



Moonee Valley Greenhouse Strategy 2010

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1 Introduction

Moonee Valley City Council is committed to reducing greenhouse emissions - joining worldwide efforts to prevent global climate change.

Moonee Valley residents have expressed their concern about climate change. During recent consultation for the Municipality's community plan *Moonee Valley 2020 - Living together, living well*, climate change was identified as one of the most important priorities for Moonee Valley to deal with. Regular community environment forums and events are very well attended in Moonee Valley.

The impacts of climate change will have wide reaching implications. For a number of years, sea levels have been rising due to melting glaciers and ice caps, and severe weather events have been increasing. Recent data indicates that the global average temperature has increased by between 0.2 and 0.6°C since the late 19th century, while Australian average temperatures have increased by 0.8°C.¹

Some changes to the climate are inevitable – even if we stop emitting greenhouse gases now, the gases we have already released will have an effect, along with natural climate patterns that are already occurring. It is important to avoid further changes, and to adapt to the impacts of climate change.

Moonee Valley City Council is committed to reducing its own emissions and to influence community, regional, state and national action.

Greenhouse gases are those in the earth's atmosphere that absorb and re-emit infra red radiation which contributes to global warming. The gases include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.

Moonee Valley's population is growing, and it is likely that emissions will increase if no action is taken. Council has set targets to reduce emissions, as the best way to prevent the worst effects of climate change and its damaging economic, social and environmental consequences.

To lead the way into a low carbon future, Council set the following targets:

- Council target: zero net emissions by 2020
- Community target: zero net emissions by 2020

This Greenhouse Strategy sets guiding principles for ongoing actions to achieve Council and community greenhouse reduction targets. The community target is outside of Council's direct control and is set as an aspirational target for which to plan, advocate and monitor.

*'Many impacts can be reduced, delayed or avoided by mitigation. Mitigation efforts and investments over the next few decades will have a large impact on opportunities to achieve lower stabilization levels. Delayed emission reductions significantly constrain the opportunities to achieve lower stabilization levels and increase the risk of more severe climate change impacts.'*²

Some impacts for Australia are:

- a) changing rainfall patterns
- b) reduced water availability
- c) increased frequency of severe weather events such as bushfires and storms
- d) whitening of coral reefs
- e) salt water intrusion into ground water and coastal wetlands

¹ Fourth Assessment Report. Intergovernmental Panel on Climate Change (2007)

² Climate Change 2007: Synthesis Report. Summary for Policy Makers IPCC (p.19)

- f) loss of agriculture & increased cost of food.

Some impacts for our local environment are:

- a) loss of gardens, trees and shrubs due to water stress
- b) more airborne dust, pollen and pollution and more weeds and pests
- c) reduced biodiversity with a loss of plant and animal species
- d) bigger storms may cause local flooding
- e) stress on parks, sporting fields and waterways like Moonee Ponds Creek and Maribyrnong River.

Some impacts for local community are:

- a) more demand for water but less water available
- b) heat stress, with the elderly and children especially at risk
- c) high prices for energy, insurance and food
- d) increase in fire hazard (potential damage) increase in weed and pest invasion³.

This *Greenhouse Strategy 2010* is supported by *Community Greenhouse Action Plan, Council Greenhouse Action Plan, Sustainable Public Lighting Action Plan and Sustainable Building Action Plan*.

³ <http://www.climatechange.gov.au/impacts>

2 Policy context

Federal Government

The Federal Government's key initiative to reduce greenhouse emissions is to introduce an emissions trading system and emissions target. Such a system 'caps' the amount of emissions allowed, and requires industry to either make savings themselves or buy the savings made by other players in the market.

The emissions trading system once approved will mandate improved greenhouse management by Australia's largest emitters (none of whom are based in Moonee Valley).

Currently, and once the emissions trading system is in place, corporations with high greenhouse emissions have to report under the *National Greenhouse and Energy Reporting Act 2007*.

For other smaller emitting businesses and householders, any reductions will be considered as voluntary. The benefits of these voluntary emission reductions include:

- a) cost savings community through reduced energy use
- b) reduced electricity demand and localises energy production to reduce network outages
- c) supporting the green industry creating additional green jobs for the community
- d) advocating on the importance of addressing climate change
- e) creating community capacity to adapt to inevitable social and environmental impacts of climate change.

The Federal Government is establishing the Australian Carbon Trust and the Climate Change Action Fund to facilitate individual action by households and businesses under the emissions trading system.

To expand the use of renewable energy the Government has set a 20 per cent target for renewable energy by 2020. This will support further development of the renewable energy industry in Australia and reduce the need for energy production from fossil fuels.

The Government developed the *National Carbon Offset Standard* to ensure there are clear criteria around how offsets are generated, verified and calculated.

State Government

In 2006, the State Government released *Our Environment, Our Future - Sustainability Action Statement* followed by the *Renewable Energy Action Plan* and the *Energy Efficiency Action Plan*.

The *Renewable Energy Action Plan* seeks to accelerate the uptake of renewable energy through a range of measures including the Victorian Renewable Energy Target (VRET).

The *Energy Efficiency Action Plan* seeks to identify economy-wide improvements in energy efficiency to reduce greenhouse gas emissions and enhance energy supply security.

The Victorian Energy Efficiency Target (VEET) scheme, which commenced in January 2009, encourages the uptake of energy efficient technology, initially in the residential sector. The *Victorian Energy Efficiency Target Act 2007* provides for the VEET scheme to operate in three-year phases, with new scheme targets and prescribed activities set for each phase.

The State Government released a *Climate Change Green Paper* in 2009 proposing ways to reduce greenhouse emissions, adapt to the impacts of climate change and move towards a low carbon economy. The strategies outlined in the Paper are designed to complement the proposed national emission trading system. The Green Paper does not propose a State based greenhouse reduction target. A new climate change strategy for Victoria will be developed based on the feedback received from the Green Paper.

A Climate Communities program has been established by the State Government to encourage greenhouse action at the local level through information sharing and financial assistance. Climate Communities will provide funding for community based projects and for regional coordinators who will work with councils and communities to support voluntary action.

Regional alliances

Local governments use regional partnerships to reduce their greenhouse emissions.

The Western Alliance for Greenhouse Action (WAGA) is one such regional body. WAGA was established in 2006 and works together to reduce the greenhouse emissions of Melbourne's Western region including Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley, Moorabool and Wyndham.

WAGA delivers greenhouse reduction projects for residential, commercial, industrial and Council operations. Projects operational in 2009 include: a large-scale housing retrofitting project, a council buildings retrofitting project, and a commercial and industrial renewable energy project.

WAGA has modeled regional emissions through its *Towards Zero Net Emissions Strategy* establishing a holistic approach to address greenhouse emissions. The strategy focuses on energy efficiency, fuel switching, renewable energy, waste to energy technologies, transport improvements and industrial and freight strategies.

Local government

Local government can directly influence activities that are the source of greenhouse gases using planning controls, local laws, community programs and good management of their own operations.

Local governments in Australia and other parts of the world have been leaders in reducing emissions.

Moonee Valley City Council developed strategies and actions to reduce emissions through the adoption of the *Environmental Sustainability Plan 2007* and the *Greenhouse Action Plan 2004*. Other Council policies addressing greenhouse issues are:

- a) Integrated Transport Plan 2008
- b) Green Travel Plan 2008
- c) Waste Management Strategy 2008 – 2014
- d) Sustainable Water Use Plan 2008
- e) Council Plan 2009-2013
- f) Moonee Valley 2020 (MV2020) 2009
- g) Open Space Strategy 2009
- h) Moonee Valley Wellbeing Strategy 2008
- i) Moonee Valley Planning Scheme

Detailed information on the international, Australian and Victorian policy context is provided in Appendix 1.

3. Greenhouse emissions profile

Council has undertaken an inventory of energy use in its own operations and in the community to identify what activities are contributing to Moonee Valley's greenhouse emissions.

Greenhouse gases are those in the earth's atmosphere that absorb and re-emit infra red radiation which contributes to global warming. The gases that industrial countries like Australia are committed to reducing under the Kyoto Protocol are: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride. With each gas having different impacts on global warming a consistent measurement is used to report all greenhouse gases as a whole- tonnes of carbon dioxide equivalent (tCO₂-e)⁴.

Moonee Valley uses the corporate and community emissions inventory from 2001 as a benchmark to measure the progress of Council's greenhouse emission reduction program.

In 2001, the total community emissions were 1.41 million tonnes of greenhouse gases and Council emissions totalled 15,650 tonnes.

a) Community emissions

Moonee Valley's most recent community greenhouse emissions profile is based upon the 2006 ABS census data taking into account the number of residents and employees in Moonee Valley.

