

GREENHOUSE PLAN

LOW CARBON CITY



Take Local Action: Be Part of the Solution

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EXECUTIVE SUMMARY

The Greenhouse Plan supports Council's Toward Zero Sustainable Environment Strategy, which governs the broad direction, action and progress of Council's environmental strategies in nine key sustainability challenges.

The Greenhouse Plan will assist Council to address emissions reduction actions in six of these challenges:

- greenhouse gas emissions
- urban design and development
- transport
- zero waste
- purchasing and procurement
- climate change.

These six challenges will be crucial to Council meeting the emissions reduction targets and timelines it has set in the Toward Zero strategy, which are:

1. Zero net Council carbon emissions by 2020 – this covers emissions from electricity and gas use, Council fleet and waste to landfill from Council operations.
2. 50% reduction in per capita community carbon emissions by 2020 – this aspirational target covers residential, business and industry emissions from electricity and gas use, travel patterns and waste to landfill.

Zero net Council carbon emissions by 2020

As at January 2011, Council's calculated emissions inventory, excluding waste, totalled 15,010 tonnes carbon dioxide equivalent (tCO₂-e) a year.¹

Council's total net annual greenhouse gas emissions are 22% lower than in 2007 largely because of GreenPower purchases.

To meet its 2020 target, Council will be aiming to reduce emissions from stationary energy consumption (electricity and gas), transport energy consumption and waste sent to landfill. Waste to landfill emissions will not be verified and included in this plan until Council completes comprehensive waste audits in 2011/12.

These are not all of the possible sources of emissions resulting from Council activities, just those that will be contributing to the target.

The greenhouse management hierarchy – measure, reduce, switch, advocate, offset, repeat – informs Council's approach to achieving its zero emissions target.

The focus for the short term is to achieve significant efficiency gains as quickly as possible in five core operations: buildings, public lighting, transport, IT, infrastructure and waste.

For each of these core operations, the Greenhouse Plan provides an 'action framework' to implement Council's emission reduction activities. Each framework details:

- the level and sources of emissions
- action paths, strategies, actions and plans that can be used to reduce emissions.

A 50% reduction in per capita community carbon emissions by 2020

Total annual greenhouse gas emissions for the Port Phillip community, as estimated at the start of 2011, are approximately 1,561,104 tCO₂-e.

The commercial sector accounts for 52.3% of total emissions, the residential sector 35.52%, and the industrial sector 12.2%.

Total community emissions have risen by about 8% since 2007. If we take no community action to reduce emissions and just rely on federal and state government policies and activities, our total 'business as usual' emissions in 2020 will be a few percent lower than in 2011.

To achieve our target of a 50% reduction, a community greenhouse action framework has been developed. Community action will be required in four key areas: behaviour; efficient technology; fuel switching and advocacy.

Some options for reducing emissions from **the residential sector** are discussed using two actions models labelled 'optimistic' and 'ambitious'.

The optimistic model combines moderate federal government action with a series of moderate residential actions and would require GreenPower or other offsets to be bought to achieve the 50% target.

The ambitious model combines more proactive federal and state government, economic and residential actions to achieve a 50% reduction in total emissions per resident without the need to purchase GreenPower or other offsets.

Action taken by **the business/commercial sector** is perhaps the most effective path to reducing emissions for the community. Most energy efficiency actions will pay for themselves within a short time and are often a no-cost or cost-reducing solution.

Based on the typical findings of an energy engineer's audit, the plan lists 10 actions that are the most likely low-cost energy efficiency improvements available to the types of businesses in the City of Port Phillip.

Retrofitting or renovating your home or business to operate sustainably can significantly reduce per capita **emissions from built assets**. Actions such as passive solar design, good cross ventilation, double/triple glazing, external shading and insulation all make a home or business much more thermally efficient and pleasant to be in, while using much less energy.

Significant reductions in **emissions from personal transport** are possible through modal shifts to walking, bike riding and public transport for short, medium and longer trip ranges.

To achieve these results, big improvements to the public transport network would be required. Council aims to gain improvements in transport connectivity and infrastructure, as well as provide disincentives to maintaining the status quo.



Taking action on climate change can draw the local community together

OUR VISION: A LOW CARBON CITY

A low carbon city is one that has transformed the way its residents and businesses use energy to minimise greenhouse gas emissions.

It uses energy and fuel efficient technologies and renewable energy sources that minimise emissions. It is easy for residents and businesses to choose more suitable materials and goods to build an energy smart city and community. Most people who can are walking, bike riding or taking public transport for most of their journeys. Roads and other public infrastructure are built with low carbon materials, while energy efficient lighting is used in public spaces.

Homes and buildings use design principles and materials rated for energy efficiency and the sun for heating in winter and daylight for lighting all year round. Open spaces, building roofs and walls use vegetation to create more comfortable indoor temperatures, making them less likely to be affected by heatwaves and extreme seasonal temperatures. Roofs are covered with solar panels to capture and use sunlight for electricity and hot water.

A low carbon city that is energy efficient, uses renewable energy sources and supports people to make sustainable choices in their day-to-day lives.

Large industrial complexes and businesses capture and reuse the heat from their production processes and share energy from onsite generation systems. Some less-used, windy foreshore sections of the city contain wind turbines that generate renewable energy for local community use. Together, these distributed energy systems support the electricity grid and help to minimise power spikes and blackouts.

Residents and businesses have energy smart lifestyles and practices. They minimise unnecessary energy and fuel use and waste to landfill. They are resilient to the progressively rising price of more expensive energy sources.



Left: Port Phillip residents enjoy a range of low carbon transport options
Right: A passive solar designed house gains deep winter sunshine

INTRODUCTION

The Greenhouse Plan sets the vision and strategy for Council and the Port Phillip community to become a low carbon city.

It is a municipal-wide plan to direct actions aimed at changing how we use energy and resources and to reduce the greenhouse gas emissions that our energy use and activities generate.

This plan expresses Council's contribution to action being taken all over the world to limit dangerous climate change. For Council and the City of Port Phillip, this means achieving zero corporate emissions by 2020 and helping our community to reduce emissions by 50% by 2020.

Who is this plan for?

The Greenhouse Plan aims to assist Council and the Port Phillip community to implement strategic and practical greenhouse abatement actions.

It details the approach that Council will take to reducing its own emissions and the contribution each action path will make.

The plan also describes the actions Council will take to facilitate community emissions reduction, advocacy priorities to encourage state and federal leadership, and introduces some actions that may be taken by the community.

How this plan was shaped

The Greenhouse Plan has been developed to incorporate:

- **Toward Zero** – Council's overarching sustainable environment strategy and greenhouse targets
- consultation and brainstorm sessions with the community and with key Council work areas
- emission reduction modelling and trend analysis undertaken by expert consultants to define the most effective pathways to reduce Council and community emissions. This material is available at: www.envirohub.com.au/council-policy-strategy

Objectives of the Greenhouse Plan

This plan aims to facilitate three Council priorities:

- To achieve Council and community greenhouse reduction priorities as set out in Council's **Toward Zero Sustainable Environment Strategy**, the **Council Plan** (2009-2013) and the **Community Plan** (2007-2016)
- To develop a community and Council culture of managing and limiting greenhouse gas emissions
- To advocate for state and national policy and strategies that will facilitate a community-wide transition to a low carbon future.

