of Greater Geelong Environment Strategy 2020–30 is designed to guide our planning, decision-making and actions for the next ten years. The focus of our effort will be to improve the health of our local environment, reducing our environmental footprint and simultaneously striving to protect the lifestyle we all enjoy.

ABOUT GEELONG

The place

The City of Greater Geelong is located 75 kilometres south west of Melbourne. Covering an area of 1,247 km², our region is made up of Geelong and its surrounding suburbs, rural and coastal townships and rural, agricultural and coastal landscapes.

The Wadawurrung people are the Traditional Owners of this area. As custodians of the land, their history, knowledge and passion continue to inform and shape the environmental practices of today.

The Wadawurrung people continue to work collaboratively with the City in caring for their lands.

The region features a diverse range of urban, rural and coastal environments, with large areas dedicated to recreation and conservation reserves. As well as supporting remnant indigenous vegetation, these landscapes are home to a diverse range of flora and fauna, including many protected species of international, national, state or regional significance.

Our waterways include the Barwon and Moorabool river systems, natural and modified lakes, small creeks and 133 kilometres of coastline, including the sheltered Corio and Port Phillip bays. These fresh and saline waterways, intertidal mudflats, estuaries, rocky reefs, sandy beaches and steep escarpments also support many different species of aquatic and bird life.

Among the 11,639 hectares of wetlands in Greater Geelong, there are significant areas of habitat designated in the Ramsar Convention on Wetlands of International Importance. The wetlands are a refuge for many threatened and migratory bird species that are of local and international significance.

The people

The estimated resident population of Greater Geelong as of 30 June 2019 was 258,934 people³. This makes the Greater Geelong municipality the most populated region in Victoria outside of metropolitan Melbourne.

According to *The City of Greater Geelong Settlement Strategy – October 2018*, we are anticipating population growth of approximately 2.5 per cent per annum for the next 16 years⁴. Under this scenario, our population is expected to grow to 387,900 by 2036, an outcome that will have implications for both our built and natural environments.

Our municipality has many individuals and community groups who are actively improving the natural environment by carrying out vital work to restore habitat, protect threatened species and waterways and deliver resource sustainability programs.

The role of the City is to partner with key stakeholders to lead, educate and support our community in caring for our environment.

2. City of Greater Geelong (2017) *Our Future, Have Your Say: Stage One Community Engagement Findings* (unpublished)

3. Australian Bureau of Statistics, www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3218.02018-19?OpenDocument (accessed on 27 March 2020).

4. City of Greater Geelong (2018) *The City of Greater Geelong Settlement Strategy*. Geelong, City of Greater Geelong, page 50.



258,934

**2019 ESTIMATED
RESIDENT
POPULATION**



2.66%

**POPULATION
GROWTH RATE
(2018–19)**



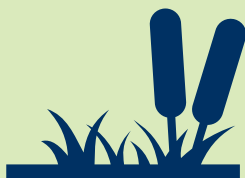
6 MILLION

**VISITORS TO
THE REGION
(2018–19)**



~18,850

BUSINESSES



1,300

**HECTARES OF
PROTECTED
NATURAL HABITAT**



11,639

**HECTARES
OF WETLANDS**



133 KM

OF COASTLINE



41,344*

**TONNES (CO²e)
COUNCIL
EMISSIONS
(2018–19)**

Figure 1 The Greater Geelong region

* Emissions total inclusive of fleet, natural gas, electricity and landfill emissions.

THE BIGGER PICTURE

This strategy has been informed by international, national, state and local conventions, legislation, strategies and policies.

Figure 2 below illustrates some of the conventions, agreements, legislation and policies relevant to environmental management at a local government level. Victoria alone also has more than 25 pieces of legislation, and over 30 strategies, relating to environmental management.



International conventions, agreements, legislation and policy

- *Kyoto Protocol*
- *United Nations Framework Convention on Climate Change Paris Agreement* – 195 nations agree to climate change targets
- *United Nations Sustainable Development Goals*
- *Bilateral migratory bird agreements*

Commonwealth context

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Renewable Energy Target Scheme*

Victorian context

- *Environment Protection Act 1970*
- *Flora and Fauna Guarantee Act 1988*
- *Planning and Environment Act 1987*
- *Local Government Act 1989*
- *Aboriginal Heritage Act 2006*
- *Catchment and Land Protection Act 1994*
- *Climate Change Act 2017*
- *Victoria's Climate Change Framework*
- *Victoria's Climate Change Adaptation Plan 2017-2020*
- *Corangamite Regional Catchment Strategy 2013-19*
- *Renewable Energy (Jobs and Investment) Act 2017*
- *Recycling Victoria – A New Economy*
- *Protecting Victoria's Environment - Biodiversity 2037*

Figure 2 The international, federal and state context

OUR PLANNING FRAMEWORK



As Figure 3 shows, this long-term strategy is helping to realise the community's 30-year vision, as described in *Greater Geelong: A Clever and Creative Future*. The vision is as follows:

"By 2047, Greater Geelong will be internationally recognised as a clever and creative city-region that is forward looking, enterprising and adaptive, and cares for its people and environment."

In particular, the strategy will help deliver on these community aspirations:

- Sustainable development that supports population growth and protects the natural environment.
- Development and implementation of sustainable solutions.

The *City of Greater Geelong Environment Strategy 2020–30* is a major strategy in our planning hierarchy that will be implemented in conjunction with other adopted strategies including:

- *Sustainability Framework* – a framework and policy that embeds sustainability within the City, so it is considered in everything we do
- *Waste and Resource Recovery Strategy 2020–30*
- *Stormwater Services Strategy 2020–30*
- *Settlement Strategy October 2018* and the
- *Urban Forest Strategy 2015-25*

As Figure 3 shows, this strategy will be supported by an action plan that will be updated every two years.

Figure 3 City of Greater Geelong Planning Framework

HOW WE ENGAGED

Information we've collated through the following activities has been used to inform the development of this strategy.

