City of DAREBIN

the place to live

DAREBIN CLIMATE EMERGENCY PLAN 2017–2022

We recognise that together with our community, other Councils and like-minded partners, we must take action.

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1 Executive Summary

EXECUTIVE SUMMARY

Our climate is changing rapidly. The past few decades have seen an unprecedented rate of warming.

The past 16 years are among the 17 warmest years on record; 2016 was the hottest year on record and the third year in a row to beat this record. Global sea levels have risen more than 20cm since the end of the 19th century. There have been devastating impacts on Australia's coral reefs, mangrove forests and marine kelp forests. There are already climate refugees and millions of people are in danger of being displaced. Commentators and researchers are already linking conflicts around the world with climate change impacts such as drought.

Council has recognised that we are in a state of climate emergency that requires urgent action by all levels of government, including local councils. We will undertake ambitious action and advocacy to reach our core goals, which are:

- to provide maximum protection for the community of Darebin and for people, civilisation and species globally, especially the most vulnerable
- to restore a safe climate at emergency speed by eliminating greenhouse emissions and enabling drawdown of excess carbon dioxide in the air
- to encourage research to find safe ways to protect people, species and civilisation from near-term dangerous temperatures, while zero emission and carbon dioxide drawdown strategies are being enacted
- to enable our community to be resilient in the face of any unavoidable dangerous climate impacts
- to engage, empower and mobilise governments, communities and organisations to take action on and achieve these goals with certainty and at emergency speed.

We recognise that together with our communities, other Councils and like-minded partners, we must take action to influence other levels of government, industries and organisations that have the greatest power to take urgent and appropriate action to respond to the climate emergency. This plan has been developed to reflect this commitment.

The development of this plan and the actions within follow a review of Council's previous Climate Change Action Plans and Adaptation Plan and a community consultation process. In these previous plans, Council committed to zero greenhouse gas emissions by 2020 for both Council and community emissions. Darebin Council will continue to aim for zero carbon for our Council and community in the short term, with a longer-term goal of moving beyond zero emissions.

We will be building on our progress so far, having reduced operational emissions by 48% from 2007 for electricity use in Council buildings.

To reach our goal, we will be working to improve our energy efficiency, generating more of our own energy on-site, entering into new renewable energy purchasing arrangements and, as a last resort, offsetting the remaining emissions.

There has been an estimated 18% reduction in community emissions since Council adopted the Community Climate Change Action Plan in 2009. While the population has been growing, to date this has been countered with energy efficiency and the installation of solar photovoltaic panels (PV). There has also been a significant reduction in electricity emissions intensity.

This plan outlines the following nine key directions to reach our core goals:

1. Climate Emergency mobilisation and leadership
2. Energy efficiency
3. Renewable energy and fuel switching
4. Zero emissions transport
5. Consumption and waste minimisation
6. Fossil fuel divestment
7. Adaptation and resilience
8. Engaging the community
9. Darebin Energy Foundation

Highlights of the plan include:

- the development of a flagship Climate Emergency campaign and program, including a Climate Emergency conference
- the creation of the Darebin Energy Foundation to accelerate sustained and meaningful action with the community (residents, businesses, schools and other organisations) to eliminate Darebin's greenhouse gas emissions, embed community resilience to climate change, and contribute in other ways to the global effort on climate change
- doubling the amount of solar PV in Darebin from 19,000kW to 38,000kw through an expanded Solar Saver program and school, business and community energy programs. These ambitious programs will involve an initial investment of $20 million by Council, the majority of which will be paid back through special rates schemes
- supporting households and businesses to be more energy efficient and more resilient to heatwaves and energy cost increases, including measures to minimise the urban heat island effect
- a continued emphasis on supporting our most vulnerable communities
- enhanced engagement and communication with our community including targeted and tailored approaches with culturally and linguistically diverse (CALD) communities
- Council leadership, with a review of all Council programs and policies to ensure alignment with Council's Climate Emergency commitment, including improvements to buildings, renewable energy and fleet.

Advocacy is a key part of the plan, as State and Federal Government policy, legislation and funding will have the biggest impact on the Climate Emergency. These include renewable energy targets, emissions trading schemes, planning policy changes and minimum energy standards for homes, commercial buildings and vehicles. Collaborative campaigns involving partners such as other councils, educational institutions, industry groups, community organisations and our community will also be vital to effect real change.

We do not have all the answers; therefore, the plan also seeks to foster innovative solutions that respond to the Climate Emergency.

2

Terms and definitions

TERMS AND DEFINITIONS

Actions: things Council says it will do between now and 2022.

Carbon budget: the amount of greenhouse gases that could be emitted globally before their concentrations reached dangerous levels can be conceptualised as a 'carbon budget' (which has been exhausted).

Carbon neutrality: when an organisation or activity balances a measured amount of greenhouse gas across a defined sector(s) with an equivalent amount of carbon sequestration, offsets or carbon credits. See also **zero net emissions** and **negative emissions**.

Climate Emergency: Climate Emergency refers both to the state of emergency described in section 3, and to a specific approach to tackling climate change, i.e. a large-scale mobilisation on an emergency footing, taking into account the scale and speed required to restore a safe climate.

Climate positive: having a net positive effect on the climate, i.e. avoiding new emissions and drawing down existing emissions. Also called carbon negative.

Commitments: what Council says it will do between now and 2022.

Drawdown: the removal of existing greenhouse gas emissions from the atmosphere, with the aim of restoring their concentration to safe levels.

Emissions boundary: an organisation's emissions boundary defines which emissions are included in their greenhouse gas inventory and reporting (and which are excluded). See over the page: 'Defining Darebin's Greenhouse Gas Emissions Boundary'.

Environmental upgrade agreement (EUA): an agreement between a property owner, a bank and local government that facilitates a building upgrade to improve energy efficiency.

ESD: Environmentally Sustainable Development.

Fossil fuels: non-renewable hydrocarbons formed within the earth over thousands of years (i.e. coal, gas, petrol) that create greenhouse gases when used as a source of energy.

Goals: the overarching aims of this document.

Greenhouse gases (GHG) / greenhouse gas emissions: carbon dioxide, methane, nitrous oxide and other gases that contribute to climate change.

GreenPower: a mechanism for purchasing renewable energy through an electricity provider, who purchases energy on the consumer's behalf from a source accredited as renewable by the Australian Government.

Negative emissions: when society (or organisation) takes more carbon dioxide out of the air than is being emitted in order to lower the level of carbon dioxide in the atmosphere. Negative emissions are needed to restore a safe climate.

Peak oil: the point at which world oil production peaks, after which it is expected to decline and eventually become unviable to extract.

Renewable energy: energy generated by renewable sources such as wind, solar, tidal, hydro and other sources.

Safe climate: a climate that allows existing and future generations, communities and ecosystems to survive.

Stationary energy: largely refers to energy used to create electricity, but also includes energy created by the direct combustion of fuels for energy in industrial processes and domestic heating.

Targets: specific aims that are measurable and may be time-bound.

Victorian Energy Efficiency Target (VEET) scheme: State Government program designed to make energy efficiency improvements more affordable, aid the reduction of greenhouse gas emissions, and encourage investment, employment and innovation in industries that supply energy-efficiency goods and services.

Zero net emissions: Carbon neutrality/ zero net emissions; when an organisation or activity balances a measured amount of greenhouse gas across a defined sector(s) with an equivalent amount of carbon sequestration, offsets or carbon credits (see also **carbon neutrality** and **negative emissions**).

Defining Darebin's Greenhouse Gas Emissions Boundary

When considering the boundary of Darebin's greenhouse gas emissions, it is important to distinguish emission sectors according to where they occur and to apply standards that are transparent, easily reportable and replicable by others. For these reasons, Council has adopted the scopes framework used in the Greenhouse Gas Protocol – the international standard in quantifying and managing GHG emissions (see table below).

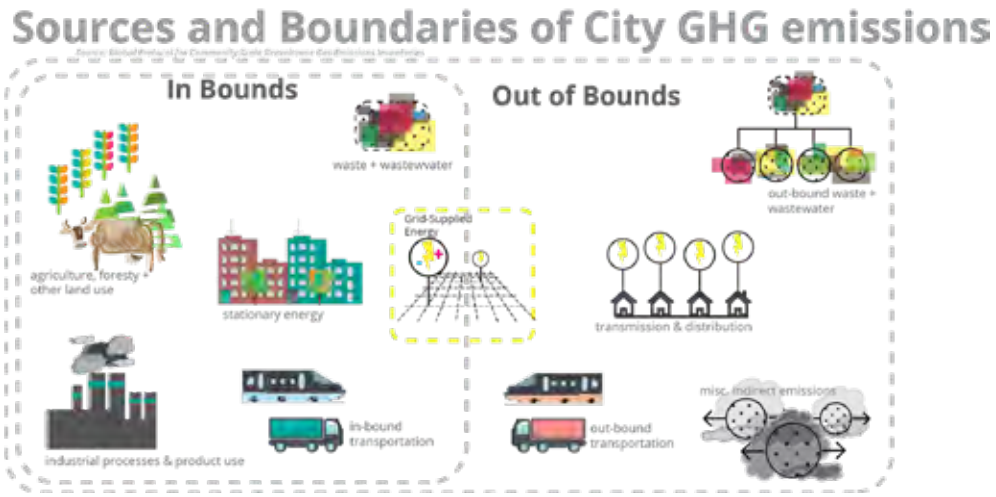
Scope	Definition
Scope 1 (direct)	GHG emissions from sources located within the city boundary
Scope 2 (indirect)	GHG emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the city boundary
Scope 3 (indirect)	All other GHG emission that occur outside the city boundary as a result of activities taking place within the city boundary

Table 1: Emissions scopes

Under this protocol, a specific standard has been developed for the city/municipality scale. The Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) framework enables Council to:

- report on the seven greenhouse gases as covered by the Kyoto Protocol
- align with methodologies and standards of other cities and municipalities, both locally and internationally
- over time, provide consistency in defining emissions scope and boundary
- align with reporting requirements for programs such as the Global Covenant of Mayors for Climate and Energy.

Figure 1 below provides a visualisation of the sources and boundary of a city's GHG emissions.



Source: Global Protocol for Community-Scale Greenhouse Gas Emission Inventories.
For more information see http://ghgprotocol.org/greenhouse-gas-protocol-accounting-reporting-standard-cities
For more detail on Darebin's emissions boundary, see Appendix 1.

MILLARD

3

Climate Emergency context

CLIMATE EMERGENCY CONTEXT

Council recognises that we are in a state of climate emergency. Unless we restore a safe climate at emergency speed, there will be dramatic and negative impacts on our community and around the world.

In Australia we are already seeing more intense and frequent heatwaves, heavy rainfall and flooding, the bleaching of the Great Barrier Reef and extreme weather leading to more bushfires.[1, 2]

Around the world, ecological tipping points are being reached. The vast ice sheets of Antarctica and Greenland have started to melt,[3, 4] with the potential to raise sea levels enough to flood some major cities and the river deltas where much of the world's food is grown.[5, 6] Climate change has the potential to contribute to conflicts and mass migrations, as natural disasters and scarcity of food and water increase.[7, 8]

There is therefore an urgent need to take action on climate change to ensure safety for ourselves, our future and all other life on the planet.[10] Darebin Council is committed to taking action to preserve a liveable planet for our children and the generations to follow.

Waiting until our climate warms by 1.5°C before taking action is not practical because a 1.5°C rise is not considered safe.[9] There will be a time lag between eliminating emissions and removing excess carbon dioxide from the air, and the cooling of the planet. We need to act now to avoid dangerous climate change and provide maximum protection for people and nature.

Our best hope of avoiding catastrophic climate change and restoring a safe climate is to move into emergency mode, as we do in times of crisis. 'Business as usual' and incremental improvements will not effect enough change quickly enough.

There are actions we can take together to secure a safe climate for current and future generations – there are historical precedents for the kind of transformation a Climate Emergency response requires. One example of "the successful execution of change with a comparable level of complexity, scale and speed … is the economic transformation and mobilisation carried out during World War II".[11]

This plan sets out Council's commitments to contribute to this rapid transformation.

1 http://www.bom.gov.au/state-of-the-climate/State-of-the-Climate-2016.pdf
2 http://www.abc.net.au/news/2017-04-10/great-barrier-reef-severe-coral-bleaching-hits-two-thirds/8429662
3 http://www.sciencemag.org/news/2017/02/great-greenland-meltdown
4 http://time.com/4745827/antarctica-water-climate-change/
5 https://www.scientificamerican.com/article/how-much-will-antarctica-and-greenland-ice-raise-seas/
6 https://www.nytimes.com/interactive/2017/04/07/world/asia/climate-change-china.html
7 https://www.irinnews.org/analysis/2017/01/19/climate-change-and-mass-migration-growing-threat-global-security
8 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4847105/
9 https://www.euractiv.com/section/climate-environment/opinion/below-1-5-degrees-target-is-only-way-to-provide-a-safe-future/
10 https://history.aip.org/climate/co2.htm#STL
11 http://www.green-innovations.asn.au/RSTI/Climate-emergency-plan%20_Darebin%20edition_.pdf
12 http://www.bom.gov.au/state-of-the-climate/State-of-the-Climate-2016.pdf

Global climate

The past few decades have seen an unprecedented rate of warming. The 16 years from 2001 to 2016 are among the 17 warmest years on record; 2016 was the hottest year on record and the third year in a row to beat the record. Global sea levels have risen more than 20cm since the end of the 19th century.[12]

If greenhouse gases continue to rise at the rate they previously have, by 2100 the global average air temperature will be 4°C above mid-19th century temperatures, leading to catastrophic effects on our environment. Even the current warming over 1°C is proving dangerous. We are already seeing the effects of climate change, with glaciers shrinking, Arctic sea ice prematurely breaking up and ecosystems being devastated. Sea levels are rising due to melting ice and warming oceans, and extreme weather events are becoming more frequent and intense.[13]

National climate

Australia's average surface air and sea temperature has increased by nearly 1°C since 1910, much of that since the 1970s. Sea levels have risen about 20cm over the past century.[14]

Climate change is causing more severe and frequent floods, storms, bushfires, droughts and heatwaves.[15] The Bureau of Meteorology has observed that since the 1970s, northern Australia has become wetter, southern Australia has become drier, the number of extreme fire weather days has increased in many places and heavy rainfall has accounted for an increasing proportion of annual total rainfall.[16] Australia can expect further warming and changes in water availability.[17]

Local climate

The average annual number of days above 35°C experienced in Melbourne is likely to increase from the current nine days per annum up to 26 days by 2070 if action is not taken to reduce emissions.[18] The local impacts of such changes will likely include:

- increased cost of food, utilities, fuel and insurance
- poor health and deaths resulting from severe weather and poorer air quality
- damage to homes, roads, power and water supplies from severe weather events
- strained emergency and community support services
- reduced water supply and more frequent and stringent water restrictions affecting households, agriculture, parks and wildlife
- local economic and organisational impacts of lost productivity due to extreme weather, making outdoor, factory and other work impractical.

13 http://climate.nasa.gov/effects/
14 http://www.bom.gov.au/state-of-the-climate/State-of-the-Climate-2016.pdf
15 http://www.climatecouncil.org.au/category/extreme-weather
16 http://www.csiro.au/en/News/News-releases/2015/New-climate-change-projections-for-Australia
17 https://www.science.org.au/files/userfiles/learning/documents/climate-change-r.pdf
18 https://www.environment.gov.au/climate-change/climate-science/impacts/vic
19 The decarbonisation of electricity means reducing its carbon intensity; that is, the emissions per unit of electricity generated tonnes/MegaWatthour or t/MWh.

3.1. Action taken so far

Global – UN Paris Climate Conference

At the Paris Climate Conference (United Nations COP21) in December 2015, 195 nations agreed to keep average global temperatures to "well below" a 2°C rise from pre-industrial temperatures, and to aim to limit the increase to 1.5°C. This first universal climate agreement became law in November 2016.

To meet the goal of well below 2°C, the economies of the world will need to be very rapidly decarbonised and excess carbon dioxide will need to be removed from the air on a large scale. Decarbonising the electricity grid is considered the easiest and most affordable aspect of eliminating emissions.[19]

Most countries have recognised the financial benefits of moving to a low-carbon economy and the high level of risk in delaying action on climate change. Many global companies and financial institutions are driving change, as they see the future as a low or zero-carbon economy, with many emerging market opportunities.

Australian Government

Australia signed the Paris Agreement and in 2016, Parliament ratified a target of 26%-28% emission reduction (below 2005 levels) by 2030.

The 2015 revised renewable energy target (RET) of 33,000 GWh (approximately 23.5% of Australia's electricity) by 2020 will play a part in increasing renewables until 2020. As the RET concludes in 2020, this mechanism will not drive long-term electricity emissions reductions let alone elimination.

The Federal Government is seen by many as failing to provide adequate levers or policies to move to a safe-climate economy.

State Government

Victorian Renewal Energy Target (RET)

In 2016 Victoria re-established a target of generating 25% of the state's energy from renewable sources by 2020 and 40% by 2025. By way of comparison, the ACT (100% renewable energy by 2020) and SA (100% renewables by 2030) governments are leading the way.

Carbon neutral by 2050

In 2017 the Victorian government announced a commitment to become carbon neutral by 2050 and an interim target of a 15-20% reduction in greenhouse gas emissions by 2020 (from 2005 levels).

Local governments

Local government has historically played a significant role in emissions reduction at community and local government level, as well as advocating for state and national reduction targets. At the Paris COP21 in 2015, local governments from around the world were well represented and made their presence felt.

Global Covenant of Mayors for Climate and Energy

TheGlobal Covenant of Mayors for Climate and Energy[20] () captures the impact of cities' collective actions and leadership through measuring and reporting on emissions reductions and climate adaptation measures (see also page 23).

20 https://www.compactofmayors.org/history/

Northern Alliance for Greenhouse Action

Northern Alliance for Greenhouse Action (NAGA) is an alliance of the Councils of Banyule, Darebin, Hume, Manningham, Melbourne, Moreland, Nillumbik, Whittlesea and Yarra, and Moreland Energy Foundation Limited.

NAGA aims to create a low-carbon society resilient to the impacts of climate change in the NAGA region. It works on climate change mitigation, adaptation to climate change impacts, advocacy, networking to build capacity for NAGA members and governance, and organisational health.

In 2009, NAGA led the development of Towards Zero Net Emissions (TZNE) for the NAGA Region. It outlined a new approach to regional cooperation to achieve reductions in greenhouse gas emissions across northern metropolitan Melbourne. The blueprint outlined a comprehensive set of strategies and actions spanning key sectors in the region. By harnessing the combined capabilities of its members and their connection with local communities, the TZNE plan demonstrated how NAGA members could effect greater change than any one member could achieve alone.

Photo courtesy of Cities Power Partnership

Darebin was one of the founding members of the Climate Council's Cities Power Partnership which was launched in Canberra in July 2017 – see page 34 for more on the Cities Power Partnership.

Darebin Council Climate Emergency Response

At the first meeting of the newly elected Council in 2016, Darebin Council unanimously recognised that we are in a state of climate emergency.

This Climate Emergency leadership has already influenced Victorian councils through their peak body, Municipal Association of Victoria (MAV), which adopted the following motion at the May 2017 State Council:

(a) We are in a state of climate emergency that requires urgent action by all levels of government, including local councils.

(b) Human-induced climate change stands in the first rank of threats to humans, civilisation and other species.

(c) It is still possible to restore a safe climate and prevent most of the anticipated long-term climate impacts, but only if societies across the world adopt an emergency mode of action that can enable the restructuring of the physical economy at the necessary scale and speed.

(d) The MAV has a particular role in assisting local governments in this regard.

This follows Darebin's leadership on climate action for more than a decade, which is summarised over page.

Darebin City Council Climate Action Milestones

2002

- Joins NAGA, a regional greenhouse alliance which collaborates on projects to reduce carbon emissions.

2003

- Adopts targets for corporate and community greenhouse emission reductions of 20% on 1995 levels by 2010.

2004

- Wins a Commendation award for its Community Power Program in the National LG awards for Community Greenhouse reductions.

2007

- Adopts Darebin Council Climate Change Action Plan, focusing on Council's own operations, and Going Places – Darebin Transport Strategy, with a strong sustainable transport focus.
- Wins United Nations Association of Australia World Environment Day Award for Darebin Travel Rewards scheme.

2008

- Achieves corporate 2010 reduction target early through an Energy Efficiency Program and the purchase of GreenPower.
- Wins Banksia award for a working example of what sustainability can look like in Reservoir Civic Centre.

2009

- Adopts Darebin Community Climate Change Plan, to support the Darebin community to significantly reduce its emissions by 2020.
- Adopts Darebin Climate Change and Peak Oil Adaptation Plan, to address the risks of climate change and peak oil.

- Adopts Food Security Policy, to guide local provision of community gardens and associated programs.
- Wins United Nations Association of Australia World Environment Day Award for Darebin's Climate Change Action Plan.

2010

2011

- Launches Darebin Cool Shade project, where 482 vulnerable households are retrofitted with external shading or draught proofing.
- Darebin Fan Fair project – over 1000 fans delivered and installed free of charge to residents vulnerable to heat waves.
- Develops Talking My Language, working with Macedonian, Greek, Italian, Vietnamese and Indian communities to develop energy efficiency information.
- Offers Solar bulk buy schemes, where 275 Darebin households had solar hot water systems installed and 58 had solar panels installed.
- Adopts Darebin Heatwave Strategy, Urban Forest Strategy and Green Business Attraction Strategy.
- Launches the Green business network, 'We are Greening our Business' Sticker and Certificate Program.
- Continues Talking My Language, working with Arabic and Chinese communities to develop energy efficiency information.