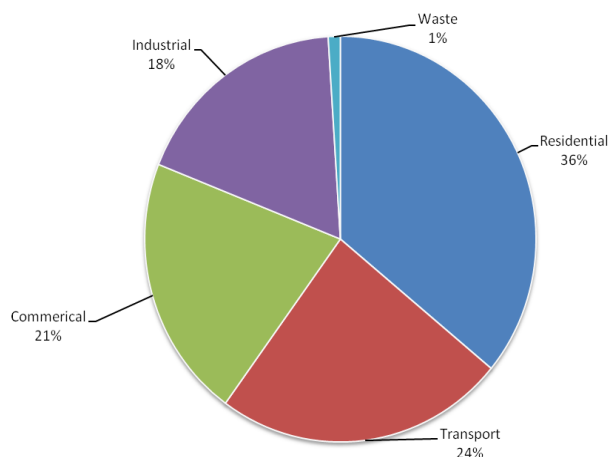
'Community' refers to all emissions from residents, business, organisations and government agencies based in the municipality of Moonee Valley. It is important to note that Council does not have control over these emissions, but can encourage community to reduce their emissions through programs, educations, incentives and local controls.

The average greenhouse emissions per Moonee Valley resident in 2006 was 4.513 tonnes of carbon dioxide equivalent. Compared to other municipalities in the western region of Melbourne, Moonee Valley has the lowest rate of emissions both per job and per dollar of GDP. This reflects more 'office – white collar' based activities relative to the industrial activities in other municipalities.

Where are emissions coming from?

Various sectors contribute to the community's greenhouse gas emissions. These include:

1. **Residential:** greenhouse emissions produced through the electricity and natural gas used to heat and cool buildings, power electrical appliances and provide hot water
2. **Transport:** greenhouse emissions produced from vehicle fuel
3. **Commercial and industrial:** greenhouse emissions produced through the electricity and natural gas used to heat and cool buildings, power electrical appliances and provide hot water. Industrial energy use may also include energy intensive functions like running motors and furnaces.
4. **Waste:** methane emissions produced from residential and commercial organic waste in landfill.



⁴ N Figure 1: Community greenhouse emissions by sector 2006

Each of these sectors are outside of Council's direct operational control, however Council will be facilitating and encouraging emission reductions wherever possible.

What reductions have been made to date?

In 2006, community greenhouse emissions⁵ totalled 1.4 million tonnes.

In the period 2001 to 2006, community greenhouse emissions were reduced by six per cent. Much of this reduction is due to an increase in the efficiency of Victorian coal⁶. However, Council has assisted the community in reducing emissions through a number of activities including residential housing initiatives, improved organic waste collection, and community education.

The list of completed actions is set out in the associated *Community Greenhouse Action Plan*.

b) Council emissions

Where are council's emissions coming from?

Council's operational emissions are separated into five key sectors:

1. **Public Lighting:** Greenhouse emissions produced through the electricity that is used to power public lighting in Moonee Valley that is either managed by Council (metered) or managed by a distributor on Council's behalf (unmetered). It includes lights located in streets, car parks, parks and sports grounds
2. **Buildings:** Greenhouse emissions produced through the electricity and natural gas used by the buildings that Council operates. Buildings range from civic centers and community halls to park barbeques. This excludes buildings that Council owns but are leased and operated by another organisation.
3. **Vehicle fleet:** Greenhouse emissions produced through the fuel consumed by Council's passenger vehicles, utility vehicles and specialised heavy equipment.
4. **Waste:** Greenhouse emissions produced directly or through the processing of waste generated by Council operations such as office waste and green waste from parks and gardens.
5. **Water:** Emissions from water are produced through the electricity that is used to power treatment plants, pumps, sprinklers, fountains and bores that Council operates.

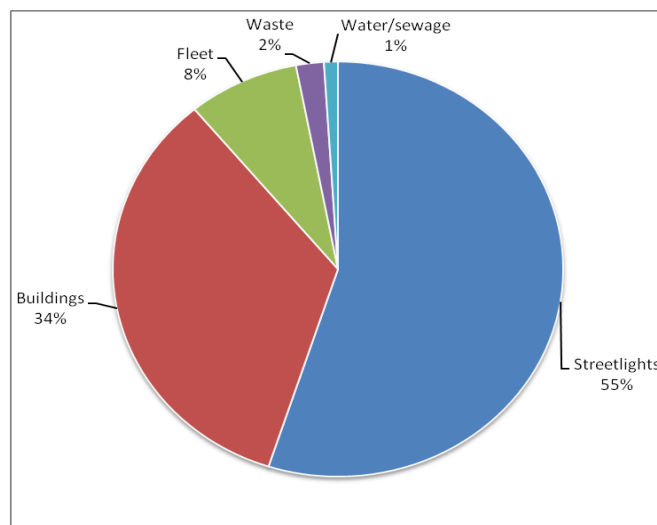


Figure 2: Council greenhouse emissions by sector 2007

⁵ Carbon dioxide equivalent

⁶ Department of Climate Change, *Electricity emission factors for end users*, National Greenhouse Account (NGA) Factors, June 2009. <http://www.climatechange.gov.au/climate-change/~media/publications/greenhouse-gas/national-greenhouse-factors-june-2009-pdf.ashx>

Each of these sectors has varying amounts of direct operational control by Council (categorised as Scope 1 and Scope 2 emissions under the *National Greenhouse and Energy Reporting Act 2007*):

The three scopes of emissions as defined by the National Greenhouse and Energy Reporting (NGER) System are outlined in the Terms and Definitions.

This Strategy is committed to reducing emissions from Scope 1 and 2 activities as summarised in Figure 3. In general, this Strategy does not seek to reduce emissions from Scope 3 (with the exception of seeking to influence public lighting managed by distributors because of the current exemptions that apply to distributors).

Greenhouse emissions from Council operations – NGERs categories

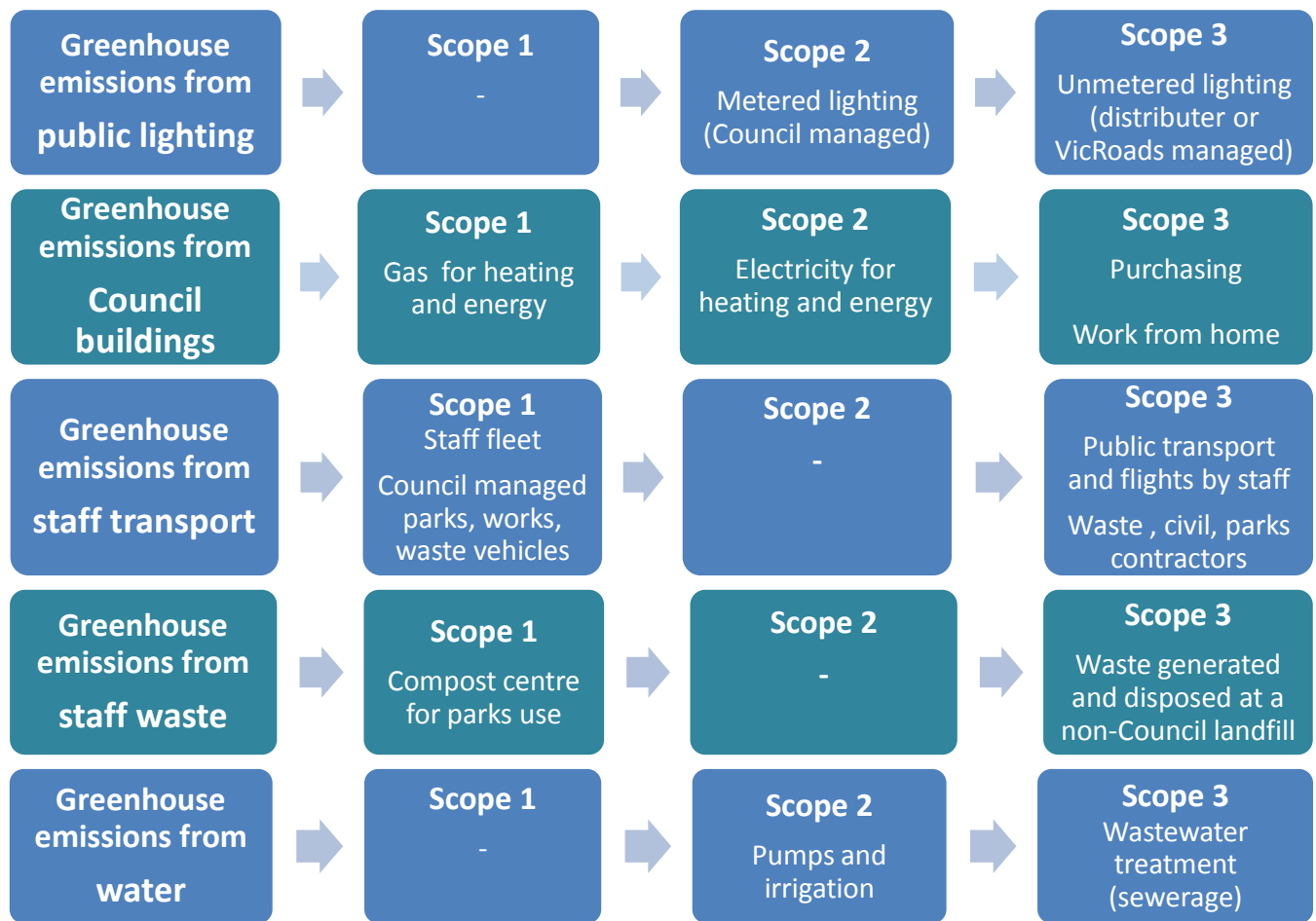


Figure 3: greenhouse emissions from Council operations – NGER categorisations.

