Macedon Ranges Shire Council

Climate Change Action Plan 2017

Contents

Summary

Our changing climate presents significant challenges for the present and the future, and everyone has a role to play in addressing climate change. Local government councils have the opportunity to reduce emissions from a range of services and operations, as well as being in a position to influence both the community and state government stakeholders in climate change action. Additionally, local government can plan for the delivery of services and management of operations in the context of a changed climate to ensure a smooth transition for Council and the community.

This Climate Change Action Plan is about the present, with a focus on how Council will reduce emissions from its own activities to minimise its impact on climate change. It also outlines how Council will influence key stakeholders and support the community in reducing emissions. After providing context and discussion about the potential for action, three tables are presented listing key actions for Council to undertake over the next four years, to ensure we meet our adopted emissions reduction target and work alongside the community to mitigate against climate change.

While it's not possible to accurately foresee the details and final costs of all works that will contribute to meeting Council's adopted emissions reduction target of 1,910 tonnes CO2-e[1] by 2020-2021 (25% reduction from 7,640 tonnes CO2-e emissions in the baseline year of 2014-2015), a summary of works is provided in Table 1 below, based on analysis and modelling undertaken in late 2016.

Works undertaken by Council in 2015-2016 achieved a reduction of 170 tonnes CO2-e. The remaining emissions reduction required (1,740 tonnes CO2-e) needs to be achieved through a combination of works listed in Table 1, some of which were commenced in 2016-2017. Depending on reductions to be achieved through investment in on-site solar power generation at Council buildings, and the impact of (yet to be determined) works for energy efficiency, there may be a shortfall in meeting the emissions reduction target. An assessment will be made in mid 2020 to determine the need for additional works or other measures like purchasing Green Power to ensure the target is achieved.

When adopting this Climate Change Action Plan on 28 June 2017, Council also resolved to plan to achieve zero net emissions by 2030-2031. A "Zero Net Emissions by 2030-2031" report will be prepared by mid 2018 setting out how Council may achieve this supplementary target and the associated resource and cost implications. This Zero Net Emissions report will inform Council's decision about whether to formally adopt a target for zero net emissions by 2030-2031. The Climate Change Action Plan will be updated as required to reflect any additional target adopted by Council.

This Climate Change Action Plan also outlines how Council will support the community in reducing greenhouse emissions across the shire. While there is no formal target for emissions reductions across the shire, Council proposes to:

> *Promote the vision of a zero net emissions shire by 2050 as a shared council-community vision, consistent with the state government target for a zero net emissions Victoria.*

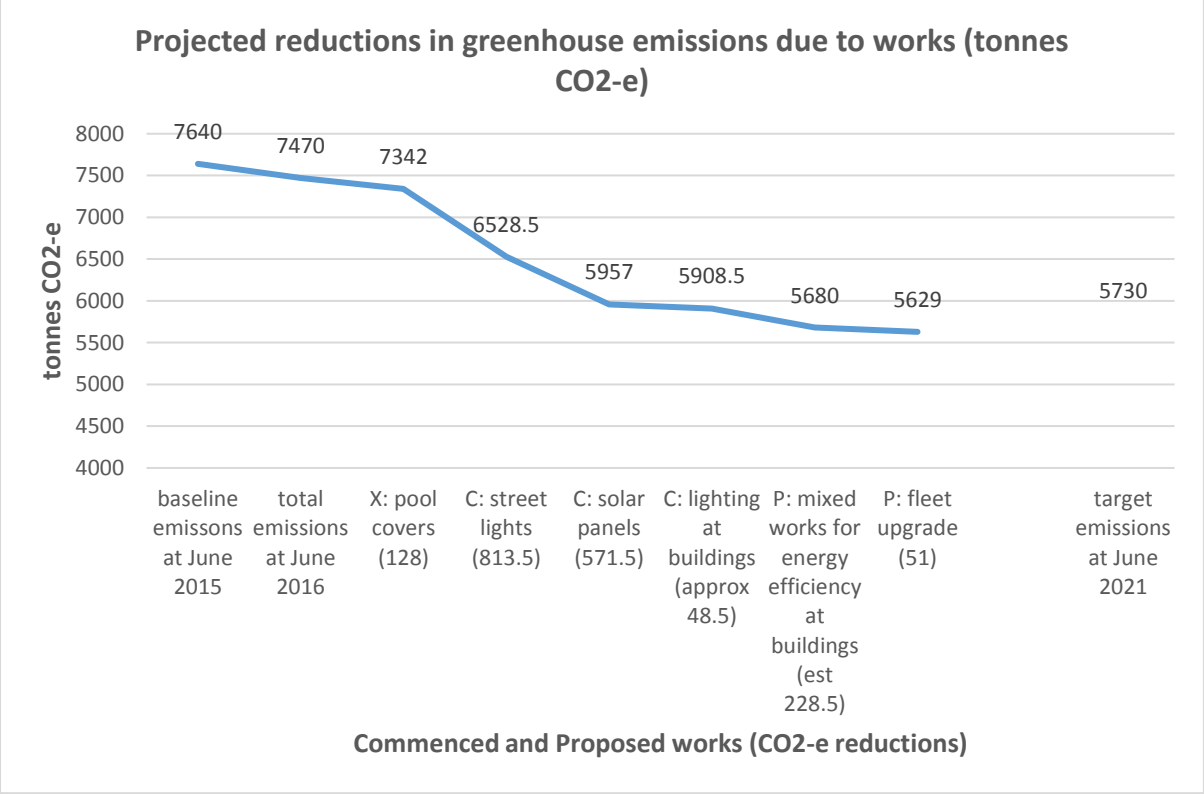
The ongoing implementation of this Action Plan will be informed by annual assessment of progress towards the targets and potentially adjusting approaches in response to external drivers.

[1] CO2-e = carbon dioxide equivalent, a standard measure of greenhouse emissions, accounting for the intensity factors of different greenhouse gases

Table 1: Summary of greenhouse emissions reduction actions to meet 25% reduction target [2]

Opportunity Area	tC02e	Capex ($)	Annual Savings ($)	Payback (yrs) (av)
Solar (mid case) [3]	571.5	$461,400	$46,950	9.4
LED Lighting Retrofit in buildings	48.5	$39,268	$5,520	7
Energy Efficiency works at buildings (6.5%) (modelled)	228.5	$420,000	$46,266	9
KTSAC & GAC - Pool Cover	128	$138,915	$20,584	6.8
Street Lighting – changing residential lights to LEDs	813.5	$1,074,422	$104,772	7.8
Fleet upgrade (12 hybrids)	45	$75,000	$25,000	3
Electric Vehicle Trial and installation two new charge stations	6	$30,000	$5,000	6
TOTAL	**1,840**	**$2,239,365**	**$254,090**	**7**

Figure 1: (indicative) cumulative impact of works to reach emissions reduction target of 25% by 2020-2021, from 2014-2015 baseline year[4]



[2] Excludes works undertaken in 2015-2016 which resulted in 170 tonnes CO2-e emissions reductions. The cumulative impact of works is shown in Figure 1.
[3] Mid case for solar panel installation (higher and lower cases are presented in Table 3).
[4] The status of works at April 2017 is indicated in the graph labels, reflecting Council's commitment to invest in climate change mitigation: X – completed, C – commenced, P – proposed

Introduction

In adopting the Environment Strategy in June 2016, Council made a commitment to reduce greenhouse emissions from its operations by 25% by June 2021 from the baseline year of 2014-2015.

Based on stronger drivers for climate change that have emerged since adoption of the target, and accounting for community feedback received in response to exhibition of the draft Climate Change Action Plan, on 28 June 2017 Council resolved to plan to achieve zero net emissions by 2030-2031. The works required to achieve this target will be investigated in 2017-2018, including the resource and cost implications. This Climate Change Action Plan will be updated as required should Council decide to formally adopt a target for zero net emissions by 2030-2031.

In addition to outlining how Council will achieve its targets, the Climate Change Action Plan outlines how Council will work with stakeholders and the local community to reduce greenhouse emissions within a broader context.

The focus of this plan is climate change mitigation – *actions that reduce greenhouse gas emissions, including actions that reduce energy consumption through behaviour change or energy efficiency, or that reduce reliance on coal fired power through use of renewable energy sources.*

Climate change adaptation - *actions that manage or reduce the consequences and impacts of a hotter, drier and more extreme climate* - will be addressed as a part of Council's review of its *Climate Change Risk Assessment and Response - Early Adaption Plan 2012.*

Context – Climate science

> *"2016 was the hottest year on record globally for the third year in a row …*
>
> *…Climate change is worsening heat-related extreme weather conditions in Australia…*
>
> *…Increased temperatures driven by climate change are increasing the risk of heatwaves, bushfires and drought in Australia"*
>
> *2016: global heat record broken again*. Climate Council report released 19 January 2017

5

> *"2016 was Australia's fourth-warmest year on record (the national observational dataset commences in 1910). Australia's area-averaged mean temperature for 2016 was 0.87°C above the 1961–1990 average…*
>
> *Maximum temperatures were 0.70°C above average, and minimum temperatures were 1.03 C above average…*
>
> *Only one year in the past ten was cooler than average (2011), and seven of Australia's ten warmest years have occurred since 2005"*
>
> *Bureau of Meteorology annual climate statement 2016* - released 5 January 2017

6

[5] http://www.climatecouncil.org.au/2016-hottest-year-report (accessed 30 January 2017)

[6] http://www.bom.gov.au/climate/current/annual/aus/ (accessed 30 January 2017)

Current climate science and what it means for Macedon Ranges Shire

Translating data about climate variables, climate trends, and likely climate futures into meaningful information at a local level is complex, involving many models and datasets. The Commonwealth Scientific Industrial Research Organisation (CSIRO) has modelled climate scenarios and projections for specific aspects of our climate such as extreme temperature, summer rainfall and winter rainfall based on extensive climate records. Projections are based on results of 40 models, which analyse long term data to predict climatic conditions according to the different emission scenarios set by the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. The scenarios are termed "Representative Concentration Pathways" (RCPs): 2.5 (low emissions, requiring sustained high level mitigation efforts), 4.5 and 6 (intermediate emissions), and 8.5 (high emissions, no mitigation efforts). The RCPs represent pathways of greenhouse gas concentrations in the atmosphere expected to result from various combinations of economic, technological, demographic, policy and institutional futures. The predicted changes in climate for these pathways are calculated for the nominated projection years of 2030, 2050 and 2090 relative to 1995.[7]

CSIRO presents climate forecasts for the main natural resource management regions across Australia and for 15 "subclusters". The subclusters relevant to Macedon Ranges Shire are the Murray Basin and the Southern Slopes. Climate forecasts for the two subclusters are presented in **Appendix 1**.

Climate forecasts for the shire that take into account local topography are not available. CSIRO has developed some tools to allow exploration of future climate scenarios, like a platform that presents future climatic conditions at one town in terms of current climatic conditions at another town. However, no towns within the shire are listed within this "town analogue explorer" tool. In the absence of localised data, the forecast changes in temperature and rainfall for towns either side of the shire are presented in Figure 2, showing that climate in the shire in 2050 will be different to today, regardless of the RCP.

A key goal of this Climate Change Action Plan is to identify actions that will contribute to creating a more favourable climate future.

The pathway to adaptation planning

Understanding the implications of a changed climate at a local level will be important for the review of Council's Climate Change Adaptation Plan. The review will need to consider how decreased rainfall and increased number and intensity of extreme weather events will impact on Council's service provision, drainage, emergency management processes and recreation facilities, amongst other things. Opportunity also exists to consider how the changing climate will impact on the shire's agricultural and commercial enterprises and the community's wellbeing.

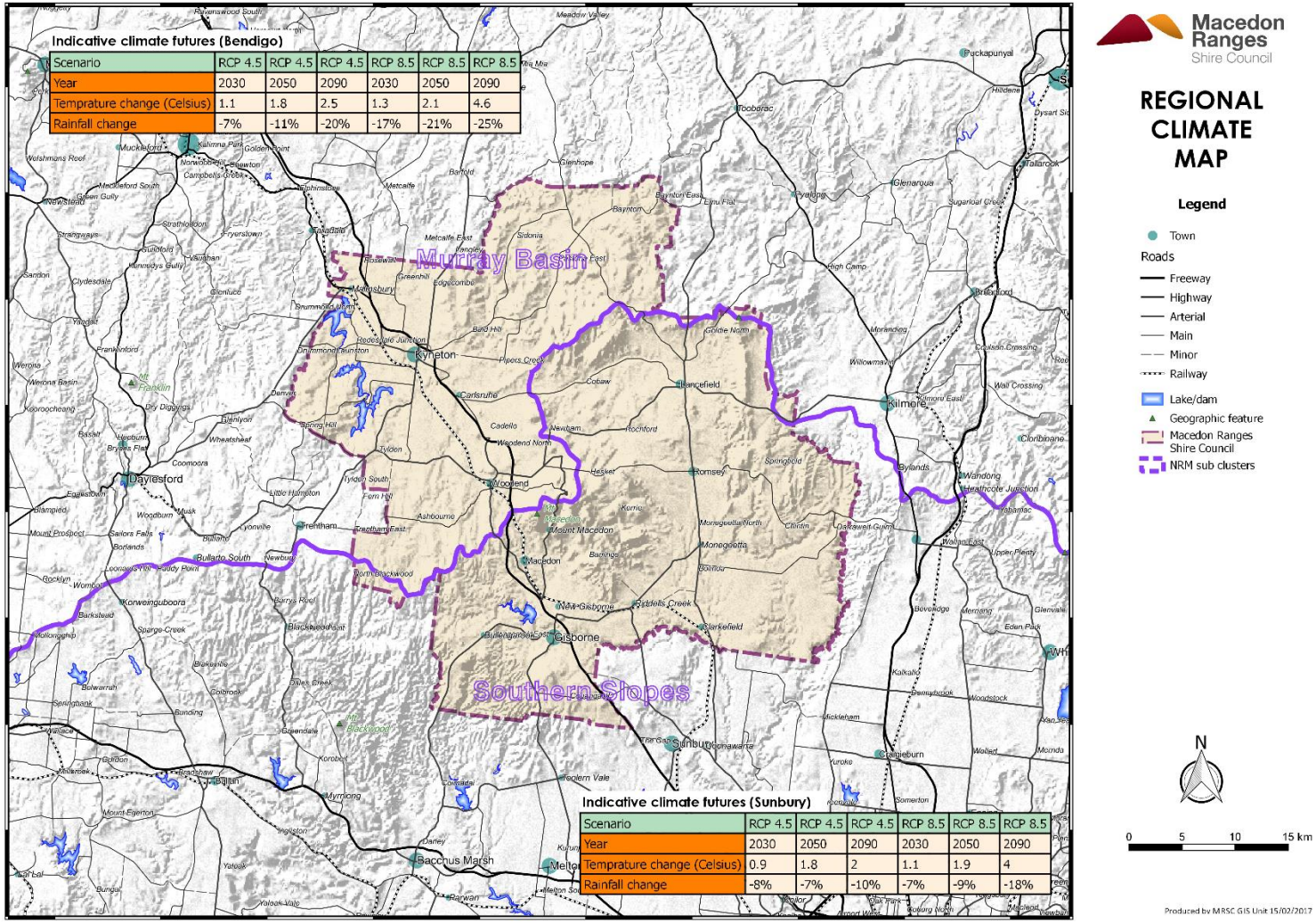
Localised climate forecasts will be useful for this adaptation planning process as well as for other work of Council, like the preparation of Council's Biodiversity Strategy which will identify how the changing climate will impact on local flora and fauna.

[7] See https://www.climatechangeinaustralia.gov.au/en/ for a detailed explanation of modelling and projections

Some guidance in this context is provided in a support tool developed by the state government titled Climate Ready Victoria, which re-presents the CSIRO information according to regions, alongside recommended climate mitigation and adaption responses for different sectors of the economy and community within the regions. It places the whole of the shire into the (southern) Loddon Mallee (meaning that differences in climate futures in the north and south parts of the shire cannot be distinguished)[8]. In the absence of localised data, Climate Ready Victoria can guide climate change action based on current science.

[8] See http://www.climatechange.vic.gov.au/understand

Figure 2: Indicative changes in temperature and rainfall, north and south of shire, selected scenarios.



Context – Drivers for action

Council's work in climate change is influenced and determined by the broader legislative and policy context operating at international, national and state levels, and by interests and activity in the community at the regional and local levels. The key drivers for climate change action are outlined below.

International context

At the 21st Conference of Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) held in late 2015, Australia endorsed the agreement to reduce greenhouse gas emissions to the extent necessary to keep the increase in global average temperature to below 2ºC from pre-industrial temperatures. This Paris Agreement came into force on 6 November 2016, and Australia ratified the agreement on 9 November 2016.

National context

National Targets

- To reduce greenhouse gas emissions to levels 26%–28% below 2005 levels by 2030.