SEPTEMBER 2018	JUNE 2019	SEPTEMBER 2019	FEBRUARY 2020	MAY-JUNE 2020
We engaged a consultant, with experience in sustainability, environment and natural resource management, to review the previous strategy and research trends to inform the preparation of the 2020 strategy.	<p>We held a cross-organisational workshop to discuss what the strategy means for all areas of our business.</p> <p>A One Planet Living community consultation session was held. The findings have been used to inform the outcomes.</p>	Community drop-in session was held with 23 environmental stakeholders groups attending.	We completed an organisation-wide peer review of the draft strategy to make sure the document was relevant to all areas of our business.	Following its endorsement by Council the draft strategy was released for community feedback for 8 weeks to inform the final strategy and action plan.

WHAT WE HEARD

The key themes identified through our engagement were:

Biodiversity

- The protection of our environment is equally important as economic and social considerations in decision making processes.
- Urban open spaces should be used for food and nature.
- Blocks of land should be reviewed for conservation purposes and farmers paid to manage bush and wetlands.
- Property owners need freely available information on how to restore small blocks and rooftop gardens should be encouraged.
- More funding should be available for environmental initiatives and for community members, via green bonds.
- The City could provide information about encouraging biodiversity to the community and schools, via the internet, leaflets and newsletters.
- The City should strengthen compliance efforts, including enforcement of wildlife protection, with calls for duck shooting to be stopped.
- Places that are good examples of biodiversity should be protected and promoted.

Sustainable urban growth

- There should be green standards for all new housing, including the type of garden, solar panels, cat-free areas, water tanks and other energy-efficiency initiatives.
- Builders and developers need to be educated about sustainable community design.
- More regulations and planning officers are needed to further protect the natural environment, including wetlands and waterways.
- Compliance with planning controls could be improved by offering incentives, such as lower rates for energy-efficient homes, tree farms and the removal of LPG.
- Tree conservation and revegetation are important and clearing indigenous trees should no longer be permitted.
- New developments should follow natural systems, as a priority, to assist in limiting urban sprawl.
- Offsets plantings for native vegetation removal should remain within our municipality.
- Having access to nature is critically important for our physical and mental wellbeing.

Emissions

- Cars in the region could be reduced by improving public transport and making bikes more accessible.
- Incentives are a great tool for behavioural change, so the City should consider reducing rates for people using solar-powered and electric cars.
- The community needs to be educated about why we need to reduce our emissions and how we can change, with an emphasis on good news stories.
- Native tree planting across the municipality should be increased to help green Geelong.
- More needs to be done to investigate carbon reduction opportunities offered by the natural world, such as carbon sinks, trees, rewilding and increased biodiversity.
- The City should demonstrate leadership by using ethical energy suppliers and creating a key performance indicator for total installation of solar systems.
- Many of our regions cultural heritage sites are at risk due to the impacts of climate change.
- Increasing biomass in our oceans and landscapes will lead to significant carbon sequestration gains.
- Sustainable agriculture practices and community food production can help reduce our regions carbon emissions.

Waste

- A circular economy, where the user pays for the waste generated, has support in the community.
- Waste management should be improved, both in residential homes and in public areas.
- The City should strengthen its procurement policies to kick-start the circular economy.
- State and federal governments need to contribute by:
 - › creating market incentives for big businesses to stop using plastic
 - › providing a recycling container deposit and
 - › introducing a standardised recycling system across the state.
- Education and incentives are the key to achieving any waste reduction goals.

- There should be stronger penalties for illegal dumping, plus resources allocated to help building inspectors investigate and prosecute builders who litter waterways.

Water

- Water should be recycled for all uses.
- Stormwater harvesting should be mandatory in all new developments.
- The City should work with Barwon Water to build sustainable water policies and practices, with a focus on recycling water.
- This strategy needs to align with others – for example, biodiversity, water, waste, urban diversity and natural systems – to avoid policy gaps and fully integrate systems thinking.
- Water flows should be maintained all year round in major rivers to prevent blue-green algae and protect wildlife and public recreation.
- Stormwater filter ponds should be rejuvenated so they are friendlier to wildlife.
- Education, incentives and community engagement are needed to bring the community on board.
- Waste water should not be discharged into our oceans.

Other comments

- This strategy should be the guiding document for all parts of the City – not just individual departments – and there needs to be support and resources to achieve this.
- Climate change is an emergency and the City should consider it as such.
- The City must engage and work closely with the Wadawarrung Traditional Owners in caring for our regions landscapes, waterways, cultural heritage and biodiversity.
- The City must lead, educate and support our community in responding to the challenges facing our environment.

CHALLENGES AND OPPORTUNITIES

Our commitment to caring for the local environment has not changed since we introduced our first environment management strategy 20 years ago. However, the complex challenges we're facing have increased substantially.

Below is a summary of some of the challenges and opportunities addressed in this strategy:

BIODIVERSITY

Challenges

Our native vegetation, habitat and biodiversity are under extreme pressure from threats associated with climate change, population growth and changes to land use in both rural and urban areas. Aside from some large areas secured in conservation reserves, such as the Ramsar Wetlands and coastal reserves, most biodiversity sites are small, fragmented and isolated.

Opportunities

Our knowledge about how to care for our environment, and our ability to respond to existing and future challenges, has improved. Partnerships with the Wadawurrung Traditional Owners, public land managers, private land owners, our community and other councils in our region is helping to protect and enhance our regions biodiversity and create linkages between previously isolated conservation areas.

While urban development and land use change in our region brings challenges, there are also opportunities to improve biodiversity. Assigning space to conservation reserves and habitat connectivity in new growth areas will support biodiversity and contribute to community health and wellbeing.

Future urban greening projects, including the ongoing implementation of the *City of Greater Geelong Urban Forest Strategy 2015–25*, create opportunities to improve biodiversity values in our urban areas.

CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS

Challenges

Local emissions are predominantly caused by energy use in buildings, residential and freight transport, industry and agriculture. If we do not change how we live, population growth, urban expansion and car dependency will lead to even higher emissions in the future.