What reductions have been made to date?

In 2007, Council emitted 15,650 tonnes of greenhouse gases from its own operations. This accounts for approximately one per cent of Moonee Valley's total emissions.

Council greenhouse emissions reduced by five per cent between 2001 and 2007. This decrease was a result of the implementation of the *Greenhouse Action Plan 2004* and an increase in the efficiency of Victorian coal⁷.

It is estimated that a further five per cent reduction in emissions has been made since 2007 due to a variety of actions to reduce emissions including public lighting retrofits, building efficiencies, fleet and waste improvements.

The list of completed actions is set out in the *Council Operations Greenhouse Action Plan*.

⁷ Department of Climate Change, *Electricity emission factors for end users*, National Greenhouse Account (NGA) Factors, June 2009. <http://www.climatechange.gov.au/climate-change/~media/publications/greenhouse-gas/national-greenhouse-factors-june-2009-pdf.ashx>

4. Greenhouse reduction targets

To date, the rise in temperature over pre-industrial levels is 0.8 degrees, and it is calculated that the temperature cannot rise by more than two degrees if devastating climate change is to be avoided.⁸

Recent scientific findings show that carbon dioxide equivalent concentrations should be 350 parts per million (ppm) or less to keep below a two degree rise in temperature to avoid the worst impacts of climate change:

*'If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO₂ (equivalent) will need to be reduced from its current 385 ppm to at most 350ppm, but likely less than that.'*⁹

Leading international scientists and researchers from the IPCC state that a concentration of 450ppm, adopted by the Garnaut Review and others, 'would give a 50-50 chance of limiting the temperature rise to 2°C or less' leaving an unreasonable risk of dangerous, runaway climate change.¹⁰

Carbon dioxide in the atmosphere is currently at 385 parts per million and we are adding two parts per million every year¹¹. Strong targets and immediate action is needed.

Community target: zero net emissions by 2020

In 2004, Council set a community greenhouse target of 20 per cent reduction by 2010. Six per cent reduction in emissions from the community was achieved by 2007. There is a need to continue an accelerated reduction. Part of the solution will be the Federal Government's pending emission trading system, and supporting regulation from the State Government.

A target of zero net emissions by 2020 for the Moonee Valley community is needed to help prevent the worst effects of climate change and its economic, social and environmental consequences.

The concept of 'zero net greenhouse emissions' commonly refers to a situation where the net emissions associated with a product or an organisation's activities are equal to zero through the acquisition and retirement of carbon offsets.

This target aligns Moonee Valley City Council with neighbouring councils and provides the basis for strong advocacy and action programs. Whilst this is the target, Council acknowledges that its role in reducing community emissions requires a shared effort.

Council will undertake programs, incentives, education, leadership opportunities and advocacy to help meet the target, but it needs parallel efforts from business, residents, community groups, non-profit organisations, and most importantly from State and Federal Government.

To reach zero net emissions by 2020 will require structural change from the business sector and residents, as well as legislation from State and Federal Government.

For Moonee Valley there is a strong base from which to start, which means that a zero net emissions target is achievable by 2020 with regulatory support. Moonee Valley is seeking a target that will prevent a temperature rise of greater than two degrees, and is in a position to meet this target because:

1. community emissions have appeared to peak¹². Unlike global emissions, reductions of six per cent were achieved between 2001 and 2006.

⁸ <http://www.ipcc.ch>

⁹ James Hansen et al *Target Atmospheric CO₂: Where Should Humanity Aim?* (April 2008)
<http://arxiv.org/ftp/arxiv/papers/0804/0804.1126.pdf>

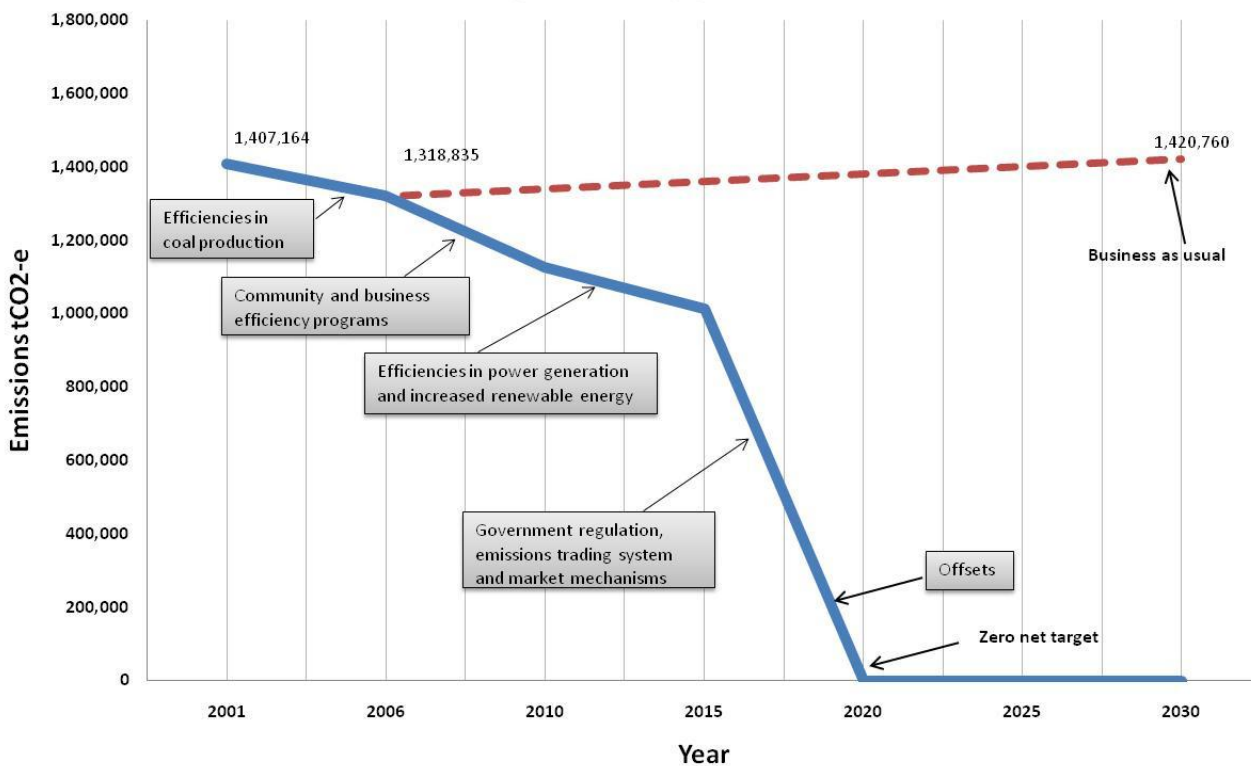
¹⁰ Richardson et al *Synthesis Report from Climate Change: Global Risks, Challenges and Decisions*. (March 2009)
<http://lyceum.anu.edu.au/wp-content/blogs/3/uploads/Synthesis%20Report%20Web.pdf> (p18)

¹¹ Richardson et al *Synthesis Report from Climate Change: Global Risks, Challenges and Decisions*. (March 2009)
<http://lyceum.anu.edu.au/wp-content/blogs/3/uploads/Synthesis%20Report%20Web.pdf> (p11)

¹² ABS (2006)

2. having the highest per capita emissions in the world, Australia has larger abatement opportunities than the global average. By applying what we already know, without any new breakthroughs in technology, Australia can achieve emission reductions of 60 per cent below 1990 levels by 2030.¹³
3. residents are interested in making change, and are already undertaking actions to reduce emissions, in particular retrofitting houses.
4. the business mix in Moonee Valley is generally low greenhouse dependent¹⁴. Moonee Valley has a relatively low rate of emissions per job and per \$ of GDP compared to other municipalities in Melbourne's west. This reflects more office white collar based activities relative to the industrial activities in other municipalities in the western region. Businesses can reduce emissions through financial efficiencies in a time of increasing energy costs.
5. Council considers that the renewable energy sector and environmental sector are business and employment growth areas that will provide a strong economic future for people working and living in Moonee Valley.