The plan will also enable Council to determine and develop key medium-term priorities to drive further emissions reductions and new actions to enable the transition to a low carbon city beyond 2020.



Transition Port Phillip - hosted "Sustainability Crawl's" in 2011 as part of facilitating a participatory community mapping project



SECTION I

Acting on greenhouse gas emissions – context

Why act now to reduce carbon emissions?

Port Phillip City Council has made a clear commitment to taking action on climate change. This decision was based on the consensus reached among the world's climate scientists that there is a direct correlation between global temperature increases and greenhouse gases resulting from human activities.

Without action to cut emissions related to fossil fuel consumption, it is estimated that by 2100¹ the average global surface temperature will be up to 4.0°C higher than in 2000. This would have catastrophic effects on human societies and the ecosystems we depend on.

Oil and gas-related products and byproducts are a fundamental part of our everyday lives, from how we travel, to the production of plastics, to the manufacture of the clothes we wear. Yet global oil and



Locals Into Victoria's Environment – www.live.org.au. More than 4000 people got together on St Kilda Beach on 17 May 2009 to create the human climate change sign. Copyright 2009

Council feels that Australia should be a leader in greenhouse abatement even though, as a country, our total annual emissions account for only around 1.5% of the global total². Australia has great opportunity to transition to low carbon energy sources such as wind and solar generation. Australia also needs to build early resilience and the capacity to continue to compete and participate in what is fast becoming a global transition to low carbon economies.

gas production are at or past their peak; supplies will eventually start to fall and the cost of extracting what is left of these non-renewable resources will rise.

This is a further compelling reason beyond climate change for making the transition to alternative, low carbon sources of energy. To ensure we can maintain our quality of life, we need to fast-track actions to shift to renewable energy and fuel sources and low embodied energy materials.

Australia has some of the highest per capita emissions in the world – nearly twice the OECD average and more than four times the world average. This means that as individuals, we are responsible for more emissions than most other people in the world.

Even if we reduced those emissions by 50%, we would still be about average for other industrialised countries.

INTERNATIONAL CONTEXT FOR GREENHOUSE ACTION

In 1988, the international community officially recognised the need to protect the global climate for the wellbeing of current and future generations. Four years later, at the first World Summit on Sustainable Development (Rio Earth Summit) in 1992, the **United Nations Framework Convention on Climate Change (UNFCCC)** was established. Its purpose was to begin to consider what can be done to reduce global warming and to cope with future temperature increases.

The pre-eminent provider of global scientific data and information on emissions growth and climate change is the **Intergovernmental Panel on Climate Change (IPCC)**³. IPCC reports are used by the UNFCCC and national governments to consider global climate and emissions reduction action. In 2007, the IPCC delivered its fourth assessment report, which found that climate change is accelerating.

International negotiations have mostly focused on how nations should reduce their emissions and what the best process is for ensuring fair and equitable emissions reductions. These culminated in the introduction of the **Kyoto Protocol** in 1997. The protocol required signatories to adopt greenhouse gas reduction targets to be achieved by 2010 and to consider international formats for binding global targets from 2012.

In 2012, the Kyoto Protocol period will end. At the time of writing, signatory nations had not yet reached an agreement on binding global reduction targets or the framework for action beyond 2012.

Countries that have set substantial reduction targets and initiated significant action include the member countries of the European Union, China, India and Brazil.



*Australia has argued strongly for international action to reduce carbon emissions.
Source: National Archives of Australia (<http://primeministers.naa.gov.au/>)*

FEDERAL AND STATE CONTEXT FOR GREENHOUSE ACTION

Australia's federal and state governments have a critical role to play in developing a society and an economy that are geared to emitting less greenhouse gases. These levels of government can influence some abatement activities by:

- fostering general community awareness and behaviour change
- increasing renewable energy targets and fostering low or zero carbon distributed energy generation
- fostering emerging green technologies and local industries to provide new and replacement job opportunities
- setting transparent targets, timelines and accountabilities for greenhouse emissions reductions and renewable energy generation.

The federal government regulates and sets national policy and negotiates Australia's role in international treaties. Australia ratified the Kyoto Protocol in 2007 and in doing so committed to limiting emissions to an 8% increase on 1990 levels by 2012⁴.

Since ratifying the Protocol, the federal government has introduced legislation and programs to reduce energy consumption in heavy industry and in residential homes. Key areas that the federal government must consider for action include:

- a range of market and non-market regulators and incentives to support the transition to a low emissions economy, including setting a price on carbon

- regulating industries that are energy intensive and high carbon emitters
- aligning our taxation system to support investment in the green economy
- introducing more stringent energy use and lifecycle labelling of appliances and key energy-using technology
- reform of the national electricity and gas markets to drive changes in how we manage and consume energy
- taking steps to either offset or cease the exportation of Australia's coal and gas.

At the state level, key areas for government action include:

- introducing state planning standards and development controls that require all new buildings and major renovations to minimise their carbon footprint during construction and operation
- introducing a sustainable transport framework that prioritises major infrastructure and network development and support for all non-car transport modes
- ensuring that our educational institutions are resourced to provide the skills and education programs required to support a transition to a low emissions society.



Our politicians have enormous responsibility to reduce the risks and cost of climate change

LOCAL GOVERNMENT CONTEXT FOR GREENHOUSE ACTION

Local government plays an important role in our communities. Councils foster and administer local environs, are a conduit to other levels of government, and build municipal-wide capacity and networks. Councils can achieve real reductions in carbon-emitting structures that they control. Through this action, they can demonstrate how to reduce emissions and influence action in their communities.

In Australia, local councils have been actively reducing their emissions for more than 12 years. Their actions have ranged from energy efficiency retrofits in buildings to behaviour change programs, switching-off equipment in facilities, installing solar panels on buildings, and replacing street lighting with more efficient technology.



Councillors - City of Port Phillip

Local government action – international context

At the Rio Earth Summit in 1992, local government's role in protecting the environment was defined in the United Nations blueprint for sustainability, **Agenda 21**. Since that time, local governments across the globe have implemented **Local Agenda 21** frameworks and programs to improve sustainable development in their municipalities.

International organisations such as the International Council for Local Environmental Initiatives (ICLEI) have been actively helping local governments to fulfil their role in reducing greenhouse gas emissions⁵ through programs such as the Cities for Climate Protection Program (which has more than 800 participating cities globally).

Councils have set targets for reducing their own emissions and those within their communities, and put in place actions to achieve these targets. As a result, cities, shires and boroughs and their communities across the world are beginning to achieve real reductions across their own operations.

Newcastle City's Climate Cam

Newcastle City Council was one of the first Australian councils to join the Cities for Climate Protection Program in 1997. Since then, Newcastle has achieved significant emission reductions in its operations.

