MANSFIELD SHIRE

Ironbark Sustainability

Mansfield Shire Council Climate Action Plan Background Paper (Draft)

Prepared for
Mansfield Shire Council

Version	Author	Date	Description of changes
V0a-d	Lucy Carew-Reid, Sandra Mack, Sue Oliver, Rachel Armstead, Hannah Preece	05/04/2021 – 13/04/2021	Initial draft
V1a	Sandra Mack	13/04/2021	Version for Council
V1a_Council	Brigitte Brocklesby and Damien Gerrans	19/04/2021 – 20/04/2021	Council project team feedback
V1b	Lucy Carew-Reid, Sandra Mack	21/04/2021	Revision of draft based on Council project team feedback
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About Ironbark Sustainability
Ironbark Sustainability is a specialist consultancy that works with government and business around Australia by assisting them to reduce energy and water usage through sustainable asset and data management and on-the-ground implementation.

Ironbark has been operating since 2005 and brings together a wealth of technical and financial analysis, maintenance and implementation experience in the areas of building energy and water efficiency, public lighting and data management. We pride ourselves on supporting our clients to achieve real action regarding the sustainable management of their operations.

Our Mission
The Ironbark mission is to achieve real action on sustainability for councils and their communities.

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Ironbark are a certified B Corporation. We have been independently assessed as meeting the highest standards of verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose.

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1.1 Strategic Context

Mansfield Shire Council (Council) has acknowledged climate change and passed a Councillor initiated resolution to develop a Climate Action Plan. In doing so, Council has made a firm commitment to mitigate the impacts of climate change within their own operations and to support the community to reduce municipal greenhouse gas emissions and adapt to a changing climate.

This Climate Action Plan Background Paper has been developed to inform Mansfield Shire Council's Climate Action Plan, Community Vision and Council Plan. It contains a range of different targets, timeframes and actions for Council to consider.

The Background Paper will be used to affirm Council's ambition, as well as that of the broader Mansfield Shire community, to address climate change. It will identify opportunities for Council to make a fair contribution to reducing and offsetting Council's own share of emissions, whilst also supporting the community to reduce theirs.

1.2 Mansfield Shire Council Corporate Emissions

In 2018/19, Council corporate activities generated 1.034 kilotons of GHG (CO_2-e). The majority of Council's measured emissions come from electricity use in buildings (56%) followed by street lighting (18%), then plant (14%). Fleet, water, liquified petroleum gas (LPG) account for 5%, 4% and 3% respectively.

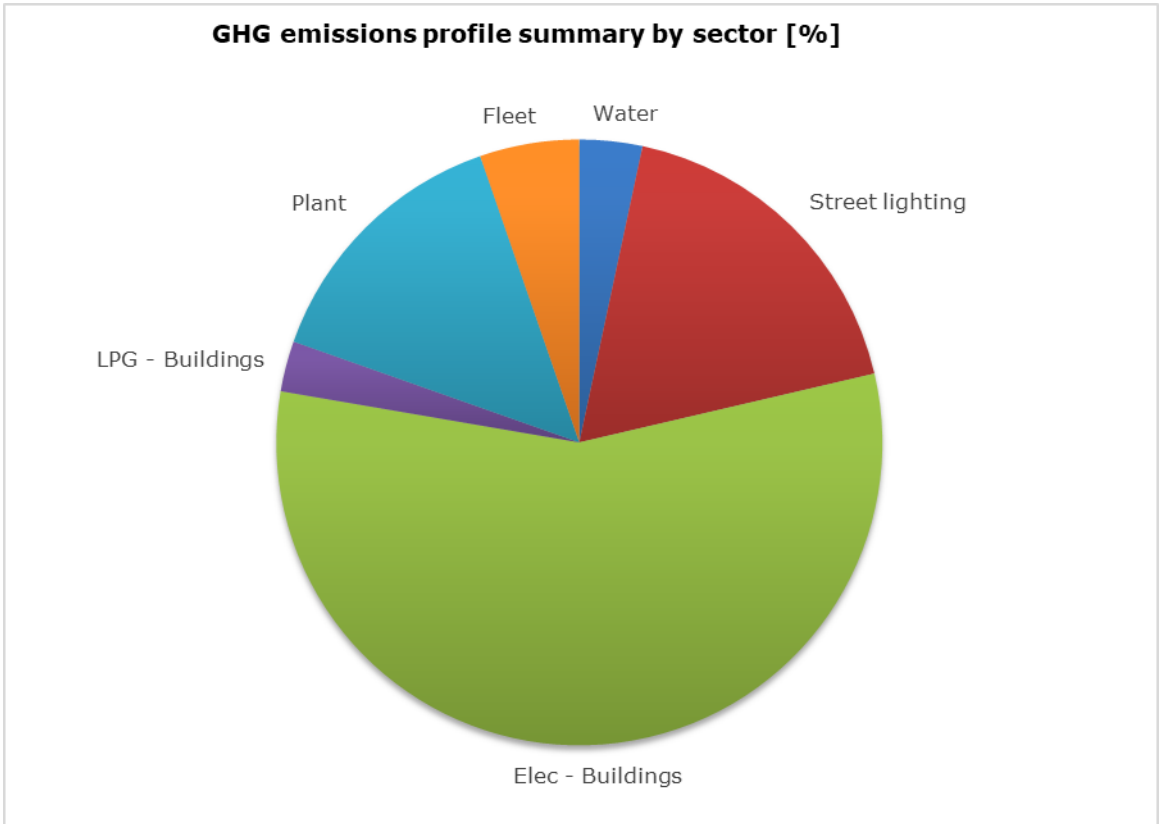


Figure 1: Emissions profile by sector 2018/19

In becoming a signatory to the Paris Agreement, Australia now has a limited, established carbon budget within which to operate in order to meet its commitment to reduce carbon emissions and limit global warming to "well below 2°C above pre-industrial levels".

As the foundational step in developing the Climate Action Plan options for Council, Ironbark has calculated a carbon budget for Council's operations. This, in turn, enables the development of what is known as a science-derived target (SDT) for reducing emissions so as to stay within this budget and limit global warming. The carbon budget and linear reduction rate for achieving a science-derived target are outlined in Table 1.

Table 1: Calculation of carbon budget for Council's corporate emissions

Calculation of budget	Council corporate	Units
2018/19 Emissions	1.07	kt CO_2e
Total carbon budget	16.9	kt CO_2e
Runway – years without change	15.7	years
Required per annum reduction rate	3.2%	% per year
	34.1	t CO_2e

If Council were to keep emitting at 2018/19 levels (1.07 kilotonnes CO_2-e[1]), Council will spend its carbon budget of 17 kt CO_2-e in 16 years or by year 2035. This duration is called Council's carbon "runway". If Council reduced emissions by 3% per annum, then it would spend its carbon budget by 2050.

It would be poor strategy, however, to simply set a 3% annual reduction target. Emissions reductions are project or action based rather than linear and tend to occur in jumps as opposed to a gradual decline. There are several possible high impact efficiency actions to implement and renewable power agreements to secure that would achieve a more significant emissions reduction more rapidly.

[1] For the purpose of the SDT setting and action planning emissions from road construction have been estimated at 40tCO_2e for 2018/19. This results in a slight discrepancy between the total emissions presented as part of the inventory and the total emissions presented as part of the SDT and action planning sections.

The following three "action pathway" options achieve reductions that enable Council to stay comfortably within the carbon budget set by the SDT to limit temperature rise to 2°C. However, each pathway has different timeframe and implementation options that have various associated costs, savings, benefits and challenges. Options presented for achieving an SDT are as follows:

- **Pathway 1: Energy Efficiency Focus**
    - The majority of available direct emissions reduction actions are implemented by 2030
    - 100% renewable power is sourced by 2035
    - $2,500 of annual offsets are purchased by either 2035 or 2050 in line with Council's net zero commitment
    - Main benefit: Energy efficiency generates long term cost savings for Council
    - Main challenges: It entails significant upfront investment and the risk of investing in innovative technology
- **Pathway 2: Renewables Focus**
    - No direct emissions reduction actions are implemented
    - 100% renewable power is sourced by 2025
    - $5,800 of annual offsets are purchased by either 2035 or 2050 in line with Council's net zero commitment
    - Main benefit: Renewable power purchase agreements incur minimal additional costs to Council as they are broadly equivalent to Council's existing electricity tariffs
    - Main challenge: Does not improve resource efficiency and therefore will not generate any cost savings, nor reduce Council's reliance on fossil fuels
- **Pathway 3: Balanced Approach**
    - Selected high impact emissions reduction actions are implemented by 2030
    - 100% renewables power is sourced by 2030
    - $2,900 of annual offsets are purchased by either 2035 or 2050 in line with Council's net zero commitment
    - Main benefits: Upfront costs are spread out over a longer period compared to Pathway 1, and select actions maximise resource efficiency impact
    - Main challenge: Not implementing all actions sooner may result in the community viewing the approach as not ambitious enough

The following table presents the costs and savings associated with each pathway side by side for comparison

Table 2: Action pathways options summary

Action area	Lifetime emissions savings from actions excl. PPA (tCO_2e)	Upfront cost of actions spread across 2021-2030 ($)	Total cost savings from actions over lifetime of assets ($m)	Average annual cost savings at 2030 ($)	PPA annual emissions offset at start year	Offset emissions at start year 2035	Offsets cost of purchase 2035*
Pathway 1. Efficiency Focus	6,915	$889,000	$2.0	$140,000	570	130	$2,500
Pathway 2. Renewables Focus	-	-	-	-	750	300	$5,800
Pathway 3. Balanced Approach	4,000	$452,000	$1.5	$110,000	700	160	$2,900

**One Australian Carbon Credit Unit (ACCU) is equivalent to 1 tCO_2e.*

***Assuming 2021 Australian Carbon Credit Units (ACCUs) spot price.*

Table 3: Summary of actions modelled

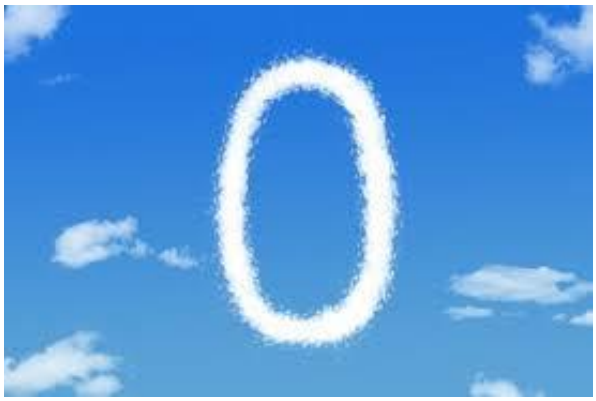
Action area – direct reductions	Action	Emissions savings over asset lifetime excl. PPA (tCO_2e)	Estimated upfront costs distributed across 2021 - 2030 ($)	Estimated total cost savings over asset lifetime ($)	Average annual cost savings ($)	Simply payback (years)	Included in Pathway Modelling
Energy Efficiency - Buildings	Implement a program of energy efficiency works at Council sites.	1,800	$271,000	$376,000	$24,000	11	1
Energy Efficiency - ESD Policy	Implement ESD Policy for all new builds and renewals between 2021/22 and 2030/31.	1,800	$84,000	$491,000	$12,000	7	1 & 3
Solar – Small Scale – Max Roll Out	Install 80kWp solar PV across viable sites (excl. maintenance costs).	1,200	$120,000	$300,000	$12,000	10	1

Solar – Small Scale – Select Roll Out	Install 40kWp solar PV across high profile, high consumption sites (excl. maintenance costs).	600	$60,000	$150,000	$6,000	10	3
Fleet – Fast Tracked Transition	Transition all passenger fleet and some utility/heavy fleet to EV – program start year 2021/22.	500	$267,000	$388,000	$67,000	4	1
Fleet – Delayed Transition	Transition all passenger fleet and some utility/heavy fleet to EV – program start year 2025/26.	500	$170,000	$388,000	$67,000	4	3
Street Lighting	Replacement of 207 residential streetlights with LEDs.	1,100	$138,000	$494,000	$25,000	6	1 & 3
Road Construction	Trial and implement leading road construction specifications[2].	500	$7,000	$0	-	-	1
Waste	Divert all FOGO in council's corporate waste stream away from landfill.	15	$2,000	$0	-	-	1

[2] This correlates to an action outlined in the Community Emissions section of the Background Paper. It has been included in the community sections as well because Council only has control over local roads – the State and Federal Governments also make and maintain roads.

There is one further activity to consider – a net zero emissions target and timeline to layer on top of the SDT. A net zero emissions commitment is an important aspirational target that provides Council and the community with a strong, clear and easily communicated and verified goal within which to frame actions and justify budget.

Many councils aim to achieve carbon neutrality earlier than their SDT dictates. Forty-four percent of all Victorian councils, around half of whom are rural or semi-rural councils, have corporate net zero emissions targets, and this number is set to increase. The majority of councils with net zero targets (63%) aim to achieve them by at least 2025 whilst the remainder have allowed themselves more time, the latest timeline being 2050.



Based on the three pathway options, Mansfield Shire Council can stay within the allocated carbon budget beyond 2050 through energy efficiency and renewable energy actions alone and still meet their SDT. Although, from an SDT perspective, Council may not need to purchase offsets until beyond 2050, the net zero emissions commitment is more than a matter of meeting the SDT. While the SDT is a-political, the net zero emissions target is Mansfield Shire Council's opportunity to communicate Council's own position to the community and establish its reputation as a leader within the local government climate change sector.

The two net zero emissions targets outlined below are intended to be complimentary to the SDT pathway options. Either target can be selected in conjunction with any of the SDT pathway options presented above.

Table 4: Net zero emissions scenarios

Target year	Justification
Net zero emissions 2035	This target represents leadership within the cohort of rural councils and is in line with other leading councils in this cohort such as Indigo Shire. It demonstrates Council's strong commitment to addressing climate change and communicates the urgency of action required within council as well as to the broader community. This target allows council time to reduce emissions in line with the SDT and thus reduce the costs of offsets significantly before committing to ongoing purchase. This ensures that funds are not diverted away from actual emissions reductions too soon.
Net zero emissions 2050	This target will enable Council to comfortably remain within the carbon budget set by the SDT assuming renewable power is purchased for all electricity from 2030. While weaker than the 2035 target, it still provides an important aspirational target with which to mobilise action within Council and communicates to the community that Council acknowledges its role in addressing climate change.

The SDT combined with the net zero emissions target will ensure Council stays within the carbon budget while communicating a clear commitment to addressing climate change within Council and the broader community.

1.3 Mansfield Shire Council Community Emissions

The Background Paper outlines and summarises Council's potential role for a wide range of interventions to support community climate action.

By looking at how to work within existing markets, removing key barriers to uptake and increasing the overall scale of climate mitigation and adaptation activity, Council can create systemic and lasting change for the Mansfield Shire.

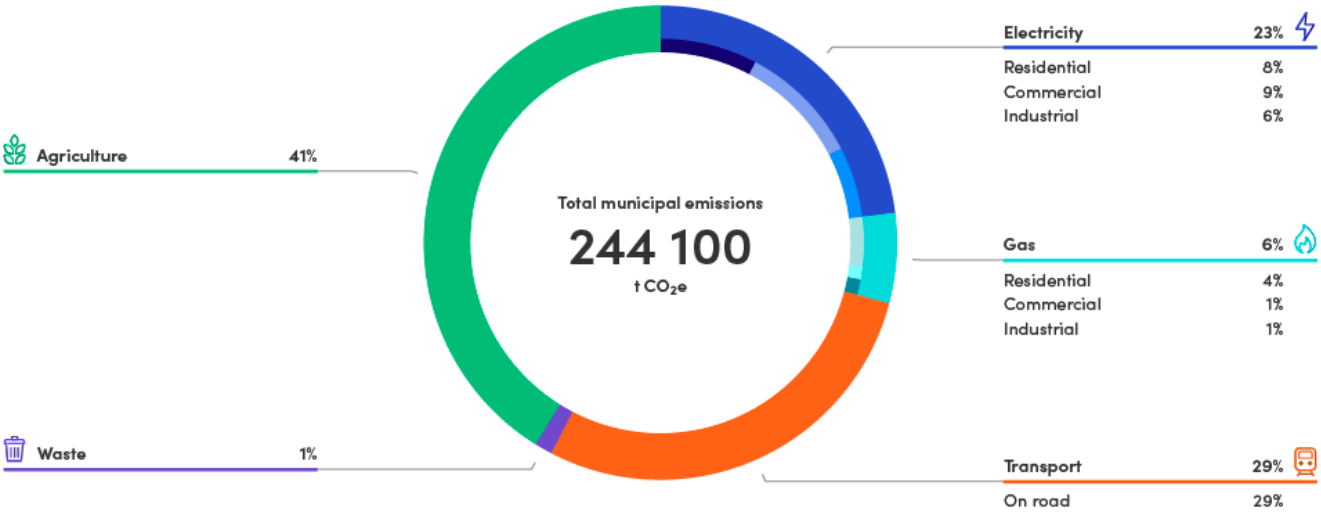


Figure 2: Mansfield Shire 2018/19 community emissions profile (source: Snapshot)

The Mansfield Shire local government area released approximately 244 kt CO_2e for the 2018/19 period (Figure 2). The largest source of emissions is the agricultural sector, responsible for generating 41% of municipal emissions. Note that there are additional emissions from the agriculture sector that are captured in other sections of the profile. For example, use of farm machinery is captured in transportation for tractor fuel use and stationary energy for farm electricity use. The second highest source of emissions is on-road transportation, accounting for 29% of emissions.

The calculated science-derived target for remaining within 2°C for Mansfield Shire is outlined in Table 5.

Table 5: Scaled science-derived target for Mansfield Shire

Remaining budget (t CO_2-e)	3,713,930
"Runway" - Remaining years without change (years)	13.6
Required linear annual reduction 2020/21 – 2048/49 (t CO_2-e p.a.)	9,991
Required linear rate of reduction 2020/21 – 2048/49 (%)	3.7%

The "remaining budget" outlined in Table 5 is the total amount of carbon that the municipality can emit if it is to make a fair contribution to limit the temperature increase to 2°C. The remaining budget for Mansfield Shire is around 3,7 million t CO_2-e from 2020/21.

The "runway" or remaining years without change (13.5 years) calculates how long this carbon budget would last, based on the emissions released om 2018/19. If the municipality were to significantly reduce annual emissions this runway would extend as the shire would not be "spending" it's carbon budget as rapidly.

The required annual reduction and required rate of reduction shows that Mansfield Shire's emissions need to reduce by around 10 kt CO_2-e, or 3.7% per year until 2048/49, if the carbon budget is to be used linearly over this time period.

A broad spectrum of community climate action options has been identified for Council to select for the upcoming Climate Action Plan. These actions also provide an indication of their cost, relevant stakeholders and collaboration opportunities (Table 6).

Table 6: Council intervention options to drive community climate action

Action area and Council cost **$** = staff time, **$$** = staff time + finances, **$$$** significant staff time + finances	**Council intervention options**	**Relevant stakeholders and collaboration opportunities**
Transport (29% of total community emissions)		
Expand the Electric Vehicle charging network **$$**	Incorporate EV charging infrastructure into strategic planning and planning regulations Facilitate external stakeholders	Electric Vehicle Council, Victorian Government, charging stations businesses (e.g. Chargefox)
Increase adoption of Electric Vehicles in the community **$$**	Education to promote EV and advertise charging locations	Electric Vehicle Council, EV companies Renewable Energy Mansfield
Electric Vehicles for the Council fleet **$$$**	Purchase EV to demonstrate leadership	N/A as corporate action. This is also profiled in the corporate section. It has also been included here because it demonstrates Council leadership and increases market possibilities for others to follow suit.
Improve sustainable transport infrastructure **$$**	Advocate for sustainable transport infrastructure Invest in cycling and walking infrastructure	Public Transport Victoria (PTV), VicRoads, Vic Department of Transport
Promote sustainable transport options **$**	Educate on sustainable transport modes	There are several programs for schools including Bike Ed run by

Action area and Council cost **$** = staff time, **$$** = staff time + finances, **$$$** significant staff time + finances	Council intervention options	Relevant stakeholders and collaboration opportunities
		VicRoads. Walk to School (Victorian Health initiative)[3]
Support carpooling & car share **$**	Facilitate carshare infrastructure Educate on benefits Require carshare infrastructure for new developments	Car pool businesses (e.g. Liftandgo[4])
Residential and Commercial Energy (22% of total community emissions)		
Planning for low emissions buildings **$$**	Require all new buildings to achieve net-zero energy or be net-zero ready	The Council Alliance for the Sustainable Built Environment (CASBE)
Planning for low emissions buildings **$**	Implement existing ESD regulations	Developers active in the municipality and region
Planning for low emissions buildings **$$-$$$**	Increase enforcement of existing ESD planning requirements	Goulbourn Broken Greenhouse Alliance
Planning for low emissions buildings **$**	Educate on benefits of ESD Provide grants/incentives for higher ESD standards	Building permit applicants
Community Energy Projects **$$**	Facilitate and host community energy groups	Renewable Energy Mansfield MP for Indi region Helen Haines' Local Power Plan[5] Climate Action Network Australia (CANA), Beyond Zero Emissions Zero Carbon Communities (ZCC)
Solar and energy efficiency for homes **$**	Facilitate financial solar schemes for rental properties and low-income households Provide incentives to homeowners to install solar, e.g. Council rates incentives	Real estate agents, Department of Environment, Land and Water Renewable Energy Mansfield
Energy efficiency retrofits and solar for businesses	Work with businesses to increase the rate of uptake of energy efficient solutions	Mansfield Business Association Renewable Energy Mansfield

[3] https://www.walktoschool.vic.gov.au/
[4] https://www.liftango.com/blog/building-the-right-carpool-program
[5] https://www.localpowerplan.com/

Action area and Council cost **$** = staff time, **$$** = staff time + finances, **$$$** significant staff time + finances	Council intervention options	Relevant stakeholders and collaboration opportunities
$	Provide incentives to businesses to install energy efficient retrofits and solar, e.g. Council rates incentives	
Agriculture and Land Use (41% of total community emissions)		
Carbon farming **$$**	Facilitate carbon farming working groups Educate on carbon farming Connect carbon farmers with buyers	National Farmers' Federation (NFF) and Victorian Farmers Federation (VFF) Aboriginal Carbon Foundation[6] Carbon Market Institute[7]
Low methane feedstock **$$**	Facilitate methane feedstock solution working group Keep farmers informed and up to date on methane feedstock technology trials and commercialisation opportunities	National Farmers' Federation's (NFF) and Victorian Farmers Federation (VFF) Meat and Livestock Australia CSIRO and Melbourne University FutureFeed group including CSIRO[8]
Climate Smart Agriculture **$$**	Facilitate climate smart agriculture working group Keep farmers informed and up to date on climate smart agriculture opportunities	GBGA Climate Smart Agriculture Development Project Victorian Farmers Federation (VFF)
Regenerative Agriculture **$$**	Facilitate regenerative agriculture working group Provide incentives or devise a rebate scheme for Mansfield landowners Keep farmers informed and up to date on regenerative agriculture opportunities	Local indigenous groups, local producers, GBGA and other alliances, National Farmers Federation (NFF), Victorian Farmers Federation (VFF), Up2Us initiative, Goulburn Broken Catchment Management Authority, Farmers for Climate Action
Land use planning **$$**	Embed strategic land use planning regulations that protect assets from climate change Change land use guidelines to facilitate sustainable agriculture practices	Council planning teams, developers and property owners, MAV

[6] https://www.abcfoundation.org.au/
[7] https://carbonmarketinstitute.org/about/
[8] https://www.future-feed.com/

Action area and Council cost **$** = staff time, **$$** = staff time + finances, **$$$** significant staff time + finances	Council intervention options	Relevant stakeholders and collaboration opportunities
Green civic infrastructure - Adaptation action **$$$**	Incorporate green infrastructure into strategic planning Require planning applications to implement green infrastructure Invest in green infrastructure on Council land	Melbourne University Green Infrastructure Group[9] can potentially provide expert advice and collaboration opportunities
Improve tree cover on Council and private land - Adaptation action **$$$**	Incorporate additional diverse and resilient tree cover into strategic planning Require planning applications to protect vegetation and plant additional diverse vegetation Increase Council land canopy cover and vegetation diversity	Developers active in the municipality and region Building permit applicants
Local food production and sustainable diets **$$**	Stock Council food service outlets with local low emissions foods Educate community on better diets and local foods Facilitate and support local farmers markets, food co-ops and veggie box services	Leisure Centre Operators, Mansfield District Leisure Trust Mansfield schools Walker Events, the organiser of the Mansfield Farmers Market and other sustainable food events[10]
Waste (1% of total community emissions)		
Food organics and garden organics (FOGO) collection service **$$$**	Set up FOGO collection for households as per Council's Waste Strategy Plan Invest in Council owned FOGO processing plant Educate the community on FOGO service	Organic waste service providers (e.g. Cleanaway)
Industrial processes and product use (estimated to be <1%)		
Sustainable Roads **$**	Trial use of low carbon recycled priority materials in council infrastructure projects Update infrastructure guidelines and processes to include learnings from trials Advocate to other levels of government to adopt low carbon road approaches	Department of Transport (DoT)

[9] https://girg.science.unimelb.edu.au
[10] http://walkerevents.com.au/farmers-market/

There are a number of actions and interventions for Council to consider that support broader community climate action. These are outlined in Table 7.

Due to the broad spectrum of action areas and emissions sources these programs cover, indicative cost cannot be provided.