Model for reducing community greenhouse emissions



Council's zero emissions target will cover all emissions that are being collected and published by the Australian Bureau of Statistics. These include emissions from direct greenhouse emissions by industries and households, but not indirect emissions from consumption, such as food miles or emissions from production processes of goods. The base year for measuring community and Council performance is 2001.

¹³ *An Australian Cost Curve for Greenhouse Gas Reduction*. McKinsey and Company (2008)

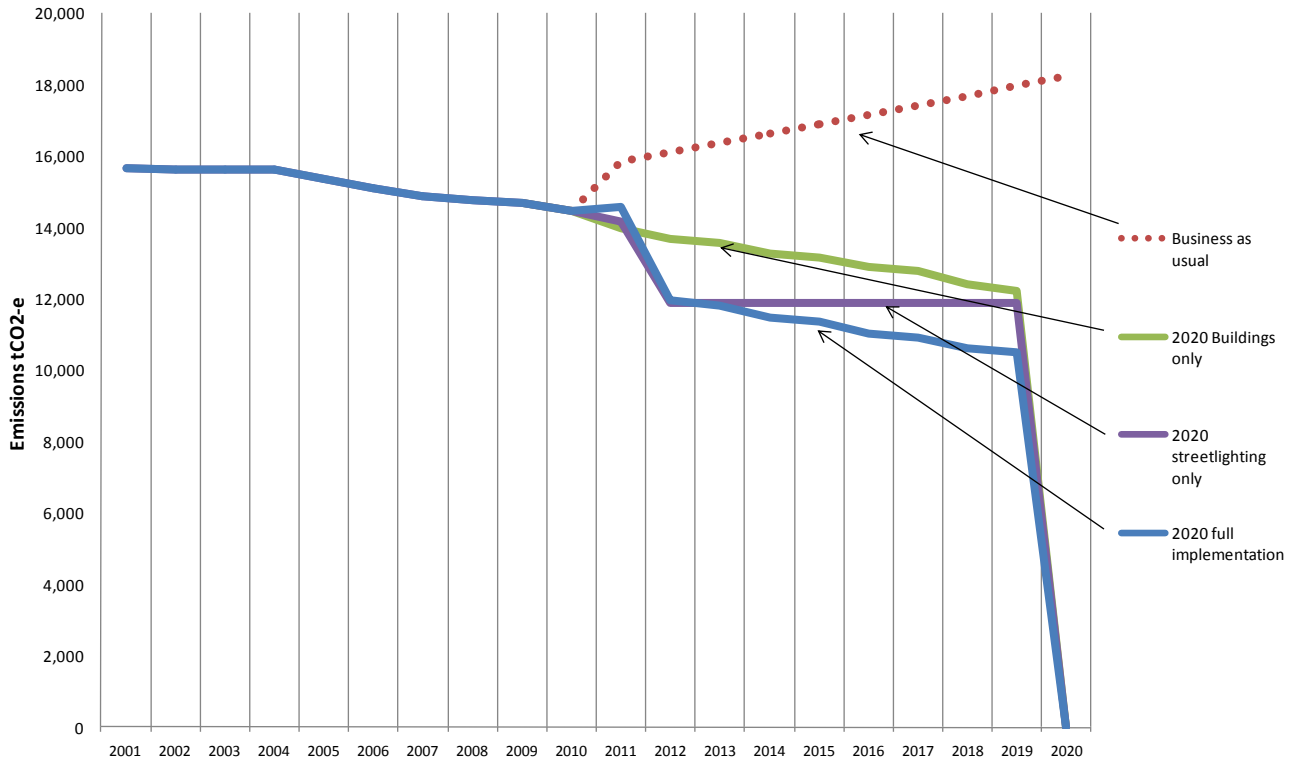
¹⁴ The Victorian Government lists the State's largest greenhouse emitting businesses under its *Environment Resource Efficiency Program*. No Moonee Valley businesses are listed in this program.

Council target: zero net emissions by 2020

A review of the target was made, benchmarking with nearby Council targets (Melbourne, Moreland, Darebin and Hobsons Bay), seeking to optimise budget and resource requirements whilst providing scope for technology advancements. The target to reach zero emissions from Council’s own operation was set to 2020 which will match the Community target.

Council’s zero emissions target is based on emissions generated by Council, and applies a detailed *Council Greenhouse Action Plan* calculating how emissions will be reduced to zero net.

A model for reducing Council greenhouse emissions



Connecting with other greenhouse reduction targets

The Australian Government is working towards a long-term target of 60 per cent emission reduction below 2000 levels by 2050. Local government is showing stronger leadership with many nearby Councils setting a target of zero net emissions by 2020. A comparison of council targets is shown in the table below.

Council	Council target	Community target
Maribyrnong	Zero net by 2015	Zero net by 2020
Melbourne	Zero net by 2020	Zero net by 2020
Moreland	Zero net by 2020	Zero net by 2020
Hobsons Bay	Zero net by 2020	Zero net by 2030
Darebin	Zero net by 2020	Zero net by 2020
Yarra	Zero net by 2012	Zero net by 2020
Western Alliance for Greenhouse Action	Not applicable	Zero net by 2020
Northern Alliance for Greenhouse Action	Not applicable	Zero net by 2020

Moonee Valley City Council is increasingly monitoring its own emissions. Council will implement an emissions data management system consistent with national frameworks to streamline monitoring

and delivering its energy related services.

Like most metropolitan councils to date, Moonee Valley City Council has limited data to provide a detailed analysis of Moonee Valley's carbon footprint to inform our community targets. Council will quantify its community emissions by 2012 and set out actions that will make the best reductions.

5. Guiding principles

In Moonee Valley, there is a need to reduce greenhouse emissions from:

- *Energy*: reduce use of fossil fuel based energy sources to decrease carbon dioxide emissions
- *Waste*: reduce waste to decrease generation of methane emissions in landfill
- *Transport*: reduce fuel powered vehicle use to prevent carbon dioxide emissions from fuel use.

Other ways to reduce emissions include locally sourced products made with greenhouse friendly processes. However, these indirect emissions are not well monitored to date, and future reporting will provide better information for Council regarding such greenhouse 'footprints'.

The greenhouse hierarchy sets the guiding principles for Moonee Valley's *Greenhouse Strategy*¹⁵ and associated action plans.

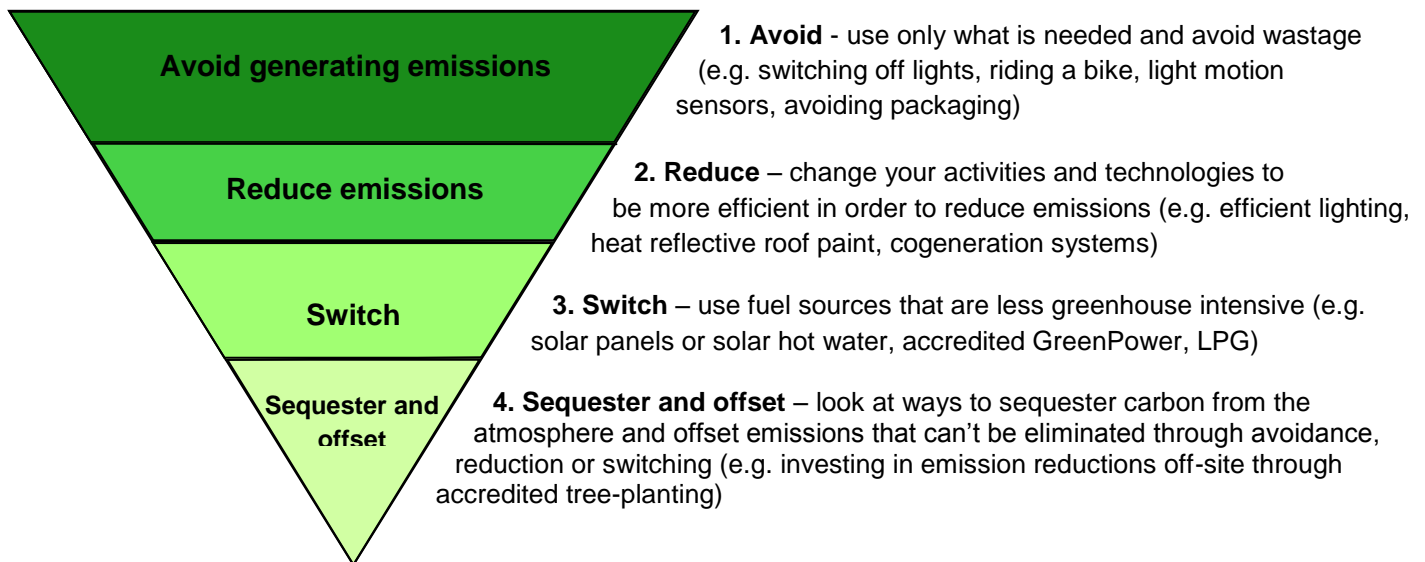


Figure 3: The greenhouse hierarchy

Other guiding principles include:

- ensuring greenhouse programs support other environmental goals for water, waste, and biodiversity.
- incorporating behaviour change into activities to best reduce emissions from energy, water and waste. Well designed behaviour change programs can achieve significant emissions reductions¹⁶.
- not using lack of full scientific certainty as a reason to postpone measures to reduce emissions
- considering both local and global impacts of greenhouse management. Whilst this strategy does not deal with indirect emissions, Council will use information on product and service life cycle assessments where available, and support the community in making informed decisions. Another

¹⁵ *Carbon Management Principles*. Victoria Environment Protection Authority (2008)

¹⁶ *Business Energy Efficiency: Case Study. Ground-breaking communications program slashes energy consumption*. Department of Energy, Utilities and Sustainability, New South Wales Government.

