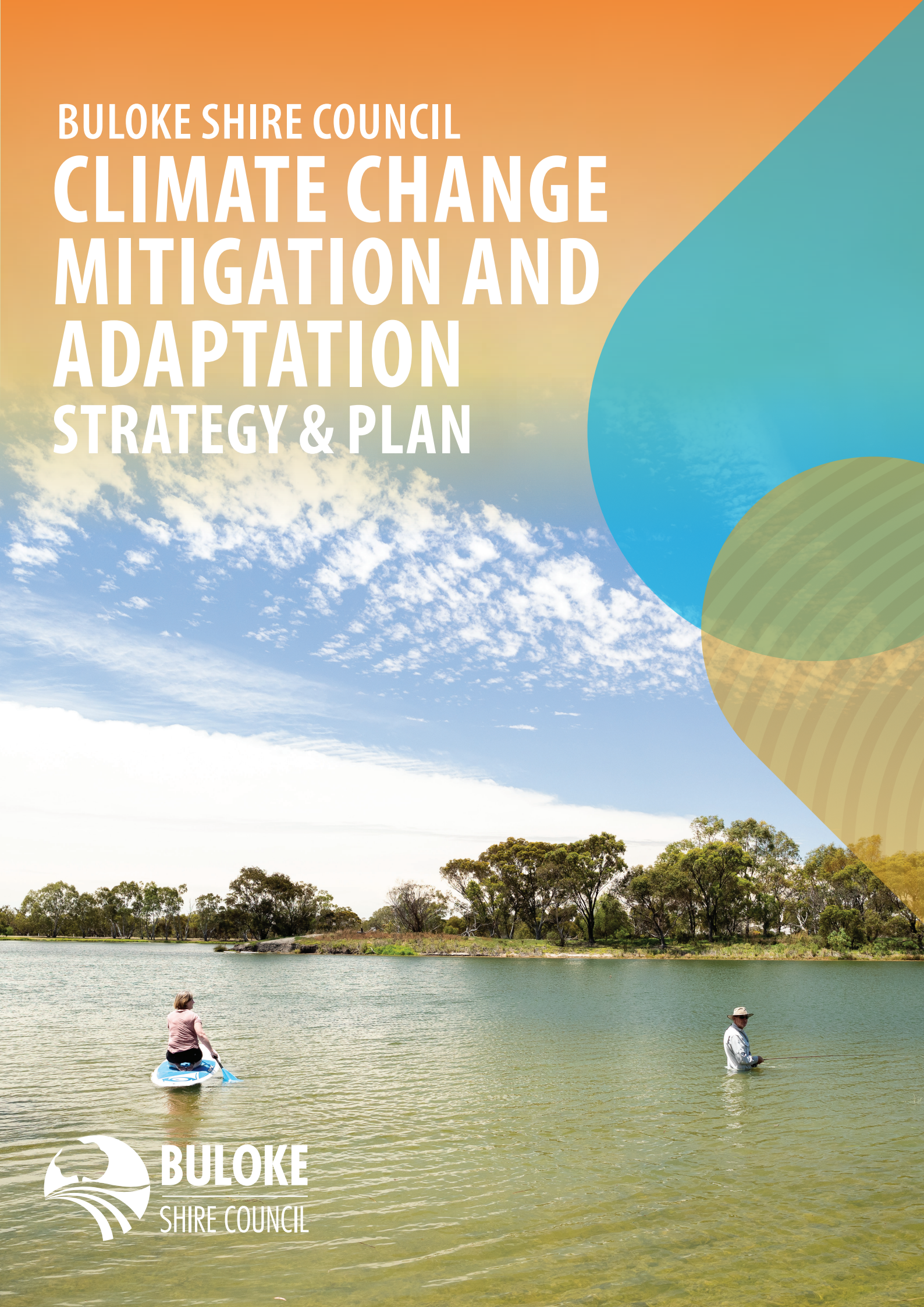
BULOKE SHIRE COUNCIL

CLIMATE CHANGE MITIGATION AND ADAPTATION

STRATEGY & PLAN



BULOKE
SHIRE COUNCIL

Buloke's Climate Change Mitigation & Adaptation Strategy & Plan

© Ndevr Environmental Pty Ltd 2020

VERSION CONTROL RECORD

Version	Date	Author/Editor	Reviewed by	Description of Change
vA.0	4.06.2021	Juliana Bedggood	Hannah Meade, Jacinta Young	Draft report
vA.1	12.08.2021	Juliana Bedggood	Jacinta Young	Final report incorporating BSC feedback from draft
vA.2	17.08.2021	Juliana Bedggood	NA	Edit to Figure 18 for relevance
vA.3	4.10.2021	Juliana Bedggood	NA	Updated Action Table that Buloke completed

Buloke's Climate Change Mitigation & Adaptation Strategy & Plan

Contents

Buloke's Climate Change Mitigation & Adaptation Strategy & Plan

Executive Summary

Buloke Shire Council (BSC) aims to develop a 10-year Climate Change Mitigation and Adaptation Strategy and Plan (the Strategy), a clear, concise and actionable plan for implementation into the Council and community. Ndevr Environmental was engaged to gather information and build the evidence base to inform the Strategy.

An overview of the process to develop the Climate Change Mitigation and Adaptation Strategy and Plan is illustrated in Figure 1, highlighting the objective of this project. This report constitutes the final deliverable of this project and provides detailed findings from the works conducted by Ndevr Environmental, including a review of relevant documents and past projects, consultations with Councillors, the community and key partners, and desktop research on best practice. These findings were synthesised into recommendations for inclusions and priorities for the Strategy.

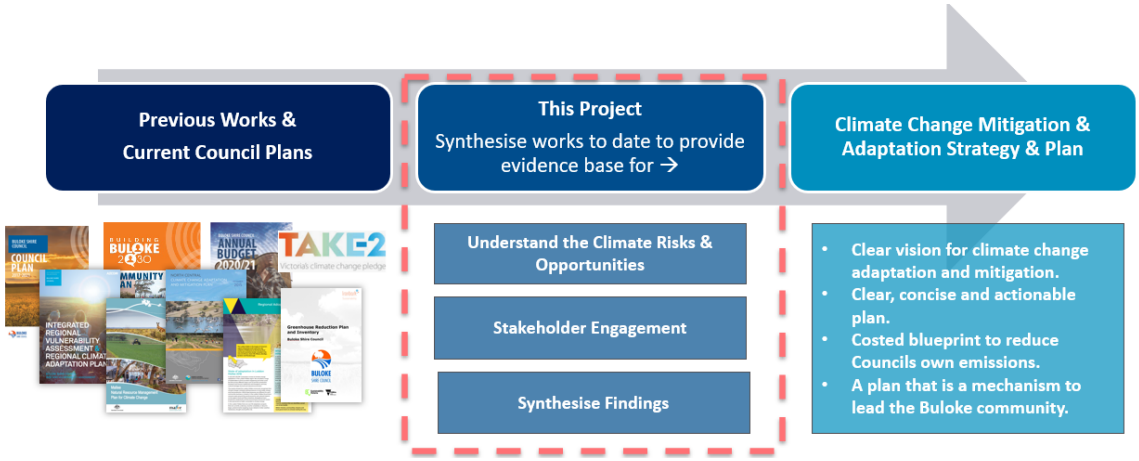


Figure 1: Overview of process to develop the Climate Change Mitigation and Adaptation Strategy and Plan, and the objective of this project.

Climate change can have **direct** and **indirect** impacts on our environment, economy and people. These impacts can be in the form of both **risks** and **opportunities** arising from **physical** impacts, or **transitional** impacts (from the process of adjusting to a changing climate and a low carbon economy). Risks and opportunities were identified for Buloke Shire under the themes of people, natural resources, built environment, economy and council operations.

Climate mitigation and adaptation actions have been identified to reduce BSC's corporate and community climate risks and enhance climate-related opportunities. Climate change **mitigation** refers to measures to avoid and reduce greenhouse gas emissions, while **adaptation** refers to measures to adjust to current and expected impacts of climate change. Mitigating climate change will help to avoid future climate change scenarios and adaptation will help manage the effects of climate change impacts that are unavoidable.

A high-level mitigation and adaptation plan has been recommended for BSC's consideration in Table 1. Actions have been categorised into **13 goals** for climate action: integrate climate into Council operations; robust emissions measurement; ongoing emergency management; waste and landfill emissions reductions; Council building improvements; community building improvements; energy security and technology switching; low emission transport; transport infrastructure improvements; improve septic tank management; enhance biodiversity, conservation and revegetation; adaptive agriculture; and shared community vision. Further detail on actions is provided in sections 7 and 8.

Table 1: Climate Change Mitigation and Adaptation Plan Completed by Buloke

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Integrate climate into Council operations	• Include climate scenario and risk profile in Councillor briefing packs and staff induction • Ensure climate mitigation and adaptation is represented in all relevant documents, policies and procedures – This can be guided through the Climate Emergency declaration process • Develop climate mitigation and adaptation guidance through the local planning scheme – more specific guidance has been provided in the report • Provide professional development training to planning staff on how to influence customers to design climate ready developments • Use the How Well Are We Adapting tool to monitor impacts of climate change on Council services and develop responses	9, 17, 18, 25	Leader, Regulator	Chief Executive Officer Community Development Works and Technical Services Corporate Services Community Development	Update relevant documentation in line with review/ renewal periods	BSC internal staff resourcing Shared resourcing with WAGA for the How Well Are We Adapting tool New funding required for professional development (approx. $500pp)	Number of staff to complete training
Robust emissions measurement	• Measure baseline corporate and community emissions in line with robust standards • Set a net zero emissions target and interim targets • Annual measurement and reporting	16, 19, 30, 39	Leader	Community Development	**Immediate**: emissions profile **Quick win**: set a net zero target by 2030 Interim targets can be done upon completion of profiling **Ongoing**: reporting	New funding required to establish measurement and reporting (approx. $25k for external support of corporate & community profiling and target setting)	Annual reporting

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Ongoing emergency management	• Continue with the MEMP – review and update regularly • Include planning for alternative transport routes in MEMP and protection of shelters • Ongoing community education campaigns and training on MEMP • Assist community groups and businesses with business continuity planning during times of emergency or extreme events	4, 7, 8, 18, 24, 27	Leader, Provider	Community Development Partner with all responsible entities identified in MEMP Potential partnership with ADAPT Loddon Mallee for continuity planning	Update relevant documentation in line with review/ renewal periods (MEMP currently being updated) Ongoing: community support	BSC internal staff resourcing	Number of organisations received continuity training
Waste and landfill emissions reductions	• Develop composting program to divert green and food organic waste from landfill • Develop Container Deposit Scheme and Soft Plastic Recycling for the region • Investigate feasibility of recycle and/or compost processing plant in Buloke. Explore partnership options such as BCG for FOGO circular economy • Investigate feasibility of Emissions Reduction Fund landfill gas capture project and implement if successful	16, 19, 39	Leader, Provider, Partner	Works and Technical Services Partnerships: BCG	Begin planning of a composting program, Container Deposit Scheme and soft plastic recycling program in **FY22** Roll out in **FY23** and continue annually Recycle/compost plant feasibility in **FY22** ERF feasibility in **FY25**	New funding (approx. $30k for each feasibility study, potentially large costs for program roll out) Consider partnering with neighbouring councils for programs (as with the mobile glass crushing unit)	Tonnes of waste deposited to landfill versus organic and recycling sites Number of households or businesses participating in programs Meeting Recycling Victoria Policy targets

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Council building improvements	• Conduct facility assessments, targeting high emitting or at-risk Council-owned facilities first • Identify specific reduction/adaptation measures for each facility and implement • Keep track of assessments and improvements in line with asset management • Sustainable Building Policy for new buildings and refurbishments	4, 5, 6, 7, 9, 20, 21, 22, 32, 34	Leader	Works and Technical Services	**Ongoing, starting FY22** (can be done simultaneously with emissions profiling) Internal Sustainable Building Policy endorsed by FY23	BSC internal staff resourcing New funding (approx. $20k for external support with assessments and opportunity identification) Draw upon Sustainable Building Policy developed in other councils	Number of buildings assessed, and improvements implemented Reduction in BSC emissions
Community building improvements	• Encourage community to participate in schemes and programs that help them to understand their energy bills and seek advice/funding on how to reduce energy consumption and make their buildings more resilient • Advocate for equitable access to insurance and policies which include climate considerations	4, 5, 6, 7, 9, 20, 21, 22, 32, 34	Supporter, Facilitator	Community Development	**Quick win**: provide links to existing schemes on website, send newsletter (BSC could provide guidance to community groups during this process) Provide submission to DELWP on ADAPT Loddon Mallee Climate Ready Plan in **2021** regarding insurance	BSC internal staff resourcing	Number of households and residents participating in programs Community emissions reductions

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Energy security and technology switching	• Advocate for suitable transmission and distribution infrastructure to support renewable energy projects • Complete Microgrid Feasibility Study and implement upon successful study • Participate in CVGA project for getting communities off gas	7, 10, 29	Supporter, Partner, Provider	Community Development CVGA to lead Microgrids and transitioning from projects	Provide submission to DELWP on ADAPT Loddon Mallee Climate Ready Plan in **2021** regarding transmission Microgrid Study: **2021-2024** CVGA project participation dependent on CVGA new strategy	BSC internal staff resourcing and CVGA contributions Microgrid rollout approx. $1M	Roll-out of microgrid Approval of new transmission lines Sign CVGA project contract
Low emission transport	• Participate in CVGA project which aims to help member councils to electrify fleet by 2030 – If this does not go ahead, Buloke should conduct its own feasibility study and transition planning • Update relevant council documents to prioritise zero emission vehicles • Raise community awareness of EVs (e.g., through visibility of BSC's own transition) and encourage community to take up State packages (e.g., grant for EV purchase) • Continue to assess community EV use and advocate for State to (co-)fund chargers • Collaborate with the Mallee Hydrogen Technology Cluster to identify opportunities as they arise	29, 32, 34, 38	Partner, Provider	CVGA to lead council project Vic Government transport programs - BSC to advocate	**Quick win**: Promote opportunities provided by the State Update relevant documentation in line with review/ renewal periods (prioritise low emission vehicles in fleet policy) CVGA project participation dependent on CVGA new strategy	BSC internal staff resourcing for document reviews, advocating and CVGA contributions Feasibility and transition plan ~$30k New funding (~$40k-$80k for zero emission light vehicle) Grant/co-fund opportunities	Sign CVGA project contract Increase in number of EVs registered in Buloke