The centrepiece of Newcastle's community climate program is the Climate Cam – a billboard in the town square that shows the real-time consumption of electricity within the entire municipality.

The Climate Cam is the world's first greenhouse gas speedometer and is the epitome of the management axiom "if you can't measure it, you can't manage it". Newcastle City Council's Environment Manager, Peter Dormand, says: "We learnt that once we started measuring energy consumption, we could see whether or not what we were doing [to save energy] was working at the Council building level. So we applied that to the entire city."

The Climate Cam is accompanied by a program to help residents, businesses and schools to reduce their emissions.



GREENHOUSE ACTION IN THE CITY OF PORT PHILLIP



Participants at the City of Port Phillip Climate Conversations.

About the City of Port Phillip

The City of Port Phillip covers 20.62 square kilometres of land, including 11 kilometres of foreshore on Port Phillip Bay. It includes the suburbs of Port Melbourne, South Melbourne, Middle Park/Albert Park, St Kilda, East St Kilda, Elwood/Ripponlea, and the St Kilda Road precinct.

Much of the municipality is well established, with little new land for development. The population is estimated at about 96,000 in 2010/2011. 40% of households are single-person, followed by couples without dependants at 25%. The city has one of the highest proportions of apartment dwellers in metropolitan Melbourne, with almost 70% of its residential housing being apartments and flats. More than 45% of residents are renters.

The city has an estimated 18,000 businesses, with a significant proportion being small to medium enterprises. Port Melbourne contains the only remnant pockets of industry. The city has many corporations and office blocks in the St Kilda Road and Kings Way areas.

Our greenhouse reduction opportunities and challenges

The City of Port Phillip is densely populated and built up. Most homes are smaller than the Melbourne average. Many are also subject to heritage requirements⁶, which can limit modifications to the building. The high number of apartment blocks presents several specific challenges and limitations to implementing sustainability actions.

Many non-residential buildings are rented by businesses and come with pre-existing and ageing infrastructure and technology. This makes it difficult for tenants to invest in energy efficiency.

Equally, there are many opportunities presented at the local level.

We have excellent infrastructure for and access to public transport, walking and bike riding. There is potential for resource sharing, including onsite energy generation, among our high-density apartment blocks. It may also be possible to make good use of the excellent wind resource that exists on our relatively long coastline.

Our community's commitment to greenhouse action

The Port Phillip community continues to be a driving force behind local and Council action on greenhouse gas reduction. The overwhelming majority of the community is interested in taking personal and collective action to reduce emissions⁷. There are several local groups working to begin neighbourhood action and to build capacity and ability in the community to reduce emissions. These early adopters are some of our key community drivers.

City of Port Phillip's journey to date

- 1996** Community creates a Council agenda for strong sustainability action, especially on greenhouse gas emissions
- 1997** Council and community greenhouse inventory initiated
- 1998/99** Council joins **Cities for Climate Protection Program**
- 2001** Council delivers one of the first community behaviour change programs in Australia, **Sustainable Living At Home**
- 2002** Council tests nascent LED technology in lights on the foreshore
- 2003/04** Council assists community members to sign up to Community Power, a Darebin City initiative to purchase renewable energy
- 2004** Council introduces its first **Sustainable Transport Strategy** and begins a range of actions to foster sustainable transport modes
- 2005** Council introduces the **Sustainable Design Scorecard (STEPS/SDS)** with Moreland City to promote sustainability standards and outcomes for renovations and new buildings
- 2006** Council revises its **Fleet Policy** to encourage staff to use alternative transport modes. It is further revised in 2008 and 2009
- 2007** Council introduces its revised umbrella strategy, **Toward Zero Sustainable Environment Strategy**, with a strong and committed agenda to greenhouse action, reduction targets and timelines. Council also introduces its **Sustainable Design Strategy**
- 2008** Council introduces a range of community programs focusing on residential greenhouse reductions such as **Climate Challenge 1000** and **Challenge 2 Change**. Council also initiates its **Sustainable Public Lighting Strategy**
- 2009** Council begins retrofitting its own buildings under its **Sustainable Building Improvement Plan** and introduces the **Community Environment eHub**, its community environment information website
- 2010** Council introduces its **Sustainable Design for Council Buildings** (component of the Sustainable Design Strategy), continues with corporate building retrofit program and community programs aimed at office blocks and apartment blocks. A bulk changeover of streetlights to more efficient lamps begins
- 2011** Development work continues on the **Sustainable Public Lighting Strategy** and guidelines, **Sustainable Building Improvement Plan**, **Greenhouse Plan** and **Sustainable Transport Plans**.

DELIVERING TOWARD ZERO

The **Toward Zero Sustainable Environment Strategy**⁸ is Council's overarching environment strategy. It governs the broad direction, action and progress of Council's environmental strategies in nine key sustainability challenges.

The Greenhouse Plan will assist Council to focus its emission reductions actions to address six of these challenges:

- greenhouse gas emissions
- urban design and development
- transport
- waste
- purchasing and procurement
- climate change.

Although Council and community waste emissions, emissions from Council's contractors and key embodied emissions are not included in the draft plan, it is intended that they will be included in future. The plan will be updated over time to reflect developments in our knowledge and potential solutions.

Our reduction targets

Toward Zero sets greenhouse emissions reduction targets and timelines for Council and the community to aim for by 2020.

Port Phillip City Council set these targets with the conviction that we can and must achieve them. As a progressive City and part of the developed world, we have excellent capacity, considerable tools and the technology to make the transition to low emissions households and businesses.

They are:

1. Zero net Council carbon emissions by 2020

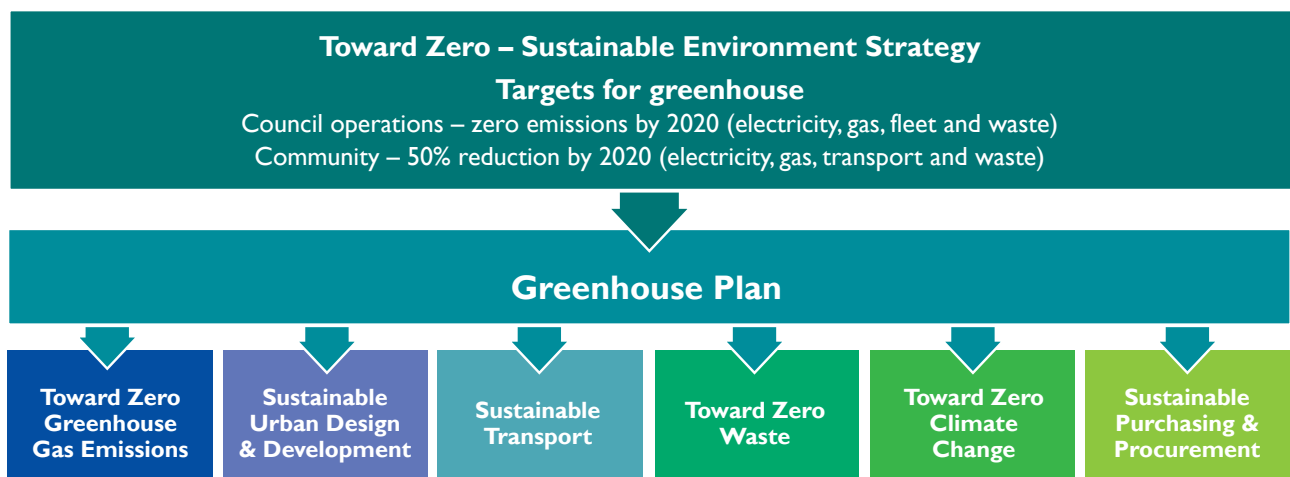
This covers emissions from electricity and gas use, Council fleet and waste to landfill from Council operations.