2013

2014

- Light$mart Program reaches its 100th business retrofit.
- Begins energy efficient street lights program, with savings of nearly 4,000t CO_2-e per year.
- Secures grant funding for significant Aquatic Centre energy efficiency upgrades.
- Adopts Urban Food Production Strategy.
- Finalist in Banksia Sustainability Awards – Local Government and UNAA World Environment Day – Local Government Award for Solar $aver.
- Installs 150kW of solar across five Council-operated sites.
- Finishes installation of nearly 300 solar systems on the roofs of Darebin pensioners, through Solar $aver program.
- Adopts Darebin Cycling Strategy, bringing about a 175% increase in cycling.
- Wins Premiers Sustainability Award – Environmental Justice and Local Government Professionals (Vic) LGPRO – Sustainability Initiative award for Solar $aver.

2015

2016

- Achieves a 49% reduction in corporate greenhouse gas emissions from 16,858 to 8,541 tonnes since 2007/08.
- Second Solar $aver program installs almost 200 solar systems on roofs of low income households and over 100kW solar on community operated facilities.

4

Darebin's emissions and progress

DAREBIN'S EMISSIONS AND PROGRESS

Darebin City Council adopted a target of becoming carbon neutral by 2020 for its own operations and for the community in 2007 and 2009 respectively. At the time these targets were set, it was recognised that major changes were needed in state and federal government policy and action from Council and the community to achieve these targets.

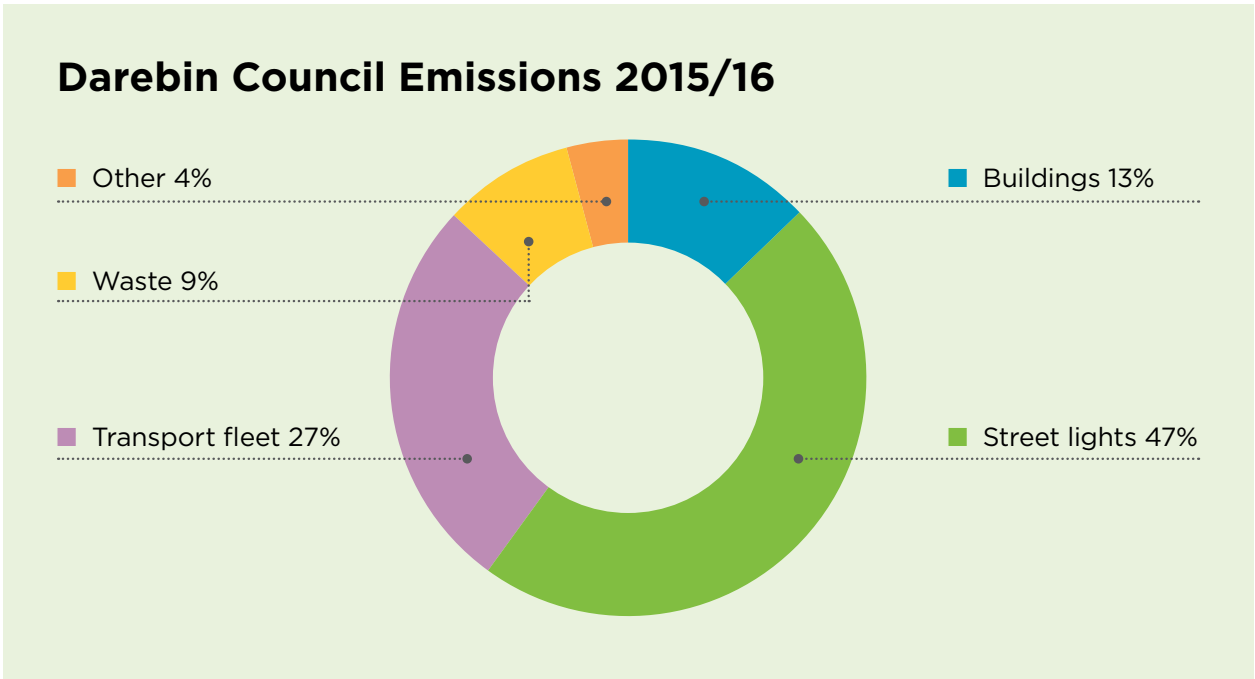
These targets were based on the desire to demonstrate leadership and provide an advocacy platform to engage other levels of government in the action required for our community to meet these targets. They were also based on the fact that the science indicated that deep reductions were needed to avoid the worst impacts of climate change, and that community consultation supported these targets.

4.1. Darebin Council emissions profile

Council's corporate greenhouse gas emissions were 8.54 kt CO_2-e in 2015-16.

Since 2008, Council has purchased 100% GreenPower for all buildings and metered sites. This has resulted in a significant reduction in greenhouse gas emissions of around 4.68 kt CO_2-e. If GreenPower had not been purchased, Council emissions from buildings would be 44% of the Council total and total Council emissions would be 13.22 kt.

Since 2006, Council has invested in improving the energy efficiency of Council-built infrastructure. Measures have included the reduction of air leakage in buildings, more efficient heating, ventilation and air conditioning (HVAC) systems, building monitoring systems, double-glazing retrofits and other technologies.



Council has invested in solar hot water systems and solar PV, such as 250kW of solar on council buildings, including a number of council-owned community child care, kindergarten and community centres.

The reductions in Council's corporate emissions through the purchase of GreenPower, investment in energy efficiency and solar hot water and PV are significant, reducing emissions by 48% from the 2007 baseline of 16.86 kt CO_2-e per year.

Council's corporate emissions of 8.45 kt CO_2-e per year are approximately 0.6% of Darebin's total community emissions.

4.2. Progress against Council corporate goal – carbon neutral by 2020

Successes

- Streetlight upgrades to energy-efficient lights reduced annual greenhouse gas emissions and electricity cost by more than 3.8kt and $550,000 respectively. The three-year project was funded by Council and the Federal Government. The new lights have provided a higher quality of light and greenhouse savings greater than expected. The community has responded positively to the changes.
- Council's energy-efficiency program has concentrated on the buildings using the largest amount of energy, including Council offices, libraries and aquatic and entertainment centres. The program has reduced energy costs by $1.3m since 2008. Projects have included lighting, heating, cooling, draught sealing and cogeneration.

Challenges

- New buildings, new services and increasing hours of operation over this period have increased energy consumption. This means Council has to work even harder to ensure total energy use is going down.
- There is currently no adopted Environmental Sustainable Development (ESD) policy for Council building works; however, a policy is under development and due to be released this year. Sometimes budget considerations limit environmental outcomes and sometimes contractors are not skilled in supplying environmental outcomes.
- Although the Council vehicle fleet has reduced greenhouse gas emissions over a number of years, in 2016 fleet emissions increased slightly. Further action is required to ensure elimination of emissions.

4.3. Darebin Community emissions profile

Darebin community greenhouse gas emissions were estimated to be 1,155 kt CO_2-e in 2015-16.

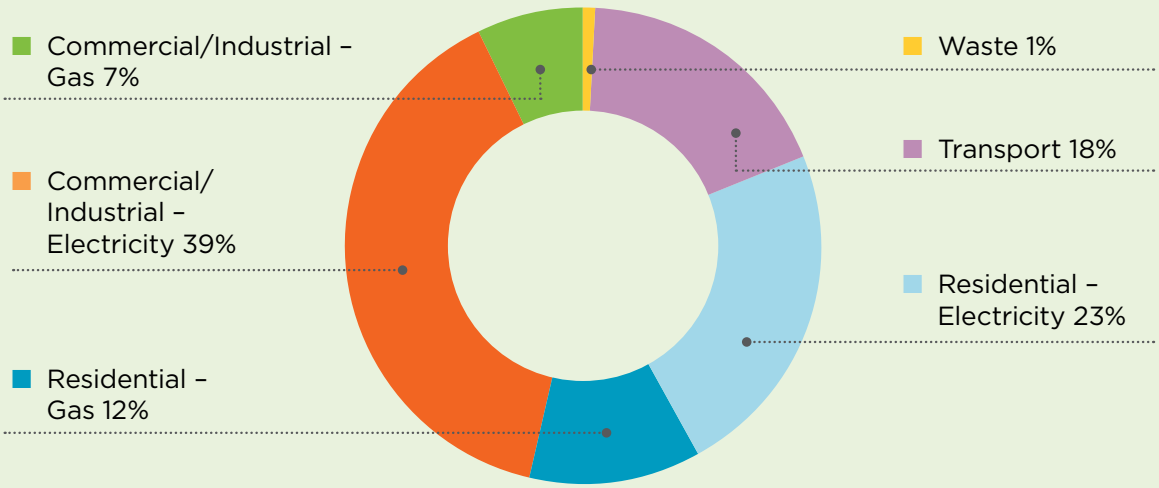
Population growth has had a significant impact on the community's emissions profile and it is anticipated that the population will continue to grow. Fortunately, energy efficiency actions, such as the installation of solar PV, seem to be countering this increase.

A positive change has been the reduction in electricity emissions intensity. Victorian electricity emissions intensity is projected to move from 1.18 t/MWh in 2016 to 0.98 t/MWh in 2022 with the closure of carbon-intensive power stations such as Hazelwood.

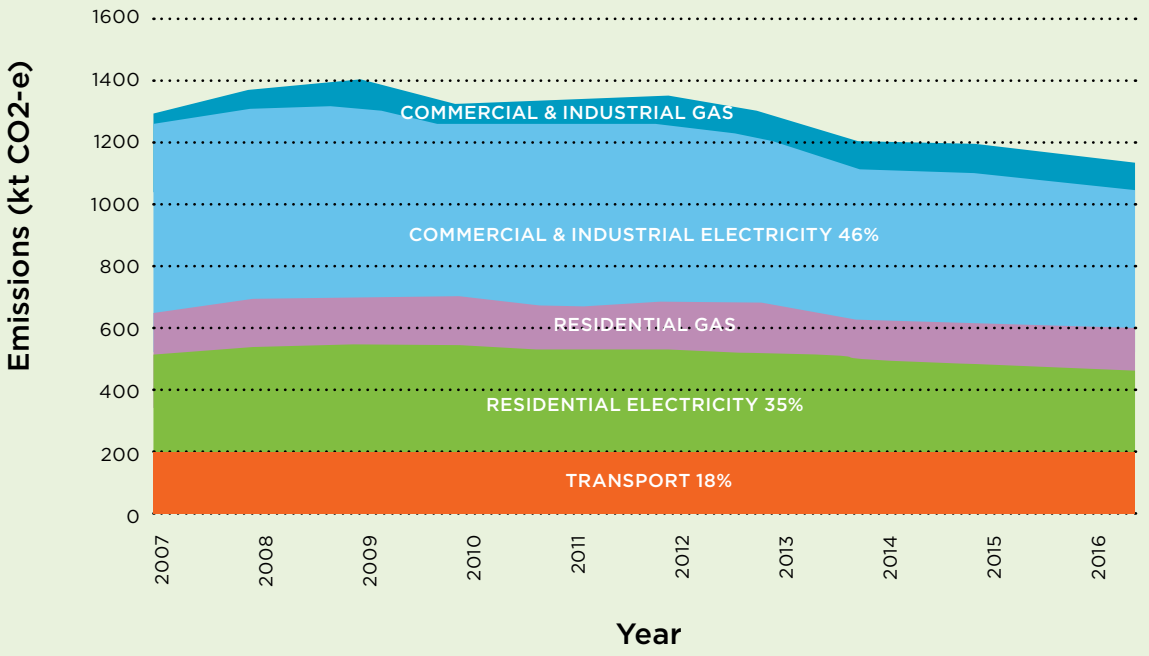
The Victorian Government has committed to increasing renewable energy from 14% in 2016, to 25% by 2020 and 40% by 2025. This represents a 2-3% annual growth of renewable energy in Victoria. Based on projected residential and commercial/industrial electricity consumption in 2022, this is expected to reduce community emissions by 110kt per year and is an important step in decarbonising our economy. However, much more action is needed.

We cannot reach zero carbon or beyond without a 100% renewable electricity system that creates a zero carbon electricity grid. This highlights the need to advocate at local, state and national levels for the creation of a 100% renewable electricity network at emergency speed.

Darebin Community Emissions 2015/16



Darebin Emissions 2007–2016



4.4. Progress against Community goal – Carbon Neutral by 2020

Successes

- Council ran a Solar Saver and a Solar Bulk buy program in 2013-14 and 2015-16 to help residents and businesses overcome the barriers to installing solar. The Solar Saver program helped install solar systems for approximately 500 pensioners and low-income households. Council paid the upfront cost of solar systems, with 10-year warranties included. The two solar programs resulted in 1800kW of solar PV being installed and an equivalent of more than 11,000 tonnes of emissions avoided. The targeting of low-income households was well received by the community. The Solar Saver model is now being pursued in South Australia, the ACT and by many councils in Victoria.
- The Sustainable Homes and Communities Program is a key environmental education partnership program between Darebin and Banyule Councils. This program has had a broad reach, including workshops, direct programs with diverse communities, community leaders programs, sustainability awards and resources to engage the wider community. It has been effective in reducing household energy and water use, minimising waste, increasing the use of sustainable transport and promoting sustainable gardening and sustainable food in line with Council targets.

- Through the Darebin Light$mart program, 142 business had their lights upgraded to energy-efficient LEDs. The businesses changed 12,000 lights – collectively saving $400,000 per year on their electricity bills and 2.789 kt of greenhouse gas emissions per year, with an average pay-back period of one year.
- The Talking My Language program worked across four municipalities with the Italian, Indian, Vietnamese and Afghan communities and in Darebin with the Greek, Macedonian, Chinese and Arabic communities. The program delivered energy efficiency information in these languages, held workshops and provided energy efficiency start-up kits.
- Council has been using the Sustainable Design Assessment in the Planning Process (SDAPP) tool since 2009. In the 2008-2012 period it is estimated that SDAPP saved Council 4569 tonnes CO_2-e.
- Between 2011 and 2014 the Cool Shade program provided 482 vulnerable households with a combination of external window shades, weather sealing and light globes to increase comfort and reduce energy costs. The program was initially co-funded by the Department of Human Services and has been rolled out in other council areas following our program.

Challenges

- Council has worked with low-income households and various CALD communities through various programs, but has not been able to reach all sections of the community. Council needs to explore new ways of helping those who are experiencing stress as a result of rising electricity prices and other challenges to reduce energy costs and adapt to climate change.
- Feedback from community consultation indicated that a portion of the community, including some culturally and linguistically diverse (CALD) communities, had heard little or nothing about Council's work on climate change, energy efficiency programs and solar PV systems for low-income households.
- It is difficult for renters to participate in energy efficiency retrofit and solar programs.

4.5. Community consultation

Between July and December 2016, Council consulted with the community on how they wanted to see Council respond to climate change. Residents participated in discussions, workshops, interviews and surveys. The infographic below provides a summary of feedback gathered through this consultation process.

A draft Climate Emergency Plan was released for public consultation in May 2017. This final Climate Emergency Plan is the result of that consultation process.

Climate Action > What next?

Participants want to hear more about emission reduction activities and programs. Darebin climate action should:

have social, health and/or financial benefits for the community

save council money in the long-term

focus on creating positive local impacts

prioritise support for the most vulnerable members of the community

Two thirds of people felt it was important that the community and the council become **CARBON NEUTRAL** by 2020, but without paying higher rates.

The highest priority should be **LOCAL ENERGY EFFICIENCY PROGRAMS** to help households reduce electricity and gas costs.

Participants thought **PURCHASING CARBON OFFSETS** to reach the carbon neutral target was a low priority.

Participants also thought **BROAD COMMUNITY EDUCATION** on climate change and energy efficiency for resident, businesses, landlords and renters and planting more trees in the municipality were important actions.

5

Our Climate Emergency goals

OUR CLIMATE EMERGENCY GOALS

5.1. Context

The onset of the global climate emergency together with many years of insufficient action by the national and state governments are making targets difficult to achieve and making local ground-up action more important. We must aim to do as much as we possibly can, as quickly as possible and bring all levels of government and our community with us.

We also recognise the need to ensure that we are well prepared for the effects of built-in climate change, such as more frequent heatwaves and floods. There will also be large transitions required for our society to transform into one that supports a safe climate. We will take action to prepare our Council and community for this transition and improve our resilience to future changes. We will undertake ambitious action and advocacy to reach our goals.

5.2. Overarching goals

The Darebin Climate Emergency Plan overarching goals informed by Council's Climate Emergency commitment and consultation with the community are:

- to provide maximum protection for the community of Darebin and for people, civilisation and species globally, especially the most vulnerable
- to restore a safe climate at emergency speed by eliminating greenhouse gas emissions and enabling drawdown of excess carbon dioxide in the air
- to encourage research to find safe ways to protect people, species and civilisation from near-term dangerous temperatures, while zero emission and carbon dioxide drawdown strategies are being enacted
- to enable our community to be resilient in the face of any unavoidable dangerous climate impacts
- to engage, empower and mobilise governments, communities and organisations to take action on and achieve these goals with certainty and at emergency speed.

5.3. Targets and timelines

At the time our zero net emissions targets were set, as noted in Section 4, it was recognised that major changes would be needed at state and federal government levels if Council and the community were to achieve these targets. As of 2017, the levels of change required have not yet taken place.

Darebin Council will continue to aim for zero greenhouse gas emissions for our Council and community. We will also take the action required to draw down Darebin's share of the greenhouse gas emissions already in the atmosphere. We recognise that we will not achieve this without urgent leadership and action from other levels of government. Council will, over the next 12 months, review our previously stated corporate goal of reaching zero net emissions by 2020 based on a detailed carbon management plan for Council's own operations (see Key Direction #1). This is part of a staged approach with a long-term goal of achieving negative emissions (i.e. producing zero net emissions and in addition drawing down further emissions).

Our emissions goals for both Council operations and the municipality as a whole are summarised over the page.

Corporate emissions goals (Council's own operations)	target	timeline	baseline
Gross greenhouse gas emissions	45% reduction	2022	2006-2007
Net greenhouse gas emissions	0 net emissions* (carbon neutrality)	2020	n/a
On-site renewable energy generation	440KW additional capacity	2022	377kw (as at August 2017)
Negative emissions (drawdown)	To be determined	TBD	TBD

Table 2: Corporate emissions goals
***Subject to endorsement of Darebin carbon management plan in 2018 – see Key Direction #1.**

While we are still aiming for zero net emissions for the whole municipality by 2020, we recognise that, in the current climate, that target is aspirational. Council will develop a drawdown plan in 2018/19 and will at this time review this target.

Community emissions goals	target	timeline	baseline
Net greenhouse gas emissions	0 net emissions	2020	n/a
Local renewable energy generation	38MW (i.e. double existing capacity)	2022	(19MW as of 2017)

Table 3: Community emissions goals

6

Action to achieve our goals

ACTION TO ACHIEVE OUR GOALS

Council aspires to be a national leader in response to this critical intergenerational issue and supports bold, ambitious and effective action. Council will continue to lead in its actions, support and advocacy in response to the Climate Emergency.

The specific actions to be undertaken to reach our goals are outlined in the next section, organised under nine Key Directions:

1. **Climate Emergency mobilisation and leadership**
2. **Energy efficiency**
3. **Renewable energy and fuel switching**
4. **Zero emissions transport**
5. **Waste minimisation**
6. **Fossil fuel divestment**
7. **Adaptation and resilience**
8. **Engaging the community**
9. **Darebin Energy Foundation**

There are also a number of complementary and supporting strategies already adopted by Council, summarised in the diagram below. Further work will be done on coordinating Council's Climate Emergency response through an organisational review including these policies and strategies (see actions under Direction 1).

Council strategies and climate change

COUNCIL PLAN

Zero greenhouse emissions: support the community in these endeavours and lead by example by minimising Council's greenhouse emissions.

DAREBIN TRANSPORT STRATEGIES

- Going Places – Darebin Transport Strategy
- Darebin Safe Travel Strategy
- Darebin Cycling Strategy.

HEATWAVE STRATEGY

Reduce heatwave effects through urban design and maintenance.

HEALTH AND WELLBEING PLAN

Healthy people and connected communities', with a goal to build healthy, safe, accessible and sustainable places.

WASTE AND LITTER STRATEGY

Avoiding and reducing the demand on resources, replacing resources that are extracted from the environment, and ensuring that materials are reused, recycled or used to generate renewable energy.

GREEN BUSINESS ATTRACTION STRATEGY

Attracting businesses that provide green products and services, as well as operate in a green way.

FOOD SECURITY POLICY

Access to safe, culturally appropriate and nutritionally adequate food for all, now and into the future.

NATURAL HERITAGE STRATEGY

Darebin is a place where natural heritage is valued and nurtured.

URBAN FOOD PRODUCTION STRATEGY

Local food systems which are secure, healthy, sustainable and fair.

GREENSTREETS STREETSCAPE STRATEGY

A safe and sustainable streetscape that increases accessibility and walkability, supported by a healthy and diverse urban tree population that enhances the community's daily experience while ensuring environmental, economic and social sustainability into the future.

OPEN SPACE STRATEGY

A well connected network of accessible open spaces that meets the diverse needs of the community and provides a range of social and environmental benefits.

WATERSHED: TOWARDS A WATER SENSITIVE DAREBIN

Value water and manage it wisely to build resilience to drought and climate change.

PLANNING POLICIES

- Municipal Strategic Statement
- Local Planning Policy ESD clause.

URBAN FOREST STRATEGY

Increase tree coverage on public land to at least 25% over 15 years.

DAREBIN CLIMATE CHANGE STRATEGY AND ACTION PLAN

6.1

Key direction # 1 – Climate Emergency mobilisation and leadership

6.1.1 Context

"The unprecedented rate of global warming is melting the polar ice caps, raising sea levels and undermining food and water security for many of the world's peoples. Action has been too slow, because economics has trumped physics. Now emergency action is the only rational response." – David Spratt, co-author of *Climate Code Red*.

The scale and speed of transformation needed to change our energy markets, our economy, our legislation and our behaviour to eliminate greenhouse gas emissions and draw down the excess CO_2 in the atmosphere requires a national and global emergency response.

To do this we need to build a broad consensus across society on the need to adopt an emergency response to climate change, from our local community in Darebin, to other Councils around Australia, to other levels of government, industry, organisations and communities around the world.