At the national level, there have been several changes to the policy drivers on climate change action, particularly in regards to mechanisms for carbon pricing and targets for renewable energy, meaning the role for local government is not clear. However, some federal programs continue to provide opportunity for local government to act on climate change, most notably, the Clean Energy Finance Corporation funds large greenhouse reduction and innovative technology projects, such as the City of Melbourne's $30M program of clean energy initiatives to help meet its goal of zero net emissions by 2020.

National Greenhouse and Energy Reporting Scheme

The National Greenhouse and Energy Reporting (NGER) scheme was established by the *National Greenhouse and Energy Reporting Act* 2007 (NGER Act), as a single national framework for reporting and disseminating company information about greenhouse gas emissions, energy production, energy consumption and other information specified under NGER legislation.

The objectives of the NGER scheme are to:

- inform government policy;
- inform the Australian public;
- help meet Australia's international reporting obligations;
- assist Commonwealth, state and territory government programmes and activities; and
- avoid duplication of similar reporting requirements in the states and territories.

The NGER scheme provides a standardised approach to measuring and reporting on greenhouse gas emissions, specifying coefficients for different greenhouse intensity factors of different emission sources, and accounting for emissions along the supply chain, from energy generation to consumption to point of emission.

State context

State Targets

- Zero net emissions by 2050
- 25% of the state's electricity to be from Victorian built renewable energy generation by 2020
- 40% of the state's electricity to be from Victorian built renewable energy generation by 2025
- 6.5 million tonnes CO2-e to be reduced through energy efficiency measures by 2020.

Victoria's Emissions Profile

Approximately 120Mt (mega tonnes) of CO2-e are released into the atmosphere in Victoria each year. This is approximately 25% of Australia's total emissions, and more than 15,700 times the greenhouse emissions generated from Council's activities. At a more individual scale, on average, each person in Victoria is responsible for emitting 20 tonnes CO2-e into the atmosphere every year.

Climate Change Act 2017

A review of Victoria's key legislation governing climate change, the *Climate Change Act* 2010, was undertaken in 2015 by an independent committee. The resulting report and its recommendations were tabled in parliament on 11 February 2016. The proposed Climate Change Bill 2016 was tabled in the Parliament of Victoria on 22 November 2016, and then passed by the Legislative Council as the *Climate Change Act* 2017 on 23 February 2017.

The *Climate Change Act* 2017:

- embeds a long-term emissions reduction target of zero net emissions by 2050;
- requires five yearly interim emission reduction targets to be set by the Premier and Minister, with the first interim target to be established by 31 March 2020;
- requires government decision-makers to have regard to climate change;
- introduces a new set of policy objectives and an updated set of guiding principles to embed climate change in government decision making;
- requires the state government to develop a Climate Change Strategy and climate change adaption plans;
- requires the government to establish a platform for declaring and supporting emissions reduction pledges from government's own operations and from across the economy; and
- requires the Minister to prepare and publish both a climate science report and an annual greenhouse emissions report.

The Act will also allow, but not obligate, councils to make a pledge statement in regards to greenhouse emissions reductions under the *Local Government Act* 1989. Council pledge statements must account for the newly legislated policy objectives and guiding principles.

In summary, while the *Climate Change Act* 2017 will not mandate actions for local government councils, it provides direction and benchmarks, enabling councils to work in accordance with the state and do their fair share in addressing climate change mitigation.

Victoria's Climate Change Framework

Victoria's Climate Change Framework is the key policy guide for government to guide its work and ensure it meets its target of zero net emissions by 2050. It outlines approaches for *Driving emissions reductions* and *Preparing for continuing changes in climate*, through *Working together*. It presents four pillars for driving emissions reductions, serving as a guide for climate change mitigation:

- Increase our energy efficiency and productivity
- Move to a clean electricity supply
- Electrify our economy and switch to clean fuels
- Reduce non-energy emissions and increase carbon storage

Part 3 of Victoria's Climate Change Framework has a focus on "transitioning key sectors of our economy", listing target areas for action that apply to both climate change mitigation and adaptation:

- Transforming the way we generate, distribute and use energy in Victoria
- Transforming the way we travel
- Creating a low emission carbon resilient built environment
- Protecting the health and wellbeing of all Victorians
- Ensuring Victoria's water future
- Building the resilience of our natural environment
- Working together to support the Latrobe valley community to transition

Victoria's Climate Change Framework does not obligate local government councils to undertake any one or more particular actions in climate change mitigation or adaptation, however, it does provide a guide for action from all sectors of the community.

Renewable Energy Roadmap for Victoria

The Renewable Energy Roadmap for Victoria was prepared in late 2015, outlining state government directions for:

- transforming the generation stock in the wholesale electricity market towards renewable energy;
- addressing barriers to distributed energy generation and storage;
- encouraging household and community renewable energy generation; and
- expanding the government's role in facilitating the uptake of renewable energy.

Then in 2016, the state government set the following renewable energy targets:

- 25% of the state's electricity to be from Victorian built renewable energy generation by 2020

- 40% of the state's electricity to be from Victorian built renewable energy generation by 2025

The renewable energy targets serve as a driver for all sectors of the community to transition away from fossil fuel energy generation, the key contributor to greenhouse emissions in Victoria.

Victorian Energy Efficiency Target

In 2015, the state government strengthened the Victorian Energy Efficiency Target (VEET) scheme, increasing targets for abatement through energy efficiency from 5.4 million tonnes of CO2-e in 2016 to 6.5 million tonnes of CO2-e in 2020. The targets will drive further investment in new energy technology and employment growth in the renewable energy sector, and deliver cuts to household energy costs.

TAKE2

The TAKE2 pledge program was established as a means for the state government to promote its commitment to achieving it's emissions reduction target. The program encourages individuals, community groups, businesses and local government to publicly declare their commitment to reducing greenhouse gas emissions, including commitments to achieving any emissions reduction targets they may have adopted. In turn, this platform also enables the state government to gain an understanding of how the state is progressing towards achieving the zero net emissions target by 2050.

The pledge program is supported by guides and tools to assist all sectors of the community to meet their pledges. The most relevant guide to Council and the local community is presented in Figure 2, showing potential actions promoted by the TAKE2 program to achieve emissions reductions, mapped against the four pillars for *Driving emissions reductions* in Victoria's Climate Change Framework.

Council became a founding partner to TAKE2 in August 2016, thereby publicly declaring its adopted emissions reduction target as a pledge.

Inquiry into community renewable energy

A parliamentary inquiry into community energy was conducted in 2016, to identify ways in which the state government may facilitate community groups to participate in the renewable energy market (addressing a key theme of the Renewable Energy Roadmap, namely, *encouraging household and community renewable energy generation)*. Council provided feedback to the Community Renewable Energy Projects Discussion Paper, to highlight the variety and complexity of concerns and issues regarding large scale renewable energy projects in the shire, particularly in regards to wind power.

At present, state government planning policy restricts the development of wind farms in the shire. It is recognised that this restriction may change as a result of the inquiry into community renewable energy, particularly in consideration of the renewable energy target for Victoria. Council also recognises the broader potential for, and state government support to, community owned renewable energy projects (e.g.the Macedon Ranges Sustainability Group received a $100,000 grant for the state government to establish a large solar array on the roof of the old timber mill in Woodend, and Hepburn Wind has also received grants from the state government (both in early 2016)).

Regional context

North Central Catchment Management Authority Climate Change Adaptation and Mitigation Plan

In 2015 the North Central Catchment Management Authority developed a Climate Change Adaptation and Mitigation Plan. The plan outlines adaptation options for responding to climate change variables for the key natural assets of rivers and floodplains, wetlands, biodiversity and soils, for example through establishing carbon plantings that provide landscape connectivity.

Council's future work in climate change mitigation and adaptation, particularly in regards to biodiversity and catchment management, will account for directions provided in this regional plan.

Port Phillip and Westernport Regional Catchment Strategy

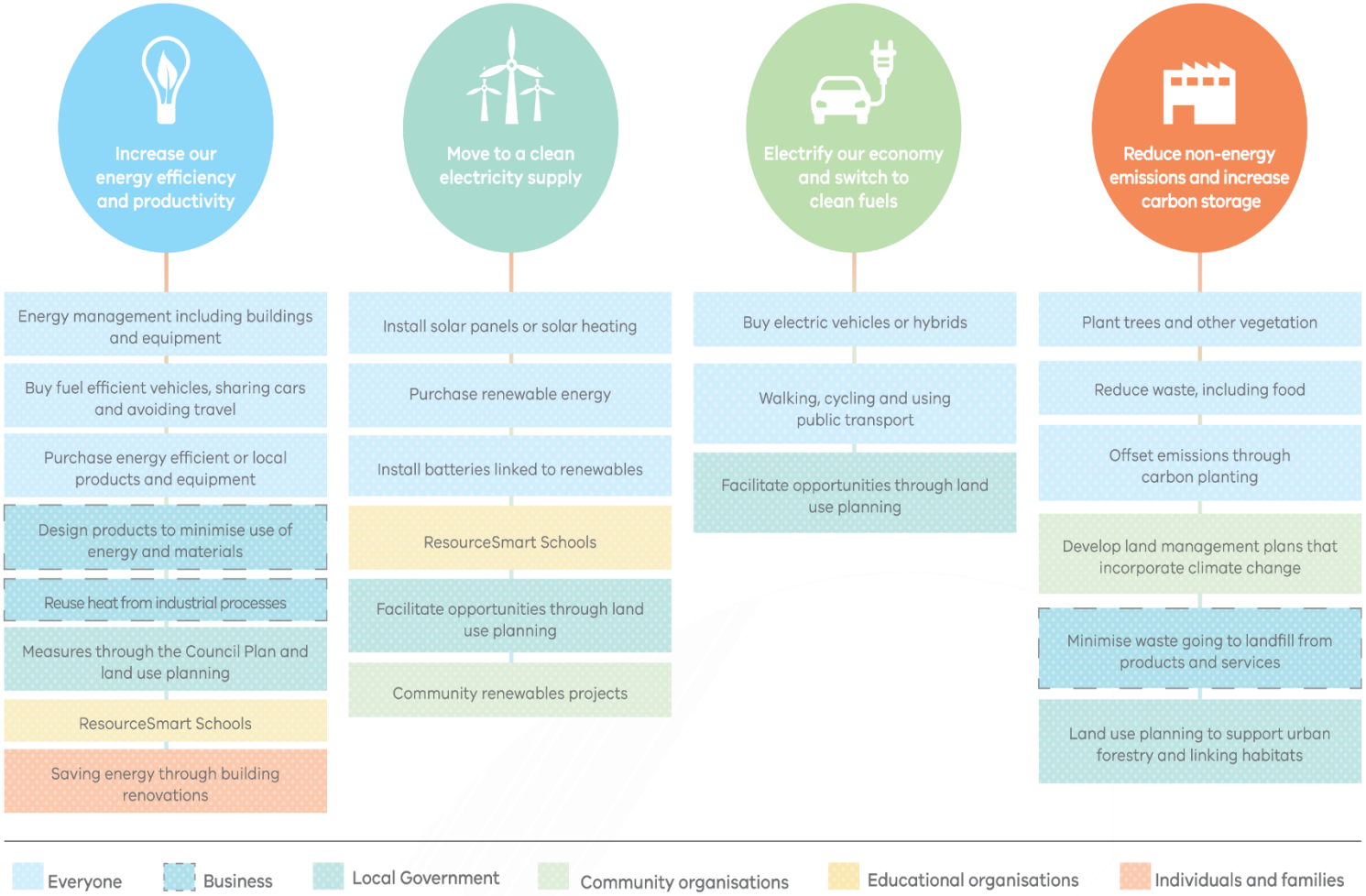
The web-based interactive Regional Catchment Strategy acknowledges the potential impacts of climate change on key assets like native vegetation and wetlands, and encourages stakeholders to undertake actions for mitigation and adaptation.

Central Victorian Greenhouse Alliance (CVGA)

The CVGA represents 13 local government councils, including Macedon Ranges Shire Council, working together to improve their ability to address the causes and consequences of climate change and to help communities in the region prepare for, and prosper in, a rapidly changing climate.

Its draft Strategic Plan 2016- 2019 state the strategic goal that mirrors the state government emissions reduction target: zero net GHG emissions across the CVGA catchment area by 2050. The goal is not binding on member councils.

Figure 2: Potential actions for TAKE2, according to pillars for *Driving Emissions Reductions* in Victoria's Climate Change Framework



Source: http://www.delwp.vic.gov.au/data/assets/pdf_file/0010/369118/DELWP_Take2-Acting-Now-on-Climate-Change.pdf (accessed 20 February 2016)

Local context

Local Targets

To reduce greenhouse emissions from Council's operations by 25% by 2020-2021, from the baseline year of 2014-2015.

To plan to achieve zero net emissions from Council's operations by 2030-2031.

To monitor progress towards the targets on an annual basis, and review and potentially amend the targets in mid 2020 to account for external drivers for climate change action at that time.

The 25% target equates to a reduction of 1,910 tonnes CO2-e, from the 2014-2015 level of 7,640 tonnes CO2-e.

The *Macedon Ranges Environment Strategy* was adopted by Council in June 2016, and along with the emissions reduction target of 25%, includes the following policy statements in relation to climate change:

- *Council acknowledges that human activity over the past two hundred years has significantly contributed to climate change.*
- *Council acknowledges the greenhouse emissions generated by its daily work activities, and will work towards reducing greenhouse emissions as a means of contributing to climate change mitigation*
- *In working to continuously mitigate Council's impact on climate change, Council will follow the energy hierarchy below:*
  - *reduce energy consumption*
  - *improve energy efficiency*
  - *invest in on-site and local renewable energy generation*
  - *purchase externally generated renewable energy*
  - *offset emissions*
- *Council acknowledges that impacts of climate change will continue to be experienced across the Shire, and will impact on key values of the Shire – its biodiversity, its landscapes and waterways, its agricultural productivity, and the lifestyles the Shire provides. Council will continue to plan and act to adapt to climate change to the best of its capacity, at the local, regional and broader levels.*
- *Where possible, Council will support and participate in local and regional initiatives for energy efficiency and renewable energy as a means of reducing greenhouse emissions from the Shire, within state government policy and legislative frameworks.*
- *Council acknowledges the work of community groups and networks extending from community hubs like neighbourhood houses in facilitating action to mitigate and adapt to climate change.*

Action CC2 in the Environment Strategy states:

> *Develop a Climate Change Action Plan to outline the range of works Council will undertake in its operations to mitigate climate change. Explore actions that may be undertaken at each level of the energy hierarchy, and the potential for working with community and industry in developing and implementing actions to address climate change. Account for, and where appropriate extend from, state and regional frameworks and plans in developing the plan.*

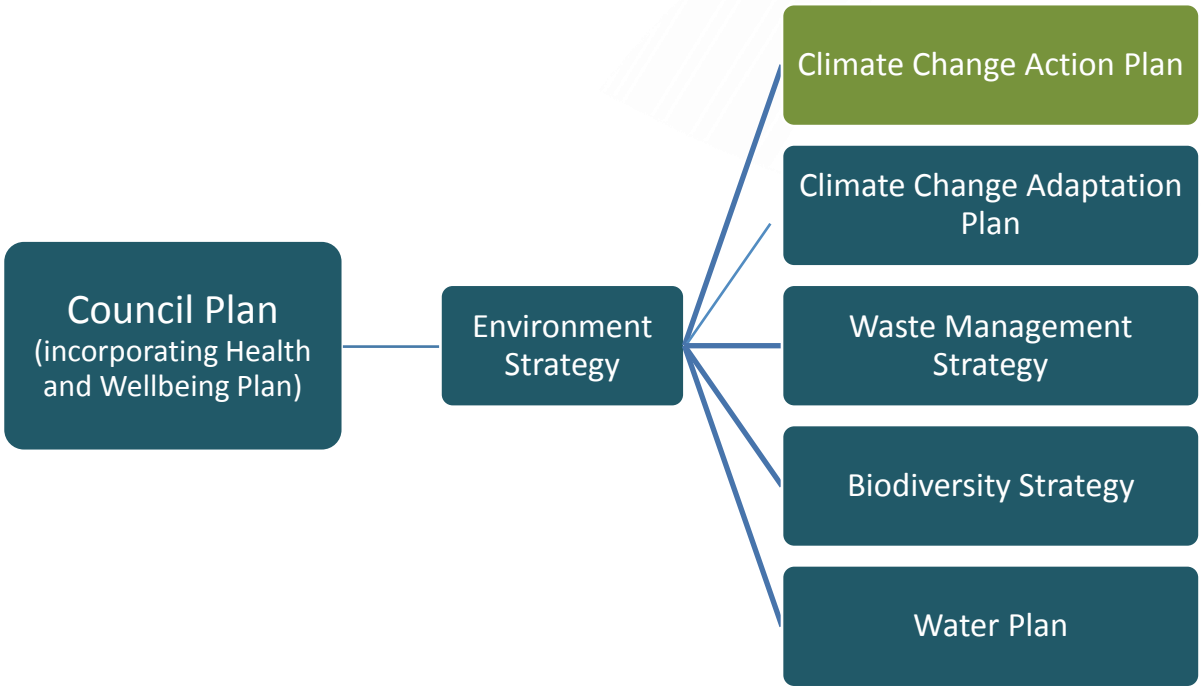
This Climate Change Action Plan implements the above action.