Table 7: Broader Council interventions to support community climate action

Action area	Council's role	Relevant stakeholders and collaboration opportunities
Support community climate action	Facilitate sustainability events Facilitate a community climate action leadership program Inform community of available climate action funding	Local community groups Sustainability groups and experts GBGA
Declaring a climate emergency	Declare a Climate Emergency and commit to increase support for community emission reduction	Climate Emergency Australia (CEA), hosted by the City of Melbourne, run by Northern Alliance for Greenhouse Action and funded by 13 founding funder councils.[11]
Partnerships	Join/lead regional initiatives to drive community action with GBGA and cohort councils Partner with private energy resilience renewable enterprises Explore alternative means of sourcing specialised expertise that Council may not have in-house	GBGA Cohort councils Private enterprises Knowledge institutions (e.g. universities)
Advocacy and leadership	Join the Cities Power Partnership (CCP) Advocate to State and Federal Government for more ambitious climate action through joint advocacy campaigns with other councils (e.g. GBGA) and local stakeholders	Climate Council - CCP Municipal Association of Victoria (MAV) GBGA Renewable Energy Mansfield Up2Us
Climate Adaptation	Partner with regional climate adaptation programs to support the community to remain resilient in a changing climate	Hume Regional Climate Change Adaptation Strategy – Climate Ready Hume

[11] https://www.naga.org.au/climate-emergency-australia.html

2. Introduction

The Mansfield Climate Action Plan Background Paper outlines best practice approaches, trends and options for Mansfield Shire Council to reduce greenhouse gas emissions (emissions), both in their own operations and throughout the community. It will be used to inform Mansfield Shire Council's Climate Action Plan, Community Vision and Council Plan.

This Background Paper maps out current Council (corporate) and community emissions and options for reducing emissions.

It establishes options for an emissions reduction target and timeline for Council's corporate[12] emissions as well as a cost-benefit analysis that assesses opportunities within but not limited to the following key areas of Council's operations: energy efficiency improvements in buildings; renewable energy generation; low emissions technology upgrades in buildings and fleet; renewable energy power; and options for offsetting remaining emissions to achieve net zero emissions status.

The Background Paper also outlines and summarises Council's potential role for a wide range of interventions to drive community climate action. The municipality emissions are profiled, and a broad spectrum of community climate action options are outlined along with an indication of their cost, relevant stakeholders, collaboration opportunities, and estimated timeframes.

Whilst there is a particular focus on climate change mitigation (avoiding catastrophic climate change), several of the potential actions listed will also assist the local government area (LGA) to adapt to a changing climate.

Once feedback has been received from the community, councillors and Council staff, a Climate Action Plan will be developed that will enable Mansfield Shire Council to demonstrate strong leadership and make a fair contribution to reducing and offsetting its own share of emissions, and support the community to tackle theirs.

[12] Corporate emissions are those generated by Council activities.

Image Source: Photo by Australian Property Journal

3. Background

3.1 Global and National Policy

Councils in Australia have a long history of participating and indeed leading international climate change and sustainability programs and movements. Climate change is a global problem than can only be solved by global solutions. The impact of greenhouse gases (GHG) on climate does not care for international borders so programs and approaches that link local action to larger state, national and international movements have long been central to the efforts of councils to fight climate change. Over 1,000 councils across multiple countries have declared a climate emergency, including 98 in Australia representing over a third of the population[13].

[13] 21 February, 2021, The Climate Emergency Declaration and Mobilisation organisation website: https://climateemergencydeclaration.org/

In the lead-up to the Paris Climate Summit in 2015 (officially known as the United Nations Climate Change Conference or COP 21), local governments around the world worked to lobby national governments to set strong emissions targets and work with cities in tackling climate change. The Paris Agreement was in December 2015, representing a historic turning point in the international fight against climate change and Australia was one of the 175 countries signing the agreement and committing to implementing an economy-wide target to keep any temperature rise "well below 2°C", and to drive efforts to keep warming below 1.5°C higher than pre-industrial levels.

Importantly, the Paris Agreement explicitly recognises and engages local and subnational governments which has been a stimulus for an increasing focus on programs and affiliations that bring local governments together to collaborate, aggregate and advocate as a sector.

In addition to the Paris Agreement to which Australia is a signatory, the Victorian Local Government Act 2020, requires councils to consider and reduce emissions of both the whole municipality and their own operations[14].

3.2 Mansfield Shire Council Climate Action to Date

To date, Mansfield Shire Council have undertaken several successful emissions reduction projects.

As an active member of the Goulburn Broken Greenhouse Alliance (GBGA), Mansfield Shire Council is raising awareness and building the capacity of the region to mitigate and adapt to the impacts of climate change through wide reaching regional projects.

A notable achievement of the GBGA is the Climate Smart Agriculture Development Project, which models the impacts of climate change and

[14] Within the Victorian Local Government Act 2020, an overarching governance principle is *'the economic, social and environmental sustainability of the municipal district, including mitigation and planning for climate change risks, is to be promoted'*.

identifies ways to continue productivity in the region – information which can be made publicly available.

The GBGA Watts Working Better program saw the energy efficient retrofit of Mansfield streetlights. Other GBGA programs include Charging the Regions electric vehicle study, sustainability training programs and carbon crunching councils. As Mansfield Shire Council is a smaller shire than others involved in GBGA, there has been limited resources to make a full commitment to all these projects.

Another key regional project Council is involved in is the Climate Ready Hume program.

Led by the State Government, the program outlines the climate risks for the region including extreme heat, harsher fire weather, less rainfall and more frequent and heavy downpours.

Presented alongside these risks are a variety of region-specific actions to be considered, which can enable the region to take advantage of opportunities and reduce the negative impacts of climate change.

At a local level, there are key plans and strategies that reflect Council's ongoing commitment to climate action. In 2018 Council developed a corporate Greenhouse Action Plan that profiled corporate emissions and outlined avenues for reducing emissions. Since then, Council has continued to document and compare annual emissions over time.

The Council Plan (2017-21), the Health and Wellbeing Plan, the Economic Development Strategy and the Environment Strategy all support the development of the upcoming Climate Action Plan (see Figure 3). The Council Plan recognises the impacts and opportunities presented by climate change, and acknowledges the very real need to build community capacity in order to respond effectively. Both the Health and Wellbeing Plan and the Economic Development Plan commit to ensuring the resilience of residents, businesses and the wider community through support from Council.

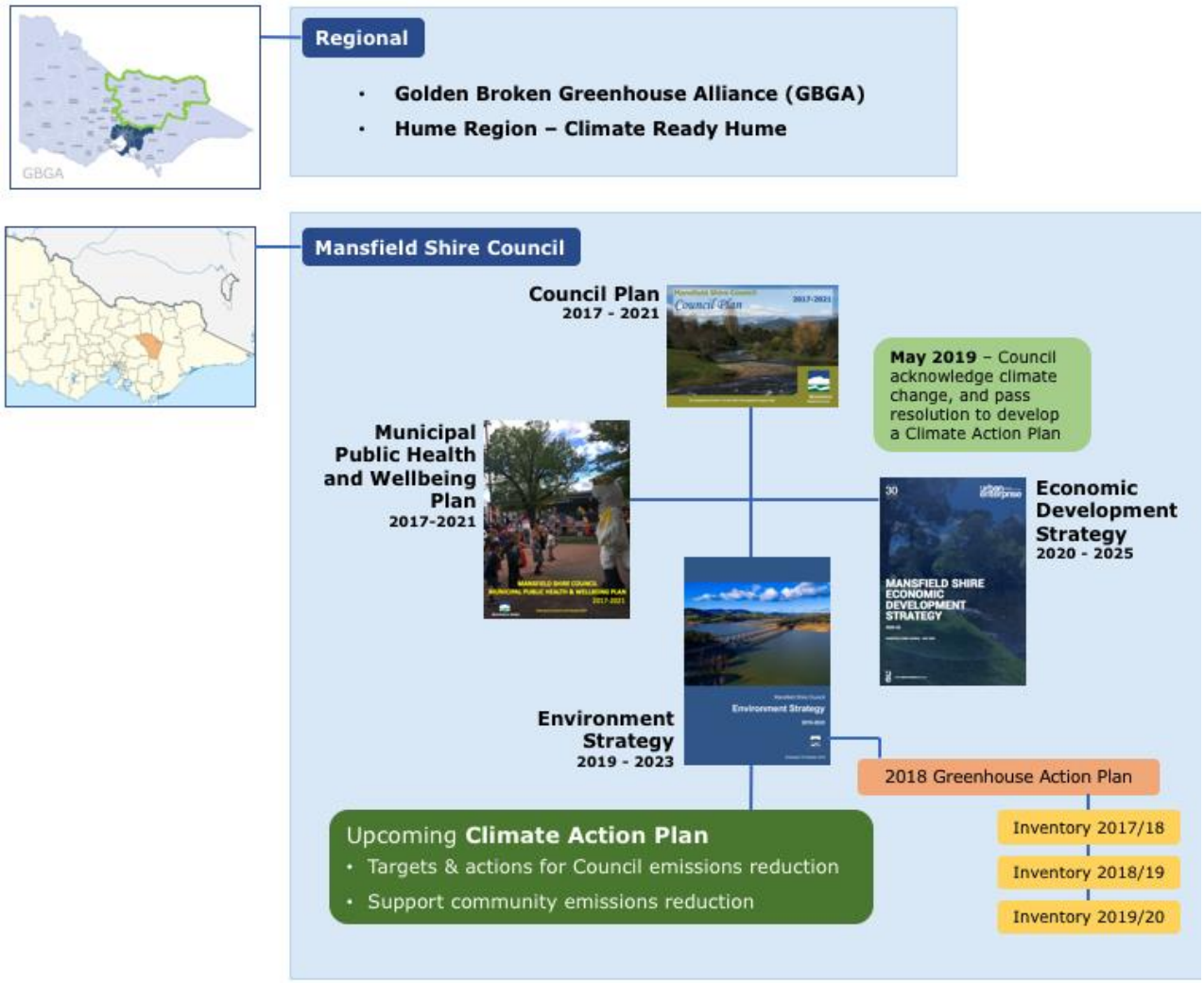


Figure 3. Strategic context of Council's upcoming Climate Action Plan

Notable projects already achieved under the mantle of Council's Environment Strategy include solar photovoltaic system installations at Council sites including a 25kW system at the Shire Offices, a transition away from gas heating to less greenhouse intensive models, setting of high environmentally sustainable design standards for the Mansfield Station Precinct Activation Project, support for the planting of urban tree coverage and advocating for public infrastructure investment such as electric vehicle charging stations and cycle and pedestrian paths. Council also supports community led climate initiatives such as Renewable Energy Mansfield and Up2Us Landcare Alliance with advice, in-kind support and letters of support for grant applications[15].

[15] Mansfield Shire Council Environment Strategy 2019-2023.

PART ONE: CORPORATE EMISSIONS

4. Council's Corporate Emissions Inventory

Council's corporate emissions are those resulting from Council's own operations. Council has undertaken corporate emissions inventories since the 2016/17 financial year (FY). Refer to Appendix A: Corporate Emissions Inventory Report Methodology Options for more information on inventory trends and best practices.

4.1 2018/19 Corporate Emissions Inventory Results

Establishing a reliable emissions baseline is the first step in developing a robust Climate Action Plan as it allows targets to be set and progress to be monitored. For the purpose of the Climate Action Plan, Council has decided that emissions from 2018/19 provides the best representation of Council's current baseline operational emissions. The Covid-19 pandemic in early 2020 and the consequential temporary closure of several Council services and facilities has skewed 2019/20 emissions data, making it less reflective of a typical year's emissions.

4.1.1 Emissions Profile Summary by Sector - 2018/19

In 2018/19, Council corporate activities generated 103.4 kilotons of GHG (CO_2-e). The majority of Council's measured emissions come from electricity use in buildings (56%) followed by street lighting (18%), then plant (14%). Fleet, water, LPG account for 5%, 4% and 3% respectively.

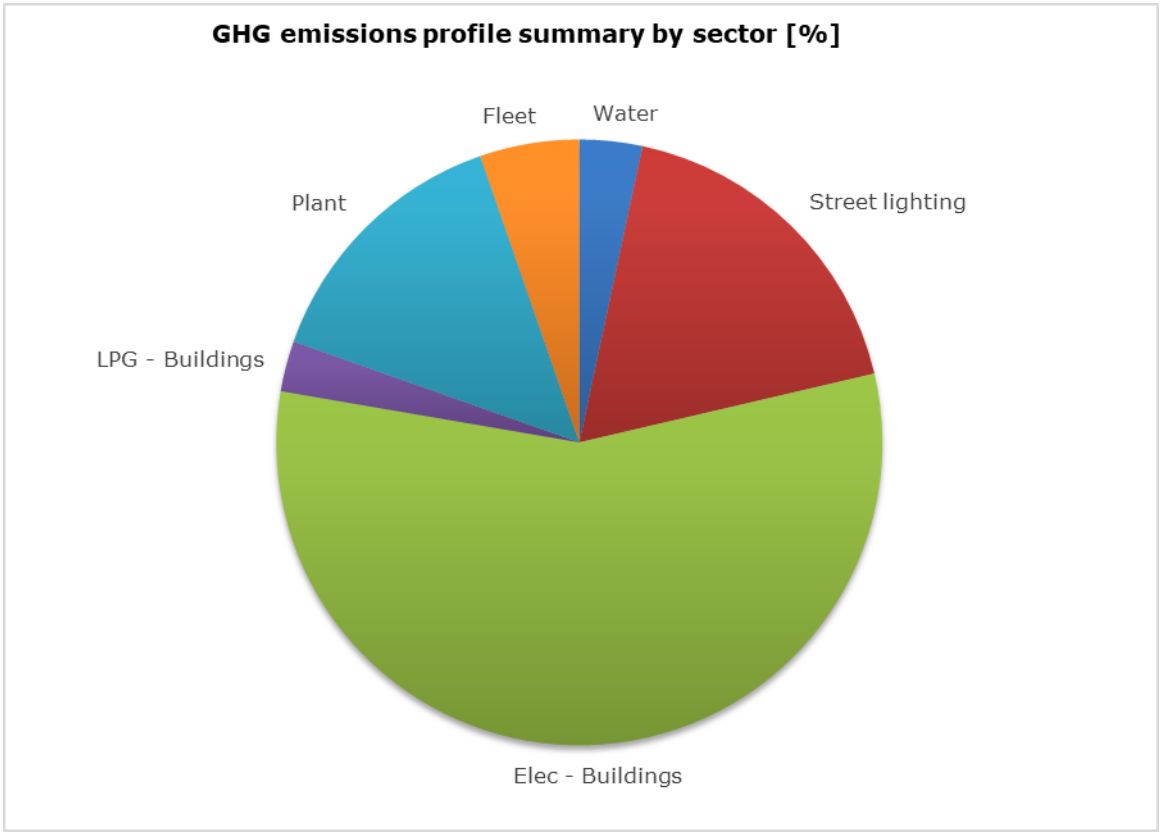


Figure 4: Emissions profile by sector 2018/19

Table 8: Emissions profile by sector

Sector	Emissions [tonnes]	Emissions [%]
Water	34.57	3.3%
Corporate Waste	2.72	0.3%
Street lighting	185.59	18.0%
Elec - Buildings	580.98	56.2%
LPG - Buildings	27.78	2.7%
Plant	147.37	14.3%
Fleet	54.73	5.3%
TOTAL	**1,033.74**	**100%**

4.1.2 Emissions Profile Summary by Cost - 2018/19

In terms of costs to Council, Figure 5 shows that costs of electricity for buildings and plant fuels have the largest impact on Council's budget. Costs of water and street lighting were also significant.

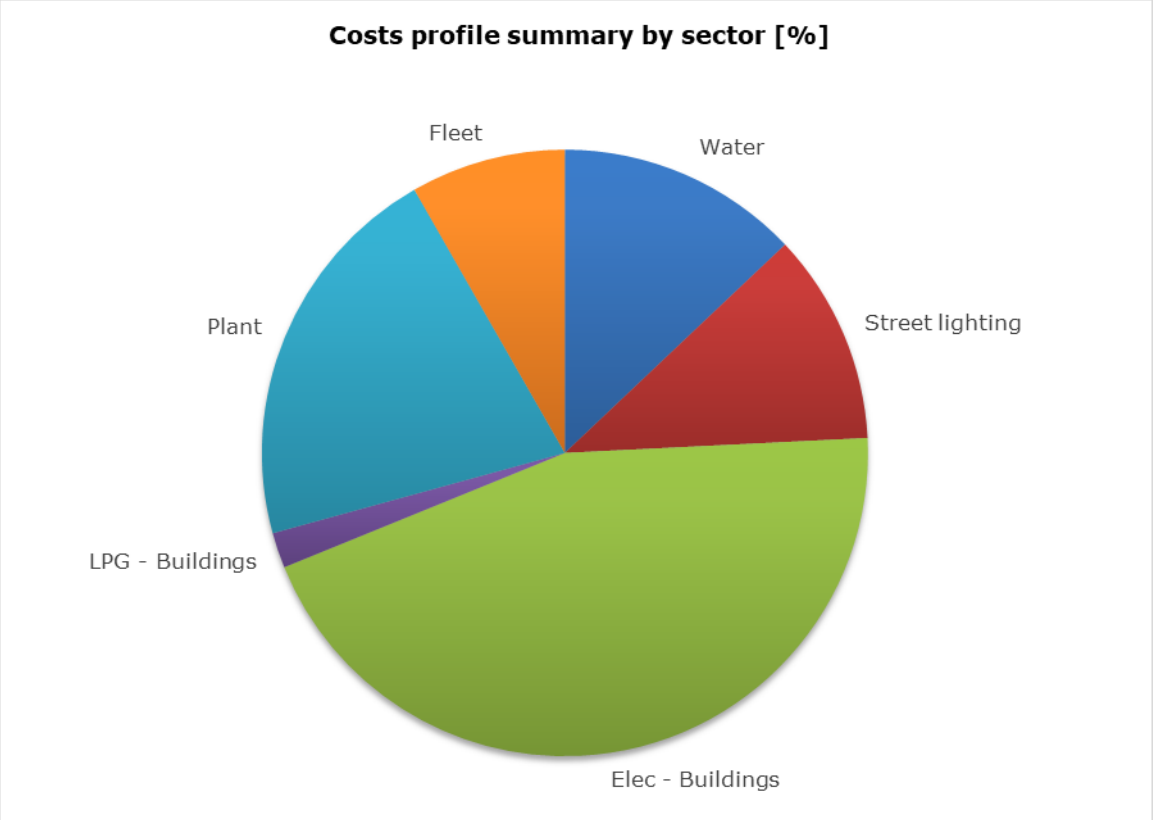


Figure 5: Emissions profile by cost 2018/19

Table 9: Emissions profile by cost

Sector	Cost	Cost [%]
Water	$ 43,799	18.3%
Street lighting	$ 38,086	15.9%
Elec - Buildings	$ 150,944	63.1%
LPG - Buildings	$ 6,369	2.7%
Plant	$ 70,993	29.7%
Fleet	$ 27,985	11.7%
TOTAL	$ 338,176	100.0%

Refer to Appendix B: 2018/19 Detailed Emissions Breakdown for more information on the 2018/19 inventory. Appendix C: Data Quality Review of Corporate Inventory Emissions Sources contains some notes on current data quality and recommendations for improvement that will be useful when undertaking future inventories. Refer to Appendix D: Action Planning Pathways Methodology and Assumptions for details on how these figures were quantified.

4.2 Council's Historical Corporate GHG Emissions

The historical emissions summary has been compiled using data sourced from inventory tools provided by Council for FY16/17[16], FY 17/18, and FY18/19. Note: some of the figures in Table 10 differ from those profiled in older Council inventory reports. This is because figures have been updated using a new and improved inventory tool. These variances are primarily due to the inclusion of account estimates where there was less than 365 days of document data per asset. The inventory tool will be supplied to Council as part of the Climate Action Plan deliverables.

Table 10: Historical trends comparison table

Reporting period	FY16/17		FY17/18		FY18/19	
Sector	Cost	tCO_2-e	Cost	tCO_2-e	Cost	tCO_2-e
Water	$19,289	30.16	$49,887	39.84	$43,799	34.57
Street lighting	$28,225	174.61	$30,009	182.85	$38,086	185.59
Elec - buildings	$107,006	500.27	$143,737	520.03	$150,944	580.98
LPG - buildings	$6,932	9.15	$4,079	27.23	$6,369	27.78
Plant	$77,842	188.72	$77,954	181.84	$70,993	147.37
Fleet	$21,849	51.10	$19,938	44.83	$27,985	54.73
Total	**$261,143**	**954.01**	**$325,604**	**996.62**	**$338,176**	**1031.02**

[16] Note: Ironbark developed and populated the FY16/17 inventory tool under the Sustainability Victoria Local Government Energy Saver program.

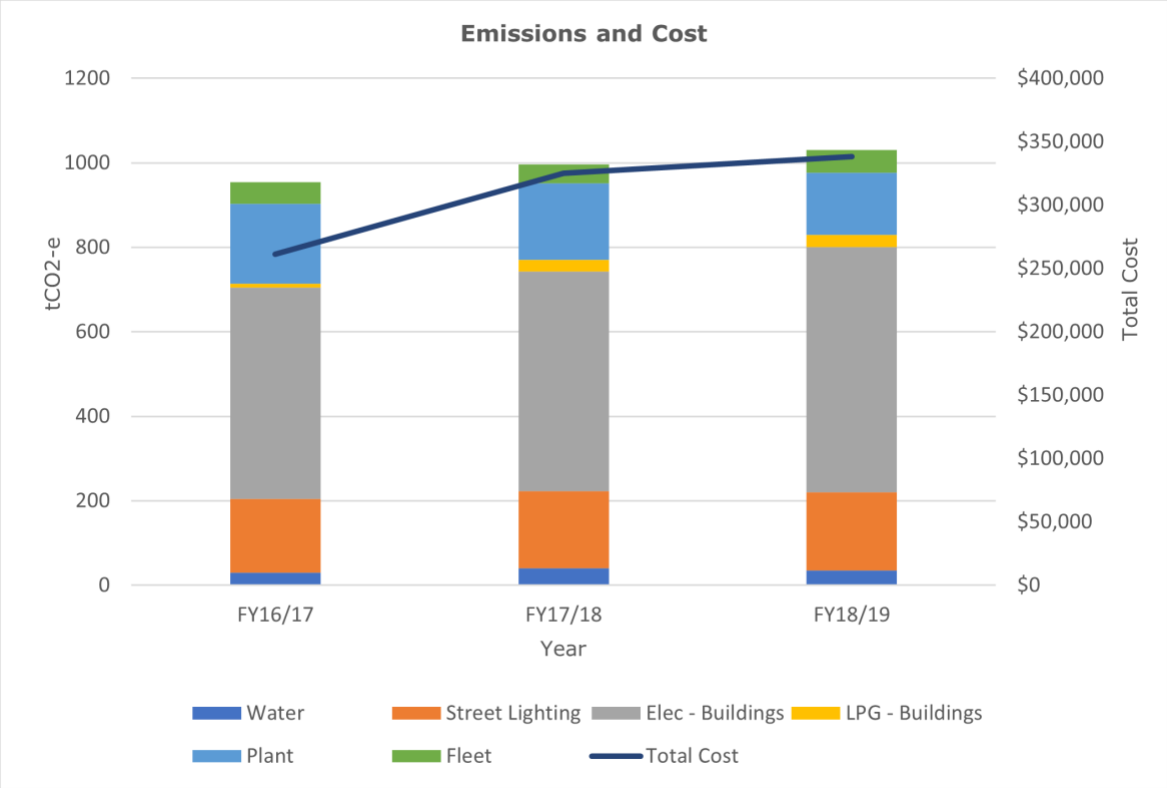


Figure 6: Emissions and cost 2016 to 2019

As can be seen in Figure 6, Council's overall emissions have increased in most sectors for each subsequent FY reporting period. Increases in emissions can partly be attributed to a steady population growth of 2% each year[17] which is likely to have increased the demand for Council services and as a result an increase in resource consumption. Increases in costs can largely be attributed to price changes in fees and tariffs as outlined in a comparison report supplied by Council[18] in combination with the increases in resource consumption.

Other more significant variations follow:

- Water – 2 of the top 3 consumers saw significant increases:
    - Recreational Reserve – Lights & Netball Court is the top water user for all reporting periods with consumption increases reflective of the dry conditions and lower than average rainfall recorded in 2018 and 2019 calendar years[19].
    - 38-42 Malcolm St - New irrigation system was installed resulting in a notable increase in consumption.
- LPG – saw a notable dip in 2017/18
    - Mansfield Shire Office - The dip in LPG emissions for FY2017/18 can partly be attributed to the upgrade of the heating system in the Mansfield Shire Office.

[17] Figure obtained from Council's website, https://www.mansfield.vic.gov.au/my-council/about-mansfield-shire
[18] Council supplied a comparison report covering 2016/17, 2017/18 and 2018/19 financial years.
[19] See the BOM website for details - http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_type=dataFile&p_stn_num=083019

  - Shire Depot – Saw a fall in LPG consumption most likely as a result of fluctuations in heating demand between reporting periods, and a fall in cost due to the procurement of a fixed amount of LPG for the depot at a reduced price.

- Electricity Building – significant increases between reporting periods:
  - There have been several new sites added and data provided during FY17/18 and FY18/19 inventory periods compared to FY16/17. In FY18/19 these sites contributed 61.06 tCO_2-e or 10% of total data emissions compared to FY 2016/17 inventory. With the top consumer of these being the Mansfield Visitor Information Centre[20].
  - Overall top 3 consumers for FY2018/19 period were Mansfield Shire, Swimming Pool Complex and Mansfield Family Child Centre respectively.
- Fleet and Plant – totals for Pant and Fleet emissions combined have remained relatively stable for each period. Increases in Fleet in 2018/2019 are most likely due to the way Fleet and Plant are being categorised.
- Street Lighting – steady increase in emissions with cost increases consistent with changes in energy rate price.

The onset of the Covid-19 pandemic has sparked a tree change for many city dwellers with demand for new housing in the Shire at an all-time high[21] and Mansfield ranked in the top 20 regional towns for first home buyers[22]. This upward pressure on Council facilities and services will need to be countered with emission reduction efforts if Council wishes to keep emissions and costs to a minimum.