2. 50% reduction in per capita community carbon emissions by 2020

This aspirational target covers residential, business and industry emissions from electricity and gas use, travel patterns and waste to landfill.

The community target is set based on the science of climate change. In order to limit global temperature rises to around 2° above pre-industrial levels and stabilise atmospheric CO₂-e levels to 450ppm (parts per million) before 2050, we would have to achieve cuts in global carbon emissions to 85-95% of current levels by 2040-2045.

Figure 1.1. Toward Zero - Key sustainability challenges that contribute to reducing emissions





Ross Garnaut led Australia's first government-commissioned climate change review.

Economy-wide pricing of carbon is the centrepiece of any policy designed to reduce emissions at the lowest possible costs.

– Ross Garnaut,
Garnaut Climate Change Review Update 2011

SECTION 2

Key mechanisms for a low carbon future

This section looks at some of the key federal and state mechanisms required to significantly reduce emissions. This section also provides some of the key advocacy priorities for the community and Council.

SETTING TARGETS FOR EMISSIONS REDUCTIONS

The role of targets

Knowing how much we are emitting allows us to set targets, and knowing where emissions come from allows us to plan actions to meet our targets.

Adding a timeline to a target sets a goal against which actions can be designed and their effectiveness measured.

A target/timeline also helps to set a strategic direction by pointing to actions that need to be taken by different types of stakeholders. For example, a household or organisation might switch its energy sources and use technology that reduces energy use. A whitegoods manufacturer might focus on producing a more energy efficient machine that also requires less energy use in its production and that can be recycled.

Setting national targets

A national greenhouse emissions reduction target is critical to creating a stepped approach to reducing the Australian economy's emissions. A reduction target is necessary to:

- determine the key emissions sources and industry practices that have to change
- set a price on carbon
- provide certainty to businesses interested in investing in large-scale renewable energy projects in Australia.

Once a country has a reduction target and a price on carbon, it can then consider some of the key mechanisms that it might use to meet the target, such as a carbon tax or an emissions trading scheme.

A country then implements measures within its own economy to meet its targets. There are two approaches:

- **Mandated abatements** – a central authority or mechanism is used to coordinate emission reduction actions in the overall economy
- **Voluntary abatements** – conducted by organisations and individuals to reduce their own emissions.

Both are essential to creating the levels and speed of greenhouse abatement that scientists indicate are required.

In March 2011, Port Phillip City Council had the privilege of adding its support to the collaboration across a significant number of local community and environment groups, including LIVE, Save Albert Park, Port Phillip EcoCentre, Transition Port Phillip, Beyond Zero Emissions, Australian Youth Climate Coalition, South Melbourne Commons, Community Alliance of Port Phillip, Port Phillip Greens, UnChain Inc. and 5 local Australian Labor Party branches to advocate with a united voice for meaningful action and national initiatives to challenge the impacts of climate change, including urgent introduction of a price on carbon pollution in Australia.

HOW CARBON PRICING WORKS

The purpose of a carbon price is to change the behaviour of consumers/buyers in favour of goods produced using low emissions technology.

Any carbon price is intended to make it more expensive for businesses with a large carbon footprint to produce goods for sale. This will, in turn, be reflected in the price of the goods. When the consumer has a choice between a more expensive, high emissions product and a cheaper, low emissions product, they will tend to choose the cheaper product.

This provides an incentive for big emitters to find ways to produce the same goods or services using lower emissions, so they remain competitive with their cleaner competitors.

Australia's largest carbon emissions come from the consumption of energy in the transport and stationary energy (electricity and gas) sectors. Of these, the greatest contributor is the production and consumption of electricity. Therefore, more efficient use of electricity and switching to renewable sources of electricity are critical to reducing total emissions.

There are several different models that could be used to introduce a carbon price. The main difference between these is that some limit emissions levels and allow the price to vary (an emissions trading scheme), while others set the price and allow emissions to vary (typically a carbon tax).

Council supports the principles underpinning the model outlined by Ross Garnaut in the sixth paper of his [Climate Change Review Update](#).

These principles are:

- environmental integrity
- cost-effectiveness
- be flexible and open to review
- autonomy
- operating and administrative costs
- investor/participant confidence
- links to international schemes.

Advocacy Goal 1

Council will continue to publicly advocate to the state and federal governments for the implementation of policy settings that take advantage of the opportunities that arise from the transition to a low carbon economy. Any policies should not further disadvantage those community members who are already socially and economically challenged.

Climate Change Plan – securing a clean energy future

In June 2011, the Australian Government released its [Climate Change Plan – securing a clean energy future](#), which introduces a carbon tax, together with a series of measures to reduce the carbon intensity of Australia's energy infrastructure. The key tenets of the Climate Change Plan are:

1. A carbon price applied to Australia's 500 largest polluters covering 60% of national emissions sources, effective from 1 July 2012
2. A commitment to reducing Australia's gross emissions by 80% by 2050, and between 5-25% by 2020
3. Significant financial support for clean energy investment and specific support for renewable energy
4. An increased focus on household and small business energy efficiency
5. Expanded support for carbon farming that recognises the synergies between soil improvement, biodiversity protection and carbon farming.

VOLUNTARY ABATEMENT AND THE ISSUE OF 'ADDITIONALITY'

'Voluntary abatement' means actions that are taken voluntarily by an individual or entity to reduce their emissions, as opposed to actions that are mandated by legislation (regulated). Most actions taken in the community are voluntary; for example, when a household or business chooses to install solar panels or buy GreenPower.

However, there are some instances when voluntary abatement does not result in the intended benefit because the reduced emissions are 'absorbed' by larger government programs.

When we ask for 'additionality' of voluntary actions, we want any emissions pricing scheme or other macroeconomic framework to be designed so that actions we take will actually have a beneficial environmental impact.

Voluntary abatement will be 'additional' when it is not absorbed into a future national greenhouse reduction target and subsequent emissions trading scheme, but is counted separately to further reduce Australia's total emissions.

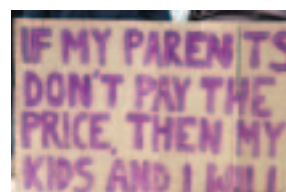
The Federal Government's proposed *Climate Change Plan – securing a clean energy future*, provides for voluntary abatement to be additional to Australia's national emissions reduction target. However, a watching brief will have to be maintained on the additionality of GreenPower in the post-Kyoto (after 2012) period as it will be affected by the international agreements and permit conditions that may be introduced at that time.