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Transport infrastructure improvements	• Update asset management in line with mitigating climate risks • Advocate for public transport infrastructure • Advocate for rail freight	8, 27, 32	Supporter, Partner	Partnership: VicRoads, neighbouring councils Chief Executive Officer and Works and Technical Services	Update relevant documentation in line with review/ renewal periods **FY24-25 and ongoing:** advocating	BSC internal staff resourcing for document review and advocating	New rail incorporated in State planning Release of new asset management framework
Improve septic tank management	• Community education on correct septic tank management to reduce risk of health and financial risks to community • Increase frequency of inspections • Advocate for improved domestic wastewater management in townships currently without formal sewerage systems	1	Leader	Community Development Partnership with Landcare	**Immediate**: devise septic tank management education program Update relevant management documentation in line with review/ renewal periods	BSC internal staff resourcing for community engagement and advocating	Number of inspections conducted Percentage of compliant systems Number of complaints
Enhance biodiversity, conservation and revegetation	• Ecological mapping and planning • Continue use of tools and tree asset management from CVGA project • Help promote existing initiatives	1, 11, 12, 13, 14	Leader, Provider, Partner	Community Development Partnership with Landcare and Traditional Custodians	**Ongoing**: CVGA tools and promoting initiatives Partnership for ecological mapping, planning and monitoring by **FY23** and ongoing	BSC internal staff resourcing for tree asset management Use resourcing from partnerships	Number of trees planted in Buloke region (by Council and other groups)

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Adaptive agriculture	• Organise educational events (e.g., Kiss the Ground movie event) • Showcase existing wins • Collaborate with State and farming/agriculture groups to provide co-funding opportunities to small farmers that are not eligible for other schemes	4, 15, 23	Provider, Facilitator	Community Development Partnership with DJPR, BCG, Landcare	**Ongoing**: annual events and promote events organized by others **Quick win**: Showcase existing wins through Council communications and events Provide submission to DELWP on ADAPT Loddon Mallee Climate Ready Plan in **2021** regarding small business access to schemes	BSC internal staff resourcing for community campaigns]	Number of participants at events Number of small farmers with approved funding
Shared community vision	• Develop a communication strategy to encourage positive discussion and acceptance of climate change • Encourage community networking through participation in existing programs • Facilitate community participation in grassroots educational campaigns (e.g., climate chats for schools)	Help to gain support for all risks/ops	Provider, Supporter, Facilitator	Community Development Partnership with DELWP, ADAPT Loddon Mallee	**Immediate**: communication strategy **Quick win**: Promote opportunities for networking (see report) **FY23 and ongoing**: grassroots education programs	BSC internal staff resourcing for community engagement	Number of participants in programs/ attending events

1 Introduction

Buloke Shire Council (BSC) aims to develop a 10-year Climate Change Mitigation and Adaptation Strategy (the Strategy) which will include a clear, concise and actionable plan for implementation into the Council and community. Ndevr Environmental was engaged to gather information and build the evidence base to inform the Strategy.

This project included an initial gap analysis of relevant documents and past projects, followed by consultations with Councillors, the community and key partners to identify key themes and priorities. These findings were synthesised into recommendations for inclusions and priorities for the Strategy.

This report is structured as follows:

- **Gap Analysis**. Presents the key findings of the gap analysis.
- **Buloke Shire Context.** Provides an overview of the Buloke region and outlines the 2030 climate scenario for the Buloke region and presents Council and community emissions profiles.
- **Climate Risks and Opportunities.** Provides an overview of the climate risk frameworks and outlines the climate-related risks and opportunities for the Buloke region and Council as identified in previous works and through this project. Each risk and opportunity are given a priority score and identifies Council's role.
- **Consultation Findings.** Key findings from the community survey and stakeholder consultations, identifying key focus areas.
- **Mitigation and Adaptation Options.** Drawing on previous works, consultations and best practice, options for mitigation and adaptation are discussed for key themes: People, Natural Resources, Built Environment, Economy and Council Operations.

2 Strategic Context

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 increase[1] .

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.

Nonetheless, Federal recovery plans, as well as State budgets announced in 2020, include various allocations and plans for cleantech and renewable initiatives. 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

[1] Climate Action Tracker. (2020). https://climateactiontracker.org/countries/australia/

carbon. Federal and State government investments will help to drive a low carbon economy which BSC could harness for its own agenda.

Given the increasing momentum towards taking positive climate action, and the likelihood of stronger policy, Buloke Shire Council is wise to be taking steps towards mitigation and adaptation.

2.2 State Government

Victoria's *Climate Change Act 2017* (the Act) provides Victoria with a legislative foundation to manage climate change risks, maximise the opportunities that arise from decisive action, and drive Victoria's transition to a net zero emissions, climate resilient community and economy. The Act sets out a clear policy framework and a pathway to 2050 that is consistent with the Paris Agreement to keep global temperature rise well below 2 degrees Celsius above pre-industrial levels.

The Act requires a Climate Change Strategy every five years to set out how Victoria will meet its emissions reduction targets, adapt to the impacts of climate change, and transition to a net zero emissions future. Victoria's Climate Change Strategy 2021-2025 has set interim targets to reduce the state's emissions from 2005 levels by 28-33% for 2025 and 45-50% for 2030. The Strategy has also prepared emissions reduction pledges for each of the 7 sectors: energy, transport, agriculture, waste, industrial, land use and whole-of-government.

In addition, the Act introduces system-based planning for adaptation, focusing on key systems that are either vulnerable to the inevitable impacts of climate change, or are essential to ensure Victoria is prepared. Under the Act, Adaptation Action Plans are required to be developed every 5 years, following the release of the Climate Change Strategy, for 7 systems: built environment, natural environment, education and training, human and health services, primary production, transport, and water. The first five-yearly Adaptation Action Plans will take effect from 2022.

BSC should both be guided by the above regulations and strategies as well as identify opportunities to harness or to collaborate with the State.

2.3 Local Government

Victoria's *Climate Change Act 2017* stipulates the following regarding climate change and decision-makers.

Subsection 17(2) states:

In considering climate change, the relevant decision-maker must have regard to:

a. the potential impacts of climate change relevant to the decision or action; and
b. the potential contribution to the State's greenhouse gas emissions of the decision or action; and
c. any guidelines issued by the Minister under section 18.

Subsection 17(3) states:

a. In having regard to the potential impacts of climate change, relevant considerations are:
b. potential biophysical impacts; and
c. potential long and short term economic, environmental, health and other social impacts; and
d. potential beneficial and detrimental impacts; and
e. potential direct and indirect impacts; and
f. potential cumulative impacts.

The *Local Government Act 2020 (Vic)* identifies several overarching governance principles which create obligations for councils in the context of climate change, including:

- Under 9(2)(c) Councils are required to promote the economic, social and environmental sustainability of the municipal district, including mitigation and planning for climate change risks.
- Under 9(2)(b) Councils are required to give priority to achieving the best outcomes for the municipal community, including future generations.
- Under 9(2)(h) regional, state, and national plans and policies are to be taken into account during Council's strategic planning.
- Under 9(2(i) Council must ensure its decisions, actions, and information are transparent.

Councils have a long history of environmental action. 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 Gap Analysis

The Gap Analysis involved a review of existing BSC data in relation to climate change mitigation and adaptation, including relevant plans and strategies, and conducted a comparison with best practice and latest climate science. Documents reviewed included:

- AECOM IRVACAP (2014)
- NCCMA Climate Change Plan (2015)
- Mallee NRM Plan (2016)
- DELWP Regional Adaptation Snapshot – Loddon Mallee (2017)
- Buloke's Greenhouse Reduction Plan and Inventory (2018)
- Buloke's current and planned projects
- Heat Health Plan
- Buloke Council Plan 2017-21
- Buloke Procurement Policy 2020
- Loddon Mallee Renewable Energy Roadmap
- BSC CCP M5 2005
- BSC Assets 2020
- Solar on council buildings 2019

Ndevr Environmental also facilitated a Climate Risk workshop to the BSC project team to present initial findings from the gap analysis and to build capacity within BSC and ensure collaboration in the identification of climate risks and actions specific to the Shire.

Key gaps identified include:

- **Climate Scenario**. There had been a few previous works completed exploring the future climate scenario of the Buloke region and associated risks but none since 2017. While there has been no deviation from general projections (e.g., increased average temperatures, reduced rainfall, increased rainfall intensity leading to flooding, etc), Ndevr Environmental presented an updated climate scenario outlook in the Gap Analysis report and is presented in section 4.1.
- **Emissions Profile.** Corporate and community emissions were assed in financial 2003/04 and again in 2016/17. Update on corporate and community emissions profiles in line with best practice standards and continue to measure and monitor annually.
- **Climate Risks.** Physical risks for the Buloke region were well identified in previous works. However, consideration of additional climate-related risks (i.e., transitional) and opportunities were lacking. Section 5 aggregates and synthesises the climate risks identified in previous works and those identified in this project.
- **Actions.** Actions planned or previously implemented relate to some of the climate-related risks and opportunities. However, there are further opportunities to mitigate or capitalise on both the existing and newly identified risks and opportunities. Actions need to be further refined to ensure they are S.M.A.R.T (i.e., specific, measurable, achievable, relevant and time-based).

4 Buloke Shire Context

4.1 Buloke 2030 Climate Scenario

A 2030 climate scenario for Buloke is provided in Table 1 based on the Victorian Climate Change Projections (2019) regional snapshots for Loddon, Wimmera and Mallee. The Loddon region is based on historical Bureau of Meteorology station data from Bendigo, while the Wimmera and Mallee scenarios are based on Horsham and Mildura, respectively. The climate scenarios are based on medium (RCP4.5) and high (RCP8.5) emissions scenarios.

General findings for climate scenario projections for Buloke Shire in 2030 are consistent across the Victorian snapshots and previous works such as the AECOM IRVACAP (2014), NCCMA Climate Change Plan (2015), Mallee NRM Plan (2016) and the DELWP Regional Adaptation Snapshot – Loddon Mallee (2017). Overall, Buloke Shire can expect:

- Average temperature increases across all seasons
- Increase in the number of extreme temperatures
- Reduced annual rainfall
- Increase in heavy rainfall intensity
- Increased evaporation
- Reduced humidity and frosts

Based on the above variables, extreme events such as floods and fires are also likely to increase. Key rivers in the Buloke region run through the major towns of Donald and Charlton and floodplains and make these towns particularly susceptible to flooding. Since 2010, Donald has experience 3 flooding events with a major flooding event which occurred in 2011. The 2011 event impacted local and state roads, power, residential and commercial housing, community facilities (e.g., swimming pool, sports club), and agricultural land. Charlton has experienced recent major flooding including September 2010, November 2010 and January 2011. In January 2011 nearly all of the town was flooded including houses, businesses, emergency service stations (i.e., ambulance, police and fire), hospital and health centre, aged care facility and schools. In addition, a major flood event occurred in Birchip in 2018, causing $10.8 million in damage. Since most of the land use in Buloke is for agriculture, bush fires are unlikely. However, farms can experience fires to grass and crops; in some previous instances, farm machine equipment has exploded and caused fires.

Figure 2: Extent of Charlton 2011 Flood Event (source: ses.vic.gov.au)

Figure 3: Extent of Donald 2011 Flood Event (source: ses.vic.gov.au)

Table 2: 2030 Climate Scenarios Across the Mallee, Wimmera and Loddon Regions

Climate variable	Mallee Historical (1986-2005)	Mallee Projected Change (2020-2039)		Wimmera Historical (1986-2005)	Wimmera Projected Change (2020-2039)		Loddon Historical (1986-2005)	Loddon Projected Change (2020-2039)	
		RCP4.5	RCP8.5		RCP4.5	RCP8.5		RCP4.5	RCP8.5
Maximum Temperature (°C)	23.9	25 (increase by an average of 1.1)	25.2 (increase by an average of 1.3)	21.4	22.5 (increase by an average of 1.1)	22.7 (increase by an average of 1.3)	20.7	21.7 (increase by an average of 1)	22.1 (increase by an average of 1.4)
Minimum Temperature (°C)	10.3	11 (increase by an average of 0.7)	11.1 (increase by an average of 0.8)	8	8.7 (increase by an average of 0.7)	8.8 (increase by an average of 0.8)	7.6	8.3 (increase by an average of 0.7)	8.4 (increase by an average of 0.8)
Rainfall (mm)	278.5	261.79 (Decrease by an average of 6%)	253.43 (Decrease by an average of 9%)	403.4	371.13 (Decrease by an average of 8%)	363.06 (decrease by an average of 10%)	499.1	479.14 (Decrease by an average of 4%)	449.19 (Decrease by an average of 10%)
Relative Humidity (%)	NA	-1.9	-2.4	NA	-2.0	-2.4	NA	-1.5	-2.7
Pan Evaporation (%)	NA	14.4	17.7	NA	13.3	14.9	NA	11.3	15.3
Solar Radiation (%)	NA	1.6	1.3	NA	1.7	1.6	NA	1.7	2.0
Surface Wind Speed (%)	NA	-1.3	-1.5	NA	-1.0	-1.7	NA	-1.1	-1.4
Extreme Daily Maximum Temperature (°C)	NA	1°C average increase	0.8°C average increase	NA	1.0 average increase	1.4 average increase	NA	1.0 average increase	0.7 average increase
Extreme Daily Rainfall (%)	NA	1%	-2%	NA	-2.0	-4.0	NA	-6.0	-7.0

4.2 Corporate and Community Emissions Profile

Under the Cities for Climate Protection program, BSC's corporate and community emissions for financial year 2003/04 were assessed. BSC's corporate and community emissions were assessed again for financial year 2016/17 under Sustainability Victoria's Local Government Energy Saver (LGES) Program. The results have been captured in Table 3 and Table 4, showing a comparison between the two assessment periods.