City Switch Green Office Case Study. City of Melbourne and Sustainability Victoria (2009)

example is deforestation which causes greenhouse emissions by disrupting the absorption of carbon dioxide from photosynthesis. Whilst land clearing is not an issue within Moonee Valley, efforts can be made to reduce it in regional, national and global areas through advocacy, education and better purchasing decisions.

6. Techniques to meet zero net emission targets

6.1 Greenhouse saving programs

Avoid, Reduce, Switch, Sequestration, Offset.

A range of programs will be delivered to meet our zero net emissions target. These programs will be aligned to the greenhouse hierarchy and guiding principles.

On the ground programs will be designed for residents, business and Council itself and will be subject to emissions reduction potential, community need, technology availability, behaviour change potential and funding options. The programs will address sustainable buildings, public lighting, waste management, water use, transport and are addressed below.

Where possible Council will support and promote existing programs from relevant stakeholders rather than creating and initiating our own (e.g. City West Water showerhead exchange).

a) Sustainable buildings

Energy efficiency is one of the most cost-effective ways to reduce greenhouse emissions along with energy and water costs. According to research undertaken by the Centre for International Economics, the building sector could reduce its share of emissions by 27 per cent through energy efficiency, while still accommodating growth in the overall number of buildings by 2050¹⁷.

Building retrofitting activities that will conserve energy include weather-proofing homes by installing insulation, blocking draughts around doorways, windows and chimneys. Activities that will improve energy efficiency include replacement of old appliances with more energy efficient appliances such as lights, showerheads, heaters, fans and air conditioners, fridges and freezers and hot water.

There is great potential to make Moonee Valley homes more greenhouse friendly, with existing households in Victoria rating on average at only two and a half stars for energy efficiency. Council is committed to increasing the average rating of homes in Moonee Valley and will set a target once the baseline is established.

For buildings, passive heating and cooling is a good way to achieve energy savings. Houses that have passive heating and cooling systems including outdoor window shading, heat reflective roof paint, well-shaded or reflective double-glazed windows and shady landscaping use up to 70 per cent less energy. Council will assist the community in making homes more energy efficient through facilitating retrofitting programs and promoting federal and state government retrofitting rebates. . According to the Australian Greenhouse Office ceiling, roof, wall and floor insulation can save up to 65 per cent on heating and cooling energy use.

Council will also support higher density housing with a particular focus on activity centres and public transport corridors. This will reduce the need to travel and support choosing alternative modes of transport such as walking, cycling or taking public transport.

Council will support capacity building programs for a range of different professionals in the built environment sector including plumbers, builders, electricians, facility managers, real estate agents and business managers to create greater skills and understanding of how to reduce emissions.

¹⁷ CIE (Centre for International Economics) 2007, Capitalising on the buildings sector's potential to lessen the costs of a broad based GHG emissions cut, prepared for ASBEC Climate Change Task Group available from http://www.asbec.asn.au/files/Building-sectorpotential_Sept13.pdf

Council will advocate for new buildings to meet environmental standards at the planning approval stage. This will include the introduction of a sustainable building assessment tool as supported by an amendment to the Moonee Valley Planning Scheme.

Council will keep retrofitting its own facilities to reduce greenhouse emissions. Council has over 100 buildings and is progressively auditing, retrofitting and monitoring their performance as reflected in the *Sustainable Building Action Plan*. Council will use this growing monitoring to set a best practice environmental performance target for the buildings it owns, operates and leases.

b) Sustainable business operations

Greenhouse emissions can arise from operations within businesses. Moonee Valley is home to a relatively small number of manufacturing businesses and has an opportunity to develop programs, education and incentive to help these businesses reduce emissions where possible.

Analysis shows that most emissions come from the metal products sector which incorporates sheet metal, iron and steel casting operations. This can be further investigated.

Opportunities for industrial ecology will also help reduce emissions by facilitating businesses to share resources and make use of a 'waste' product no longer needed by another. There are also opportunities to share freight and develop precinct distributed energy proposals.

c) Sustainable transport

Sustainable transport initiatives seek to increase the use of more environmentally friendly modes of transport, namely fuel efficient vehicles, public transport, cycling and walking.

Council aims at reducing greenhouse emissions from transport through its existing *Integrated Travel Plan* and *Green Travel Plan*.

For the community, Moonee Valley takes a holistic approach to providing a better integrated transport network by considering a range of initiatives including public transport, private vehicles with incentives for smaller vehicles, car share, preparing for an electric vehicle network, efficient freight management, cycling, pedestrian and travel demand management. This includes improved networks, infrastructure, planning controls and information for all.

For staff, initiatives to minimise emissions from the journey to work and during business hours include providing a bicycle fleet, tickets for public transport use, and incentives for non-car use.

d) Sustainable waste management

Council is committed to reducing its waste to landfill as set out in its *Waste Management Strategy*. With its current diversion away from landfill of 44.8 per cent, Moonee Valley has become a leading Council in this area.

Composting organics, reusing and recycling products, and minimising packaging are waste reduction initiatives currently underway by Council for both its own operations and for the community. Further advancements in advanced waste treatment are progressing with State Government support, which will further help reduce the amount of waste going to landfill.

Council will facilitate educational programs, supporting infrastructure and incentives to help residents apply best practice composting to minimise greenhouse emissions from organic waste.

e) Sustainable water use

Council is committed to reducing sustainable water use as set out in its *Sustainable Water Use Plan*.

Direct Council operational control falls with the greenhouse emissions from pumping and irrigating. This Strategy does not deal with the greenhouse emissions arising from wastewater treatment once water enters the sewer system.

Water reduction initiatives includes sustainable building programs that incorporate low flow showerheads and fittings which reduce hot water use, and efficient appliances which reduce the amount of water entering the sewerage systems for treatment.

Water sensitive urban design works including water harvesting, treatment and groundwater use are to be designed to minimise greenhouse emissions through location, technology and renewable energy sourcing. By designing for trees to be watered passively from roads and other surfaces will in turn keeps trees healthier and reduce the heat load on nearby buildings. This will help to reduce air conditioning needs and therefore greenhouse emissions.

f) Sustainable public lighting

Public lighting represents around 55 per cent of total emissions from Council operations. Moonee Valley has audited all of its lights and developed a *Sustainable Public Lighting Action Plan* to significantly reduce emissions by retrofitting to more efficient lighting types whilst still meeting Australian Standards.

The majority of Council's public lighting is unmetered and managed by a lighting distributor. Under the *National Greenhouse Energy Reporting Act 2007*, this lighting is classified as Scope 3 as it is not in the direct operational control of Council. In contrast, the metered lighting managed by Council is Scope 2 and Council has direct operational control.

Council has put forward a plan for both Scope 2 and Scope 3 lighting and has done this because distributors are not required to report on emissions from public lighting even though they have direct operational control. It is important to take a leadership role on public lighting to achieve a 55 per cent reduction on greenhouse emissions.

To invest in all the energy efficient retrofits, Council continues to seek Federal and State Government regulatory and financial support.

Implementation of the Plan will reduce Council's emissions by twenty per cent.

6.2 Renewable energy

Switch

Once efficiencies have been implemented to prevent greenhouse emissions, it is necessary to source the remaining energy needs from renewable sources that have no, or very low emissions for example, solar panels or wind turbines.

Moonee Valley has mapped its potential renewable energy sources including wind, solar and bioenergy maps. These maps cover Melbourne's West (coordinated by WAGA) and will be used to develop effective renewable energy programs. Council will investigate the feasibility of pilot initiatives with partners, businesses and households in Moonee Valley to help with the growing awareness and application of renewable energy in everyday life.

It is necessary for Council to source renewable energy in order to meet its target of zero emissions by 2020. This will comprise a mix of renewable energy installations and accredited GreenPower. Renewable energy sourcing will be planned annually based on funding opportunities and ensuring greenhouse reduction opportunities are maximised before committing to GreenPower to meet our target of zero net emissions.

a) Renewable energy sources

Solar energy

Enough energy from the sun strikes the Earth in one hour to provide all the energy consumed by the Earth's entire population in one year.