Climate change is already impacting vulnerable areas across our region, including coastal zones and low-lying areas.

In the future, sea-level rise and storm surges have the potential to rapidly erode our vulnerable coastal zones. Drought will increase fire risks and decrease the health and productivity of the land. In new and existing urban areas, an increase in the number of extreme hot days will also be a significant challenge. As an organisation, we must plan and act to reduce these impacts.

Opportunities

We are much better placed to address climate change impacts now than we were ten years ago for the following reasons:

- we understand the risks climate change represents to our environmental, social and economic future and how we can lead a community wide response to this threat.
- technology advances have increased the availability of sustainable infrastructure and energy solutions. These solutions are part our plan to respond to the threat of climate change and achieve our goal of becoming a zero-emission region.

WASTE

Challenges

Waste is becoming an increasingly global environmental issue. Our use of non-biodegradable wastes, such as plastics, is overwhelming our natural environment, polluting our land, rivers, coasts and the oceans.

Locally it is projected that our community will generate up to 58,000 tonnes of household waste by 2026. This waste will pose a threat to our natural environment if not managed well.

Opportunities

Government policy is moving toward a circular economy – a model that aims to design waste out of the system, either by returning resources to nature or sending them back through a system to be productively used. This change of approach, combined with advances in waste processing methods and technologies, brings significant new opportunities to reduce the amount of waste going to landfill.

Changes in the recycling industry and increased media focus on waste have attracted attention to the waste issue in the community. With this awareness comes an opportunity to mobilise people to reduce, recover and recycle materials as part of a whole-of-community effort to reduce waste.

The City of Greater Geelong Waste and Resource Recovery Strategy 2020–30 provides strategic direction and over 80 actions to help address waste and pollution issues.

WATER

Challenges

Climate change will likely result in decreased annual rainfall across our municipality. At the same time, population growth will increase demand for water, putting pressure on our drinking water supply. As periods between rainfall increase, it will place stress on our waterways and impact our ability to manage water quality.

Climate change is also expected to increase the number and intensity of extreme weather events, putting pressure on waterways, as well as our stormwater and drainage infrastructure. This may result in property damage, erosion and sediment transfer, loss of biodiversity and changes in the water table.

Opportunities

We have an opportunity to become more water-resilient by investing in stormwater and rainwater harvesting infrastructure. Greenfield urban development offers an unprecedented opportunity to apply the principles of water sensitive design and integrated water management.

As with climate change, what we know about water management has expanded significantly in recent years. The opportunity to share this knowledge and further partner with government, business and the community to make positive changes is significant. The outcome would be a more holistic approach to water conservation.

LIVEABILITY IN OUR CITIES AND TOWNS

Challenges

Over the past few decades, our urban areas have become dominated by hard surfaces, such as roads, footpaths, gutters, buildings and roofs. These surfaces absorb heat and repel water and reduce the health and amenity of our green spaces. When combined with increasing temperatures and declining rainfalls, these changes will increase the urban heat island effect (see box below).

It is predicted the urban heat island effect will be most pronounced in Geelong's central business district, due to its northerly aspect, wide grid-based streets, lack of tree canopy and hard surfaces, streets and buildings.

Opportunities

Connection with nature is essential for human health and wellbeing, especially in highly-modified urban environments. Without green spaces, trees, water and biodiversity, our streetscapes become uncomfortable, barren, unhealthy places to live. We need to bring nature back into our existing urban areas and plan for best-practice urban ecology outcomes.

Urban development and renewal and land use change in our region presents opportunities to incorporate natural elements into our streetscapes that will contribute to our community health and wellbeing.

WHAT IS THE URBAN HEAT ISLAND EFFECT?

The urban heat island effect refers to the way built-up areas have a greater capacity to absorb, hold and emit the sun's heat, compared to rural areas. It can lead to extreme temperatures of up to 60°C on the street when the ambient temperature is about 35°C.

Extremes of heat at the streetscape level can contribute to adverse health and wellbeing issues including heat distress, dehydration and heat stroke, especially for vulnerable people in the community, such as the elderly.

BOOK EXCHANGE

TOILETS

KINGSTON PARK RESERVE

NATURE PLAY

PICNIC AREA

CHALLENGE

STRATEGY OVERVIEW

This ten-year strategy sets the long-term strategic goals we will use to help realise our clever and creative vision.

Specifically, it aims to:

- deliver on our sustainability commitments
- embed environmental considerations in decision-making across our business
- communicate the importance of the environment to the region's future.

The key goals we are committed to achieving are shown in the table below and each goal has been assigned a series of targets we're aiming to achieve by 2030.

STRATEGIC GOALS	
Goal 1	Become a zero-emission, climate-ready city and region
Goal 2	Create greener community spaces
Goal 3	Contribute to a circular economy by reducing waste
Goal 4	Protect, enhance and restore our region's biodiversity
Goal 5	Achieve better integrated water management through planning and design

Together with this strategy, we have developed *The City of Greater Geelong Environment Strategy Action Plan*. This plan will describe the actions we'll implement to help us achieve our long-term goals, and will be updated every two years.

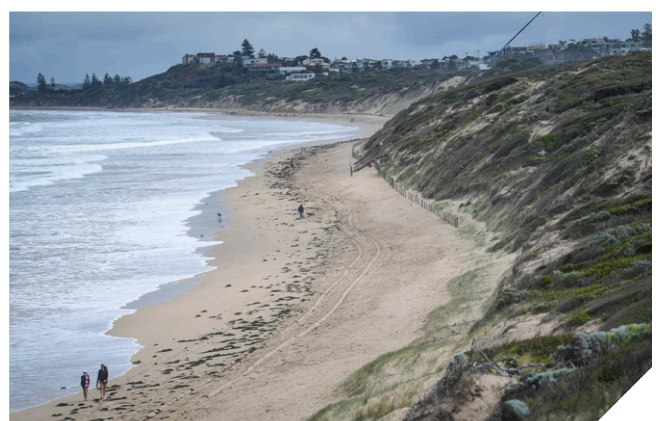
We'll use the Global Reporting Initiative Environmental Standards to report on these actions and progress towards our targets every two years. Planning and reporting in this way will help us keep pace with the rapid changes that are happening in environmental management.