The greatest source of corporate emissions is from closed and open landfills. While waste data was not captured for FY17, it is likely to be captured in the landfill emissions category if all Council waste goes to Council landfills. There may be some overlap between the waste data captured for the community emissions and the landfill data captured for corporate emissions.

Stationary fuels consist of diesel and ULP used for plant equipment, as well as LPG. This represents the second greatest source of corporate emissions, followed by emissions from Council buildings and leased assets which is mainly electricity use.

For the community emissions profile, stationary energy is the largest emissions source and mainly consists of electricity use across the community. The profile excludes emissions associated with land/biological activities from agriculture but includes fuel and electricity use.

Table 3: Buloke corporate emissions profile

Emission Category	tCO_2-e 2003/04	Percentage of total emissions	tCO_2-e 2016/17	Percentage of total emissions
Council Buildings	819	30%	671.47	17%
Stationary Fuel	Not captured	NA	959.72	25%
Vehicle Fleet	1,204	44%	430.34	11%
Landfills	Not captured	NA	1,535	40%
Streetlighting	669	25%	192.86	5%
Water	Not captured	NA	17.77	<1%
Waste	39	1%	Not captured	NA
Leased Assets	Not captured	NA	50.17	1%
Total	**2,731**	**100%**	**3,854**	**100%**

Table 4: Buloke community emissions profile

Emission Category	2003/04 tCO2-e	Percentage of total emissions	2016/17 tCO_2-e	Percentage of total emissions
Stationary energy	93,005	75%	108,837	62%
Transportation	25,988	21%	57,192	33%
Waste	5,658	4%	4,372	3%
Wastewater	Not captured	Not captured	4,053	2%
Total	**124,651**	**100%**	**174,454**	**100%**

Final

5 Climate Risk and Opportunities

As a public sector organisation, BSC is bound by the *Public Administration Act 2004 (Vic)* which highlights that public authority directors have duties of care and diligence to consider climate risk in their activities. Such duties are at least as stringent as those of private corporation directors. Public authority directors are increasingly likely to be closely scrutinised and held to account for climate risk management. More information can be found in CDP publication: Public Authority Director's Duty & Climate Change (2019).

The Task Force on Climate-related Financial Disclosures (TCFD) has been embraced as the best practice for assessment and disclosure of climate change-related risks and opportunities. The TCFD framework is illustrated in Figure 1.

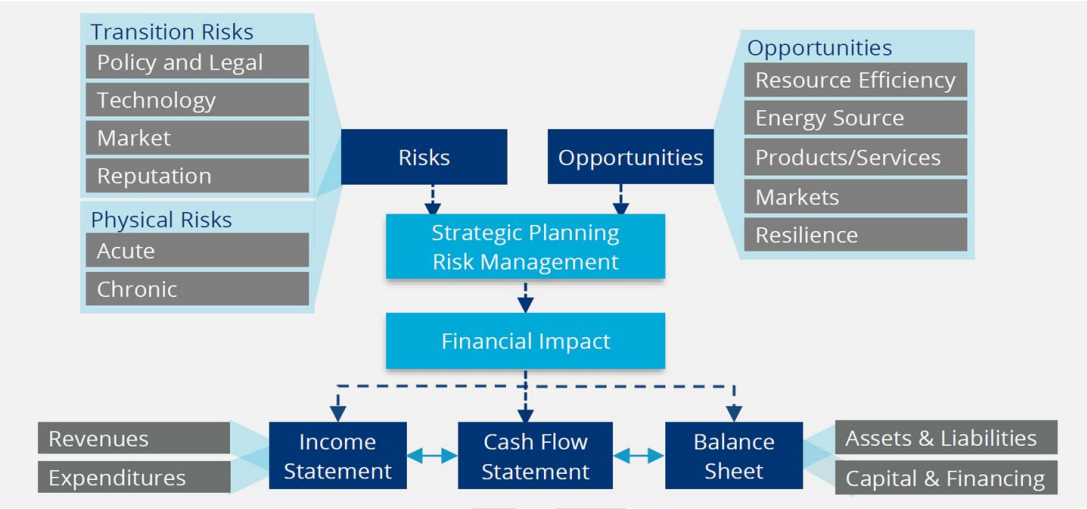


Figure 4: TCFD climate-related risk and opportunities framework

While the TCFD standards were initially developed with financial disclosures from the private sector in mind, there are indications that the public sector is now moving to embrace the concepts and approaches contained in the TCFD Recommendations. TCFD is therefore a helpful and relevant framework in considering how Buloke Shire can meet its obligations with respect to assessing and managing climate change-related risks and opportunities.

The TCFD framework classify climate related risks/opportunities into two main categories:

- **Physical**: Risks and opportunities arising from direct or indirect physical impacts associated with rising aggregate global temperatures. These physical risks can be event driven (acute) or longer-term shifts (chronic) in climate patterns. Physical risks may have financial implications for organisations, such as direct damage to assets and indirect impacts from supply chain disruption. For example, direct impacts to the built environment from increasing intensity and frequency of extreme weather or more gradual changes like rising sea levels.
- **Transitional**: Risks and opportunities arising from the process of adjusting to a changing climate including the transition to a low carbon economy. Activities include policy, legal, technology, or market changes that may (or may not) occur in the processes of adjusting to a decarbonised economy. An example of a transitional risk is a carbon price, which therefore increases operating costs of an asset or lowers demand for high-carbon products, and therefore results in a situation where some assets are "stranded".

Both transition and physical risks will affect an organisation's ability to achieve its objectives.

According to Buloke's Council Plan (2017-2021), BSC's key objectives are:

- Deliver services in a financially sustainable way
- Build a healthy and active community
- Diversify and enhance the local economy
- Respond to and enhance built and natural environments
- Support Councillors, staff, volunteers and the community to make informed and transparent decisions

Discussions with the BSC project team in the climate risk workshop confirmed the physical risks identified in previous works and identified transitional risks and climate-related opportunities. All identified risks and opportunities have been summarised in Table 2 beginning overleaf. Due to the nature of climate-related risks, horizons for consideration will have to extend to 10, 20 and 30-year timeframes to fully capture the potential impacts. The current Climate Change Mitigation and Adaptation Strategy and Plan will apply to the next 10 years (to 2030). While the 2030 scenario may not be as extreme as longer timeframes, it is important to plan for the future. It is likely that the identified climate-related risks and opportunities will manifest to some extent over the next decade.

Each risk and opportunity has been given a rating (low, medium, high or extreme) based on its likelihood and consequence (see Figure 2). These ratings have been amalgamated from previous works and confirmed with BSC. Note, that in the case of climate-related opportunities, the consequence will be positive. The risk ratings will inform recommendations for, and prioritisation of, mitigation and adaptation actions.

	Consequences				
Likelihood	**Insignificant**	**Minor**	**Moderate**	**Major**	**Catastrophic**
Almost Certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Moderate	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	Medium
Rare	Low	Low	Low	Low	Medium

Figure 5: Likelihood vs consequence matrix adopted in AECOM (2014)

Table 5: Summary of climate-related risks and opportunities for Buloke Shire

Category	#	Risk/Opportunity	Risk Type	Rating
People	1	Health risks from increase in dust (respiratory illness) and extreme climate events (heatwaves, flooding - septic tanks in small towns, power outages)	Physical Risk	Extreme
	2	Job security & safety issues due to reduced agriculture and business productivity or physical stressors of extreme climatic events	Physical Risk	Medium
	3	Isolation risks from extreme climate events (heatwaves, flooding, power outages) - telecommunications, transport, health services, emergency services (incl evacuation)	Physical Risk	High
	4	Increased jobs for maintenance and capital works from built environment physical risks	Physical Opportunity	Medium
Built Environment	5	Damage to, or premature deterioration of, assets from increased temperatures and extreme climate events	Physical Risk	High
	6	Reduced soil moisture may impact stability of built assets	Physical Risk	Medium
	7	Extreme climate events cause disruptions to essential services (e.g., power blackouts, telecommunications	Physical Risk	Extreme
	8	Extreme climate events reduce accessibility to transport routes, hospitals, schools, etc	Physical Risk	High
	9	Increased market valuation through resilience planning	Transitional Opportunity	Medium
	10	Energy security through micro grids and renewable energy	Transitional Opportunity	Extreme
Natural Resources	11	Reduced soil health as a result of increased average temperatures, evaporation and reduced rainfall	Physical Risk	Medium
	12	Biodiversity losses (i.e., reduced vegetation growth, influx of pest flora/fauna, reduced access to water, reduced regeneration capacity)	Physical Risk	Medium

Category	#	Risk/Opportunity	Risk Type	Rating
	13	Reduced water supply and quality due to reduced rainfall and increased evaporation, and sediment run-off (quality)	Physical Risk	High
	14	Increased visitation for nature-based tourism	Transitional Opportunity	Medium
	15	Changes in climate resulting in agricultural production for some existing crop/production systems or through the introduction of new systems (e.g., tree plantation)	Transitional Opportunity	High
Council Operations	16	Increased liability of councils (and businesses) if decisions do not take account of widely accepted climate risk	Transitional Risk	Medium
	17	Planned fire burning (i.e., fire management regimes) may alter with increase in fires	Physical Risk	Medium
	18	Extreme events may divert staff to respond to emergency work causing a backlog of routine service delivery and productivity	Physical Risk	High
	19	Enhanced emissions reporting obligations	Transitional Risk	Medium
Economy	20	Increased maintenance ad capital costs of built assets	Physical Risk	High
	21	Increased operating costs for cooling due to increased temperatures and heat waves	Physical Risk	High
	22	Increased insurance costs or re-pricing of assets for flood prone areas	Transitional Risk	High
	23	Reduced productive value (particularly agriculture which is most susceptible to and greatly impacted by drought and flooding)	Physical Risk	High
	24	Work disruptions caused by extreme climate events	Physical Risk	High
	25	Increase in water treatment and extended irrigation periods	Physical Risk	High
	26	Limited access to State/Federal funding with increasing events	Physical Risk	High
	27	Reduced supply and distributive capacity for businesses in case of transport disruptions	Physical Risk	Medium
	28	Changing consumer preferences for low carbon products	Transitional Risk	Medium

Final

Category	#	Risk/Opportunity	Risk Type	Rating
	29	Mandates/regulations resulting in stranded assets	Transitional Risk	High
	30	Increased pricing of GHG emissions or costs to comply with relevant regulations	Transitional Risk	High
	31	Costs associated with transitioning to a low carbon economy (e.g., investment in new technology)	Transitional Risk	High
	32	Increase costs of energy, fuel and raw materials	Transitional Risk	High
	33	Circular economy – input cost savings, job creation	Transitional Opportunity	High
	34	Move to more efficient buildings or transport can reduce operating costs and reduce exposure to future fossil fuel price increases – Operational savings can be used for funding further improvement (i.e., revolving energy fund)	Transitional Opportunity	High
	35	Low carbon practices or products as a competitive advantage	Transitional Opportunity	Medium
	36	Carbon farming (sequestration) to generate carbon credit units	Transitional Opportunity	High
	37	Food security could result in increased demand for local produce	Transitional Opportunity	Medium
	38	Electric Vehicle Tourism	Transitional Opportunity	Medium
	39	Reduced exposure to emissions will reduce sensitivity to carbon pricing	Transitional Opportunity	High

Final

6 Consultation Findings

6.1 Community Survey

There were 46 responses, 6 were unusable (no responses to any questions) and an additional one was a duplicate. Hence, there were 39 responses in total. Of the 39 respondents, 82% reside within Buloke Shire and 85% work within the municipality. Reflecting the average age of the population, most respondents were over the age of 50. A breakdown of age and occupation is illustrated in the graphs below.

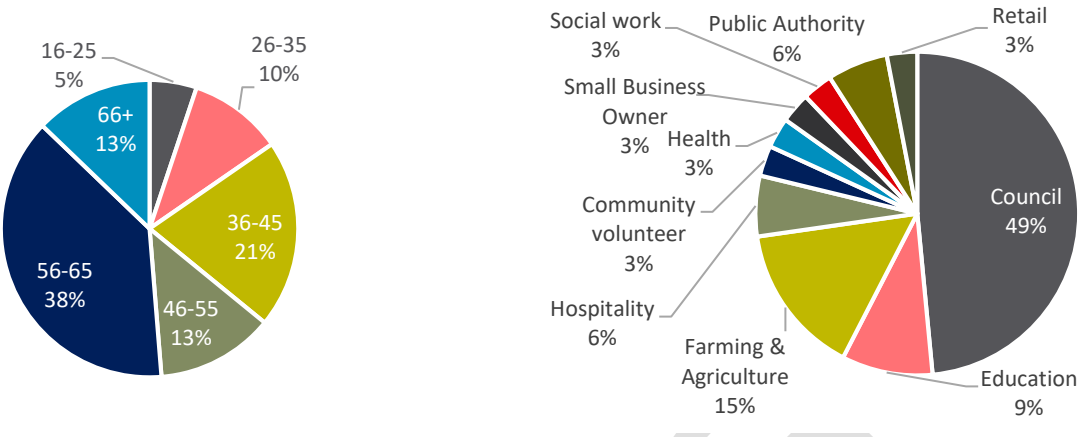


Figure 6: Breakdown of age (left) and sector of occupation (right)

The general knowledge of the causes and impacts of climate change appears to be well understood (see Figure 7), and climate change is perceived to be very important or important by 82% of respondents (see Figure 6).