[20] While the centre was listed in the site list for FY16/17 inventory, there was no NMI associated or data reported.
[21] https://www.mansfield.vic.gov.au/news/homebuyers-coming-in-droves-enjoy-mansfields-lifestyle-and-open-spaces
[22] https://www.domain.com.au/news/revealed-the-best-tree-change-or-sea-change-regional-towns-for-first-home-buyers-1011893/

4.3 Council's Emissions Projections to 2030/31

The business as usual (BaU) trajectory for Mansfield Shire Council's corporate emissions has been modelled to provide an understanding of the impacts of planned works within Council, as well as external factors that may affect the corporate emissions profile.

The modelling indicates that overall emissions will likely remain stable over the next decade. Modest growth in Council services will be countered by decreases in the emissions intensity of grid supplied electricity and standardised improvements to energy efficiency in buildings and vehicle design. With a 1.1% annual increase in population projected to 2036[23], Mansfield Shire is not projected to be a high growth area. While the impacts of new buildings have been incorporated into the projection, significant increases in these areas are not expected at this point.

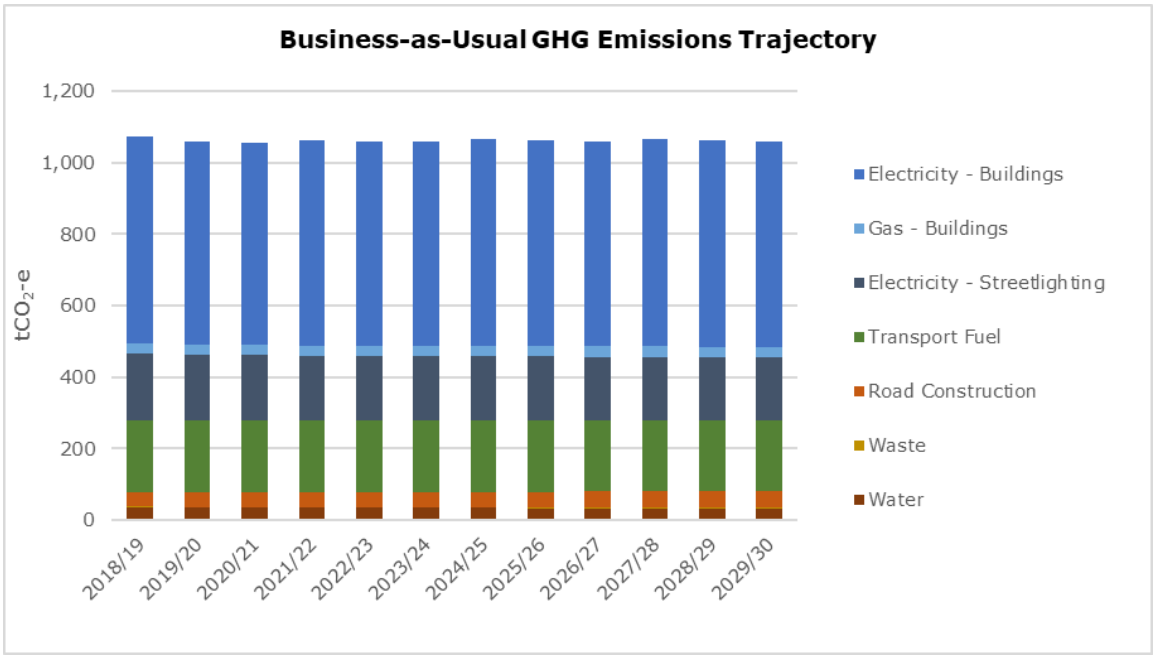


Figure 7: Business-as-usual corporate GHG emissions projection to 2030

[23]https://www.mansfield.vic.gov.au/sites/default/files/largefiles/Mansfield%20Shire%20Economic%20Development%20Strategy%202020-25.pdf

5. Corporate Emissions Target and Action Plan Pathway

5.1 Target Setting Context

5.1.1 Role of Targets

As Council is investigating target options for reducing GHG emissions at the corporate level, it is useful to explore their role and application. Council climate strategies have three key types of targets:

Top down – what needs to be achieved (Science-derived Targets)

The *Science-derived Target* is determined from an external requirement, in this instance, the recommendations of the Intergovernmental Panel on Climate Change (IPCC) to avoid catastrophic climate change. It may be better thought of as a limit, rather than a target. It is independent of political or other considerations and does not consider how difficult (or otherwise) the target will be to achieve. The primary motivation for this target is to avoid some negative outcome.

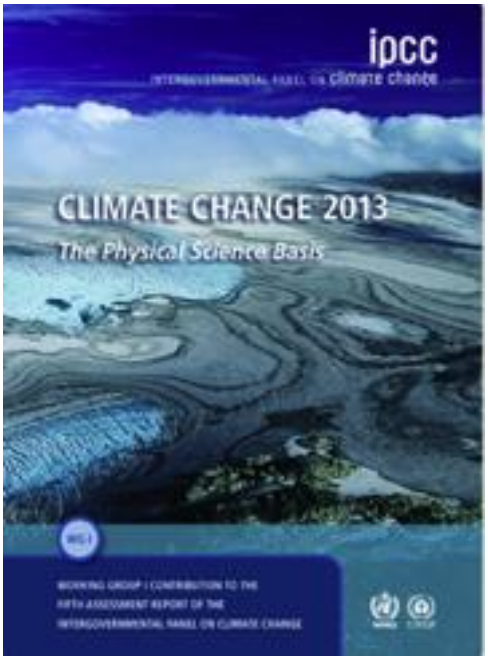
Aspirational – a 'call to action'

The *Aspirational Target* is set according to political or other considerations and will typically involve something memorable or easy to communicate. The primary motivation for this target is to establish a common rallying point and to motivate all stakeholders. It is often used as a secondary public target that is connected to a more complicated primary target. For example, councils will use a net zero emissions reduction target as their aspirational and front-end target, while keeping their Science-derived Target for strategy development and action planning internally. They do so because net zero emissions targets are easier to communicate and present a more powerful statement of intent to the public.

Bottom up – what we can achieve (Action-plan Based)

The *Action-plan Based Target* is one that is constructed from what can be achieved from the actions being considered in a council's action plan. It can be ambitious; however, its scope is directly derived from planned actions. An example of this type of target is, "Our factory will produce 10,000 widgets this quarter". This approach has been largely abandoned as a stand-alone approach by Australian Councils because – put simply – it does not avoid catastrophic climate change and as such cannot be considered a climate target. Bottom-up targets are however valuable in monitoring performance against the action plan but only in conjunction with an SDT.

5.1.2 Science-derived Targets



At the United Nations Framework Convention for Climate Change (UNFCCC) Paris Conference in 2015, the Australian Government signed an international agreement between 195 countries to keep any temperature rise "well below 2°C", and to drive efforts to keep warming below 1.5°C higher than pre-industrial levels.

Climate science tells us that warming beyond 1.5°C threshold is likely to have increasingly severe social, economic and environmental impacts, not least on a water scarce continent like Australia. As of October 2018, the IPCC announced that there were no longer any scenarios for remaining within this temperature increase-range without the use of carbon removal technologies.

This Paris Agreement entered into force on 4 November 2016, explicitly recognises and engages local and subnational governments and their critical role in supporting the transformation, including setting goals and strategies aligned with the science.

In becoming a signatory to the Paris Agreement, Australia now has a limited, established carbon budget within which to operate in order to meet its commitment. The development of science-derived targets for councils enables us to understand the scale of action that is required at a municipal level to stay within this budget.

An emissions reduction target for an organisation, entity or community is considered "science-derived" or "science-based" when it is aligned with the broader emissions reduction required to keep global temperature increase below 2°C compared to preindustrial temperatures, as described in the Fifth Assessment Report of the IPCC.

5.1.3 National and State Target Trends

Australia is a signatory to the Paris Climate Agreement which pledges to reduce carbon emissions and limit global warming to "well below 2°C above pre-industrial levels". In late December 2021, the Federal Government re-committed to an emissions reduction target of 26-28 per cent below 2005 levels by 2030. This is despite the Government's main climate change advisory body recommending an emissions reduction target of 40-60 per cent below 2005 levels by 2030[24].

The Victorian Government's Climate Change Act 2017 establishes a long-term target of net zero emissions by 2050. As of March 2021, the State Government is soon to announce updated

[24] Climate Change Authority, Final Report on Australia's Future Emissions Reduction Targets, Climate Change Authority, 2 July 2015, https://www.climatechangeauthority.gov.au/news/final-report-australias-future-emissions-reduction-targets, (accessed 25 March 2021).

interim targets for 2025 and 2030 and some reduction targets for individual sectors, including the high emissions transport and agriculture industries.

5.1.4 Local Government Best Practice Targets and Trends

The intention of a science-derived carbon budget is to provide a framework for setting targets. It allows a clear understanding of the scale of action that is genuinely required and helps define responsibility for action. It is also a valuable communication tool to demonstrate a fair share of action that needs to be undertaken.

Leading councils see the science-derived target (SDT) as the bare minimum to achieve for corporate emissions and generally aim to exceed the SDT by achieving carbon neutrality earlier than their SDT dictates. There are also a handful of leading councils that are already carbon neutral, while **the majority of others have far more ambitious targets than both the State and Federal Governments** as shown in Table 11.

A high number of Victorian councils (44%), around half of whom are rural or semi-rural councils, have corporate net zero emissions targets. A further 33% are due to update their corporate targets in 2022 and the number of councils with net zero emissions targets may increase.

The majority of councils with net zero emissions targets (63%) aim to achieve them by at least 2025, and 11% aim to achieve them by 2050 (in line with the State Government). Other councils have already achieved net zero emissions status.

Victorian councils are leading the way in setting community emissions reduction targets (33% as opposed to the Australian average of 10%) and are also leading in terms of undertaking actions to reduce community emissions (68% as opposed to the Australian average of 25%).

It is worth noting that other councils may in fact have established targets and actions for reducing corporate and community emissions, however their efforts might not be profiled on their website.

Table 11: Federal, state and local government targets

Government	Target
Federal Government	26-28% below 2005 levels by 2030
Victorian State Government	Net zero emissions by 2050 Interim targets to be announced soon
Australian councils*	According to research undertaken by Beyond Zero Emissions and Ironbark Sustainability (2020-2021): • 24% Australian councils have corporate emissions targets profiled on their websites • 10% Australian councils have community emissions reduction targets • 25% Australian councils implement community emissions reduction actions

Victorian councils (79)[25]	• 60 (76%) VIC councils have corporate emissions reduction targets
	  ○ 35 (44%) councils have a corporate net zero emissions target, half of which are in rural or semi-rural areas
	  ▪ 13 (37%) of these are by 2020
	  ▪ 9 (26%) of these are by 2025
	  ▪ 9 (26%) of these are between 2026-2040
	  ▪ 4 (11%) are by 2050
	  ○ 16 (33%) VIC councils have other corporate emission reduction targets that will expire by 2021**
	• 26 (33%) councils have community emissions reduction targets
	• 54 (68%) councils implement community emissions reduction actions

Neighbouring council corporate emissions targets	Indigo Shire: Net zero by 2035[26] Benalla Rural City: Currently establishing a target Murrindindi Shire: Currently establishing a target Alpine Shire: Currently establishing a target

** Other councils may have targets, but do not publicly display them*

***This would indicate that these targets are most likely up for renewal in the next year and it is expected that many of these will set net zero emissions targets*

5.2 Target and Action Pathways Activities

This Background Paper breaks the target setting and action planning process for Mansfield Shire Council into 3 stages:

1. Science-Derived Target - First is the establishment of a carbon budget and science derived target (SDT) for Council. This is the *Top-Down target* and forms the foundation upon which the pathways options have been developed.

2. Action Plan Pathways Options - Secondly three pathways for achieving this SDT are presented with the aim of demonstrating the breadth of approaches and actions available to

[25] Beyond Zero Emissions and Ironbark Sustainability Research from 2020/21

[26] 'Environment Strategy' at https://www.indigoshire.vic.gov.au/Residents/Environment/Environment-and-Sustainability

Council, and the costs, benefits and challenges associated with each approach. These pathways represent the *Bottom-Up target* and include a commitment to 100% renewables as part of the timeline. Council will need to select a pathway (or blend of pathways) to pursue. The selected pathway will then be expanded upon within the Climate Action Plan element of this project with more specific internal targets and KPIs being developed to monitor progress.

3. Net Zero Emissions Target - Thirdly is the net zero emissions target date. This is what is termed the *Aspirational Target* and will be valuable in communicating Council's commitment to mitigating climate change both internally and publicly, motivating action and mobilising funds within Council, and demonstrating leadership in climate change mitigation within the wider community.

Refer to

Appendix D: Action Planning Pathways Methodology and Assumptions for details on how the following figures were quantified.

5.2.1 Activity 1: Science Derived Target – The Foundation

A science-derived carbon budget for Council's corporate emissions provides a framework for setting targets and demonstrates that Mansfield Shire Council is undertaking appropriate action to mitigate the effects of climate change. An SDT allows a clear understanding of the scale of action that is genuinely required and helps define responsibility for action.

As the foundational step in developing the Climate Action Plan options for Council, Ironbark has calculated a carbon budget and science-derived target (SDT) for Council's operations. The carbon budget and linear reduction targets are outlined in Table 12.

To connect the activities of Council to the Science-Derived Target (SDT) at the national scale, the economic activity, size of the organisation and the fleet mix for the Council is used.

Table 12: Calculation of carbon budget for Council's corporate emissions

Calculation of budget	Council corporate	Units
2018/19 Emissions	1.07	kt CO_2e
Total carbon budget	16.9	kt CO_2e
Runway – years without change	15.7	years
Required per annum reduction rate	3.2%	% per year
	34.1	t CO_2e

Based on the calculation in 2018/19 of around 1.07 kt CO_2-e[27], if Council were to keep emitting at this level, Council will spend its carbon budget of 17 kt CO_2-e in 16 years or by year 2035 – we have termed this duration Council's carbon "Runway".

If Council reduces its corporate emissions in line with the linear per annum reduction rate of 3%, Mansfield Shire Council will achieve net zero emissions by 2050.

It is crucial that any target set by Mansfield Shire Council is done so within the framework of the carbon budget as outlined by the IPCC with the foundational objective being to avoid catastrophic climate change. In short this means Council's Climate Action Plan must enable Council to stay within the carbon budget set by the SDT.

Although the target may appear ambitious, SDTs are the minimum required and should be used as the foundation upon which all other targets must lie. For this reason, all options presented in this Background Paper see Council achieving reductions which enable Council to stay comfortably within the carbon budget set by the SDT to limit temperature rise to 2°C.

[27] For the purpose of the SDT setting and action planning emissions from road construction have been estimated at 40tCO_2e for 2018/19. This results in a slight discrepancy between the total emissions presented as part of the inventory and the total emissions presented as part of the SDT and action planning sections.

Photo by Fezbot2000 on Unsplash

5.2.2 Activity 2: Action Plan Pathways

The following sections outline the potential pathways Council could pursue to achieve a Science-derived Target:

- Pathway 1: Energy Efficiency Focus – The majority of available direct emissions reduction actions are implemented alongside 100% renewable power by 2035.
- Pathway 2: Renewable Power Focus – 100% renewable power by 2025 with no direct emissions reduction actions are implemented.
- Pathway 3: Balanced Approach – Select high impact emissions reduction actions are implemented alongside 100% renewables power by 2030.

Consultation with Council and feedback from the community will confirm which pathway – or what combination of pathways – is suitable for Mansfield Shire Council to pursue.

5.2.2.1 Pathway 1: Energy Efficiency Focus – Majority of Reduction Actions + 100% Renewable Power 2035

Modelling of emissions reduction actions demonstrates that there are significant existing opportunities for Council to reduce emissions in the medium term through improving energy efficiency and transitioning away from fossil fuels. If Council were to implement all available emissions reduction actions modelled by 2030, Council would be able to stay well within the emissions reduction trajectory set by the SDT. After 2035 Council would need to begin purchasing or generating renewable electricity to cover its buildings and streetlighting demand in order to stay within the carbon budget. The actions modelled in this pathway are outlined in Table 13 alongside indicative costs and savings.

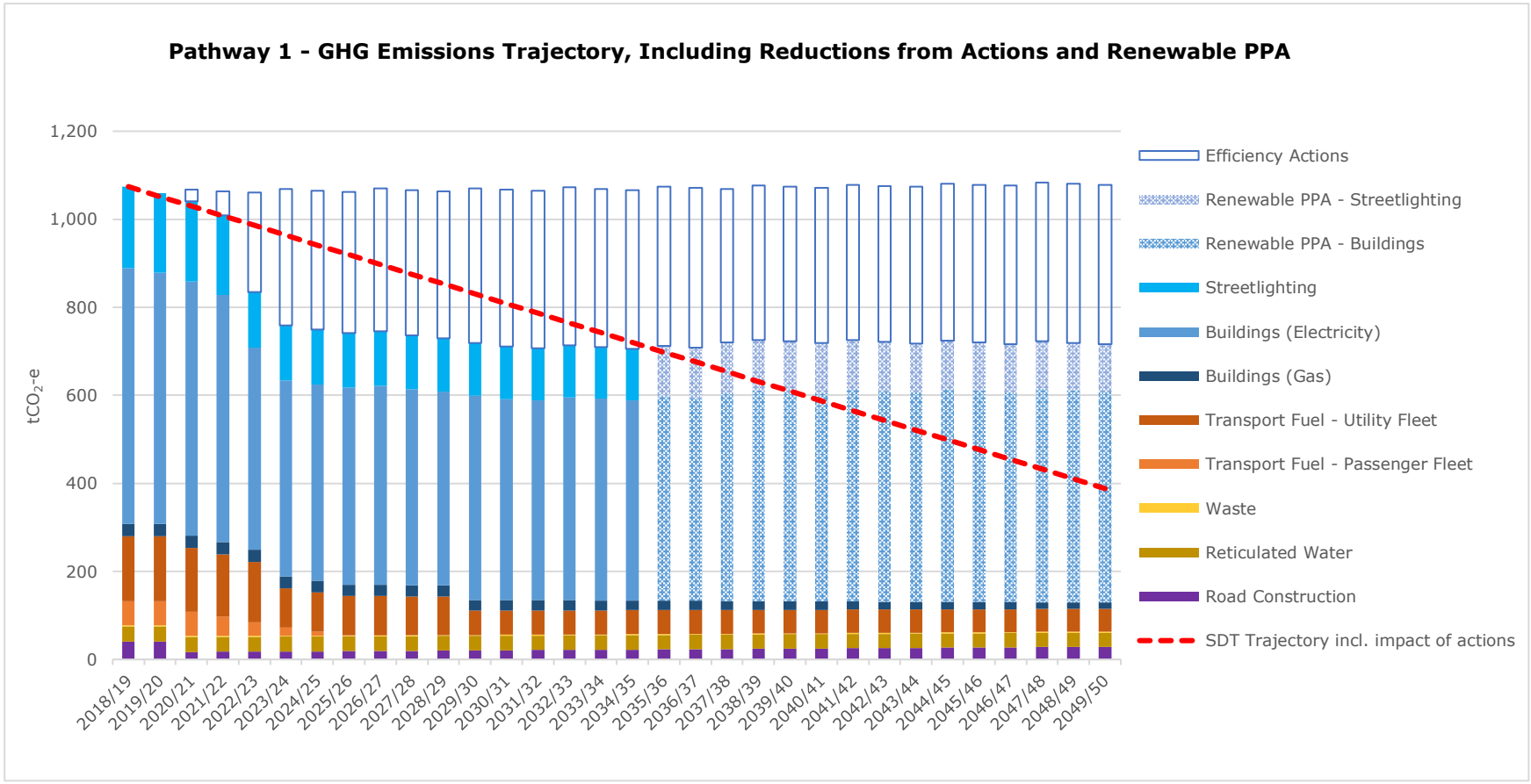


Figure 8: Pathway 1 GHG emissions trajectory

Table 13: Cost benefit analysis of action opportunities

Action area – direct reductions	Action	Emissions savings over asset lifetime excl. PPA (tCO_2e)	Estimated upfront costs distributed across 2021 - 2030 ($)	Estimated total cost savings over asset lifetime ($)	Average annual cost savings ($)	Simply payback (years)
Energy Efficiency - Buildings	Implement a program of energy efficiency works at Council sites.	1,800	$271,000	$376,000	$24,000	11
Energy Efficiency - ESD Policy	Implement ESD Policy for all new builds and renewals between 2021/22 and 2030/31.	1,800	$84,000	$491,000	$12,000	7
Solar – Small Scale	Install 80kWp solar PV across viable sites (excl. maintenance costs).	1,200	$120,000	$300,000	$12,000	10
Fleet	Transition all passenger fleet and some utility/heavy fleet to EV – program start year 2021/22.	500	$267,000	$388,000	$67,000	4
Street Lighting	Replacement of 207 residential streetlights with LEDs.	1,100	$138,000	$494,000	$25,000	6

Road Construction	Trial and implement leading road construction specifications[28].	500	$7,000	$0	-	-
Waste	Divert all FOGO in council's corporate waste stream away from landfill.	15	$2,000	$0	-	-
Total		**6,915**	**$889,000**	**$2,049,000**	**$140,000**	**-**

Table 14: Procurement options Pathway 1

Action area - procurement	Action	Emissions savings per annum at start year (tCO_2e)	Estimated costs of action per annum ($)	Estimated cost savings per annum ($)
Renewable Power Purchase	Engage in a renewable PPA to cover 100% of Council's electricity consumption from 2035/36	570	$0[29]	$0
Offsets Purchase	Purchase offsets to cover residual emissions at 2035 or 2050 in line Council's net zero emissions commitment.	130	$2,500	-

[28] This correlates to an action outlined in the Community Emissions section of the Background Paper. It has been included in the community sections as well because Council only has control over local roads – the State and Federal Governments also make and maintain roads.
[29] Note that well designed PPA procurement processes can offer renewable power tariffs will be equivalent to, or better than Council's existing electricity tariff arrangements.

If all available actions were implemented to 2030 alongside renewable power purchase from 2035 this pathway would enable Council to stay comfortably within its allocated carbon budget well beyond 2050 without the need to purchase offsets.

Council will however most likely set a net zero target for 2050 or earlier. The figures in Table 13 and Table 14: Procurement options Pathway 1Table 14 give an indication of the residual emissions and estimated costs of offsetting these emissions at 2035 based on the actions modelled and current ACCU offset prices. The residual emissions and costs at 2050 will be dependent upon further actions implemented by Council post 2030 (which have not been included in this modelling), and the offset price at this time.

Benefits and Challenges

Pathway 1 prioritises actions which improve resource efficiency within Council and directly reduce scope 1 emissions. This approach has a number of benefits and challenges which Council should consider.

Benefits of this pathway include:

- Energy efficiency generates long term cost savings for Council.
- Energy efficiency supports the broader sustainability principle of resource efficiency.
- Improved energy efficiency in buildings can also improve user comfort and productivity.
- Transition to EVs reduces pollution in the community resulting from Council vehicles.
- Transition to EVs is a visible demonstration of Council's leadership in this key area.

Challenges to this pathway may include:

- Energy efficiency actions and EV fleet will entail significant upfront costs for Council.
- Demonstrating leadership involves risk as Council may be investing in less well-established technology such as electric heavy vehicles.
- The actions detailed in the plan will in some cases necessitate significant changes in Council's internal procedures and staff behaviour e.g. implementation of the ESD policy, or use of electric cars and other vehicles.

5.2.2.2 Pathway 2: Renewable Power Focus – No Efficiency Actions + 100% Renewable Power 2025

By purchasing renewable power through a power purchase agreement (PPA) Council can easily eliminate the majority (around 70%) of emissions with minimal administrative or capital cost. This pathway demonstrates the importance of renewable power purchase in enabling Council to stay within its carbon budget and in minimising the cost of offsets.

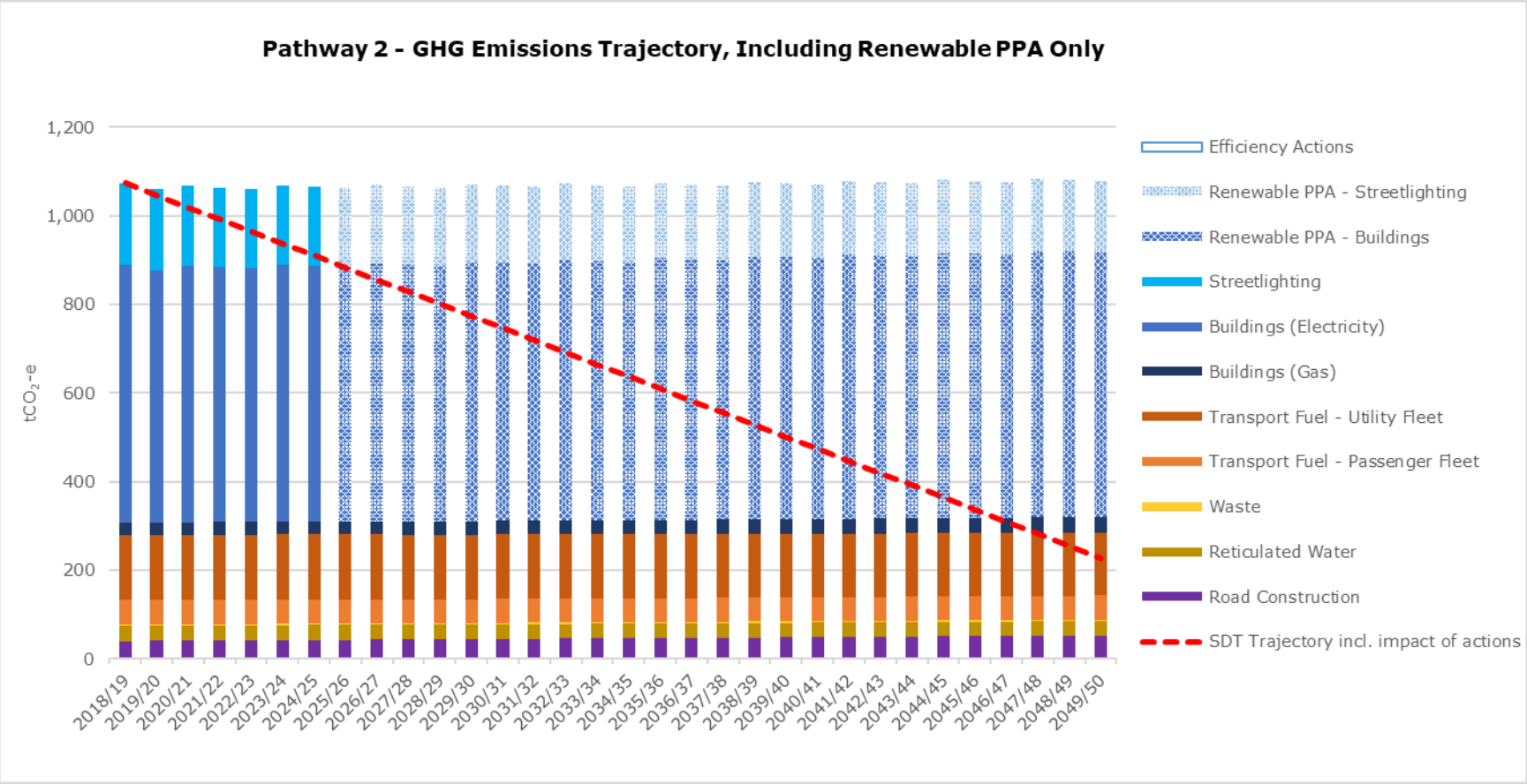


Figure 9: Pathway 2 GHG emissions trajectory

The actions modelled in this pathway are outlined in Table 15 alongside indicative costs and emissions and cost savings.