Above: Members of Geelong Youth Council with protected vegetation signs



Above: Planting to green community spaces



Above: Coastal areas and cultural heritage sites are under threat from sea-level rise caused by climate change

GOAL 1: BECOME A ZERO-EMISSION, CLIMATE-READY CITY REGION

The planet is experiencing long-term increases in average temperatures due to human-induced greenhouse gases entering the Earth's atmosphere. This is expected to have significant impacts in the south-western region of Victoria over the coming decade, including higher average temperatures, more intense and frequent heatwaves, more extreme bushfires, declining rainfall and inundation from sea-level rise.

In 2018-19, our organisation's total emissions were 41,344 tonnes of carbon dioxide equivalents⁵. We have a responsibility to reduce our emissions, as well as prepare for the potential outcomes a changed climate may bring (see Appendix B for more information about mitigation and adaptation). Failing to prepare could have serious consequences, such as heat-related failures of public assets, a decline in the health of our natural environment, higher rates of infectious and water borne disease and flooding that results from sea level rise and higher peak flows through stormwater systems.

GUIDING PRINCIPLES AND DIRECTIONS FOR 2020–30

PRINCIPLES		DIRECTIONS
1.1	Increase energy efficiency and renewable energy production.	<ul style="list-style-type: none"> a. Continue implementing energy efficiency programs in City-owned and operated facilities. b. Support businesses to improve energy consumption efficiency and renewable energy production through initiatives, such as Environmental Upgrade Agreements for commercial property owners. c. Support community efforts to implement innovative renewable energy production and storage solutions and achieve energy consumption efficiencies. d. Support environmentally sustainable design outcomes through planning controls, policy, education and incentives.
1.2	Switch to renewable electricity and cleaner fuels.	<ul style="list-style-type: none"> a. Prioritise the development of sustainable transport infrastructure and services. b. Switch to renewable power supplies. c. Invest in energy efficiency and renewable energy programs. d. Increase community capacity to adopt energy efficiency measures. e. Pursue financial divestment away from fossil-fuel-aligned investments. f. Support community efforts to transition to a zero-carbon environment.
1.3	Reduce non-energy emissions and increase carbon storage.	<ul style="list-style-type: none"> a. Prioritise service and infrastructure solutions to reduce and capture municipal waste emissions. b. Support business and community efforts to reduce non-energy emissions. c. Promote sustainable agriculture practices through planning controls, policy, education and incentives. d. Establish a carbon sequestration target to be achieved through revegetation biomass gains.

5. Azility (2020, February 18) City of Greater Geelong Emissions Detail Data Download. Retrieved from <https://www.azility.co>

PRINCIPLES		DIRECTIONS
1.4	Increase awareness and understanding of climate change impacts.	<p>a. Increase awareness and understanding of climate change impacts and adaptation responses across all areas of our business, and the community.</p> <p>b. Engage our community in the development of a climate change response plan and community emission reduction targets.</p> <p>c. Advocate for, promote and support local, regional, state and federal climate change mitigation and adaptation responses.</p>
1.5	Build climate change adaptation into decision-making.	<p>a. Support regional economic adaptation to climate change risks and opportunities.</p> <p>b. Build climate resilient community infrastructure and services.</p> <p>c. Plan for climate change and emergency management at the municipal level, provide relief and recovery services, and support emergency response operations.</p> <p>d. Develop a proactive culture in our organisation that leads to better decisions for climate change resilience.</p> <p>e. Prioritise, monitor, evaluate and report on climate change adaptation efforts.</p>
1.6	Increase collaborative climate change responses.	<p>f. Establish stronger relationships with key stakeholders to improve knowledge of, and plan responses to, regional climate change impacts.</p> <p>g. Connect with businesses and community to find new ways to respond to climate change.</p>

OUR TARGETS

1. All City-managed operations to be carbon neutral by 2025.
2. 100% renewable electricity supply used for all City owned and operated buildings and streetlights by 2025.
3. Adopt a climate change response plan by 2021
4. 95 per cent of Drysdale Landfill methane gas emissions recovered and used for energy production by 2025.
5. All City-owned light fleet vehicles powered by zero-emission power sources by 2030.
6. Amend our Environmentally Sustainable Design Policy to require sustainable design assessments for all multi-unit developments by 2023.
7. All new large city-owned buildings built after 2020 to achieve a 5-star 'Green Star' environmental rating.
8. All new small city-owned buildings built after 2020 to comply with Built Environment Sustainability Scorecard sustainable design standards.
9. Review planning policies and processes to support UN Sustainable Development Goals and the IPCC 1.5-degree pathway by 2025.



Above: The 5-Green-Star-rated Geelong Library and Heritage Centre

GOAL 2: CREATE GREENER COMMUNITY SPACES



ABOVE: The Johnstone Park rain garden is an example of green-blue infrastructure.

To help us plan future housing supply, we are projecting a population growth rate of 2.5 per cent per annum until 2036⁶. As a result of this growth, more people will be living in urban landscapes – areas typically characterised by extensive areas of buildings and roads, small areas of green open space and an absence of surface water (except after rain events). Without a determined effort, our cities and towns have the potential to become hot, dry and barren landscapes at greater risk of the urban heat island effect.

To counteract this, we need to establish more nature-based green-blue infrastructure solutions. Nature-based green-blue infrastructure refers to natural and constructed assets that are either:

- land-based (green), such as trees, gardens, nature strips, parks and open spaces or
- water-based (blue), such as stormwater, drains, wetlands, ponds and waterways.

This type of infrastructure brings many benefits, including cooler cities and towns, increased community physical and mental wellbeing and increased biodiversity.

Providing green spaces within and between urban areas was one of the highest-rated community ideas from 'Our Future' engagement process⁷. From a blue infrastructure perspective, we also need to rethink how we can reuse stormwater, bringing it back to the surface and allowing it to infiltrate to cool our urban areas.