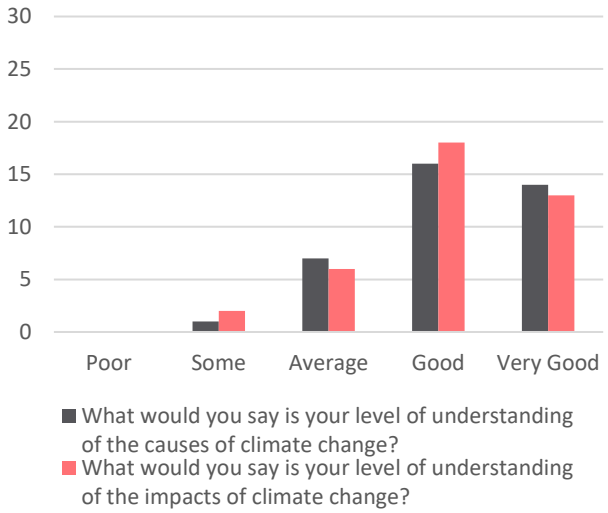


Figure 8: Respondents' understanding of climate change

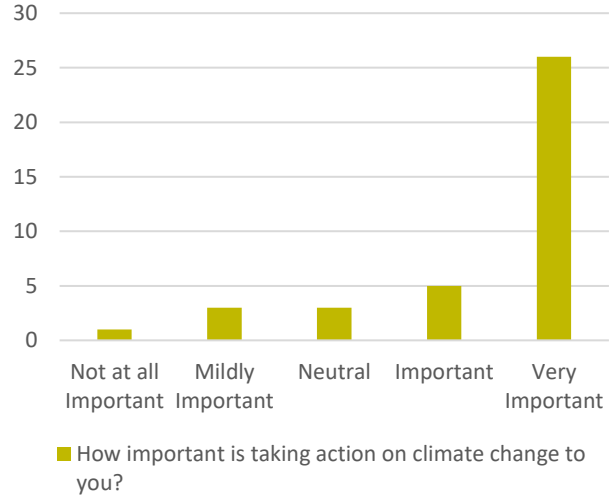


Figure 7: Respondents' perceived importance of climate change

Of the 2030 climate scenario predictions, respondents were most concerned about **increase in extreme temperature days and fire risk** and **reduced annual rainfall**. The top concerns about climate change impacts included: disruption to **essential services** (e.g., power blackouts, telecommunications); closely followed by loss of **native plants** and **animals**, and reduced **crop** yields or **livestock** health; followed by increase in **pests**, and **water** quality and security.

When asked about how they felt about how climate change may impact their lives, respondents were mostly concerned about the impact on their **quality of life** (e.g., health, freedom, access to resources, etc), **cost of living** and **economic viability of businesses** (particularly farming and family farms).

The above results can be used to help BSC frame messaging to the community on climate change.

The Buloke community is already making progress towards climate change mitigation and adaptation (Figure 8). To reduce their emissions, respondents have made efforts primarily towards waste reduction, improving energy efficiency, installing solar panels and making improvements to their property. To enhance their resilience to climate change, respondents have made efforts primarily towards installing rainwater tanks, planting vegetation on their property, making building improvements, and fire prevention and management actions.

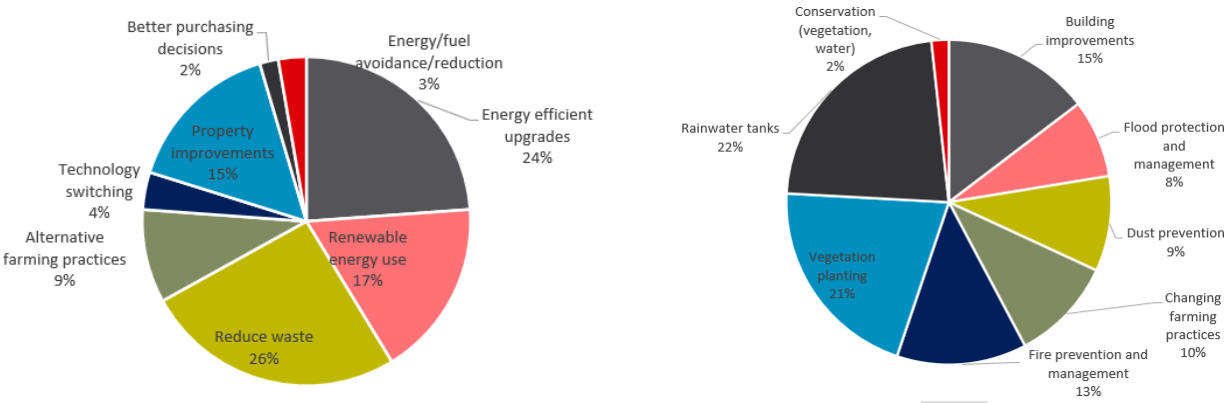


Figure 9: Current mitigation (left) and adaptation (right) actions implemented by the Buloke survey respondents

Despite efforts to reduce waste, use rainwater tanks, install solar, plant vegetation, and make improvements to their property, survey respondents still identified these as key areas they would like to receive more support in implementing (Figure 10). Improved systems for recycling and green waste were the most commonly requested actions for support, closely followed by renewable energy systems at the community level. This is evident when looking at what respondents identified as the largest barriers to mitigating and adapting to climate change: lack of systems and infrastructure (Figure 99). Funding was also identified as a key barrier.

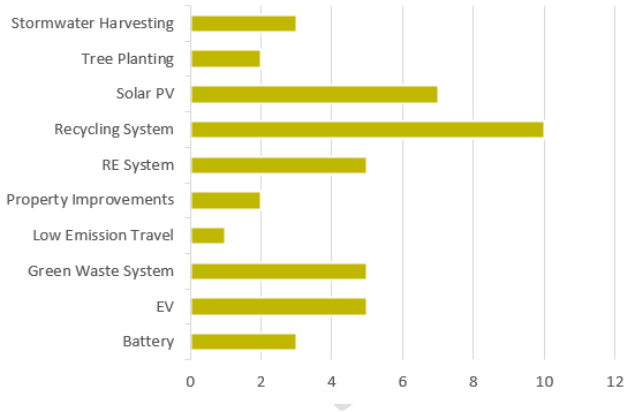


Figure 11: Actions respondents would like support in implementing

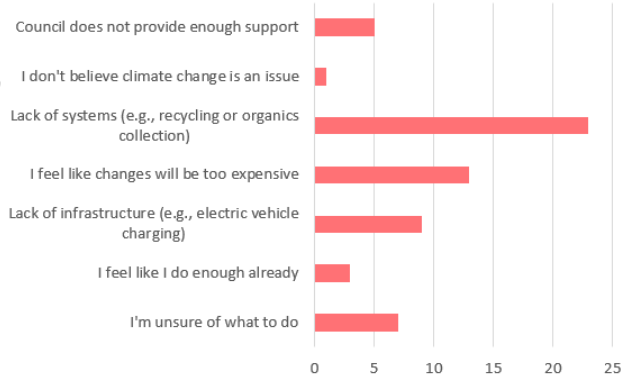


Figure 10: Barriers to implementing actions to mitigate and adapt to climate change

Ideas to improve existing systems and infrastructure included:

- **Recycling**. Soft plastic collection point. Glass collection point. Improve the transfer stations to allow the collection of more materials such as textiles, shoes, carpets etc., and have a partnership with the recyclers of such materials to collect and use them.
- **Green waste**. Turning green waste into compost and wood chips. Support use of green waste services (e.g., composting and worm farms). Composting scheme to educate and encourage composting at home.
- **Renewable energy**. Solar farms and wind turbines stations for each town, with power storage.

When asked about how BSC could best support the community to take climate action, Council leadership, promoting community collaboration and lobbying were agreed to being the most helpful (Figure 11). These are closely followed by information programs and funding schemes.

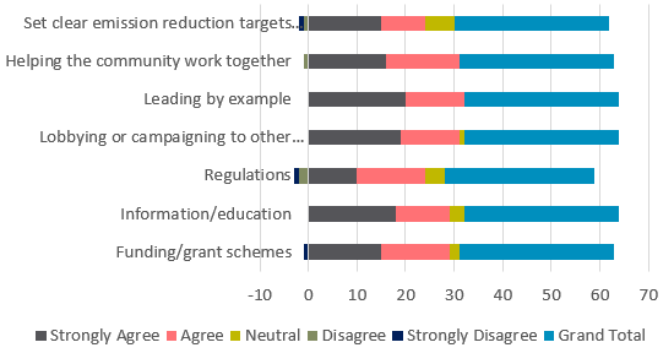


Figure 12: Desired support from Council.

Some specific supportive actions that survey respondents have suggested under the categories are as follows:

- **Lead by example**. Replace their vehicle fleets with electric or hybrid vehicles (cars, utes, machinery etc.). Council should be capturing all food waste from their offices and composting waste.
- **Information/education**. Provide environmentally friendly tips. Support the delivery of long-term behaviour change type programs in businesses and schools in the Shire (e.g., Resource Smart Schools). Information sessions and workshops at grassroots level.
- **Funding/grant schemes**. Rate reduction for carrying out climate change activities - whether that be household rates or farm rates.
- **Lobby**. Lobby for improved rail freight to reduce the number of trucks in the area and for the return of passenger rail.

The survey responses indicate that the majority of the Buloke community are aware of, and care about, climate change.

6.2 Key Partner Engagement

Organisations consulted include:

- Victorian Government Department of Environment, Land, Water and Planning (DELWP)
- Victorian Government Department of Jobs, Precincts and Regions (DJPR)
- The Central Victorian Greenhouse Alliance (CVGA)
- South-East Mallee Landcare
- Buloke and Northern Grampians Landcare
- Birchip Cropping Group
- North Central Catchment Management Authority

Other Victorian Government departments provided information through email correspondence.

Discussions included key climate-related concerns for the Buloke region which Council should focus on and existing or planned programs and opportunities for BSC to collaborate or support. These discussions identified key priorities and the role of BSC. All stakeholders expressed interest in collaborating with BSC; either through financial contributions, knowledge sharing, advertising (i.e., Council to encourage community and businesses to participate in partner programs or to forward on information), or planning (e.g., strategic planning for Council or for partner).

Final

Table 6: Key outcomes from consultations

Theme	Overview
Main concerns about climate change for the region	• Extreme heat days or heatwaves • Biosecurity • Drought and erosion • Water security • Seasonal changes in rainfall
Key priorities	• Regeneration of habitat and biodiversity • Ecotourism • Soil health • Integrated Water Management and alternative approaches • Community quality of life • Cost of living
Focus areas for BSC action	• Creating a shared vision in the community • Engage youth • Emergency management • Engage Traditional Custodians • Draw on expertise and resources of others • Encourage long-term scenario planning and participation in R&D • Ensuring climate is considered in all Council decision-making
BSC role	• Messaging – communicate and celebrate existing wins of Council, community groups and businesses • Education programs – support or facilitate the delivery of education programs or events • Gain access to Federal and State funding (e.g., whole or matched funding programs offered from State and Federal governments such as the SV energy efficiency and solar for community facilities) • Emergency management and planning. Where do people go in times of property damage? • Advocate to State and Federal governments, utility providers (e.g., transmission lines) • Partner – with regional cities (e.g., Mildura, Swan Hill, Bendigo), authorities (e.g., catchment management authorities) and local financial institutions (e.g., Bendigo Bank) • Regulations – using the planning scheme to encourage private participation (e.g., connectivity between remnant vegetation across properties) • Encourage participation in existing programs (e.g., DELWP, Landcare, etc.)

Final

7 Mitigation Options

7.1 General

7.1.1 Previous or Planned Actions

As discussed in section 4.2, BSC has measured its emissions profile and that of the community previously. BSC has also taken the Victorian Government's TAKE2 pledge.

7.1.2 External Influences

Victoria's *Climate Change Act 2017* has adopted a pledging model for whole-of-government, sectors and councils to coincide with the interim targets to ensure the whole of Victoria meets its 2050 target. As a platform for local governments and the Victorian Government to work together towards a net-zero future, councils can submit voluntary pledges under the Act. This may become a requirement in the future for funding eligibility.

7.1.3 Actions for Consideration

Climate Emergency. Given that Buloke is already experiencing the effects of climate change and the vulnerability of its population and economy to climate, declaring a climate emergency may provide a good framework for Council to incorporate climate in its decision-making and processes.

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. 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 emergency. To date, 100 local governments in Australia have made the declaration with Victorian councils representing 33 of those.

Note that a key part of a climate emergency response is to embed climate in all strategies, plans and policies. This will greatly assist in emissions reduction and resilience efforts. For example, 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 socially sustainable. In addition, the CVGA aims to facilitate knowledge sharing among its members to incorporate climate in all decision-making and council documentation (e.g., Council Plans).