Council has mapped potential roof space for solar systems in Moonee Valley's industrial areas. Council will engage roof owners and solar power producers in a discussion about how these potentials might be realised.

Council recognises the importance of solar access to properties with installed solar panels. Efforts will be made to avoid shading through design and relocation opportunities. On some sites there is greater environmental value in enabling higher buildings to be developed that increase housing density. In such circumstances it would be counterproductive to limit development potential in urban locations because of individual access for solar panels. Higher density development, including more height, in existing urban areas with public transport and within activity centres brings environmental benefits including reduced private vehicle trips, and reduced demand for fringe land.

Council will promote and facilitate the uptake of solar power systems, solar cells, solar hot water systems and other solar powered goods through bulk buying initiatives in partnership with other local governments. The first bulk buy program that Council facilitated was very successful with an uptake of 167 solar power systems in Moonee Valley.

Bioenergy

A bioenergy plants are increasingly advancing in terms of technology and financial feasibility. The bioenergy map for Moonee Valley will identify sites that currently have significant organic waste that could be treated or pyrolysed in order to generate renewable energy whilst reducing waste to landfill.

Sustainable biofuels for vehicles are supported, however these are not to come from environmentally destructive practices (eg palm oil plantations) or that result in the replacement of food.

Wind energy

A wind mapping study¹⁸ completed in 2008 shows that there are low wind speeds in Moonee Valley. Opportunities for wind energy may arise on future tall buildings with greater wind exposure using new generation wind turbines. With current technology, wind energy is not feasible in Moonee Valley due to low wind speeds. Council supports viable wind energy projects in Melbourne's West through the Western Alliance for Greenhouse Action.

Hydro and ocean energy

Hydro, tidal and wave power are not feasible in Moonee Valley, as these technologies require strong river streams or steady ocean currents to produce electricity.

Geothermal energy

Geothermal energy in Australia is in its early stages. As the technology progresses, Council will investigate applying it in Moonee Valley via technology such as ground sourced heat pumps. Moonee Valley can support large geothermal energy projects through offset funding or other means. Large projects currently under exploration are located at the Otway Basin in Victoria, the Cooper/Eromanga Basin in South Australia, and in the Hunter Valley in New South Wales.

GreenPower

Installing renewable energy at the point of use is an effective way to reduce greenhouse emissions however in some instances this may not be feasible due to financing, ownership or siting challenges. In these instances, it is preferable to pay for renewable energy to be provided via an electricity retailer. This is known as GreenPower – and is an accredited system developed by the Federal Government.

Accredited GreenPower is electricity produced from renewable sources (e.g. wind and solar) that can be purchased through energy retailers. Buying GreenPower helps maintain and promote growth in renewable energy industry and green jobs, along with increasing and stabilising the price of Renewable Energy Certificates through increasing demand for renewable energy.

For community, Council will provide information and facilitate programs that support the uptake of renewable energy including the option of GreenPower.

For Council operations, Council will pursue greenhouse saving actions and its own renewable energy generation as a high priority. Closer to 2020 Council will then draw on 100 per cent GreenPower for remaining energy needs, if planned changes to the national greenhouse reporting and offsetting

¹⁸ *Wind Mapping for the western regions of Melbourne*. Western Alliance for Greenhouse Action (2008)

schemes occur to allow for Green Power to achieve emission reductions above the national target and therefore can be counted towards Council's zero net emissions target.

Through the Western Alliance for Greenhouse Action, Council will investigate and support community power projects that create renewable energy projects in the region.

b) Distributed energy

Energy efficiency can be achieved at both the point of use, for example a light fitting, and at the point of creation and transmission from power plants.

Power plants are typically only 30 per cent efficient in converting fuel into electricity with the rest of the energy lost as waste heat and another 10 per cent lost in transporting the electricity. More efficient ways to produce electricity are smaller power plants located near the customer, where the heat and electricity can be usefully employed and losses in transport are reduced. This is called distributed energy, sourced ideally from renewable energy, to set up cogeneration or trigeneration systems.

Cogeneration involves the use of a heat engine or a power station to simultaneously generate both electricity and useful heat. Cogeneration can be applied to commercial and residential facilities and buildings, which for example consume gas and electricity to produce heat and steam for general heating, water heating, and run production processes.

Council will investigate, and where feasible, assist location of small-scale cogeneration or trigeneration in Moonee Valley to increase energy efficiency. This often involves coordination of different end users (such as a cluster of businesses) to take advantage of one system.

c) Regulations and incentives for renewable energy

Renewable energy target

Renewable energy is an important part of achieving Moonee Valley's zero net emissions target. Sourcing from renewable energy will be increased as part of Council's ongoing program to reach zero net emissions by 2020.

The Federal Government has a Renewable Energy Target (RET) of sourcing 20 per cent of energy from renewable sources by 2020. Such a target will require the development and application of new technologies. Council will advocate for continual research and application of renewable energy as a means of providing small scale energy and base load power at the larger scale.

Feed in tariffs

When homes and organisations set up renewable energy installations, they are able to meet some or all of their own electricity needs. This in turn, will reduce their electricity bill. Sometimes the renewable energy installation will provide more energy than is needed by the owner. This can put their energy bill into credit.

One of the ways that governments are able to support renewable energy installations is through tariffs. This can be in the form of a 'gross feed in tariff' whereby the owners are reimbursed for all of the energy they generate, or a 'net feed-in tariff' where the owners are reimbursed for the energy they generate that exceeds their own needs. This energy is then returned to the 'grid', and redistributed for others to use and contributing to the national Renewable Energy Target.

In Victoria, the tariff system provides limited support including:

- a premium net feed-in tariff for solar panel systems is available to households, community organisations and small businesses with energy consumption of less than 100 MWh a year with solar panel systems up to five kilowatts in size. Owners will get a credit of 60 cents per kilowatt hour for energy they feed back into the grid. This is about four times the current cost of electricity in Victoria. The tariff will be paid as a credit off the householder's consumption bill by the electricity provider, not as a direct cash payment, and will expire at the end of each year. This system is only helpful for those sites that are only sourcing renewable energy for some of their electricity needs, as others have no need for the credits.

- other renewable power systems for homes and businesses of up to 100 kilowatt capacity, including wind, hydro and biomass, will remain eligible for the existing standard net feed-in tariff, which pays only the retail rate for any excess power they supply to the electricity grid.

Council will advocate for the following improvements to the feed-in tariffs:

- a 'gross' rather than a 'net' feed-in tariff, that pays solar owners for all the renewable energy they generate, not just the excess electricity that is not used
- a tariff that will be paid in cash rather than in electricity credit to be used within one year
- a scheme that is open to systems larger than a five kilowatt capacity
- a premium net feed-in tariff that is available to other renewable power systems that are now eligible for the existing standard feed-in tariff.

Renewable Energy Certificates

Renewable Energy Certificates (RECs) are a financial incentive provided by the Federal Government to those who install renewable energy systems. It is possible for the REC's to then be sold to help subsidise the original cost of the renewable energy system. The value of these certificates fluctuates according to market conditions. The REC's are generally sold to electricity retailers who are buying them to help meet their own mandatory renewable energy targets.

Each REC represents 1 megawatt (1000 kilowatt hours) of energy production that the system will produce over the course of its installation¹⁹. Recently, the Federal Government has increased the 'value' of one megawatt hour of electricity generation from one REC to five RECs.

By selling RECs, the cost of wind and solar installations is subsidised; however it can come at an 'environmental cost'. That is, when RECs are sold to large electricity retailers, they use this renewable energy to achieve their targets, rather than creating their own renewable energy.

It is therefore more effective for RECs to be kept so that those wind and solar installations will create renewable energy above and beyond the federal targets.

Council aims to equip as many of its facilities as possible with renewable energy installations to showcase what is possible and to achieve its renewable energy target.

Council will keep the RECs created through installing systems where financially possible. This will depend on energy usage, system costs and resulting payback periods. Council will generally keep REC's when installing renewable energy systems for its own operations, for sites where payback period for the system are less than 10 years through reduced energy and maintenance costs. It may however sell the RECs if the money is redirected back to another renewable energy project.

6.3 Removing greenhouse gases from the atmosphere

Sequester

A large challenge for climate change is to not just stop the growth in emissions but to take excess carbon out of the air so it doesn't continue to heat the planet. Emissions can be sequestered via natural and artificial means including:

Natural:

- Oceans: oceans are home to algae which have natural photosynthesis processes that absorb carbon dioxide. Ocean sequestration schemes are likely to be large, and will likely require a State or Federal coordinated response. This needs to be managed within the realms of ocean health.
- Trees: trees absorb carbon dioxide through the photosynthesis process. This emphasises the importance of reducing forest clearing, and supporting sustainable tree planting programs above and beyond existing schemes. Tree-planting schemes need to be consistent with the Kyoto

¹⁹ RECs are regulated under the Renewable Energy (Electricity) Act 2000.