6.1.2 Supporting policies

Mobilisation

Council has committed to undertake strong Climate Emergency action and engage our community, other local governments, organisations and players in taking action. Darebin Council can lead the way. We can work with other councils to show what is possible at a local level and we can influence municipalities across the world; for example, through forums like the Cities Power Partnership and the Global Covenant of Mayors for Climate and Energy (see below).

As a local government, Council recognises that to maximise the impact of a climate emergency program the state and federal governments will need to commit to climate emergency action. The scale and speed required to transform legislation, markets and economies sit with these levels of governments. Therefore, a key part of our program is to take action to accelerate the process of getting these governments to declare a Climate Emergency and commit to programs of the necessary scope, scale and speed. At the time of the development of this plan, the influence of Council's original commitment in 2016

Cities Power Partnership and the Global Covenant of Mayors for Climate and Energy

Darebin has joined the Climate Council's Cities Power Partnership (https://www.climatecouncil.org.au/cpp) and will join the Global Covenant of Mayors for Climate and Energy (http://www.globalcovenantofmayors.org/). These alliances aim to support, celebrate and accelerate the climate leadership municipal governments are demonstrating, on the national and international stages respectively. These alliances will amplify our ability to share our own models of success with others, and learn from the experiences and innovations of councils around Australia and the world. Joining these fora also provides an opportunity for us to spread the Climate Emergency message, and to invite other members to join us in declaring a state of Climate Emergency and committing to the actions that will restore a safe climate for current and future generations.

6.1

had already inspired communities around Australia and in other countries.

Leadership on emissions elimination

As well as our leadership role in mobilising others, Council also recognises the need to show leadership by ramping up the elimination of our own operational emissions. Apart from being consistent with a Climate Emergency approach, this is also crucial to our credibility and reputation in this area and, in turn, our ability to influence and mobilise others effectively.

Council has prioritised action in this order:

1. **Avoid and reduce energy use as far as possible**
2. **Increase energy efficiency as much as possible**
3. **Generate as much renewable energy on-site as possible**
4. **Buy energy from renewable sources**
5. **Draw down existing emissions from past activities**
6. **Consider offsetting any emissions (that cannot be eliminated or drawn down in the short term).**

This hierarchy does not imply that each step will be completed before the next step begins. Council will seek and respond to opportunities across all six actions, bearing in mind their relative importance.

In order to set out a clear pathway for elimination of our emissions, Council will develop a detailed carbon management plan by September 2018. The targets associated with this plan will include those summarised in the table below. Note that Council will at this time either confirm or adjust our previously stated goal of reaching zero net emissions by 2020.

Drawdown

Council acknowledges the need to go beyond carbon neutrality and recognise our past emissions. We need to draw down existing greenhouse gases from our atmosphere to restore a safe climate. While some methods for achieving this are known, this is an area in which methodologies and solutions at the scale required are still being developed and further research is essential. Council will need to determine what would be a fair and feasible goal for Darebin in terms of drawdown, and to develop a strategy for achieving that goal.

Corporate emissions goals (Council's own operations)	target	timeline	baseline
Gross greenhouse gas emissions	45% reduction	2022	2006-2007
Net greenhouse gas emissions	0 net emissions* (carbon neutrality)	2020	n/a
On-site renewable energy generation	440KW demand	2022	n/a
Negative emissions (drawdown)	to be determined	TBD	TBD

Table 4: Corporate targets and timelines (See Directions 2 and 3 for further related actions)
***Subject to endorsement of Darebin carbon management plan in 2018.**

6.1

6.1.3. Objectives and Actions

OBJECTIVES

1. Build local engagement with climate emergency action broadly and deeply.
2. Engage and partner with other councils and organisations to mobilise State and Federal Governments to declare and act on the climate emergency as soon as possible to meet the goals of this plan.
3. Build support for climate emergency action globally.
4. Encourage and support innovation that can be scaled up to contribute to achievement of the goals of this plan.
5. Develop a drawdown plan for Darebin, based on removing our community's fair share of the excess carbon dioxide already in the air.
6. Demonstrate leadership in climate emergency action.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Demonstrate leadership through strong climate emergency action as an organisation.	2018-2021	> Undertake an organaisational review of all Council programs and policies to ensure alignment with Council's Climate Emergency commitment.
	2017-2022	> Publicise key emission elimination achievements.
	2017-2018	> Join the Global Covenant of Mayors for Climate and Energy.
	2018	> Develop carbon management plan.
	2018-2022	> Implement carbon management plan.
Strategies	**Timeframe**	**Actions**
Develop a flagship Climate Emergency campaign and advocacy program to engage other levels of government, other councils and other stakeholders to establish climate emergency programs and to cooperate on climate emergency action.	2017-2018	> Convene a climate emergency conference to bring other councils, organisations, industry and the community together to identify strategic action and collaboration.
	2017-2022 (all)	> Develop information on climate emergency program development and delivery. > Deliver outreach through a variety of media including media releases, presentations, conference papers, social media etc. > Undertake and collaborate on strong advocacy programs to State and Federal Governments to declare and act on the Climate Emergency as soon as possible. > As part of Darebin's Strategic Advocacy Framework, develop specific advocacy initiatives which may include: – Large-scale, Darebin Council-led campaigns – Participation in alliance-led campaigns – Sustained, ongoing and opportunistic advocacy; articulation of our position on the Climate Emergency at every relevant forum or opportunity – Responsive advocacy (e.g. commenting on relevant government reviews, policy directions, news and events, etc).

6.1

Creation of the Darebin Energy Foundation	2017-2018	> Formalise the role that the Darebin Energy Foundation will take in response to the Climate Emergency as part its establishment.
Foster innovation that can be scaled up	2018-2022	> Position Darebin to trial or be a demonstration site for innovations and programs that respond to the Climate Emergency.
Draw down excess carbon dioxide already in the air.	2018-2022	> Advocate to state and federal governments for a rapid increase in research of drawdown methods and implementation of existing methods.
	2018-2020	> Determine Darebin's share of the drawdown goal excess carbon dioxide already in the air, and develop a drawdown plan for Darebin to reach this.

Council supporting the community

Strategies	Timeframe	Actions
Engagement with the community to build comprehensive climate awareness and commitment to effective emergency action	2017-2022	> Include Climate Emergency information in key Council communications such as website, events, social and printed media. > Provide engaging presentations, events, screenings, art installations, etc, that increase community awareness and commitment and include calls to action.
Support community groups to engage with and take action on the Climate Emergency	2017-2022	> Provide support including grants and the provision of venues. > Partner and collaborate with groups on relevant campaigns.
Educate and support the community to increase vegetation and improve soil carbon throughout the municipality as drawdown action	2017-2022	> Provide support including grants and the provision of venues. > Partner and collaborate with groups on relevant campaigns.

What do we need others to do to make this happen?

Darebin Community (households, businesses, schools, organisations, groups, etc)

- Take opportunities to learn about and spread the message of the Climate Emergency.
- Act to eliminate emissions and get involved in local emissions-elimination projects.
- Get involved in advocacy to get State and Federal governments to take action on the Climate Emergency.
- Get involved in local activities that contribute to drawdown, such as planting vegetation.

State and Federal Government

- Declare a Climate Emergency and take urgent action to restore a safe climate.
- Engage other governments to do likewise.

6.2

Key direction # 2 – Energy efficiency

6.2.1. Context

Using energy efficiently means our response to the Climate Emergency can be more efficient and cost effective, as we will not be wasting energy.

Energy efficiency in buildings still remains one of the cheapest ways to reduce energy use and eliminate carbon emissions. Most energy efficiency options can provide a financial saving.

Housing energy standards

Australian housing standards are poor compared with many OECD countries. Prior to 1991 there were no housing energy specifications in Victoria.

In 2005, Victoria introduced a new minimum housing energy standard of 5 stars.[21] However, 86% of Victorian housing built prior to housing standards performs at an average of 1.81 stars.

Draught-sealing

The average Victorian home built pre-1990 has approximately 40 air-changes per hour (ACH) under a blower door pressure test.[21a] (Blower door testing is one of the ways to check that a building is constructed to a specified standard.) This is equivalent to having your front door open all the time. New Australian homes average approximately 15 ACH.[21b]

A standard new home in the US/Canada has a maximum of 3.6 ACH.

As a result, in 2013 an average Victorian household paid $2800 on household energy use.[22]

In May 2011, Victoria lifted housing standards to a minimum 6-star energy rating, which covers all new housing and any substantial renovation. This has been a positive step forward, but remains a long way behind other countries.

There are a number of very simple basic design principles which, if incorporated into new housing and renovation/retrofits, can make a substantial difference to the energy performance of a house:

- Orientation and shading
- Passive solar heating and cooling
- Airtightness and insulation
- Thermal mass and glazing[23]

If these passive design principles were incorporated into all new and, as far as possible, renovated housing stock, this would make a substantial difference in the quality, efficiency and comfort of our homes.

By 2020, all new housing in Germany must be climate neutral.[24] In California, all new residential housing must be zero-net energy by 2020 and all commercial buildings must be zero-net energy by 2030.[25] It is time Victoria and Australia moved to substantially higher new building standards.

21 The Nationwide House Energy Rating Scheme (NatHERS) is a star rating system (out of ten) that rates the energy efficiency of a home, based on its design. 10 stars is excellent and uses almost no energy. See http://www.nathers.gov.au/

21a http://iree.org.au/wp-content/uploads/2017/02/IREE_2017_Full_paper_McNicol.pdf

21b http://www.nathers.gov.au/sites/prod.nathers/files/publications/House%20Energy%20Efficiency%20Inspect%20Proj.pdf

22 http://www.sustainability.vic.gov.au/-/media/resources/documents/services-and-advice/households/energyefficiency/rse014-households-energy-report_web.pdf?la=en

23 http://www.yourhome.gov.au/passive-design

24 http://www.bmub.bund.de/fileadmin/Daten_BMU/Pools/Broschueren/aktionsprogramm_klimaschutz_2020_broschuere_en_bf.pdf

25 http://www.californiaznehomes.com/framework

6.2

Passive House

Freiburg Council social housing at Weingarten West. Council retrofitted the 16 storey concrete building to passiv haus standard, requiring minimal heating/ cooling.

Mandatory Disclosure

The ACT has had a Mandatory Disclosure at point of sale scheme since 1999.[27b]

According to a 2008 study, home owners who invested in improving the energy performance of their house by 1 star level, on average increased its market value by about 3%. [27c]

Mandatory Residential Energy disclosure is common in European countries and has been in place for a long time.

Mandatory Disclosure at point of sale or rental

Despite new 6-star standards in Victoria, most of these new houses are probably only performing at a 3-4 star rating.[26] This is likely due to a lack of consumer awareness, a lack of building industry training, and limited monitoring of these aspects of the construction industry.

Mandatory energy efficiency ratings disclosed at point of sale or rental would provide transparency for otherwise hidden factors (e.g. insulation levels, draught proofing) and allow a prospective buyer/ renter to make an informed assessment of the house's value.

The new Victorian Government Residential Efficiency Scorecard is a positive move to providing transparency in the energy performance of residential housing. It is, however, a voluntary scheme and a mandatory scheme needs to be introduced to serve the interests of renters, home buyers and the building industry.[27a]

Introducing minimum standards at point of sale and rental

The introduction of mandatory disclosure is the first step in improving the energy efficiency of buildings, by allowing the industry to develop the skills and knowledge to provide and interpret energy disclosure information. The introduction of minimum energy standards would then be required to lift the energy performance of buildings.

The benefits of a minimum standard are:

- reduced consumer energy costs
- reduced health risks associated with heatwaves and cold periods
- creation of building industry jobs
- development of retrofitting skills in the building industry.

26 http://www.thefifthestate.com.au/innovation/building-construction/australias-building-energy-efficiency-system-is-broken/70863

27a http://www.vic.gov.au/news/residential-efficiency-scorecard.html

27b http://www.prres.net/papers/OLeary_Residential_Energy_Efficiency_Mandatory_Disclosure_Practice.pdf

27c https://www.choice.com.au/home-improvement/energy-saving/reducing-your-carbon-footprint/articles/house-energy-ratings

6.2

Energy poverty

When a household spends a large proportion of its income on energy bills, and often restricts their energy consumption in order to pay for other essentials, they are considered to be experiencing energy poverty. Low-income households are particularly vulnerable to heat and cold weather stress. Many low-income households are renters in very inefficient, leaky and uncomfortable properties. Because they spend a high percentage of their income on energy, they are less likely to be able to afford energy-efficiency measures, creating a cycle of energy poverty. Low-income households would be better protected by the introduction of minimum standards for energy efficiency.

In Victoria, only 58% of private and 55% of public rented homes are insulated, compared with 95% of owner-occupied homes. One of the most effective ways to help the disadvantaged reduce their energy use and vulnerability to temperature extremes is to introduce mandatory energy ratings for all buildings, combined with tax offsets for energy efficiency improvements in rental properties[28].

In early 2017, the Victorian Government announced a new "Making Home Energy More Affordable" program, targeted at 800 low-income households. Through zero-interest or low-interest loans, households will be able renovate their homes, replace appliances and install solar.[29]

It is anticipated that the average household would save $500 per year on energy costs through a typical retrofit of $4500 for measures such as draught proofing, ceiling insulation and a heater upgrade.[30]

Appliance ratings and efficiency tools

A considerable amount of electricity used in the home is consumed by appliances: refrigerators, dishwashers, washing machines, TVs, computers and other electronic devices. Mandatory minimum standards for appliances would therefore drive substantial efficiency improvements. Energy labels first appeared on refrigerators in 1986, and a review found that between 1986 and 2000, the average efficiency of new refrigerators purchased by Australian consumers improved by around 40%.[31]

Standby power accounted for more than 10% of Australia's residential electricity consumption in 2005. The Australian Government introduced new regulations that mean all electrical equipment sold from 2013 cannot exceed 1 watt when on standby mode, which brought Australia in line with European standards. This simple cost-effective regulation has saved Australians a considerable amount of money in wasted electricity.[32]

28 https://theconversation.com/renters-are-being-left-out-in-the-cold-on-energy-savings-heres-a-solution-65712

29 https://www.energy.vic.gov.au/energy-efficiency/home-energy-assist

30 http://www.premier.vic.gov.au/cutting-energy-bills-for-800-homes-in-need/

31 https://theconversation.com/energy-smart-appliances-cut-australian-power-bills-by-billions-25816

32 Based on 120 households, residential standby power consumption was estimated to cost Australian consumers approx. $950 million resulting in 6.5 million tonnes of carbon dioxide emissions: http://www.energyrating.gov.au/products-themes/standby-power/about/

6.2

Environmentally sustainable development (ESD) planning

Darebin Planning Scheme Amendment GC42 builds on the overarching ESD objectives of the State Planning Policy Framework, the Municipal Strategic Statement and local policies contained within the Darebin Planning Scheme.

This amendment seeks to ensure that all development requiring a planning permit achieves best practice across a wide range of ESD principles, including energy efficiency, water resources, indoor environment quality, stormwater management, transport, waste management and urban ecology.

ESD guidelines have been developed for Council building projects to help achieve Council's climate and other environmental strategies and are currently being incorporated into a formal ESD policy.

Northland Urban Renewal Project (NURP)

The redevelopment of a significant portion of the municipality is a once-in-a-generation opportunity. The Northland Urban Renewal Project presents an opportunity for Council to facilitate the development of a model sustainable precinct. The precinct plans will consider:

- high levels of active transport and reduced dependency on cars
- solar passive designs incorporated into all residential and commercial buildings
- high energy performance housing well above mandatory minimum State standards, e.g. 7 to 8-star energy rating
- high levels of solar PV, heat pumps and energy efficient heating and cooling across the precinct, and potentially showcasing 'energy plus' or zero-carbon housing
- green walls, green roofs and a green street level infrastructure which incorporates the thermal benefits of green roofs/walls, reducing the urban heat-island effect and ensuring the capacity to retain and filter stormwater and contribute to drawdown
- future-proofing buildings and related infrastructure, e.g. mandating the provision of conduits for electric vehicle charging to enable retrofitting of charging facilities, when the technology is required in the next 5-10 years.

All these sustainability aspects will need to be facilitated through the statutory planning processes. NURP presents an ideal opportunity for Darebin to model a more liveable, active community precinct that showcases zero-carbon living and businesses of the future.

6.2

Commercial and industrial energy efficiency

Energy efficiency presents a major opportunity for Australia to eliminate greenhouse gas emissions in a cost-effective way. Energy productivity improvements could account for 420 MtCo2-e, or 44% of Australia's 2030 greenhouse reduction targets.[33] The Australian Government and Council of Australian Governments Energy Council agreed to boost energy efficiency by 40% by 2030, or approximately 2-3% efficiency per year.[34]

The 2010 Climateworks study, *Low Carbon Growth Plan for Australia*, outlines a comprehensive economy-wide blueprint for ambitious reduction in greenhouse gas emissions.[35] The study identifies 54 least-cost opportunities across the economy to achieve a 25% reduction in Australia's emissions below 2000 levels. A 2012 follow-up study indicated that industrial and manufacturing industries could save 11% of total energy use, with the majority offering a payback of less than two years.[36]

6.2.2. Supporting policies

State

The Victorian Energy Efficiency Target (VEET) scheme, also known as the Energy Saver Incentive, is designed to make energy efficiency improvements more affordable, contribute to the reduction of greenhouse gases, and encourage investment, employment and innovation in industries that supply energy-efficienct goods and services.

This scheme has enabled many households and businesses to change to energy-efficient lights, draught stoppers, chimney balloons or to upgrade to better standard kitchen appliances, heating and cooling, refrigeration and pool pumps. Expansion of the scheme and enabling easier access to it will improve uptake and outcomes.

Federal

The Australian government's Equipment Energy Efficiency (E3) program aims to reduce energy consumption by household and business appliances through the use of energy labels and enforceable standards for energy consumption.[37] The program has saved the Australian economy 13.5 million tonnes of emissions and resulted in a financial saving of $1.6 billion – at an abatement cost of -$119 per tonne.[38]

Minimum energy efficiency standards are the key drivers to reducing energy consumption, energy costs and also greenhouse gas emissions. Experts recommend that the minimum standards program should expand the appliances

33 https://www.environment.gov.au/system/files/resources/b8540c8a-8a31-4aba-a8b5-63cc46466e33/files/australias-2030-abatement-potential-summary.pdf

34 http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/National%20Energy%20Productivity%20Plan%20release%20version%20FINAL_0.pdf

35 http://climateworksaustralia.org/sites/default/files/documents/publications/climateworks_lcgp_australia_full_report_mar2010.pdf

36 http://www.climateworksaustralia.org/sites/default/files/documents/publications/climateworks_ieedap_summary_dec2012.pdf

37 http://www.energyrating.gov.au/

38 https://theconversation.com/energy-smart-appliances-cut-australian-power-bills-by-billions-25816

covered by the scheme (e.g. ceiling fans, swimming pool pumps), and the minimum standards should be accelerated. For too long Australia has been a dumping ground for poor performing or end-of-run appliances that wouldn't meet European or North American standards.

The Australian Government Commercial Building Disclosure (CBD) Program requires most sellers and lessors of office space of 2000 square metres (1000 square metres from 1 July 2017) or more to obtain a Building Energy Efficiency Certificate (BEEC) before the building goes on the market for sale, lease or sublease. There is not currently a significant supply of office stock in the Darebin area; therefore, this program needs to be expanded to support our business types.

6.2.3. Darebin and energy efficiency

One of the most cost-effective ways of eliminating Darebin's greenhouse gas emissions is to reduce energy consumption.

The commercial and industrial sectors (using electricity and gas) are the largest source of Darebin community emissions – 46% or 533 kilotonnes in 2016.

Residential energy (using electricity and gas) is the second biggest source of Darebin community emissions – 35% or 403 kt in 2016.

The commercial and industrial sectors are very diverse, including education and training, retail and wholesale trade, manufacturing, health care and social assistance, construction, accommodation and food services. Notably, 58% of our 13,000 businesses operate from private homes. Although there is a greater number of smaller businesses, manufacturers are, in aggregate, the largest energy users.

Some efficiency improvements will relate to all businesses to varying degrees – e.g. retrofitting of LED lights will work for most businesses – but the type of technology will be different for a retail shop when compared to a warehouse. Council, through the Green Business Program, has implemented a Light$mart program which has helped more than 140 businesses to upgrade to energy-efficient LEDs.

6.2

Similarly, in 2016 Council actively engaged with these businesses to offer the benefits of solar PV through Council's Solar Bulk-buy program.

Businesses often recognise the value of energy efficiency or solar, but struggle to find the time to investigate the possibilities, get quotes and make informed decisions about quality, value and warranty. Because Council's providers are trusted, the Light$mart and Solar Bulk-buy programs have accelerated business-owners' uptake of energy efficiency or solar PV and have been a helpful motivator and driver of action.

There is currently significant contact time involved in getting businesses to consider energy efficiency issues but smart resourcing of this area can bring about significant results. Energy upgrade agreements are available for larger solar installations for businesses and there has been interest in this from some larger sites in Darebin.

Many businesses in Darebin operate from rental premises, but well-designed lease terms can allow favorable returns for business renters from energy efficiency investments.

6.2

Energy-efficient street lights

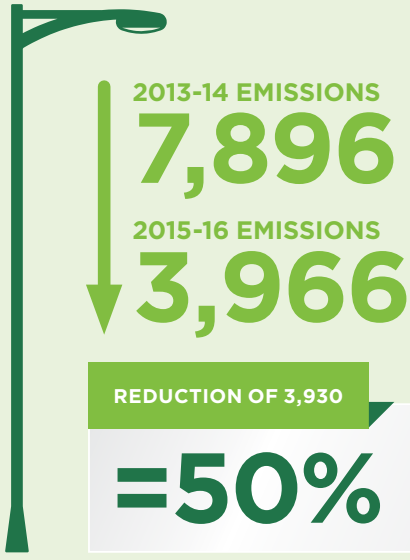
he Darebin Green Light Program 2013-2016 has delivered a range of positive outcomes for our community, with 9675 streetlights changed to energy-efficient lights. These have produced a more even spread of light, less fade over time, less spill into private property and lower maintenance costs. A very significant 3,029,866 kWh of electricity will be saved per year, resulting in a reduction of nearly 4000 tonnes of greenhouse gas emissions per year.