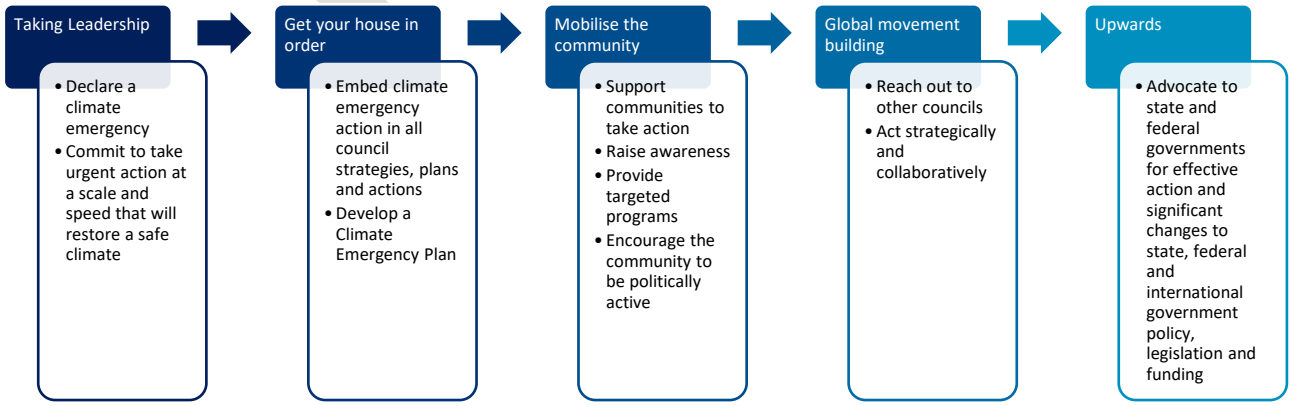


Figure 13: Climate emergency process

Final

Emissions Reduction Targets. Part of the climate emergency response includes a rapid transition to zero emissions across all sectors, as well as the drawdown of all the excess greenhouse gases in the air. Also, Victoria has a legislated target of net zero emissions by 2050. Under the *Climate Change Act 2017 (Vic)*, local governments can voluntarily pledge emissions reductions targets. BSC has previously taken the TAKE2 pledge, so setting an emissions reduction target will be a good next step and help to drive ambition. Setting emissions reduction targets will likely aid in Council's mitigation efforts and will align with State and peer targets.

Achieving net zero emissions follows the process illustrated in Figure 14. Net zero emissions is achieved through balancing a measured amount of carbon emissions released, with an equivalent amount sequestered or offset, or purchasing carbon credits to make up the difference. International and national carbon credits are expected to increase in price in future years (estimated at $20 and $35, respectively), presenting a financial risk to Council in the achievement of a net zero target without a strong focus on emissions reduction. Implementing emissions reduction opportunities will reduce BSC's emissions profile, reduce the cost of offsetting and will most likely result in operational cost savings after the payback period.

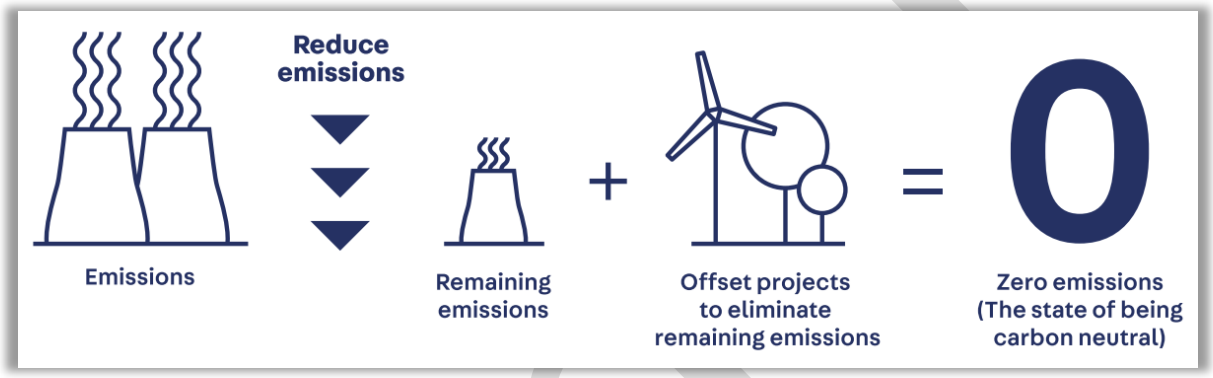


Figure 14: Process to achieving zero emissions (source: Climate Active Guide).

Emissions Evaluation and Monitoring. Ndevr Environmental has identified an opportunity for BSC to align its emissions profile and that of the community with the Australian Climate Active and GHG Protocol standards. Alignment with such standards ensures all relevant emissions sources within Council's operational control are considered and robust methods for estimating emissions are used. In addition, BSC can monitor and report on its corporate and community emissions annually in line with reputable standards which will mitigate transitional risks associated with increased reporting obligations, as well as enable Council to track progress towards its emissions reduction targets and action, and to withstand future public scrutiny.

Emissions Reduction Measures. It is good practice to first investigate the 'what' and 'how' of emission sources on site to identify suitable measures for reduction. According to the FY17 emissions assessment, BSC's largest emission source was its landfills, followed by stationary fuel (e.g., generators), then energy consumed by buildings, then its fleet. Reduction measures should focus on the emission sources that will have the biggest impact, that BSC is able to influence, that have the lower cost of abatement (considering whole of life costs) and align strategically with Council's other objectives. More detailed assessments will be able to assist with prioritisation. For example, BSC could conduct an energy audit program to systematically assess its buildings to identify feasible measures to optimise energy or upgrade equipment. Similarly, BSC could conduct fleet assessments and waste audits. The assessments will help to identify actions to avoid or reduce emissions, which is the most cost-effective way to reduce emissions. These cost savings can be used to finance other actions. Some opportunities regarding key emission sources are provided in in the following sections.

7.2 Energy

7.2.1 Previous or Planned Actions

For its own emissions, BSC has:

- Completed energy & water audits on community sporting complexes (Sea Lake, Birchip, Nullawil)
- Completed energy efficiency improvements such as heating/cooling, thermal and lighting upgrades
- Installed solar PV at 12 facilities and a total of 134 kW, including:
    - Recreational Reserve Community Pavilions – Wycheproof, Birchip, Nullawil, Sea Lake
    - Council offices – Wycheproof, Sea Lake, Charlton
    - Charlton Per-School and Kindergarten
    - Tip – Donald, Sea Lake, Charlton, Wycheproof
- Upgraded streetlights – 650 lights upgraded to LED 2013-2016 and 240 lights upgraded to LED FY21
- Became a signatory of the Victorian Energy Collaboration (VECO), committing 100% of its electricity (including streetlighting and building assets) to be renewably sourced through the PPA beginning FY22.

For the community, BSC:

- Participated in the **Loddon Mallee Renewable Energy Roadmap** project which found that Buloke Shire has good potential for renewable energy (e.g., wind farms), but a key challenge is the distance to suitable transmission and distribution infrastructure. More investment in the network would be necessary to enable investment in generation in these areas. BSC could advocate for necessary upgrades to the infrastructure.
- Is currently participating in a **Microgrid Feasibility Study** through the CVGA. Microgrids are 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 or stationary fuel. The project is funded by a $1.4 million Federal Government grant to determine feasibility of microgrids and if they could run off local renewable energy. CVGA will be organising bulk buying opportunities for solar and battery storage for community members if feasible. Not only could microgrids eliminate LPG and stationary fuel emissions, but they could also provide energy security.
- Led a **Solar Savers** program whereby three houses took up a loan from BSC to install solar panels.

7.2.2 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:

- Developing a Gas Substitution Roadmap in consultation with stakeholders including unions, businesses and the community over the course of 2021, which will detail the transition pathways to achieve net-zero emissions and will identify opportunities for households and businesses that use natural gas to become more energy efficient and to switch to lower-emissions energy sources.
- $335 million to replace old wood, electric or gas-fired heaters with new energy-efficient systems that are safer and cheaper to run.
- $112 million towards sealing windows and doors and upgrading heating and hot water in 35,000 social housing properties.
- $128 million for one-off $250 Power Saving Bonus payments to help eligible concession card holders to pay their energy bills.
- $14 million to expand the Victorian Energy Upgrades program ensuring more Victorian households access discounted energy efficient products and services.
- $5.9 million to establish a new 7-star energy efficiency standard for new homes to improve energy

Final

performance and reduce running costs.

- $3.6 million to develop minimum energy efficiency standards for rented homes that reduce energy costs and improve comfort.
- $22.6 million to maintain a safe, secure, reliable and affordable energy system, protect consumers under the existing Energy Fairness Plan and deliver programs that lower energy bills, including the Victorian Energy Compare website.
- Investing $26.7 million in funding to support microgrids, neighbourhood batteries and community-owned renewable energy projects.

7.2.3 Actions for Consideration

Reducing emissions from BSC's energy use from its buildings and community facilities should follow the hierarchy depicted in Figure 13. 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. The VECO will reduce Council's electricity emissions to zero. However, emissions will still be generated through the use of gas and fuel (e.g., generators, plant). Further, actions to avoid or reduce electricity use (and other energy use) will result in cost savings.

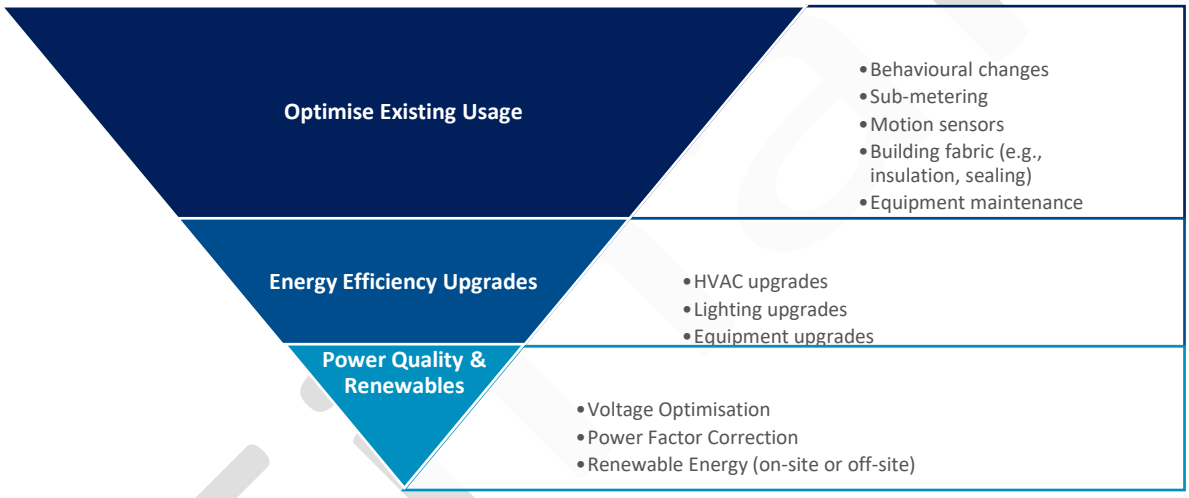


Figure 15: Energy Efficiency Hierarchy

Energy efficiency and optimisation. BSC should 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).

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 BSC's PPA, while hydrogen energy will produce low to no emissions. At the time of this report, the CVGA is developing its new strategy with focus areas including getting communities off gas. The case study below illustrates how entire facilities can be converted from natural gas to electric. Additionally, plant equipment using stationary fuels can be converted to lower emission alternatives. Council should consider transitioning its entire light and heavy vehicle fleet to low emission alternatives. The hydrogen hub in Mildura may also assist with the transition (see section 7.4).

BSC can encourage and **support the community to participate in schemes and programs** that help them to understand their energy bills and seek advice/funding on how to reduce energy consumption. Such programs include:

- The Victorian Energy Upgrades program. Encourage participation by promoting the significant discounts or rebates they can access on upgrade opportunities such as LED lighting, solar hot water systems and reverse cycle air-conditioners. Other programs are likely to be announced in line with the budget commitments.
- Sustainability Victoria offer ResourceSmart Schools as a free program that supports Victorian schools to embed sustainability across the school facilities, community and curriculum, while saving resources and money for the school. Schools join the program, then have access to an online portal, where they learn and practice ways to integrate sustainability.
- The Federal Government provides the Business Energy Advice Program. The $11.7 million program delivers trusted advice to help small businesses and their representatives get better energy deals and increase their energy efficiency.

Sustainable Building Policy. BSC can incorporate environmentally sustainable design (ESD) standards in statutory planning and internal guidelines for new builds and refurbishments. The Council Alliance for a Sustainable Built Environment (CASBE) has developed guidelines for the planning scheme which many Victorian councils have adopted. This will ensure new private developments are designed to support low carbon living. Many councils (e.g., Darebin City Council) have developed internal sustainable building policies for their own buildings. BSC can draw upon these policies developed in other councils.

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**.

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.

Final

7.3 Waste

7.3.1 Previous or Planned Actions

BSC has already begun to divert waste from landfill. Buloke's Waste and Resource Recovery Strategy 2020-25 highlights that the Donald landfill is expected to reach capacity by 2031 and the Birchip landfill has a remaining life of 25 years. This can be prolonged through landfill diversion efforts. The Strategy has already identified communication and education programs, home composting, and recycling initiatives. Existing initiatives include:

- Green waste drop-off at transfer stations
- High construction and demolition waste fees
- Recycling C&D waste
- Loddon Mallee Waste App
- Participating in Loddon Mallee Resource Recovery group
- Education programs
- "Glass Out" scheme

7.3.2 External Influences

Waste emissions and reduction efforts are affected by federal legislation 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.

The waste sector pledge released in the Victorian Climate Change Strategy is for a 50% reduction in organic waste going to landfill, and a commitment to support emerging waste and recycling industries and economic opportunities. The Government is investing $515 million to deliver this pledge.

The Victorian Government's Recycling Victoria Policy places mandatory waste and recycling requirements on all councils in Victoria. This 10-year policy aims to reduce waste and to transform the recycling sector toward a circular economy by 2030. Relevant targets imposed on councils, and actions expected to be taken are listed in Table 66. In addition, all households will have access to services for glass recycling by 2027 and to food organics and garden organics by 2030.

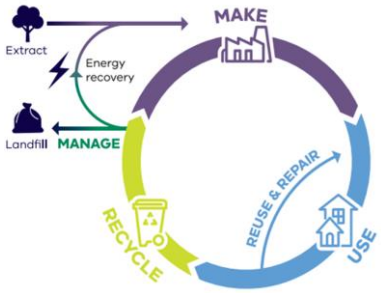


Figure 16: Circular Economy Graph taken from the Recycling Victoria Council.