In the context of Council's suite of plans, strategies and polices, this Action Plan is linked to higher level plans as shown in Figure 4. The Council Plan (2017-2027) states Council's commitment to climate change action:

> *Address climate change mitigation, resilience and adaptation*

As climate change impacts on all functions and services of Council, and on all sectors of the community to some degree or another, this Action Plan is not an independent document. It has implications for nearly all departments across Council, and in keeping with the *Climate Change Act* 2017, aims to provide direction for incorporating climate change into all decision-making of Council.

Figure 4: Climate Change Action Plan in context of Council strategies and plans



Community Action

Council's work in climate change action is also influenced by the level of activity in the community. The policy statements and objectives stated for climate change in the 2016 Environment Strategy reflect community input into the development of the strategy, and Council support for renewable energy has been influenced by community advocacy and interest in the past year or two. Most notably, the Macedon Ranges Sustainability Group has advocated for Council to take action on climate change, particularly in regards to on-site renewable energy generation, including the possibility of a council-community partnership for installation of solar panels on Council buildings with high community use.

A few examples of everyday community climate change action include community gardens (as managed by the Kyneton Transition Hub, and at Riddell's Creek neighbourhood house), compost bins and rainwater tanks at neighbourhood houses, and men's sheds diverting waste from landfill through re-purposing recycled materials.

Methodology

This Climate Change Action Plan follows an assessment of the potential for emissions reduction from Council operations undertaken in late 2015, which resulted in Council adopting a greenhouse emissions reduction target in June 2016. In the latter half of 2016, two investigations were commissioned by Council to inform the development of this Climate Change Action Plan:

- The Alternative Technology Association was engaged to conduct a feasibility study on establishing a revolving energy fund. The study included analysis of meter consumption data and billing data (like tariffs etc) to identify optimal system sizes for selected buildings against several financial metrics. It also reviewed existing models of "revolving energy funds" as arrangements for reinvesting savings from on-site renewable energy projects into additional projects. The study was funded under the Victorian Climate Change Grants, and involved three workshops with a project reference group (comprising of representatives from Council, City of Greater Bendigo, the Macedon Ranges Sustainability Group, the Bendigo Sustainability Group, and the Department of Environment, Land, Water and Planning (DELWP)). The resulting report "Designing a revolving energy fund for Macedon Ranges Shire Council" was prepared in late 2016.

- A consultancy specialising in local government climate change action, Ironbark Sustainability, was engaged to identify the potential for emissions reduction across all Council operations. Two workshops were held with relevant staff during the study. A "Climate Action Plan" was prepared in late 2016.

Additionally, this Climate Change Action Plan has been informed by discussions with regionally-based state government staff, discussions with staff from across Council, and targeted consultation with key community stakeholders, including Council's Health and Wellbeing Committee. A list of community groups consulted during the preparation of the draft Climate Change Action Plan is provided in **Appendix 2**. A simple survey conducted at the Sustainable Living Festival in Woodend on 4 March 2017 also helped inform how Council may assist the community in addressing climate change.

In late March, the draft Climate Change Action Plan was released for public feedback. This final version has been amended from the draft to account for community feedback and discussions within Council.

Managing our greenhouse emissions

Council's greenhouse emissions profile

Council's corporate greenhouse emissions profile has been determined for both 2014-2015 and 2015-2016 based on available data.

Under the National Greenhouse and Energy Reporting Scheme, sources of emissions are categorised into scope 1, 2 or 3 according to the degree of control that Council has over the site at which the emissions are generated. For example, emissions generated at the point of consumption, like fuel consumption by fleet vehicles, are classified as Scope 1; emissions generated from an offsite energy source, like emissions from electricity use at streetlights are classified as Scope 2; and emissions from air travel undertaken for Council business is classified as Scope 3, as they occur in the broader community.

Table 2 below provides a summary of emissions by source, regardless of the scope category for that source under the National Greenhouse and Energy Reporting Scheme Technical Guidelines. Figure 5 presents Council's greenhouse emissions profile for 2015-2016.

Emissions from municipal waste

In accordance with the reporting framework governed by the National Greenhouse and Energy Reporting Scheme, emissions associated with waste generated from across the shire (municipal waste) and from Council's own operations (corporate waste) are accounted for at the receiving landfill site. As no landfill site is operated by Council, greenhouse emissions from waste need not be factored into its operational emissions profile.

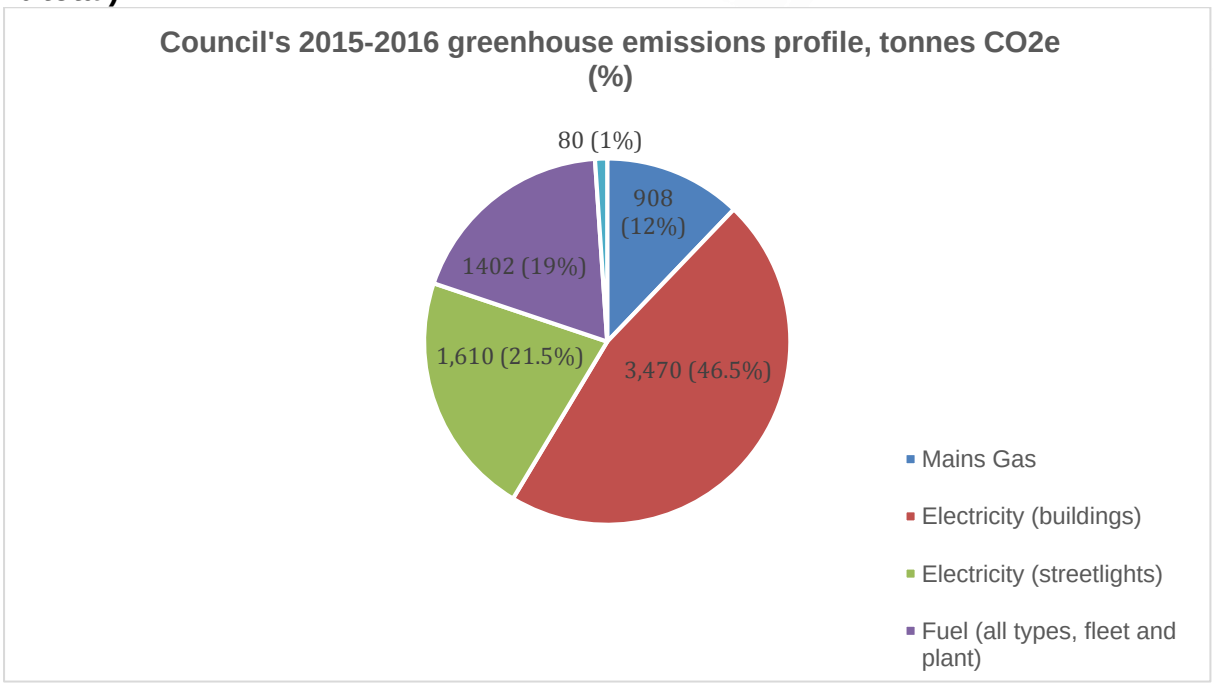
However, to improve its accountability for greenhouse emissions, Council may calculate emissions associated with corporate waste. While there is no accurate data about the quantity of waste generated from Council's own operations and associated emissions, it is reasonable to assume that it would equate to approximately 50 tonnes, based on known data of similar sized councils.

Table 2: Emissions from Council operations by source, 2014-2015 and 2015-2016

Emissions Source	2014-2015 tCO2-e	2015- 2016 tCO2-e	2015-2016 (% of total)
Mains Gas	698	908	12%
Electricity (buildings)	3,580	3,470	46.5%
Electricity (streetlights)	1,775	1,610	21.5%
Fuel (all types, fleet and plant)	1,533	1,402	19%
Other sources (including corporate waste)	54*	80*	1.0%*
TOTAL (*estimates)	7640	7470	100%

As shown in Figure 5 below, almost 60% of the total emissions from Council operations are from electricity and gas used at Council's buildings, 21.5% from electricity use by streetlights, and the remainder from transport (19%). There is also a small amount of emissions from an estimated amount of waste generated at Council work sites, and from minor activities like air travel or unmetered bore pumps. Together, emissions from these sources are estimated to be 1% of Council's total emission sources (represented as "other").

Figure 5: Council's 2015-2016 greenhouse emissions profile (tonnes CO2-e and % total)



Works undertaken by Council in 2015-2016 enabled the organisation's total emissions to decrease from the 2014-2015 baseline figure of 7,640 tonnes to 7,470 tonnes.

Council's emissions reduction target

In 2016 Council adopted the target:

To reduce greenhouse emissions from Council's operations by 25% by 2020-2021 from the baseline year of 2014-2015.

The target effectively equates to a reduction of 1,910 tonnes CO2-e from the 2014-2015 levels of 7,640 tonnes CO2-e (rounded to closest 10), approximately equivalent to the emissions associated with the average lifestyle of 380 Victorians.

In a state-wide context, there are now more drivers for climate change action than there were in mid 2016, as outlined earlier in this Action Plan. Additionally, technology for energy efficiency is rapidly evolving and becoming more cost effective, which increases the feasibility for Council to implement works to reduce greenhouse emissions. This broader context provides a basis for Council's decision:

To plan for to achieve zero net emissions by 2030-2031.

A 'Zero Net Emissions by 2030-2031' report will be prepared by mid 2018 which sets out the works and initiatives required to achieve this target and the associated resource and cost implications to Council. This Action Plan will be updated as required following consideration of the 'Zero Net Emissions by 2030-2031' report by Council.

Council's targets in the context of growth in operations and services

It is anticipated that the shire's population will increase by approximately 2% per year until 2020-2021, meaning that emissions from Council services and operations will increase by approximately the same amount. Current indications are that the associated increase in emissions would be offset by the increased role that renewable energy generation will play in the electricity market, and therefore in the decreased amount of coal-fired electricity purchased by Council.

From this perspective, another way to view the adopted target is on the basis of no change in Council's total emissions profile, so that at June 2021, the total emissions from Council's operations cannot exceed 5,730 tonnes CO2-e.

A potential sub-target

The recently legislated target for renewable energy generation in Victoria provides incentive to Council to consider setting its own target for onsite renewable energy generation. A target could mirror that set for the state, based on electricity demand, or be expressed as a proportion of emissions reduction to be generated from on-site renewable energy. Similarly, the Victorian Energy Efficiency Target can provide a guide for mitigating climate change through energy efficiency. As the legislative drivers and accompanying programs for meeting the state-wide targets are implemented, it may be feasible for Council to set its own sub-targets for the adopted emission reduction target.

There are several benefits in setting sub-targets, like guiding investment in reducing emissions from different types of potential action, demonstrating leadership to the community, and promoting the importance of renewable energy (both on site and at industry scale) in moving away from coal fired power.

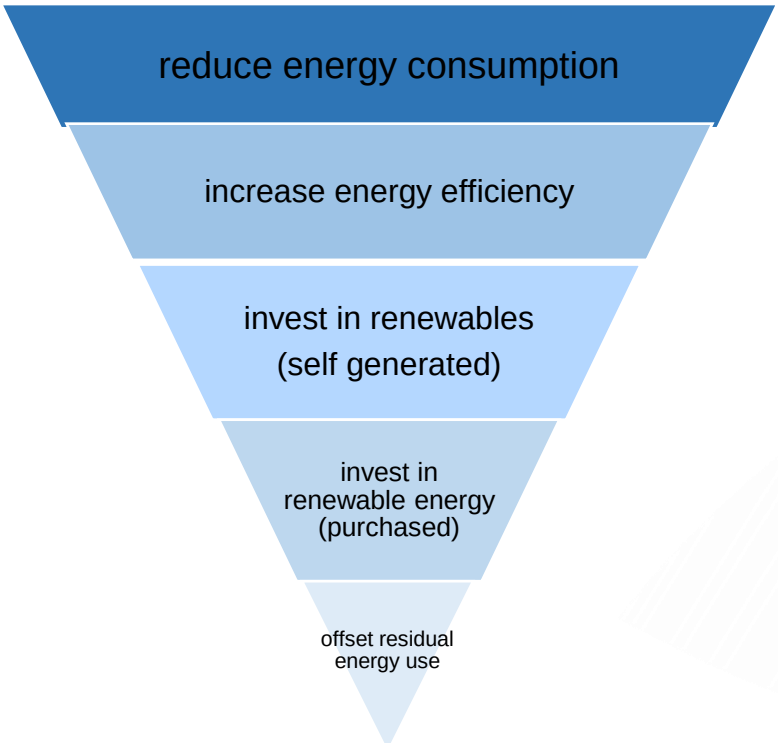
Recommendation

(5.4 in Table 1) Review Council's emissions reduction target in mid 2020, with the view to setting a sub-target for renewable energy generation (for example, a minimum of 25% of Council's emission reduction target (477.5 tonnes CO2-e) is to be achieved through generation of on-site renewable energy).

Achieving our targets

This section outlines potential areas for Council to reduce greenhouse emissions from its own operations. In keeping with Council's adopted policy on climate change, emission reduction opportunities are presented in the context of the energy hierarchy, which encourages action according to long term cost benefits to Council, represented in Figure 6 below:

Figure 6: The energy hierarchy



Benefits of taking action

In addition to the environmental benefits associated with reducing greenhouse emissions, there are a number of other benefits to reducing emissions from Council operations. These include:

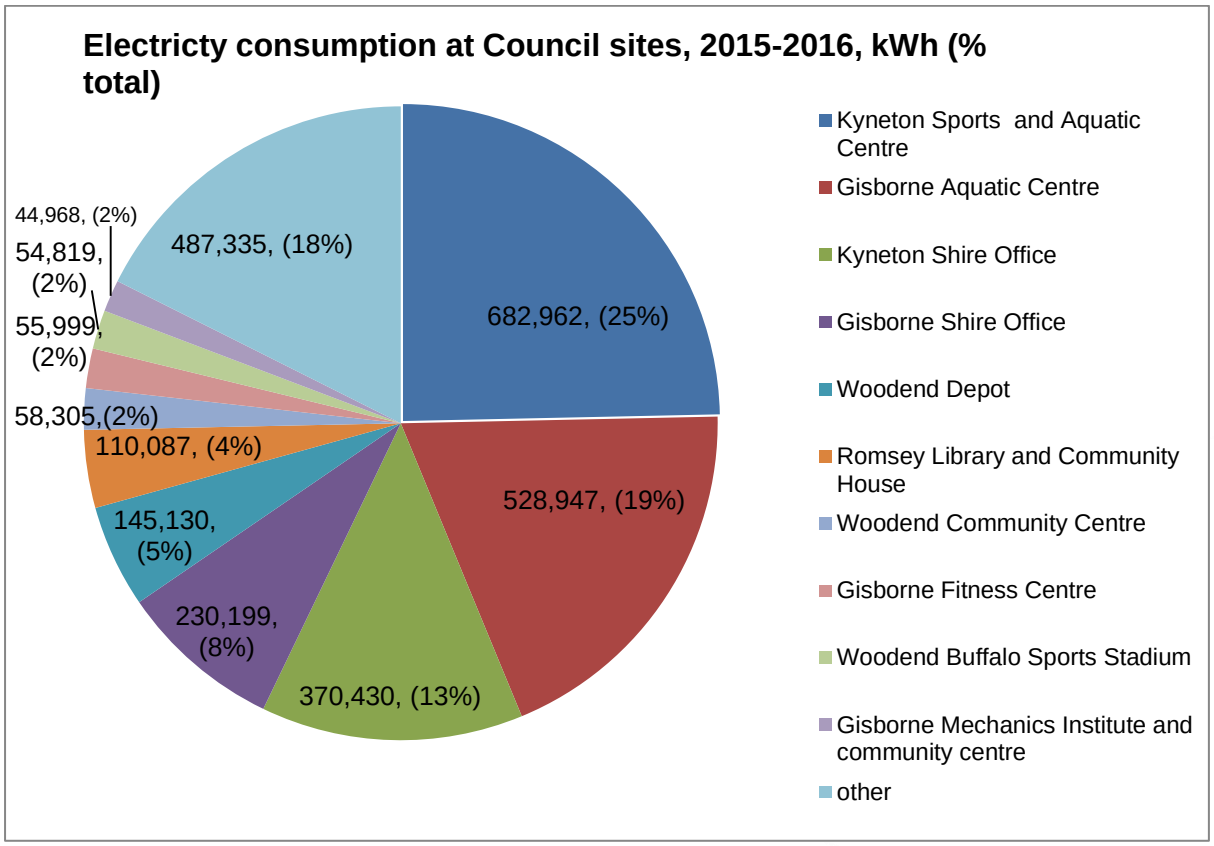
1. Mitigating the impacts of growing energy costs
2. Increasing the property value and reduces maintenance and operation costs.
3. Reducing Councils "carbon exposure" to likely future prices on carbon
4. Improving amenity and comfort in buildings and therefore improving productivity by occupants
5. Improving resilience of buildings to heat waves and other extreme weather events

Reducing emissions associated from operations through various energy efficiency, renewable energy and fuel substitution projects also brings a number of social benefits such as improved comfort in buildings and demonstrated commitment and leadership to the broader community.