Table 15: Procurement options Pathway 2

Action area - procurement	Actions	Emissions savings per annum (tCO_2e)	Estimated costs of action per annum ($)	Estimated cost savings per annum ($)
Renewable Power Purchase	Engage in a renewable PPA to cover 100% of Council's electricity consumption from 2025/26.	750	$0	$0
Offsets Purchase	Purchase offsets to cover residual emissions at 2035 or 2050 in line Council's net zero emissions commitment.	300	$5,800	-

Based on Councils BaU emissions trajectory if a renewable PPA was established for 100% of Council's electricity consumption at 2025/26 this pathway would keep Council within the SDT budget to around 2060 with no further actions by Council. This of course assumes there are no major capital works or major growth in services within Council during this time.

Council will however most likely set a net zero target for 2050 or earlier. The figures in Table 15 give an indication of the residual emissions and estimated costs of offsetting these emissions at 2035 based on the actions modelled and current ACCU offset prices. The residual emissions and costs at 2050 will be dependent upon further actions implemented by Council post 2030 (which have not been included in this modelling), and the offset price at this time.

Benefits and Challenges

Pathway 2 prioritises emissions reduction through procurement of renewable electricity. This approach has a number of benefits and challenges which Council should consider.

Benefits of this pathway include:

- PPAs incur minimal additional costs to Council as PPA renewable power tariffs are likely to be broadly equivalent to Council's existing electricity tariffs.
- PPA's are a low-risk way to reduce emissions rapidly and significantly.
- Introduction of a PPA will require no changes to the way in which Council operates internally minimising administrative burdens and the need for change management.
- Committing to a PPA by 2025/26 does demonstrate leadership by Council.

Challenges to this pathway include:

- A PPA does not improve resource efficiency within Council and will not generate any cost savings for Council.
- There are no co-benefits such as reduced air pollution or improved built environment.
- A PPA does not contribute towards reducing Council's reliance on fossil fuels.
- The annual cost of offsets is significantly higher than for pathways which include direct emissions reductions.
- Until Council is able to reduce direct emissions to zero offsets will need to be purchased in order to stay within the SDT – if Council does not reduce scope 1 emissions then in theory Council could be left purchasing offsets to cover these residual emissions indefinitely.
- A PPA alone is weak from a community engagement and reputational perspective as it does not require material action or investment from Council. The majority of community feedback to date calls for Council to undertake efficiency actions in conjunction with renewable energy projects (see Appendix F: Community Climate Action Feedback to Date).
- A PPA does not contribute as directly to the necessary cultural shift toward a lower carbon municipality in the way that an EV fleet, or solar PV array at Council might.

Image Source: Photo by Science in HD on Unsplash

5.2.2.3 Pathway 3: Balanced Approach – Select Efficiency Actions + 100% Renewables Power 2030

Pathway 3 seeks to take advantage of the most cost effective and strategic opportunities available to Council (the "low hanging fruit") to improve energy efficiency and reduce reliance on fossil fuels while relying heavily on the PPA to meet the majority of Council's emissions reduction requirements. Initial reductions are made through direct efficiency improvement actions, this is then followed by introduction of a PPA in 2030/31. The select actions modelled in this pathway are outlined in Table 16 alongside indicative costs and emissions and cost savings.

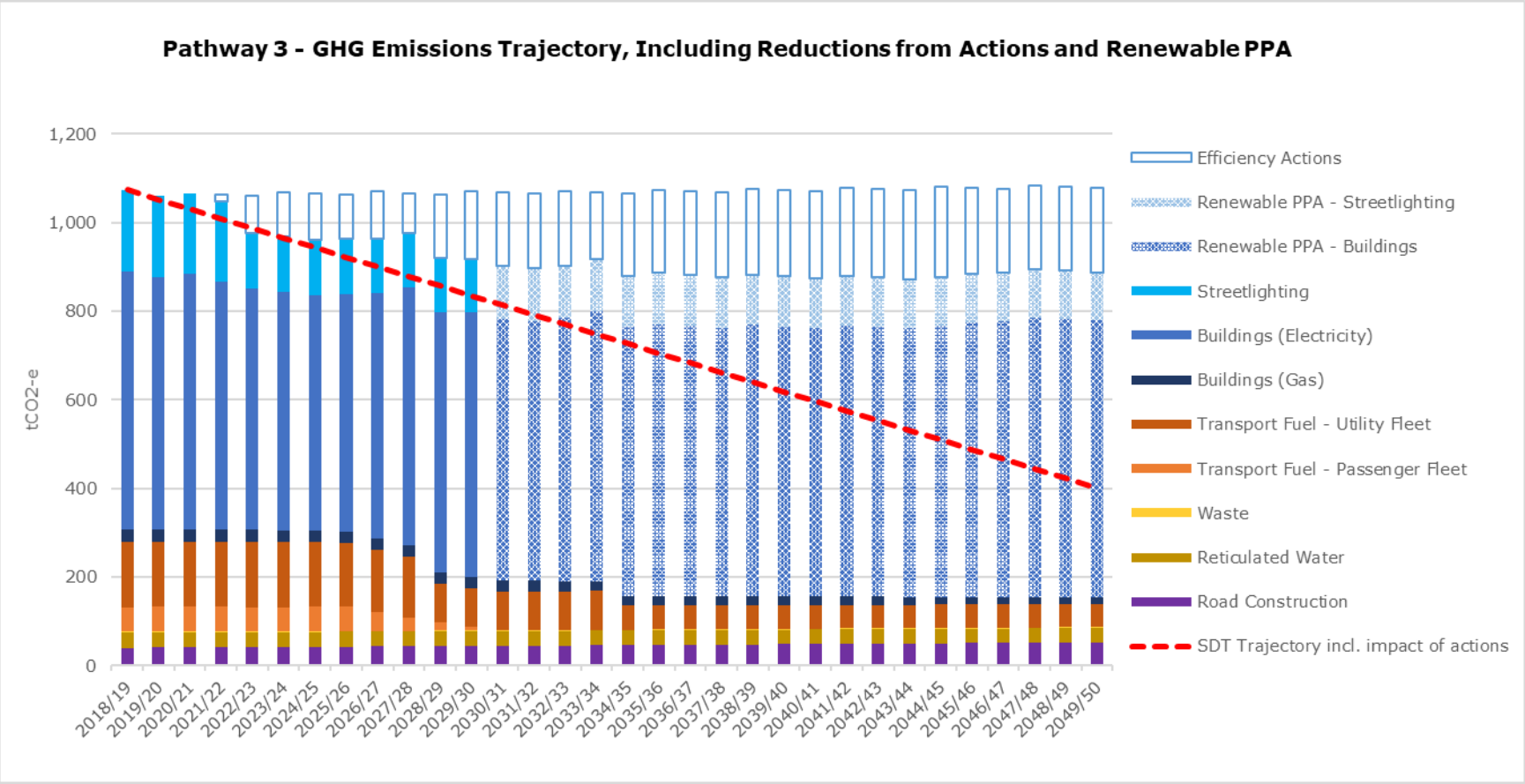


Figure 10: Pathway 3 GHG emissions trajectory

Table 16: Cost benefit analysis of select action opportunities

Action area – direct reductions	Action	Emissions savings over asset lifetime excl. PPA (tCO_2e)	Estimated upfront costs distributed across 2021 - 2030 ($)	Estimated total cost savings over asset lifetime ($)	Average annual cost savings ($)	Simply payback (years)
Energy Efficiency - ESD Policy	Implement ESD Policy for all new builds and renewals between 2021/22 and 2030/31.	1,800	$84,000	$491,000	$12,000	7
Solar – Small Scale	Install 40kWp solar PV across high profile, high consumption sites (excl. maintenance costs).	600	$60,000	$150,000	$6,000	10
Fleet	Transition all passenger fleet and some utility/heavy fleet to EV – program start year 2025/26.	500	$170,000	$388,000	$67,000	4
Street Lighting	Replacement of 207 residential streetlights with LEDs.	1,100	$138,000	$494,000	$25,000	6
Total		**4,000**	**$452,000**	**$1,523,000**	**$110,000**	**-**

Table 17: Procurement options Pathway 3

Action area – procurement	Action	Emissions savings per annum at start year (tCO_2e)	Estimated costs of action per annum ($)	Estimated cost savings per annum ($)
Renewable Power Purchase	Engage in a renewable PPA to cover 100% of Council's electricity consumption from 2030/31.	700	$0	$0
Offsets Purchase	Purchase offsets to cover residual emissions at 2035 or 2050 in line Council's net zero emissions commitment.	160	$2,900	-

If the select actions listed in Table 16 were implemented to alongside 100% renewable power purchase from 2030/31 this pathway would enable Council to stay comfortably within its allocated carbon budget well beyond 2050 without the need to purchase offsets.

Council will however most likely set a net zero target for 2050 or earlier. The figures in Table 16 give an indication of the residual emissions and estimated costs of offsetting these emissions at 2035 based on the actions modelled and current ACCU offset prices. The residual emissions and costs at 2050 will be dependent upon further actions implemented by Council post 2030 (which have not been included in this modelling), and the offset price at this time.

There is of course flexibility in terms of which actions are selected as part of this pathway. Council's internal priorities will be incorporated into any subsequent action plan should this pathway be pursued. For the purpose of the Background Paper the actions modelled in Table 16 have been selected based on the following rational:

- ESD Policy – a strong ESD policy helps to future proof Council by ensuring inefficient, high emission buildings are not locked in for decades. This action can also support the shift away from gas usage within council buildings thus reducing scope 1 emissions not covered by the PPA.
- Small scale rooftop and ground-mounted Solar – by focusing only on high impact and/or high-profile solar projects Council can reduce the capital outlay while still gaining some of the benefits of costs savings and community visibility that solar brings.
- EV Fleet – internal combustions engines are already beginning to be phased out worldwide so the shift to EV will be necessary within council in the near future. Initiating this transition earlier allows council time to plan and stage the shift as well as demonstrating leadership within the community. Fleet is also a significant source of scope 1 emissions which will not be addressed by a PPA.
- Lighting – streetlighting bulk changes are a low risk opportunity to make significant energy and cost savings within Council. The changeover of Mercury Vapour (MV) lamps is also a compliance issues as these lamps are being discontinued.

Benefits and Challenges

Pathway 3 aims to strategically combine direct emissions reductions with procurement of renewable electricity. This approach has a number of benefits and challenges which Council should consider.

Benefits to this pathway include:

- Total upfront costs for Council are reduced compared to Pathway 1.
- Costs are spread out over a longer period which will reduce the annual budget required to meet the target in the short to medium term compared to Pathway 1.
- Select actions have been chosen to maximise resource efficiency impact and enhance visibility of Council's climate change mitigation actions within the community.

Challenges to this pathway include:

- Available opportunities to reduce costs and resource consumption are being missed.
- There is a risk that the community may question why some actions have not been carried out or are not being carried out sooner e.g. why does council not have any EV fleet until 2025/26?

5.2.3 Activity 3: Net Zero Emissions Commitment

It would be very exciting to see Mansfield Shire lead the way in a commitment to zero emissions in an ambitious time frame. As a small (but growing) Shire, surely we have the ability to make this happen.

Community member Jimmy C via Have your say on climate action, 03/9/21

A net zero emissions commitment is an important aspirational target to layer on top of the SDT. It provides Council and the community with a strong, clear and easily communicated and verified goal within which to frame actions and justify budget.

As the pathways modelling illustrates, Mansfield Shire Council should be able to stay within the allocated carbon budget beyond 2050 through reductions in scope 1 and 2 emissions alone. Although, from an SDT perspective, Council may not need to purchase offsets until beyond 2050, the net zero emissions commitment is more than a matter of meeting the SDT. While the SDT is a-political, the net zero emissions target is Mansfield Shire Council's opportunity to communicate Council's own position to the community and establish its reputation within the local government climate change sector.

In some respects, setting a net zero emissions target is easy; it is simply a matter of deciding when Council wishes to begin purchasing offsets. However, while administratively simple, a net zero emissions target is a very public commitment and must be considered in terms of the aspirations of the community and Council's reputation.

If Council wished, net zero emissions status could be achieved at any point from next year and there are many Australian councils who are already Carbon Neutral certified, as well as several councils who are aiming for net zero emissions uncertified. However, although the costs of purchasing offsets are relatively low per year, offsets must be purchased ongoing over a long period of time (at least several decades). Over a decade a $2k annual spend on offsets would be diverting $20,000 in funds away from actual emissions reduction actions. For a rural council with limited resources the leadership value of carbon neutral status must be balanced against these other considerations.

Table 18: Net zero emissions scenarios

Target year	Justification
Net zero emissions 2035	This target represents leadership within the cohort of rural councils and is in line with other leading councils in this cohort such as Indigo Shire. It demonstrates Council's strong commitment to addressing climate change and communicates the urgency of action required within council as well as to the broader community. This target allows council time to reduce emissions in line with the SDT and thus reduce the costs of offsets significantly before committing to ongoing purchase. This ensures that funds are not diverted away from actual emissions reductions too soon.
Net zero emissions 2050	This target will enable Council to comfortably remain within the carbon budget set by the SDT assuming renewable power is purchased for all electricity from 2030. While weaker than the 2035 target, it still provides an important aspirational target with which to mobilise action within Council and communicates to the community that Council acknowledges its role in addressing climate change.

The two net zero emissions targets outlined in Table 18 are intended to be complimentary to the SDT options provided in Section 5.2.1. Either target can be selected in conjunction with any of the SDT options presented above. The SDT combined with the net zero emissions target will ensure Council stays within the carbon budget while communicating a clear commitment to addressing climate change within Council and the broader community.

Community feedback to date indicates that a net zero emissions commitment would be welcomed. Refer to Appendix F: Community Climate Action Feedback to Date.

5.3 Purchase or Generate

Once an SDT Pathway and net zero emissions commitment have been decided upon, Council can then explore how the renewable power and offset elements of the action plan will be executed.

5.3.1 Renewable Power

As an essential element of all pathways presented, Council will need to consume 100% renewable electricity by 2035 at the latest. The most straight forward approach is to procure 100% renewable power through a power purchase agreement (PPA). However, Council could also explore the possibility of investing in a large-scale solar array and becoming an electricity generator.

5.3.1.1 Power Purchase Agreements

A power purchase agreement (PPA) is a contract between an electricity buyer and seller. In the context of this report, PPAs refer to an agreement that the buyer will ensure that a certain amount of energy is generated from renewable sources, such as large-scale solar or wind farming.

The Victorian Greenhouse Alliances have established a Local Government Electricity Contract Working Group to help Victorian councils save money and reduce greenhouse gas emissions through their electricity contracting.

The Working Group is developing a PPA for Victorian councils to procure low-cost renewable energy from 2020/21, at the conclusion of the current retail contracts.

5.3.1.2 Generating Renewables

If Council has access to land within the municipality (either Council owned or leased) then the possibility of developing a solar farm could be explored. A solar array of around 500kWp would generate sufficient Large-Scale Generation Certificates (LGCs) to cover Council's buildings and streetlighting electricity emissions by 2030 (assuming some energy efficiency measures are implemented before then).

Table 19: Large-scale solar scenario

Action area	Action	Lifetime emissions Savings excl. PPA (tCO_2e)	Estimated lifetime costs of action ($)*	Estimated lifetime cost savings ($)
Solar – Large-scale	Develop 500kWp of solar on council owned land	11,000	$1,000,000	$1,700,000

**Costs assume that the necessary grid capacity is already in place to accommodate the array without Council needing to invest in additional grid infrastructure.*

While this option would of course require significant upfront investment from Council as well as project management costs, it would also generate significant cost savings in the long term and would be a strong climate action story for Council. A renewables generation approach has been adopted successfully by other councils such as Sunshine Coast in Queensland[30].

Refer to Appendix E: Carbon Accounting for Renewable Energy Certification for advice on the use/retirement of any renewable energy certificates and the impacts on council carbon budgets.

Image source: Enviren Solar, Sunshine Coast Solar Farm, Queensland

[30] https://www.sunshinecoast.qld.gov.au/Environment/Sunshine-Coast-Solar-Farm/Solar-Farm-Overview

5.3.2 Offsets

Since it is currently not possible for Council to eliminate 100% of its emissions through efficiency and renewable power, offsets will be necessary to achieve Net zero emissions status.

5.3.2.1 Purchasing Offsets

When offsetting carbon emissions there are a number of options available. The most common way to offset emissions is to purchase carbon offsets. These offsets vary greatly in price and in quality, but there are a number of reputable providers such as the Carbon Market Institute's Carbon Marketplace, Emissions Reduction Fund project register, and the VERRA registry. The Climate Active Program has firm guidelines on which offsets are eligible; it is recommended that Council follows the Climate Active guidelines when selecting offsets.

Council may choose to purchase offsets that are generated in Australia (Australian Carbon Credit Units (ACCUs)) or cheaper offsets that are generated by international projects such as Verified Carbon Offsets (VCUs), or a combination of both. According to the latest quotes from offset brokers, spot prices for ACCUs had reached on average $18.

Many councils have a preference for purchasing Australian offsets due to perceived superior quality and because there is greater knowledge of the regulation surrounding the production of these offsets. However, on the other hand VCUs can typically be purchased at a much cheaper rate than ACCUs which can be an important factor in the decision.

5.3.2.2 Generating Offsets

Instead of purchasing offsets from outside of the municipality it may be possible to work with other stakeholders within the community to establish an Emissions Reduction Fund project and self-generate ACCU offsets within the municipality. These offsets could then be purchased by Council with any surplus going to the marketplace or contributing towards the offset of Mansfield Shire's community emissions. More information on establishing an offset project through the Emissions Reduction Fund can be found via the Clean Energy Regulator[31].

As a rural council, Mansfield Shire Council has the unique opportunity to collaborate with the local farming sector to initiate an agriculture-based carbon sequestration or emissions reduction project. Possible projects available within the shire might include:

- Reducing methane emissions from livestock
- Sequestration of carbon in agricultural soils
- Reforestation or afforestation

Setting up a local project would require significant resources from Council to initiate and manage. However, it would also see Council taking an active role in contributing to emissions reductions beyond Council's own operations and would establish a strong relationship between Council and the farming community. Such collaborative partnerships will be invaluable in addressing climate change moving forward. Further information on how Council could facilitate such a collaborative project can be found in Section 9, Community Emission Reduction Options.

[31] http://www.cleanenergyregulator.gov.au/ERF/About-the-Emissions-Reduction-Fund/eligibility-to-participate-in-the-emissions-reduction-fund

5.3.2.3 Climate Active Program (Carbon Neutral Certified)

In addition to achieving the Net zero emissions target councils can opt to be certified carbon neutral under the federal government's Climate Active Program (formerly the National Carbon Offset Scheme). This is the same as a Net zero emissions target except that it includes the costs associated with achieving certification under Climate Active. There is no impact on the emissions pathway.

Achieving carbon neutral certification under Climate Active comes with additional costs and resources associated with certification such as:

- Preparation of Climate Active submission documents (Climate Active inventory development and Public Disclosure Statement)
- Annual certification fee
- Technical assessment by a registered consultant
- One off Independent audit of Climate Active inventory in the baseline year

Additionally, for Council to align with Climate Active, the corporate inventory developed in this report requires additional emissions sources to be included. The Climate Active standard states that all emissions sources should be included subject to a "relevance test".

The Australian Government's Carbon Neutral Program is used to certify organisations such as local governments to comply with Climate Active. Becoming certified carbon neutral is an excellent communication tool and provides a terrific platform for robust emissions reporting and third-party verification. However, Council would be advised to carefully consider approaching certified carbon neutrality, as there are some important, long term implications to Council's budget.

Currently, any attempts to become carbon neutral for organisations involves the purchasing of carbon offsets to bring any remaining emissions down to zero. It also involves costs in the reporting and compliance with Climate Active. By committing to certified carbon neutrality, Council would be adding an additional, ongoing expense to the budget. Whilst offsets are well regulated and contribute to global emissions reductions, it is important that all avenues to directly reduce emissions from operations and in the community are pursued.

5.4 Action Pathways Options Summary

The following table presents the costs and savings associated with each pathway side by side for comparison.

Table 20: Action pathways options summary

Action area	Lifetime emissions savings from actions excl. PPA (tCO_2e)	Upfront cost of actions spread across 2021-2030 ($)	Total cost savings from actions over lifetime of assets ($m)	Average annual cost savings at 2030 ($)	PPA annual emissions offset at start year	Offset emissions at start year 2035	Offsets cost of purchase 2035*
Pathway 1. Efficiency Focus	6,915	$889,000	$2.0	$140,000	570	130	$2,500
Pathway 2. Renewables Focus	-	-	-	-	750	300	$5,800
Pathway 3. Balanced Approach	4,000	$452,000	$1.5	$110,000	700	160	$2,900

**Assuming 2021 Australian Carbon Credit Units (ACCUs) spot price.*

Note when looking at the offset costs that these are high level estimates only. Offset prices are both variable depending on the type purchased and volatile depending on the carbon market during a particular year. The actual cost at 2035 or 2050 will be highly dependent on the choice of offsets and the price at the time of purchase. The only guarantee is that purchasing fewer offsets will be less costly.

It is also important to note that the costs of purchasing offsets at 2050 will be dependent on the impacts of any further reduction actions Council undertakes after 2035. Actions post 2035 have not been modelled as part of this project and so costs have only been presented for the 2035 start year.

PART TWO: COMMUNITY EMISSIONS

Photo credit: Charlie Lovick herding cattle on his Merrijig property near Mansfield, Victoria. Colin Taylor, The Weekly Times, August 21, 2015, weeklytimesnow.com.au (accessed April 2021)

6. Council's Community Emissions Profile

For Council, the abatement of community emissions differs from corporate emissions in that with corporate emissions, Council has direct control through their actions to reduce emissions. With community emissions, Council only has a limited amount of control and influence over many of the emissions sources. This section outlines and summarises Council's potential role for a wide range of interventions to drive community climate action. The municipality emissions are profiled, and a broad spectrum of community climate action options are outlined along with an indication of their cost, relevant stakeholders and collaboration opportunities.

6.1 Community Emissions Profile

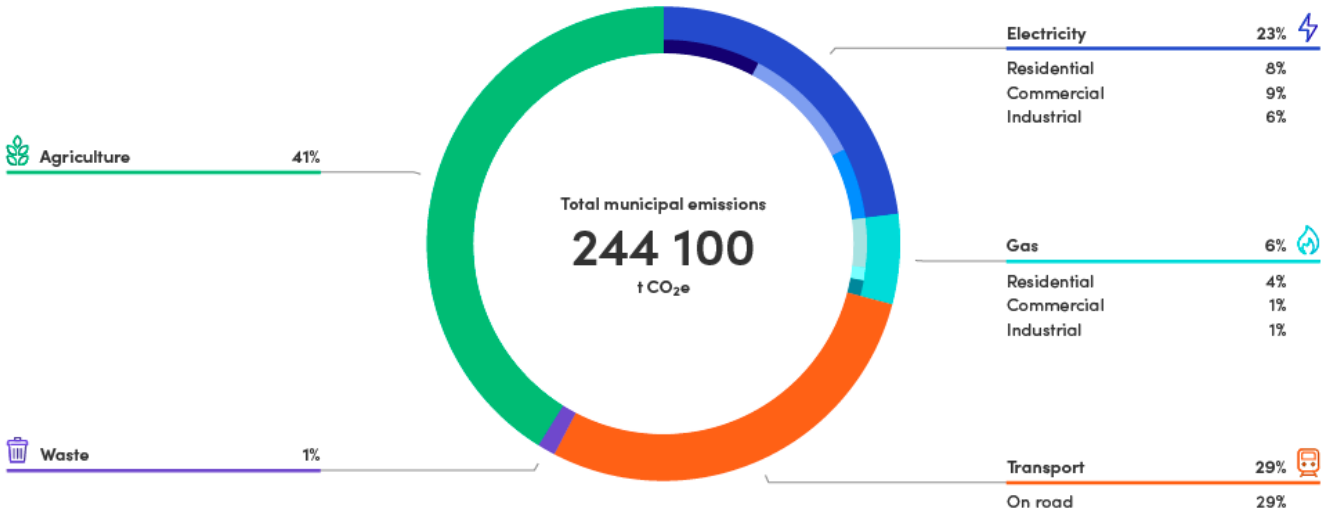


Figure 11: Mansfield Shire 2018/19 community emissions profile (source: Snapshot)

As seen in Figure 11, the Mansfield Shire local government area released approximately 244 kt CO_2e for the 2018/19 period in total.