6. City of Greater Geelong (2018) *Settlement Strategy Summary – October 2018*. Geelong, City of Greater Geelong, p 9

7. City of Greater Geelong (2017) *Our Future: Time to Decide – Stage Two Community Engagement Findings (unpublished)*.

GUIDING PRINCIPLES AND DIRECTIONS FOR 2020–30

PRINCIPLES		DIRECTIONS
2.1	Increase amenity of community spaces and reduce urban heat risk.	<ol style="list-style-type: none"> Improve assessment and planning processes to support appropriate long-term responses to urban heat, nature-based green-blue infrastructure solutions and people's connection with nature. Adopt minimum greening requirements and methodologies for the development of sustainable and biodiverse streetscapes, infrastructure and open space areas in new developments. Support measures to mitigate urban heat in new developments and retrofit existing streetscapes.
2.2	Increase adoption of nature-based, green-blue infrastructure solutions.	<ol style="list-style-type: none"> Secure alternative water supplies suitable for use in the irrigation of sport fields to reduce our reliance on potable water. Partner with Barwon Water, Barwon Coast, the CCMA and our community to improve the biodiversity values and ecological health of our waterways. Increase the use of landscape planning permit conditions to achieve community space greening outcomes. Encourage passive irrigation techniques for urban landscapes. Integrate green-blue infrastructure into active travel links to provide shaded and biodiverse transport connections. Adopt Water Sensitive Cities practices to increase stormwater infiltration, promote evapotranspiration, mitigate flooding and remove pollutants from stormwater runoff.
2.3	Connect people to nature.	<ol style="list-style-type: none"> Increase the biodiversity levels and ecological health of our urban public spaces. Partner with Wadawurrung Traditional Owners to incorporate cultural heritage elements into community spaces. Utilise climate resilient flora species that support biodiversity outcomes in community spaces. Provide opportunities for active transport, nature play, art and design, and passive and active learning about nature. Integrate requirements for greening of community spaces into infrastructure development projects. Support partnerships and programs that engage our community in environmental restoration projects. Support programs that engage our community in local sustainable food production.

OUR TARGETS

- Increase tree canopy cover in urban Greater Geelong to 25 per cent by 2045, with an interim target of 20 percent by 2030.
- Develop an urban ecology plan by 2025.
- Develop an integrated water management strategy and waterway management plan by 2025.
- Plant one million new trees in Greater Geelong by 2030.
- Establish and maintain parkland areas within 400 metres of all households.
- Develop and implement a sustainable food policy to support community food production by 2023.
- Improve landscape planning controls to support desired urban greening outcomes by 2024.
- Complete urban heatwave vulnerability modelling and identify priority urban greening sites by 2023.

GOAL 3: CONTRIBUTE TO A CIRCULAR ECONOMY BY REDUCING WASTE

Waste is a global problem. Not only are modern societies producing more waste, the waste being produced – most notably plastics – is having worldwide environmental impacts. Recent changes to the global recycling industry have highlighted the scale of these issues.

Greater Geelong’s residents are projected to generate 58,700 tonnes of household waste per annum by 2026. Without a sustainable waste and resource recovery system, the waste generated by our community will rapidly accumulate, affecting the health of our natural environment and causing risks to public health and wellbeing.

Our organisation manages a complex waste management system that includes kerbside and public waste collection, sorting, recovery and residual waste transport and disposal. This means we have a strong interest in managing the social, environmental and financial costs of transporting, processing and disposing of waste. It also means we are well-placed to educate residents and businesses on ways to reduce their waste.

We need to act collectively to reduce waste by making better purchasing decisions, avoiding disposable or single-use goods, minimising packaging and supporting a circular economy model (see box right).



WHAT IS A CIRCULAR ECONOMY?

A circular economy is a model that aims to design waste out of the system. It retains the value of the materials we produce as waste through greater reuse, recovery and recycling and, in turn, dramatically reduces our use of natural resources and the volumes of waste produced.

GUIDING PRINCIPLES AND DIRECTIONS FOR 2020–30

PRINCIPLES		DIRECTIONS
3.1	Avoid creating waste.	<ul style="list-style-type: none"> a. Avoid and reduce waste in our operations and at City-sponsored events b. Promote a circular economy through sustainable procurement practices. c. Avoid and reduce waste in the planning and design of new City-owned buildings and facilities. d. Support community and business efforts to avoid and reduce waste through education, behaviour change, capacity-building and innovative services. e. Advocate to state and federal governments for waste-minimising design, manufacturing and packaging policy and legislation. f. Advocate for, promote and support a more circular regional economy.

PRINCIPLES		DIRECTIONS
3.2	Recover more resources.	<ul style="list-style-type: none"> a. Support community and business efforts to increase reuse, recovery and recycling through education, behaviour-change, capacity-building and innovative services, in partnership with Barwon South West Waste Resource and Recovery Group. b. Support and deliver a sustainable kerbside recycling system. c. Support new and existing markets for recovered resources. d. Review and improve waste data capture and reporting processes for landfill, kerbside collection and resource recovery. e. Promote increased use of recycled materials in road, building and other infrastructure constructions, including environmental applications. f. Provide infrastructure and services in our buildings that support increased recycling rates. g. Partner with other agencies to promote research and development of clean technologies that increase reuse, recovery and recycling.
3.3	Protect the environment from waste impacts.	<ul style="list-style-type: none"> a. Continue to partner with other local governments and environmental organisations to identify and develop sustainable waste management and infrastructure solutions. b. Protect the environment from litter pollution in public open spaces through enforcement, education and control measures. c. Monitor, review and improve litter reduction measures for wetlands and waterways. d. Partner with key agencies to better educate the community about illegal dumping and litter prevention. e. Promote programs and businesses that reduce the impact of waste on the environment. f. Continue to partner with government agencies and stakeholders to secure funding for environmental protection works. g. Advocate for increased enforcement, technical advice and support from the Victorian Environment Protection Authority.