Protocol, which requires a forest of at least 0.2 hectares in size, a tree crown cover of at least 20 per cent, a tree height of at least 2 metres and planted after 1990.

- Soils: carbon is stored in soil via inorganic materials such as limestone and via organic materials such as plant roots, leaf litter, humus, charcoal and other materials of biological origin. Whilst carbon stored in soils can be released by natural and artificial processes, the remainder will be retained in the soil.

Artificial:

Capturing carbon and preventing it from being released into the atmosphere via combustion, decay or other processes. Wood is a carbon rich material, and its use in a building with a long life span will capture that carbon compared to burning the wood which returns the carbon to the atmosphere.

Whilst artificial (or an artificial advancement of a natural process), many of these sequestration opportunities can be managed to limit or enhance environmental impacts. It includes:

- Biochar: soils represent a short to long term carbon storage option when combined with a carbon solidifying processes in the form of charcoal (or biochar). Carbon is able to be stored within soil structures instead of being released into the atmosphere. This can have added environmental benefits including improved soil capacity, and is a very viable option for Moonee Valley and its neighbouring municipalities to support.
- Carbon capture and storage: carbon capture and storage is currently supported by Federal and State Government and refers primarily to capturing carbon at coal fired power stations and storing underground. Moonee Valley considers this to be one of a suite of sequestration options (if research deems it to be a successful process), and does not consider it should be undertaken at the expense of other methods.
- Methane sequestration and power generation: Capturing and combusting methane prevents it entering the atmosphere. Burning methane produces fewer emissions compared to it directly entering the atmosphere. Landfills are prime sites for this sequestration method, as they emit large amounts of methane. It is also possible to use the heat from flaring to generate energy.

Due to the scale of sequestration projects, Council will need to deliver these in regional, State or Federal partnerships, or invest in programs via an accredited off-set scheme.

Council supports a future that seeks to 'close the loop' on emissions in the municipality. An example of this is counting the value of its own tree and vegetation plantings for removing carbon from the atmosphere. Currently, tree planting protocols for sequestering carbon do not count such plantings, however Council will proceed to better monitor and value a carbon cycle at a local scale.

6.4 Offsetting remaining emissions

Offset

Even with minimal energy use, the highest efficiency standards and the greatest commitment to renewable energy, there will still be some greenhouse emissions (e.g. gas for cooking and heating). These will however be minimal and accredited systems exist that enable these emissions to be offset by reducing or sequestering emissions at another site.

Council will only invest in offsets that have been recognised by the National Carbon Offset Standard. This is to demonstrate that projects meet quality requirements (e.g. would not have happened without the offset market, are not sold to multiple-buyers, and are permanent).

Council will investigate and if feasible support establishment of local and regional offset projects that can be accredited under the Standard.

7. Implementation, monitoring and review

Implementation

The *Greenhouse Strategy* serves as a framework to ensure continued commitment to implementing activities and to identify new opportunities as they arise. Implementation of the *Greenhouse Strategy* will take a Council wide approach. As shown in the previous sections Council has already implemented a number of actions that were included in the *Greenhouse Action Plan 2004* and/or the *Environmental Sustainability Plan 2007*.

Monitoring

Ongoing monitoring is vital and will be particularly driven by the establishment of an emissions data management system for Council. The system will enable council to effectively calculate corporate emissions and the efficiency savings that are outlined in *Corporate Greenhouse Action Plan 2010*.

A Council report will be prepared every year to report on implementation of actions and on emissions saved. The review will identify areas in need of additional or alternative actions to ensure ongoing success of the Strategy in line with the Council and community targets.

Review

The Strategy will remain a dynamic document and take into consideration changes in knowledge, awareness, attitude and technology for addressing climate change.

The *Council Greenhouse Action Plan* and *Community Greenhouse Action Plan* will be updated on an ongoing basis. The success of these actions will be measured by costs, emission reductions, participation of stakeholders and observable behaviour changes in community and Council staff.

A comprehensive review of the Strategy will occur in 2013-2014. This review will assess the suitability of reductions targets and guiding principles in light of any changes to technologies, legislation, funding, Federal and State policy and community expectations.

Appendix 1: Policy context

International greenhouse mitigation

The Convention on Climate Change

Over a decade ago, most countries joined the United Nations Framework Convention on Climate Change (UNFCCC) to consider what can be done to reduce global warming and to cope with inevitable temperature increases.

The Convention on Climate Change sets a framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognises that the climate system is a shared resource whose stability can be affected by emissions of greenhouse gases. The Convention enjoys near universal membership, with 192 countries, including Australia, having ratified. The Convention entered into force on 21 March 1994.²⁰

The Kyoto Protocol

The Kyoto Protocol is an international agreement linked to the Convention on Climate Change. The Protocol sets binding targets for 37 industrialised countries and the European community for reducing greenhouse gas emissions. Reductions amount to an average of five per cent against 1990 levels over the period 2008-2012.

The Protocol places a heavier burden on developed nations, recognising that these are principally responsible for the high levels of greenhouse gas emissions as a result of more than 150 years of industrial activity.

The Kyoto Protocol was adopted in Kyoto, Japan, in 1997 and entered into force in 2005. One hundred and eighty two Parties of the Convention, including Australia, have ratified the Protocol to date.²¹

The Intergovernmental Panel on Climate Change

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP). IPCC assesses scientific, technical and socio-economic information to understand climate change, its potential impacts and options for adaptation and mitigation.

The IPCC's Fourth Assessment Report (2007) concludes that global warming has accelerated in recent decades, and there is strong evidence that warming over the past 50 years is attributable to the increase in greenhouse gas emissions from human activities.

Australian greenhouse mitigation

Australia has the highest per capita emissions in the world. This is due to our heavy reliance on fossil fuels for the generation of electricity, amounting to approximately 90 per cent of the energy generated²². Through ratifying the Kyoto Protocol, Australia has committed to ensuring its greenhouse emissions over 2008 to 2012 are no more than 8 per cent above 1990 levels.

The Australian Government has embraced a comprehensive plan of action to reduce our national emissions. Key elements include:

- The Carbon Pollution Reduction Scheme (CPRS)
- National Renewable Energy Target (RET)

²⁰ http://unfccc.int/essential_background/convention/items/2627.php

²¹ http://unfccc.int/kyoto_protocol/items/2830.php

²² <http://www.smh.com.au/articles/2004/06/18/1087245110190.html>

- The National Greenhouse and Energy Reporting Act 2007
- Helping households and businesses to use energy more wisely
- Investing in research and development on low emissions technologies

The Carbon Pollution Reduction Scheme (CPRS)

The Federal Government is planning to introduce emission trading in 2011 by establishing the Carbon Pollution Reduction Scheme (CPRS). The CPRS has two distinct elements - the cap on carbon pollution and the ability to trade. The cap achieves the environmental outcome of reducing carbon pollution; the ability to trade ensures carbon pollution is reduced at the lowest possible cost.

Permits equivalent to the cap will be auctioned or given away to the largest 1000 polluters who are responsible for about 75 per cent of Australia's emissions. These permits will then be bought and sold between the largest polluters depending on their desire to increase or decrease their emissions.

The CPRS acts as a 'cap' above which the aggregate quantity of emissions from sources covered by the scheme cannot rise.

National Carbon Offset Standard

The Federal Government has developed National Carbon Offset Standard to ensure there are clear criteria around how offsets are generated, verified and calculated.

National Renewable Energy Target (RET)

The Government has set a 20 per cent target for renewable energy by 2020 to expand the use of renewable energy. To deliver on this goal a national RET scheme is being established which will expand the previous Mandatory Renewable Energy Target (MRET) by over 4 times in 2020. Renewable energy sources such as wind, solar and geothermal will be a key part of the global solution, and Australia has vast potential in these key areas.

The National Greenhouse and Energy Reporting Act 2007

The National Greenhouse and Energy Reporting Act 2007 has established a mandatory reporting system for corporations with high greenhouse emissions.

The first reporting period under the Act commenced on 1 July 2008. Key features of the Act are:

- Reporting of greenhouse gas emissions, energy consumption and production by large corporations.
- Public disclosure of corporate level greenhouse gas emissions and energy information.
- Consistent and comparable data available for decision making, in particular, the development of the Carbon Pollution Reduction Scheme.

Investing in research and development on low emissions technologies

The Government plans to tackle climate change with a wide range of technologies, including clean fossil fuels, biofuels, hydrogen and energy efficiency.