Council will save $577,375 (GST excluded) each year on electricity costs and reduced operation, maintenance and replacement charges.

The Green Light Program only covers pedestrian level lighting in Darebin streets. There is potential to upgrade the 1500 vehicular (V) street lights with energy efficient lamps, where the electricity costs are shared between VicRoads and Council. VicRoads understand the financial and greenhouse benefits of upgrading to LED street lights.

Energy-efficient street light replacement program

(Tonnes CO_2)



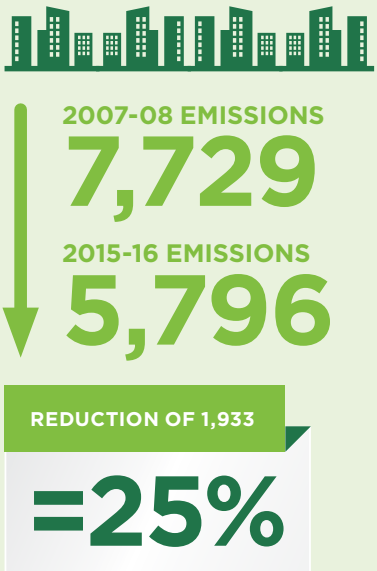
In-house energy efficiency program

Council has invested in energy efficiency work on Council buildings. In 2016 the saving from this program was $315,300, with a total cumulative saving of $1,317,200 since 2008.

For every $1 Council spends on the energy efficiency program, $1.40 is saved over the lifetime of the works. This program represents excellent value for Council and ratepayers. Council continues to explore and invest in energy performance initiatives that recoup their cost in 10 years or less.

Council's energy efficiency program

(Tonnes CO_2)



6.2

6.2.4. Objectives and Actions

OBJECTIVES

1. New buildings to meet high ESD standards, including minimum energy efficiency standards
2. Existing buildings to be retrofitted to be energy efficient
3. New appliances and lighting, including street lighting, to meet high ESD standards including energy efficiency standards
4. Existing appliances and lighting, including street lighting, to be upgraded to be energy efficient.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Continue energy efficiency program for council buildings	2017-2022	> Works to include: Building Monitoring Systems, HVAC upgrades, double glazing, insulation, air-leakage control, saving on average 221t per year and returning $1.40 for every $1 spent. > Consider participation in a Council building energy performance benchmarking program.
Build new buildings to a high ESD standard	2017	> Review ESD guidelines and adopt a Council ESD policy with a minimum standard for new Council buildings, extensions and renovations and upgrades.
	2017	> Include ESD as a key project management checkpoint early in the design process for all council building projects.
	2017- 2022	> Provide training in ESD for all teams involved in council building projects.
Make streetlight use more energy efficient	2018-2022	> In partnership with VicRoads, upgrade V level streetlights to energy-efficient LEDs.
	2018-2022	> Investigate installation of timer and dimming technology on pedestrian street lights.
Advocate for Government action and support	2017-2022	> Advocate for actions in 'What do we need others to do?' section. > Partner with other councils and organisations such as the Council Alliance for a Sustainable Built Environment (CASBE) for advocacy. > Advocate for approval of the GC42 Darebin Environmentally Sustainable Development (ESD) Policy and removal of any sunset clauses. > Advocate for a statewide ESD building policy. > Advocate for higher ESD standards in the National Construction Code.

6.2

Council supporting the community

Strategies	Timeframe	Actions
Support retrofit of homes to make them more energy efficient	2017-2019	> Partner in programs such as 'Making home energy more affordable' with State government and partners to retrofit low-income households, including insulation, air leakage and efficient heating/cooling.
Ensure new developments and precinct planning meet high levels of energy efficiency	2017-2022	> Continue to implement Sustainable Design Assessment in the Planning Process (SDAPP) for planning applications. > Implement GC42 Darebin Environmentally Sustainable Development (ESD) Policy. > Continue with One Planet framework and high ESD requirements in precinct planning for Northland Urban Renewal Precinct (NURP) and future precinct plans. > Continue to support and promote the Green Building Council of Australia (GBCA) to develop, promote and implement rating tools and advocate to industry and governments.
Extend the reach of the Green Business program	2017-2022	> Investigate opportunities where common technologies/systems may apply across a range of businesses and explore the benefit of bulk-buy or facilitated rollout, e.g. LED lights, timers, solar and batteries. > Investigate and support financing programs for commercial building retrofits and solar, such as Environmental Upgrade Agreements. > Investigate cost-effective models for business energy advice services.
Improve home energy efficiency through the Victorian Government Energy Efficiency Scorecard	2017-2022	> Explore potential for Council to work with the Victorian government and the community to use the Scorecard as an aid in purchasing housing and appraising rental properties.
Support changeover to energy efficient appliances	2019	> Explore the potential to extend the Solar Saver program or appropriate finance mechanisms to support changeover to energy-efficient appliances.

6.2

What do we need others to do?

Darebin community (households, businesses, schools, organisations, groups, etc)

- Use energy wisely – you can monitor and gain insight into your use by signing up for the free Jemena portal
- Buy appliances with high-energy efficiency ratings
- Turn appliances off standby
- Support advocacy for adopting minimum energy standards at point of sale or rental
- Insulate and draught-proof your property – even if you are a renter/ tenant, you may be able to split the cost with the property owner
- Get your building checked by an approved industry technician for insulation levels and air leaks
- If you run a business, consider taking advantage of VEET to be more energy efficient, and participating in Council's solar, Light $mart and Green Business programs.

State Government

- Adopt a statewide ESD building policy
- Improve ESD standards in building codes and planning mechanisms including the raising of the minimum energy rating from 6-star to 8-star minimum.
- Require passive design principles to be incorporated in all building design
- Require all new buildings to be 'energy plus' (produce more energy than is used on site, including the embodied energy of the building)
- Advocate for embodied energy to be covered more comprehensively in relevant regulations and tools
- Introduce minimum house energy standards at point of sale and rental with a transition to a 4-star energy rating by 2018, 5-star by 2019 and 6-star by 2020
- Increase monitoring and verification of all new housing and renovations, to provide consumer confidence that housing actually performs to specified minimum energy ratings
- Demonstrate policy leadership in best-practice ESD for new state government buildings and upgrades to existing buildings
- Support accurate and thorough product labelling relating to emissions impact of the product throughout its lifecycle.

6.2

- Approve the GC42 Darebin Environmentally Sustainable Development (ESD) Policy
- Provide comfortable and high ESD public housing
- Streamline the provision of energy use data to households, businesses and communities to support and develop energy literacy
- Develop finance support mechanisms to enable households, especially low-income households, to fund energy efficiency upgrades and best-in-category appliances to improve household energy efficiency
- Adopt housing minimum energy standards at point of sale or rental as soon as possible and develop other ways to address the issue of the tenant-landlord split incentives
- Develop an energy efficiency rating system for commercial appliances to help businesses make smart choices
- Provide grants and programs that enable small, medium and large businesses to operate in an energy-efficient way
- Strengthen the VEET over time to ensure it keeps pace with industry and technological advancements.

Federal Government

- Expand and improve the Australian Government Equipment Energy Efficiency Program, which determines the minimum energy performance standards of appliances
- Develop financial support mechanisms to enable households, especially low-income households, to fund energy efficiency upgrades and best-in-category appliances to improve household energy efficiency
- Support and mandate commercial and industrial sectors to significantly raise energy efficiency
- Expand and improve the Commercial Building Disclosure (CBD) Program
- Advocate for embodied energy to be more comprehensively covered in building rating systems.

6.3

Key direction # 3 – Renewable energy and fuel switching

6.3.1. Context

To meet our goal of eliminating greenhouse gas emissions to contribute to the restoration of a safe climate at emergency speed, we need to stop burning coal, oil and gas, and transition to 100% renewable energy as soon as we possibly can.

Electricity and gas emissions are currently 53.5% of Australian[39] and 81% of Darebin greenhouse gas emissions. A high percentage of electricity generated in Victoria comes from brown coal, which has one of the highest electricity emissions intensities in the world.

Solar PV costs in Australia have dropped 58% in five years and, according to the Climate Council, are expected to continue to fall by a further 40-70% by 2040[40].

Australia has the highest per capita roof-top solar PV installations in the world, with more than 1.58 million homes, or 20% of dwellings, powered by roof-top solar[41].

100% renewable energy is possible

Solar and wind technologies are intermittent in their electricity production. Managing a modern electricity grid with higher percentages of intermittent renewable energy can and must be planned for. Back-up electricity and grid stability can be provided in a number of ways, including energy storage (hydro, molten salt storage or batteries) at a large scale, or by battery storage, hot water systems and electric vehicles at domestic levels. In a modern and well-managed grid, 100% renewable energy would be able to meet the same reliability standards of the National Electricity Market (NEM) today.[42]

Solar panels on Darebin Arts and Entertainment Centre.

39 https://www.environment.gov.au/system/files/resources/48275b92-3f4b-44d0-aa4e-50ece408df86/files/nggi-quarterly-update-jun-2016.pdf

40 https://www.climatecouncil.org.au/solar-report

41 http://pv-map.apvi.org.au/historical#4/-26.67/134.12

42 The Zero Carbon Australia Stationary Energy Plan, Beyond Zero Emissions, 2010; Least cost 100% renewable electricity scenarios in the Australian National Electricity Market, Mark Ben Elliston, Iain MacGill, Mark Diesendorf, 2013; 100 per cent renewable study - modelling outcomes AEMO, 2013; Electricity network Transformation Roadmap, Energy Networks Association and CSIRO, 2016.

6.3

Switching from gas

Previous approaches in moving to a 100% renewable energy supply have included using gas as an interim transition fuel. However, since there is no carbon budget left, continued use of gas is no longer appropriate. Battery and pumped hydro are now cost-competitive with gas for the supply of peak-demand electricity.[43]

At the domestic scale there are electricity-based replacement technologies for all home gas-based technologies. Heat pumps for hot water, reverse-cycle air conditioning for heating and cooling and induction stove tops are cheaper to operate than the gas equivalents. At the residential level, zero emissions from stationary energy can be reached through the purchase of 100% GreenPower, or by generating renewable energy on-site (e.g. rooftop solar).

In November 2014, the Alternative Technology Association reviewed the market and concluded that many households would be better off financially if they switched from gas to efficient electric appliances[44].

Batteries

Batteries are not a renewable energy generator, but are an electrical energy storage device. Wind and solar energy production is intermittent and may not coincide with the times of greatest demand for energy. Batteries are closely connected to the success and adoption of renewable energy as they allow excess energy to be captured when it is generated, and stored for later use.

Currently the money households receive for the energy their solar systems feed into the grid (feed-in tariff – FIT) is much lower than what they have to pay to buy electricity from the grid. The financial benefit of solar PV is therefore reduced if a high proportion of the electricity is exported to the grid. This typically occurs when a household's demand for energy is highest at night, while output of their rooftop solar system is highest during the day. Affordable battery storage will make it more financially feasible for households to install larger solar systems and save more on their electricity bills, because the true value of their electricity is stored and used. The battery industry expects Australia to be a world-leading adopter of residential batteries due to the combination of high solar radiation, high residential electricity charges and low feed-in-tariffs for solar.[45]

The market price for batteries is still relatively high, but is expected to decrease in the coming years. Fewer than 500 domestic batteries were installed in Australia in 2015 but the market increased to 6750 installations in 2016. The market is expected to triple in 2017.[46]

43 http://reneweconomy.com.au/ex-hazelwood-boss-says-solar-storage-already-cheaper-than-gas-17924/

44 https://www.ata.org.au/news/are-we-still-cooking-with-gas

45 https://onestepoffthegrid.com.au/battery-storage-australia-track-world-biggest-market/

46 http://www.batterystorage.info/articles/2017/02/sunwiz-report-notes-6750-battery-installations-in-2016-up-from-500-in-2015/

6.3

Solar is democratising energy

There are many people who are seeking a greater degree of energy independence – moving away from a carbon-intensive grid, insuring against rising electricity prices and avoiding high network charges. Australian electricity prices are high compared with many OECD countries, and electricity transmission costs are very high due to the centralised nature of our generation systems, which are few and spread out over long distances.

Affordable solar PV has effectively broken the dependence on the traditional grid network and fossil fuel-powered electricity. The advent of lower-cost solar PV is bringing in energy democratisation around the world.

Installing solar PV on homes results in residents having a higher level of interest in electricity production and the electricity grid. Instead of being passive consumers, residents become active producers and consumers (pro-sumers). People are engaged and empowered.

National Energy Market

Due to the way the National Energy Market (NEM)[47] currently operates, energy prices tend to be volatile because they are dictated by immediate demand and supply. This is one reason why power from existing sources with long-established infrastructure and predictable supply (such as coal-fired power stations) can continue to be profitable. Conversely, it is difficult for new sources of energy (such as wind and solar) to become profitable. They require more new investment (e.g. new infrastructure) and offer intermittent supply, while the income they can generate is unpredictable because of the market's volatility.

The electricity market rules could be amended to mandate both energy efficiency improvements and emissions elimination. This would allow the Australian Energy Market Regulator and the Essential Services Commission in Victoria to regulate the private companies managing the Victorian distribution networks effectively.

Electricity market rule changes should help to facilitate community-owned renewable energy projects and smaller, more flexible decentralised power generators. Countries such as Germany have been able to create markets that have allowed and encouraged smaller-scale community-owned generation opportunities, benefitting the participants and the market.

Council could play a role in working with the electricity distribution networks and the community to establish a community renewable energy project and, to that end, will collaborate with the Darebin Energy Foundation.

47 https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM

6.3

6.3.2. Supporting policies

State

In 2016, the Victorian Government re-established a target of 25% renewable energy by 2020 and 40% by 2025.[48] While this is a step forward in one of the world's most greenhouse-intensive electricity supply systems, Victoria is well behind the targets of the Australian Capital Territory (100% renewable energy by 2020) and South Australia (100% renewables by 2030).

Federal

The Federal Government is failing to provide adequate market incentives to move to a zero carbon electricity network. The 2015 revised renewable energy target (RET) of 33,000 GWh (approximately 23.5%) by 2020 will play a part in increasing renewables until 2020. As the RET concludes in 2020, this mechanism will not drive long-term electricity emissions reductions let alone elimination.

6.3.3. Darebin and renewable energy

Unaffordable electricity and gas bills are one of the greatest causes of rental arrears in Victorian low-income households.[49] Solar panels reduce electricity costs, so are especially beneficial for such households. However, low-income and pensioner households are often unable to install solar panels due to the high up-front cost, or because they are living in rental properties.

Darebin Solar Saver, Solar Bulk Buy programs and the installation of solar on Council buildings have contributed to 10% of the installed solar in Darebin up to 2016.[50]

Council can continue to play a key role in facilitating resident and businesses installing solar PV through programs such as Solar Saver (a rates-based repayment scheme), supporting environmental upgrade agreements (EUAs) and bulk purchasing programs.[51]

Community energy

Approximately 30% of Darebin residents live in rental accommodation, and many businesses operate from leased premises. Solar PV is fixed to the roof of a property and consequently becomes the property of the owner. It is tenants who typically pay the electricity bills and who would benefit from reduced electricity costs through the installation of solar PV. Under current electricity market conditions, there is little incentive for a property owner to pay to install solar for the benefit of a tenant.

48 https://www.energy.vic.gov.au/renewable-energy/victorias-renewable-energy-targets

49 http://sydney.edu.au/news/84.html?newsstoryid=9874

50 675 households, businesses and council buildings resulting in approximately 2,000 kW of solar PV.

51 EUAs are a council-based mechanism to help businesses access funding for building works to improve energy efficiency, reduce waste and cut water use.

6.3

A significant number of Darebin residents live in multi-storey higher density accommodation with limited solar access. There are many homeowners who simply do not have suitable solar access due to shading by trees or buildings.

Community energy projects around the world allow residents to purchase a share in a renewable energy project and then buy their energy from that project.

Purchasing of renewable energy

There is a range of existing and emerging market options to purchase and/or create new renewable energy. Examples include

- GreenPower (electricity supplied by a retailer who purchases Large-scale Generation Certificates (LGCs) from renewable energy generators additional to the National RET)
- local electricity trading / virtual net metering on a small / local scale (in which an electricity customer with on-site renewables is allowed to assign their 'exported' electricity generation to other site/s, instead of claiming the FiTs)
- power purchase agreements with a retailer or a generator to create new renewables
- organisations building their own offsite large scale renewable generator (trading the power into the market and offsetting their own consumption against this)
- joining with a number of similar organisations to purchase renewable power directly (see Melbourne Renewable Energy Purchasing Group on opposite page).

GreenPower increases the amount of renewable energy built and generated above the Renewable Energy Target (via provision of LGCs) through a thoroughly audited process.

Some of the emerging purchasing models address hedging of future pricing, greater flexibility, and potentially cheaper renewable energy. Many of these rely on virtual net metering – the mechanism provided by a retailer whereby renewables generated on one site can be netted off the bills of other sites. Unfortunately, as of 2017 no Victorian electricity retailers have come forward to offer this, partly due to the large initial cost. However, in New South Wales, some projects are going ahead.[52]

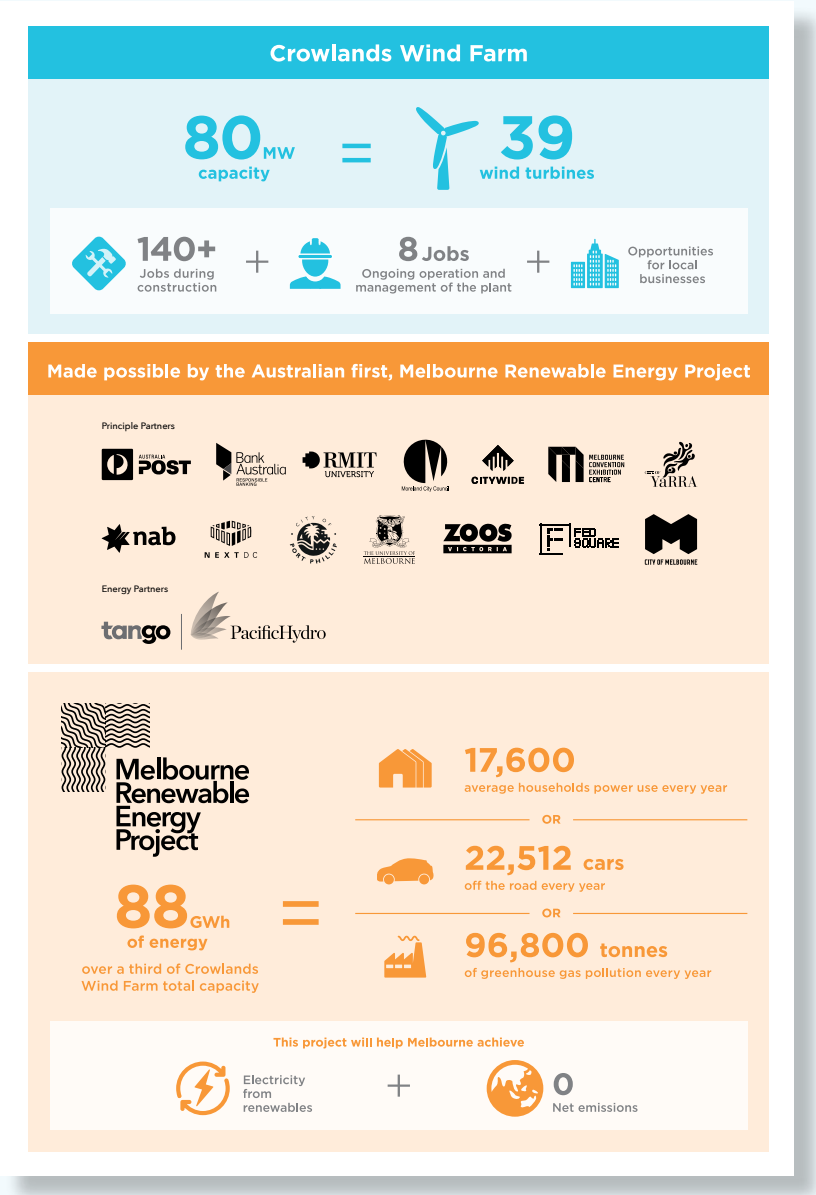
In 2016-17, purchasing GreenPower for Council's buildings cost more than $300,000. In the context of the urgent action required in relation to the Climate Emergency, these funds could currently be better spent on advocacy, local energy efficiency and renewable energy generation and exploring alternative renewable energy purchasing (see Melbourne Renewable Energy Purchasing Group, over page). To maximise the efficacy of its expenditure, Council could take advantage of energy efficiency (Victorian Energy Efficiency Certificates) and renewable energy (Small-scale Technology Certificates) credits. Council has also received a New Energy Jobs Fund grant to explore suitable mechanisms for renewable energy purchasing.

52 http://reneweconomy.com.au/byron-shire-to-be-first-in-australia-to-pilot-virtual-net-metering-74516/

6.3

Melbourne Renewable Energy Purchasing Group

Four councils (City of Melbourne, Yarra City Council, Port Phillip City Council and Moreland City Council) and a number of other large organisations and businesses have formed a purchasing group that will go to tender for a retailer/developer to deliver renewable energy over the long-term. This provides price certainty for both the retailer/developer and the consumer. They will purchase 88GWh of energy from new large-scale renewable energy facilities. The power purchasing agreement will be long-term, and the councils will have 100% of their electricity use supplied through this agreement. The main aim of this project is to drive new investment above and beyond the Renewable Energy Target.