OUR TARGETS

- Reduce waste produced in City-operated office buildings by 20 per cent by 2025.
- Develop a single-use plastics policy for City operations and events by 2020.
- Single-use plastics phased out of City-owned buildings by 2022.
- Halve the volume of organic materials going to landfill from residential waste bins between 2020 and 2030, with an interim target of 20 percent reduction by 2025.
- Reduce residential recycling bin contamination rates to less than 10 per cent by 2025.
- Use at least 95 per cent of landfill gas generated at the Drysdale Landfill for energy production by 2022.



GOAL 4: PROTECT, ENHANCE AND RESTORE OUR REGION'S BIODIVERSITY

Our region's rural lands, coastal reserves, waterways, forests, grasslands, nature reserves and streetscapes support flora and fauna species, natural habitats and ecological processes. They are also critical to our health, wellbeing and prosperity, providing clean air and water, productive soils, natural pest control, pollution and flood mitigation and carbon sequestration.

Like much of the world the health of our natural environment is in serious decline and urgent action is required to protect, enhance and restore our regions biodiversity and ecological processes.

As a significant land manager in the region and the responsible authority for administering the planning scheme, we are directly responsible for protecting natural species and habitats, controlling pest plants and animals and supporting biodiversity in public reserves, waterways and streetscapes. We also have a role to play in educating, supporting and partnering with our community and other land managers to protect and enhance our regions biodiversity.

To effectively conserve our regions biodiversity, we must prioritise how we protect, enhance and restore natural assets (see Appendix C for more detail).

GUIDING PRINCIPLES AND DIRECTIONS FOR 2020–30

PRINCIPLES		DIRECTIONS
4.1	Collaborate with the Wadawurrung Traditional Owners to connect culture and biodiversity	<ul style="list-style-type: none"> a. Collaborate with the Wadawurrung Traditional Owners and use traditional knowledge of country to improve biodiversity planning and management practices. b. Establish Aboriginal Cultural Heritage Land Management Agreements to improve protection and management of cultural sites. c. Partner with the Wadawurrung Traditional Owners to promote knowledge exchange, cultural education and the use of language. d. Enable greater access to country to facilitate stronger cultural connections.
4.2	Protect and enhance indigenous biodiversity.	<ul style="list-style-type: none"> a. Prioritise the protection of indigenous biodiversity and habitat in all council planning, decision making and operational activities with potential environmental impacts. b. Protect and enhance indigenous biodiversity prioritising: <ol style="list-style-type: none"> 1. Remnant biodiversity patches larger than 10 hectares 2. Threatened indigenous biodiversity species and communities 3. Under-represented Ecological Vegetation Classes 4. Establishment of biolinks to reduce habitat fragmentation 5. Protection of remnant old trees c. Expand indigenous biodiversity patches through natural regeneration and revegetation programs. d. Restore indigenous biodiversity and habitat to support ecologically healthy waterways, estuaries and wetlands. e. Review and strengthen the planning scheme including enforcement controls to prevent further loss of indigenous biodiversity. f. Support the restoration of indigenous biodiversity and ecological processes in rural and coastal landscapes through planning controls, education and incentives. g. Increase works to control pest plant and animal impacts on indigenous biodiversity. h. Ensure the protection of threatened species and habitats through the development of conservation action plans.

PRINCIPLES		DIRECTIONS
4.3	Restore biodiversity in modified urban landscapes	<ul style="list-style-type: none"> a. Integrate biodiversity into urban landscapes through planning and design processes. b. Restore biodiversity to our parks, roadsides, reserves, waterways, streetscapes, coastal and rural landscapes using Ecological Vegetation Classes, natural regeneration techniques and indigenous plants of local provenance. c. Restore habitat into urban landscapes through the establishment of indigenous tree, shrub and understory plantings and other habitat elements such as wetlands, logs and stags. d. Restore degraded waterways and wetlands to create habitat and ecologically healthy water flows.
4.4	Adaptive management approach to biodiversity conservation	<ul style="list-style-type: none"> a. Monitor, analyse and report on biodiversity status, trends and impacts and use the data gained to adapt planning and management practices and improve conservation outcomes. b. Develop knowledge, strategies and management practices to improve the climate resilience of conservation reserves. c. Improve planning controls and public land management practices to reduce impacts of urban development and human activity on indigenous biodiversity.
4.5	Build community knowledge, engagement and partnerships	<ul style="list-style-type: none"> a. Partner with the state government, neighbouring councils, water, coastal and catchment management authorities to achieve regional biodiversity improvements. b. Partner with regional environmental organisations to support the protection and enhancement of biodiversity sites on private lands. c. Develop education and engagement resources to increase community understanding and involvement in biodiversity conservation activities. d. Provide opportunities for our community to engage with nature.

OUR TARGETS

- Establish conservation protection for all remnant biodiversity patches larger than 10 hectares by 2025.
- Establish an additional 1,000 hectares of protected natural habitat by 2030.
- Engage 100,000 people in nature education and conservation activities by 2025.
- Review and update our *Biodiversity Strategy* by 2021.
- Prevent any new indigenous species or habitat area extinctions during the term of this strategy.
- Achieve a net gain of biodiversity within Greater Geelong during the term of this strategy.



GOAL 5: BETTER INTEGRATED WATER MANAGEMENT THROUGH PLANNING AND DESIGN

Our finite water supplies are under pressure due to the impacts of climate change and continuing population growth. As Figure 4 shows, without intervention, current water supplies may no longer reliably meet demand by 2029.

Impacts of climate change will include periods of drought, declining water storage levels and drying of our environment. We're also likely to experience more extreme rainfall events that will damage property, infrastructure, environmental and cultural assets through flooding.