The largest source of emissions in Mansfield Shire is the agricultural sector, responsible for generating 41% of total emissions for the municipality. This is significant, and it needs to be noted that there are additional emissions from the agriculture sector that are captured in other sections of the profile. For example, use of farm machinery is captured in transportation for tractor fuel use and stationary energy for farm electricity use.

The second highest source of emissions is on-road transportation, accounting for 29% of emissions.

The residential sector is the third largest source of emissions accounting for 12% of the total emissions, followed by the commercial sector (10% of the total emissions) and the industrial sector (7% of the total emissions). Emissions in from the residential and commercial sectors

result from electricity and gas consumed by buildings and facilities within the municipality. Emissions resulting from waste are relatively minor (1% of total emissions).

This profile has been prepared to be compliant with BASIC reporting under the Global Protocol for Community-scale Greenhouse Gas Inventories (the GPC). A GPC-compliant community emissions profile and science-derived target are important tools in climate planning. By understanding total emissions and prominent sources and the necessary scale of emissions reductions, Council can direct efforts for collaboration, engagement and mitigation.

It is important to note that Council only has a limited amount of control and influence over many of the community emissions sources. While Council can advocate and assist the broader community to implement climate action projects, a cross-sectoral approach – with residents, business and other levels of government – is required for substantial emissions reductions throughout the municipality.

7. Community Emissions Reduction Targets

Council has not established and adopted an emissions reduction target for the Mansfield community. This Background Paper investigates Council's potential role in setting a municipal target and explores different target options. This section outlines the concept of a Science-derived Target (SDT) for the Mansfield community. It also touches on a more ambitious aspirational target and an action-based target for Council to consider.

This section repeats some of the information on targets found in Section 5.1. Refer back to Section 5.1. for more details including national, state and local government targets and trends.

Option 1: Top down – Science-derived Target

Adopt a Science-derived Target (SDT). SDTs are seen as the minimum to limit temperature rise to 2°C and avoid catastrophic climate change. SDTs should be the bar upon which Council builds. Using science-derived targets (SDTs) presents an effective and intuitive way to establish the boundaries of what this overall trajectory should be, and from there identifying targets that are in-line with Council's and the community's aspirations. It is also a valuable communication tool to demonstrate a fair share of action that needs to be undertaken. Importantly, the establishment of science-derived targets links the efforts of Council to the international community through alignment with the Paris Agreement.

The calculated science-derived target for remaining within 2°C for Mansfield Shire is provided in Table 21.

Table 21: Scaled science-derived target for Mansfield Shire

Remaining budget (t CO_2-e)	3,713,930
"Runway" - Remaining years without change (years)	13.5
Required linear annual reduction 2020/21 – 2048/49 (t CO_2-e p.a.)	9,991
Required linear rate of reduction 2020/21 – 2048/49 (%)	3.7%

The "remaining budget" outlined in Table 21 is the total amount of carbon that the municipality can emit if it is to make a fair contribution to limit the temperature increase to 2°C. The remaining budget for Mansfield Shire is around 3,7 million t CO_2-e from 2020/21.

The "runway" or remaining years without change (13.5 years) calculates how long this carbon budget would last, based on the emissions released in 2019/20. If the municipality were to significantly reduce annual emissions this runway would extend as the shire would not be "spending" it's carbon budget as rapidly.

The required annual reduction and required rate of reduction shows that Mansfield Shire's emissions need to reduce by around 10 kt CO_2-e, or 3.7% per year until 2048/49, if the carbon budget is to be used linearly over this time period.

Option 2: Aspirational Target

Council could set a more ambitious aspirational target such as net zero emissions by 2040. The primary motivation for this target would be to establish a common rallying point and encourage all stakeholders to get motivated. This net zero emissions target would also be easy to communicate.

Option 3: Bottom up Target – what we can achieve (Action-plan Based)

The Action-plan Based Target is one that is constructed from what can be achieved from the actions being considered in a council's action plan. It can be ambitious; however, its scope is directly derived from planned actions. An example of this type of target is, "We will install 20kW of solar this quarter". This approach has been largely abandoned as a stand-alone approach by Australian Councils because – put simply – it does not avoid catastrophic climate change and as such cannot be considered a climate target. Bottom-up targets are however valuable in monitoring performance against the action plan but only in conjunction with an SDT.

7.1 Target Setting in the Local Context

As outlined in Section 5.1, Victorian councils are leading the way in setting community emissions reduction targets (33% as opposed to the Australian average of 10%) and are also leading the way in terms of undertaking actions to reduce community emissions (68% as opposed to the Australian average of 25%).

Research on the more regional context has shown that cohort councils (Indigo Shire, Benalla Rural City, Murrindindi Shire, Alpine Shire) are in the process of setting community targets.

8. Council's Role in Reducing Community Emissions

For Council, the abatement of community emissions differs from corporate emissions in that Council has direct control of reducing corporate emissions to a relatively known and well documented amount. For example, when a council installs solar panels on a council facility roof, there is a direct and easily measurable impact. Community emissions on the other hand, are mostly not within councils' direct control. Using the example of electric vehicles (EV), councils' role could be to encourage or facilitate other stakeholders to install EV charging stations rather than installing the stations themselves.

In summary, Council's role is to support the abatement of community emissions through a series of interventions that can facilitate community actions (i.e. actions by others). An intervention is something that a council does to increases the uptake of an action implemented by the community, either by making it happen earlier or at a greater rate (Figure 12).

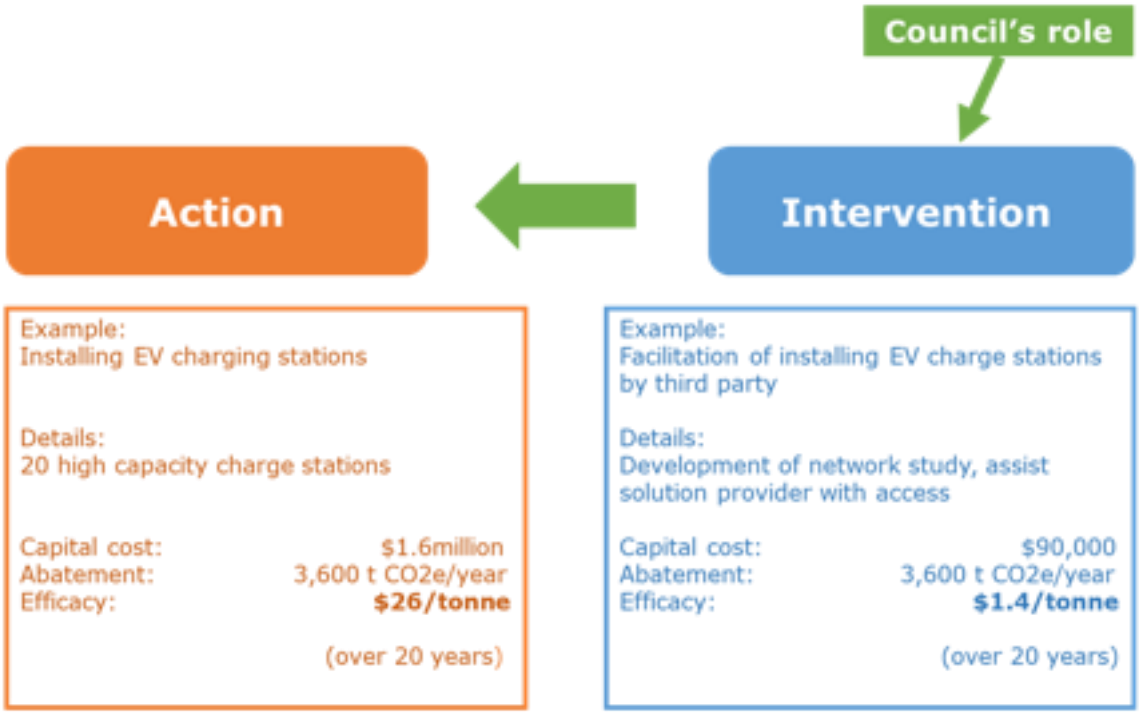


Figure 12: Local Government Role in Community Emission Reduction

One strategic way to work out what interventions to put in place is to identify any market barriers that impede the uptake of any given action. Market barriers may impede action uptake by delaying it or by reducing its market saturation. Market barriers include poor business case, lack of knowledge, no available capital, limited supporting infrastructure or split incentives. The most effective way that Council can create systemic change that leads to lasting emissions reduction is to address these market barriers.

An example of a "split incentive" market barrier is rooftop solar for rental homes where there is no financial incentive for the owner to install solar power as it is the renter who will save on

electricity bills. An example of a council intervention is to facilitate an agreement process between homeowners and renters that allows the homeowners to recoup on any savings attributable to the solar panels.

An example of a *poor* intervention would be for Council to provide support for an activity that has no market barriers, such as solar on owner occupied dwellings[32].

Ironbark have identified twelve key **interventions** that councils can employ to support **actions** that reduce community emissions. These interventions are listed in Figure 13.

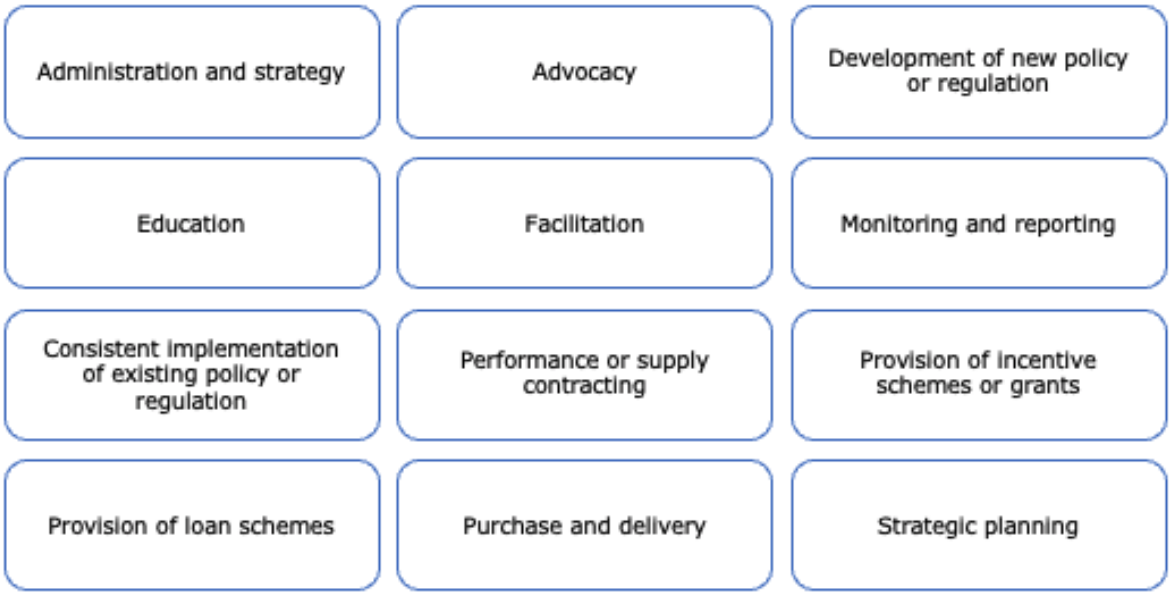


Figure 13: Main types of interventions

Local governments are often the first to respond to localised climate change impacts. Their strong connections to the community and local knowledge mean they have a tangible sense of what climate change will mean for their community. This generates the urgency to act.

Their equally strong connection to state and federal government presents the opportunity to advocate for climate action on behalf of the community. Councils' strong partnerships with state government and with other local governments can build community capacity and resilience in the face of climate change. Working together, state and local governments have delivered a range of climate change projects across Victoria such as Environment Upgrade Finance for businesses and residents[33]. More, however, can be done to leverage such partnerships.

One of the most vital roles councils can play is that of leaders in the community and the region. Councils can set an example through their own operations, and the community and cohort

[32] However! To make it somewhat more complicated, if such an intervention was of low cost to Council and achieved a great amount of public good will that in turn inspired the community to reduce their energy consumption, then it might be deemed appropriate.
[33] https://www.energy.vic.gov.au/energy-efficiency/environmental-upgrade-agreements

councils can follow suit. A good example for this is introducing electric vehicles to the Council fleet to show the community what is possible. Mansfield can look to cohort councils such as Indigo Shire for an example of local government leadership. Indigo Shire is the only cohort council to have declared a climate emergency, set an emissions reductions target of net zero by 2035 for corporate operations, and have ambitious climate action plans and policies to reduce both corporate and community emissions. Similarly, Benalla Rural City Council has outlined plans to establish a corporate emissions reduction target in their most recent Council plan.

Using the approach of intervention rather than direct action, advocacy, education, facilitation and provision of grants or loan schemes become key tools to influence change.

Council already provides a wide range of support services to the community, ranging from planning to infrastructure. Where councils have traditionally fallen short in terms of community emissions reduction is not capitalising on their core business (transport and roads, waste management, planning, open space planning and management and compliance - e.g. parking, the built environment and tree removal). If well directed, these services are invaluable to driving community climate action.

Photo by Helena Lopes on Unsplash

9. Community Emission Reduction Options

Ironbark have identified a broad spectrum of climate action options for Council to choose from. For each action opportunity identified, there may be several interventions available to Council.

Photo by chuttersnap on Unsplash

Table 22 below outlines and summarises Council's potential role for a wide range of interventions to drive community climate action. The table also provides information on relevant stakeholders, collaboration opportunities, cost, and estimated timeframes for potential emissions reductions.

Council has the opportunity to choose interventions that align with their priorities, and that demonstrate leadership and offer support to the community.

There are some interventions that Council can choose to undertake that can easily build on their current activities. A good example is running community education campaigns using existing communications channels and Council events.

Once feedback has been received from the community, councillors and Council staff, some of these actions will be selected to be included in the Mansfield Shire Council Climate Action Plan.

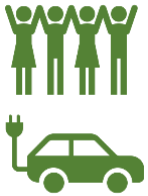
Table 22: Summary of Council intervention options to drive community climate action

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
Transport (29% of total community emissions)				
Expand the Electric Vehicle charging network 	Strategic Planning - Incorporating EV charging infrastructure into strategic planning Regulation - Modifying assessment of planning applications to encourage implementation of charging infrastructure Facilitation - Provide assistance and streamlining of EV charging infrastructure to external stakeholders	Electric Vehicle Council, Victorian Government, charging stations businesses (e.g. Chargefox)	$$ Staff time, administration and facilitation cost for working groups.	Council is already a participant in the state-wide 'Charging the Regions' project aimed at helping local governments in Victoria to understand their role in providing or facilitating public electric vehicle charging infrastructure. There is community interest in EV charging stations to be implemented, mainly from businesses in order to encourage continued tourism. For example, local winery Delatite Wines provides free charging stations to visitors powered by on-site solar PV[34]. Renewable Energy Mansfield (REM) would also like see EV charging stations implemented throughout the community. There are currently 3 small charging sites in Mansfield. Link to Council's Health and Wellbeing Plan: Transitioning away from internal combustion engine (ICE) vehicles not only reduces emissions from the transport sector, but also reduces air pollution. Therefore, this action area provides great health co-benefits.
Increase adoption of Electric Vehicles in the community 	Education - Promotion of EV benefits and location of charging infrastructure through Council's website	Electric Vehicle Council, EV companies Renewable Energy Mansfield	$$ Staff time, budget for financial incentives	Council is already promoting the locations of existing charging stations on its website. Link to Council's Health and Wellbeing Plan: see above.

[34] https://www.theguardian.com/environment/2021/mar/28/leading-the-charge-how-the-hospitality-sector-is-building-australias-ev-network

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
Electric Vehicles for the Council fleet 	Purchase & Delivery - Council intervention to show leadership to the community. Increasing adoption of EV Council busses, garbage trucks, passenger fleet and heavy fleet	NA as corporate action	$$$ Budget for new EV fleet vehicles	As a member of the GBGA, Mansfield Shire Council has participated in an Electric Vehicle Feasibility Study – Building the case for electric vehicles in Council fleets. Link to Council's Health and Wellbeing Plan: see above. Note this action has cross over with the corporate emissions section (see Table 13 and Table 16). It has also been included here because by adopting EVs for its fleet, it demonstrates Council leadership and increases market possibilities for others to follow suit.
Improve sustainable transport infrastructure 	Advocacy - for investment in public infrastructure that facilitates a future low carbon economy, such as bicycle and walking paths and provision for better public transport. Purchase & Delivery - Investing in cycling and walking infrastructure	Public Transport Victoria (PTV), VicRoads, Vic Department of Transport	$$ Staff time, budget for capital works	Mansfield Shire Council already actively advocates to key stakeholders for more resources to be devoted to the implementation of linking bike paths and for investment in public infrastructure that facilitates a future low carbon economy, such as electric vehicle charging stations, bicycle and walking paths and provision for better public transport. Council is continually developing its pedestrian network including walking infrastructure. Link to Health & Well Being Plan: Active transport not only reduces transport emissions but also has health benefits.
Promote sustainable transport options 	Education - Support the behavioural shift to more sustainable modes of transport, including bikes, walking, and PT	Programs for schools such as Bike Ed (VicRoads). Walk to School (Vic Health) [35]	$ Staff time	Council already promotes its pedestrian network on the Council website. Mansfield has a bus service throughout the district for school drop-off and pick-up to limit car usage. Link to Health & Well Being Plan: see above

[35] https://www.walktoschool.vic.gov.au/

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
Support carpooling & car share 	Facilitation - Facilitating the installation of carshare infrastructure Education - Provide materials to the community about the benefits of car-share and existing car share programs Regulation - Create regulation requiring the installation of carshare infrastructure for new developments	Car pool businesses (e.g. Liftandgo[36])	$ Staff time	Council has developed a car-pooling system that enables residents aged 55 years and over to access a spare seat into Mansfield and beyond. It involves an app so that people can offer free seats and others can book them.
Residential and Commercial Energy (22% of total community emissions)				
Planning for low emissions buildings 	New Regulation - Phase in requirements for all new buildings to achieve net-zero energy or net-zero energy ready.	30 councils (incl. Bass Coast, Wodonga) belong to the Council Alliance for the Sustainable Built Environment (CASBE) that has helped them establish local Environmentally Sustainable Design (ESD) statutory planning systems and accompanying materials called the Sustainable Design and Assessment in the Planning Process (SDAPP). As of March 2021, CASBE are inviting all VIC councils to join their application for the	$$ Staff time, administration cost	Council's current Environmental Strategy encourages the community to plan future building designs to reach a 7-star energy rating or above. Several councils use their planning controls to require certain Green Star targets to be achieved, however for commercial buildings this is generally for large ($3m+) projects. Council have made certain commitments to higher ESD standards for the built environment, including ensuring the Mansfield Station Precinct Activation Project meets Green Star design and construction standards[37]. A best practice approach is via the CASBE SDAPP framework which covers both residential and commercial buildings.

[36] https://www.liftango.com/blog/building-the-right-carpool-program
[37] Environment Strategy 2019-2023, page 26.

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
		"Elevating ESD Targets Planning Scheme Amendment" that will further improve the SDAPP to achieve even higher ESD standards and net zero carbon buildings.		Whilst the current and upcoming State Government and Commonwealth Government planning and building provisions – that all councils must uphold as standard practice – achieve a certain level of energy efficiency compared to past standards, they currently don't achieve net zero buildings. [38] Feedback on the Have Your Say forum shows that there is strong community support for improvements to new building standards. Link to climate adaptation and Health Plan: ESD buildings not only reduce emissions, but also provide affordable living outcomes through reduced utility bills and improved comfort levels.
Planning for low emissions buildings 	Consistent implementation of existing ESD regulations - Work with relevant staff across council and developers to ensure existing ESD regulations are implemented consistently across the shire.	Developers active in the municipality and region	$ Staff time	Many council ESD standards fail to deliver deep and sustained change. Consistent implementation and compliance– or lack thereof – is the make or break of effective ESD outcomes, indeed not only for higher ESD standards but also for meeting the baseline standards such as the National Construction Code. Link to Climate Adaptation and Health Plan: see above
Planning for low emissions buildings 	Enforcement - Deploy resources to increase the enforcement of ESD planning requirements. This may take the form of an ESD officer working in conjunction with surveyors.	This position would be less resource intensive if shared across the region. The Goulbourn Broken Greenhouse Alliance would be an apt regional organisation to host	$$ - $$$ Additional staffing	For example, the South East Climate Change Alliance is considering employing an ESD compliance officer to be shared by all alliance councils. Moonee Valley City Council and Moreland City Council have ESD enforcement officers to support the implementation of their local ESD planning policy. Link to Climate Adaptation and Health Plan: see above

[38] The State Government have announced some ESD Victorian Planning Provisions set to achieve higher ESD outcomes. However, there is no commitment that they will achieve net zero buildings in the near future. The current 2019 (and future 2025) National Construction Code for commercial buildings and the upcoming 2022 National Construction Code for residential buildings will also achieve higher emission reduction compared to previous standard practice, however their ability to achieve net zero emission buildings is currently unknown.

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
		an officer that can be shared across councils.		
Planning for low emissions buildings 	Education and Incentives & Grants - Education on benefits of ESD, and provision of grants for high ESD standards	Building permit applicants	$ Staff time	Link to Climate Adaptation and Health Plan: see above
Community Energy Projects 	Facilitation - Provide facilitation service to community groups interested in projects. E.g. provide facilitators and council owned community buildings as meeting locations	Renewable Energy Mansfield MP for Indi region Helen Haines' Local Power Plan[39] has a vision to bring locally-owned renewable power stations, jobs, opportunities and a significant supply of cheap, clean, local power to the region. Climate Action Network Australia (CANA), Beyond Zero Emissions Zero Carbon Communities (ZCC)	$$ Staff time, external expertise, administration and facilitation cost	Council is already committed to supporting community led renewable energy and efficiency programs for greater energy independence. Indigo Power (IP) is a community renewable energy project based in the Hume region. IP is a community owned energy company and social enterprise, which also convenes the North East Community Energy Network. The Network brings together community energy groups from across the region to collaborate on clean energy projects. [40]. There is community interest in seeing Mansfield Shire create a more power resilient township, by Council investing in structures to accommodate alternative power. Through the Have Your Say Forum, community members have demonstrated keen interest in seeing Mansfield Shire Council expand in this area.

[39] https://www.localpowerplan.com/
[40] https://indigopower.com.au/about-us/

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
				Link to Climate Adaptation and Health Plan: see above
Solar and energy efficiency for homes 	Facilitation - Work with solar installation companies and real estate agents to devise schemes that provide financial mechanisms for landlords to install solar on rental properties Incentives and Grants – provide incentives to homeowners to install solar, e.g. Council rates incentives Adapting low-income households to climate change (Residential Environment Upgrade Finance[41])	Real estate agents, Department of Environment, Land and Water Renewable Energy Mansfield	$ Staff time, administration cost, external expertise	Indigo Shire Council provides a "solar guide" for its community, so that they can make informed choices when installing solar PV on their homes[42]. The Solar Analytics program includes a calculator that facilitates an agreement between landlord and tenant on a modest rental increase that is offset by energy savings[43]. Link to Climate Adaptation: Energy efficient buildings not only reduce emissions, but also provide affordable living outcomes through reduced utility bills.
Energy efficiency retrofits and solar for businesses 	Facilitation - Working with businesses to increase the rate of uptake of energy efficient solutions Incentives and Grants – provide incentives to businesses to install energy efficient retrofits and solar, e.g. Councils rates incentives	Mansfield Business Association Renewable Energy Mansfield	$ Staff time, external expertise	Previously, "greening businesses" was pitched to local businesses and landlords, with little take up or interest due to pandemic and bushfires. Now is good time to go re-pitch these ideas, ask about appetites for greening buildings and businesses, saving money with rates incentives etc., there may be tenancy benefits too. Helping businesses to become more energy efficient helps them to futureproof their business to rising energy cost. Murrindindi Council's 'Dindi Bulk Buy Program' launched in April 2018. Since then, 65 solar systems totaling 318kW have been

[41] https://www.energy.vic.gov.au/energy-efficiency/environmental-upgrade-agreements
[42] https://www.indigoshire.vic.gov.au/files/assets/public/environment-amp-sustainability/solar-guide.pdf
[43] https://www.solaranalytics.com/au/

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
				installed on the rooftops of homes and businesses across the municipality[44]. Link to Climate Adaptation: see above.
Agriculture and Land Use (41% of total community emissions)				
Carbon farming 	Facilitate a working group with local farmers and other relevant stakeholders to discuss carbon farming solutions and the potential for Mansfield farmers to trial these. These working groups may also draw in expertise from the research sector. Facilitate carbon farming training and project management advice to build the carbon industry in the region. (e.g. provide training facilities) Connect carbon farmers with buyers and facilitate group purchases for local carbon soil credits. E.g. group of councils commit to purchase soil credits as offsets	National Farmers' Federation (NFF) Victorian Farmers Federation (VFF) Aboriginal Carbon Foundation[45] assists in training farmers and implementing projects Carbon Market Institute[46]	$$ Staff time, administration and facilitation cost for working groups.	Several of Mansfield Shire Council's councillors are farmers and are aware of carbon credits sales opportunity. There is community interest in this area, as seen in feedback on the Have Your Say Forum. Carbon farming is a major priority under the Federal government's announced new Technology Investment Roadmap.[47] Carbon Market Institute's[48] Carbon Farming Industry Roadmap identified that by 2030, with strong targets and policies, carbon farming projects could deliver up to $24 billion in revenue and up to 21,000 direct and indirect jobs.