For more information see: http://www.melbourne.vic.gov.au/business/sustainable-business/Pages/melbourne-renewable-energy-project.aspx

6.3

6.3.4. Objectives and Action

OBJECTIVES

1. Speed the switch of the Darebin Council and community to 100% renewable energy use
2. Increase solar PV on rooftops across Darebin
3. Switch from gas to renewable electric power
4. Influence state and federal governments with a view to phasing out fossil fuels and switching to 100% renewable energy.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Install solar PV on Council properties and infrastructure	2017-2022	> Install 440kW of solar PV on council buildings over the next 5 years. Review this target with a view to expanding it, based on the roof space available, changes in battery pricing, whether local electricity trading/Virtual Net Metering becomes available, and in light of the new feed-in-tariff.
Purchase renewable energy	2017-2018	> Actively explore with NAGA, other alliances and Councils the prospect of purchasing renewable energy through one of the emerging models available to Councils.
	2017-2022	> Reallocate current funds required for GreenPower purchase ($300,000) to more strategic action and review if impact or pricing changes.
Phase out natural gas use from Council buildings	2019	> Develop a natural gas exit strategy for Council's existing buildings. > Ensure any new Council buildings being built will be gas-free.
Advocate for Government action and support	2017-2022	> Advocate for actions in the 'What do we need others to do?' section.

6.3

Council supporting the community

Strategies	Timeframe	Actions
Double the installation of solar PV in Darebin through residential, school, business and community energy programs from 19,000 kW to 38,000kW by 2022	2017-2019 & 2020-2022	> Deliver an expanded Solar Saver Program to install 11,000kW solar on homes, organisations, schools and businesses, including community energy projects over 5 years. The program is proposed to be delivered over two cycles. > Deliver a Solar Bulk Buy Program – 1000 households and businesses over 5 years
	2017-2022	> Deliver a Solar Program for 20 businesses at 250kW through Environmental Upgrade Agreements.
Explore options for solar + battery programs and residential energy efficiency retrofits through rates schemes and Bulk Buys.	2019-2022	> When the economics, technology and market signals are appropriate, explore how Council can encourage the uptake of batteries potentially through an extended Solar + Battery + Energy Efficiency Retrofits Bulk Buy program.
Support community-owned renewable energy projects.	2018-2020	> With Darebin Energy Foundation, explore options for supporting local community-owned renewable energy projects.
Promote switching from gas to electric appliances	2018	> Provide information to promote switching from gas to electric appliances.
	2018-2022	> Explore hosting a 'Get off gas' bulk-buy program for hot-water heat pumps, reverse-cycle conditioning and induction stove tops for households and businesses.

6.3

What do we need others to do?

Darebin community

- When buying electricity, buy 100% renewable (Government-approved GreenPower).
- Install solar PV at home, work, school and on community facilities
- Install supporting battery technology if feasible and appropriate
- Real estate agents: encourage landlords to provide comfortable, low-cost, marketable homes by installing on-site renewables
- Help facilitate community-owned renewable energy projects for those who rent or have limited solar access
- Advocate for 100% renewable energy in the electricity grid.

State Government

- Adopt and reach 100% renewable electricity targets at emergency speed
- Consider solar access rights or appropriate compensation mechanisms
- Streamline grid connection regulation and costs and recognise the benefits of de-centralised energy
- Ensure fair solar feed-in-tariffs
- Fund and support local government and community renewables projects.

Federal Government

- Extend the Renewable Energy Target beyond 2020 and establish a new goal of 100% renewable energy at emergency speed
- Together with COAG, establish a nationwide minimum and fair solar feed-in-tariff for all solar households
- Together with COAG amend the National Electricity Rules and other regulation to:
  - mandate energy efficiency, greenhouse gas emissions elimination and climate change considerations
  - facilitate community renewable energy market participation and the facilitation of local energy trading (Virtual Net Metering) across boundaries and sites
  - Introduce changes to the NEM that support capacity market mechanisms for wholesale electricity
  - Consider ‘5-minute pricing’ for the National Energy Market (NEM) rather than the current 30-minute pricing, which excludes battery and fast responding technologies
  - Ensure genuine community benefit in market changes
- Facilitate, fund and support local government and community renewables projects
- Streamline grid connection regulation and costs, while recognising the benefits of decentralised energy.

6.4

Key direction # 4 – Zero emissions transport

6.4.1. Context

Transport is a growing cause of carbon emissions, as about half of Australia's emissions from transport come from cars.[53] As part of our Climate Emergency Plan we have to tackle transport and eliminate the emissions associated with it.

In Darebin, 15% of the community's emissions are from transport, compared to the Australian average of 18% of emissions from transport.[54] As a third of trips made by Darebin residents are less than five km, there is a huge opportunity to support walking and cycling to eliminate these emissions. Encouraging car sharing and low/zero emissions vehicles for the remaining journeys that need a vehicle will further reduce our emissions.

Australia is ranked last out of 16 major OECD countries for energy efficiency in the transport sector,[55] and has the ninth-highest transport emissions per capita in the world.[56] Of the global car market, 80% is covered by mandatory light vehicle CO2 emissions standards. Unfortunately, the Australian market is not. This risks Australia becoming a 'dumping ground' for polluting cars not permitted in other car markets.[57]

Electrification of transport

New Zealand has announced a target of doubling the number of electric vehicles on their roads every year, aiming for 64,000 electric vehicles by 2021.[58] The Norwegian parliament has set a goal that all new cars sold in Norway will be zero (electric or hydrogen) or low (plug-in hybrids) emissions by 2025.[59] France and the UK have decided to ban internal petrol and diesel vehicles by 2040.[60]

The most effective way to decarbonise transport is to reduce private vehicle use as much as possible, and change the fuel we use – moving from fossil fuels to electrification and renewable fuels. This goes hand-in-hand with eliminating the emissions of our electricity supply by switching to renewables.

Electrification of transport is a critical step in order to eliminate Council's and the community's transport emissions. Electric vehicles produce no tailpipe emissions and have lower lifecycle emissions.[61] The Victorian Government ran a trial of electric vehicles in 2012.[62] The Victorian Government provides minimal support for electric vehicles, with a small registration discount of $100 for hybrid and electric vehicles.

53 https://www.environment.gov.au/system/files/resources/9437fe27-64f4-4d16-b3f1-4e03c2f7b0d7/files/aust-emissions-projections-2016.pdf

54 https://www.climatecouncil.org.au/transport-emissions-and-climate-solutions

55 The Path Forward for Electric Vehicles in Australia, 2016

56 https://www.climatecouncil.org.au/transport-emissions-and-climate-solutions

57 Ibid. Countries and regions as diverse the United States, Europe, Japan, Korea, China, India, Canada and Mexico have standards in place

58 ReNew Issue 138

59 http://www.thedrive.com/news/7917/norway-doubles-down-on-plans-to-make-gas-cars-obsolete-by-2025

60 https://www.theguardian.com/politics/2017/jul/25/britain-to-ban-sale-of-all-diesel-and-petrol-cars-and-vans-from-2040

61 http://www.theicct.org/electric-vehicles

62 http://economicdevelopment.vic.gov.au/__data/assets/pdf_file/0004/1092568/Electric-Vehicle-trial-mid-term-report.pdf

6.4

Sustainable transport

Locally, it is important to provide infrastructure and support for walking, cycling and public transport, to ensure our community has viable, attractive travel options other than cars. Car sharing services provide an efficient way of using cars and car sharing programs have demonstrated success in reducing private car ownership.[63] To help car sharing to succeed, it needs to be integrated with high-quality public transport (for the regular commutes to work) and located where there is a higher residential and commercial density, and a good pedestrian and cycling environment.[64]

Australia has a low ratio of spending on public transport, with only 50c spent on public transport for every $1 spent on roads.[65] Research has found, however, that where investment is directed away from roads and parking and towards public and active transport, equivalent mobility can be achieved, while also reducing overall public and private spending on transport and reducing greenhouse gas emissions.[66] New public transport infrastructure in the form of the Gold Coast Light Rail recently led to a 25% increase in public transport use on the Gold Coast, with 6.18 million trips taken in its first year of operation.[67]

63 Over 1000 Cars and No Garage: How Urban Planning Supports Car(Park) Sharing; Jennifer Ken and Robyn Dowling in urban Policy and Research, 2016, Vol 34, No 3. Pp.256-268. http://rsa.tandfonline.com/doi/abs/10.1080/08111146.2015.1077806

64 Ibid

67 https://www.climatecouncil.org.au/transport-emissions-and-climate-solutions

68 https://www.climatecouncil.org.au/transport-emissions-and-climate-solutions

69 Ibid

6.4

Benefits of zero-emission travel

Social, health and economic benefits of a sustainable transport system

As carbon emissions are reduced by lowering the emissions in our transport system, some added benefits include:

REDUCTION OF AIR POLLUTION

As car use is reduced and the fuel that is used is decarbonised, this process often leads to lower amounts of other air pollutants such as nitrous oxide and particulates. It's been estimated that there are around 3000 deaths a year in Australia that are attributable to air pollution *(Environmental Justice Australia, 2014).*

INCREASED ROAD SAFETY

As more people walk and ride bikes there is a corresponding increase in the awareness of how to drive safely around people who are walking and cycling.

PHYSICAL HEALTH BENEFITS OF ENABLING MORE WALKING AND CYCLING

In 2008, it was estimated that the total economic cost of physical inactivity to the Australian economy was $13.8 billion each year *(Medibank Private (October 2008): The cost of physical inactivity).*

SOCIAL EQUITY IN MOBILITY

14% of Darebin households do not have a vehicle (compared to 9.5% for Melbourne) *(ABS 2011 census)*, so for Darebin residents in particular, improving non-car forms of transport will be beneficial for a larger proportion of our population and increase accessibility to daily needs.

ECONOMIC BENEFITS OF REDUCING TRAFFIC CONGESTION

The annual avoidable cost of traffic congestion in Australian cities will rise to over $20 billion by 2020 *(Commonwealth of Australia BITRE (2007): Estimating urban traffic and congestion cost trends for Australian cities, Working Paper No.71 p92).*

6.4

6.4.2. Supporting policies

Local

Going Places – the Darebin Transport Strategy 2007-2027 seeks to create sustainable, accessible travel for Darebin residents, and guides Council action on transport in Darebin. This is complemented by the *Darebin Safe Travel Strategy 2010-2015, Darebin Cycling Strategy 2013-2018*, the *Car Sharing Policy 2015*, and will be joined by a *Walking Strategy in 2017*.

Aims include increasing the proportion of trips made by walking, cycling and public transport. This will reduce the trips made by car, and thereby reduce our carbon emissions despite the expected growths in population and travel.

State

Plan Melbourne is the Victorian Government's metropolitan planning strategy, guiding how Melbourne will grow and change to 2050. This provides a long-term vision for housing, increasing jobs and liveability, integrating public transport and infrastructure and addressing climate change in Melbourne. It was published in 2014, but is currently being refreshed following further public consultation.

The *Refresh Discussion Paper* published in 2015 prioritises a number of rail projects with significance for Darebin: the Melbourne Metro Rail project, removal of level crossings, and the Mernda Rail Extension project. In addition, funding has been allocated for cycling and walking, led by a new body, Active Transport Victoria. The concept of 20-minute neighbourhoods is continued, supporting the Darebin Transport Strategy objective to support local living to reduce the need to travel long distances to access daily needs.

In January 2017, the Victorian government announced that all trams in Melbourne will be run on 100% renewables from a large-scale solar farm by the end of 2018, resulting in a reduction of more than 80,000 tonnes of greenhouse gas emissions every year. Two tram routes run through the Darebin municipality, so thousands of residents and workers will benefit from emissions-free travel.

In addition to this, the Victorian government has committed to a renewable energy target of 25% by 2020, and zero net emissions by 2050.

Federal

The Australian Government *Urban Transport Strategy 2013* acknowledges transport is an integrated system that needs long-term planning.

The federal government consulted on a vehicle CO2 emissions standard in December 2016-March 2017. The consultation paper set a 2020 start time and proposes three possible standards. The most stringent standard still leaves us lagging four years behind the EU by 2025, so nothing below this standard would be adequate.

6.4

What does a zero emissions transport system look like?

- Walking and cycling are prioritised in planning, making both safer
- Good, reliable, affordable public transport is available
- Planning policies will ensure jobs, amenities, essential services, shops are accessible by zero carbon forms of transport
- Personal transport use is lower, with electric cars forming the majority of car sharing (car clubs, car next door, ride share).
- Transport by car is powered by renewable energy. Charging points are a standard part of new developments, there is on-street charging for those who don't have private car space, plus rapid charging and battery swap at convenient locations.
- The majority of freight is transported by zero-emissions rail services, the rest on zero-emissions vehicles.
- Increased sourcing of local materials in the products we buy means freight has less distance to travel.
- More working remotely and flexible work patterns to reduce the peak time commute.

6.4.3. Darebin and Zero emissions transport

Between 2006 and 2011 there was a 34% increase in the share of walking, cycling and public transport journeys to work in Darebin,[68] and private vehicle kilometres per person decreased by 32% between 2007 and 2009.[69]

Bike use increased by 130% between 2006 and 2012 in Darebin;[70] however, only 4.3% of the employed population travel to work by bike,[71] so the potential to increase the shift from cars (54% of travel to work) to bikes is significant. Cycling has become safer due to increased infrastructure, such as supporting cycling on and off roads, addressing gaps and known conflict points on popular on-road routes, and as a result of training to increase riders' skill, knowledge and awareness.

In Darebin, 78% of households own at least one motorised vehicle, with vehicle ownership increasing between 2006 and 2011. Over the period 2012-14, 74% of kilometres travelled by residents of Darebin were by car.[72]

Building on the consistent annual investment in walking infrastructure around key destinations in Darebin over many years, a Principle Pedestrian Network has now been developed to prioritise future works. The focus will continue to be on works that make it safer, easier and more pleasant to walk, including improving footpaths in activity centres, providing pedestrian crossings on busy roads, increasing greenery on walking routes and upgrading links to public transport and other popular destinations.

68 Australian Bureau of Statistics, Census Journey to Work 2011
69 VISTA 2009
70 Darebin Council Super Tuesday counts 2006 to 2012
71 ABS Journey to Work data, Census of Population and Housing, 2011
72 VISTA 2012-14 provisional figures

6.4

To encourage behaviour change towards sustainable forms of transport, Council runs and facilitates a number of activities and programs including providing a bike valet at our festivals, bike rides as part of Music Feast, support for organisations to run Ride to Work Day events, and a program of activities for Walk to School Month.

A number of car sharing approaches are available for the Darebin community – Car Next Door provides a peer-to-peer service, a variety or ride/lift share services allow individuals to arrange to share individual trips, and membership of a car share company gives the ability to hire a car locally for discrete journeys. These services all reduce the need for private car ownership, and in doing so address issues around parking demand, and reduce the number of vehicle trips made. There is an increasing demand in the community for car share, so during 2016 Council installed 15 new car-share spaces in Darebin.

According to electric vehicle infrastructure-mapping website plugshare.com, there are two publically available charging points in the Darebin municipality – one a fleet provider in Preston, and the other at Melbourne City Football Club in Bundoora (La Trobe University site).

The State Government is responsible for managing public transport and certain roads, including arterials, in Victoria. Council works with the relevant authorities to improve public transport access and facilities, and to seek improvements to public transport. Changes to State-managed roads are made through VicRoads.

Photograph: Brian Cohen

6.4

6.4.4. Objectives and Actions

OBJECTIVES

1. Reduce the number of private vehicle kilometers travelled in Darebin by increasing the share of public transport use, walking and cycling
2. Expand availability of car-share services in Darebin
3. Advocate for improved frequency and accessibility of public transport
4. Increase use of electric vehicles
5. Advocate for a zero emissions standard for each vehicle category as soon as zero emissions vehicles are available, and to fill the gaps in the mean-time advocate for the highest standard found in the large vehicle markets.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Upgrade Council's vehicle fleet with lowest emission vehicles	2017	> Review fleet policy for standard purchases to be hybrids or meet highest possible level of environmental standards
	2018	> Explore electric vehicle options for fleet
	2017-2022	> Partner with others to look at public charging options
	2017-2022	> Partner with others to explore electric car share options
	2017-2022	> Explore lower emission options for heavy fleet including electric and hydrogen fuel alternatives
Increase number of staff walking, cycling and using public transport for commuting and work trips	2017-2022	> Continue the Green Travel program, which incentivises staff to use sustainable forms of transport to commute > Continue to provide electric bikes/Myki cards for work travel
	2017-2022	> Advocate for state and national government action and support

6.4

Council supporting the community

Strategies	Timeframe	Actions
Deliver behaviour change, education and marketing programs to increase the uptake of zero/lowest emissions modes of transport	2017-2022	> Continue to offer programs to increase the safety and confidence of children and adults riding a bike > Continue to create targeted programs supporting walking, cycling and public transport
Improve the walkability of our city, public transport nodes, interchanges and access to public transport services	2017-2022	> Implement Master Plans for JUMP (High Street Preston Junction), Thornbury, Fairfield Village Streetscape (Station Street), Reservoir streetscape and the Retail Activity Centres Strategic Review > Continue to audit and implement recommendations on the Principle Pedestrian Network
Create a cohesive and safe high-quality network of bicycle routes to key destinations including workplaces, schools, shops and services	2017	> Implement the remaining recommendations from the Darebin Cycling Strategy Technical Report to improve Key and Local Cycling Corridors
	2018/19	> Develop a new Darebin Cycling Strategy to encourage more cycling and make cycling safer
Support and collaborate with car-share companies to achieve an expansion of the car-share network	2017	> Mandate car sharing parking provisions for future master plans through a planning control as appropriate e.g. car-sharing spaces in lieu of car parking, or Development Contributions Plan
Increase uptake of electric vehicles in Darebin	2017-2022	> Specify conditions under which new developments are required to install electric vehicle charge conduits in new residential and workplaces developments
	First by end 2017	> Purchase and install public electric vehicle charging points

What do we need others to do to make this happen?

Darebin Community (households, businesses, schools, organisations, groups, etc)

- Create a safe and respectful environment for pedestrians and cyclists
- For shorter trips, try walking or cycling instead of driving
- When planning your journey, consider the public transport option instead of driving.
- Be an ambassador for zero/lowest emissions travel and share your travel choices with others
- Consider buying electric/lowest emissions vehicles when replacing a vehicle
- Consider using car share or ride-share services as an alternative to owning a car
- If you run a business or organisation, provide incentives for staff to use sustainable transport to get to work
- If you run a business or organisation, consider installing an electric vehicle charging point.

6.4

State Government

- Switch the electrified train system to 100% renewable electricity
- Cooperate and collaborate with councils across Melbourne on walking and bicycle projects to ensure consistency and continuity
- Lead the development of bicycle routes and fund bicycle infrastructure
- Increase the frequency, convenience and quality of public transport services for the whole community (especially to improve gaps in the north of the municipality) and facilitate high-speed rail services
- Update the planning scheme to require new developments to have features and facilities for sustainable transport modes, including home/business electric vehicle charging
- Update building regulations to support home and business electric vehicle charging stations
- Shift freight from road to rail
- Make bicycle education a key part of the school curriculum
- Support electric vehicles and facilitate the transition to electric vehicles through planning and resourcing of public charging infrastructure
- Introduce electric buses across the public transport system
- Ensure public transport is powered by renewable energy.

Federal Government

- Switch the electrified train system to 100% renewable electricity
- Fund walking and cycling infrastructure
- Fund and/or build a renewable energy powered fast rail system so the bulk of interstate air travel can be eliminated
- Build comprehensive electrified rail capacity for moving freight across Australia
- Prioritise funding of significant public transport infrastructure over road spending and invest in and facilitate interstate high-speed rail services
- Update Australian Standards to prioritise safety for walking and cycling
- Provide tax incentives for lowest emission vehicles e.g. fringe benefit tax exemption for lowest emission vehicles and remove tax incentives that encourage unnecessary driving and vehicle purchase
- Introduce vehicle CO2 emissions standards starting in 2018 that are at least equal to the best standard in the largest world car markets and as zero emissions vehicles become available for each vehicle segment lift the standard to zero emissions.
- Decarbonisse the electricity grid through committing to 100% renewable energy
- Develop an Electric Vehicle Strategy to increase the uptake of electric vehicles, provide confidence to the electric vehicle supply market and address regulatory and transition to electric vehicles issues.

6.5

Key direction # 5 – Consumption and waste minimisation

6.5.1. Context

The rapid depletion of the earth's resources and our waste problem are two sides of one coin: unsustainable consumption.

When we buy something, we tend to see the item itself. We don't see all the resources that went into making it: the water, energy, minerals, land and materials. We also don't think about what is going to happen to the item when we've finished with it, but everything we buy has environmental impacts 'upstream' (in its production and distribution before use) and 'downstream' (when it is recycled or sent to landfill). Sometimes there are also impacts as we use it (energy use associated with appliances, for example). Often small things have big impacts. For example, a single empty aluminium drink can requires 40-50 times its own weight in ore, water, chemicals, coal, and greenhouse gases to produce, while recycling a single can saves the same amount of electricity as a television uses in three hours. The energy associated with an item's production is known as its embodied energy.

Food is also a particularly important aspect of consumption, as it accounts for a relatively high percentage of the average Victorian's environmental (and carbon) footprint, and a high proportion of our household waste (see 'What's in Household Waste?' below).[73] Food contributes to a large range of environmental issues from greenhouse gas emissions to the pollution and depletion of land and water to reducing biodiversity, with beef and cheese having particularly high impacts.[74] The need to address the impact of food on the climate emerged as a strong theme in the community consultation process associated with the development of this plan.