Table 7: 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 %	• 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	

Final

7.3.3 Actions for Consideration

In addition to existing programs, BSC can consider the following to further reduce emissions from Council and community waste:

- **Compost program**. Efforts to encourage composting can be taken from the 'Compost Revolution' program. The program has been utilised by a number of councils to date 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.
- **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. Council can choose between curbside collection or drop-off points. Based on Buloke's current system, a transfer station could be made as the drop-off point.

Figure 17: Container Deposit Scheme

- **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. BSC can work with RED Cycle to create drop-off points.
- **Creating a market for recycled/re-used waste**. BSC should explore the opportunity to encourage industry to set up a recycling facility in the region and benefit from the existing transfer stations. This will mean that recycled materials are being produced and supplied within the region. One of the biggest challenges facing the success of the recycling market is ensuring the demand for the end product. Council is in a position to create demand and stimulate market development through its procurement policies. This may help to diversify the economy in the region.
- **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. BSC could conduct a feasibility study and business case on the development of a landfill gas capture project under the ERF.
- **Behaviour change programs**. Sustainability Victoria has a Recycling Victoria Household Education and Behaviour Change Fund where councils can be awarded up to $30,000 to deliver campaigns when introducing new recycling services. Applications close June 18, 2021. Stay tuned for additional rounds.

Final

7.4 Transport

7.4.1 Previous or Planned Actions

BSC has begun installing 2x 50kW DC chargers at Council offices and will be procuring hybrid vehicles. In addition, the Council Plan identified advocating for accessible public and community transportation for Buloke residents as a key action.

7.4.2 External Influences

The transport sector pledge released in the Victorian Climate Change Strategy is for zero emission vehicles to represent 50% of new car sales by 2030, with $100 million pledged to achieving this target through policies and programs. Some of these programs include a $46 million package for a subsidy program to help Victorians buy ZEVs and a $19 million package to establish a coordinated fast-charging network.

7.4.3 Actions for Consideration

At the time of this report, the CVGA is developing its new strategy with focus areas including a 2030 target for light and heavy vehicles to be electric. The CVGA intends to assist member councils to develop supportive policies. Participating in this project may assist BSC in achieving the below efforts to reduce transport emissions from its own fleet:

- Conduct a **fleet assessment** and review of policies and procedures. This will help to identify specific details regarding the below actions.
- **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.
- **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.
- **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 electric vehicle alternatives are now available on the market with long ranges, cargo and towing capacity, and payloads rivalling those of conventional vehicles. BSC has already begun to transition some fleet vehicles to electric and install chargers. BSC can also consider transitioning heavy vehicles (e.g., Greater Shepparton City Council is trialling an electric truck). For more information and guidance, see the Electric Vehicle Council's Local Government Resource Pack. In addition, BSC can consider hydrogen fuel. The National Energy Resources Australia (NERA) announced funding to develop an Australian network of hydrogen clusters. Among those announced to lead a cluster was the Mallee Regional Innovation Centre. The Mallee Hydrogen Technology Cluster will cover the North-West of Victoria, across the Mildura Rural City Council, Swan Hill Rural City Council, Buloke Shire Council and Gannawarra Shire Council areas. The aim is to produce green hydrogen which can be used to fulfil the Mallee's demand for transport, electrical and gas, assisting the

Final

positive transition to a decarbonised economy. There may be potential for BSC to trial hydrogen as an alternative fuel source for its fleet (particularly heavy vehicles) as well as a stationary energy source in the future.

7.5 Land Use & Agriculture

7.5.1 Previous or Planned Actions

Consultations with key partners and survey results revealed that farmers are already taking action to reduce their emissions and sequester carbon. For example, the Birchip Cropping Group reported that its network uses GPS and variable weight technology to reduce fuel loads, and is collaborating with Dja Dja Wurrung on a carbon sequestration project using kangaroo grass.

7.5.2 External Influences

The Federal Department of Agriculture, Water and the Environment has a trial program, Carbon + Biodiversity Pilot, under the Agriculture Stewardship Package. The Carbon + Biodiversity Pilot is trialing arrangements to reward farmers for improving on-farm biodiversity together with carbon projects under the Emissions Reduction Fund (ERF). The Carbon + Biodiversity Pilot is part of the wider $34 million commitment of the Australian Government to biodiversity stewardship on farms. The 2021–22 Budget delivers $32.1 million over four years in additional funding. The Carbon + Biodiversity Pilot is being developed with the Australian National University (ANU). The Carbon + Biodiversity Pilot will be run in six Natural Resource Management regions, with North Central Victoria identified as one of the regions. Farmers only require 5ha to participate. While applications close on 11 June 2021, the program may be successful and added to the ERF scheme which farmers could benefit from in the future.

The Victorian Climate Change Strategy has a pledge for both land use and agriculture. The land use pledge is to cease native timber harvesting in state forests from 2030 and plant up to 30 million trees. An investment package of $15.4 million has been dedicated to provide information, tools and services to support emissions reduction, adaptation and climate risk management across the Victorian agriculture sector. The Victorian Government is also investing $77 million over 16 years to help land managers restore and protect natural landscapes and vegetation through the Nature Restoration for Carbon Storage – BushBank program.

The agriculture pledge includes an investment package of almost $20 million in emissions reduction activities. This investment will deliver flagship trials of leading research and technological innovations that help farmers to reduce emissions while maintaining productivity and profitability. There is also an objective to collaborate on a national scale to enhance research and innovation, improve greenhouse gas reporting, and improve access to financial support for climate action for Victorian farmers. Further, the Victorian Government has expanded the Agriculture Energy Investment Plan, providing an additional $30 million to continue supporting farmers to improve on-farm energy generation and efficiency.

In addition, the $15.3 million Victorian Carbon Farming Program provides another avenue for private landholders to reduce emissions and build resilience to a changing climate. This Program will support private landholders to:

- Plant agroforestry and shelterbelt trees
- Access existing carbon markets, and
- Realise on-farm benefits and new income streams.

7.5.3 Actions for Consideration

As highlighted in section 4.2, BSC's previous community emissions assessment excluded emissions associated with land use and agriculture. When measuring and monitoring the community emissions profile, BSC should

Final

include land use and agriculture. This can be further facilitated if farmers are encouraged to measure and monitor their emissions.

Consultations with key partners revealed a need for a consistent and robust standard for measuring agricultural and farming emissions. BSC can collaborate with agriculture and farming organisations to advocate for such a standard, and then market its use to the broader agricultural community. The GHG Protocol has produced an Agricultural Guidance document for carbon accounting in the sector. It identifies the environmental and business benefits and trade-offs for various farming practices (Figure 16). In addition, Agriculture Victoria has links to current tools for on-farm carbon accounting.

There are many programs already underway or in the pipeline. BSC can showcase existing wins and encourage participation in programs using messaging regarding the benefits to farmers which will likely increase uptake.

Practice	Potential GHG benefits	Potential environmental co-benefits	Potential agronomic / business benefits	Potential trade-offs or problems
Cover crops Non-commodity crops planted in between rows of commodity crops or during fallow periods	• Increased soil C sequestration • Reduced *indirect N_2O emissions from soils* due to a reduction in N leaching • Reduced scope 3 emissions from fertilizer manufacture	• Improved soil nutrient content • Reduced wind and water erosion • Reduced nutrient and sediment run off and leaching	• Reduced fertilizer needs • Reduced weed growth • Reduced irrigation needs • Supplemental livestock feed (extends grazing season, cattle weight gain) • Increased profit	• Requires extra time and knowledge to manage, and some new techniques for growing commodity crops • Requires more fuel use for crop planting
Conservation tillage A range of cultivation techniques (including minimum till, strip till, no-till) designed to minimize soil disturbance for seed placement, by allowing crop residue to remain on soil after planting	• Increased soil C sequestration • Reduced indirect N_2O emissions from reduction in run-off • Reduced scope 3 emissions from fertilizer manufacture	• Improved soil water retention and drainage • Reduced water and wind erosion • Reduced nutrient and sediment runoff	• Reduced fertilizer needs • Reduced fuel and labor costs from fewer field passes • Improved yields • Retains top soil	• Potential increase in herbicide use • Increased pest threats in repetitive single commodity production
Rotational or mob livestock grazing on pasture Grazing practices that maximize plant health and diversity, while increasing the animal carrying capacity of the land	• Increased soil C sequestration • Reduced CH_4 emissions from enteric fermentation (due to improved feed)	• Increased plant cover and productivity • Improved soil water retention and drainage • Reduced water and wind erosion • Reduced nutrient and sediment runoff	• Increased herd size • Can increase length of grazing season • Reduced need for purchases of feed • Pastures more able to exclude weeds / exotic species • Potentially reduced herbicide costs • Helps avoid burning	• Requires careful management in some areas with sensitive species • Labor intensive
Anaerobic digester Enclosed system in which organic material such as manure is broken down by microorganisms under anaerobic conditions	• Reduced N_2O and CH_4 emissions from manure management • Reduced scope 3 emissions from fertilizer manufacture	• Reduced risk of accidental toxic leakages (pathogens killed) • Reduced ammonia and VOC emissions	• Processed solids can be used as bedding • Reduced need for fertilizers (as nutrient availability in the digestate is increased) • Electricity / heat generation	• Digester technologies can be expensive
Windbreaks Plantations usually made up of one or more rows of trees or shrubs	• Increased C sequestration in biomass and soils	• Reduced soil erosion	• Greater animal survival and health in livestock systems	• May take some land out of production

Figure 18: Some agricultural practices that can reduce GHG emissions and improve farm performance (GHG Protocol Agricultural Guidance)

8 Climate Change Adaptation

8.1 Council Operations

8.1.1 Previous or Planned Actions

BSC has developed, and continues to maintain, a comprehensive Municipal Emergency Management Plan (MEMP). The MEMP identifies tasks such as emergency shelter and accommodation for displaced households, essential supplies, and medical and mental health support and assigns responsibility to various agencies. The MEMP also incorporates working with other councils (e.g., resource sharing) as governed by the MAV Mutual Aide Agreement.

Figure 19: BSC staff flood levee training

Temporary flood levies are part of BSC's response to flooding events. Staff participated in a flood levee training exercise in 2020 (Figure 17).

8.1.2 External Influences

The Victoria Planning Provisions, a subordinate instrument of the *Planning and Environment Act 1987 (Vic)*, incorporates various state-wide planning policies on climate change and its impacts, which planners must take into account and give effect to through their decisions. Some examples of clauses specifically referencing climate change adaptation include:

- Clause 13.01 Climate change impacts – includes policy on natural hazards, coastal inundation and erosion considerations (see extract).
- Clause 11.03 Planning for places – requires greenfield planning to respond to climate change.
- Clause 14.01 Agriculture – seeks to support agricultural adaptation to climate change.
- Clause 15.02 Energy and resource efficiency – supports a cooler environment and minimisation of greenhouse gas emissions.
- Clause 19.03 Integrated water management (see further information listing relevant clauses in the VPP).

8.1.3 Actions for Consideration

BSC's response to climate change (mitigation and adaptation) requires a holistic approach and participation from all departments. Climate change impacts many facets of business activities and services. As such, climate mitigation and adaptation need to be driven internally and embedded within Council systems, processes and staff thinking. This can be done by:

- Incorporating BSC's climate scenario and risk profile in **Councillor briefing packs and staff induction.**
- Ensure **climate mitigation and adaptation is represented** in all relevant documents (e.g., Council and Community Plans), policies (e.g., procurement policy) and procedures (i.e., decision-making).
- **Planning Scheme.** Incorporate climate mitigation and adaptation in the planning scheme (use existing resources such as those from CASBE). Any updates and how they might impact development processes/outcomes should be communicated to the community. Engagement should help to minimise conflict.
- **Tools**. The Western Alliance for Greenhouse Action (WAGA) developed How Well Are We Adapting, a web-based climate change adaptation monitoring, evaluation and reporting tool for Victorian local governments. Through an internal reporting section, the tool allows local governments to track climate change impacts on council services and assets and evaluate responses over the long term. Monitoring impacts and learning about council's responses over time, develops knowledge and skills for implementing adaptation actions. The use of this tool enables participating councils to raise institutional

Final

awareness and capacity around the issue of climate change adaptation, identify where services might be impacted in the future and ensure residents most at risk to the impacts will be protected.

- **Resourcing**. Continue to collaborate with neighbouring councils for shared resources for emergency management as well as other initiatives (e.g., through the CVGA). Consider if there is a need for seeking additional resources in times of peak HACC demand. In addition, BSC relies heavily on volunteers. With an ageing population (and volunteers) and large distances between townships, BSC may want to support volunteer uptake with recruitment drives.

8.2 Community

This category includes people and businesses.

8.2.1 Previous or Planned Actions

Through its membership with the CVGA, Buloke has participated in, and benefited from, several projects which address community health and liveability related to the climate (as well as other co-benefits). These include:

- **Resilient Community Assets**. This project involved street tree planting, heatwave plan template and online training for councils, as well as 'HEAT Help' packs for HACC and aged care clients.
- **Cool It.** This project consists of two phases, where the first developed heat vulnerability mapping and a tool for councils to use and the second phase involved tree planting based on findings from phase 1 and a climate resilient tree asset planting list. BSC planted over 80 trees in Sea Lake, Donald, Charlton and Wycheproof. Tree planting also has benefits for natural resources and carbon sequestration.

BSC also maintains a:

- Buloke Health and Wellbeing Plan
- Vulnerable Person Register

8.2.2 External Influences

The Victorian Government will generate an Adaptation Plan for the Health and Human Services system that will finalised by 31 October 2021 into effect in 2022. The pilot plan for 2019-21 can be found here. In addition, the regional adaptation plan, ADAPT Loddon Mallee Climate Ready Plan is currently in draft and will be released later in the year. Both will identify key priorities and actions for the Buloke community and should be considered in the development of BSC's Strategy and Plan.

The Victorian Public Health and Wellbeing Plan 2019-23 includes climate change as a focus area. Guidelines for local government for addressing climate change in municipal health plans was developed by the Department of Health in 2020.