Helping households and businesses to use energy more wisely

Through financial incentives, energy efficiency regulations and targeted information, households will be helped to use less energy while saving money. Key measures include low interest loans for Australian

households to implement energy and water savings and rebates for energy-efficient insulation for rental homes, rooftop solar power panels, solar hot water systems, rainwater tanks and grey water recycling.

State Government greenhouse mitigation

Climate Change Green Paper

The State Government has released a Climate Change Green Paper as the next step in its response to climate change. The Paper proposes ways to reduce greenhouse emissions, adapt to the impacts of climate change and move towards a low carbon economy. The strategies outlined in the Paper are designed to complement the national CPRS. The Paper does not propose a State based greenhouse reduction target.

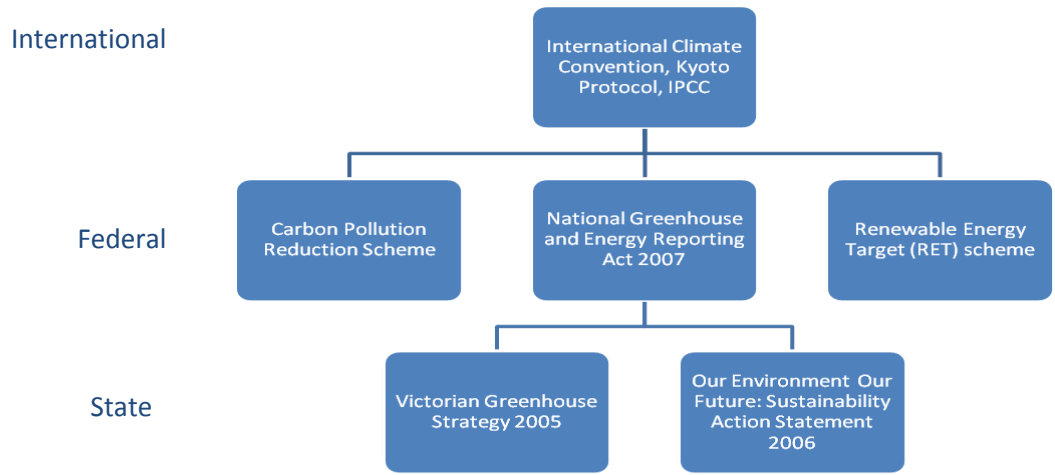
The State Government will develop a new climate change strategy for Victoria based on the feedback received.

Feed-in tariff for renewable energy

The Victorian Government has introduced a premium net feed-in tariff to support households to invest in solar panel systems. The scheme is available to households, community organisations and small businesses with energy consumption less than 100 MWh a year with solar panel systems up to five kilowatts in size. Owners will get a credit of 60 cents per kilowatt hour for energy they feed back into the grid. This is about four times the current cost of electricity in Victoria. The tariff is paid as a credit off the householder’s consumption, not as a direct cash payment, and will expire at the end of each year.

Under the Victorian scheme, other renewable power systems for homes and businesses of up to 100 kilowatt capacity, including wind, hydro and biomass, will remain eligible for the existing standard feed-in tariff, which pays the retail rate for any excess power they supply to the electricity grid.

Overview relevant international, federal and State policies



Terms and definitions

Buildings (greenhouse) emissions: see Council emissions

Carbon dioxide equivalent (CO₂-e): A standard measure that takes account of the different global warming potentials of greenhouse gases and expresses the cumulative effect in a common unit.

Carbon footprint: A measure of the carbon dioxide equivalent emissions attributable to an activity, commonly used at an individual, household, organisation or product level.

Carbon neutrality (zero net greenhouse emissions): Commonly refers to a situation where the net emissions associated with a product or an organisation's activities are equal to zero through the acquisition and retirement of carbon offsets.

The concept commonly refers to a situation where the net emissions associated with a product or an organisation's activities are equal to zero through the acquisition and retirement of carbon offsets.

The concept of carbon neutrality or zero greenhouse emissions is being defined by common usage. There are no international or national official definitions or standards (ACCC). The United Nations as well as Australia, the United Kingdom and the United States of America are currently in the process of defining the concept for official use.

'Zero net greenhouse emissions', or being 'carbon neutral', requires maximum effort to reduce emissions by being efficient, changing behaviour and using energy that does not release emissions. Beyond this, any remaining emissions can then be reduced to 'net zero' by drawing an equivalent amount out of the atmosphere by sequestration. These sequestered 'offsets' are then converted (such as plants converting carbon dioxide to oxygen) or captured so they are no longer in the atmosphere (such as capturing in biochar or underground) and contributing to global warming.

Any progress in this definition will be considered by Council in its next review of the Greenhouse Strategy.

Carbon sink: A natural or manmade reservoir that accumulates and stores carbon dioxide for an indefinite period.

Clean Development Mechanism (CDM): The CDM allows greenhouse gas emission reduction projects to take place in countries that have no emission targets under the Kyoto Protocol, yet are signatories. The CDM is defined in Article 12 of the Kyoto Protocol.

Commercial and industrial (greenhouse) emissions: see community emissions

Community emissions: All greenhouse emissions from residents, business, organisations and government agencies based in the municipality of Moonee Valley. Various sectors contribute to the community's greenhouse gas emissions. These include:

Residential: Greenhouse emissions produced through the electricity and natural gas used to heat and cool buildings, power electrical appliances and provide hot water.

Transport: Greenhouse emissions produced from vehicle fuel

Commercial and industrial: Greenhouse emissions produced through the electricity and natural gas used to heat and cool buildings, power electrical appliances and provide hot water. Industrial energy use may also include energy intensive functions like running motors and furnaces.

Waste: Methane emissions produced from residential and commercial organic waste in landfill

Corporate emissions: see Council emissions

Council emissions: All greenhouse emissions from Moonee Valley City Council's operations. Various sectors contribute to the Council's greenhouse gas emissions. These include:

Public Lighting: Greenhouse emissions produced through the electricity that is used to power public lighting in Moonee Valley that is either managed by Council (metered) or managed by a distributor on Council's behalf (unmetered). It includes lights located in streets, car parks, parks and sports grounds

Buildings: Greenhouse emissions produced through the electricity and natural gas used by the buildings that Council operates. Buildings range from civic centres and community halls to park barbecues. This excludes buildings that Council owns but are leased and operated by another organisation.

Vehicle fleet: Greenhouse emissions produced through the fuel consumed by Council's passenger vehicles, utility vehicles and specialised heavy equipment.

Waste: Greenhouse emissions produced directly or through the processing of waste generated by Council operations such as office waste and green waste from parks and gardens.

Water/sewage: Emissions from water and sewage are produced through the electricity that is used to power treatment plants, pumps, sprinklers, fountains and bores that Council operates.

Emissions: The release of greenhouse gases in the atmosphere.

Greenhouse emissions: see emissions.

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

GreenPower: A government accreditation program for the purchase of electricity generated from renewable energy which produces no net greenhouse gas emissions.

Kyoto Protocol: An international treaty created under the UNFCCC in 1997. It entered into force in 2005. Among other things, the Kyoto Protocol sets binding targets for the reduction of greenhouse gas emissions by developed countries and countries in transition. It includes individual emission reduction targets for Annex I countries to be met within the first commitment period of 2008-12.

National Greenhouse and Energy Reporting (NGER) System: The national reporting framework for information related to the greenhouse gas emissions, and energy production and use of corporations operating in Australia. The framework is established under Commonwealth legislation, which makes registration and reporting mandatory for corporations whose greenhouse gas emissions or energy production or use meet certain thresholds.

Offset: Represents a reduction in greenhouse gases, or enhancement of greenhouse gas removal from the atmosphere by sinks, relative to a business-as-usual baseline. Carbon offsets are tradeable and often used to negate (or offset) all or part of another entity's emissions.

Operational control: The greatest authority to introduce and implement any or all of the following for the Facility: (i) operating policies; (ii) health and safety policies; (iii) environmental policies. Only one corporation can have operational control over a Facility at any time.

Public lighting (greenhouse) emissions: see Council emissions

Residential (greenhouse) emissions: see community emissions

Scope 1 emissions: The release of greenhouse gas into the atmosphere as a direct result of activities at a Facility.

Scope 2 emissions: The release of greenhouse gas as a result of electricity generation, heating, cooling or steam that is consumed by a Facility.

Scope 3 emissions: The release of greenhouse gas into the atmosphere that is generated in the wider economy as a consequence of a facility's activities but that are physically produced by another Facility.

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

Transport (greenhouse) emissions: see community emissions

Vehicle fleet (greenhouse) emissions: see Council emissions

Waste (methane) emissions: see community/ Council emissions

Water/sewage (greenhouse) emissions: see Council emissions

Western Alliance for Greenhouse Action (WAGA): Regional partnership of local governments to reduce their greenhouse emissions including Brimbank, Hobsons Bay, Maribyrnong, Melton, Moonee Valley, Moorabool and Wyndham.

Zero net emissions: see carbon neutrality