Foods with a low environmental impact (like fruit, vegetables and grains) also tend to be the foods that nutritionists suggest we eat more of, while the most carbon-intensive foods are also the ones that, for our own health, we should minimise, as pictured below.[75]

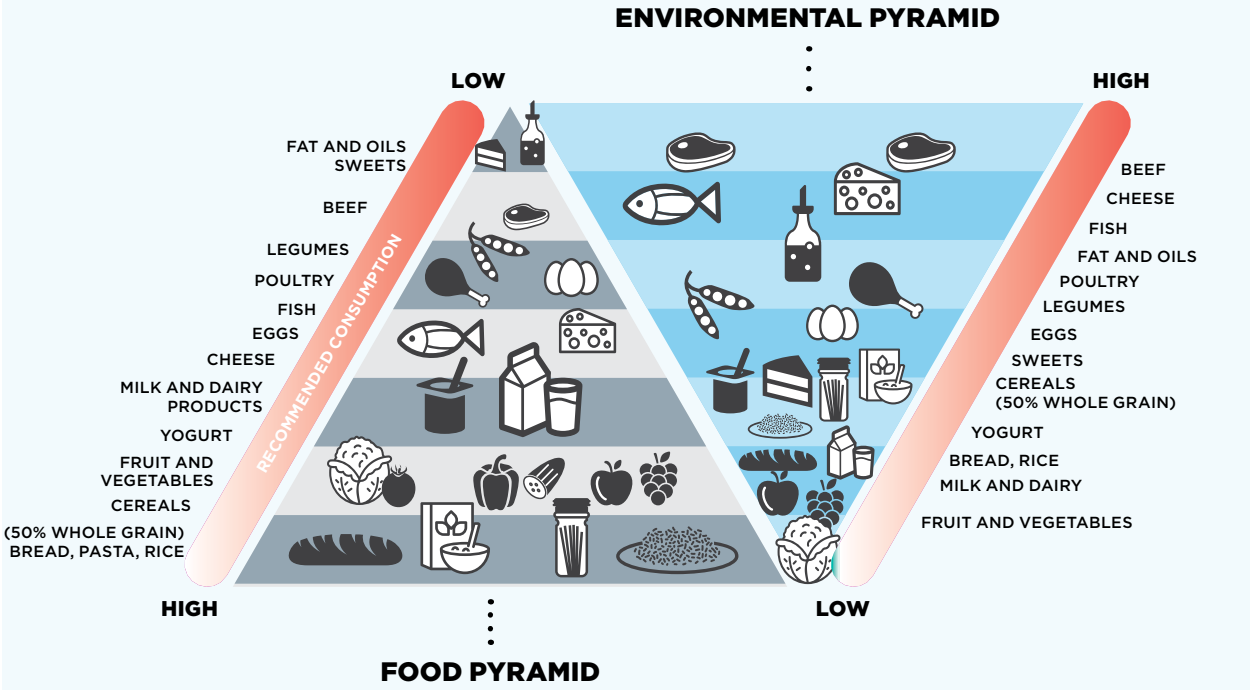
73 For a range of resources on food and sustainability see https://sustainabletable.org.au/.

74 http://environmentvictoria.org.au/wp-content/uploads/2014/03/One-Planet-Living-Report-2014.pdf

75 https://www.barillacfn.com/en/dissemination/double_pyramid/

6.5

Environmental/Food Pyramid



In Australia many of us buy, consume and waste far more than we need to lead happy and healthy lives, and more than the earth can sustain.[76] The Global Footprint Network estimates that as of the 2 August 2017, we had used more of the planet's resources than what can be replenished in an entire year.[77] In other words, we are consuming the natural capital of the earth, and there is an urgent need to reduce consumption to levels that are healthy both for us and the planet.

In Australia we often create unnecessary waste by buying things we don't really need, or not using things we have bought, or throwing something out because there is a newer model we prefer. For example, of every five bags of groceries brought into the average Australian home, the equivalent of one bag is thrown away unused.[78] Australians frequently upgrade to new appliances or clothes when there is nothing wrong with what they already have.

When food and other organic waste decompose in landfill, they release methane and other greenhouse gases. Approximately 2.8% of Australia's greenhouse gas emissions are from waste.[79] Nationally, greenhouse gas emissions from waste have declined, mainly due to more effective capture of the methane released.[80] However, waste is increasing, so we have a great opportunity to reduce waste going to landfill and related emissions.

76 https://theconversation.com/enoughs-enough-buying-more-stuff-isnt-always-the-answer-to-happiness-70703

77 http://www.footprintnetwork.org/

78 http://www.lovefoodhatewaste.nsw.gov.au/portals/0/kit/print/120437LFHWBenchmarkStudyColourPress.pdf

79 Department of Climate Change and Energy Efficiency, National Greenhouse Gas Inventory, 2010: http://ageis.climatechange.gov.au/

80 http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1370.0~2010~Chapter~Waste%20emissions%20(6.6.6)

6.5

Reducing consumption and waste, and managing waste better, are important parts of the response to the Climate Emergency because:

- we can avoid,eliminate or reduce production and transport emissions
- we can protect land, water and soils
- we can avoid or capture and use emissions from landfill
- it can make our actions more efficient and cost effective
- composting can be used to create healthy plants in urban areas, combating the urban 'heat island' effect, absorbing carbon emissions and offsetting emissions from the composting process.

6.5.2. Supporting policies

Local

The *Darebin Waste and Litter Strategy 2015-25* has a vision for Darebin to be a cleaner, more liveable and healthier place, with reduced litter and waste.

Council acknowledges that a Climate Emergency response needs to address the climate impact of food and will elevate the prominence of sustainable food both in our own policies and in our community education offerings.

There are several Council documents that include aims to reduce the climate impact of food.

- The *Urban Food Production Plan* aims to support the creation of local food systems in Darebin (as well as across other Melbourne urban and peri-urban areas and regional Victoria) to reduce reliance on globalised carbon intensive food systems
- The *Waste and Litter Strategy* addresses food wastage
- One of the guiding principles in Council's *Food Security and Nutrition Strategy* is to promote environmental sustainability through localised food production, sustainable food choices and food waste management strategies to support the future food security of the municipality against the impacts of broader factors such as climate change and peak oil.
  It also includes actions to:
  - Develop and implement a communication plan and social marketing campaign to promote healthy eating
  - Support community initiatives that increase food literacy around food purchasing, preparation, and nutritious and sustainable food choices.

State

State legislation is designed to implement the policy *Getting full value: the Victorian Waste and Resource Recovery Policy*[81] and the *Draft State-wide Waste and Resource Recovery Infrastructure Plan 2013-43*.[82] A significant change in the statewide policy is that there are no longer numeric waste diversion or resource

81 http://www.depi.vic.gov.au/environment-and-wildlife/sustainability/waste-management-and-resource-recovery/?a=182537

82 http://www.sustainability.vic.gov.au/~/media/resources/documents/our%20priorities/integrated%20waste%20management/swwrip/iwm%20draft%20swrrip%202013-2043%20-%20sections%201%20to%208%20-%20sept%202013.pdf

6.5

recovery goals, which have been commonly used since the early 1990s. The focus is now on optimising environmental, economic and social outcomes.

The *Metropolitan Waste and Resource Recovery Strategic Plan* articulates the long-term direction for resource recovery and waste management in metropolitan Melbourne. Darebin City Council is a member council of the Metropolitan Waste and Resource Recovery Group (MWRRG) and contributes to strategic development, technical input, education, projects and also participates in regional contracts. Council works with neighbouring and regional councils, MWRRG, Sustainability Victoria, EPA Victoria and others on waste minimisation and enforcement initiatives.

The Victorian Government's 'Love Food Hate Waste' program aims to raise awareness about avoidable food waste from Victorian households.

Federal

The *National Waste Management Policy: Less Waste, More Resources* was introduced in 2009.[83] The main practical implication of this policy for local government in Victoria is the development of national product stewardship schemes for greater recovery of items such as e-waste (electronic waste - (implemented), tyres (under development) and paint (proposed).[84]

The national waste policy sets a broad direction until 2020, again with no targets.

6.5.3. Darebin and Consumption and Waste

Consumption is a complex matter, as is the task of reducing it. Many of Council's environmental education programs, grants programs and other programs contribute to this task by building more capacity and self-reliance in our community, reducing both physical and psychological drivers for excessive or unsustainable consumption. Some of the specific ways in which we build this capacity include:

- fostering community-building skills and connectedness through grants, training and a variety of support for community groups and programs
- building the capacity of residents to produce and share food locally, decreasing dependence on global food systems
- deepening people's understanding of environmental issues, including consumption and waste, and enabling them to take action (e.g. through the Sustainable Homes and Communities Program)
- celebrating groups and individuals and initiatives for their achievements in sustainability (e.g. through the biennial Sustainability Awards)
- providing alternatives to buying new things (e.g. through the Darebin Libraries, where not only books but many other resources can be borrowed, and the Resource Recovery Centre, where useful items are diverted from landfill and are available to purchase second-hand).

83 https://www.environment.gov.au/protection/national-waste-policy

84 http://www.environment.gov.au/protection/national-waste-policy/product-stewardship/legislation/product-list-2016-17

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Council will also look for opportunities to strengthen the theme of making our consumption patterns sustainable throughout all of our environmental education activities.

Through Council's new Strategic Advocacy Framework we will also develop an advocacy response to the Climate Emergency, including exploring opportunities for an engagement campaign specifically addressing consumption.

Waste to landfill from Council's waste collection accounts for 1% of Darebin's community emissions. Although a small amount, there are many opportunities to reduce emissions and gain other financial and environmental benefits from reducing waste in Darebin. The waste for commercial, industrial and construction activities, collected privately has not been able to be quantified and is not included in this report. Key Darebin industries such as manufacturing, retail trade, accommodation and food services are notably high waste generators. Council's 'Sustainable Leaders in Manufacturing' program is working with businesses to reduce waste.

Council's kerbside waste and recycling services are focused and designed around kerbside collection for residential properties. These services are provided to more than 60,000 households. Darebin currently provides limited services based around the residential services model to non-residential premises including businesses, schools, public buildings and recreational reserves.

Darebin is part of a waste landfill contract put together by the Municipal Waste and Resource Recovery Group (MWRRG), together with 28 local councils in the region. Darebin's kerbside waste currently goes to landfill, and is reportedly one of only two Melbourne landfills accredited to ISO 14001 Environmental Standards. It focuses on producing alternative energy, landfill rehabilitation and protection of groundwater. The landfill recirculates its leachate back into the waste, resulting in a significant amount of methane gas generated; however, 85% of methane generated at the site is captured and used to produce electricity. The landfill has conducted a Carbon Footprint study which indicates that it has a better greenhouse gas performance than many high-technology disposal systems. The 85% capture at the site is well above the national average which was 28% in 2008.[85]

85 http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1370.0~2010~Chapter~Waste%20emissions%20(6.6.6) – emissions from landfill

6.5

In 2013 a Darebin waste audit of 300 waste trucks was carried out to identify the contents of a typical household waste bin. The audit showed that 43% of materials currently going to landfill are recyclable or compostable. There is a huge opportunity here to ensure waste gets treated in a way that has lower carbon emissions by correctly separating it.

Reducing green and food organic waste by avoiding creating the waste or composting on site is the best option. As more than 40% of waste in a household waste bin is food and garden waste, at-home composting, worm farming or similar offer potential significant opportunities.

Outlook Environmental, a social enterprise, manages the Darebin Resource Recovery Centre (DRRC) under contract to Council and has a contractual obligation and commercial incentive to recover materials where they can. This means that materials which can be recycled more cheaply than the cost of sending them to landfill are typically recycled. DRRC recovers approximately 40% by weight of materials coming onto the site with a residual 9000-10,000 tonnes of waste sent to landfill each year.

In council operations, the most recent 2012/13 audit of Council's Preston municipal offices indicated that 80% of waste (by volume) was diverted from landfill. Expenditure on environmental goods as a percentage of total Council expenditure increased to 21% in 2013/14, showing that this approach is having some effect, but there's still room for improvement.

What's in household waste?

- Food makes up a large proportion of waste. In Darebin, food waste is around 38% by weight and almost all of this food waste (92%) is home compostable. This high proportion of food waste is despite Council promoting at-home management of food and more than 40% of Darebin households reporting that they use compost bins or worm-farms.
- Compostable garden waste in Darebin's waste bins contributes a further 4% by weight to the waste stream. This garden waste could be recovered through the existing green waste recycling bin service. This is only about half the amount of garden waste found on average in metropolitan Melbourne's kerbside waste, reflecting Darebin's high uptake of the green waste recycling service (over 60% of households use the service).
- Just over 10% of the contents of Darebin's waste bins are comprised of recyclable paper, plastics and packaging containers. This is well below the metropolitan average, reflecting high kerbside recycling rates in Darebin.
- One audit suggests as much as 8% by weight of waste is comprised of nappies. This is consistent with audits in similar areas that found nappies make up between 5-10% by weight of the household waste bin.
- Overall, around 50% of Darebin's kerbside waste could be recycled instead of being sent to landfill by home composting, using household recycling bins and green waste recycling bins.

6.5

6.5.4. Objectives and Actions

OBJECTIVES

1. Reduce consumption to sustainable levels.
2. Reduce consumption of carbon-intensive foods.
3. Reduce the amount of waste to landfill overall.
4. Divert food waste from landfill.
5. Reduce contamination of green waste and recycling.
6. Divert recycling from landfill.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Enable and support council staff to reduce their waste and consumption	2017-2022	> Continue to expand waste and recycling practices throughout Council buildings and venues > Embed strong environmental procurement practices to reduce waste creation > Continue to reduce waste from council operations > Continue actions to reduce council's paper use > Continue to implement education on waste minimisation through staff programs, with a stronger emphasis on avoidance (i.e. reducing consumption in the first place).
Advocate for Government action and support	2017-2022	> Advocate for actions in "What do we need others to do section"
Embed avoidance of consumption and minimising carbon-intensive products (including food)	2017-2022	> Through the organisational review of all Council programs and policies embed: – questioning and where possible avoiding consumption – specifically reducing consumption of carbon-intensive products (including food) – providing more vegetarian and other sustainable catering options at Council-run events.

6.5

Council supporting the community

Strategies	Timeframe	Actions
Place a stronger emphasis on reducing consumption (including carbon-intensive foods) through existing environmental education programs (see also Key Direction 8)	2017-2022	> Give greater explicit prominence to reducing consumption (including carbon intensive dietary choices) in existing programs such as the Sustainable Homes and Communities Program, Sustainability News and other programs.
	2017-2022	> Give consideration to how education and promotion around lowest carbon dietary choices can best be effected, building on our existing food-related strategies. Consider introducing a specific program/campaign on reducing high-impact choices (e.g. Meat Free Mondays) as part of the Environmental Education Program.
	2017-2022	> Consider updating and relaunching the Budget Bites booklet and pocket guide and / or promote other sustainable food guides.
	2017-2022	> Explore possibilities for consumption-related advocacy and engagement through Darebin's Strategic Advocacy Framework.
Prompt the community (households, businesses, schools and other organisations) to engage in waste avoidance and reduction, divert recycling from waste, and reduce contamination of recycling bins	2017-2022	> Undertake waste and recycling audits to provide data on waste and recycling behaviours and inform contamination education programs > Continue to provide prompt and efficient information on waste reduction and recycling options to the community > Develop and implement community engagement programs on reducing waste and maximising recycling > Continue to provide the community with options for hard waste collections that separate recyclable materials > Progressively replace larger and obsolete waste bins with 80L bins as standard > Partner with agencies such as MWRRG, Sustainability Victoria and EPA Victoria in community programs, grants and other opportunities to reduce waste creation > Develop and implement options for identifying, educating and potentially penalising those who misuse waste and recycling systems > Investigate waste service charges or incentives to discourage waste generation.
Improve recycling	2017-2022	> Continue to introduce a wider range of recycled materials at the DRRC.
	2018-2020	> Develop a best-practice recycling contract to provide service excellence for resource recovery for the Darebin community.
Reduce food waste to landfill	2018-2020	> Investigate providing food waste service options to residents.
	2017-2022	> Continue to encourage residents and businesses to reduce food waste through avoidance, home composting systems and participation in programs / workshops.

6.5

What do we need others to do to make this happen?

Darebin community (households, schools, businesses, organisations, groups)

- Reduce the amount of waste produced by reducing unnecessary consumption and avoiding excessive packaging
- Get informed about the ecological footprint of food choices and their carbon intensity
- Reduce food waste and compost food scraps in your own compost bin or a community composting project
- Get information from Council on what can be recycled and ensure you're disposing of waste in the correct bin
- If you run a business or organisation, participate in Council's recycling service (two bins for a one-off fee) or arrange private recycling collection services if you need more
- If you run a business that produces food scraps, compost these or organise a private food waste recycler to collect these.

State Government (including MWRRG)

- Undertake feasibility studies and provide funding for innovative waste projects
- Provide support and solutions for eliminating waste to landfill
- Facilitate the transition to organic waste collection services where feasible, incorporating food waste, biochar and waste to energy projects
- Adopt and enforce the highest levels of resource recovery before landfill and energy recovery from landfill as specifications in regional waste contracts
- Provide a greater focus and increased spending on waste avoidance and elimination education, information and programs
- Introduce a ban on plastic bags.

Federal Government

- Expand the product stewardship scheme (where those involved in producing, selling, using and disposing of products have a shared responsibility to ensure that those products or materials are designed and managed in a way that reduces their impact throughout their lifecycle, on the environment) to include more products.

6.6

Key direction # 6 – Fossil fuel divestment

6.6.1. Context

Fossil Fuel Divestment is a subset of ethical investment. It means removing investment from companies involved in the fossil fuel supply chain and the institutions that fund it. This can be most effective when linked with advocacy action urging the institution to stop investing in or funding fossil fuel projects. Essentially you are "letting your money talk".

In a Climate Emergency world, this approach makes sense on two levels. It aims to stop the extraction of fossil fuels by reducing available funds and it also recognises that screening investments for climate risk is good long term financial management. On the positive side there are more and more investment opportunities in climate-positive investments such as renewable energy.

6.6.2. Supporting policies

Local

Darebin Council supports the removal of investment assets including stocks, bonds, and investment funds from the fossil fuel supply chain, in an attempt to reduce climate change. Council has adopted a policy to guide how Council invests its funds to ensure that it does not support the fossil fuel industry directly and influences investment by financial institutions away from the fossil fuel industry.

This involves a positive screening approach for Council's investment with financial institutions to:

- actively invest with fossil-free financial institutions within the Darebin City Council Investment Policy parameters
- advocate for fossil-free financial institutions to improve their credit rating and financial rate of return.

Council has also written to Vision Super, Council's primary superannuation provider, asking them to outline what they will do in terms of fossil fuel divestment.

Council will continue to review divestment opportunities and share advocacy campaigns with other councils and organisations.

Other Governments and institutions

There are many other local governments across Australia who have taken divestment action. The Melbourne City Council, Moreland City Council, Yarra City Council are just a few neighbouring Councils that have committed to divestment. The Northern Alliance for Greenhouse Action and the Eastern Alliance for Greenhouse Action recently undertook a review of local government progress on divestment. They reported in May 2017 that "most progress to date has been confined to the investment of surplus council funds to manage cash flow requirements … Opportunities exist to divest other financial activities (including transactional banking services, council borrowings and employee superannuation funds)."[86]

86 «https://eaga.com.au/wp-content/uploads/Divestment-From-Financial-Organisations-Supporting-Fossil-Fuel-Industries-2017-05-10.pdf

6.6

To our knowledge the ACT government is the only higher level of government who has publically divested funds from fossil fuel companies.

There are many public institutions including Latrobe University who have divestment policies and this is a growing trend.

6.6.3. Objectives and Actions

OBJECTIVES

1. Stop extraction and supply of fossil fuels through divestment and advocacy.
2. Encourage others to act on fossil fuel divestment.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Fossil fuel divestment	2017	> Integrate Council's Investment Policy and Fossil Fuel Divestment Policy into one comprehensive policy.
	2017-2022 (all)	> Actively invest with fossil-free financial institutions within the Darebin City Council Investment Policy parameters > Advocate for fossil-free financial institutions to improve their credit rating and financial rate of return > Partner with relevant fossil fuel divestment campaigns > Encourage other local governments, organisations and institutions to act on fossil fuel divestment > Educate staff on their options for fossil-free superannuation.
Advocate for Government action and support	2017-2022	> Advocate for actions in 'What do we need others to do?' section.

Council supporting the community

Strategies	Timeframe	Actions
Create awareness about divestment and campaigns	2017-2022	> Provide information sessions on divestment and relevant campaigns.

86 «https://eaga.com.au/wp-content/uploads/Divestment-From-Financial-Organisations-Supporting-Fossil-Fuel-Industries-2017-05-10.pdf

6.6

What do we need others to do to make this happen?

Darebin community (households, businesses, schools, organisations, groups, etc)

- Be a conscious consumer – ask your financial institution what their policy is on fossil fuel divestment
- Consider switching your bank account if you are not satisfied with their answer, and if you are lucky enough to have investments or superannuation, switching these to a fossil-free or more ethical option. There are many resources to help you with this on the Market Forces website
- Consider joining campaigns that are looking to stop extraction of fossil fuels.

State Government and Federal Governments

- Commit to and implement fossil fuel divestment
- Phase out extraction and supply of fossil fuels in Victoria.

6.7

Key direction # 7 – Adaptation and resilience

6.7.1. Context

While we are taking action to avoid catastrophic climate change, it is vitally important to plan for the warming that is already occurring and that will continue to occur, even while Council and the community are taking action to eliminate emissions and take the excess carbon dioxide out of the air. Council will need to support the community to prepare for and adapt to the new conditions that a changing climate will bring.

Climate adaptation measures are required to protect Council's assets and minimise disruption to the local economy. Extreme weather events, storms and floods will impact on both public and private assets and infrastructure. This includes roads and associated infrastructure, power lines, water supply, public transport networks, buildings, parks, and open space.

What is the 'urban heat island effect'?

Heatwaves are a prolonged period of excessive heat. Climate change is expected to lead to more intense and more frequent extreme heatwaves in Victoria.[87] In urban areas, particularly the inner and middle ring Melbourne councils, the impacts associated with heatwaves are exacerbated by the absorption of solar radiation by buildings and infrastructure, leading to localised warming of the surrounding area. This is known as the urban heat island effect.