8.2.3 Actions for Consideration

BSC has existing resources which address climate risks to people within the Buloke community. Some areas for improvement are outlined below:

- The Heat Health Plan currently focuses on air-conditioner use which can exacerbate the risk of power outages, raise energy bills, and increase emissions. BSC can update the plan and drive awareness on the importance of other thermal control measures as first steps before the use of air-conditioning.
- Include respiratory health in the Buloke Health and Wellbeing Plan. Work with agribusinesses to set up monitoring and alerts for increases in air pollution.

Final

- **Building upgrades.** BSC could advocate and/or partner a co-funding arrangement to upgrade homes and businesses to make them more resilient (and thermally efficient). BSC may be able to utilise the Victorian Energy Upgrades program for this. Another opportunity for partnership may be through local finance institutions (e.g., Bendigo Bank). BSC can also ensure it takes measures to upgrade its own buildings and community facilities, or new builds consider climate risks in the design.

> **Case Study – Queensland Government**
>
> The Queensland Government (with a contribution from the Australian Government) has a developed a Household Resilience Program which provides funding to help eligible homeowners in coastal parts of Queensland improve the resilience of their homes against cyclones. Owner-occupiers who live in a house built before 1984, located within 50km of the coastline from Bundaberg to the Queensland/Northern Territory border, can apply to receive a Queensland Government grant of 75% of the cost of improvements (up to a maximum of grant value of $11,250 including GST).

- **Cool community zones**. Include heatwaves in the MEMP and/or ensure identified refuge centres can be made available to the community as cool spaces during heatwaves. Encourage residents to seek refuge in these shared cool zones particularly if they are unable to keep cool in their own home or if they are at risk of isolation.
- **Continuity planning**. Encourage community groups and businesses to develop plans that ensure continuity of their operations.
- **Encourage networking**. Encourage the community and businesses to network and share learnings. For example, DELWP has established networks for the community and businesses in the Loddon Mallee through its Regional Climate Leadership program. DELWP has also established the Youth Climate Network for the region. With an ageing population, Buloke's resilience will rely on encouraging youth to stay in the region and participate. Mount Alexander Shire Council supports young people to develop and implement climate change projects and recognise young sustainability leaders through the Mount Alexander Youth Awards.
- **Grassroots educational campaigns**. Climate change should be openly communicated in a positive context and not through a 'scare' context. The community should be given hope and the information and tools to succeed. Messaging can be tailored based on the concerns identified in section 6.1 and following the guidance developed by Monash University on behalf of DELWP for communicating climate change.

8.3 Natural Resources

This category includes flora, fauna, soil and water.

8.3.1 Previous and Planned Actions

There are many existing and planned agricultural adaptation initiatives occurring in the Buloke region led by BSC and external parties. The Cool It and ResourceSmart Schools programs have been previously identified. Other existing and planned initiatives include:

- Weed mapping and pest management
- Wimmera Mallee water pipeline
- School chats and programs such as those run by conservation management networks (e.g., Kar Kara CMN)
- The NCCMA Regional Floodplain Strategy (2018-2028) was developed in conjunction with local governments. NCCMA do modelling which can be shared with BSC for its emergency management planning, strategic and statutory planning. It can also be distributed to Council's rate base.
- Landcare works on biodiversity surveys, revegetation and biodiversity corridors

Final

8.3.2 External Influences

The Victorian Government will generate Adaptation Plans for the water and natural environment systems later in 2021. A Pilot Water Sector Adaptation Action Plan was developed for water in 2018.

The Victorian Government announced $523.2 million to protecting vulnerable wilderness and improving visitor facilities so more people can get out and enjoy Victoria's natural wonders.

8.3.3 Actions for Consideration

There are a few opportunities which BSC can lead or partner in:

- **Biodiversity and conservation management**. Improve ecological mapping through collaborations with catchment management authorities, Landcare and Traditional Custodians to share information, resources, tasks (e.g., biodiversity surveys), and to assist with prioritisation of items of environmental and cultural significance. Develop or support initiatives which preserve and promote biodiversity (e.g., Landcare's biodiversity corridors).
- **Integrated Water Management.** A collaborative approach to planning that brings together organisations that influence all elements of the water cycle (e.g., water corporations, local governments and catchment management authorities), including waterways and bays, wastewater management, alternative and potable water supply, stormwater management and water treatment. It considers environment, social and economic benefits. Following the DELWP's Integrated Water Management Framework for Victoria, BSC can work with relevant organisations to improve water security, water health and stormwater drainage.

  DELWP Integrated Water Management Framework for Victoria – Benefits of Stormwater Harvesting

  - reduce reliance on the potable water supply network, helping avoid or defer infrastructure upgrades, and provide resilience for local governments wanting to keep sports grounds, parks and trees watered during droughts and prolonged dry periods
  - provide urban cooling through greening, canopy cover increases and increased soil moisture, leading to preventative health benefits
  - reduce flooding, helping to maintain amenity, defer upgrades in the drainage network and reduce insurance liabilities
  - deliver waterway health benefits from an ecology, channel morphology and water-quality perspective
  - improve community education and water literacy
- **Planning**. BSC can include water management in strategic planning and incorporate relevant requirements into the planning scheme at a high level in an ESD policy and in zoning plans and 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.

Final

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.

8.4 Agriculture

This category includes all farming and agricultural businesses.

8.4.1 Previous or Planned Actions

There are many existing and planned agricultural adaptation initiatives occurring in the Buloke region led by external parties. Identifying these will assist BSC in identifying gaps or areas in which it may provide support. Existing and planned initiatives include:

- **Regenerative Agriculture.** Regenerative agriculture assists with soil carbon sequestration which helps with mitigation. The Regenerative Agriculture Group has quickly gained traction with many broadacre landholders becoming members. The group focuses on holistic grazing practices, avoiding pesticide use and use of cover crops. The Birchip Cropping Group expressed a concern that regenerative agriculture could reduce yield. BSC could play a role in showcasing successful case studies and provide details on the success factors.
- **Adaptive Agriculture.** The Birchip Cropping Group has many initiatives underway including process changes such as sewing times, genetic variation for new and emerging crop types, managing nutrient strategies, tools for managing pest and disease.
- **Drought Tolerance.** The Federal Government, through the Future Drought Fund has provided funding to eight drought resilience hubs across Australia including $8 million to the Victoria Drought Resilience Adoption and Innovation Hub. The Victorian Hub will be led by the University of Melbourne in partnership with five farming groups – Birchip Cropping Group, Food & Fibre Gippsland, Southern Farming Systems, Riverine Plains and the Mallee Regional Innovation Centre – together with Deakin University, Federation University, La Trobe University and Agriculture Victoria. The aim of the Hub will be to help farmers, agricultural businesses and communities become more resilient to the impacts of future droughts.
- **Mapping.** Approximately half of Birchip Cropping Group's members have weather stations and soil probes, creating a network of resource sharing. The agriculture sector is well adept at using climate information for seasonal outlooks for short-term planning.
- **Soil Health.** Potential collaboration between Birchip Cropping Group and Sustainability Victoria for use of FOGO waste on crops to improve soil health.
- **Collaboration.** NCCMA engages with agribusinesses already for planning, natural resource management project delivery.

Landcare advised that the majority of farmers it works with are proactive about climate change. This is evidenced by the above initiatives.

Final

8.4.2 External Influences

Victoria's Climate Change Strategy has pledged that farmers will have on-farm climate action plans by 2030 and committed almost $20 million to support the agriculture sector response to a changing climate. In addition, the Victorian Government will also support the agriculture and other primary production systems to adapt to the impacts of climate change through the Primary Production Adaptation Plan that will be finalised later in the year and come into effect in 2022.

Agriculture Victoria has an investment of $15.4 million to provide information, tools and services to support emissions reduction, adaptation and climate risk management across the Victorian agriculture sector. This includes building tools needed to support climate resilient decision making and provide foundational data and information to support up to date and localised decisions. Further, the Victorian Land Use Information System will also be upgraded with an investment of $4 million. Data from the system will inform a new Agriculture Climate Spatial Tool that supports farmers to adapt their businesses based on future climate scenarios, and thus support long-term planning.

8.4.3 Actions for Consideration

A key role BSC can play is to support existing programs and generate messaging to help normalise innovative practices such as regenerative agriculture. This could be done through:

- **Promoting**. Liaise with farmers and agricultural organisations to generate case studies and promote through various mediums (e.g., online and social media marketing, community forums, etc.). In addition to promoting innovative solutions, BSC can also acknowledge and promote existing strengths of the industry (i.e., seasonal modelling for short-term planning).
- **Coordinating/supporting events**. Partner with groups such as Landcare for events (e.g., community movie night of Kiss the Ground).

Other actions include:

- Consultation with DJPR identified that **long-term planning** is an emerging focus for the agriculture sector. BSC can work with DJPR and Agriculture Victoria to encourage agribusinesses to consider long-term climate impacts to make informed decisions and plan for transitions to their business.

Case Study – Southern Grampians Shire Council

The Agribusiness Land Capability Mapping project was funded by the Victorian Government under the Victorian Adaptation and Sustainability Partnership and in collaboration with Deakin University. Overlaying climate, soil, topography and water data with eight commodities across cropping, pastures and vegetable resources, models for climate scenarios for 2030, 2050 and 2070 were developed. The resulting output is an online, interactive mapping tool which allows the user to interrogate maps across the Shire to demonstrate viability of agricultural industries under future climate change.

The online maps can be accessed here: www.growingreaterhamilton.com.au.

- **Planning Scheme.** Ensure strategic planning and local planning policies protect future land use from unsustainable practices. Consultations with key partners identified big corporations buying agricultural properties as a concern because large and/or international corporations may implement initiatives which will not align with the climate mitigation and adaptation objectives for the region. Introduce regulations and enforcement for native vegetation to protect and conserve remnant vegetation on farms. Conversely, some initiatives may support the objectives (e.g., building aviaries for bird manure to improve soil health) and require more streamlined approvals processes.
- Continue to advocate against tilling and use of chemical sprays.

Final

8.5 Built Environment

This category includes all infrastructure (i.e.., buildings, roads, utilities, drainage).

8.5.1 Previous or Planned Actions

Energy emissions reduction actions identified in section 7.2 are relevant to built environment adaptation (i.e., improving energy security). Other relevant actions include:

- Flood levee systems in Donald and Charlton to protect infrastructure in times of emergency
- BSC has implemented soil injections beneath Council buildings (e.g., in Donald)

8.5.2 External Influences

The Victorian Government will generate Adaptation Plans for the transport and built environment systems. The Plans will be released for comment later this year and become operational in 2022.

To support the renewable energy investment required for our energy transition, Victoria is upgrading its electricity grid to give it the capacity to transmit more renewable energy and to ensure it can withstand future climate change impacts – including more high-demand days during summer. Currently, Ausnet has proposed an upgrade to the Western Victoria Transmission Network. BSC can advocate to the State Government for upgrades to its region.

8.5.3 Actions for Consideration

- Include climate considerations in **procurement and asset management**. Assess the vulnerability of existing assets and viability under the identified climate risks. Update asset management register accordingly. Develop climate resilience standards for the development and maintenance of more flexible assets and infrastructure, including resilience to dust. Stay abreast of emerging materials and technology to ensure relevancy of best practice standards.
- **Planning Scheme.** Ensure climate modelling is incorporated into strategic planning and local planning ordinances to govern decision-making and approvals for the need for infrastructure in highly vulnerable areas and/or designs that consider associated risks.
- **Emergency Management.** Ensure emergency shelters are physically protected and have reliable power options. Deliver education and awareness campaigns to ensure the community can take similar measures for their households and businesses. Include clean up advice in the campaigns. Continue to train staff and entrench governance structure.
- **Reduce damage to transport** infrastructure from weather events so that service continuity is assured, and disruptions minimised. Work with VicRoads to manage and reduce climate change impacts to key transport infrastructure. Strengthen assets and infrastructure through maintenance and capital works to improve service continuity in extreme events.
- **Improve septic tank management**. Community education on correct septic tank management to reduce risk of health and financial risks to community. Increase frequency of inspections. Advocate or improved domestic wastewater management in townships currently without formal sewerage systems.
- **Advocate for transmission and distribution infrastructure** that will support renewable energy and support microgrids which may alleviate power outages (as well as benefits identified in section 7.2).
- **Advocate for equitable access to insurance** and policies which include climate considerations.

Final

9 Recommendations and Next Steps

9.1 Development of Strategy and Plan

This report and recommendations will inform BSC's development of its 10-year Climate Change Mitigation and Adaptation Strategy and Plan. The following section provides recommendations for the action plan which BSC can review and revise for its own action plan. The draft plan below amalgamates the options identified in sections 7 and 8, identifying activities (i.e., steps to deliver the action), alignment with risk/opportunity identified in section 5, role of BSC, responsibilities and KPIs across 13 goals for climate action.

Once released, BSC should review the place-based and system-based Adaptation Plans developed by the Victorian Government in line with the *Climate Change Act 2017*, make relevant submissions to contribute to the feedback process and update its own Strategy and Plan as necessary.

As is important with any change, stakeholders need to be brought along on the journey to ensure adoption and uptake. This project included foundation engagement with a BSC working group, executive and Councillors for internal buy-in. The community and key partners were also engaged to ensure their concerns and priorities are captured.

A draft Strategy and Plan will be drafted by BSC and released for public comment.

9.1.1 Action Plan

In line with the Buloke Beyond 2030 community plan, BSC can assign potential role/s to the actions under the following categories:

- **Leader**. Planning and providing direction.
- **Provider**. Delivering services and projects.
- **Partner**. Forming partnerships with other stakeholders in the interest of the community.
- **Facilitator**. Bringing groups and interested parties together.
- **Supporter**. To support and advocate for the community.
- **Regulator**. Regulating some activities through legislation.