[44] https://www.dindi.com.au/wp/2020/02/21/solar-system-giveaway/
[45] https://www.abcfoundation.org.au/
[46] https://carbonmarketinstitute.org/about/
[47] https://www.industry.gov.au/data-and-publications/technology-investment-roadmap-first-low-emissions-technology-statement-2020
[48] https://carbonmarketinstitute.org/about/

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
Low methane feedstock 	Facilitate a working group with local farmers and other relevant stakeholders to discuss low methane feedstock solutions and the potential for Mansfield farmers to trial these. These working groups may also draw in expertise from the research sector. Keep track of trials and the commercialisation of low methane feedstock technologies and keep farmers up to date on new developments.	National Farmers' Federation's (NFF) Meat and Livestock Australia Victorian Farmers Federation (VFF) CSIRO and Melbourne University are involved in low methane feedstock research and trials. FutureFeed - exists to support the growth of the use of seaweed as a natural ingredient for livestock to reduce carbon emissions. They are the global IP holder for the technology.[49]	$$ Staff time, administration and facilitation cost for working groups.	The most progressed and promising technology in Australia is seaweed supplementation. Initial trials have shown that supplementing a cow's daily feed with Asparagopsis taxiformis — a red seaweed native to Australian coastal waters — resulted in an average drop in methane production[50]. According to sustainable agriculture experts from the University of Melbourne the results were promising, but more work was needed to establish whether or not the product would be safe to be used at scale.[51] The CSIRO and Meat and Livestock Australia are involved in research and trials of this technology.[52]
Climate Smart Agriculture 	Facilitation - Facilitate a working group with local farmers and other relevant stakeholders to discuss climate smart agriculture solutions and the potential for Mansfield Shire farmers to trial these. These	Mansfield Shire Council has participated in the GBGA Climate Smart Agriculture Development Project – Identifying agricultural opportunities under a climate changed future.[53]	$$ Staff time, administration and facilitation cost for working groups.	The Climate Smart Agriculture Development Project saw the development of a spatial assessment tool to model changes to regionally important agricultural commodities under the future impacts of climate change. This tool has given the project participants (including Mansfield Shire Council) the capacity to see the spatial and temporal changes to the production areas of seventeen important regional commodities, and for the first

[49] https://www.future-feed.com/
[50] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0247820
[51] https://www.abc.net.au/news/science/2021-03-18/cows-fed-seaweed-methane-emissions-reduced-82-per-cent/13253102?utm_medium=content_shared&utm_source=abc_news_amp&utm_campaign=abc_news_amp&utm_content=mail
[52] https://www.abc.net.au/news/science/2021-03-18/cows-fed-seaweed-methane-emissions-reduced-82-per-cent/13253102?utm_medium=content_shared&utm_source=abc_news_amp&utm_campaign=abc_news_amp&utm_content=mail
[53] http//www.gbga.com.au/climate-smart-agriculture-development.html

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
	working groups may also draw in expertise from the research sector. Keep track of smart agriculture initiatives and keep farmers up to date on new developments.	Victorian Farmers Federation (VFF)		time provides a picture of likely future land use patterns. The project analysis showed that the region's agricultural diversity and output may improve under a changing climate. Climate Smart Agriculture will help farmers to adapt their operations to a changing climate. Link to Climate Adaptation: Climate smart agriculture will assist farmers to adjust their operations to a changing climate.
Regenerative Agriculture 	Facilitate a working group with local farmers and other relevant stakeholders to discuss regenerative agriculture practices and the potential for a trial by Mansfield Shire farmers and producers. These working groups may also draw in expertise from the research sector. Provide incentives or devise a rebate scheme for Mansfield landowners, which would support sustainable and responsible land management practices. Keep track of regenerative agriculture initiatives and developments and keep farmers up to date.	Local indigenous groups, local producers, GBGA and other alliances, National Farmers Federation (NFF), Victorian Farmers Federation (VFF), Up2Us initiative, Goulburn Broken Catchment Management Authority, Farmers for Climate Action	$$ Staff time, administration and facilitation cost for working groups.	Regenerative Farming practices rebuild soil health and biodiversity, resulting in carbon draw down, an improved water cycle and can even support sequestration efforts[54]. Council can look at other examples of sustainable land management rebate schemes, such as the one run by City of Whittlesea[55]. Schemes such as this incentivise eligible landowners to improve their land use and enhance biodiversity. Some regenerative practices also link to suggested actions in the State Government's Climate Ready Victoria (Hume) initiative[56]. Link to Climate Adaptation.

[54] https://whatsyour2040.com/regenerative-agriculture
[55] https://www.whittlesea.vic.gov.au/community-support/grants-awards-and-competitions/sustainable-land-management-grants-and-incentives/
[56] https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0022/60745/Hume.pdf

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
Land use planning 	Regulation – implement responsible and consistent strategic land use planning to protect assets from climate impacts and uphold principles of ESD. Facilitation – facilitate sustainable agricultural practices through changes to land use planning and development approvals.	Council planning teams, developers and property owners, MAV	$$ Staff time, administration and facilitation cost	Local governments can review current planning controls to ensure that they enable new adaptive responses that plan for future climate impacts and technology for climate mitigation. Strategic land use planning can seek to enhance resilience through improved zoning controls. There are also opportunities to contribute to sustainability objectives, environmental conservation and economic development, as well as indirect benefits to community health and wellbeing through strategic land use planning. Some land use planning aspects link to suggested actions in the State Government's Climate Ready Victoria (Hume) initiative[57]. Link to Climate Adaptation and Health Plan
Green civic infrastructure - Adaptation action 	Strategic Planning - Incorporating green infrastructure into strategic planning Regulation - Modifying assessment of planning applications to encourage implementation of green infrastructure Purchase & Delivery - Investing in green infrastructure for Council owned land	Melbourne University Green Infrastructure Group[58] can potentially provide expert advice and collaboration opportunities	$$$ Staff time, budget for capital works and plantings, horticulture contractors	Green infrastructure is directly related to community health and climate adaptation. It assists in keeping spaces cool and in managing stormwater near where it falls. Using green infrastructure strategies to reduce stormwater runoff can strengthen efforts to preserve open space and natural areas and encourage development in existing communities. Most green infrastructure uses the natural processes of soils and vegetation to capture, slow down, and filter runoff, often allowing it to recharge ground water. Green infrastructure elements also help make neighbourhood streets and greenways pleasant and safe for walking and biking and reinforce a sense of place. Link to Climate Adaptation and Health Plan

[57] https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0022/60745/Hume.pdf
[58] https://girg.science.unimelb.edu.au

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
Improve tree cover on Council and private land - Adaptation action 	Strategic Planning - Incorporating additional tree cover into strategic planning Regulation – Modify assessment of planning applications to protect vegetation on private land and require additional plantings Purchase & Delivery - Invest in additional plantings and overcome impediments to increasing canopy cover and vegetation diversity on Council land e.g. streetscapes, parks and reserves Plant a diversity of trees to ensure climate, pest and disease resilience and prioritise plantings to areas of need	Developers active in the municipality and region Building permit applicants	$$$ Staff time, budget for additional vegetation, horticulture contractors	Trees and other vegetation regulate the local climate by shading streets, parks and buildings. Increasing the shire's tree canopy will therefore help to reduce the effects of climate change on the health of the Mansfield community. The Have Your Say forum show that there is considerable community interest in seeing tree cover increased in the Shire, and in protection of existing native vegetation. Community feedback specifically encourages shading of public open spaces such as car parks with tree cover. An adopt a street tree program was also suggested. This would include residents helping with maintenance of trees on their nature strips. Link to Climate Adaptation and Health Plan
Local food production and sustainable diets 	Purchase & Delivery - Stock council owned food service outlets with local low emissions foods (e.g. Mansfield Swimming Pool, leisure centres) Education – educate community on better diets and local foods that produce lower emissions through the website, schools and at community events.	Leisure Centre Operators, Mansfield District Leisure Trust Mansfield schools Walker Events is the organiser of the Mansfield Farmers Market and other events that have a strong focus on health and sustainability through local food choices.[59]	$$ Staff time, administration and facilitation cost	By making simple switches to diets such as reducing the amount of meat and animal products and consuming food from local producers, emissions from agriculture can be reduced. Council could seek to educate local residents about the power of sustainable food choices. Working with schools to educate students on local food production and sustainable diets will help to build knowledge in young people so they make good food choices. High Country Fresh offers a veggie box services via Facebook.

[59] http://walkerevents.com.au/farmers-market/

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
	Facilitation - Facilitate and support local farmers markets, food co-ops and veggie box services			Link to Health Plan
Waste (1% of total community emissions)				
Food organics and garden organics (FOGO) collection service 	Purchase & Delivery - FOGO collection for households, and free FOGO bins Council's Waste Strategy Plan outlines a plan to implement FOGO collection in 2024.[60] Purchase & Delivery - Invest in council owned food and garden organics processing infrastructure Education – Engage and support the community on uptake of FOGO (crucial to its success).	Organic waste service providers (e.g. Cleanaway)	$$$ Staff time, external expertise, capital works, budget to roll out FOGO bins	Waste kerbside collection services are directly managed by Council, making the introduction of systems to reduce emissions relatively straightforward. Food and organic waste typically comprise between 40-50% of total municipal waste volume. In Victoria almost 250,000 tonnes of food waste are sent to landfill each year. Councils across Victoria are now providing food waste recycling services for their residents. Recycling food waste is good for the environment, returning valuable nutrients to the earth. It also reduces the production of methane and the volume of waste sent to landfill.[61]. Waste management, including FOGO, has been identified as an important issue in the community through stakeholder consultation and the 'Have Your Say 'forum.
Industrial processes and product use (estimated to be <1%)				
Sustainable Roads 	Purchase & Delivery - Trial use of low carbon recycled priority materials in council infrastructure projects. Regulation - Update infrastructure guidelines and processes to include learnings from trials.	Department of Transport (DoT)	$ Staff time, budget for trials	Local road construction is an area that Council has fairly direct control over and by making simple changes to the use of materials as well as adjustments to infrastructure guidelines in-line with Department of Transport (DoT) specifications, significant emissions savings can be realized. This program recommends starting with a trial that is aimed at ensuring that Council teams, contractors and community members are confident in the materials and comfortable to work with them. Once the trial has been successfully implemented and there is

[60] https://www.mansfield.vic.gov.au/sites/default/files/largefiles/Mansfield%20Shire%20Waste%20Strategy%202020_0.PDF
[61] https://www.sustainability.vic.gov.au/campaigns/love-Food-Hate-Waste/love-a-list

Action area	Intervention options	Relevant stakeholders and collaboration opportunities	Cost to Council **$** = staff time only, **$$** = staff time and finances, **$$$** significant staff time and finances	Notes
	Advocate to other levels of government to adopt low carbon approaches to the roads they make and maintain.			support to progress, Council's infrastructure guidelines can be updated with lower emissions specifications, and Council can advocate with confidence to the State and Federal Government to ensure the construction of their roads is low carbon. Note this action has cross over with the corporate emissions section (see Table 13).

In addition to the interventions outlined above that target specific actions areas and emissions sources there are a number of actions and interventions for Council to consider that support broader community climate action. These are outlined in Table 23 below. Due to the broad spectrum of action areas and emissions sources these programs cover, indicative cost end emissions reductions cannot be provided.

Table 23: Broader Council interventions to support community climate action

Action Area	Intervention description	Relevant stakeholders and collaboration opportunities	Notes
Support community climate action 	Facilitate community events such as Sustainable House Day, sustainability workshops and Earth Hour to engage the community in sustainability initiatives Facilitate a community climate action leadership program (e.g. Darebin, Moreland, Yarra) Inform the community of available funding for community climate action initiatives.	Local community groups Sustainability groups and experts Goulburn Broken Greenhouse Alliance (GBGA)	Council can help to build community knowledge and understanding of climate change issues by providing information through events and on their website in an easy to understand format. This may include information on the direct impacts of climate change to the Shire, the future risks, potential community mitigation and adaptation options, and links to helpful resources. This may also include info on available grants to local businesses or community groups. Community feedback through the 'Have Your Say' forum has indicated that lack of knowledge on climate change and available grants is an important issue in the community. Grants are being established by Up2Us that will fund climate actions such as purchasing EV charging stations for small outlying communities. Some councils employ a funding officer to look for funding that may be available to support community projects. An example of funding includes the Local Government Energy Savers Program, or the Office of Environment and Heritage Sustainable Councils and Communities program in NSW. This is a pilot program that aims

			to work with resource constrained councils to increase energy efficiency for businesses and residents.
Declaring a climate emergency 	Declare a Climate Emergency and commit to rapidly increase and extend efforts to support the community in reducing emissions.	Climate Emergency Australia (CEA) has been set up by councils across Australia to enable local government to work together on the climate emergency. CEA became operational in June 2020, is hosted by the City of Melbourne, run by NAGA and funded by 13 founding funder councils.[62]	Following Darebin City Council declaring a climate emergency in 2016, more than 98 municipalities across Australia, representing over eight million people, as well as 1,400 local governments across the world have declared or acknowledged a climate emergency. There is strong interest in Council declaring a Climate Emergency from members of the community, seen feedback on the Have Your Say forum.
Partnerships 	Join/lead regional initiatives to drive community action with Goulburn Broken Greenhouse Alliance and cohort councils Investigate partnerships with private enterprises supporting energy resilience and the uptake of renewables. Explore alternative means of sourcing specialised expertise that Council may not have in-house.	GBGA Cohort councils Private enterprises Knowledge institutions (e.g. universities)	One example for sourcing specialised expertise through potential partnerships with private enterprises is Mondo. This company works with cities, regional centres and local communities to help them achieve their energy goals through bringing in their expertise in engineering and energy intelligence. Mondo develop Energy Hub projects in collaboration with Shire Councils, local businesses, community groups and government agencies. These pioneering initiatives can have far reaching benefits for the region's economy, local employment, the community, the environment and tourism. Along with solar systems and battery storage, they are developing opportunities such as hydrogen conversion, waste to energy, and electric vehicle charging networks. These types of projects empower communities to generate, store, manage and use electricity for local benefit. [63]
Advocacy and leadership 	Join the Cities Power Partnership (CCP) to show leadership and gain access to networking and knowledge sharing on best practice council led climate action[64] Advocate to State and Federal Government for more ambitious climate action through joint advocacy campaigns with other councils (e.g. GBGA) and local stakeholders	Climate Council - CCP Municipal Association of Victoria (MAV) GBGA Renewable Energy Mansfield Up2Us	Several councils including members of the GBGA have committed to the TAKE2 pledge to undertake climate change action.[65] In addition to joining advocacy campaigns with other councils, Council can partner with local groups such as Renewable Energy Mansfield and Up2Us to advocate for action on climate change. Council can advocate for support from State and Federal Governments through effective and adequate funding of climate policies and programs. Advocacy within Mansfield Shire Council for climate change actions and policy can help to continue the conversation on local issues. There should be advocacy within all

[62] https://www.naga.org.au/climate-emergency-australia.html
[63] https://mondo.com.au/communityc
[64] https://citiespowerpartnership.org.au
[65] https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/take2#Whocanpledge

			Council departments, with climate risk and emissions potential embedded into decision making processes.
Climate Adaptation 	Facilitation - Supporting the community in adapting to a changing climate through participating in regional adaptation programs and initiatives	Hume Regional Climate Change Adaptation Strategy – Climate Ready Hume	Climate Ready Hume is a Victorian Government funded program developing a regional climate change adaptation strategy, whilst supporting local projects, education and awareness on climate change adaptation. Climate Ready Hume includes all Hume region councils: Alpine Shire Council, Benalla Rural City Council, Greater Shepparton City Council, Indigo Shire Council, Mansfield Shire Council, Mitchell Shire Council, Moira Shire Council, Murrindindi Shire Council, Strathbogie Shire Council, Towong Shire Council, Wangaratta Rural City Council and Wodonga Council.

APPENDICES

Appendix A: Corporate Emissions Inventory Report Methodology Options

Council's corporate emissions are those resulting from Council's own operations.

Methodology for Reporting on Organisational Boundaries

The first step in estimating your carbon footprint or GHG inventory is identification of organisation boundary.

For an organisation, the emissions boundary must include all emissions under the direct control or ownership of an organisation, as well as emissions they can strongly influence.

There are three possible approaches for setting up the organisational boundary

1. Accounting for emissions Council assets under **equity share approach** i.e., GHG emissions from operations according to its share of equity in the operation (e.g. an electric vehicle charging station that has shared ownership).

2. Accounting for emissions from Council assets under **financial control** i.e., assets that Council pays the utility costs for, either wholly or partially.

3. Accounting for emissions for Council assets under Council's **operational control** i.e., assets that Council pays the utility costs for *and* for activities that Council has the ability to introduce and influence through operating policies, health and safety policies and environmental policies **(This is the most commonly used approach)**.

The operational control approach is the most commonly used approach. It aligns with the National Greenhouse and Energy Reporting (NGER) Act and is considered standard practice for organisations to use. Under the NGER Act, an organisation is mandated to report against all activities with greenhouse gas or energy use implications under the operational control of the corporation. Relevant activities are those defined by the NGER Act as reportable and include scope 1 and scope 2 emissions, energy consumption and energy production.

The same operational control approach is used under the Climate Active Carbon Neutral Standard (previously called the National Carbon Offset Standard). Climate Active includes the following emissions in the organisational emission boundary:

1. All stationary energy and fuels used in buildings, machinery or vehicles in the organisation's control (e.g., natural gas, fuels used in generators or vehicles)

2. All electricity consumed by buildings, machinery or vehicles in the organisation's control

3. All other emissions identified as a direct result of the organisation's operating

Background to Direct and Indirect Emissions and Emissions "Scopes"

Once Council has determined its organisational boundaries in terms of the operations that it owns or controls, it then determines what emissions within their organisational boundaries to report on. This involves identifying emissions associated with its operations, categorising them as **direct** and **indirect** emissions, and choosing the scope of accounting and reporting for indirect emissions.

Direct GHG emissions (scope 1) are emissions from sources that are owned or controlled by the organisation.

Indirect GHG emissions (scopes 2 and 3) are emissions that are a consequence of the activities of the organisation but occur at sources owned or controlled by another organisation.

Council emissions are further defined using the "scopes" framework. In line with the NGER Guidelines[66], and the GHG Protocol Corporate Standard[67], emissions can be divided into three scopes.

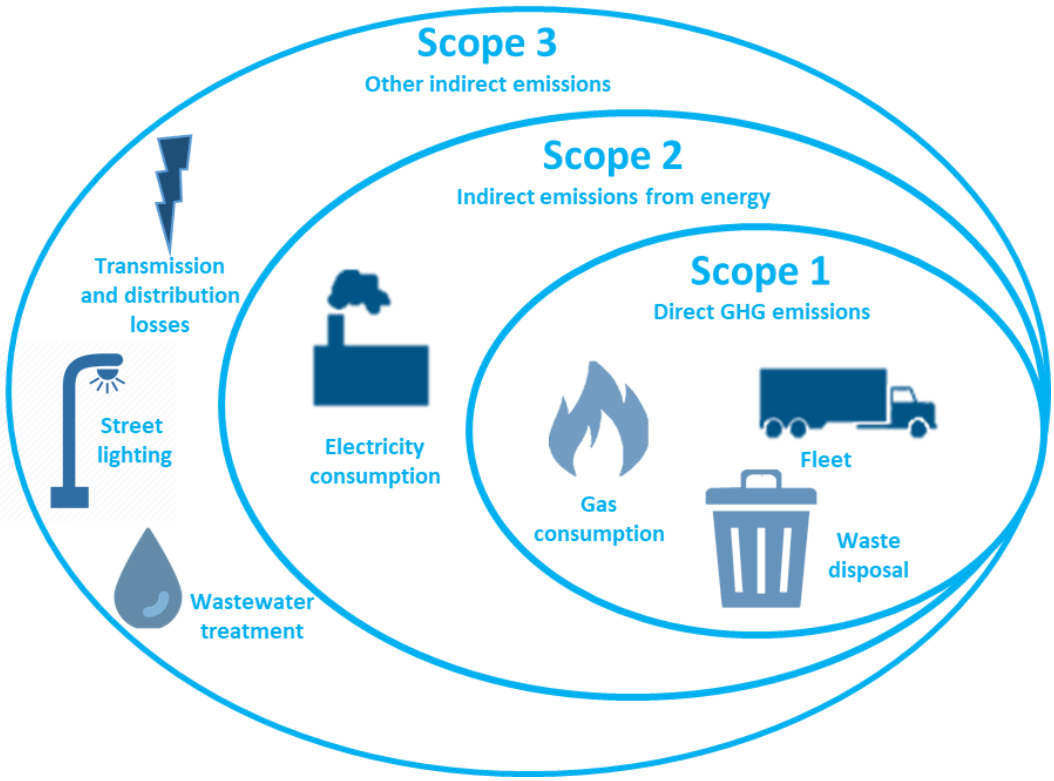


Figure 14. Emissions scope summary

The definitions for each scope are outlined below:

[66] www.cleanenergyregulator.gov.au/NGER
[67] https://ghgprotocol.org/corporate-standard

- Scope 1 emissions are defined as "direct emissions from owned or controlled sources" and are emissions created when Council burns a fuel in an owned asset such as fleet burning diesel or petrol, or a building burning bottled gas for hot water. Emissions from council owned landfill sites also fall into scope 1. Typical sources include
    - Gas consumption
    - Fuel consumption (transport/stationary)
    - Lubricants (petroleum based oil/grease)
    - Fugitive emissions (HVAC, Vehicles)
    - Council-owned and operated landfills
- **Scope 2** emissions are defined as "indirect emissions from the generation of purchased energy" and include electricity purchased for Council-owned and operated assets. Typical sources include
    - Electricity consumption
- **Scope 3** emissions are defined as "all indirect emissions (not included in scope 2) that occur in the value chain of the reporting entity (Council)" these include electricity purchased for street lighting, emissions associated with water use and emissions from the extraction and production of fuels (including diesel, petrol, gas and electricity). Typical sources include
    - Water usage for council corporate, community and commercial operations
    - Contractor Fuels
    - Asphalt
    - Office paper
    - Flights
    - Hire cars and taxis
    - Accommodation
    - Scope 3 portion of sources in Scope 1 and Scope 2

Segregating emission sources into these three "scopes" ensures that no two organisations can account for the same emissions in the same scopes, therefore ensuring that there is no double counting of emissions.

The completeness of councils' corporate emissions inventories varies across the country and are impacted by factors such as the availability of a council's emissions data, the capacity of council officers, the expectations of the community and council resources.

Inventory Reporting Framework Options

The below section highlights two of the national frameworks/guidelines for reporting greenhouse gas emissions.

The National Greenhouse and Energy Reporting System (NGERS)

In 2007 the Australian Government via the National Greenhouse and Energy Reporting Act 2007 (the NGER Act) introduced the National Greenhouse and Energy Reporting Scheme (NGERS), providing the first mandated national reporting guidelines for Australian organisations.

The objectives of the NGER Act are to inform government policy and the Australian public; help meet Australia's international reporting obligations; assist Commonwealth, state and territory government programs and activities; avoid the duplication of similar reporting requirements in the states and territories; and underpin the introduction of an emissions trading scheme.

Organisations that meet an NGER threshold must report their greenhouse gas emissions; energy production; energy consumption; and other information specified under NGER legislation.

Climate Active Carbon Neutral Standard

Climate Active[68] is a Commonwealth Government program that allows Australian organisations to achieve certified carbon neutral status for their whole organisation, products/services, events and buildings/precincts.

When going carbon neutral under Climate Active, all greenhouse gas emissions must be considered, including your organisation's emissions, emissions in your value chain, and radiative forcing for flights. In addition, you need to develop a strategy on how to reduce emissions in your organisation, not just offset them.

The benefits of Climate Active certification are for credibility, promotion and visibility - it allows Council to be listed as part of the network on the Climate Active website. However, Council is advised to carefully consider approaching Climate Active certification, as there are some important, long term implications to Council's budget.

Ultimately, a best practice council's inventory objective is to achieve the level of reliability and accuracy required to inform sound decision making in the action planning stage of the project, as opposed to achieving full compliance with the Climate Active reporting frameworks. For councils with net zero targets, it is best practice to align with Climate Active, but not necessarily report on all emissions required under the scheme.

There is no necessity to be certified Climate Active (carbon neutral) when aiming for net zero emissions. The term "carbon neutral" can be used as a target without certification. However, the language that has been adopted by other councils with carbon neutral targets but have opted to not pursue certification tends to be "net zero emissions", "zero emissions" or similar instead of "carbon neutral". Councils that have chosen not to be officially certified have still chosen to *align* their GHG inventories closely to the Climate Active guidelines. The main reasons are credibility and accountability to the community and to lay the foundations if they decide to formalise carbon neutral status down the track. Moreover, following these guidelines would ensure that Council has a more complete representation of its corporate GHG emissions.

Difference between NGERS and Climate Active

Reporting under NGERS is mandatory for large energy users and carbon emitters, and only applies to scope 1 and scope 2 greenhouse gases. On the other hand, Climate Active is

[68] Climate Active

voluntary and it requires the organisation to report upstream and downstream scope 3 emissions, as well as scope 1 and scope 2.

Current reporting trends and indicative costs

Refer to Table 24 for an outline of national practices and trends in GHG inventory calculation and reporting. All of these comply with NGERS.