Urban form can play a significant role in influencing temperatures. Research by Nigel Tapper of Monash University highlights the significant contribution that even small areas of urban greening can make to surface and air temperatures during heatwave events.[88]

Trees can reduce temperatures by 2-3°C by providing shading and reducing ground surface evaporation.[89]

Increasing both canopy cover and density in locations and contexts which result in significantly cooler microclimates will reduce the effects of the urban heat island effect.

Multiply the benefits

Many adaptation strategies also reduce emissions, which provide the best value for money and most equitable solutions.

87 https://www2.health.vic.gov.au/public-health/environmental-health/climate-weather-and-public-health/heatwaves-and-extreme-heat

88 Tapper, N. (2014) Tackling Urban Heat. Professor Nigel Tapper's presentation at the City of Moreland (25 June 2014) on urban heat island effects.

89 Darebin Urban Forest Strategy 2013

6.7

Multiply the benefits – mitigation and adaptation

Actions which both reduce greenhouse gas emissions and support communities to adapt to new climate conditions may be more cost effective and deliver multiple social and environmental benefits:

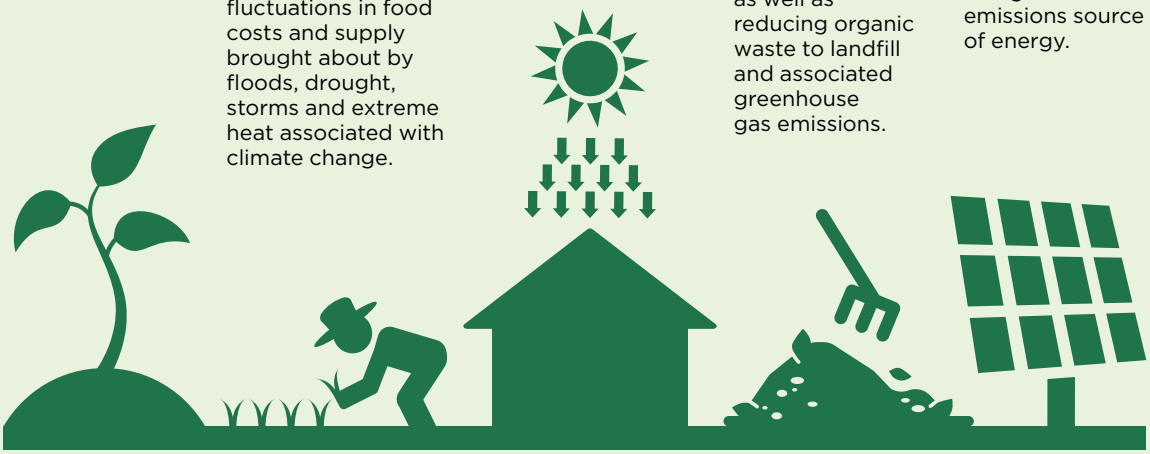
PLANTING
trees can reduce the severity of the urban heat island effect as well as absorbing carbon.

GROWING
and sourcing food locally can help reduce reliance on the greenhouse-gas-intensive globalised food system and help resilience to fluctuations in food costs and supply brought about by floods, drought, storms and extreme heat associated with climate change.

HOME INSULATION
both reduces the impact of heatwaves on occupants as well as reducing energy use.

RECYCLING FOOD WASTE
through composting provides compost for food growing as well as reducing organic waste to landfill and associated greenhouse gas emissions.

SOLAR PANELS
allow households to cool or warm their homes in a cost effective way, as well as being a zero emissions source of energy.



6.7.2. Supporting policies

Local

Many Darebin Council policies support our adaptation to the climate:

- A key strategic area of the *Heatwave Strategy 2013-17* is to reduce heatwave effects through urban design and maintenance. Planning for and managing issues of heatwaves will be incorporated into all Council policies and strategies concerning the Public Realm, Open Spaces, Parks and Leisure. The Heatwave strategy also seeks to encourage safe behavior during heatwave conditions and facilitate partnerships between care and emergency planning systems.
- *Watershed: Towards a Water Sensitive Darebin 2015-2025* commits Council to developing Darebin as a water sensitive city that values water and manages it wisely to enhance liveability, support a healthy environment and build resilience to drought and climate change. It includes water conservation, water quality and liveability targets. The Darebin drainage study which is currently being finalised complements the strategy.

6.7

- The *Urban Food Production Strategy 2014-18* aims to support the creation of local food systems in Darebin, as well as across other Melbourne urban and peri-urban areas and regional Victoria. The aim is to reduce our reliance on globalised conventional food systems which are highly vulnerable to the impacts of climate change and contribute significantly to greenhouse gas emissions worldwide.
- The *Open Space Strategy 2007-17* details a range of actions including sustaining partnerships to manage natural heritage sites, maintaining the ecological and recreational value of creek corridors, planning for open space contributions and engaging the community in assessing and maintaining open space quality. This strategy is being reviewed in 2017.
- The vision of the *Urban Forest Strategy 2013-28* is to create a healthy, diverse and resilient Urban Forest. The aim is to increase tree coverage on public lands in the City of Darebin to at least 25% over the plan's 15 years. Council will focus on planting species with a high tolerance for a range of climactic conditions, including increasingly hotter temperatures and more variable rainfall.
- The vision for the *GreenStreets Streetscape Strategy 2012-20* is also to create a healthy and diverse street tree population, as well as including water sensitive urban design (WSUD) and/or passive irrigation technology in at least 20% of all streetscape trees planted annually, increasing the percentage cover of permeable surfaces in the streetscape by 15% by 2020 and providing at least one new community garden facility each year until 2020.The *GreenStreets Streetscape Strategy* works hand in hand with the *Water Sensitive Darebin and Urban Forest* strategies to ensure trees in the public realm are adapted to a changing climate. For example, 100% of new or replacement trees planted by Council have either no irrigation requirements (beyond establishment), or can survive with passive irrigation, or irrigation from alternative water sources.
- Through the *Darebin Natural Heritage Strategy 2015-2025*, Council is committed to working with land managers and the community to value, nurture and care for our natural heritage assets for current and future generations. The impacts of a changing climate will be felt on natural heritage sites across Darebin. This needs to be taken into account when making decisions about re-vegetation programs and maintenance plans for natural heritage sites and creek catchments.

6.7

Darebin is also participating in the Resilient Melbourne Strategy. This is a metropolitan-wide strategy to enhance and improve the capacity of individuals, institutions, businesses and systems within metropolitan Melbourne to adapt, survive and thrive no matter what kind of chronic stresses and acute shocks they experience.

State

Victoria's Climate Change Adaptation Plan sets out the Government's four-year plan of action to help Victorian communities meet the challenges of the threat.[90] The Plan highlights the importance of a strong and sustainable partnership between state and local governments in dealing with the challenges of adapting to climate change in Victoria.

The Victorian Government *Better Apartment Design Standards* were implemented in the Victoria Planning Provisions and all planning schemes in March 2017. These give planners more say in multi dwelling apartment design, including mandatory minimum energy efficiency and open space requirements, such as the provision of trees / urban greening.

Federal

The *National Climate Resilience and Adaptation Strategy* sets out how Australia is managing climate risks for the benefit of the community, economy and environment. It identifies a set of principles to guide adaptation practice and resilience building, and outlines the Government's vision for the future.

90 http://www.climatechange.vic.gov.au/news/victorias-climate-change-adaptation-plan

6.7

6.7.3. Darebin and Adaptation

Of the nine Melbourne municipalities in the Northern Alliance for Greenhouse Action (NAGA) Darebin has been found to be among the most vulnerable to both flooding and heatwaves.[91]

The most disadvantaged and vulnerable in our community are those who will be most impacted by the effects of climate change (such as heatwaves, flood damage to housing and disruption to essential services) and the least equipped to adapt. Sections of Darebin's population are significantly more vulnerable to the impacts of heatwaves. These include older people (65 years and older), children under 5 years of age, pregnant or nursing mothers, people with pre-existing medical conditions, such as diabetes, heart disease or mental illness, and people with a disability. The risk is compounded in disadvantaged groups such as low income earners, people living in poorly insulated housing or without air conditioning, who are homeless or have limited access to transport. Preston and Reservoir, areas of high relative socioeconomic disadvantage,[92] also scored the highest heat related vulnerability index rating in a heat vulnerability study undertaken by Monash University in 2013.[93] Adaptation planning and action will need to specifically address the complex needs of these at-risk populations.

The impact of flooding and heatwaves on businesses can be severe and include lost revenue through the disruption of travel and movement of goods, decreased staff reliability and comfort, increased operating costs and reduced efficiency.

Council is working with Melbourne Water and the local community to reduce flood risk in Darebin, where nearly 5000 households are at risk.[94] Council will deliver, support and advocate for initiatives to increase permeability of ground cover, detain and reuse water on-site and provide drainage infrastructure to convey and slow flood water and reduce the likelihood of flood damage.

91 http://www.naga.org.au/uploads/9/0/5/3/9053945/adaptation_in_the_north_volume_1.pdf

92 Darebin Heatwave Strategy 2013. The SEIFA Index of Disadvantage measures the relative level of socio-economic disadvantage based on a range of attributes including income, low educational attainment, unemployment, and jobs in relatively unskilled occupations. East Preston and East Reservoir have high SEIFA disadvantage rating compared with Northcote, Fairfield and Alphington

93 https://www.nccarf.edu.au/content/spatial-vulnerability-analysis-urban-populations-extreme-heat-events-australian-capital

94 http://www.naga.org.au/uploads/9/0/5/3/9053945/adaptation_in_the_north_volume_1.pdf

6.7

Darebin has conducted a climate change risk assessment to identify the key risk areas and vulnerabilities and prioritise adaptive actions (*Climate Change and Peak Oil Adaptation Plan 2009*).

In response to a need for additional open spaces and natural environments, Council has committed to the policy principle of a net increase in green open space in Darebin. A Darebin Nature Trust will be formed in 2017 to ensure that green space provision parallels Darebin's growth and achieves best-practice outcomes for our environment and growing community.

There are limitations to Council's influence and impact on private tree coverage. In the northern areas of Darebin where the impact of the urban heat island effect has been assessed as more severe than other areas, the private canopy may well be decreasing as private landowners capitalise on increasing land values through subdivision and higher density developments.

Council faces a range of challenges in supporting healthy natural landscapes and trees. Urban soils are generally poor and compacted and may lack the necessary structure and microbial population to support tree health over the long term. Applying ecological solutions to managing weeds and disease will help optimise urban soil health and microbiology, which in turn supports climate and water-sensitive vegetation, healthy ecosystems and biodiversity. Many of Darebin's main parks and open spaces such as Darebin Parklands and All Nations Park are located on old landfill sites, which present additional challenges when maintaining and enhancing tree populations and natural landscapes, thus requiring site-specific approaches.

Given local government is on the frontline in dealing with the impacts of climate change, it has a key role in ensuring that the local context is adequately considered in the overall adaptation response and it involves the local community directly in efforts to facilitate effective change. Local government can advocate effectively to state and federal governments about the on-the-ground needs of local communities to inform an integrated overall response.

6.7

6.7.4. Objectives and Actions

OBJECTIVES

1. Minimise the urban heat island effect and the impact of heatwaves on Darebin's most vulnerable residents.
2. Create a flood and drought resilient city through integrated solutions to water management.
3. Create public open space that meet the diverse needs of the community and incorporates climate and water sensitive vegetation, healthy ecosystems and biodiversity.
4. Implement community-based local food systems which reduce reliance on the carbon-intensive global food system.
5. Enhance and increase the community capacity to support one another during extreme events.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Develop water systems to support a resilient city	2015-2025	> Reduce Council's annual potable water use > Increase Council's annual use of water from alternative sources > Reduce the number of assets and properties at risk of flooding.
Protect water for the environment and liveability	2015-2025	> Ensure all new or replacement trees use little or no water or can use alternative water sources for irrigation > Ensure all sports grounds, courts, fields, courses and areas have either warm-season grass, no irrigation needs, alternative water irrigation or are treated to reduce water use > Investigate/implement large scale stormwater harvesting and increase permeable surfaces to relieve flooding in high-risk areas > Implement programs and works to protect and improve the health of Darebin's waterways and waterbodies > Implement good urban design incorporating WSUD and ESD practices and principles.
Reduce the urban heat island effect	2017-2022 (all)	> Continue to implement Urban Forest and Green Streets strategies planting thousands of trees per year in parks and on nature strips to increase the canopy to over 25% > Promote and encourage Green roofs, walls and facades > Implement legislation and programs to protect significant trees > Review the Open Space Strategy > Work with federal and state governments, electricity distribution companies and developers to develop underground electricity supplies to protect tree canopies.
Work with other local governments on regional resilience projects	2017-2022	> Contribute to and participate in the metropolitan wide Resilient Melbourne Strategy.
Advocate for state and federal government action and support	2017-2022	> Advocate for actions in 'What do we need others to do?' section.

6.7

Council supporting the community

Strategies	Timeframe	Actions
Develop water systems to support a resilient city	2015-2025	> Work with State Government and others to support reduction of residential and business potable water use.
Develop a Water Smart Community	2015-2025	> Work collaboratively with agency partners, Councils, regional bodies and the Darebin community on water projects > Undertake education and information programs on water-smart actions and initiatives.
Apply adaptation standards to all new developments	2017-2022 (all)	> Implement minimum standards of energy performance, water efficiency, stormwater management and urban ecology as specified in GC42 ESD policy > Apply the DELWP *Better Apartment Design Standards* in the assessment of apartment building applications > Implement holistic and integrated adaptation actions in all Urban Renewal projects, including the Northland Urban Renewal Precinct and TW Blake Reserve Renewal > Apply principles of Food Sensitive Planning and Urban Design to urban renewal projects.
Support urban food production	2017-2022 (all)	> Identify suitable sites in pocket parks and other streetscapes that have the required resident support for fruit and nut trees > Explore opportunities to develop urban food production sites on Council land as demonstration sites for integrated food growing, water and waste management.
Reduce the urban heat island (UHI) effect	2017	> Establish Darebin Nature Trust to improve Darebin's open space provision and protect/enhance local biodiversity.
	2018	> Undertake tree canopy coverage assessment to determine change from 2012.
	2017-2022 (all)	> Continue to work with community, 'friends of' and stationeers groups and schools to increase tree coverage on public land > Educate and support residents and businesses to plant climate resilient trees on private land > Partner with educational institutions / universities to undertake / access research on new tree species suitable to Melbourne's changing climate and share with the community > Investigate partner programs that subsidise home retrofits for disadvantaged community members > Investigate feasibility of engaging a consultant to undertake a study of microclimates in key Darebin locations to validate the impact of adaptation measures designed to lessen the UHI effect during heatwaves.

6.7

Ensure community infrastructure can withstand the impacts of extreme weather events	2017-2022	> Continue to implement regional adaptation solutions through NAGA, in line with the 2015 NAGA Integrated Regional Vulnerability Assessment report findings and management actions.
Work with residents and businesses to provide practical advice and steps to adapt to climate change and minimise the impact of extreme temperatures	2017	> Run education programs on retrofit measures which will protect residents from heatwaves and extreme weather events.
	2017-2022	> Continue support to businesses to become more resilient through the Sustainable Leaders in Manufacturing (SLIM) and We are Greening our Business programs.
	2017	> Investigate joining the ASPIRE program to facilitate industrial ecology partnerships between/ across Darebin businesses as well as Melbourne more widely.

6.7

What do we need others to do to make this happen?

Darebin community (households, businesses, schools, organisations, groups, etc)

- Increase tree coverage, plants and food gardens on your property
- Support Council's street tree planting and other greening programs (for example, by participating in community planting days)
- Look after and plant out your nature strip (http://www.darebin.vic.gov.au/Darebin-Living/Caring-for-the-environment/Nature-Strips-and-Street-Trees)
- Share sustainable gardening knowledge, skills and resources with neighbours
- Invest in housing design features that minimise the impact of extreme temperatures e.g. home insulation, window shades, door and window seals, reflective/white roofs
- Grow more of your own food, or join a community food growing garden.

State Government

- Take into account the severity and frequency of climate change-induced flooding events when managing drainage, river flows and waterways
- Resource Melbourne Water to undertake flood protection works within the city to reduce the number of properties at risk of flooding
- Promote and encourage green roofs, walls and facades
- Introduce a mandatory energy rating scheme for all properties homes and businesses – required whenever a home or business is purchased / sold, rented or leased
- Recognise urban agriculture in the State Planning Policy Framework so it can be integrated in the Metropolitan Planning Strategy, and included in the Darebin Planning Scheme
- Review standards for tree clearing of powerlines in urban settings to improve canopy cover.

Federal Government

- Ensure well-resourced research into what is needed to adapt to climate change in different sectors
- Use climate resilience as a key factor when assessing funding bids for infrastructure projects.

6.8

Key direction # 8 – Engaging the community

6.8.1. Context

While the Plan has outlined programs that Council will undertake to support community action, Council are working more broadly to raise awareness of the Climate Emergency and the variety of ways the community can make a difference.

In 2013, just under half of Australians surveyed by the Climate Institute felt that the things they do on a daily basis contribute to climate change, and just over half felt that their daily actions can help address climate change.[95] Three years later, 68% of people thought individuals and households should be contributing to action on climate change and 72% are using energy-efficient devices in their homes. 85% see a product's environmental impact as quite or very important, holding equivalent status to price.[96]

Only 8% of people say they do not think climate change is occurring. Those who do think it's occurring went up from 64% in 2012 to 77% just four years later. The Australian public seem to be relatively aware. So why isn't more being done? 90% of Australians believe responsibility rests with the federal government to at least do part of the work to address climate change, with 67% thinking the federal government should take the leading role. And only 19% consider the Australian government to be doing a good job in this regard, with 33% viewing their performance as fairly poor or terrible.[97]

However, in many cases, the Climate Institute found people feel they are simply not given enough clarity about what they could be doing about climate change:

> "When I think of things about climate change, it's a big unknown. Everyone's an expert on these things and it's hard to know who to trust." – Brisbane focus group participant, 18-54 year olds

> "Perhaps what needs to be promoted is the action that we can take. I hear lots of news that is all about fear mongering. Tell me something that we can actually take action on. We hear about recycling and low-energy bulbs, but surely there's more that we can do."
> – Melbourne focus group participant, 25+ year olds

> "Oh, not again. I'm sick and tired of hearing about it. I'd like some simple, practical ideas."
> – Newcastle focus group participant, 55+ year olds

Local government can play a role in being a trusted organisation to support the community to take action on the Climate Emergency, whether it's finding the best deal on solar panels, improving cycling infrastructure, facilitating the community to share local solutions with each other or encouraging people to engage with state and federal governments.

95 http://www.climateinstitute.org.au/verve/_resources/TCI_ClimateOfTheNation2013_web.pdf

96 http://www.climateinstitute.org.au/verve/_resources/COTN_2016_Final_WEB_260916.pdf

97 Ibid

6.8

6.8.2. Supporting policies

All current Council strategies and policies supporting this plan have strategies that aim to promote action amongst individuals and organisations in Darebin. The Darebin Energy Foundation in the next section is a key initiative to support this. Additionally a Council Environmental Engagement Strategy is being developed and will outline strategies to engage the community in environmental action, including a strong emphasis on messages and actions in line with our Climate Emergency approach.

While not yet pursuing a climate emergency approach, the state government has committed to reaching net zero carbon emissions in Victoria by 2050, and as part of this they have launched a voluntary climate change pledge program for all Victorians called TAKE2.[98] It enables state and local government, businesses, community, educational organisations and individuals in Victoria to pledge their commitment to take action on climate change.

Living Sustainably: the Australian Government's National Action Plan for Education for Sustainability (2009) sets out a framework for national action.[99] It focuses on 'Demonstrating Australian Government leadership', 'Reorienting education systems to sustainability', 'Fostering sustainability in business and industry' and 'Harnessing community spirit to act'.

6.8.3. Engaging and supporting Darebin community action

Council is involved in a number of activities to engage the community in climate action. Our Sustainable Homes and Communities Program, run in partnership with Banyule Council for the last 11 years, empowers residents and community groups to lead and deliver positive environmental initiatives in their local area. As well as workshops and events, the Community Leaders in Sustainability course builds skills and training in project management, leadership, grant writing, marketing and communication, building partnerships, effective group work and covers a range of aspects of environmental sustainability. It results in participants developing and leading their own projects in their community. Some of these projects include:

- Utilising Google Maps community editing capability to integrate Darebin's bike routes
- WeCycle – retrofitting old bicycles and giving them to people who need them
- Speaking of Sustainability – a sustainability related toastmasters group
- Establishing a seed bank at Northcote Library Food Garden
- Establishing a community garden near the Bell St station

98 https://www.take2.vic.gov.au/

99 https://www.environment.gov.au/system/files/resources/13887ab8-7e03-4b3e-82bb-139b2205a0af/files/national-action-plan.pdf

6.8

Sustainability News provides emailed tips and advice to subscribers to help them reduce their impact, and promotes case studies of sustainable living and working.

Council events such as the Backyard Harvest Festival, the Homemade Food and Wine Festival and the Kite Festival provide residents with an engaging way of thinking about climate change issues. Weeding and revegetation activities provide residents with direct contact with nature.

Council runs networking events for the Green Business Network, and industry forums on sustainability. The business Solar bulk-buy program and LED light retrofits have been promoted to business across Darebin, and 138 businesses are now displaying 'We are Greening our Business' stickers, and are listed under the Green Business category, illustrating to everyone their commitment to the environment. Finding suitable low-cost accommodation for new green and sustainable businesses to locate in Darebin is a challenge that Council is committed to working on.

A new clause in our Local Planning Framework commits developers to incorporate environmentally sustainable designs into their projects.

Council supports Sustainability Victoria's Resource Smart program, which is delivered by CERES to some schools in Darebin.[100] The program provides support for schools to be more sustainable, as a way of tracking their progress, and presenting certification upon achieving a target. Council also visits schools and receives visits from schools to provide environmental education.