Advocacy Goal 2

Council is committed to advocating for 'additionality' of voluntary community abatement (to be counted in its own right) in any future Australian emissions trading scheme.



Climate change rally (source Nick Carson, 2011).



Community support for a price on carbon (sources from left Takver, Melbourne 2011, centre and right <http://indymedia.org.au/>).

THE ROLE OF PLANNING AND BUILDING REGULATIONS

New homes and buildings are now required to achieve a 6-star energy rating in Victoria (from May 2011), but most homes and businesses in the City of Port Phillip were built before this requirement was introduced. It has been estimated that most existing Australian homes (pre 2003) have an operational energy efficiency of around 1 to 2 stars.

While Councils administer and enforce local planning and building standards, these are set by the state planning framework and national building regulations.

The planning system and building regulations could play a more significant role in reducing emissions by requiring that new buildings and renovations minimise waste during construction and are designed to result in highly energy and thermally efficient spaces.

Energy efficiency is the only sustainability criteria assessed under the Building Code of Australia (BCA) and does not target best practice standards but minimum requirements. Whether these requirements are implemented or not is also not assessed by the Building Commission of Victoria.

The current planning system in Victoria largely does not formally consider sustainable design, or apply sustainability criteria through the planning process except in new development areas where there is a requirement for a level of solar orientation. This means that sustainability is not considered holistically at the most critical design and costs phase for new buildings or additions to existing buildings.

Council is one of several Victorian local governments currently encouraging voluntary uptake of sustainable design through the planning process. However, Council recognises that it would allow much more consistency of practice as well as significantly increase the uptake of sustainable design if it were dealt with through a state-wide planning response.

Advocacy Goal 3

With an alliance of Victorian councils, Port Phillip City Council is committed to advocating to the state government that sustainable design be incorporated into the Victorian planning system.

Council's municipal strategic statement

The environmental impact of the built environment is acknowledged by Council's Municipal Strategic Statement (MSS), which deals with land use planning and built form. The MSS aims to create a city that produces low greenhouse gas emissions by encouraging environmentally sustainable design and development, increasing housing and employment densities in locations closest to public transport, and creating an integrated and sustainable transport network.

Key action – ESD local planning policy

The planning system provides an opportunity to ensure that all new developments and major extensions are energy efficient and less greenhouse intensive from the design stage. Currently, Council operates a voluntary sustainable design scheme called SDAPP (Sustainable Design Assessment in the Planning Process) which ensures that participating developments achieve greater sustainable design outcomes than minimum building requirements. The adoption of an ESD Local Planning Policy would introduce a formal requirement that developments make a contribution to achieving Toward Zero targets.

THE ROLE OF RENEWABLES AND OFFSETS

Australia's per capita emissions are the highest in the world primarily because of the predominant use of coal-fired electricity.

By setting and achieving federally-based renewable energy production targets (for instance; Australia's 20% renewable energy in the electricity grid by 2020), governments are, in effect, fostering the growth of alternative and new renewable energy production and its infrastructure in Australia.

Increasing renewable energy targets not only encourages corporations that sell energy to develop and implement increasing renewable energy sources, they also provide for greater micro-generation opportunities such as solar arrays on local roofs. Businesses and homes can also choose to purchase the output of these generators as accredited GreenPower and know that they are using clean energy sources.

Carbon offset programs offer carbon credits that can be purchased to 'neutralise' your carbon emissions. These credits can come from projects in Australia or overseas. Offsets generally fall into two categories:

- Projects that draw carbon dioxide out of the atmosphere into 'forest sinks' through the planting of bio-diverse ecosystems and trees. An example is GreenFleet offsets
- Projects that support other people in preventing greenhouse gases which would otherwise be released into the atmosphere. An example is the national GreenPower program, which allows people to invest in the accredited renewable energy industry reducing emissions that would otherwise come from coal.

The federal **Climate Change Plan – Securing a Clean Energy Future** currently guarantees that the voluntary use of both GreenPower and other accredited programs will be 'additional' to Australia's international reduction commitments. This means that households, small businesses and community organisations that are voluntarily reducing their emissions via these programs, can do so with the guarantee that this extra abatement will not be counted towards the government's mandated reduction programs. Therefore your voluntary reductions will not lead to

Advocacy Goal 4

Council is committed to continuing to advocate for progressively increased state and federal renewable energy targets, as well as a national feed-in tariff that provides a reasonable return on investment for householders, small businesses and community organisations (i.e. within a 7 year payback) generating renewable energy. In the context of rising electricity prices in most Australian states, these systems become even more attractive to many micro-generation investors.

Advocacy Goal 5

Council is committed to achieving a national community carbon standard that allows for valid accounting and verification of voluntary and community abatement in municipalities.

Key action – carbon offset guidelines

The City of Port Phillip will develop carbon offset guidelines to help Council and the community to select and buy carbon offsets. In addition to specifying environmental standards, the guidelines will identify offsets that create abatement either locally or in regions that Council has friendship agreements with, such as the Shire of Hindmarsh in western Victoria or Suai in East Timor. In this way, the guidelines will encourage social and economic benefits as well as environmental benefits.

additional permits becoming available to Australian or international polluters already covered under international commitments.

To support this, many Councils and community organisations believe that there should be an agreed protocol for how voluntary community abatement is verified and guaranteed.



Living sustainably involves making informed choices about our lifestyle to deliberately reduce our impact on the environment.

SECTION 3

Achieving a 50% reduction in community emissions

The Port Phillip community comprises the residents of all the households and the employees of all the businesses in the City of Port Phillip. This section explores the potential for the community to reduce greenhouse gas emissions through a series of actions that together, will halve per capita emissions.

Achieving a 50% reduction in community emissions will require a range of short and medium-term strategies. Energy and fuel efficiency can deliver initial reductions, but further significant measures such as fuel switching will be required.

This section provides an opportunities map to illustrate some of the ways that community emissions could be reduced. It also provides reduction actions for residents and businesses.

Taking action – community greenhouse action framework

The actions that can be taken by households and businesses are concentrated in six key areas:

- **measure** – conduct a greenhouse audit of your home or business and lifestyle practices. This helps to explain where your highest emissions sources are as well as how to reduce them
- **behaviour** – wise use, minimising and preventing unnecessary energy and fuel use, including in what you choose to buy
- **efficient technology** – achieving energy and fuel efficiency

- **fuel switching** – switching to renewable and low emission energy and transport fuel sources
- **advocacy** – advocating for federal and state policy, regulations and specific action to reduce the Australian economy's dependence on carbon-based energy and material sources. People need to advocate with every purchase by choosing and asking for goods and materials that are renewable, have low greenhouse intensity, and can be recycled or reused
- **offsets** – use offsets only after all other actions to reduce emissions have been taken.