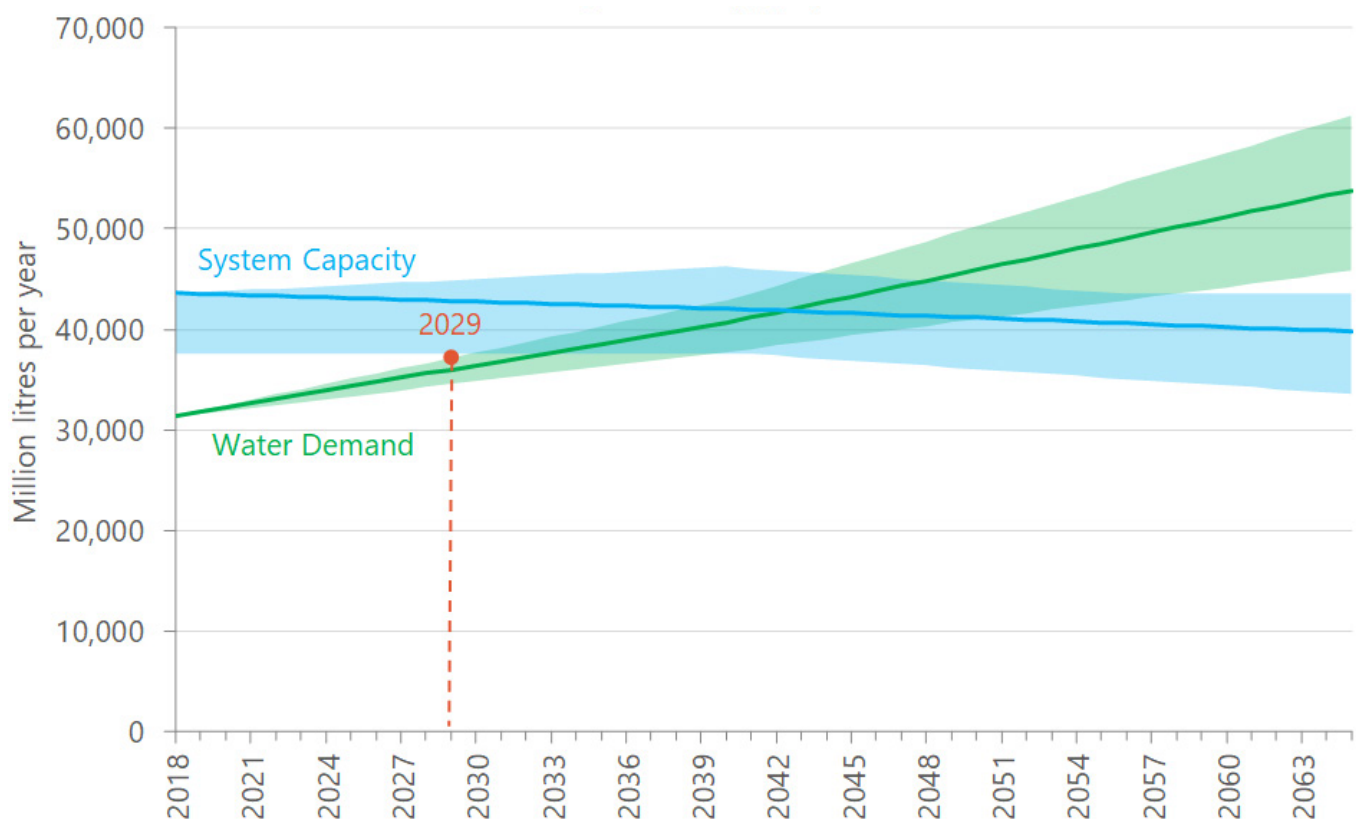


Figure 4 Geelong water supply system 2018–65 (courtesy of Barwon Water)

We need to prepare for these impacts by managing our water resources wisely, securing a sustainable water supply for the ongoing health of our community and our environment.

Integrated water management is a collaborative approach to managing all water resources – including drinking water, sewerage, waterways, floodplains, drainage and stormwater networks. It involves working with all relevant stakeholders to plan and deliver improved water management processes.

As an organisation, we are a significant stakeholder in this process. Our role can be roughly divided into four areas:

- **Management** – we oversee drainage and stormwater assets across more than 300 stormwater catchments, as well as the water we use in our day-to-day operations.
- **Planning** – we design major drainage and stormwater infrastructure in areas of urban development.
- **Regulating** – we oversee planning and design in new urban developments, check onsite domestic wastewater systems and enforce building controls in flood-prone areas.
- **Support** – we help our community to recover after significant flood events and work to improve the ecological health of significant urban waterways.

In all these different roles, we have a responsibility to make sure that water resources are managed in the most sustainable way possible.

GUIDING PRINCIPLES AND DIRECTIONS FOR 2020–30

PRINCIPLES		DIRECTIONS
5.1	Support sustainable water use.	<ul style="list-style-type: none"> a. Act as a sustainable water user. b. Implement best practice stormwater harvesting schemes. c. Reduce demand on drinking water supplies by using alternative water supplies. d. Reduce potable water usage in all new multi-unit, commercial and mixed-use developments. e. Reduce potable water usage in existing and future City-owned assets.
5.2	Sustainable management of drainage and stormwater asset networks.	<ul style="list-style-type: none"> a. Use adaptation programs to reduce stormwater flooding impacts on people, infrastructure, places and the environment. b. Support urban greening by applying integrated water management practices. c. Integrate stormwater reuse into natural and built environments to create multi-functional community spaces. d. Develop partnerships with governments, water corporations, key agencies, organisations and our community, to plan and deliver sustainable water management outcomes.
5.3	Create ecologically healthy, accessible urban waterways.	<ul style="list-style-type: none"> a. Partner with Barwon Water, Barwon Coast, the CCMA and our community to improve linkages, biodiversity values and the ecological health of our waterways. b. Improve understanding of the values and threats to urban waterways. c. Improve our capacity to achieve the best possible social, environmental and economic outcomes from urban waterways. d. Secure dedicated resources to achieve best practice in urban waterway management. e. Develop infrastructure to treat or divert waste water before it is discharged into natural waterways.