Table 24: Corporate inventory reporting options (all compliant with NGERS)

Option and est. annual cost	Inclusions	Trends
Basic and standard inventory level		
1. Basic – Council Corporate GHG Inventory $3,000 - $5,000*	Reports mainly only on scope 1 and 2 emissions from fuel usage, energy use and waste disposal. Additionally, scope 3 emissions from street lighting are typically included (since despite being a scope 3 emission this constitutes a significant portion of most councils' emissions). *Mansfield Shire Council closely aligns with this level. Refer to the section below for more details.*	From ~1995-2010, this was a very common approach for most councils. This is no longer the case.
2. Standard – Council Corporate GHG Inventory $6,000 – $8,000*	Reports on all emission sources that council has operational control of, across direct and indirect scopes. Includes taking the organisation through the identification of organisational and operational boundaries, materiality/relevance test, followed by inventory reporting.	Councils are increasingly focusing on scope 3 emissions as opportunities from scope 1 and 2 emissions sources get implemented (low-hanging fruits).
Best practice inventory level		
3. Climate Active-aligned inventory $8,000 - $10,000*	This includes all emissions sources and scopes under the operational control approach in alignment with Climate Active (formerly known as NCOS). This is helpful for councils who want to report on a national comprehensive framework and/or prepare for certification in the future. Includes emission sources based on Climate Active's Materiality and Relevance Test	This is the most common approach for councils who are aiming for net zero emissions or carbon neutrality. (E.g. Fremantle, Ballarat, Port Phillip, Byron, Noosa councils)
Leading inventory level		
4. Climate Active-certified inventory $15,000**	This involves additional reporting and compliance requirements to establish and maintain Climate Active certification, including preparation of Public Disclosure Statement, Reporting on External Calculators, and Grandfathering template. Additionally, there are ongoing budget implications from the procurement of offsets to maintain certification.	Leading councils only (e.g. Bayside City Council, Brisbane City Council, City of Sydney, City of Adelaide, Moreland City Council, City of Randwick, City of Yarra and City of Melbourne) that have committed to being carbon neutral

**Assumed cost for inventory preparation. Inventory software additional.*

*** Estimated cost of preparing Climate Active submissions documents and inventory preparation (excludes annual certification fees and audit fees for every 3 years).*

Council's Current Inventory Methodology and Where to From Here

Since 2016/17, Mansfield Shire Council has strived for inventory completeness and regularly documents changes from the last iteration to rationalise any updates to emissions trajectory over time or reduction targets. This approach can be considered good practice.

Mansfield Shire Council 2016/17 to 2019/20 corporate emissions inventories report on emissions that are under their operational control. The inventories are largely compliant with the NGERS framework and a Basic inventory level (described in Table 24 on the previous page).

See Table 25 below for what emissions have been included in Council's 2018/19 corporate inventory compared with what Council would need to report on should it wish to align with NGERS or Climate Active.

Table 25: Gap analysis of emissions sources included by Council in 2018/19

Scope	GHG emissions sources	Mansfield 2018/19 reported emissions	To achieve minimal NGERS Compliance	Climate Active compliance (aligned or certified)
Scope 1	Fleet Fuels (Gas, Diesel & Liquified Petroleum Gas)	✓	✓	✓
	Plant Fuels (Gas, Diesel & Bottled Gas)	✓	✓	✓
	Natural Gas	N/A	✓	✓
	Fugitive Emissions (Refrigerants)	×	✓	✓
	Lubricants	×	✓	✓
	Waste to Landfill	N/A	✓	✓
Scope 2	Electricity (Council) (Emissions produced through the electricity used by buildings that Council owns and occupies)	✓	✓	✓
Scope 3	Street Lighting[69] (Emissions produced through the electricity used by street lights that Council pays the bills for)	✓	✓	✓
	Electricity (Commercial) (Emissions produced through the electricity used by buildings that Council owns but does not occupy)	✓	×	✓
	Contractor Fuels	×	×	✓
	Water use (emissions produced through the processes associated with delivery of water to Council facilities, and disposal of wastewater*)	✓	×	✓

[69] Street lighting can be reported as a Scope 2 or 3 emission for councils depending on if they fall under council's operation control. If Mansfield wishes to report an NGERS-compliant carbon footprint, street lighting should be considered a Scope 2 emission. For further details see https://100percentrenewables.com.au/carbon-accounting-energy-streetlighting/

Scope	GHG emissions sources	Mansfield 2018/19 reported emissions	To achieve minimal NGERS Compliance	Climate Active compliance (aligned or certified)
	Electricity (No operational control)**	×	×	✓
	Corporate Waste (Emissions created from the waste produced at Councils' sites)	✓	×	✓
	Transport Fuels	×	×	✓
	Natural Gas (Scope 3 emissions)	×	×	✓
	Stationary Fuels	×	×	✓
	Flights	×	×	✓
	Natural Gas (No operational control)	×	×	✓
	Hire Cars and Taxis	×	×	✓
	Office Paper	×	×	✓
	Public Transport	×	×	✓
	Lubricants	×	×	✓
	Asphalt	×	×	✓
	Accommodation	×	×	✓

** Note that any council who is also a water retailer would report water emissions as scope 2.*
*** E.g. Council owned and leased out; tenant pays the bills*

To be compliant with NGERS, Council would need to profile fugitive and lubricant emissions (known as scope 1 emissions under NGERS), and stop reporting on certain scope 3 emissions including: street lighting, commercial buildings (rented to tenants), water use and corporate waste.

The reason why NGERS doesn't require the reporting of these emissions is because this framework has a strong focus on avoiding double counting. Given that landfill operators, water retailers and (potentially) commercial building operators will be accounting for these emissions, they advise against including them in an inventory.

To align or be accredited with Climate Active, Council would need to report on all scope 1 and 2 emissions, and all the scope 3 emissions they can influence through their policies and operations management.

Where to from here:

It can be very confusing to work out what framework to comply with – NGERS or Climate Active? Whilst neither of them is mandatory, it is ideal to align with a national approach to capitalise on the expertise that is fed into these frameworks, and ensure Council conducts best practice inventories.

Most best practice councils will simply use a basic rule of thumb when deciding what emissions to include, which is to **include emissions sources that they have operational control over – i.e. they have the ability to influence their reduction**.

Therefore, many councils will aim to *largely* align with NGERS by reporting on all scopes 1 and 2 emissions sources, but will disregard the NGERS approach of avoiding double-counting scope 3 emissions if they identify they can influence these emissions. Or they will largely align with Climate Active and try to report on scope 3 emissions, so long as it isn't too time consuming or costly to do so.

In regards to reporting on all scope 3 emissions (as advised by Climate Active), Climate Active has a useful relevance test of requiring that any emissions source under council's operational control that contributes to ≥5% of total emissions should be included.

Another approach by several councils is to determine whether the scope 3 emissions source is of importance to key stakeholders, and/or whether council has strong influence over. Paper use is common example of this; it usually contributes to a miniscule percentage of emissions, but is often of importance to council staff, and easy for council to influence.

One avenue for Council to consider in the future is to source fugitive and lubricant emissions data for the next reporting period of 2021/22 in order to have a full data set of scopes 1 and 2 emissions. Should these emissions amount to a greater than 10% change in total emissions, then it would be recommended that Council also redo their 2018/19 baseline year and update their Climate Action Plan accordingly to address these emissions sources.

Appendix B: 2018/19 Detailed Emissions Breakdown

Table 26 provides the break down by emissions sources for the period 2018/19.

Table 26: Emissions profile by sector and scope

Emissions source	Consumption	Units	CO_2-e tonnes	Percentage of inventory	Cost	% Total cost
Direct emissions (scope 1)						
Diesel for Fleet	10	kL	25.92	2.51%	$ 13,107.04	4%
Diesel for Plant	51	kL	140.10	13.55%	$ 70,922.67	21%
Gasoline for Fleet	11	kL	26.10	2.52%	$ 14,878.38	4%
Gasoline for Plant	0	kL	0.12	0.01%	$ 70.30	0%
LPG bottled & bulk for buildings	16,839	litres	26.23	2.54%	$ 6,368.96	1.9%
TOTAL DIRECT EMISSIONS (scope 1)			**218.46**	**21.13%**	**105,347.35**	**31%**
Indirect emissions (scope 2)						
Electricity (Council)	488,093	kWh	522.26	50.51%	$148,207.01	44%
TOTAL INDIRECT EMISSIONS (scope 2)			**522.26**	**50.51%**	**$148,207.01**	**44%**
Indirect emissions (scope 3)						
Electricity - Street Lighting	158,627	kWh	169.73	16.42%	$ 38,086.12	11%
Electricity (Commercial)	8,471	kWh	9.06	0.88%	$ 2,736.93	1%
Water (Council)	19,218	kl	34.57	3.34%	$ 43,799.48	13%
Corporate waste	148	kg	3	0.26%	-	0%
Emissions from manufacture, transmission and other losses electricity for Council and Commercial sites	496,564	kWh	49.66	4.80%	-	0%
Emissions from manufacture, transmission and other losses electricity for Street Lighting	158,627	kWh	15.86	1.53%	-	0%
Emissions from diesel extraction, production and transport for plant & fleet	61	kL	8.48	0.82%	-	0%

Emissions from petrol extraction, production and transport plant & fleet	11	kL	1.40	0.13%	-	0%
Emissions from LPG extraction, production and transport for buildings	16,839	litres	1.55797	0.15%	-	0%
TOTAL INDIRECT EMISSIONS (scope 3)			**293.18**	**28.35%**	$ 84,622.53	25%
TOTAL EMISSIONS (scope1+2+3)			**1,033.90**	**100.00%**	**$338,176.89**	**100%**

Appendix C: Data Quality Review of Corporate Inventory Emissions Sources

This section provides an overview of each emissions source captured for the 2018/19 corporate inventory. Specifically, it provides:

- A description of the emissions source
- A review of the data quality
- Specific recommendations to improve emissions reporting in the future.

It also contains commentary on how to report on additional emissions sources that currently aren't profiled by Council. This includes:

- Fugitive emissions (refrigerants)
- Lubricants
- Contractor fuels
- Staff travel to/from work
- Hire car and taxis
- Staff accommodation
- Asphalt
- Flights
- Office paper

All these emissions sources excluding fugitive and lubricant emissions are scope 3 emissions. They are therefore considered acceptable omissions in respect of the NGERS guidelines which stipulate that Council need only report scope 1 and 2 emission sources. However, if Council were to pursue carbon neutrality via Climate Active certification, all relevant scope 3 emissions would need to be reported including these emission sources.

Refer to Appendix A: Corporate Emissions Inventory Report Methodology Options to help to inform Council's decision on what emissions sources to include in future (and potentially retrospective) inventories.

Electricity

Description

Emissions from electricity fall under both the scope 2 and scope 3 emissions categories.

Scope 2 electricity emissions are defined as "indirect emissions from the generation of purchased energy" and includes electricity purchased for Council-owned and operated assets.

Scope 3 electricity emissions are calculated for the following emissions sources:

- Electricity - street Lighting – electricity consumption from street lighting, and emissions resulting from manufacture, transmission and other losses.
- Electricity (Commercial)
- Transmission and distribution – these are emissions that result from the manufacture, transmission losses and other losses of electricity consumed directly by all Council sites.

The emissions factors for electricity (both consumption and transmission) change year on year as they are calculated based on the energy mix and other factors which are highly changeable. This is in contrast to the emissions factors for some other sources such as fuels which remain constant. Ironbark uses the emission factors published by the Federal Government in the National Greenhouse Accounts Factors documents for electricity emissions calculations.

Data Quality and Issues

There are a couple of potential issues with the data:

43 electricity meters/NMIs did not have 365 days-worth of data in the inventory tool. Data was estimated to cover the full reporting period for these accounts. The estimate amounts equate to 20% of council electricity consumption. For details of the NMIs, days missing and consumption/cost estimated refer to

- Appendix D: Action Planning Pathways Methodology and Assumptions.
- Emission factors in the old inventory tool were not up to date. The new inventory tool provided to council includes updated factors.

Recommendations

To improve the quality of future reporting Ironbark recommends the following:

- Review council sites to determine Council's operational control and differentiate between:
    - Electricity (Council) – where Council, owns, operates and occupies the site – reported as Scope 2
    - Electricity (Commercial) – where Council owns a site but it is occupied and operated by a business – reported as Scope 3 or excluded
    - Electricity – Street Lighting – where Council pays the bill for a street lighting asset – reported as Scope 3
- Establish a utilities billing review process to ensure bills are being received for all sites under Council control. If Council is receiving the electricity bills and then billing the tenant, include a note and mark as not under Council operational control (Commercial).
- Ensure electricity data is being sourced from retailers as outlined in the tool manual. This is the preferred method of sourcing data as it includes more detail.
- Establish a process to maintains a comprehensive list of all sites including NMI's with associated electricity retailer, asset category, asset name and asset address.
- Ensure data entered in the inventory tool covers 365 days for each NMI and estimate any data gaps as outlined in the tool manual.
- Ensure emission factors are current in the inventory tool for each FY.

Liquified Petroleum Gas (LPG) bottled and bulk

Description

Emissions from LPG fall under both the scope 1 and scope 3 emissions categories.

Scope 1 emissions are defined as "direct emissions from owned or controlled sources" and are emissions created when Council burns a fuel in an owned asset; in this case a building using LPG.

Scope 3 emissions are generated from the extraction, production and transport of natural gas for buildings.

LPG is largely consumed for heating so consumption is therefore heavily dependent on weather. For this reason, it is normal for gas consumption to fluctuate year on year. Variation of 10% between reporting periods is considered reasonable.

Data Quality and Issues

Overall data quality for gas was high.

Recommendations

To improve the quality of future reporting Ironbark recommends the following:

- Ensure all accounts are clearly linked to a site.
- Establish a utilities billing review process to ensure bills are being received for all sites under council control, and that bills are not being received for sites which are not under Council control.
- Discuss with your gas retailer/or the Finance team options for improving Council's access to clear, reliable, and complete billing data reports. Work to ensure that this is setup in a standard format that can be easily exported on an annual basis.

Transport Fuels and Stationary Fuels

Description

Emissions from transport and stationary fuels fall under scopes 1 and 3.

Scope 1 emissions cover emissions from the burning of fossil fuels (gasoline and diesel) by the fleet and plant under Council's direct control.

Scope 3 emissions are generated from the extraction, production and transport of fuels.

Emissions from fuel consumption are divided into Fleet (Diesel and Gasoline) and Plant (Diesel and Gasoline).

Transport Fuels covers Council's vehicle fleet, and off-road (plant) vehicles. Stationary Energy includes emissions from fuel consumption for electricity generation (diesel generators), fuels consumed in construction, and other sources like domestic heating, and plant fuel consumption.

Data Quality and Issues

Council provided consumption data in litres for diesel and gasoline for fleet and plant. Overall data quality was high.

Data issues were as follows:

- Vehicles listed as "com" in the Site List are categorised as "Plant", vehicles listed as pool, private and "L2P" are categorised as "Fleet". Council should confirm this categorisation is correct.

Recommendations

To improve the quality of future reporting Ironbark recommends the following:

- Continue requesting standard fuel consumption reports from the supplier and maintain existing reporting systems for fuel consumption in litres ensuring fuel type and category (fleet or plant) are clearly marked, and costs are recorded alongside consumption volumes.
- To help identify available fuel alternatives and to improve the visibility of any savings we suggest council distinguish fuel consumption using the following categories:

- Passenger vehicles: this is basically staff cars - sedans, wagons, SUVs
- Heavy/utility fleet vehicles: Trucks, Utes, vans
- Plant: diggers etc.
- Stationary energy: Generators, boilers etc.

Or at its simplest, separate out "Plant' (diggers etc) from road vehicles "Fleet".

Lubricants

Description

Emissions from lubricant use by Council fall under scope 1. There are two emissions factors available for lubricants; one for oils and one for greases. It is therefore important that the lubricant type is reported as well as the volume consumed.

Data Quality and Issues

No data was provided for lubricants.

Recommendations

To facilitate future reporting Ironbark recommends the following:

- Investigate ways to capture the use of both oil and greases within Council operations from vehicles and plant and ensure that both the type (oil or grease) and the volume (grams or litres) of lubricant that is consumed or purchased by Council is documented.

Fugitive Emissions (Refrigerants)

Description

Fugitive emissions occur where refrigerants with a high Global Warming Potential leak into the atmosphere and are a Scope 1 emissions source.

Data Quality and Issues

No data was provided for refrigerant leakage.

Recommendations

To facilitate future reporting Ironbark recommends the following:

- For large heating ventilation and air conditioning systems, work with Council's building air conditioning maintenance team to record the type of refrigerant and the amount (kilograms) used each year for maintenance.
- For smaller reverse cycle air conditioners, record the number of units used in Council buildings and the type and charge of refrigerant used and apply standard yearly leakage factors.
- Similarly work with team maintaining Council's vehicles to record the type of refrigerant and the kg used for vehicle maintenance.
- Record the number of fridges used in Council buildings and the type and charge of refrigerant used and apply standard yearly leakage factors.

Water

Description

Council's emissions from water supply and disposal fall under scope 3 indirect emissions. This figure includes water supplied to Council owned and controlled buildings and facilities. While differentiation has been made between council buildings and commercial, there is no differentiation of community buildings, nor for non-building consumption such as irrigation.

Data Quality and Issues

Data was sourced from the inventory tool supplied by Council:

- It is unclear whether data covers all of Council's water usage including water for irrigation or road works.
- 7 water accounts did not have 365 days' worth of data reported - data was estimated to cover the full reporting period for these accounts. This amounts to 2% of council water consumption. For details of the Accounts, days missing and consumption and cost estimated refer to

- Appendix D: Action Planning Pathways Methodology and Assumptions.

There are a number of accounts where it is unclear which asset the account belongs to and whether Council should be reporting on the account, refer to

- Appendix D: Action Planning Pathways Methodology and Assumptions.

Recommendations

To improve the quality of future reporting Ironbark recommends the following:

- Review the sites covered in the inventory tool to determine a breakdown that might be of interest to Council, such as:
    - Water (Council) – where Council, owns, operates and occupies the site.
    - Water (Community) – where Council owns and operates a site but it is occupied by a Community group.
    - Water (Commercial) – where Council owns a site but it is occupied and operated by a business.
    - Water (irrigation) – water used for irrigation of Council parks and gardens.
    - Water (road works) – water used in the construction of roads.
- Establish a utilities billing review process to ensure bills are being received for all sites under council control, and that bills are not being received for sites which are not under Council control. If Council is receiving the water bills and then billing the tenant, include a note and mark as not under Council operational control (Commercial).
- Continue exporting data in the same format as provided for FY2018/19 ensuring that consumption and cost data is included.

Asphalt

Description

Asphalt is a scope 3 emissions source and covers asphalt and gravel aggregate used for road reconstruction or road works which have been contracted by Council during the reporting period. Asphalt use can vary significantly depending on the works executed during the reporting period. This emissions source may be significant in future years.

Data Quality and Issues

No data was provided for asphalt.

Recommendations

To facilitate future reporting Ironbark recommends the following:

- Inform the procurement or road projects team that they will be required to provide data on asphalt usage for Council reporting.
- Aim to get as much detail about the data as possible including the amount of crude oil used and the amount of aggregate and any information available about the aggregate such as recycled content.
- Expand data collection to include information on other infrastructure emission sources, especially concrete (i.e. emissions from road building are typically 50% from concrete and

50% from the rest of the road building), land clearing (for new or expanded roads) and contractor vehicles.

Office Paper

Description

Office paper is a scope 3 emission source and includes all printer/copier paper purchased during the reporting period.

Data Quality and Issues

No data was provided for office paper.

Recommendations

Council should contact their procurement team for information on the number of reams and paper type and size purchased during the reporting period.

Contractor fuels

Description

Where council contracts other companies to undertake works for them that use large amounts of fuel, Council should report the emissions for the fuel use as their Scope 3 emissions. Examples are waste and road works contractors.

Data Quality and Issues

No data was provided for contractor fuels.

Recommendations

To facilitate future reporting Ironbark recommends the following:

- Work with contractors to collect fuel used on Council projects.
- Work with procurement team to ensure this requirement is included in future contracts.

Staff travel to/from work

Description

Staff travel to and from work is a scope 3 emissions source.

Data Quality and Issues

No data was provided for staff travel.

Recommendations

To facilitate future reporting Ironbark recommends the following:

- Including questions around staff travel in an appropriate annual Council staff survey.

- Data required is km travelled for each mode of travel. Typically, surveys ask for main mode of travel, days/week used and estimate of km travelled.

Flights

Description

Flights for business travel is a scope 3 emissions source and covers all flights taken by council employees, and non-council staff on Council business.

Data Quality and Issues

No data was provided for flights.

Recommendations

To facilitate future reporting Ironbark recommends the following:

- Ensure all relevant details (as outlined in the Data Collection Guide provided by Ironbark) are included in reporting.
- Work with and inform the finance or corporate strategy team that they will be required to provide detailed data annually in a standard format on flights including:
    - Departure and destination cities and class of travel for all flights.
- Use the departure and destination cities to determine km travelled.
- Apply the UK emission factors for the km and class of travel.

Hire cars and taxis

Description

Hire cars and taxis are a scope 3 emissions source and covers taxi/Uber travel by council employees, and fuel used by hire cars.

Data Quality and Issues

No data was provided for hire cars and taxis.

Recommendations

To facilitate future reporting Ironbark recommends the following:

- Collect data on total spend on taxis and Uber from finance.
- Work with finance to see how data on fuel used in hire cars can be captured with the aim of getting the cost of fuel separated from other travel related costs so an estimate of fuel use can be calculated.

Accommodation

Description

Accommodation is a scope 3 emission source and includes emissions generated from the energy consumed by accommodation used by council staff when travelling on business.

Data Quality and Issues

No data was provided for accommodation.

Recommendations

To facilitate future reporting Ironbark recommends the following:

- Ensure all relevant details (as outlined in the Data Collection Guide provided by Ironbark) are included in reporting.
- Work with and inform the finance or corporate strategy team that they will be required to provide detailed data annually in a standard format on accommodation for business travel for Council reporting.

Appendix D: Action Planning Pathways Methodology and Assumptions

General Assumptions

Energy Prices

Table 27: Energy price assumptions

Council energy contract	Unit	Most recent value	Year	Reference
Grid Electricity – current tariff	$/kWh	$0.1950	2018/19	Average from bills provided by Council as part of the inventory.
Renewable PPA – estimated tariff	$/kWh	$0.1950	2018/19	It is assumed that the electricity tariff on a 100% renewable energy PPA contract will be equivalent to the current electricity tariff paid by Council.
Street Lighting (unmetered) - Grid Elec	$/kWh	$0.1200	2018/19	Average from bills provided by Council as part of the inventory.
Street Lighting (unmetered) - Renewable PPA	$/kWh	$0.1200	2018/19	It is assumed that the electricity tariff on a 100% renewable energy PPA contract will be equivalent to the current electricity tariff paid by Council.
Natural Gas	$/MJ	$16.7465	2018/19	Average from bills provided by council converted from L ($0.669859078/L) to MJ.
Petrol	$/L	$1.4590	2018/19	Average from fleet data provided by Council as part of the inventory.
Diesel	$/L	$1.5174	2018/19	Average from fleet data provided by Council as part of the inventory.

Emissions Factors

Emissions factors are sourced from the National Greenhouse Accounts Factors – August 2019.

Business-as-usual Projections

Business-as-usual (BAU) ten-year emissions projections include the following assumptions:

- Buildings efficiency improvements (electricity and gas) of 0.1% per year
- Street lighting efficiency improvements of 0.1% per year
- Vehicle efficiency improvements of 1.0% per year

- Improvements to state emissions factor, in line with targets proposed by the Victorian State Government
- Increase in energy portfolio in line with Council's new works budget and with consultation with Council's Sustainability Team through the Questionnaire.
- Population growth rate of 1.1 % in line with projections for 2018-2036 cited in Mansfield's Economic Development Strategy 2020-2025.

Energy Efficiency Actions

Area	Assumptions
Street Lighting	Standard CatP and CatV 100% Council owned – replace: 29 x 80W MV with 17W StreetLED. 20 x 150W HPS with 70W RoadLED 19 x 250W HPS with 155W RoadLED 2 x 400W MV with 155W RoadLED 23 x 42W CFL with 17W StreetLED 6 x 32W CFL with 17W StreetLED 1 x 100W HPS with 70W RoadLED 12 x 400W HPS with 275W RoadLED Standard CatP and CatV cost shared with VicRoads – replace: 46 x 80W MV with 17W StreetLED 9 x 150W HPS with 70W RoadLED 1 x 100W HPS with 70W RoadLED Average economic scenario presented. Majority of lights have been replaced through the Watts Working Better program.
Buildings and Facilities Energy Efficiency	Large Building Program – Implement a program of energy efficiency works at Council sites with an annual consumption >10,000 kwh/pa. Assumes 25% energy savings are achieved through lighting and heating upgrades and improved insulation. Assumes costs per tCO_2e/pa saved of $2,000. Savings and costs are based on savings opportunities identified through Type 1 audits at buildings of similar type and energy demand at other councils. Significant HVAC works have been implemented at the Mansfield Shire Council Offices, savings exclude HVAC actions at this site. Small Building Program - Implement a program of energy efficiency works at Council sites with an annual consumption 1,000-10,000 kwh/pa. Assumes 25% energy savings are achieved through lighting and heating upgrades and improved insulation. Assumes costs per tCO_2e/pa saved of $4,000. Savings and costs are based on savings opportunities identified through Type 1 audits at buildings of similar type and energy demand at other councils. Only sites with an electricity consumption of >1,000 kWh per annum have been included to maximise the cost benefit ratio. It is assumed that "low hanging fruit" for building efficiency such as gap sealing, LED lights, etc. have not yet been implemented at most sites.