Buildings

Figure 7 below shows the relative emissions from the “top ten” user sites of electricity, and serves as a guide to identify where to focus efforts for reducing emissions.

Figure 7: Council’s 2015-2016 greenhouse emissions profile (kWh and % total)



Council has many sites with relatively low electricity consumption which together, consume 18% of Councils’ total electricity consumption (grouped as “other” in Figure 7). While it may seem that action at any one site will not have a great impact, it is important to continue minimising emissions from these sites as opportunities arise, to reduce their cumulative impact on Council’s environmental and financial footprint.

Reducing energy consumption in Council buildings

In terms of the energy hierarchy, actions should first focus on reducing energy consumption. While some gains can be made in this area through works such as ensuring computers and printers switch to standby after a set time of no use, and maximising insulation and sealing gaps around windows and doors to reduce the need for heating and cooling, substantial reductions in greenhouse emissions are also possible through individual behaviour and practices (for example, switching off equipment and lights).

There is also the potential to reduce energy consumption and greenhouse emissions from Council’s profile through ensuring facilities are used efficiently. This may involve rationalising community facilities, maximising use of under-utilised facilities and removing or upgrading appliances and lighting.

Increasing energy efficiency in Council buildings

The second rung of the energy hierarchy promotes a focus on energy efficiency before on site renewable energy generation (third rung). Actions for improving energy efficiency include converting lights to lower wattage LEDs, and ensuring IT equipment and appliances are as energy efficient as possible.

In addition to reducing greenhouse emissions and electricity bills, many actions for energy efficiency provide additional benefits such as improved building comfort and more consistent lighting levels. However, these initiatives can be resource intensive to implement due to complexities often associated with retrofitting existing infrastructure.

Incremental energy efficiency works

A range of energy efficiency actions can be implemented across Council's buildings to meet Council's emissions reduction target.

The study conducted by Ironbark Sustainability allowed for an 8% emissions reduction to be gained through energy efficiency actions, based on known experience in other councils and the size and consumption patterns at Council's existing buildings. Works in this category include installing pool covers, sub floor insulation or motion sensor triggered lights. An indicative cost of undertaking these types of works to reduce emissions by 228 tonnes is around $420,000.

In early 2017, Council installed pool covers at both the Gisborne Aquatic Centre and the Kyneton Sports and Aquatic Centre. The correct use of the pool covers will reduce the need for heating water, and provide ongoing annual emissions reduction of 138 tonnes CO2-e.

Council should continue to upgrade components of buildings to improve energy efficiency as opportunity arises, and where plant and equipment is coming to the end of life. For example, the gas boilers at the aquatic centres have been installed within the past five or six years, so rather than replacing them with high efficiency boilers now while they are still in good operating order, they could be replaced closer to their end of life.

In some cases commissioning a detailed energy audit may be warranted in order to identify areas for maximising energy efficiency and emissions reduction, for example, at the Kyneton Mechanics Institute or the Kyneton Town Hall, which are both high energy users with structural constraints and heritage considerations.

Recommendations

(1.3 in Table 1) Undertake works to minimise energy consumption and maximise energy efficiency as circumstances allow and upgrades are undertaken at Council buildings (for example, installing timers, sensors, insulation, etc).

(1.4 in Table 1) Conduct specialised energy audits for problematic buildings to identify optimal works for reducing emissions (for example, performance venues).

(1.5 in Table 1) Assess the feasibility of replacing gas boilers at the aquatic centres and the Kyneton Mechanics Institute with high efficiency gas boilers (or other best practice technology when existing boilers are close to end of life.

Lighting

Improvements in lighting technology means that replacing lights with LEDs is an attractive option for increasing energy efficiency. LEDs require less power and less maintenance, with a longer life than other types of indoor lights, thereby resulting in reduced operating costs to Council, and reduced emissions. Reducing emissions through LEDs costs approximately $780 / tonne abated over the life of the lights (15-20 years).

Ironbark Sustainability estimated that almost 50 tonnes of emissions could be abated through retrofitting internal lights with LEDs. Depending on the types of existing lights to be replaced and the amount of power they draw, meeting this target translates to changing a total of around 1,000 lights at a cost of approximately $40,000. An inventory of indoor lighting across all buildings is required to determine if it's possible to achieve this reduction, and the cost.

As a standard practice, LEDs are installed whenever existing lights need replacement. Additionally, several changeovers have occurred, including the changeover of 225 lights at the Gisborne shire office with 181 LEDs, and the change to LEDs in the pool area and foyer of both aquatic centres. In 2016-2017, 180 lights at the Gisborne community centre (including library and mechanics institute) were replaced with LEDs.

Some Council buildings have lighting requirements specific to their use, like the stage at Kyneton Town Hall. As technology improves and becomes more accessible, low energy / high efficiency special purpose lighting can be installed, either as lights require replacements, or as a bulk changeover. For example, the refurbishment of the Bluestone Theatre included installation of colored LED lights in the seating area, and some LED stage lights have been installed at Kyneton Town Hall.

Recommendation

(1.2 in Table 1) Continue to replace indoor lighting with LEDs as circumstances allow and conduct proactive changeovers at high use buildings.

Renewable Energy

Solar power generation

The most common way for generating renewable energy onsite is through installing solar panels (also termed solar photovoltaic systems, or solar PV) on the roofs of buildings. The price of solar panels has decreased in recent years while the technology has improved. This means that in cases where a building's structure is sound and its orientation is favourable, generation from solar panels may be more attractive than undertaking multiple energy efficiency works.

Currently, 1kW of solar provides approximately l.3 tonnes of emissions abatement and has an upfront cost of approximately $1,000 per tonne of greenhouse gas emissions abated each year over the project life of 25 years.

In the past couple of years, Council has installed solar panels at several sites. The extension and refurbishments to the Gisborne Shire Offices included installation of a 30kW system, the construction of new Early Years Hub at Gisborne included installation of a 5kW solar system, and a 5kW system was installed at each of Romsey, Macedon and Woodend kindergartens.

The environmental and financial benefits of the solar panels at the Gisborne Shire Offices are outlined in **Appendix 3.**

In 2016 the Alternative Technology Association (ATA) assessed the financial viability and environmental benefits of installing solar panels on 18 Council buildings, selected according to structural suitability and roof orientation. The feasibility of installing additional solar panels on the roof of the Gisborne Shire Office was then assessed in early 2017. The findings of the analyses and modelling are summarised in Table 3 below.

TABLE 3: Key metrics for current and potential solar panel installations on Council buildings.

Size	Size (kW)	tC02e/yr	Budget (from 2017-2018)	Estimated Annual Savings	Payback (yrs)
Gisborne Shire Offices	30	39.7	✓	✓	✓
Gisborne Shire Offices (additional 50kW)	50	67.5	$62,500	$7,200	9
Kyneton Sports Aquatic Centre 30kW	30	39.7	$40,000	$4,000	10
Kyneton Sports Aquatic Centre 99kW *	99	131	$121,770	$12,685	10
Gisborne Aquatic Centre 30kW	30	39.7	$40,000	$4,000	10
Gisborne Aquatic Centre 99kW *	99	131	$121,770	$12,485	10
Woodend Depot	30	39.7	$38,700	$4,087	9.5
Gisborne Mechanics Institute – Community Centre	20	26.4	$27,000	$3,230	8.5
Gisborne Library	10	13.2	$13,500	$1,581	8.5
Kyneton Mechanics Institute	10	13.2	$13,500	$1,166	11.5
Kyneton MCHC / pre-school**	5	6.6	$7,250	$511	14
Lady Brooks Kindergarten	5	6.6	$7,250	$355	7.8
Tony Clarke Reserve – Sports Centre	10	13.2	$13,500	$1,373	9.8
Macedon kinder	5	6.6	✓	✓	✓
Riddells Creek MCHC / kinder	5	6.6	$7,250	$355	7.8

Size	Size (kW)	tC02e/yr	Budget (from 2017-2018)	Estimated Annual Savings	Payback (yrs)
Riddells Creek Recreation Centre	10	13.2	$13,500	$736	9.2
Romsey Recreation Centre	10	13.2	$13,500	$1,558	8.8
Romsey Library and Community House	30	39.7	$38,700	$4,958	8.4
Romsey MCHC	5	6.6	✓	✓	✓
Swinburne Avenue kinder**	5	6.6	$7,250	$560	15
Woodend Community Centre	20	26.5	$27,000	$3,302	8.2
Woodend Buffalo Sports Stadium	10	13.2	$13,500	$1,716	7.9
Woodend Kindergarten	10	13.2	$13,500	$1,386	9.7
TOTAL (with 30kW at GAC and KSAC) (	290	383.4	$348,400	$34,864	**9 (av)*** **
TOTAL (with 99kW at GAC and KSAC, and additional 50kW at Gisborne)*	478	633.5	$574,440	$59,034	**9 (av)*** **

*Installing a 99kW system at the aquatic centres is subject to approval by Powercor.
**While the installation of solar panels at the two kindergartens may not be financially feasible due to long payback periods, they are included in this list due to their high demonstration value.
***Excludes the long payback period of two kindergartens

Based on analyses to date, it is feasible for Council to reduce its greenhouse emissions by approximately 380 tonnes through installation of solar panels, equating to almost 20% of the total abatement required to meet the adopted 25% reduction target. Dependent on approvals from Powercor for connection of larger systems, emissions reductions from solar panels at Council buildings could increase to over 630 tonnes, or almost 33% of the total abatement required for Council to meet its 25% reductions target.

There may also be further potential to reduce emission from installing solar panels at sites not included in Table 3, for example, the Kyneton Town Hall.

Recommendation

(1.1 in Table 1) Install solar panels on selected Council buildings, according to recommended or optimal system sizes.

Funding options

Two pathways exist for funding installation of solar systems:

- ***The main road:*** fund installations on a site by site basis, through the normal capital works and budget planning process over the next four years.

- ***The short cut:*** fund installations as one large project. This approach generates project management efficiencies and provides a means for Council to realise financial savings sooner than would occur in the normal capital works and budget planning process. In commencing implementation of this plan with a commitment to meeting the adopted emissions reduction target, Council is providing $450,000 for solar panel installation and energy efficiency works in 2017-2018.

Re-investment options

The cost savings generated from renewable energy projects can be either absorbed into general revenue in line with standard financial and budgeting processes, or set aside and re-invested in further energy efficiency projects through a "revolving energy fund" represented graphically in Figure 8 below.

Figure 8: Representation of a "revolving energy fund".

The study conducted by the ATA reviewed options for establishing a "revolving energy fund" to fund solar panel installations on Council managed buildings. There are many models for how a revolving fund may be established, generally falling into two types:

- Internal fund – Council provides the capital for funding installations, and the savings are set aside and re-invested by Council into other works for energy efficiency or renewable energy. An internal revolving energy fund requires a separate accounting process to track the related expenditure and returns on investment from works undertaken to improve energy efficiency or generate renewable energy.

- Community-Council partnership fund – a community group funds the purchase and installation of panels on “rented” roof space (typically Council-owned, community-use buildings), and sells the power to Council, using the “income” to reinvest into other renewable energy projects. This approach redirects expenditure on electricity into the local community rather than a commercial energy retailer.

A current example of a council-community partnership fund relates to the library at Bendigo, where the Bendigo Sustainability Group rents roof space from the City of Greater Bendigo, manages the panels it purchased and installed on the roof, and now sells the power generated to Council through a Power Purchase Agreement. This means that there is no capital outlay to Council for purchasing panels, and that Council pays for power to a local community group instead of a commercial energy retailer. The Bendigo Sustainability Group can then reinvest money into other community renewable energy projects.

A more local example exists within a program of the Macedon Ranges Sustainability Group (MRSG), namely the Macedon Ranges Revolving Energy Fund (MrREF), whereby the group purchased and installed a 40kW system on the old Black Forest Timber Mill. Most of the energy produced is used by the tenants on site, who pay for their electricity use into MRSG's MrREF. Over the 25 year life of the panels. MrREF will use this income to fund other community energy projects in the shire.

Several other community-council partnership models for renewable energy generation exist across Victoria, and current work by state government to facilitate community energy projects is expected to result in streamlined processes for both community groups and for partners like local councils. For example, governance guidelines are being refined as they are shared amongst existing projects, and there are templates for Power Purchase Agreements that can be accessed by partners in a joint project.

The study conducted by the ATA mapped three approaches to establishing a council – community partnership, with varying degrees of Council support (minor, medium (collaboration), and high (partnership project)). The approaches have varying degrees of governance and contractual arrangements involved, summarised in Table 4 below.

Table 4: Summary of three approaches to a council – community partnership for funding solar panel installations

Approach	Example	Advantages	Disadvantages
Minor	Council redirects savings from its own works for energy efficiency to a stream of the community funding scheme (CFS) targeted for renewable energy projects. The community partner organisation works with interested community groups to access funds and install panels.	A relatively low level of governance between Council and community partner organisation. Promotes community climate action through CFS.	Low drivers for the community partner organisation to work on Council owned sites. High level of volunteer time required by community partner organisation.

Approach	Example	Advantages	Disadvantages
Medium	Council rents roof space to community partner organisation who purchases and installs panels, and sells power to Council through a Power Purchase Agreement. Council represented on board of community partner organisation in a high level governance role.	Good demonstration of council - community partnership to reduce emissions in the wider community. Council diverts payments away from commercial energy retailers to the local community.	Need more governance and reporting processes for both the community partner organisation and Council, including roof rental agreement, Power Purchase Agreement and memo of understanding (examples exist that can be adapted to a local project). Council saves on the capital cost of panels. Financial benefits to community partner organisation and Council.
High	A cost shared arrangement for installations, potentially on a larger scale, for both capital outlay and operations. Council takes an active role on board of community partner organisation to co-manage projects	Once established, could accelerate climate action at a large scale	More resource intensive for both Council and the community partner organisation.

The study identified that a collaborative approach for funding solar panels would be viable for the Woodend Community Centre, and almost equally as viable for several other Council-owned community-use buildings.

There is also opportunity to establish a partnership for funding solar panels at Council owned buildings that are managed by a third party. For example, buildings like the Gisborne Business Incubator, which is leased to training provider Workspace and tenanted by several emerging businesses, may be a candidate for a partnership between a community partner organisation and Workspace, with Council providing the roof space for the installation. A similar arrangement could apply to the Council-owned neighbourhood houses that don't already have panels on roofs. As Council does not pay the electricity bills for these sites, the savings in greenhouse emissions cannot be attributed to Council's emissions profile or reduction target, but installation of panels on such buildings is an effective way for Council to facilitate climate action in the broader community through management of its own assets.

Both the Bendigo Sustainability Group and the Macedon Ranges Sustainability Group, as accredited energy retailers, have expressed interest in partnering with Council in a trial council-community funding arrangement.

Recommendation

(1.9 in Table 1) Investigate options for a trial community – Council partnership to install solar panels at either a Council owned and managed site like the Woodend Community Centre, or a Council-owned and third party managed site like a neighbourhood house, with a view to establishing a trial in 2017-2018.

Undertaking works to buildings

There is no one 'correct' approach for undertaking works to reduce emissions from Council buildings - the approach will vary from council to council, dependent on several factors like building stock, management arrangements, and financial resources and staff capacity. Some councils approach building management through formal policy and accompanying procedures, for example, setting minimum performance standards for buildings, and funding retrofits to meet standards. For example, Moreland City Council has a Sustainable Building Policy, and Yarra City Council has an Environmentally Sustainable Design (ESD) Buildings Policy. The two councils also worked together to develop an audit sheet for smaller buildings, under a program "sustainable small facilities" which can be accessed through the Municipal Association of Victoria and Ironbark Sustainability.

Although there is currently no formal approach to managing buildings for maximising energy efficiency through current processes at Council, there are several platforms that allow this to happen in future. Council's asset management strategy requires building condition audits to be conducted every five years, with the results informing capital works plans and budgets. The Assets Management Plan (in particular, Part C: Buildings) addresses different aspects of building management, including maintenance, upgrades and renewals. Both the building condition audits and the Asset Management Plan provide avenues to assess and progress energy efficiency (or more broadly, environmental performance) of buildings in a systematic manner. For example, there may be scope in the audit process to include energy audits for nominated buildings and / or for major upgrades to buildings. Additionally, as a support tool, Council's Assets Management System (Assetic - myData) can accommodate modules for different asset types, providing the capacity to record and track capital and maintenance works.

At a broader level, there is also scope to address climate change through budget planning processes of Council, for example, when scoping capital works projects or masterplans or precinct plans, or developing strategies and policies for Council.