Port Phillip community turn lights out and join hands for Earth Hour 2009



Public transport runs on renewable energy and better stops make it easier to get rid of the car

Solar cooling efficiently keeps buildings cool

Community demonstration house

Street lights are efficient and run on GreenPower

South Melbourne Market Solar precinct

Commercial scale solar installations

Seaweed and green waste conversion to biogas

Wind power generation

Car share facilities are spread throughout the municipality

Industrial eco-precinct allows businesses to share energy and locally recycle water and materials

Connected walking and cycling network

Solar powered toilet blocks

OPPORTUNITIES MAP

Existing and potential ways to achieve a low carbon city

Green precincts help us to live and work sustainably

Green roofs and walls increase building insulation and regulate internal temperature

Community buildings like Albert Park Yacht Club have solar arrays

Houses and apartments are more energy efficient when they have appropriate shading, double glazed windows and use curtains and energy efficient appliances.

Bike share facilities are available throughout the municipality

small and vertical axis wind turbines contribute to household energy

Well designed buildings are long lasting and healthy

Community bus runs on biodiesel

Council building's use 20-40% less energy due to upgraded lights, appliances, IT systems and air conditioning, and are powered by renewable energy.

Community composting facilities are spread throughout the area

Businesses reduce utility bills by paying attention to energy efficiency, and impress their customers too!

Electric car charging stations are available

Community gardens reduce food miles and increase fresh food security

Pedi-Cabs offer a sustainable alternative transport

Solar PVs contribute to household energy

TOTAL COMMUNITY EMISSIONS

Total annual greenhouse gas emissions for the Port Phillip community are almost 1.6 million tCo2-e (about 1,561,104 tCo2-e as estimated at the start of 2011).

Emissions from within the City of Port Phillip arise from the residential sector (35.5%), commercial sector (52.3%), and the industrial sector (12.2%).

The community emissions calculated and targeted for reductions by 2020 include:

- electricity and gas use at home or in the business
- transport fuel use for local and everyday travel patterns. This does not include long distance or air travel or transitional traffic and freight
- waste sent to landfill from weekly collection services at homes and businesses. This does not include waste from building and construction.

However, these sources may make up only one-third of a person's total carbon footprint. Indirect emissions are created through the things we choose to buy and the food we consume. Figure 3.2 shows the average breakdown of direct and indirect emissions for a Port Phillip resident⁹.

Figure 3.1 Contributions of major sectors to the community's carbon footprint

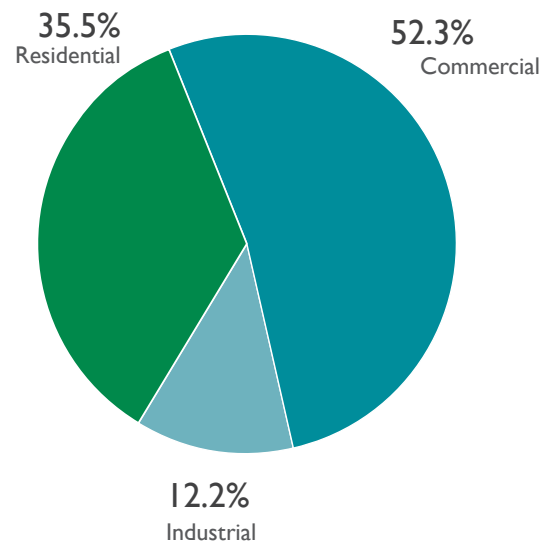
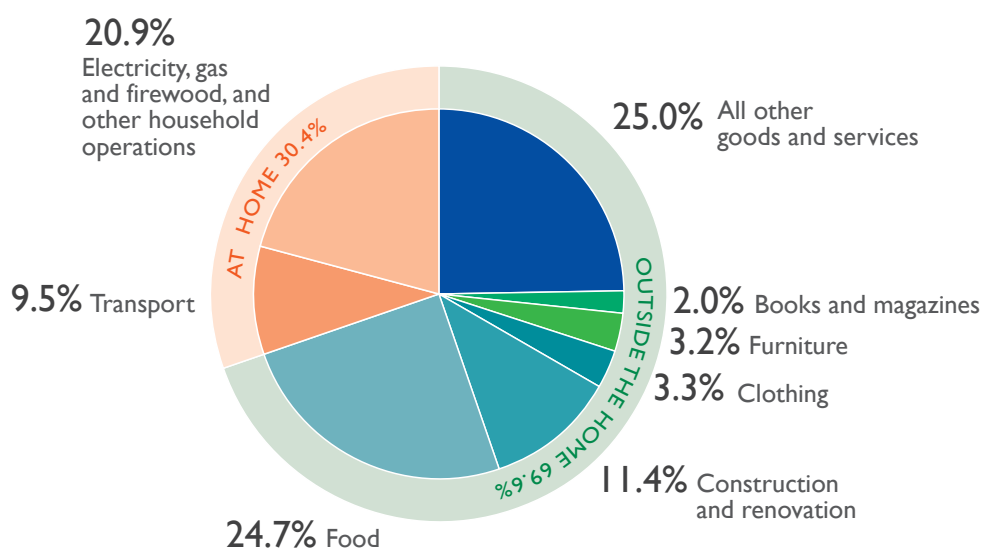
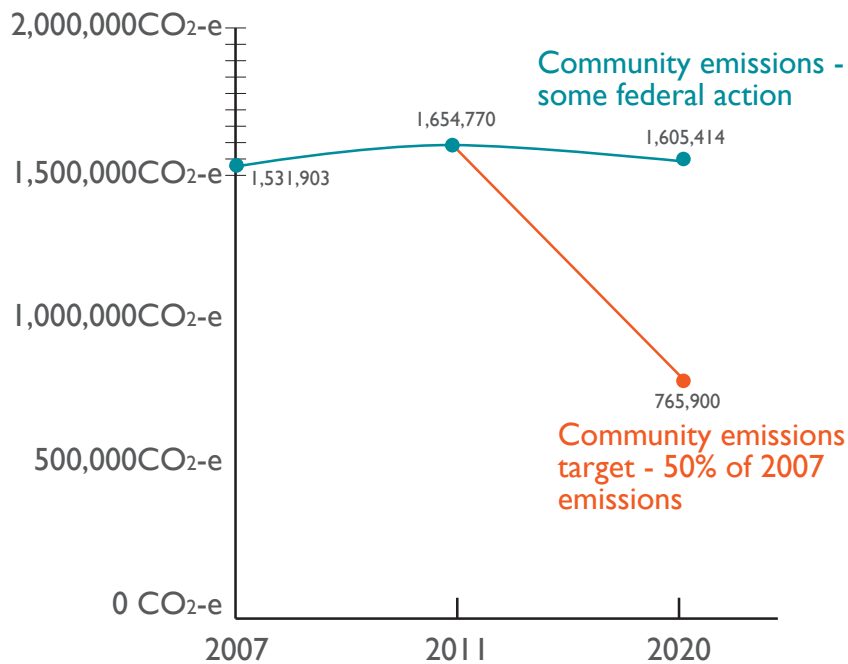


Figure 3.2. Total carbon footprint for the average Port Phillip resident. Source: Australian Conservation Foundation Consumption Atlas (<http://www.acfonline.org.au/consumptionatlas/>, August 2011)



TRENDS FOR COMMUNITY EMISSIONS

Figure 3.3. Projected 'business as usual' emissions trajectory for Port Phillip community in which the community undertakes no additional action



Total community emissions have risen by about 8% between 2007 to 2010. Much of this increase is related to our use of more technology and appliances, as well as greenhouse gas intensive materials and fuel sources. Population increase has also been a factor.