OUR TARGETS

- Develop a waterway management plan by 2025.
- Develop an integrated water management plan for the North Western Geelong Growth Area by 2025.
- Develop an integrated water management plan for Geelong by 2025.
- Identify catchment management units that don't comply with best-practice standards for water quality, and establish priority infrastructure improvement projects, by 2026.
- Implement the *Stormwater Services Strategy 2020-2030*.

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APPENDIX



A Superb Fairy-wren

APPENDIX A – GLOSSARY

Biodiversity – is the variety of living organisms, the genetic differences between them and the communities and ecosystems in which they occur. Biodiversity underlies all the ecosystem processes that make life possible and is crucial to the ecological stability of Geelong and our planet.

Carbon emissions – refers to all greenhouse gases, including carbon dioxide, methane, nitrous oxide and so on.

Carbon footprint – refers to the total carbon emissions caused by an organisation or other entity.

Carbon neutral – means an organisation, product or service which has been proven to have reduced its emissions where possible and compensated for the remainder by investing in carbon offsets to be 'net zero' carbon emissions.

Carbon offset – is the process of reducing carbon emissions produced in one area of the city's operations to compensate for emission generated elsewhere.

Catchment management unit - refers to a collection of drainage catchments based on similar urban environments, hydrological catchments and discharge points. There are 25 catchment management units in our municipality.

Circular economy – refers to an economic model that continues to recover used resources so that they can be reused.

Climate change – the phenomenon of changing weather patterns caused by the overall warming of the planet due to greenhouse gas emissions

Green-blue infrastructure – refers to the natural and built assets within urban landscapes which are living (green) and which manage water (blue).

Greenhouse gases – atmospheric gases responsible for causing global warming and climate change. The six Kyoto Protocol classes of greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydro-fluorocarbons (HFCs), per-fluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

Integrated water management – water cycle systems including natural, built and services aspects, such as waterways, wetlands and floodplains, drainage and stormwater, drinking water and sewerage as well as water's interfaces with the land in public open spaces.



Our Garden
Organics Processing
Facility in Anakie

Mitigation – refers to activities undertaken to reduce carbon emissions to the atmosphere

Offset – a reduction in greenhouse gases, or enhancement of greenhouse gas removal from the atmosphere by sinks, relative to a business-as-usual baseline.

Public Open Space – refer to all City controlled lands that are available for public access.

Sequestration – the removal of atmospheric carbon dioxide, either through biological processes (for example, photosynthesis in plants and trees), or geological processes (for example, storage of carbon dioxide in underground reservoirs).

Urban Heat Island Effect – refers to the higher rate of heat absorbed by hard surfaces in urban areas – that is bitumen, paving, concrete, building walls and so on – that causes built up urban areas to be generally warmer than surrounding peri-urban or rural landscapes.

Water Sensitive Urban Design – the management of stormwater within the urban landscape that mitigates floods, reduces pollution and provides public amenity.

APPENDIX B – MITIGATION AND ADAPTATION

Our response to the global issue of climate change will be via:

- Mitigation (or abatement) measures – these are actions we can take to address human-induced greenhouse gas emissions, as the underlying cause of climate change.
- Adaptation measures – these are the actions we can take to ‘prepare for actual or expected changes in the climate to minimise harm, act on opportunities or cope with the consequences.’⁸

MITIGATION MEASURES

For local government organisations, greenhouse gas emissions are separated into three types (see Figure 5). Collectively, all these emissions contribute to our ‘carbon footprint’.

EMISSION TYPE	DEFINITION	HOW CAN WE RESPOND
Scope 1	Emissions derived from direct combustion of fossil fuels and methane from the breakdown of municipal waste.	<ul style="list-style-type: none">• Reduce emissions from vehicles and facility heating, in line with state and national targets.• Manage emissions associated with the breakdown of municipal waste from landfill.• Support the community to reduce their emissions by planning communities that are less reliant on cars.
Scope 2	Emissions are associated with our use of electricity from the grid, which itself has been generated (mostly) from burning coal and natural gas.	<ul style="list-style-type: none">• Design new buildings and facilities that are energy efficient.• Upgrade and retrofit buildings.• Switch to renewable energy.• Support the community to reduce their emissions.
Scope 3	Emissions generated by third parties (not electricity) because of our activities, such as business travel, paper and water use.	<ul style="list-style-type: none">• Procure goods and services that are emissions-friendly.• Support businesses to reduce emissions through initiatives such as Cleantech Geelong.

Figure 5: Greenhouse Gas Emission Types

ADAPTATION MEASURES

We have been proactive in preparing for climate change in our own operations by embedding climate change into our business risk management systems and working to improve our understanding of potential risks to land, essential services and infrastructure. We were also one of the first local governments in Australia to develop an adaptation strategy in 2011.

Our role is to lead in climate change adaptation, working with the community and stakeholders to understand the issues and risks, evaluate the alternatives and collaboratively implement appropriate adaptation measures.

8. (Victorian Climate Change Act 2017).

APPENDIX C – OUR ROLE IN CONSERVING BIODIVERSITY

RANKING	ACTION	OUR ROLE
1	Protect highest-value biodiversity	<ul style="list-style-type: none"> • We protect the health of high value biodiversity assets on land we manage. We have direct control of significant areas of high-quality remnant biodiversity and habitats in various types of reserves, particularly conservation, coastal, waterways and roadsides. • We use legislative, regulatory and compliance powers to protect biodiversity. • We support community efforts to protect high-quality biodiversity on public and private lands through education programs and resourcing incentives.
2	Enhance biodiversity	<ul style="list-style-type: none"> • As a major land manager in the region, we directly manage biodiversity by increasing the quality, extent and connectivity of habitat, supporting flora and fauna populations, managing ecological balance, introducing diversity and protecting threatened species. • We support community efforts to enhance biodiversity on public and private lands and increase community participation in biodiversity enhancement projects.
3	Restore biodiversity in modified rural and urban landscapes.	<ul style="list-style-type: none"> • We deliver projects that restore biodiversity values in rural and urban landscapes. • We support community participation in biodiversity restoration projects to restore biodiversity in rural and urban areas.



Nature supporting community
health and wellbeing

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