Recommendations

(1.6 in Table 1) Develop an Environmentally Sustainable Design (ESD) guideline that seeks to maximise the environmental performance of new buildings and major upgrades. Incorporate the guideline into the Assets Management Plan Part C. Develop support materials and procedures to facilitate implementation of the guideline.

(1.7 in Table 1) Develop and implement guidelines for upgrades to "small use" buildings for environmental performance standards. Develop support materials to facilitate implementation of guidelines (for example, requiring an energy audit, or including a checklist in building condition reports to apply to nominated buildings) that can then inform works programs for upgrades and retrofits to buildings.

(1.8 in Table 1) Implement the Work Order and Maintenance module of Council's asset management system. Establish a process to ensure optimal use of the module, ensuring that information is recorded to enable the environmental and financial impact of works to be measured and monitored, to facilitate more informed decision making, improved long term management and a greater ability to plan for the service needs of present and future generations.

(4.4 in Table 1) Investigate opportunities to amend internal procedures regarding budget planning to facilitate the integration of climate change into decision making across Council, particularly in regards to management of assets and delivery of services. For example, refine criteria for environmental consideration in templates for new initiative and capital works bids to increase the focus on greenhouse emissions at design, construction and operational stages.

Showcasing works to buildings

Improvements for environmental sustainability are being made from several perspectives at buildings associated with Council's Early Year's Services. 5kW solar panel systems have been installed at each of Romsey, Macedon and Woodend kindergartens. New shade features (natural and built) are being installed at Woodend and Riddells Creek early years centres, and at Manna Gum Early Years Hub. Upgrades are planned to the Riddells Creek and Romsey early years centres within the next four years, providing the opportunity to improve the environmental performance of the buildings, for example, installing solar panels, and installing energy efficient heating and cooling systems.

Additionally, the recent construction of Manna Gum to high environmental performance standards can inform development of early year's facilities in the future. Environmental design features at Manna Gum include solar hot water, double glazed windows, automated ventilation using temperature sensors, and rainwater tanks connected to toilets, and native vegetation in landscaping, all examples of building for a changing climate. The features provide opportunity for introducing students to the practical application of subjects for STEM (science, technology, engineering and mathematics), and for demonstrating climate action to the broader community. For example, the building could include display panels in walls to show insulation, and display meters to track generation of energy on site.

Maximising the environmental performance of buildings used for early years services will support several other initiatives underway. As part of their accreditation under the Australian Children's Education and Care Quality authority, the kindergartens meet standards specified under seven National Quality Care criteria, maintain their rating of "exceeding" standards. This includes Standard 3.3 under "Physical environment:

Standard 3.3 The service takes an active role in caring for its environment and contributes to a sustainable future.

Element 3.3.1 Sustainable practices are embedded in service operations.

Element 3.3.2 Children are supported to become environmentally responsible and show respect for the environment.

In practice, this includes teaching environmentally responsible practices to children, through a Reduce-Reuse-Recycle approach to waste, and a water-wise approach to water, alongside visible examples of energy conservation. The high public profile of early year's buildings provide an ideal opportunity to promote a coordinated approach by Council to demonstrate and promote climate action to the broader community.

Recommendation

(1.10 in Table 1) Establish a showcase project with a focus on buildings for Early Years' Services, for example, "Greening young environments". The showcase project would include a works plans for existing and new buildings, and integrate physical works with delivery of services, to promote a coordinated commitment to high environmental performance and practices at the facilities.

Energy Security

In considering the rapid rate of technological advances in on site electricity generation, it is opportune for Council to consider securing power supply at one or more key sites through installation of a battery system, whereby excess power generated by day can be stored and drawn overnight, or provide a back-up supply of power in case of power blackouts. This may be particularly appropriate at sites where Council wants to ensure that operations and / or information and communications technology will not be affected in the event of power blackouts, or at sites with consistent energy demands in the evenings.

Additionally, installation of solar panels to allow for potential connection to battery storage will enable Council to "future proof" its buildings in regards to energy supply.

Recommendation

(1.11 in Table 1) Investigate opportunities to trial battery storage of electricity at a suitable Council facility. Aim to ensure installation of solar panels will be compatible with potential connection to battery storage.

Public Lighting

Streetlights

The management arrangements for street-lighting is complex, with host distribution businesses (Powercor for most of the shire) owning the poles, wires and the lights, and Council paying for the electricity used by lights. As electricity consumption by streetlights is not metered, billing charges are based on the number and type of lights and the kilowatt hour (kW) cost for the total amount of power drawn over the hours of operation. In general, Council pays 100% of costs associated with lights in residential streets (P lights), and shares the cost of electricity and maintenance of lights on major roads (V lights). Council can select the type of light used in residential areas, but has little influence on the type of light on major roads. Council also pays an Operation Maintenance and Repair Charge to Powercor, which differs according to different types of lights. Additionally, there are some lights classed as "non-standard" (includes decorative and feature lighting), often with complex ownership and maintenance implications depending on whether the lights are associated with new subdivisions or specific infrastructure like bridges.

Council has approximately 2,500 residential streetlights and approximately 480 cost-shared lights on major roads, the source of 1610 tonnes CO2-e in 2015-2016, or 21.5% of Council's total emissions profile (refer to Figure 4). Upgrading suitable residential street lights (mostly 80W mercury vapour lights) to LEDs will reduce energy consumption and associated greenhouse emissions, improve the lighting quality, and improve personal safety at ground level. A summary of the financial benefits for changing over streetlights to LEDs is presented in Table 5.

Council's current street light replacement program

In mid 2016, Council commenced its street lighting changeover program by replacing the 100 residential lights in Lancefield with energy efficient LEDs. There are a further 55 LEDs across the shire, installed in new developments or as "repairs" to no-longer-functioning lights.

In its 2016-2017 capital works budget, Council allocated approximately $1M to complete the changeover of residential streetlights to LEDs, and is currently undertaking this work with Powercor. The project was informed by a feasibility study conducted in 2015 by Ironbark Sustainability, which determined the environmental and financial benefits of having LEDs as residential streetlights (see Table 5 below).

As part of Council's move to become a "Smart City", Council is looking to purchase a more sophisticated light fitting (with a photoelectric (PE) cell) which will enable Council to fit the lights with a range of different sensors to monitor local conditions, including metrics such as localised weather conditions, air quality and traffic numbers. The business case presented in Table 5 is likely to be a bit different with the inclusion of PE cells.

Table 5: High level business case for changing over residential street lights

Business case element	Amount
Number of residential streetlights to be changed	**2186**
Council Project Cost	$1,074,422
Net Present Value	$1,238,100
Simple Net Savings (20 yrs)	$2,095,447
Payback Period[9]	7.85 yrs
Project Greenhouse Savings over life of lights	17,319 tonnes
Annual greenhouse savings from completion of installation	813.5 tonnes
Average annual financial savings	$104,772

The changeover of streetlights being undertaken in 2016-2017 will result in ongoing annual savings of 813.5 tonnes CO2-e, a substantial portion of the 1910 tonnes needed to mitigate to reach the adopted emissions reduction target.

The changeover does not include major road lighting (cost shared with Vicroads) or non standard (or decorative) lights. Decorative lighting retrofits have additional costs and therefore a weaker business case. A major road lighting retrofit will require advocacy to and partnership with VicRoads, who are co-owners of the lights. It will also need support from the host distribution business (mostly Powercor) to allow the installation of new technology.

[9] *The business case for changing streetlights involves complex financial analyses, using an agreed approach to modelling used by the Municipal Association of Victoria and Ironbark Sustainability. The analysis accounts for projected changes in tariffs and OMR charges over the life of the lights, and includes a discount rate in the cash flow analysis. This means that the annual savings are reduced over the life of the lights, with greater savings in the first few years after installation. Therefore, the payback period is not equivalent to the capital cost divided by the average annual savings.*

These works could be considered over the life of this Action Plan, potentially as part of a regional solution. The business case for both cost shared lights and decorative lights will need to be prepared and works scheduled into the budget planning process.

Council's management of street lighting and relevant regulations (for lighting output, etc) is outlined in Council's street light policy (Section 3.4 in Policy – Engineering requirements for infrastructure construction. The policy is due for review, providing an opportunity for Council to specify its preferences and requirements for decorative lighting in new developments and as feature lights.

Recommendations

(2.1 in Table 1) Continue to investigate the possibility of changing over cost shared streetlights to energy efficient lights, possibly through a regional partnership involving Powercor, VicRoads, relevant councils and other stakeholders.

(2.2 in Table 1) Investigate the feasibility of converting non-standard / decorative lights to energy efficient lamps, accounting for feature lighting and for lights in now developments that will become the responsibility of Council.

(2.3 in Table 1) Update Council's street lighting policy (section 3.4 in Policy – Engineering requirements for infrastructure construction) to reinforce lighting output stands and regulations, and specify Council's requirements for light types in new developments as feature lighting.

Metered public lighting

In addition to streetlights, Council is also responsible for metered public outdoor lighting, including in settings such as carparks and at sports fields and tennis courts. Upgrades to lighting at sports fields have either recently been completed or will be undertaken in the near future. The use of LEDs for lighting sports fields is a relatively new area of action for energy efficiency and emissions reductions, with only a few projects underway at the local government level. Council can observe outcomes as projects progress in other local government areas over the next few years, and determine the feasibility of replacing existing lights in the future when they approach their end of life. The contribution these works can make to meeting Council's emissions reduction target can be determined closer to the time of planning works in detail.

Recommendation

(2.4 in Table 1) Identify the most energy efficient lighting for special outdoor uses like sports fields, and plan to upgrade lighting for maximum energy efficiency and emissions reduction when undertaking planned works. Monitor the impacts of works through analysis of electricity accounts.

Fleet and Plant

Fleet

The emissions from fuel consumption associated with Council's fleet and plant make up 19% of Council's total emissions profile (1,402 tonnes CO2-e)

In a shire like Macedon Ranges containing three main towns and nine small towns spread across 1,745km2, limited options exist to reduce use of fleet vehicles for work purposes. The scope for reducing emissions from Council's fleet is restricted to upgrading its fleet to incorporate fuel efficient and hybrid or electric vehicles, and refining fleet management so that only travel undertaken for work purposes is reflected in Council's emissions profile.

Upgrading fleet vehicles

The efficiency and technology of cars is improving at a rapid rate, providing opportunity for Council to trial new vehicles in a regional setting. There has been significant advancement in the Australian hybrid and electric vehicle market over the past few years with a number of state and industry trials taking place, a more evident network of recharge stations being established and the release of electric vehicle standards. There is enough data to determine that from a financial perspective, there is a favourable business case for replacing passenger fleet vehicles doing less than 16,000km/yr with a hybrid vehicle (such as a Camry) and replacing passenger fleet vehicles doing more than 16.000km/yr with an electric vehicle (such as a Nissan Leaf). Additionally, there are a number of pilots and trials for hybrid and electric commercial and heavy vehicles underway, presenting the possibility of reducing emissions from non-passenger fleet vehicles.

The study undertaken by Ironbark Sustainability identified the potential to reduce emissions from Council's fleet by 51 tonnes CO2-e, through the adoption of new vehicle technology, summarised in Table 6 below.

Table 6: Potential emissions reductions from Council's fleet

Action	tC02e	Capex ($)	Annual Savings ($)	Payback (yrs)
Replace 12 existing passenger fleet vehicles with hybrid vehicles over the life of this plan	45	$75,000.00	$25,000.00	3
Add an electric vehicle in the fleet and install two electric vehicle charge stations.	6	$30,000*	TBD	TBD
TOTAL	**51**	**$105,000**	**TBD**	**TBD**

*Cost of electric vehicle above cost of equivalent fleet vehicle. Excludes the cost of installing charge stations, which can vary widely depending on capacity and compatibility with different battery types in electric vehicles (from $5,000 to $45,000)

Refining fleet management

Council's current arrangements for vehicle use by staff is governed by its Vehicle Policy. The policy encourages the selection of "environmentally favourable" vehicles, but adherence to the recommendation does not appear to be monitored. The policy also promotes selection of "fit for purpose" vehicles, but this only applies to unit coordinators and eligible officers of Council, not to staff on higher bandings. There is scope to strengthen these aspects and other provisions in the Council vehicle policy to maximise the efficiency of Council's vehicle fleet and minimise emissions associated with its use. For example, the policy could specify a restricted number of high performing vehicles for staff to select, and assessment of fit for purpose could apply made for all eligible staff based solely on work requirements.

Additionally, Council's current processes for recording travel by staff in fleet cars do not distinguish between commuter travel, business related travel, and personal travel. This means that the current figure for emissions from Council's fleet is greater than emissions associated with travel for work purposes, as at present, it is based on fuel consumption for all types of travel undertaken in fleet vehicles. Processes need to be refined to facilitate a more accurate and effective approach to accounting for emissions from fleet vehicles attributable to Council operations.

Aside from actual types of vehicle in the Council fleet, driver-behaviour programs like EcoDriver[10] and incentives for alternative transport can encourage staff to reduce driving and associated emissions, while also providing financial savings to organisations like councils and health benefits to staff. For example, established programs like Commuter Club enable organisations to purchase yearly travel passes at a 10% discount then deduct the cost from staff pay, providing a financial incentive to staff to commute to work via public transport.

Other arrangements, like establishing video conferencing at Council offices, can also reduce travel for business related purposes, not only reducing emissions and costs of travel, but also saving staff time.

Recommendations

(3.1 in Table 1) Replace 12 existing fossil fuel vehicles with hybrid vehicles over the life of this plan, subject to ensuring suitable vehicles are available that meet Council's needs at an appropriate cost.

(3.2 in Table 1) Trial an electric vehicle in Council's fleet, including the installation of electric vehicle charging stations at the Kyneton and Gisborne offices (or other suitable locations) subject to ensuring a suitable vehicle model is available that meets Council's needs at an appropriate cost. Investigate options for allowing and managing public access to these charge stations.

(3.3 in Table 1) Review and amend Council's vehicle fleet policy to increase the efficiency of the vehicle fleet while facilitating emissions reductions. Consider amendments like updating section 10 to guide selection of hybrid or electric vehicles and explore means of providing incentives and disincentives to favour specific vehicles, selected for environmental performance standards and suitability to work requirements.

[10] EcoDriver – a driver behaviour program aimed at reducing emission through training staff to drive vehicles to maximum efficiency. A trial conducted by the Eastern Alliance for Greenhouse Action (EAGA) and South East Councils Climate Change Alliance (SECCCA) led to a reduction in fuel consumption and emissions, thereby generating savings to councils https://eaga.com.au/projects/eco-driver/

(3.4 in Table 1) Develop and implement a fleet management system to improve data collection processes regarding use of fleet vehicles, enabling a more accurate picture of travel patterns to be obtained, and an accurate emissions profile relating to business related travel to be determined.

(3.5 in Table 1) Investigate the suitability and feasibility of the Commuter Club program for Council staff, or explore establishing similar incentives for alternative transport suited to staff travel patterns.

(3.6 in Table 1) Continue development of video conferencing facilities or other systems that support remote communications to reduce the need for travel between work sites for meetings.

Plant

There is currently little scope for reducing emissions associated with fuel use by Council's operational plant (heavy duty works vehicles), although as indicated above, this is likely to change in the next few years with improvements in alternative fuel vehicles. For example, the increasing capacity of hydrogen fuel trucks may enable replacement of some heavy vehicles in Council's plant, thereby reducing emissions.

Waste

The emissions generated from municipal waste are accounted for at the receiving landfill site. As Council does not operate any landfill, waste is not included in its emissions profile.

However, the management and disposal of municipal waste continues to cost Council money, and costs the environment. In particular, household waste which generates methane – and is largely avoidable – costs Council money in collection, transport, and landfill fees, and when converted to CO2-e, is very greenhouse intensive.

An audit of 300 household bins (100 in each of Gisborne, Woodend, and Kyneton) undertaken in late 2014, showed average household bin contain 9.9 kg of waste, with 59% of this being unavoidable waste. The audit found that an average 41% of bin content could be diverted from landfill - 25% is food waste, 7% is garden waste, and 4% is recyclable paper products (5% is recyclable plastics). While it is outside the immediate scope of this Climate Change Action Plan to address the diversion of this greenhouse intensive waste from landfill, it needs to be acknowledged that there is significant potential to reduce emissions and cost to Council through diverting greenhouse intensive waste from landfill. Current initiatives for reducing waste to landfill include:

- Council is currently participating in a region-wide feasibility study for sending greenhouse intensive garden waste from the household collection service and from its own operations to a bio-digester proposed to be established in Daylesford. This would divert organic waste from landfill, and convert it to energy, thereby offsetting energy consumption at nominated site(s).

- In regards to hard waste deposited at transfer stations, a feasibility study into establishing a "tip shop" at one of Council's transfer stations was conducted in 2015. The proposed budget bid for 2017-2018 includes an allocation to modify infrastructure at the Kyneton transfer station to enable the establishment of a tip shop. While the reduction in emissions may be relatively minor, diverting hard waste from landfill also reduces emissions associated with transport of hard waste to landfill.