What are Port Phillip community emissions likely to be in 2020 if no further action is taken?

In fact, recently introduced federal government policies including to supply 20% of Australia's electricity needs from renewable sources by 2020, and changes to lighting regulations mean that by 2020 our total 'business as usual' community greenhouse emissions will be lower than in 2011 (see Figure 3.3).

Proactive national and state policy changes to reduce the greenhouse intensity of our electricity and increase the energy efficiency of technology can significantly reduce total emissions per person. They will also reduce the effort required by each person, household or business to reduce their own emissions.

There will continue to be a growth in electricity and fuel consumption, largely because of larger homes and lifestyle choices. Equally, electricity and fuel prices will continue to significantly rise in the coming decade.

REDUCING ENERGY USE AT HOME – SOME ACTION OPTIONS

Two action models, 'optimistic' and 'ambitious' (see Figures 3.4 and 3.5), show a series of potential emission reduction scenarios to 2020. Each reduction wedge assumes that a combination of actions will be taken from 2011 to 2020 that result in a reduction in emissions per resident.

They aim to demonstrate the likely reductions per resident (averaged) that can be achieved and whether it can get us near to the aspired 50% reduction per resident by 2020. They also show to what extent each action can reduce (or contribute to) a resident's emissions.

Both models assume three predetermined outcomes:

1. **Some government action** – that some level of government action has occurred that will reduce the per capita community greenhouse gas emissions
2. **Growing technological efficiencies** – that technology and appliances will continue to become more efficient, in turn reducing per capita greenhouse gas emissions
3. **The rebound effect** – this is the increased consumption behaviour that typically occurs when energy efficiency technologies are introduced.

Assumptions behind each scenario

The 'optimistic' and 'ambitious' scenarios assume some proactive government action:

- the optimistic model assumes a federal government mandated 20% renewable energy supply is fed into the national electricity grid by 2020 plus changes to lighting supply regulations
- the ambitious model looks at a more proactive federal government renewable energy target of 30% by 2020, changes to lighting supply regulations, and a successful Victorian Energy Efficiency Target scheme by 2020
- both models include the effect of a carbon price on consumer choice, with the optimistic model using the introduction of a carbon price and the ambitious model using a carbon price of \$50 per tCO₂-e.

Householder actions

Both scenarios assume significant action by householders across the city.

Behaviour change – no and low-cost actions can provide up to 25% reduction in total household energy use. The ambitious model assumes almost



This traditional terrace in Albert Park now has triple glazing, deep eaves and uses passive solar design. The result – a truly comfortable and low carbon home!

double the behaviour change of the optimistic model. Behavioural actions that a household can take include:

- using the correct thermostat settings for automatic heating and cooling – 18-20°C in winter and 24-26°C in summer
- sealing all doors and windows from drafts
- using heating and cooling only where and when needed, and shutting doors to seal the space
- using shade externally in summer and heavy curtains in winter
- switching off when not in use and turning off standby power (at the wall) for TVs, DVD players, stereos, computers, chargers and gadgets.

Energy efficient technology – advances in appliance technology will result in efficiencies gained through replacement over time. The ambitious model assumes a slightly higher emissions reduction than the optimistic model. Energy efficient technology actions include upgrading to gadgets and appliances that are the right size, low-wattage and energy efficient (at least four energy stars) and using them wisely.

Residential retrofit – advances in building thermal efficiency and the efficiency of fittings, combined

with increased energy and water efficiency building standards for extensions and major rebuilds, will result in a 4.5% reduction in emissions per resident under the optimistic model by 2020 and a 6.4% reduction under the ambitious model. Residents can:

- install energy efficient lighting
- ensure all new buildings or extensions are well sealed
- install insulation to a minimum R3.0 in walls and R4.0 in ceilings
- install heaters that are the right size and energy efficient
- install ceiling fans and/or efficient and appropriately sized cooling systems
- install Water Efficiency and Labelling Standards (WELS) rated showerheads.

Fuel switch – household emissions can be reduced by installing and using renewable energy, in particular solar hot water and solar photovoltaic electricity systems. The more households that do this, the more emissions are reduced. Purchasing GreenPower generated by renewable energy sources elsewhere is also a great way to reduce emissions.



Spot the energy saving answers: Lights switched off when not in the room, window closed with curtain drawn, skylight closed and covered, appliances off at the power point, TV off when it's not being watched, wearing warmer clothes instead of using a heater and managing bills, drying clothes on the clothesline. Learn more at www.envirohub.com.au

THE OPTIMISTIC MODEL

The optimistic model (see Figure 3.4) combines moderate federal government action with a series of moderate residential actions¹⁰.

It suggests that if some government and community action were undertaken in all these action wedges, greenhouse gas emissions per resident could fall by almost 30% from present levels by 2020. Nearly half of this reduction would be due to government policy and the response of businesses to economic measures. A further reduction of up to 22% can be achieved through direct community actions.

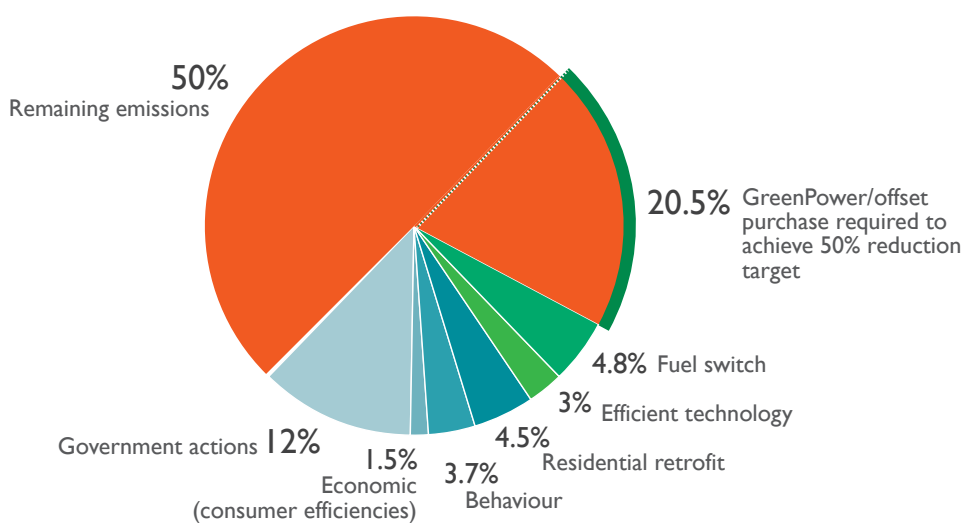
However, about six percentage points of this total 36% reduction will be negated by a rebound effect, where emissions and cost savings from efficiency actions are used up by extending appliance use or purchasing more appliances.