Council supports environmentally sustainable development through its energy efficiency program for its own buildings, and through adopting an ESD (environmentally sustainable development) local planning policy in 2016.

This policy references the BESS (Built Environment Sustainability Scorecard) tool for planning applicants to use to assess their development against. (BESS) is an assessment tool created by local governments in Victoria. It assists builders and developers to show how a proposed development demonstrates sustainable design at the planning permit stage.[101]

100 http://www.resourcesmartschools.vic.gov.au/
101 http://bess.net.au/
102 http://www.washington.edu/news/2016/06/03/finding-connections-to-nature-in-cities-is-key-to-healthy-urban-living/

6.8

We know that access to nature creates an appreciation for nature and willingness to take action to protect it.[102] However, with the development of high rise or multi-dwelling living, changing demographics and an overall increase in population, more of Darebin's residents do not have access to private open space. As a result, public open spaces are becoming more important to the health, socialisation and recreation of the community. Darebin's Open Space Strategy and new Darebin Nature Trust will seek to increase access to public open spaces.

Darebin has an active community with many individuals and groups working to take action on climate change.

Organisations such as Transition Darebin, DCAN (Darebin Climate Action Now), and the various friends' and stationeers groups provide practical action and engage the community on climate change issues. There are also a number of (largely advocacy-based) local community groups and broader movements focussing specifically on Climate Emergency action: Community Action in the Climate Emergency (CACE), Research and Strategy for Transition Initiation and the Climate Emergency Declaration Campaign. The Darebin Environment Reference Group (DERG) provides advice and feedback to Council regarding environmental issues. Many other organisations such as schools, kindergartens and church groups are also taking action on climate change.

6.8

Council provides community grants – both cash grants of up to $6000 and facility hire grants to the value of $6000. 'Sustainable and resilient neighbourhoods' is one of four priority areas for funding. Council provides support and advice for groups seeking funding from other government and philanthropic grant processes. Larger community ideas can also be considered through the annual Council budget process.

In the consultation to develop this action plan, participants indicated that they wanted more information and engagement with Council on climate change and what they can do to reduce their emissions.

Moving forward, starting with the development of the Environmental Engagement Strategy, Council will be looking for opportunities to strengthen messages in line with our Climate Emergency approach, and make sure that it is explicit and prominent in all our environmental education activities. We will bear in mind the need to emphasise the positive actions that individuals and groups in our community can take and to leave people feeling empowered and able to contribute.

The Darebin Energy Foundation, discussed in the next section will further focus on accelerating sustained and meaningful action with the community (residents, businesses, education and other organisations) to eliminate Darebin's greenhouse gas emissions and embed community resilience to climate change.

Greening Google Maps

This community project came out of the Community Leaders in Sustainability program. Greening Google Maps aims to increase the accessibility and availability of cycling information to those living in or journeying through the City of Darebin area. Whilst Council produces a number of paper maps or PDFs (TravelSmart), many people first turn to publically available mapping platforms such as Google Maps for information on cycle paths and bike infrastructure.

The founders of this project discovered that bike paths on Google maps were not up to date. Utilising Google Maps community editing capability, they integrated Darebin's bike routes, cycle friendly streets and public bike parking (such as Parkiteer bike cages). This is an important way to encourage cycling in Darebin, as some people may have seen the lack of cycling routes advertised on Google Maps as a barrier to taking up cycling. Improving this information removes that barrier and encourages sustainable transport choices.

6.8

6.8.4. Objectives and Actions

OBJECTIVES

1. Increase climate change and climate emergency knowledge and action amongst residents.
2. Increase climate change and climate emergency knowledge and action amongst businesses.
3. Support community groups working on climate action to be productive and work well together.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Maintain staff awareness programs on climate change	2017-2022	> Use internal communications such as e-newsletters and events to advise staff on our climate change polices relevant to their work and how they can make practical changes to help restore a safe climate. A high percentage of staff live in Darebin and can disseminate information to broader communities > Specifically educate staff on the Climate Emergency approach.
Promote sustainable buildings and infrastructure	2017	> Promote new ESD local planning policy (GC42) to, and provide ESD training for, architects and building designers operating in Darebin.
	2017/18	> Promote our energy efficiency and renewables work on our buildings through onsite posters.
Advocate for Government action and support	2017-2022	> Advocate for actions in 'What do we need others to do?' section.

6.8

Council supporting the community

Strategies	Timeframe	Actions
Work directly with residents to give them practical ways to contribute to the restoration of a safe climate and adapt to climate change **(Note the next section on the Darebin Energy Foundation also responds to this issue)**	2017-2022	> Ensure that messages aligned with the Climate Emergency approach are made explicit and prominent in existing programs such as the Sustainable Homes and Communities Program, the biennial Sustainability Awards, Sustainability News and other programs, and in the new Environmental Engagement Strategy > Continue funding for the Sustainable Homes and Communities Program to support the community to take action on climate change > Provide monthly Sustainability News e-newsletter to subscribers and promote it to new subscribers > Provide regular stories for Darebin Community News, the Council's quarterly community-wide newsletter, and regular features for Council social media platforms.
Provide climate change and climate emergency education through events – both those specifically organised by Council to raise awareness, and general events	Annual	> Continue to run Backyard Harvest to celebrate and educate on home grown food, giving residents the tools to be more resilient in the face of climate change impacts.
	2017	> Explore Arts and Environment programs to engage new people not already involved in the climate movement.
	2017-2022	> Continue to promote climate emergency action at the Kite Festival, which is attended by up to 16,000 people.
	2017	> Plan and run climate emergency awareness activities at CALD community events.
Recognise and celebrate community action and provide residents and business with direct experiences of exemplars of climate emergency actions	2018	> Continue to run the biennial Sustainability Awards to promote and celebrate action on the Climate Emergency and other environmental issues including environmentally sustainable design in the built environment.
	2017	> Sign up to Take 2, promote to others and promote Council pledges.

6.8

Work directly with businesses to support and incentivise them to take practical steps to eliminate their own greenhouse gas emissions and adapt to climate change	2017	> Expand reach of sustainable business program with increased resourcing.
	2018	> Investigate how Council can incentivise businesses to take up energy efficiency and solar projects by providing interest-free loans and support from beginning to end of works.
	Annual	> Promote Ride to Work Day.
	2017-2022	> Facilitate peer-to-peer learning among businesses through Green Business Networking events > Continue to facilitate green sticker / certificate program so businesses can promote their environmental actions.
Provide a facilitating role between the many climate change groups and campaigns in Darebin, to help them to maximise their effectiveness	2017-2018	> Bring groups together for an event around World Environment Day to better enable them to work together and use each other's strengths to further their shared agendas.
	2017	> Assess, through the Interim Darebin Energy Foundation, what support can be provided to groups.
	2018-2022	> Help to facilitate community energy projects (with DEF) where there is community interest.
	2017-2022	> Continue to provide community grants to support local community action on climate change.
Support businesses to address the climate emergency	2017/2018	> Assist new start-up businesses focusing on addressing climate change.

6.8

What do we need others to do to make this happen?

Darebin community (households, businesses, schools, organisations, groups, etc)

- Participate in Council and community facilitated activities to learn more about environmental sustainability and the role individuals, businesses, organisations and households can play in reducing our impact on the environment and restoring a safe climate
- Share information, concerns, and solutions with neighbours, friends, colleagues
- Join/support local environmental groups
- Work with Council to bring the Climate Emergency message to the broader community.

State Government

- Provide funding for local government environmental education initiatives and grants to support greater collaboration between groups in identifying and addressing the most important challenges and opportunities across Darebin
- Provide funding for community energy projects
- Ensure policy consistency with a climate emergency approach to reduce uncertainty for businesses making investments.

Federal Government

- Demonstrate policy leadership in best-practice ESD for new buildings and upgrades to existing buildings
- Actively and accurately communicate, and support community understanding of climate change science
- Legislate for accurate and thorough product labelling and labelling relating to emissions impact of product throughout its lifecycle
- Ensure policy consistency to reduce uncertainty for businesses making investments.

6.9

Key direction # 9 – Darebin Energy Foundation

6.9.1. Context

Council is establishing the Darebin Energy Foundation (DEF) to accelerate sustained and meaningful action with the community (residents, businesses, education and other organisations) to engage with the climate emergency challenge. The Foundation will have a strong focus on our most vulnerable and disadvantaged communities.
The Foundation will work with Council, community groups, other governments, authorities, the private sector and other organisations to achieve this aim.

6.9.2. Supporting policies

Darebin Council adopted the following roles for DEF in the Terms of Reference for the foundation in February 2017.
In the formation of the foundation these will be revised to align with Council's Climate Emergency commitment.

The foundation will:

- facilitate a Darebin climate think tank to develop local zero emissions and resilience proposals and solutions
- harness and encourage community participation and investment (volunteering and donation)
- develop and contribute to programs that educate and mobilise the community on the above issues
- develop and trial innovative programs and delivery mechanisms that can be scaled up to achieve significant change
- advocate to governments and industry to increase climate change action and funding for community and local government action
- advocate to the State and Federal Governments regarding policies and issues that support the purpose of the Foundation
- work to ensure there are sustainable long-term funding and resourcing commitments from Council to drive down emissions and embed climate resilience in our community, with a strong focus on our most vulnerable communities
- work with Council to deliver identified actions of the Climate Emergency Plan including, but not limited to, community-owned renewable energy projects
- devise and apply for other sources of funding (e.g. grants, fee for service etc.) that improve effectiveness and financial sustainability of the Foundation.

The Terms of Reference clarify that the Foundation will complement and enhance Council's work on climate change and will not duplicate effort.

6.9

6.9.3. Objectives and Actions

OBJECTIVES

1. Accelerate sustained and meaningful action with the community to engage with the Climate Emergency challenge.

ACTIONS

Council corporate actions

Strategies	Timeframe	Actions
Establish Darebin Energy Foundation (DEF)	2017	> Establish an interim DEF to determine the most effective long term foundation governance model for Council consideration by February 2018.
	2018	> Revise Terms of Reference to ensure alignment with the Climate Emergency commitment.
	2018	> Set up the Climate Think Tank as the first Darebin Energy Foundation action.
	2018	> Implement final model for Foundation.
	2018-2020	> Provide ongoing support to DEF following establishment.

What do we need others to do to make this happen?

Darebin community (households, businesses, schools, organisations, groups, etc)

- Consider joining the Darebin Energy Foundation board or the Climate Think Tank
- Support or participate in Darebin Energy Foundation initiatives.

State and Federal Governments

- Provide funding and support for Darebin Energy Foundation initiatives.

7

Measuring, reviewing, reporting and revising

MEASURING, REVIEWING, REPORTING AND REVISING

The Climate Emergency Plan covers the next five years, from 2017 to 2022. A major review and evaluation of the plan will commence in 2021 and the plan for the next period will be established. This will be timely, as the cost and efficiency of the lowest carbon technologies is rapidly improving and the 2020-2025 period is considered a pivotal time in the transition to zero carbon energy, housing and transport. Given the need for emergency speed action, the Plan may also be updated whenever necessary within this period.

Council will report annually on the progress of the implementation of the plan. Reporting will include a review of progress against our targets, in a format similar to the table below.

Goal	target	timeline	baseline	2018	Cumulative (from 2017)
Corporate emissions goals (Council's own operations)					
Gross greenhouse gas emissions	45% reduction	2022	2006-2007	X% reduction	X% reduction
Net greenhouse gas emissions	0 net emissions* (carbon neutrality)	2020	n/a	X kt of CO2-e	X kt of CO2-e
On-site renewable energy generation	440KW additional capacity	2022	377kw (as at Aug 2017)	xKW installed	xKW installed
Community emissions goals					
Net greenhouse gas emissions	0 net emissions	2020	n/a	X kt of CO2-e	X kt of CO2-e
Local renewable energy generation	38MW (i.e. double existing capacity)	2022	(19MW as of 2017)	xMW installed	xMW installed

Table 5: sample report template
***Subject to endorsement of Darebin carbon management plan in 2018 – see Key Direction #1.**

This annual reporting will also be an opportunity for revising and updating the plan as new information, research and results come to light, and as we learn from the implementation of the plan.

When Darebin joins the Covenant of Mayors, we will also be reporting our GHG emissions data publicly each year to international standards.

8 Resourcing

RESOURCING

The current budget allocation for the Climate Emergency plan implementation is $427,000 including $127,000 for direct programs and $300,000 for the purchase of GreenPower (paid across the organisation as part of electricity purchase.) This funding will be reapportioned in line with recommended strategic directions.

Additional resourcing requirements include:

- $20 million for the expansion of the Solar Saver program, with this divided into two $10 million programs proposed for consideration in the 2018-19 and 2020-21 budgets. Recruitment and special scheme administration would be undertaken in the preceding year. These funds would be recouped via the special rates scheme but there would be a cost to the Darebin budget of borrowing charges (if applicable) and forgone interest.
- Capital funding to be considered in the annual budget include:
  - Council building energy efficiency fund – $1 million is proposed over the 5-year plan period. These works would have a minimum 10-year payback in reduced energy costs
  - Additional funding to support high quality ESD outcomes in Council buildings
  - The 440kw solar proposed for council buildings is estimated to cost $660,000 over the 5-year plan period. These installations would average a 7-year payback in reduced energy costs
  - Streetlight upgrades of cost shared lights with VicRoads are estimated to cost $780,000, with a 10-year payback in reduced energy costs. They are dependent on VicRoads cofunding the upgrades.

Additional programs including purchase of electric vehicles will be costed and considered for future budgets.

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APPENDIX 1: DEFINING DAREBIN'S COMMUNITY GREENHOUSE GAS EMISSIONS

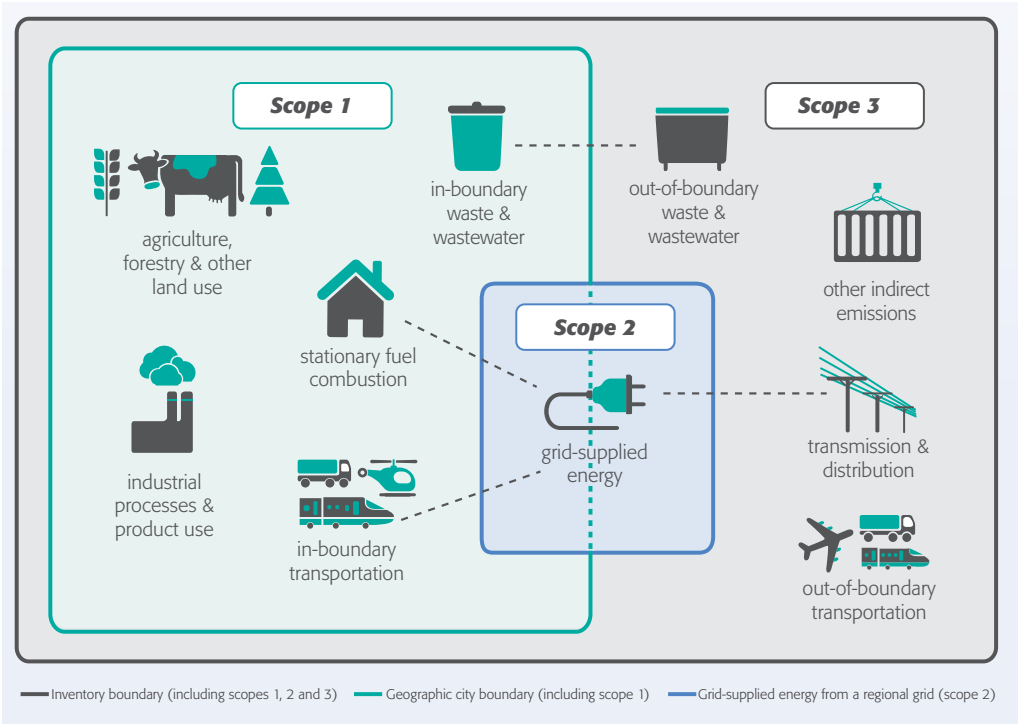
Background and context

The methods that cities have used and applied for measuring and reporting community greenhouse gas (GHG) emissions has varied significantly over time. Within Australia, this methodology was traditionally created and administered via ICLEI Oceania and their subsequent reporting programs. With these programs no longer offered, establishing a robust and consistent approach moving forward is now required. Beyond this, the key requirements of a new method would need to not only distinguish emission sectors according to where they occur clearly, but also apply the scopes framework used in the Greenhouse Gas Protocol- the international standard in quantifying and managing GHG emissions.

Scope	Definition
Scope 1 (direct)	GHG emissions from sources located within the city boundary
Scope 2 (indirect)	GHG emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling within the city boundary
Scope 3 (indirect)	All other GHG emission that occur outside the city boundary as a result of activities taking place within the city boundary

Table 1. Emissions scopes for cities

Figure 1 below provides a visualisation example of the sources and boundary of a city's GHG emissions.



Source: Global Protocol for Community-Scale Greenhouse Gas Emission Inventories.

Framework to be used

Based on Council's investigations into the various options, the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) aligns with Council's needs for measuring and reporting GHG emissions in the following ways.

The GPC framework enables Council to:

- report on the seven greenhouse gases as covered by the Kyoto Protocol
- align with methodologies and standards of other cities and municipalities, both locally and internationally
- provide consistency in defining emissions scope and boundary over time
- align with reporting requirements for programs such as the Global Covenant of Mayors for Climate and Energy.

GHG emission sectors included in the GPC

SECTOR	Definition and inclusions	Comments
STATIONARY ENERGY	Stationary energy sources are one of the largest contributors to a city's GHG emissions. These emissions come from the combustion of fuel in residential, commercial and institutional buildings and facilities and manufacturing industries and construction, as well as power plants to generate grid-supplied energy. This sector also includes fugitive emissions, which typically occur during extraction, transformation, and transportation of primary fossil fuels.	Expected to be the largest sector for the Darebin community.
TRANSPORTATION	Transportation covers all journeys by road, rail, water and air, including inter-city and international travel. GHG emissions are produced directly by the combustion of fuel or indirectly by the use of grid-supplied electricity. Collecting accurate data for transportation activities, calculating emissions and allocating these emissions to cities can be a particularly challenging process. To accommodate variations in data availability, existing transportation models, and inventory purposes, the GPC offers additional flexibility in calculating emissions from transportation.	Expected to be a major contributor to Darebin's GHG emissions.

SECTOR	Definition and inclusions	Comments
WASTE	Waste disposal and treatment produces GHG emissions through aerobic or anaerobic decomposition, or incineration. GHG emissions from solid waste shall be calculated by disposal route, namely landfill, biological treatment and incineration and open burning. If methane is recovered from solid waste or wastewater treatment facilities as an energy source, it shall be reported under Stationary Energy. Similarly, emissions from incineration with energy recovery are reported under Stationary Energy.	Some subsets of this sector anticipated to be negligible or not applicable due to the activities conducted within Darebin's municipal boundary.
INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU)	GHG emissions are produced from a wide variety of non-energy related industrial activities. The main emission sources are releases from industrial processes that chemically or physically transform materials (e.g., the blast furnace in the iron and steel industry, and ammonia and other chemical products manufactured from fossil fuels and used as chemical feedstock). During these processes many different GHGs can be produced. In addition, certain products used by industry and end-consumers, such as refrigerants, foams or aerosol cans, also contain GHGs which can be released during use and disposal.	Some subsets of this sector anticipated to be negligible or not applicable due to the activities conducted within Darebin's municipal boundary.
AGRICULTURE, FORESTRY AND LAND USE (AFOUL)	Emissions from the Agriculture, Forestry and Other Land Use (AFOLU) sector are produced through a variety of pathways, including livestock (enteric fermentation and manure management), land use and land use change (e.g., forested land being cleared for cropland or settlements), and aggregate sources and non-CO_2 emission sources on land (e.g., fertilizer application and rice cultivation). Given the highly variable nature of land-use and agricultural activity across geographies, GHG emissions from AFOLU are amongst the most complex categories for GHG accounting.	Some subsets of this sector anticipated to be negligible or not applicable due to the activities conducted within Darebin's municipal boundary.
OTHER SCOPE 3	Not included in GPC	Not applicable

Table 2. Emissions sectors as defined by the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories

Sector and sub-sectors	Scope 1	Scope 2	Scope 3
STATIONARY ENERGY			
Residential buildings	✓	✓	✓
Commercial and Institutional buildings and facilities	✓	✓	✓
Manufacturing industries and construction	✓	✓	✓
Energy industries	✓	✓	✓
Agriculture, forestry, and fishing activities	✓	✓	✓
Non-specified sources	✓	✓	✓
Fugitive emissions from mining, processing, storage and transportation of coal	✓		✗
Fugitive emissions from oil and natural gas systems	✓		✗
TRANSPORTATION			
On-road	✓	✓	✓
Railways	✓	✓	✓
Waterborne navigation	✓	✓	✓
Aviation	✓	✓	✓
Off-road	✓	✓	✗
WASTE			
Disposal of solid waste generation in the city	✓		✓
Biological treatment of waste generated in the city	✓		✓
Incineration and open burning of waste generated in the city	✓		✓
Wastewater generated in the city	✓		✓
INDUSTRIAL PROCESSES AND PRODUCT USE (IPPU)			
Industrial processes	✓		✗
Product use	✓		✗
AGRICULTURE, FORESTRY AND LAND USE (AFOUL)			
Livestock	✓		✗
Land	✓		✗
Other agriculture	✓		✗
OTHER SCOPE 3			
Other Scope 3			✗

Table 3. Darebin community greenhouse gas emissions boundary

✓	Inclusions for Council greenhouse gas emissions reporting boundary (BASiC reporting)
✓	Optional emission sub-sectors (currently outside of greenhouse gas emission reporting boundary) (BASiC + reporting)
	Sub-sectors that do not have GHG emissions in that scope category.
✗	Other scope 3 emissions not required to be reported.

References and further reading:

GHG Protocol for Cities: http://www.ghgprotocol.org/greenhouse-gas-protocol-accounting-reporting-standard-cities

Global Covenent of Mayor: http://www.globalcovenantofmayors.org

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