At the household level, to encourage reduction of organic waste in the wider community, Council currently subsidises the cost of worm farms and compost bins to residents, and conducts workshops regarding their maintenance.

In regards to its own operations, Council does not have data regarding waste generated at its works sites and from its activities. Work is underway to improve data management systems which will allow a greenhouse emissions figure associated with corporate waste to be determined, in accordance with the Waste Management Strategy adopted in December 2014. In the interim, a figure of 50 tonnes CO2-e is allowed for in Council's emissions profile, based on known data from similar sized councils. Council is working to reduce waste from its corporate activities, for example, staff manage worm farms at the Gisborne and Kyneton offices and the Woodend depot to divert food waste from landfill and most Council work sites have receptacles for recyclable materials. Additional initiatives to reduce emissions through everyday practices at work sites can be explored through a renewed Green Team.

There are no recommendations in regards to waste presented in this Climate Change Action Plan, as the need to improve data collection processes to enable corporate waste to be quantified is addressed in Council's existing Waste Management Strategy.

Green Power / Offsets

The 4th and 5th rungs of the energy hierarchy relate to consumption of renewable energy generated elsewhere (sold as accredited GreenPower) and purchase (or establishment) of alternative forms of offsets, such as paying a premium for reforestation programs.

GreenPower is regarded as an indirect investment, in that purchasing accredited GreenPower supports investment in renewable energy capacity by the party that generates the renewable energy, meaning that the co-benefits associated with the investment may occur anywhere in Australia. The return to Council is indirect, and at a much lower level than a direct investment in on site energy efficiency works or renewable energy generation. In the absence of a price on carbon, there is no direct financial return to Council from the purchase of GreenPower. On this basis, it makes more sense for Council to maximise their investment in local energy efficiency and renewable energy options prior to deferring to GreenPower or voluntary carbon offsets to meet their ongoing carbon emissions abatement goals.

Council currently purchases 5% of its electricity requirements as Green Power, attracting a premium per kW. Until mid 2016, this premium was substantial, for example, it cost Council an additional $1,200 / year to purchase electricity for Councils' largest consumption site, the Kyneton Sports and Aquatic Centre. A new contract brokered through Procurement Australia commenced on I July 2016, which included much lower premiums for Green Power. Regardless, it should be acknowledged that although purchase of Green Power is in accordance with a Council resolution of 2009, purchase of Green Power is on a lower rung of the energy hierarchy, and does not provide any ongoing benefits to Council or the local community.

Accredited offsets for vehicle emissions include Green Fleet, whereby membership funds investment in selected projects like establishment of biodiverse forests, to offset emissions associated with vehicle use. Council does not subscribe to any offset program for emissions associated with fleet or other operations.

Recommendation

(4.1 in Table 1) Withdraw the purchase of Green Power through Council's electricity supply contract. Re-assess progress towards the emissions target in mid-2020 to identify if purchase of Green Power will be needed to meet the reduction target.

Extending Council influence

Purchasing and Procurement

In addressing the 2016 Municipal Association of Victoria (MAV) Environment Conference on 12 July 2016, Rob Gell emphasised the importance of the influence that local government can have on broader climate action through it's procurement procedures and practices.

Influencing environmental outcomes outside of local Council through purchasing and procurement and is most effective when policy is supported by tools to enable policy to be enacted. Programs like EcoBuy provide guidance and support in the form of technical references and application tools to assist councils in adopting and practicing procedures for sustainable purchasing and procurement (for example, lists of suppliers and providers with high environmental performance standards, or modules to finance systems). Any program for sustainable purchasing and procurement needs to be supported by organisational leadership and organisation-wide application and monitoring to be effective.

Council's Environment Strategy adopted in June 2016 includes the policy statement:

"Council will aim to incorporate outcomes for resource efficiency at the broader level through its wide range of procedural policies and processes".

"Environmental benefit" is now included as a mandatory evaluation criteria for procurement of its major goods and services. One component of the criteria is: *Reducing greenhouse emissions (maximising energy efficiency, generating or purchasing renewable energy, minimising emissions from transport, and purchasing ethical offsets for greenhouse intensive activities like air travel)*.

Recommendation

(4.2 in Table 1) Continue to develop and apply processes for ensuring environmental criteria are adequately addressed and assessed in the procurement of goods and services, for example, developing a checklist, reference guide or template for staff and providers of goods and services.

Ethical investment of Council funds

The management of Council funds can have a significant influence on climate action in the broader economy and community. Investing in, or borrowing from, institutions who practice corporate social and environmental responsibility (for example, invest their funds in clean energy instead of coal fired power stations, or return a percentage of profits to local community groups) encourages other institutions to follow suite while demonstrating Council commitment and leadership in climate action to the local community.

Section 5 in Council's Investment Policy, adopted in November 2015, includes a clause for "Environmental Consideration": *Council will give preference to investing its funds in banks and financial institutions that do not invest in or finance the fossil fuel industry, providing they meet the criteria in sections 5.1 and 5.2* (safeguarding Council's investments and maximising return on movements respectively). While the policy does not specify a target, management of Council funds is tracked to ensure that a minimum of 20% of Council funds are invested ethically.

Recommendation

(4.3 in Table 1) Continue enacting Council's investment policy to reduce support to the fossil fuel industry

The built environment

The environmental performance of developments in the shire is influenced by State and Federal building codes and regulations, as well as State and local planning policies.

Existing building permit requirements

The Building Code of Australia sets out environmentally sustainable design (ESD) requirements for domestic and commercial developments, including energy efficiency standards.

Domestic buildings
Currently all new dwellings are required to achieve a 6 star energy efficiency rating using an energy rating tool such as FirstRate or Green Star. On a scale of 10 stars, zero stars means the building shell does little to keep houses cool in summer and warm in winter. Buildings that achieve 10 stars are not likely to require any artificial heating or cooling. If a proposed extension will increase the building volume by more than 50%, then both the extension and the original part of the house needs to achieve the 6 star rating.

Dwellings in Victoria are also required to install either a solar hot water service or water tank connected to the toilets.

Commercial buildings
ESD requirements for commercial buildings are set out in Part J of the National Construction Code which forms part of the Building Code of Australia. Part J sets out a range of minimum requirements relating to energy efficiency and heating and cooling. As with domestic buildings, these ESD requirements apply to new commercial buildings as well as existing buildings if a proposed additional would increase the building volume by more than 50%.

While the ESD requirements under the Building Code of Australia make an important contribution to reducing energy consumption and associated greenhouse gas emissions, the Code could be improved to require a higher star rating and / or installation of renewable energy generation. This is a matter that could be incorporated into Council's advocacy platform.

Existing planning provisions

The State Planning Policy Framework references climate change impacts in the context of environmental risks, however, the objective of the policy relates to coastal inundation and erosion. Clause 15.02 refers to sustainable development, with objective 15.02-1 stating:

To encourage land use and development that is consistent with the efficient use of energy and the minimisation of greenhouse gas emission.

The Local Planning Policy Framework within the Macedon Ranges Planning Scheme includes several objectives related to addressing climate change in the built environment:

Objective 3 in Clause 21.08-3: *To ensure development and built form occurs in a sustainable manner*

Objective 3 in Clause 21.09: *To encourage housing development to be environmentally sustainable*

The latter objective is supported by the following strategies:

Encourage energy efficient subdivisions and buildings

Ensure subdivisions and development add to the walkability and accessibility of townships

The Macedon Ranges Planning Scheme also states that further strategic work is required to facilitate environmental sustainability in housing developments.

At present, implementation of these planning guidelines is not supported by any tools such as fact sheets, checklists or requirements for energy efficiency assessments or rating regarding environmental performance.

Council Alliance for a Sustainable Built Environment

The Council Alliance for a Sustainable Built Environment (CASBE) works with member councils to introduce consistent ESD policies into local planning schemes. To date seven councils in Victoria have introduced ESD policies into their planning schemes. Four other councils have planning scheme amendments to introduce ESD policies either awaiting approval from the Minister for Planning or on public exhibition. All of these councils are within metropolitan Melbourne with the exception of Yarra Ranges Shire.

These ESD policies require sustainable design assessments or sustainable design management plans (including energy rating reports) to be submitted with planning permit applications for specified developments – e.g. multi-dwelling proposals and medium to large scale commercial and industrial developments. These policies address 10 “Key Sustainable Building Categories” such as urban ecology, water efficiency, transport and waste management as well as energy efficiency. The policies aim to achieve better ESD outcomes than required through the Building Code of Australia.

It is noted that many of the requirements set out in CASBE’s ESD policy apply more to apartment or office buildings as opposed to small scale unit developments in a rural context (e.g. requirements relating to submission of green travel plans and waste management plans).

Introduction of ESD policies in planning schemes has also been criticised for duplicating building permit processes and introducing additional administration and costs to the development approval process.

ESD policy options for Macedon Ranges Shire Council

Most development in Macedon Ranges comprises new single dwellings or extensions to existing dwellings. Most of these dwellings or dwelling extensions are not subject to the planning permit application process. Based on planning permit approvals between 2011-2012 to 2015-2016 (not including 2014-2015), CASBE's standard ESD policy would have applied to approximately 200 dwellings on average each year.

In terms of commercial buildings, further analysis is required to determine how many planning permit applications for offices, retail buildings or industrial developments are likely to be subject to CASBE's standard ESD policy if adopted by Council.

Implementing CASBE's standard ESD policy in Macedon Ranges would require:

- Administration of the planning scheme amendment
- Sustainable Design Advisor / consultant services to assess compliance with the policy, including reviewing sustainable design assessments and liaising with proponents - $30,000 per year (rough estimate)
- CASBE membership - $2,750 per year
- Access to the BESS assessment tool - $3,750 per year

Before confirming whether to adopt CASBE's standard ESD policy, Council needs to consider:

- The environmental benefit relative to the cost to Council given the limited reach of the policy
- Equity between proponents given that approximately two thirds of new dwellings in the Shire are not subject to planning approval and would not be required to meet the policy's higher ESD standards.
- The possibility that the Victorian Government will introduce a state-wide ESD policy into all Victorian planning schemes.
- Financial implications for developers, including implications for the financial viability of Council's commercial and industrial estates

Given that the State Government may introduce enhanced state-wide ESD requirements, and given the limited reach of ESD planning policies in rural shires such as Macedon Ranges, at this stage it is recommended that Council seek to enhance community knowledge of ESD opportunities through means such as information sessions and dissemination of fact sheets. It is also recommended that Council advocate to the State Government for enhancements to state-wide ESD policies and increased minimum building standards.

Recommendations

(4.5 in Table 1) Promote Environmentally Sustainable Design principles to planning permit applicants, developers and the general public through means such as information sessions and fact sheets.

(4.6 in Table 1) Advocate for stronger state-wide Environmentally Sustainable Design policy and regulations through the planning system and building code.

Advocacy

Councils can advocate to state and federal governments for increased action on climate change from several perspectives, for example, advocate for:

- increased action and leadership in regards to policy and programs addressing climate change
- increased support in terms of finances and resources to undertake mitigation actions or adaptation action,
- increased support to the clean energy sector (including renewable energy, electric vehicles, etc).

Advocacy can be reactive or proactive. Examples of reactive advocacy include responding to discussion papers regarding proposed policy and legislation in regards to implications to Council and the community as undertaken in regards to discussion paper for the enquiry into community energy. Council will continue to respond to relevant proposals from state government as needed, potentially through representative bodies like the Municipal Association of Victoria (MAV) or the Central Alliance for Greenhouse Action (CVGA). Council may proactively advocate on matters particularly relevant to the shire and community, like improved transport public services, or large scale renewable energy projects. Advocacy for climate change can also occur through other avenues of Council's responsibility, for example, as an environmental determinant of health and wellbeing, action for climate change mitigation and adaptation can be promoted in advocacy for policy and program support in health and wellbeing initiatives.

Recommendation

(4.7 in Table 1) Define Council's advocacy position for key areas of climate change action, including (but not limited to):

- *Improved environmental performance standards and regulations for developments*
- *Removal of financial and administrative barriers to renewable energy generation at the domestic and neighbourhood scales*
- *Introduction of state government initiatives to support energy efficiency and renewable energy in the residential rental market*
- *Increased resources for improved infrastructure and services for non-car transport (public transport, walking as and cycling infrastructure, charging stations for electric vehicles, etc)*
- *Implementation of state and / or nation-wide behaviour change campaigns*

Working with the community

Community vision

As noted earlier in this Action Plan, the State Government has legislated a target for zero net emissions by 2050 for Victoria. The same goal is reflected in the strategic plan of the Central Victorian Greenhouse Alliance.

It is recommended that Council promote that the state target and regional goal apply to, and are shared by, the Macedon Ranges community.

Recommendation

(C.1 in Table 3) Promote the vision of a zero net emissions shire by 2050 as a shared Council – community vision, consistent with the target for a zero net emissions Victoria.

Spectrum of community influence

Council's Environment Strategy presents a high level framework for working with the community:

Communications: aims to raise awareness through activities such as articles in Council's newsletters, brochures and information sessions

Engagement: aims to facilitate action through initiatives such as workshops, financial incentives and citizen science programs

Partnerships: aims to achieve collaborative planning and action through partnerships agreements and task-based reference groups

The Environment Strategy also includes a stakeholder matrix that identifies an indicative level of engagement for different target audiences. The section of the matrix that relates to climate change is provided at **Appendix 5**.

Expanding on this framework, potential Council actions to support community action on climate change include:

Inform: provide information about sustainable living, MASH's solar program and TAKE2 through channels such as fact sheets, social media and Council's eNewsletters; host information sessions;

Engage: host workshops and knowledge sharing forums with different sectors of the community

Facilitate: fund climate change related projects through grants schemes; facilitate the development of community climate change action plans; provide infrastructure to reduce the need for using fossil fuels (such as walking and cycling paths and charging stations for electric vehicles); subsidise energy audits; provide direct advice to residents about environmentally sustainable design

Partner: partner with the community to establish local projects that address climate change, like renewable energy generation

Additionally, Council can progress community climate change action through advocacy. This might include advocating for removal of financial barriers to energy efficiency building upgrades (e.g. through no or low interest loans), advocating for improved buildings standards, or providing regulations or incentives for management of food waste.

Current activities

To date Council has focused on informing the community about sustainable living, promoting existing community programs and participating in regional or state-wide projects. This includes promoting the residential solar bulk buy program MASH (More Australian Solar Homes), supporting recycling of household organic waste through worm farming workshops and a rebate program, participating in the state-wide Solar Savers program which facilitates solar panel installation on low income households and promoting Environmental Upgrade Agreements to facilitate environmental works for commercial buildings.

A summary of current Council support to community climate change action is presented in **Appendix 4**. It is recommended that Council continue to support these programs.

Within the community, action to address climate change is progressing independently of Council. There are community gardens at neighbourhood houses (Riddell's Creek) and community halls (Newham) which reduce food miles and improve community wellbeing at a local level; a community revolving energy fund administered by the Macedon Ranges Sustainability Group whereby fundraising enabled installation of solar panels at the Woodend Primary School; and a bicycle repair and restoration project encouraging cycling instead of car travel. Council does have some avenues for providing support to community initiatives, most notably through the Community Funding Scheme and the Places for People Program, however the number of applications for environment projects under these programs is low. Additionally, Council indirectly encourages practices for environmental sustainability through other means like including criteria for sustainability in the business awards application form and promoting the benefits of shopping and working locally, which can be built upon in the future.

Proposed initiatives to increase support to the community

Different communities in the shire may have different ideas and priorities for addressing climate change. Additionally, different sectors of the community and individuals experience different barriers to taking action on climate change. From this perspective, Council needs to better understand drivers for action, and develop initiatives and programs customised to different sectors of the community. A Climate Change Communications and Engagement Plan, extending from the frameworks presented in Appendix 4 and Appendix 5, could help guide Council in this work.

In the meantime, it is recommended that Council continue existing activities, and aim to promote climate change action to different sectors of the community and different population groups, customising messages and information to target audiences through a range of media, and utilising venues like libraries and aquatic centres to distribute information. Council can also explore opportunities to provide information and deliver programs alongside existing community education programs (for example, through neighbourhood houses) and review opportunities to facilitate climate change action through existing Council grant schemes.

It is also recognised that climate change action may take different forms in different localities, for example, in some localities the priority for increasing sustainability may involve local food production, while in other localities the community may wish to work towards shared renewable energy generation and / or battery storage, or partner with local food stores to reduce organic waste going to landfill. It is therefore recommended that Council develop and trial a partnership process for developing localised community climate action plans.

Recommendations are presented in this action plan to extend from existing support to community action on climate change. A matrix summarizing Council's proposed community support initiatives is provided at **Appendix 6,** and an indicative cost-benefit analysis of initiatives is presented in **Appendix 7**.

Recommendations

(C.2 in Table 4) Support and promote future community energy efficiency and renewable energy programs (including future programs of MASH).