	Building efficiency measures at sites have only been assumed to have been implemented if this has been noted by Council in the questionnaire. Larger scale energy efficiency investments are assumed to be included by the additional costs and savings generated by the ESD policy for renewals.
Buildings and Facilities Solar PV - Small Scale	Solar PV installation costs are $1.50/Watt. Conversion rate for solar is 3.6kWh/kW/day. 90% of onsite solar generation directly translates to a reduction in grid-supplied electricity. Assumes an average of 5Kw systems installed on 12 small sites (>5,000 kwh/pa consumption to ensure the majority of energy generated can be used onsite) and 20kw installed across 2 larger sites such as Mansfield Shire Council Offices where 12kw at $25k is already planned for installation and the Mansfield Swimming Pool. This is based on a reasonable estimate of what would be feasible given the energy consumption and building types in Council's asset list. Assumes approximately $2,000 annually in maintenance costs not included in upfront costs. Sites included in the solar PV analysis have been selected based on electricity consumption with higher consuming sites being prioritised based on the assumption that these sites will have both a larger roof space and electricity demand. The suitability of selected sites for solar PV has not been assessed as part of the cost benefit analysis. For Pathway 3 the select solar program includes installation of half of the capacity identified above.
Buildings and Facilities ESD Policy	An ESD Policy would be applied in the following scenarios and have the following impact: 25% reduction in emissions from new buildings 3% increase in capital cost for new buildings 20% reduction in emissions through renewal of existing buildings 3% increase in capital cost for renewals Existing buildings are renewed at a rate of 2.5% per year (i.e. 40-year lifespan) Assumes gas consumption will be phased out through the ESD policy. BAU costs for new builds assume $75k per build in line with the minimal new builds projected by Council as outlined in the Questionnaire and will impact on a modest projected increase in emissions from new builds ($15tCO_2e$ per build). BAU costs for renewals are assumed to be $200K per annum. This assumes that the ESD policy will be applicable to around 40% of the annual average of $500K for renewals detailed in Council's Annual Reports.
Fleet Passenger Vehicles	The cost benefit analysis uses the consumption data, vehicle lists and cost data provided as part of the 2018/19 inventory. Electric Passenger Vehicle Modelling:

	Modelling includes 20 cars. Electric passenger vehicle example models and related efficiency and cost information have been sourced from https://fleets.chargetogether.org/vehicle-guide/ Passenger vehicle recommendations assume a 3-year life span of the vehicle and include costs recovered from resale. Resale costs recovered assume 50% of costs are recovered at three years based on conservative depreciation rates for electric vehicles for example: https://www.whichcar.com.au/car-advice/ev-depreciation The cost differential between ICE vehicles and EVs is assumed to reach parity by 2025/26. Charging Station Action: Assume that one charging station is installed for each electric passenger vehicle in council's fleet at an average cost of $8,000 per charging station. This is based on quotes received by other councils.
Fleet Heavy Vehicles	Heavy Vehicle Modelling: Electric truck assumptions have been sourced from SEA Electric and include the following: On average a vehicle can travel 200k on a 100kwh–220 kwh charge. Heavy vehicle modelling includes 8 trucks and 13 Utes. Heavy vehicle and utility vehicle recommendations assume a 10-year life span of the vehicles and do not include any costs recovered from resale. The turnover period of vehicles should be assessed as part of the Sustainable Fleet Policy to ensure Council can maximise the savings recouped. Costs of efficient Utes is assumed to be equivalent to the cost of less efficient models. Sustainable Fleet Policy: Emissions savings to be achieved based on more efficient route planning and more efficient driving practices. Costs include policy development and driver training to be run every 2 years for drivers of top 5 consuming vehicles (trucks and Utes only) and policy review every 5 years.
Waste	Divert all FOGO in council's corporate waste stream away from landfill. Costs cover $1.5 new waste strategy development and provision of infrastructure such as bins. Assumes a 51% reduction in emissions as a result of removing FOGO from Council's corporate waste stream. Based on the National Greenhouse Accounts Factors for municipal and commercial waste by waste stream.
Road Construction	Road construction emissions for Council have been estimated by scaling road construction emissions from another rural Victorian council by the length of road within the municipality. This results in 8,000 tonnes of asphalt and gravel being used and releasing 40 tCO_2e per annum. This may vary significantly year on year depending on the works being carried out by Council. Assumes a shift from current road material specifications to leading road material specifications results in a 59% emissions reduction.

Energy Generation Solar PV - Large Scale	Solar PV installation costs are $1.50/Watt. Conversion rate for solar is 3.6kWh/kW/day. 100% of onsite solar generation directly translates to a reduction in grid-supplied electricity. Cost savings assume an electricity sale price of 50% of the retail price. This takes into account that it is unlikely that the electricity generated will be consumed directly by Council buildings. Assumes approximately $12,500 annually in maintenance costs. Assumes 500kwp is installed on available land. Assumes the necessary grid infrastructure is already in place to accommodate the installation and no additional investment is required by Council for grid infrastructure. %00kw has been modelled as this is enough energy to offset Council's current electricity consumption. These figures are highly estimated and are intended to be indicative only. The scale feasible will be dependent on the land available, council budget and local existing grid infrastructure. A detailed feasibility study will be required by Council before pursuing further.
Discount Rate	The Net Present Value figures have been calculating by applying a discount rate of 2.75% ^ lifetime of investment in line with the 15 Yr Australian Government Bond Rate.

Appendix E: Carbon Accounting for Renewable Energy Certification

Double Counting Emission Reductions

While it's agreed that emission reductions achieved through solar and purchasing of certificates shouldn't be double counted, in reality, everyone is following the lead of Climate Active who say you only need to ensure no double counting when it comes to Large-scale Generation Certificates (LGCs).

The Principle of Double Counting

In principle there is opportunity to double count the benefits of solar or certificates such as LGCs (Large-scale Generation Certificates), STCs (Small-scale Technology Certificates), VEECs (Victorian Energy Efficiency Certificates) and ACCUs (Australian Carbon Credit Units).

For example, if you purchase a solar system and get a rebate, that "rebate" is either based on the sale of the STCs (under 100kw system) or LGCs (over 100kW system).

The STC/LGCs are certificates which represent the amount of "greenness" or carbon reductions the system will create over its lifetime.

If you get the rebate, you are selling the STC/LGCs to a third party who are giving you $,so you're selling the greenness. You can't then continue to pretend that the electricity you're producing is green….that would be double counting!

A Confusing Element of Double Counting

Although the principle of double counting is sound and makes sense not to do, Climate Active only apply it to large solar systems, over 100kW who get LGCs.

Ironbark haven't identified the rationale behind this.

Summary by Scheme

Table 28. Summary by scheme

Certificate	Used for	Treatment
REC (Renewable Energy Certificate)	In Australia, RECs are supported by Australia's Renewable Energy Target, which states that by 2020, 33,000 GWh must be generated from renewable sources (this equates to about 23.5% of the overall total). The scheme ends in 2030 To track renewable energy, Renewable Energy Certificates (RECs) are assigned for every megawatt hour created from renewables.	Depends on whether it's STC or LGCs…see below.

	A REC has a financial value attached to it, which fluctuates depending on prevailing market conditions. RECs are divided into Small Scale Technology Certificates (STCs) and Large-Scale Generation Certificates (LGCs)	
STC (Small-scale Technology Certificates)	STCs are like an upfront subsidy for renewable energy systems that are under 100kW. They are deemed upfront and come with your renewable energy installation and are usually converted to cash and given to you as a rebate	Previously, selling the STCs meant that you were not allowed to account for the emission reduction. However, under revised Climate Active's rules, behind-the-meter energy usage originating from small-scale onsite generation systems can now be treated as zero-emissions energy, regardless of whether any STCs have been created, sold or transferred to any other party. So, if you have data on solar electricity produced then consumed ("behind the meter" consumption) you can report it and assign it zero emissions in your inventory. Also, if you export electricity from your solar system and you have data, you can count this as a "reduction measure" using the Scope 2 emission factor for the state you're in.
LGC (Large-scale Generation Certificates)	If your renewable energy system is larger than 100kW, you are eligible for one LGC for every megawatt hour your solar PV system generates. The LGCs are not deemed upfront. You need to keep track of your renewable energy generation on an annual basis to be able to create and then sell LGCs.	If you sell the LGCs, you will generate income. However, if you sell your LGCs, the carbon reduction and renewable energy generation associated with the energy generated cannot be claimed. So, if you have data on "behind the meter" energy usage from your solar system and you've sold the LGCs you must report this as an emission source using the Scope 2 and 3 emission factors for the state the system is in. If you don't sell your LGCs or if you voluntarily retire the LGCs. You can count the behind the meter usage as zero emissions and if you export any electricity you can claim it as a credit based on the Scope 2 emission factor.
GreenPower®	This is an independent government accreditation scheme. GreenPower® purchases are additional to Australia's Renewable Energy Target, and an auditing process ensures that no double counting can occur. You can purchase GreenPower® from your electricity retailer, an independent provider or through a GreenPower® PPA	GreenPower® is treated as a Reduction measure and purchases offset both Scope 2 and 3 emission (advised by Ben.Jobson@environment.gov.au).

ACCUs (Australian Carbon Credit Units)	Under the Federal Liberal government's Emission Reduction Fund (ERF) organisations and individuals can earn ACCUs for emissions reductions. The ACCUs can be sold to the Commonwealth or they can be sold on the voluntary market and are eligible as offset units under Climate Active.	ACCUs must be voluntarily retired to count as Carbon Offsets in Climate Active.
State Based White Certificate Schemes (ESCs (NSW) & VEECs (Vic))	These schemes reward energy saving projects with a credit worth one tonne of CO_2-e	Emissions reductions resulting from activities supported by these schemes can be counted towards your carbon account regardless of whether any associated certificates have been created, sold or transferred to any other party.

Appendix F: Community Climate Action Feedback to Date

As of 16 March 2021, Council has received a considerable amount community feedback on Council taking action on climate change. This information was collected via email, Council's website and social media. Their feedback has been outlined in the following tables collected via the Have Your Say on Climate Action Council webpage (posted 26 February 2021).

Table 29. Community feedback summary

Name:	Date:	Title:
David R	2/23/21	Zero carbon, Renewables and EV Charging
Comment:		
1. Council should commit to zero carbon by 2025 (or 2030 at the latest) 2. Council should support/subsidise EV Charging stations (and if pay for use they should pay for themselves...over time). If we can install four at the winery (free) then I believe our town should also have them. They will help visitation all year round and encourage the uptake of EV vehicles in our area. 3. I believe that Council should work closely with Helen Haines to promote her plan re community/regional energy hubs. 4. I believe that all new housing developments should be forced to install water tanks, PV panels (and be their own energy hub) and recycle water. I realise that Local gov't can't force this but they can lobby/encourage State Gov't to amend planning regulations to insist on this.		
Responding comments and authors:		
A great start in the smaller towns like Woods Point, Gaffney's Creek and Matlock would be an option to be able to recycle. Currently everything just goes into a skip bin. As the tip doesn't have any gates etc out of town people regularly dump large items that would usually cost them elsewhere. Making more landfill for the shire. (Emily J)		
Couldn't have put it better, fantastic set of priorities. (Andrew)		
Great suggestions David! And imagine if rates could be linked to a business's carbon footprint? And enable Mansfield region (collectively) to reduce our load on the grid, and start to push our renewable back the other way! We need to seek the community's collective interest and present to Helen Haines - the Community Action Group and Renewable Energy Mansfield could collectively bring these ideas together for long term community benefit. Housing developments should be 'sustainable'!!!! That includes heat, water, energy and transport. How can the region continue to bring in external 'city minded' developers that literally create an issue for the next decade around these key deficiencies. If they are not 'sustainable' there should be a bid or community consultation to make them see this as a priority to garner community support (perhaps a NE rating etc)? (Mansfield Community Action Group)		
Name:	**Date:**	**Title:**
P Craven	2/24/21	Mansfield Shire to reach zero emissions by 2022.
Comment:		
While other councils are aiming for zero emissions by 2030, I hope to see Mansfield reach zero emission by 2022 (at least). I hope to see Mansfield Shire lead the way . 1. Council to install solar and back up batteries on existing buildings in the town, i.e schools, community buildings, sports complex. 2. Strict and accountable recycling, compost and education on house hold waste. Recycling of ag waste, specifically bailing twine and silage wrap, worm farms and e-waste to be exemplary on a national level.		

3. Policy around climate action in Council operations (again to lead the way).

4. soil regeneration throughout big and small ag enterprises to become the expectation (we seem to be the last doing this).

5. Local food promotion and delivery for better health, food security and reduction in food travel and waste.

6. Policy in all planning to have all new and renovated buildings with a minimum of 8 star rating and full solar and battery set up.

Responding comments and authors:

Yes and yes!1) Council solar and renewables - community investment strategy?

2) Local recycling - join Community Action Group ... we are keen to explore and find local solutions of shortening the supply chain!

3) Climate Action - Council delivered their 'climate action plan' ... just needs to adhere and follow it!

4) Soil regeneration - how about we just incentivise regenerative farmers to increase the carbon and natural capital in soils. A carrot rather than a stick! And best of all, local businesses can offset direct with local farmers..... bettering our region on both counts!

5) We also need more local producers, and to understand more the metrics around what the local food 'system' demands. So much is dependent on demand ... and seasonal variation. And yes for local cafes, restaurants and supermarkets to see the bigger picture benefits for supporting our local producers, and building local provenance around our clean and green image.

6) Local development ... so yes! Why would we destroy our local old growth forestry and trees, to build 'more houses'? The Council should consider the 'big picture' of high value sustainable development, rather than cheap and short term 'bums on seats' developments that are not thought out in relation to energy, water, waste. Surely a longer term view is needed more than ever?

(Mansfield Community Action Group)

Name:	**Date:**	**Title:**
Andrew	2/26/21	Increase percentage of tree cover in the townships

Comment:

Plant fast growing deciduous and native trees along streets and urban township areas such as parks. This will reduce the overall heat impact and make the town more liveable over hot, dry summers. Have a target of percentage tree coverage in the townships. Trees provide great shade and will keep temperature down. Easy to do. Just decide on the percentage increase and go for it. It will make a difference.

Responding comments and authors:

Native trees are a fire hazard (Skippy)

Name:	**Date:**	**Title:**
Me	2/26/21	How about we let residents dispose of their rubbish at a realistic cost.

Comment:

We once received a coupon with our rates notices to dispose of rubbish at the tip. Move along and that has ceased also prices at the "recycling centre" have increased expontially . Result people no longer take rubbish there and dispose of it by other means, usually fire. As a Shire here is an opportunity to do something positive.

Name:	**Date:**	**Title:**
Jess	2/27/21	Solar, grow veg, insulation, tiny houses

Comment:

Suggestions for the climate/environmental project, from link: Easy access to solar panels (& batteries) with easy access to the solar rebates too. Free/Discount backyard compost bins and vegie garden boxes for everyone. More tiny housing. Free/discount insulation materials for everyone & installers. Discounts on double glazed glass.

Name:	Date:	Title:
Jess	2/27/21	Community vegie gardens

Comment:

Community vegie gardens. (Generally: more plants are good, better food security, people won't have to travel as much - not all people initially have motivation to grow at home)

Name:	Date:	Title:
Skippy	2/25/21	Introduce an environmental levy for all visitors. Perhaps we a $2 bridge toll.

Comment:

This levy would be used to provide and maintain more garbage bins. And pay for environmental officer to inspect camp sites. Plant deciduous trees. Put up better information signs and directions to bin sites. I have seen many drive through coin Bridge tolls in the USA work quite effectively.

Responding comments and authors:

Great idea ... a toll on the bridge ... but who would administer? Would the 'CityLinks' of the world consider this as a regional support? Rather than visitors having to have 'another' toll. Eastlink and Citylink seem to work this out? (Mansfield Community Action Group)

Name:	Date:	Title:
Upper Gumtree	2/28/21	Solar panels for Shire Offices and other buildings

Comment:

Solar panels would reduce electricity costs at each of the shire's buildings. Panels could possibly be funded by subscription. I Imagine it would cost somewhere in the order of $30k to mount panels on the main shire office. Shares valued at $1000 could be offered to the public. Any feed in tariff could be used as a return on investment and returned to investors. Whilst this would not be a commercial return it may assist to incentivize participants. EV charging stations could be fed by panels on buildings to parking bays for either the shires own shire Electric vehicles or to public charging stations in the vicinity of shire offices. The idea is not to remove electricity bills completely but to reduce costs and provide EV charging in a low carbon manner

Responding comments and authors:

Such an easy win .... where is the business plan for this? Bring it to a community meeting - and seek local investment that can co-invest with the Council (hopefully!) (Mansfield Community Action Group)

Name:	Date:	Title:
Jimmy C	3/9/21	Leader in climate action

Comment:

It would be very exciting to see Mansfield Shire lead the way in a commitment to zero emissions in an ambitious time frame. As a small (but growing) Shire, surely we have the ability to make this happen. It would additionally save money on Council operations and therefore rate payers money would be spent on a healthier environment for residents. Solar on all Council buildings, carbon farming, local food sold to local people, better recycling and management of organic waste. Education and festivals on energy smart / waste free Mansfield. All developments and renovations to be at 7 star rating or above.

Responding comments and authors:

Great suggestions! The local 'Community Action Group' is completely 'community' driven. But many of us are passionate about enabling parts of this to come to fruition - and need as many community voices as we can muster!

Carbon farming - there are carbon offset projects that could directly benefit local regenerative farmers, and enable businesses to become carbon neutral. This area given our sunshine could be a leader in this!* Local food - we need to support more local producers, to grow more food locally, and to have restaurants, cafes and supermarkets be willing to actively support local producers with fair prices and provenance. Plus local processing facilities that can enable farmers to do what they do best (grow food).

* Recycling - big question! What are the areas of 'recycling' that the community could own, invest in and benefit from? That the council cannot or isn't managing (soft plastics or green waste a good start?)

* Broader council recycling - how can Mansfield Shire get more involved in NE recycling initiatives? Considering that bottle and can recycling is just 2hrs over the border. How can we have a vendor machine that can tackle some of the complex issues of high volumes of tourism and local waste, and put money back into our local economy?

* Organic waste - we need farms to register, and make sure there are no (!!) residues in the waste from golf courses or curated grounds of any type. To avoid any contamination events.* Education and festivals - absolutely! Watch this space for our next event in May!

* Developments - yes Council(ors) should all be concerned about the types of future and developments we want to see. How to protect all the reasons people come to Mansfield. And not take out all the redgums from the 'RedGum' estate ... just to name one! We need sustainable development around people, place, land and food .... this includes water, energy and transport..... to name a few! And city developments are not (!!!) suited to this region ... we need appropriate regional development that protects the natural environment, and enhances all the reasons why people want to live here.Great work! Keep the voices coming!

(Mansfield Community Action Group)

Name:	Date:	Title:
Mansfield Community Action Group	3/9/21	Solar, grow veg, insulation, tiny houses

Comment:

Perhaps a conversation around tiny housing - and the Councils appetite or 'interest' in this concept. Includes affordable housing, diversifying incomes on farms. REM are doing some good work around the information and access to Solar (let's not repeat what is already working). A green waste or more education around local composting options a good thing. Not sure that council can/will provide 'free' bins, but perhaps they could be subsidised?

Mansfield Primary School

Background:

Two students did an enquiry into Climate Change - aimed at Mansfield Shire. Principle is asking further into the student and parent body, for comments to the Climate Action Plan.

Comments:

Climate Change, it's not something to joke about anymore. The Council should focus more on creating zero carbon emissions. Like Helen Haines suggested during her address to parliament, 'Building renewable assets is like the new goldrush, Mansfield doesn't want to miss out.' And just like many other locals we think it shouldn't. The fact that we are children doesn't matter either, its more our future than yours. We want to live in Mansfield for the next 80 years. How long will you be in Mansfield for?

Renewables:

1.The shire could purchase electric vehicles for their employees to use. It would reduce carbon levels by a lot, and building charging stations for these vehicles may cost money, but it will certainly be worth it in the long run. This will attract tourists who drive EV to our town, increasing tourist businesses.

2. Solar farms and/or windmills. This is self-explanatory. You can use these energy sources for shire buildings, and streetlights. Another idea for streetlights is motion sensor lights, we noticed the lights are on all night and it seems no one is making use of them.

Organic Waste:

Methane seems to do a lot of damage if you investigate it. It makes up a large percentage of the gas from natural sources and is 28 times more powerful than carbon dioxide at warming the earth over 100 years, which makes it a big problem. To fix this a lot of Australian towns and cities have introduced a curb side compost disposal unit. People put their organic waste into the green compost bin and a garbage truck picks it up and takes it to a facility where it gets composted to reduce methane levels. We believe Mansfield should build an organic waste facility to compost our own waste. Mansfield does some composting, but curb collection is an important part of this.

Tree preservation:

As we know, trees absorb carbon and produce clean air (O2) and by cutting down those trees, we are not only reducing the clean air but also putting more carbon dioxide into the atmosphere. And in certain spots around town, you can see the area where trees used to be, now gone. There is a perfect solution to this problem, and we have a couple of ideas for it: 1.There can be a limit to how many trees you can cut down a month/year. 2.Foodworks and plenty of local establishments sell firewood, you can just buy this from there. 3.Only chop the trees that are already on the ground, maybe ants and wildlife live here, but you'll just have to find another tree in that case. 4.For every tree that's cut down we could plant 1 or 2 trees in an area that's safe. We could build a farm or a paddock where we could plant these trees, or anywhere really.

In conclusion, the mayor when addressing global warming mentioned in the newspaper, 'It needs to be affordable, achievable, and practical'. Becoming carbon neutral may not be those things, but it will be worth it to save our planet and reduce bushfires and floods. This is very important. Think of the devastation from those bush fires. If declaring a climate emergency like many other shires will help, then that's what we should do. Please act on this, thank you.

Question: 1. Does your organisation/sector have any greenhouse gas emission and/or energy reduction targets?
Responses:
We have publicly pledged (on the website, so must be true) to be carbon neutral by 2025. I was thinking 2030-35 but our daughter Polly thinks differently! (Delatite Wines)
No don't have targets as such but consciously make efforts to reduce, reuse, and recycle. (PNL 4WDriving)
Yes, we have currently employed a consultant to advise us in best ways to reduce emissions. We have set a target of 25% over 3 years. (Bonnie Doon Hotel)
No. (Alpine Patisserie Mansfield)
No (Southern Charm)
Question: 2. Do you have any greenhouse gas emission and/or energy reduction strategies or initiatives in place?
Responses:
Purchased 2 EV's for use around winery and vineyard. Installed 100kW new solar PV panels and a 72kW battery. Mondo Energy involved with a Power Purchasing agreement. Will probably increase these if and when grants available. We're also installing 4 free EV charging stations that can charge all makes of cars. We've also switched most of our paper to recycled green paper and moved to 'green' non plastic

pallet shrink wrap and green clingwrap in our kitchen. Replacing one of our diesel engine irrigation pump combo with a variable speed drive 3 phase irrigation pump. Planting more trees. And we're a member of the Porto Protocol – a small but growing movement of international wine producers and wine industry suppliers who have pledged to reduce emissions and their carbon footprint on a continual basis. And to share that knowledge where and when they can. (Delatite Wines) We have a tree planting program in place and operating. (PNL 4WDriving) Replace ageing and inefficient machinery and appliances. Harness heat energy lost to cooling fridges etc and utilise elsewhere. (Bonnie Doon Hotel) We source and stock. Biodegradable packaging. We try not to use single use plastic. We recycle as much as possible. We limit wastage where ever possible. We encourage customers to consider not using packaging if possible. We use electricity on timers to manage consumption. (Alpine Patisserie Mansfield) Our only contribution to greenhouse gas emission is our vehicle, which is used to transport clients between designated pick up point and a hiking track. There is no other way that we can transport clients and there is no vehicle on the market that runs on electricity suitable to do the job. I suppose the only other contributor we use is our hiking cooking stove on overnight hikes, but it is the only way that we can heat up food. (High Country Hiking Tours) No (Southern Charm)
Question 3. Do you think your organisation/sector would like to see more greenhouse reduction initiatives?
Responses:
Simple answer is yes. Personally I think all new housing developments should be generating renewable power and have battery storage. They also should be recycling water. I realise this is a state Gov't planning issue but councils could champion it. And Mansfield Council should invest in EV Charging station – good for tourism. (Delatite Wines) It is difficult with Covid and health regulations. In order to be compliant in some of the regulations it requires products etc they are not always eco-friendly. Investment in energy saving Is costly. (Alpine Patisserie Mansfield) Not sure how initiatives would be critical for my business to make an impact. Only waste that I could possibly divert is recycled cardboard & packaging used by manufacturers for shipping. (Southern Charm)
Question 4. What are some of the barriers to implementing greenhouse reduction actions your organisation faces?
Responses:
Not enough alternatives to plastic for packaging. Not being able to reuse glass bottles by simply washing them. Back in the late 80's we could purchase 'new' wine bottles that had just been washed and so they didn't need to be recycled. So much better for the environment as recycling glass takes almost as much energy as it takes to make new glass. Cost to move from diesel engines to electric….need electric tractors and utes!! (Delatite Wines) Local councils not encouraging separation and reduction of waste especially in industrial areas. (PNL 4WDriving) Cost of implementing strategies. (Bonnie Doon Hotel) Big issue for us is only one recycling collection a fortnight. As a business our recycle bin fills faster than our waste bin. (Alpine Patisserie Mansfield) We would like to install solar but we have a tree blocking the roof. The tree is the wrong species for the position but it takes precedent over energy savings. (Alpine Patisserie Mansfield) Energy saving investment is costly. (Alpine Patisserie Mansfield) Hygiene regulation measure result in needing to use non eco friendly products, alternative are too expensive or impractical. (Alpine Patisserie Mansfield)

Question 5. What assistance would you need to overcome these barriers?
Responses:
Gov't grants (maybe just $ for $), knowledge of different alternatives. (Delatite Wines)
Education, grants, and the council having programs that industry can partake in. (PNL 4WDriving)
Funding assistance. (Bonnie Doon Hotel)
Need more information how this relates to my retail shop. (Southern Charm)
Question 6. Are there any emission reduction initiatives that you would like to see in your organisation?
Responses:
I think we're on the right track but can always do more. And always willing to learn about better ways to do things. (Delatite Wines)
Batteries to store solar energy (PNL 4WDriving)
Funding, trees cut, more education to the consumer. Eg if you want to use your own coffee cup it needs to be clean! (Alpine Patisserie Mansfield)
More recycling options that are not expensive or difficult to manage. (Alpine Patisserie Mansfield)
Need more information how this relates to my retail shop. (Southern Charm)