When prioritising actions, BSC can conduct a high-level multi-variate analysis of the criteria illustrated in Figure 18 and outlined below. Currently, the actions in Table 7 appear in order of prioritisation completed by Ndevr Environemntal.

- **Impact**. Actions that would make the biggest impact should be considered first. For example, (e.g., waste and landfill is the largest source of emissions, thus focussing efforts there first will yield greater results more quickly.
- **Ability to influence**. BSC has the ability to influence climate change mitigation and adaptation through the above roles, but BSC has the greatest control as a leader, provider or regulator. Actions delivered through other roles may still play an important role in existing programs.
- **Co-benefits**. Actions may alleviate or address climate risks and opportunities spanning across several categories. For example, actions under the natural resources theme are likely to benefit agriculture due its reliance on the natural environment.
- **Strategic alignment**. Actions align strategically with other Council objectives (e.g., Council Plan).

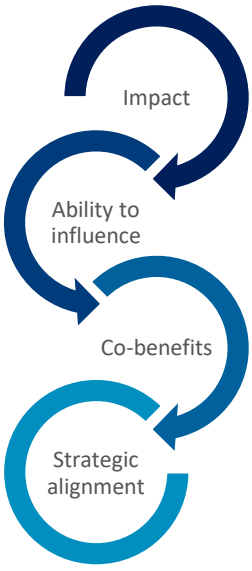


Figure 20: Prioritisation framework

Final

Table 8:Climate Change Mitigation and Adaptation Plan completed by Buloke

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Integrate climate into Council operations	• Include climate scenario and risk profile in Councillor briefing packs and staff induction • Ensure climate mitigation and adaptation is represented in all relevant documents, policies and procedures – This can be guided through the Climate Emergency declaration process • Develop climate mitigation and adaptation guidance through the local planning scheme – more specific guidance has been provided in the report • Provide professional development training to planning staff on how to influence customers to design climate ready developments • Use the How Well Are We Adapting tool to monitor impacts of climate change on Council services and develop responses	9, 17, 18, 25	Leader, Regulator	Chief Executive Officer Community Development Works and Technical Services Corporate Services Community Development	Update relevant documentation in line with review/ renewal periods	BSC internal staff resourcing Shared resourcing with WAGA for the How Well Are We Adapting tool New funding required for professional development (approx. $500pp)	Number of staff to complete training
Robust emissions measurement	• Measure baseline corporate and community emissions in line with robust standards • Set a net zero emissions target and interim targets • Annual measurement and reporting	16, 19, 30, 39	Leader	Community Development	**Immediate**: emissions profile **Quick win**: set a net zero target by 2030 Interim targets can be done upon completion of profiling **Ongoing**: reporting	New funding required to establish measurement and reporting (approx. $25k for external support of corporate & community profiling and target setting)	Annual reporting

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Ongoing emergency management	• Continue with the MEMP – review and update regularly • Include planning for alternative transport routes in MEMP and protection of shelters • Ongoing community education campaigns and training on MEMP • Assist community groups and businesses with business continuity planning during times of emergency or extreme events	4, 7, 8, 18, 24, 27	Leader, Provider	Community Development Partner with all responsible entities identified in MEMP Potential partnership with ADAPT Loddon Mallee for continuity planning	Update relevant documentation in line with review/ renewal periods (MEMP currently being updated) Ongoing: community support	BSC internal staff resourcing	Number of organisations received continuity training
Waste and landfill emissions reductions	• Develop composting program to divert green and food organic waste from landfill • Develop Container Deposit Scheme and Soft Plastic Recycling for the region • Investigate feasibility of recycle and/or compost processing plant in Buloke. Explore partnership options such as BCG for FOGO circular economy • Investigate feasibility of Emissions Reduction Fund landfill gas capture project and implement if successful	16, 19, 39	Leader, Provider, Partner	Works and Technical Services Partnerships: BCG	Begin planning of a composting program, Container Deposit Scheme and soft plastic recycling program in **FY22** Roll out in **FY23** and continue annually Recycle/compost plant feasibility in **FY22** ERF feasibility in **FY25**	New funding (approx. $30k for each feasibility study, potentially large costs for program roll out) Consider partnering with neighbouring councils for programs (as with the mobile glass crushing unit)	Tonnes of waste deposited to landfill versus organic and recycling sites Number of households or businesses participating in programs Meeting Recycling Victoria Policy targets

Final

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Council building improvements	• Conduct facility assessments, targeting high emitting or at-risk Council-owned facilities first • Identify specific reduction/adaptation measures for each facility and implement • Keep track of assessments and improvements in line with asset management • Sustainable Building Policy for new buildings and refurbishments	4, 5, 6, 7, 9, 20, 21, 22, 32, 34	Leader	Works and Technical Services	**Ongoing, starting FY22** (can be done simultaneously with emissions profiling) Internal Sustainable Building Policy endorsed by FY23	BSC internal staff resourcing New funding (approx. $20k for external support with assessments and opportunity identification) Draw upon Sustainable Building Policy developed in other councils	Number of buildings assessed, and improvements implemented Reduction in BSC emissions
Community building improvements	• Encourage community to participate in schemes and programs that help them to understand their energy bills and seek advice/funding on how to reduce energy consumption and make their buildings more resilient • Advocate for equitable access to insurance and policies which include climate considerations	4, 5, 6, 7, 9, 20, 21, 22, 32, 34	Supporter, Facilitator	Community Development	**Quick win**: provide links to existing schemes on website, send newsletter (BSC could provide guidance to community groups during this process) Provide submission to DELWP on ADAPT Loddon Mallee Climate Ready Plan in **2021** regarding insurance	BSC internal staff resourcing	Number of households and residents participating in programs Community emissions reductions

Final

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Energy security and technology switching	• Advocate for suitable transmission and distribution infrastructure to support renewable energy projects • Complete Microgrid Feasibility Study and implement upon successful study • Participate in CVGA project for getting communities off gas	7, 10, 29	Supporter, Partner, Provider	Community Development CVGA to lead Microgrids and transitioning from projects	Provide submission to DELWP on ADAPT Loddon Mallee Climate Ready Plan in **2021** regarding transmission Microgrid Study: **2021-2024** CVGA project participation dependent on CVGA new strategy	BSC internal staff resourcing and CVGA contributions Microgrid rollout approx. $1M	Roll-out of microgrid Approval of new transmission lines Sign CVGA project contract
Low emission transport	• Participate in CVGA project which aims to help member councils to electrify fleet by 2030 – If this does not go ahead, Buloke should conduct its own feasibility study and transition planning • Update relevant council documents to prioritise zero emission vehicles • Raise community awareness of EVs (e.g., through visibility of BSC's own transition) and encourage community to take up State packages (e.g., grant for EV purchase) • Continue to assess community EV use and advocate for State to (co-)fund chargers • Collaborate with the Mallee Hydrogen Technology Cluster to identify opportunities as they arise	29, 32, 34, 38	Partner, Provider	CVGA to lead council project Vic Government transport programs - BSC to advocate	**Quick win**: Promote opportunities provided by the State Update relevant documentation in line with review/ renewal periods (prioritise low emission vehicles in fleet policy) CVGA project participation dependent on CVGA new strategy	BSC internal staff resourcing for document reviews, advocating and CVGA contributions Feasibility and transition plan ~$30k New funding (~$40k-$80k for zero emission light vehicle) Grant/co-fund opportunities	Sign CVGA project contract Increase in number of EVs registered in Buloke

Final

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Transport infrastructure improvements	• Update asset management in line with mitigating climate risks • Advocate for public transport infrastructure • Advocate for rail freight	8, 27, 32	Supporter, Partner	Partnership: VicRoads, neighbouring councils Chief Executive Officer and Works and Technical Services	Update relevant documentation in line with review/ renewal periods **FY24-25 and ongoing:** advocating	BSC internal staff resourcing for document review and advocating	New rail incorporated in State planning Release of new asset management framework
Improve septic tank management	• Community education on correct septic tank management to reduce risk of health and financial risks to community • Increase frequency of inspections • Advocate for improved domestic wastewater management in townships currently without formal sewerage systems	1	Leader	Community Development Partnership with Landcare	**Immediate**: devise septic tank management education program Update relevant management documentation in line with review/ renewal periods	BSC internal staff resourcing for community engagement and advocating	Number of inspections conducted Percentage of compliant systems Number of complaints
Enhance biodiversity, conservation and revegetation	• Ecological mapping and planning • Continue use of tools and tree asset management from CVGA project • Help promote existing initiatives	1, 11, 12, 13, 14	Leader, Provider, Partner	Community Development Partnership with Landcare and Traditional Custodians	**Ongoing**: CVGA tools and promoting initiatives Partnership for ecological mapping, planning and monitoring by **FY23** and ongoing	BSC internal staff resourcing for tree asset management Use resourcing from partnerships	Number of trees planted in Buloke region (by Council and other groups)

Goals	Actions	Risks	Role	Responsibility	Timing	Resourcing	KPI
Adaptive agriculture	• Organise educational events (e.g., Kiss the Ground movie event) • Showcase existing wins • Collaborate with State and farming/agriculture groups to provide co-funding opportunities to small farmers that are not eligible for other schemes	4, 15, 23	Provider, Facilitator	Community Development Partnership with DJPR, BCG, Landcare	**Ongoing**: annual events and promote events organized by others **Quick win**: Showcase existing wins through Council communications and events Provide submission to DELWP on ADAPT Loddon Mallee Climate Ready Plan in **2021** regarding small business access to schemes	BSC internal staff resourcing for community campaigns]	Number of participants at events Number of small farmers with approved funding
Shared community vision	• Develop a communication strategy to encourage positive discussion and acceptance of climate change • Encourage community networking through participation in existing programs • Facilitate community participation in grassroots educational campaigns (e.g., climate chats for schools)	Help to gain support for all risks/ops	Provider, Supporter, Facilitator	Community Development Partnership with DELWP, ADAPT Loddon Mallee	**Immediate**: communication strategy **Quick win**: Promote opportunities for networking (see report) **FY23 and ongoing**: grassroots education programs	BSC internal staff resourcing for community engagement	Number of participants in programs/ attending events

Draft

9.2 Monitoring and Reporting

Regular monitoring, evaluation, review and, where appropriate, amendment of actions is all part of the continual improvement/adaptive management that needs to be applied to the implementation of actions. This continual process is illustrated in Figure 19.

Monitoring should be an integral part of the plan to give assurance that the measures remain effective. The delivery and effectiveness of implemented actions can be reported on in line with BSC's existing reporting frameworks.

To ensure BSC's approach remains valid and relevant to local climatic conditions, priorities and emerging opportunities, the Strategy and Plan should be reviewed regularly. The Strategy and Plan can be a fluid document whereby actions are reviewed and prioritised annually and incorporated into the annual budget. The document itself (e.g., risk assessment and plan) can be reviewed in line with BSC's risk management system and the release of the Victorian Government's Climate Change Strategy and Regional Adaptation Plans, to ensure strategic alignment upon the release of new climate science.

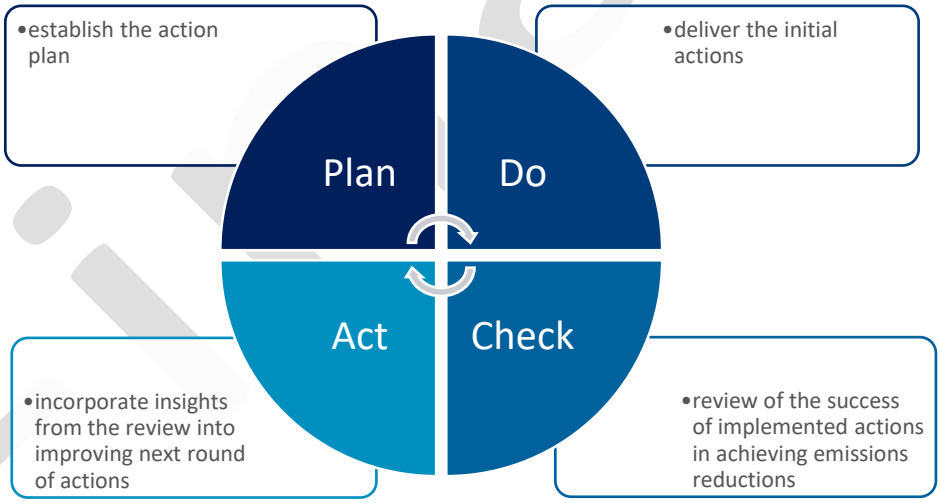


Figure 21: Continuous Action Monitoring Process

9.3 Conclusion

This report and the identified actions provide BSC with the foundation necessary to develop its Strategy and develop shorter term operational plans that are more concise and with detailed costings.

To ensure effective implementation of all actions, climate action needs to be embedded within the organisation and represented in all decision-making. Hence, this action has been prioritised first in the action plan table.

Next, it is recommended that BSC measure its corporate and community emissions profile in line with best practice standards to ensure sufficient rigour and robustness that will withstand public scrutiny. Measurement and monitoring will assist in tracking progress and identifying priority actions for emissions reduction.

Ndevr Environmental recommends that BSC set a net zero target for corporate emissions by 2030 (i.e., by the end of the Strategy). Net zero emissions is achieved through balancing a measured amount of carbon emissions released, with an equivalent amount sequestered or offset, or purchasing carbon credits to make up the difference.

It is important that BSC bring staff and the broader community along its climate action journey. Several actions have been identified as 'quick wins' (e.g., celebrating and sharing existing success stories, making use of existing resources and enhancing the community's access to these resources).

ndevr environmental

© Ndevr Environmental Pty Ltd 2021

Ndevr Environmental is a specialist carbon, energy and sustainability focused consultancy that partners with clients to achieve positive business and environmental outcomes.

Melbourne – Sydney – Brisbane – Perth – Singapore
ndevrenvironemntal.com.au

Certified B Corporation

Climate Active NETWORK MEMBER