(C.3 in Table 4) Continue to promote Environmental Upgrade Agreements as a means of funding investment in energy efficiency in the commercial sector.

(C.4 in Table 4) Participate in the state-wide Solar Savers project (funded through the New Energy Jobs Fund). Work with the project reference group and project officers as relevant, and facilitate recruitment of residents for the program (scheduled for 2018).

(C.5 in Table 4) Utilise existing communications channels such as Council's website, eNewsletters, social media and Fact Sheets to celebrate Council and community achievements, promote sustainable living (including promotion of 'buy local' and 'reduce, re-use, recycle messages') and promote Council's support of TAKE2. Use these channels to promote wider community participation in the pledge program, customising messages to target audiences.

(C.6 in Table 4) Utilise emerging government programs targeting climate change action amongst different sectors of the community, including grants schemes, and promote and participate in programs where suitable for the local community.

(C.7 in Table 4) Promote the importance of climate change action through the business sector. Explore ways to effectively facilitate environmental sustainable practices (for example, through business peer-to-peer forums and Council's business awards).

(C.8 in Table 4) Explore opportunities to work with existing community programs to extend outreach, for example through neighbourhood houses

(C.9 in Table 4) Encourage small scale community based climate change projects through the Community Funding Scheme, potentially through a separate stream of this grant program.

(C.10 in Table 4) Facilitate development and implementation of a pilot community climate change plan for a local community in the shire, potentially as an extension of the Places for People program. Extend the community climate change planning process to other local communities as appropriate

(C.11 in Table 4) Develop a Climate Change Communications and Engagement Plan, based on identification of barriers and drivers for climate change action amongst different sectors of the community. Include relevant actions from this Action Plan in the Communications and Engagement Plan.

Funding climate action

The exact cost of meeting the abatement of 1,910 tonnes CO2-e (25% target) will depend on the mix of works undertaken at buildings. As indicated earlier in this Action Plan, based on analyses to date, the 25% reduction target can be attained through investing approximately $450,000 (above investment to mid 2018). This may be funded in a range or combination of ways:

- Within Council's resources through the normal budget planning processes
- Through loans – from banks, or potentially the Clean energy Finance Corporation
- Through partnerships with other councils, community groups, industry etc
- Through grants and funds from state and local government

Options and associated costs for achieving Council's aspirational target of zero net emissions by 2030-2031 will be investigated in 2017-2018 and reported to Council for consideration as a part of future budget processes. These investigations and costings will also be utilised to support funding applications as appropriate.

The pathway(s) taken in regards to funding action will determine the rate at which emissions are reduced and savings are returned to Council, and will also influence Council's ability to monitor the impact of works to inform future climate action.

Additional resourcing requirements will also be required to increase the level of support proposed for community climate change action, as indicated in Table 3.

Keeping the action plan alive

The term "Action Plan" implies doing, and "doing" is dynamic. Implementing the Action Plan involves converting recommendations into reality, and monitoring the impact of the actions on a continuous basis in three key ways:

- quantitative measurement and analysis of financial and environmental outcomes
- assessment of the effectiveness of changes to organisational processes and procedures
- community acceptance of Council's efforts in taking climate change action

The effectiveness of this Action Plan will be assessed annually, through analysis of cost and consumption data for power, to be undertaken internally and through Council's subscription to the monitoring and reporting service from Planet Footprint. Evaluation will also include discussion and surveys involving internal and external stakeholders as appropriate. The results will be incorporated into the annual environment report resulting from implementation of the broader Macedon Ranges Environment Strategy.

Recommendations

(1.13 in Table 1) Analyse energy consumption and cost data to verify the environmental and financial benefits of works undertaken to reduce greenhouse emissions from Council buildings, and promote benefits to the wider community.

(2.5 in Table 1) Monitor accounts for public lighting and report on financial and environmental benefits from conversion to LEDs, and promote benefits to the wider community.

(3.7 in Table 1) Continue to monitor emissions associated with fuel consumption, and measure the environmental and financial impacts of any changes introduced to fleet management.

(5.1 in Table 1) Refine and customise greenhouse reporting (currently provided by Planet Footprint through a Council subscription), possibly targeting ten or twenty main buildings, to measure financial and environmental impact of works. Investigate potential alternative means of quantitatively analysing, monitoring and reporting on emissions.

(5.2 in Table 1) Report emissions reductions in the annual environment report to Council. Include summarised information regarding data on buildings, public lighting, fleet and plant, and corporate waste, and qualitative assessments regarding the changes to policy and procedures. Release this report to the public and promote Council's progress towards achieving its target.

(5.3 in Table 1) Review implementation of this Action Plan and monitor progress towards the adopted emissions reduction target on an annual basis.

Beyond 2020

In 2015, the then Climate Change Authority recommended that the federal government adopt two targets that would enable Australia to play its part in containing global warming to below 2^{o}C from pre industrial levels:

- 30% reduction by 2025 from 2000 levels
- 40% – 60% reduction by 2030 from 2000 levels

And in 2016, the State Government set a target of zero net emissions by 2050 for Victoria, which is now legislated in the *Climate Change Act* 2017.

Council's target To plan to achieve zero net emissions from Council's operations by 2030-2031 responds to the science-based recommendation and the direction from State Government, and demonstrates Council's commitment to a better future.

Recommendation

(5.5 in Table 1) Explore means for Council to achieve zero net emissions by 2030-2031, and determine the feasibility of Council adopting an additional emissions reduction target.

Innovation into the future

The location of the shire and Council's range of assets provide opportunity for large scale renewable energy generation to either offset residual emissions (from fuel and power consumption that cannot be addressed through works), or to sell power to the larger electricity market. Establishing a "solar farm" on Council land or roof space can be achieved

in a range of ways with different levels of Council involvement, and will be subject to policy, planning controls, and approval by Powercor. The scale of works will influence the complexity of arrangements, and the benefits to Council and commercial or community partners (for example, in regards to the administration of Small Technology Certificates compared to Large Generation Certificates).

In order to position itself to take advantage of a low carbon future, investigations into options for large scale renewable energy generation can be undertaken during the first phase of this Action Plan.

Recommendation

(1.12 in Table 1) Identify Council owned land (or roof space) that could be made available for large scale renewable energy generation, whereby Council could produce power to offset demand from buildings, or lease the land to a community group or commercial energy provider for a large scale renewable energy project.

RECOMMENDED ACTIONS

The recommendations listed in the tables below are drawn from the discussion above, along with additional recommendations (particularly in regards to monitoring and evaluation) are represented here in three tables, reflecting Council's commitment to climate change action at three levels:

- Within our organisation
- With agency stakeholders
- With our community

The level of detail in each table, and in each action, varies according to known information, and to enable the action to remain current for as long as possible. All actions are to commence by, and in the cases of works be completed by, June 2021, to ensure Council's emissions reduction targets will be met.

The resource requirements for implementing actions are indicative, expressed as a range:

Current resources	the action can be implemented with current resources
$	<$10,000
$$	$10,000 - $100,000
$$$	> $100,000
TBD	the cost of implementation needs to be determined, or is subject to external programs

Table 1 – Recommended actions 2017-2021: within our organisation

Action	Responsible Department	Timeframe	Resources Requirements
1 Council Buildings			
1.1 Solar panels Install solar panels on selected Council buildings according to recommended system sizes. Aim to install systems that are compatible to battery storage of electricity.	Engineering and Projects	2017 - 2021	(approx.) $500,000
1.2 Indoor lighting Continue to replace indoor lighting with LEDs as circumstances allow, and conduct proactive changeovers at high use buildings.	Engineering and Projects	2017 - 2021	$$
1.3 Incremental energy efficiency works Undertake works to minimise energy consumption and maximise energy efficiency measures as circumstances allow and upgrades are undertaken (for example, installing timers, sensors, insulation, etc).	Engineering and Projects	2017 - 2021	$$$
1.4 Energy audits Conduct specialised energy audits for problematic buildings to identify optimal works for reducing emissions (for example, performance venues). Schedule implementation of works as circumstances allow (for example, an energy audit undertaken for the aquatic centres in 2015 led to a budget allocation for installation of pool covers in 2016-2017).	Engineering and Projects	2017 - 2021	$$
1.5 Replacement of gas boilers Assess the feasibility of replacing gas boilers at the aquatic centres and the Kyneton Mechanics Institute) with high efficiency gas boilers (or other best practice technology) when existing boilers are close to end-of-life.	Engineering and Projects, Aquatics and Leisure, Arts and Culture	2020 - 2021	TBC
1.6 ESD Guideline for Council Buildings – major works Develop an Environmentally Sustainable Design (ESD) guideline that seeks to maximise the environmental performance of new buildings and major upgrades.	Engineering and Projects, Strategic Planning and Environment	2017 - 2019	$$

Incorporate the guideline into the Assets Management Plan Part C. Develop support materials and procedures to facilitate implementation of the guideline.			
1.7 ESD Guideline for Council Buildings – minor works Develop and implement guidelines for upgrades to "small use" buildings for improving environmental performance standards. Develop support materials and procedures to facilitate implementation of the guideline, for example, requiring a basic level energy audit or including a checklist in building condition reports for nominated buildings that can then inform works programs for upgrades and retrofits to buildings.	Engineering and Projects, Strategic Planning and Environment	2018 - 2019	$$
1.8 Tracking works to buildings Implement the Work Order and Maintenance module of Council's asset management system. Establish a process to ensure optimal use of the module, ensuring that information is recorded to enable the environmental and financial impact of works to be measured and monitored, thereby providing more informed decision making, improved long term management and the ability to plan for the service needs of present and future generations.	Engineering and Projects	2018 - 2019	$$$
1.9 Macedon Ranges Renewable Energy Fund Investigate options for a trial community – council partnership to install solar panels at either a Council owned and managed site like the Woodend Community Centre, or a Council-owned and third party managed site like a neighbourhood house, with a view to establishing a trial in 2017-2018.	Strategic Planning and Environment, Engineering and Projects, Finance	2017 - 2018	TBD
1.10 Integrated Council Services Investigate opportunities to establish a showcase project with a focus on buildings for Early Years Services, for example, *Greening young environments*. The showcase project would include a works plans for existing and new buildings, and integrate physical works with delivery of services, to promote a coordinated commitment to high environmental performance and practices at the facilities. Explore other opportunities for showcase projects as works are implemented at other types of buildings with high public use (for example, at aquatic centres or performance venues).	Engineering and Projects, Community Services, Communications	2017 - 2021	$$$

1.11 Energy Security and Battery Storage Investigate opportunities to trial battery storage of electricity at a suitable Council facility. Aim to ensure installation of solar panels will be compatible with potential connection to battery storage.	Engineering and Projects	2018 - 2019	$$$???
1.12 Large scale renewable energy generation Investigate opportunities for large scale renewable energy generation on Council land or roofs, whereby Council could produce power to offset demand from buildings, or lease the land to a community group or commercial energy provider for a large scale renewable energy project.	Engineering and Projects, Finance	2018 - 2019	Current resources
1.13 Monitoring and Reporting and Promoting progress Analyse energy consumption and cost data to verify the environmental and financial benefits of works undertaken to reduce greenhouse emissions from Council buildings, and promote benefits to the wider community.	Communications, Strategic Planning and Environment, Engineering and Projects	ongoing	Current resources
2 Public lighting			
2.1 Cost-shared street lights Continue to investigate the possibility of changing over cost-share streetlights to energy efficient lights, possibly through a regional partnership involving Powercor, VicRoads, relevant councils and other stakeholders.	Engineering and Projects	2017 - 2019	TBD
2.2 Non-standard street lights Investigate the feasibility of converting non-standard / decorative lights to energy efficient lamps, accounting for feature lighting and for lights in new developments that will become the responsibility of Council.	Engineering and Projects	2017 - 2019	TBD
2.3 Street lighting policy Update Council's street lighting policy (Section 3.4 in Policy – Engineering requirements for infrastructure construction) to reinforce lighting output standards and regulations, and specify Council's requirements for light types in new developments and as feature lighting.	Engineering and Projects	2018 - 2019	Current resources
2.4 Outdoor metered lighting Identify the most energy efficient lighting for special outdoor uses like sportsfields, and plan to upgrade lighting for maximum energy efficiency	Engineering and Projects,	2020 - 2021	TBD

and emissions reduction when undertaking planned works. Monitor the impacts of works through analysis of electricity accounts.	Strategic Planning and Environment		
2.5 Monitoring and reporting on streetlighting Monitor accounts for public lighting and report on financial and environmental benefits from conversion to LEDs, and promote benefits to the wider community.	Strategic Planning and Environment, Engineering and Projects	ongoing	Current resources
3 Managing Council's fleet			
3.1 Hybrid vehicles Replace 12 existing fossil fuel vehicles with hybrid vehicles over the life of this plan, subject to ensuring suitable vehicles are available that meet Council's needs at an appropriate cost	Operations	2017 - 2021	$75,000
3.2 Electric vehicles Trial an electric vehicle in Council's fleet, including the installation of electric vehicle charge stations at the Kyneton and Gisborne Offices (or other suitable locations), subject to ensuring a suitable vehicle model is available that meets Council's needs at an appropriate cost. Consider allowing public access to these charge stations.	Operations	2017 - 2021	$30,000
3.3 Fleet management policy Review and amend Council's Vehicle Policy to increase the efficiency of the vehicle fleet while facilitating emissions reductions. Consider amendments like updating section 10 to guide selection of hybrid or electric vehicles, and explore means of providing incentives and disincentives to favour specified vehicles, selected for environmental performance standards and suitability to work requirements.	Operations	2017 - 2018	$
3.4 Refining fleet management Develop and implement a fleet management system to improve data collection processes regarding use of fleet vehicles, enabling a more accurate picture of travel patterns to be obtained, and an accurate emissions profile relating to business related travel to be determined.	Operations	2017 - 2018	$$$

3.5 Incentives to reduce commuter travel Investigate the suitability and feasibility of the Commuter Club program for Council staff, or explore establishing similar incentives for alternative transport suited to staff travel patterns.	Green Team Finance	2017 - 2018	$
3.6 Reducing work travel Continue development of video conferencing facilities or other systems that support remote communications to reduce the need for travel between work sites for meetings.	Information and Communications	2017 - 2019	$$
3.7 Monitoring and Reporting on fleet management Continue to monitor emissions associated with fuel consumption, and measure the environmental and financial impacts of any changes introduced to fleet management.	Operations, Finance, Strategic Planning and Environment	ongoing	Current resources
4 Amending Council processes			
4.1 Green Power Withdraw the purchase of Green Power through Council's energy supply contract. Re-assess progress towards the emissions target in mid-2020 to identify if purchase of Green Power will be needed to meet the reduction target.	Finance, Strategic Planning and Environment	Mid 2017 Mid – 2020	Current resources
4.2 Procurement Continue to develop and apply processes for ensuring environmental criteria are adequately addressed and assessed in the procurement of goods and services, for example, developing a checklist, reference guide or template for staff and providers of goods and services.	Finance, Strategic Planning and Environment	2017 - 2019	Current resources
4.3 Investment of funds Continue enacting Council's investment policy to reduce support to the fossil fuel industry.	Finance	2017 - 2021	Current resources
4.4 Integrating climate change into decision making Investigate opportunities to amend internal procedures regarding budget planning to facilitate the integration of climate change into decision making across Council, particularly in regards to management of assets and delivery of services. For example, refine criteria for environmental consideration in templates for new initiative bids and capital works bids,	Finance, Engineering and Projects, Operations, Strategic Planning and Environment	2017 - 2018	Current resources

to increase the focus on greenhouse emissions, at design, construction and operational stages.			
4.5 Encouraging sustainable development Promote Environmentally Sustainable Design principles to planning permit applicants, developers and the general public through means such as information sessions and fact sheets.	Strategic Planning and Environment, Statutory Planning	2018 - 2021	$
4.6 Advocating for sustainable development Advocate for stronger state-wide Environmentally Sustainable Design policy and regulations through the planning system and building code.	Strategic Planning and Environment, Statutory Planning	2018 - 2021	Current resources
4.7 Advocating to make climate action easy Define Council's advocacy position for key areas of climate change action, including (but not limited to): • Improved environmental performance standards and regulations for developments • Removal of financial and administrative barriers to renewable energy generation at the domestic and neighbourhood scales • Introduction of state government initiatives to support energy efficiency and renewable energy in the residential rental market • Increased resources for improved infrastructure and services for non-car transport (public transport, walking as and cycling infrastructure, charging stations for electric vehicles, etc) • Implementation of state and / or nation wide behaviour change campaigns	Strategic Planning and Environment,	2017 - 2019	Current resources
5. Monitoring and Evaluation			
5.1 Monitoring emissions Refine and customise greenhouse reporting (currently provided by Planet Footprint through a Council subscription), possibly targeting ten or twenty main buildings to measure financial and environmental impact of works. Investigate potential alternative means of quantitatively analysing, monitoring and reporting on emissions.	Strategic Planning and Environment, Finance, Engineering and Projects	2017 - 2018	$

5.2 Reporting progress Report emissions reductions in the annual environment report to Council. Include summarised information regarding data on buildings, public lighting, fleet and plant, and corporate waste, and qualitative assessments regarding the changes to policy and procedures. Release this report to the public and promote Council's progress towards achieving its target.	Strategic Planning and Environment, Finance, Engineering and Projects, Operations	ongoing	Current resources
5.3 Keeping the plan alive Review implementation of this Action Plan and monitor progress towards targets on an annual basis. Review and potentially amend targets in mid 2020 to account for external drivers in climate change action.	Strategic Planning and Environment	Annually - mid year, mid 2020	Current resources
5.4 Keeping our target alive Review Council's emissions reduction target in mid 2020, with the view to setting a sub-target for renewable energy generation.	Strategic Planning and Environment	Mid 2020	Current resources
5.5 Beyond 2020 Explore means for Council to achieve zero net emissions by 2030-2031, and determine the feasibility of Council adopting an additional emissions reduction target.	Strategic Planning and Environment	Mid 2018	$

Table 2 – Possible Council actions post 2021*

Renewable energy and energy efficiency Address any outstanding opportunity for on-site renewable energy generation or energy efficiency in Council buildings. Progress with more innovative approaches to sustainable building management, like battery storage, a Council-community partnership for generating on site renewable energy, and large scale renewable energy generation.
Integrated Council Services Extending from experience in establishing a showcase project with a focus on buildings for Early Years Services, progressively address other building categories and develop coordinated programs to promote environmental performance to user groups (for example, at aquatic centres or performance venues).
Processes Regularly review policy and guidelines regarding the environmental performance of buildings and monitor their implementation.
Monitoring and Reporting and Promoting progress Continue to analyse energy consumption and cost data to verify the environmental and financial benefits of works undertaken to reduce greenhouse emissions from Council buildings, and promote benefits to the wider community.
Replacement of gas boilers Based on assessments to be undertaken in 2020-2021, secure the upgrade of gas boilers at the aquatic centres and the Kyneton Mechanics Institute (or replacement with most effective and efficient heating systems)
Public lighting
Progress any outstanding opportunity for improving the energy efficiency of public lighting to maximise emissions reductions (for example, cost shared lights and decorative lighting)
Continue to monitor accounts for public lighting and report on financial and environmental benefits from conversion to LEDs, and promote benefits to the wider community.
Determine the feasibility of replacing metered outdoor lighting with LEDs (like sports fields and feature lighting).

Managing Council's fleet and plant
Continue to upgrade Council's fleet to maximise efficiency and emissions reductions. Plan for the replacement of plant as suitable technology alternatives become available.
Council processes
Assess progress in reducing emissions on an annual basis to identify if purchase of Green Power or other offsets will be needed to meet any yet-to-be-adopted reduction targets.
Review application of procurement processes and investment of funds and amend accordingly to optimise influence on climate change action
Monitoring and Evaluation
Continue to refine and customise greenhouse accounting and reporting processes, and report emissions reductions in the annual environment report to Council.

*Opportunity to progress some actions may arise prior to mid 2020. The table of future works is indicative, based on likely progress in implementing this action plan at mid 2017.

Table 3 – Recommended actions: with agency stakeholders

The actions listed below are not time specific, in that they are to be undertaken as opportunity arises, or as circumstances require Council to proactively work with agency stakeholders. All actions will be the responsibility of the Strategic Planning and Environment department in Council, working with other units and departments as relevant.

- Promote Council's position and work in addressing climate change to the state government as a means for advocating for support. Work with the responsible state government department, or through umbrella organisations like the MAV.

- Utilise opportunities to develop projects and access grants for climate change action programs and projects as appropriate for Council, and form partnerships with key stakeholders at the local, regional or state levels when feasible to do so.

- Continue to participate in regional initiatives for climate change action, for example, in the development and implementation of relevant projects being facilitated by the Central Victorian Greenhouse Alliance.

- Work with the North Central CMA in programs addressing climate change on landscapes and biodiversity values as relevant.

Table 4 – Recommended actions 2017-2021: with our community

Action	Lead Unit	Resource Requirements	Key Community Stakeholders
C.1 A shared vision Promote the vision of a zero net emissions shire by 2050 as a shared council – community vision, consistent with the target for a zero net emissions Victoria.	Strategic Planning and Environment	Current resources	Everyone in shire
C.2 Continuing current work – residential sector Support and promote future community schemes for energy efficiency and renewable energy, including MASH.	Strategic Planning and Environment, Communications	Current resources	residents
C.3 Continuing current work – commercial sector Continue to promote Environmental Upgrade Agreements as a means of funding investment in energy efficiency in the commercial sector.	Economic development and Tourism, Communications	Current resources	Commercial sector
C.4 Continuing current work – statewide project Participate in the statewide Solar Savers project funded through the New Energy Jobs Fund. Work with the project reference group and project officers as relevant, and facilitate recruitment of residents for the program (scheduled for 2018)	Strategic Planning and Environment	Current resources	Low income households
C.5 Celebrating success and encouraging action Utilise existing communications channels such as Council's website, eNewsletters, social media and Fact Sheets to celebrate Council and community achievements, promote sustainable living (including promotion of 'buy local' and 'reduce, re-use, recycle messages') and promote Council's support of TAKE2. Use these channels to promote wider community participation in the pledge program, customising messages to target audiences.	Strategic Planning and Environment, Communications, relevant departments	$	Nominated target audiences as appropriate

C.6 Collective action through programs Utilise emerging state government programs targeting climate action amongst different sectors of the community, including grants schemes, and promote and participate in programs where suitable for the local community.	Strategic Planning and Environment	TBD	Targeted sectors of community
C.7 Working with business in climate change Promote the importance of climate change action through the business sector. Explore ways to effectively facilitate environmental sustainable practices (for example, through business peer-to-peer forums and Council's business awards	Economic Development and Tourism, Strategic Planning and Environment	$	Business / Agribusiness sector
C.8 Building on local action Explore opportunities to work with existing community programs to extend outreach, for example through neighbourhood houses	Strategic Planning and Environment	Current resources	A local community / group
C.9 Local projects through Community Funding Scheme Encourage small scale community based climate change projects through Council's Community Funding Scheme, potentially through a separate stream of this grant program.	Strategic Planning and Environment, Community and Culture	$$	A local community / group
C.10 Local community climate change plans Facilitate development and implementation of a pilot community climate change plan for a local community in the shire, potentially as an extension of the Places for People Program. Extend the community climate change planning process(es) to other local communities as appropriate.	Strategic Planning and Environment, Community and Culture	$$	A local community / group
C.11 Climate Change Communications and Engagement Develop a Climate Change Communications and Engagement Plan, based on identification of barriers and drivers for climate change action amongst different sectors of the community. Include relevant actions from this Action Plan in the Communications and Engagement Plan.	Strategic Planning and Environment, Communications, relevant departments	$$	Everyone in shire

Appendix 1: Summary of climate futures for shire

Table 1 below shows trends and confidence in predictions for both the north and south parts of the shire, for the RCP4.5 and the year 2030 (representing the likely outcome from enacting current recommendations for action), summarised from work undertaken by CSIRO. The change is represented as a range, noting that for rainfall in particular, there is some uncertainty in regards to the comparative influence of natural variability compared to induced climate change upon future rainfall. A level of confidence is assigned to each climate variable, reflecting the degree of alignment in result from the many models used in analysis.

Table 1: Forecasts for selected climate variables, north and south parts of the shire, at RCP4.5

Subcluster	Climate variable	Forecast (RCP4.5 2030)	Level of confidence
Southern Slopes (Victoria West – Melbourne)	Winter rainfall	-15 to +8%	High confidence
	Summer rainfall	-15 to +13%	Uncertain
	Days over 35oC	12 to 15 days	Very high confidence
	Frost risk days	0.8 to 0.4	High confidence
Murray Basin – (Canberra)	Winter rainfall	-15 to +8%	High confidence
	Summer rainfall	-15 to +13%	Medium confidence
	Days over 35oC	9.4 to 14	Very high confidence
	Frost risk days	76 to 87	High confidence

Appendix 2: List of community groups consulted in development of plan

Meetings and / or discussions were held with the following groups:

- Council's Health and Well Being Committee
- Agribusiness forum (and farmers' market coordinator)
- Macedon Ranges Sustainability Group
- Kyneton Transition Towns

Email notification and / or exchange with the following:

- Macedon Ranges Green Energy Coalition
- Bendigo Sustainability Group
- Transition Town Riddells
- Neighbourhood house coordinators

Additionally, Landcare groups and individual residents would have seen updates about development of the plan, including invitations to forward submissions, through environment e-newsletters.

Council acknowledges the ongoing interest and contributions from the community in its efforts to progress environmental outcomes. The above mentioned groups, along with additional groups and individuals who express interest in the future, will continue to be notified about Council's progress in climate change action. Additionally, broad scale media like Council's Facebook page and the youth Facebook page, used to promote the development and exhibition of the draft Climate Change Action Plan, will continue to be utilised.

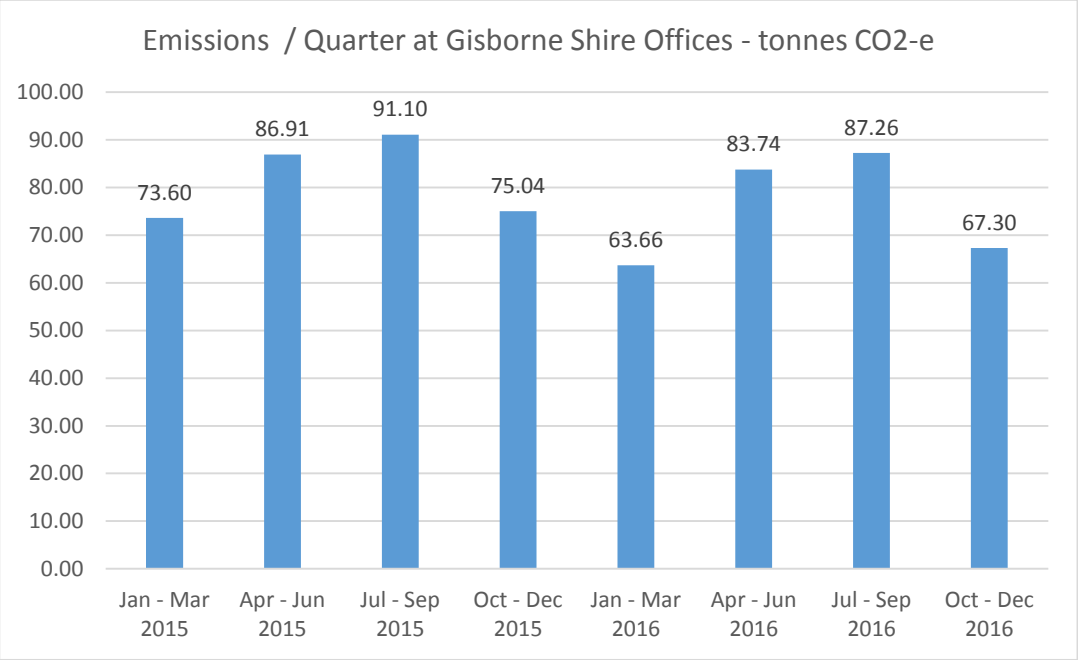
Appendix 3: Environmental and financial benefits of investing in climate action at Council buildings

Council's investment in energy efficiency has increased over the past few years, both in new building works and in maintenance works. The new Manna Gum Early Years Hub has many features for environmental sustainability, including a 5kW solar system, and automated ventilation systems to allow passive cooling. Analysis of energy consumption and cost data, including benchmarking against comparable buildings will be undertaken in late 2017 when there is sufficient data to enable meaningful analysis. Construction of the centre has set a minimum standard for the construction of new Council buildings in the future.

Another major project has been the extension and refurbishment of the shire offices at Gisborne. The works included installation of a 30kW solar system, and replacement of 225 light fittings with 181 LEDs, alongside more minor works like installation of motion sensors in meeting rooms.

Analysis of energy consumption and cost data shows that although the office area has increased by about 465m2, there has been a reduction in greenhouse emissions in 2016 compared to 2015, for each quarter of the year, as shown below. And from a financial perspective, Council paid $947.30 ***less*** in energy charges for October – December quarter in 2016 than for the same period in 2015. These savings will continue into the future over the life of the solar panels and LEDs.

Emissions at Gisborne Shire Offices, pre- and post- refurbishment



Appendix 4: Current programs for community climate change action

MASH

More Australian Solar homes (formerly mount alexander solar homes) is a non for profit venture opening through the Hub Foundation in Castlemaine. The core program is a bulk buy and installation of solar systems for residential homes. Council provided formal support to the Round 3 of the program, conducted in the latter half of 2016. At the end of 2016, solar panels had been or were being installed on 185 homes across the shire. Additionally, due to the cost effectiveness for bulk buy, the program returned a free solar system to a community building for every 100 systems installed in the shire. A further round of other program is due by mid-2017.

Solar PV for low income households – New Energy Jobs Fund Round 1

Round 1 of the state government's $20M New Energy Jobs Fund in 2016 provided the opportunity to apply for funds targeted at enacting the state government's intention of creating jobs in the "new energy" sector that reduce greenhouse emissions. Council partnered in a state-wide project being led by Maroondah City Council (host council for the Eastern Alliance for Greenhouse Action (EAGA), aimed at facilitating installation of solar panels on low income households through removing financial barriers. The project will see solar panels installed on almost 1000 household across Victoria, through employment of regional project officers. Council's participation in the program will allow 24 households in the shire to be fitted with solar panel systems, with a low interest loan being repaid by residents over ten years.

Solar Towns

Round 2 of the federal government solar towns program, conducted in 2016, had a focus on Sunbury and the Macedon Ranges. The program provided funds to community groups for installing solar panels on their buildings, subject to feasibility assessments. Council owned buildings were ineligible for funding. And while Council was not a direct partner in the program, it promoted the program and answered queries for community groups, partnering with the project officer from MASH in this service. Across the shire, 21 community groups received funds to install solar panels, including churches, community health centres and sporting clubs.

Environmental Upgrade Agreements

An Environmental Upgrade Agreement is an agreement between a building owner or property manager, a financial institution, and a local government that provides long-term low interest finance for investments in energy efficiency. In August 2016, Council agreed to offer Environmental Upgrade Agreements in order to support businesses to reduce costs and to improve their environmental performance. Business can apply to Sustainable Melbourne Fund for a low interest loan to undertake works to buildings to improve environmental performance. The loans are paid back via rates, with Council's involvement proving security to the Sustainable Melbourne Fund.

Additional actions

In addition to the discrete projects outlined above, Council also encourages climate action through the occasional information session or workshop, for example, the Environment Event: Improving your home's efficiency in April 2017. And although upgrades to community buildings and projects promoting a reduction on energy and water consumption are eligible for grants under Council's Community Funding Scheme, there were no submissions addressing these criteria in the 2016 round of funding. However, the Macedon Ranges Sustainability Group did receive funding to host the 2017 Sustainable Living Festival, meaning it can be held free of an entry fee, thereby facilitating access to information about climate action.

Appendix 5: Stakeholder Engagement Matrix from the Environment Strategy 2016

Stakeholder	Level of engagement for climate change matters
Traditional owners / indigenous community	Communication / Engagement
Visitors	Communication
Residents	Communication / Engagement
Landcare / “Friends” groups working on public land	Communication
Landholders / Landcare groups working on private land	Communication
Primary producers	Communication
Absentee landholders	Communication
Rural lifestyle property owners	Communication
Environment groups with focus on climate change or sustainable living	Engagement / partnerships
Neighbourhood houses / community learning centres	Engagement / Partnerships
Schools – primary and secondary	Communication
Business / Industry	Engagement / Partnerships
State government departments	Engagement / Partnerships
Regional agency networks	Engagement / Partnerships
Water authorities / catchment management authorities	Engagement / Partnerships
Non-government organisations	Engagement / Partnerships

Appendix 6: Proposed community support matrix

	Inform	Engage	Facilitate	Partner
How	Fact Sheets	Workshops	Council's Community Funding Scheme	Utilise Council buildings or land for renewable energy
	Social media	Forums, including peer-to-peer discussions	Loans through rate payments	Financial or in kind support
	Council's website	Council's business awards	Community climate change planning at a local level	
	Information sessions			
What	Promote community programs such as solar bulk buy schemes (e.g. MASH)	Promote emissions reductions in the business sector	Energy Upgrade Agreements for commercial upgrades	Trial a revolving energy fund in partnership with the community.
	Provide sustainable living tips, including buying local and reducing consumption	Sustainable living workshops, including through Neighbourhood Houses	Solar Savers program that facilitates solar panel installations for low income households	
	Promote wider community participation in TAKE2		Small scale community climate change plans and / or projects	
	Promote Council emissions reduction activities and works		Large scale community climate change plans and / or projects	
	Promote success stories in the community			
	Promote ESD principles to planning permit applicants and the general community			

Appendix 7: Community support initiatives cost benefit analysis