To achieve the target of halving emissions per resident, a further 20.5% reduction will need to be achieved through the purchase of GreenPower or other offsets.



Solar power has a role to play in achieving emissions reductions

Figure 3.4. The optimistic model, showing the potential contributions of various types of action to reducing community emissions under an optimistic scenario.



The reductions shown are slightly lower than the actual projected reductions to account for the rebound effect. The optimistic scenario estimates the rebound effect at 6%.

THE AMBITIOUS MODEL

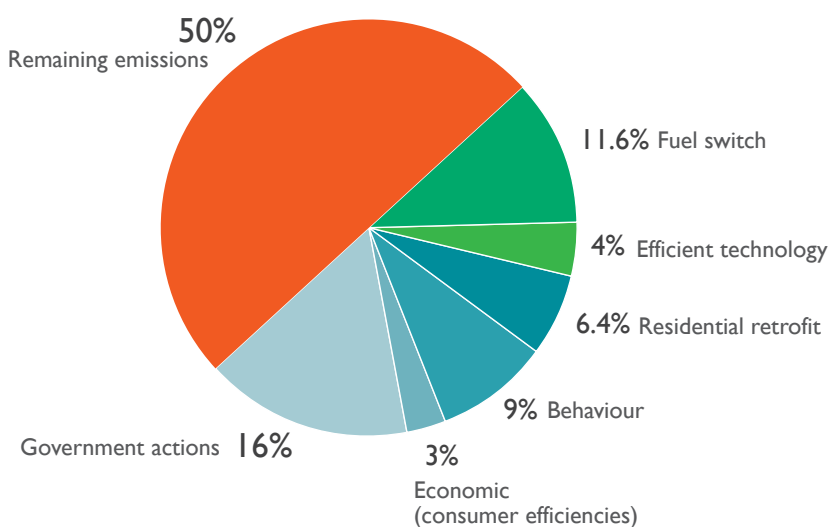
The ambitious model (see Figure 3.5) combines more proactive federal and state government, economic and residential actions to achieve a 50% reduction in total emissions per resident without the need to purchase GreenPower or other offsets¹¹.

It suggests that a more proactive government approach would reduce total emissions per resident by one-fifth (20%). This approach might involve, for example, a 30% target for renewable energy in our

electricity grid by 2020, a successful Victorian Energy Efficiency Target (VEET) scheme, and greater resulting economic stimuli. This scenario assumes that the rebound effect is only a 3% increase in consumption rather than 6% used in the optimistic scenario.

A more proactive community could provide a further 30% reduction in emissions per resident by 2020. This would achieve the target of a 50% reduction per resident without needing GreenPower purchases or offsets.

Figure 3.5. The ambitious model, showing potential contributions of various actions to reducing community carbon emissions under an ambitious scenario.



The reductions shown are slightly lower than the actual projected reductions to account for the rebound effect. The ambitious scenario estimates the rebound effect at 3%.



Above: A City of Port Phillip local action planning group, where locals plan and action a range of initiatives

REDUCING ENERGY USE IN THE WORKPLACE – SOME ACTION OPTIONS

Action taken at the commercial level is perhaps the most effective path to reducing emissions for the community. Most energy efficiency actions will pay for themselves within a short time (sometimes instantly) and are often a no-cost or cost-reducing solution.

Energy auditing and efficiency organisations regularly report that they can identify potential savings of around 40% of a client's total energy use. These savings are often realised during the audit period, when the engineers find switches, timers, thermostats or meters that are poorly adjusted or simply missing.

Businesses in the City of Port Phillip are generally office based (e.g. professional, technical and scientific services, finance or property), in retail, construction, health and hospitality.

Based on the typical findings of an energy engineer's audit, the following actions are the most likely low-cost energy efficiency improvements available in these types of businesses.

1. **Undertake a qualified energy audit and, if appropriate, use a monitoring program**
Monitoring systems use existing power company data to compile a picture of a business's daily, weekly and monthly usage patterns. This identifies peaks in time-of-day usage and where energy is being wasted. Such systems can usually be instigated without the installation of new hardware.
2. **Lighting systems** Replacing light globes with high efficiency fluorescent systems with zone-specific auto dimming, and eventually with LED systems with desk-specific auto dimming, can save up to 90% of lighting-related electricity.
3. **Behaviour** Simple initiatives designed to educate employees and subcontractors on the benefits of energy-saving behaviour can have significant effects on energy usage.



Behaviour change programs can reduce waste of energy (and money!) in most businesses.

4. **HVAC** Heating, ventilation and air-conditioning systems (HVAC) have improved radically over the past few years. A new system can recoup its costs in 2-3 years.
5. **IT and data centres** Data management systems are a big user of energy through the IT equipment and the HVAC systems used to cool it. No-cost actions involve console settings that turn off the screen (and screen saver) and put the computer to sleep after a period of inaction. More complex and specialist work can be done on server virtualisation, which amalgamates the data management of several in-house servers into one dedicated machine and backup. This can result in a reduction of up to 80% of energy and associated HVAC load.
6. **Actions specific to retail** The retail and hospitality sectors are a large component of the city's energy use. Shopping centre operators are finding energy savings of up to 60% are possible by improving their HVAC systems and centre design. Smaller operators can also benefit from these actions.
7. **Refrigeration** A very large contributor to retail-based greenhouse gas emissions comes from refrigeration. Unenclosed displays and incorrectly set temperature controls waste massive amounts of energy, often fighting with nearby heating systems. These can be fixed relatively cheaply, with the added advantage of improving the shelf life of products. Improving insulation systems and materials also increases energy efficiency.



8. **Energy performance contracts** Businesses can also use an energy performance contract, where their energy management is contracted out and has guaranteed cost and energy use savings for the contract period.
9. **Supply chain** Organisations that buy goods and services have a special capacity to influence others. Tenders, works and supply contracts increasingly include environmental performance as a selection criterion, encouraging supplier organisations to reduce greenhouse gas emissions.
10. **'Green leases' and energy exclusive leasing contracts** Leases that include energy and water have given tenants little incentive to improve their efficiency of use. Changing these arrangements to share incentives can produce reductions of up to 30% in total energy use.

Currently available programs to green up your workplace include:

- **CitySwitch** is delivered in Melbourne by the Cities of Melbourne, Port Phillip and Yarra and Sustainability Victoria. The program enables organisations to implement energy efficiency actions. Commercial tenants who get involved with CitySwitch will find that the environmental and financial benefits of participation are substantial. Contact jelliott@portphillip.vic.gov.au
- **VECCI** (Victorian Employers' Chamber of Commerce and industry) provide green office training; for more information, call VECCI on 03 8662 5333.

REDUCING BUILDING EMISSIONS – SOME ACTION OPTIONS

Buildings that are renovated or renewed with the smallest possible footprint and to achieve low or zero net operating emissions are often much more healthy, comfortable and functional spaces that cost much less to operate.

Sustainable buildings generally can have an ecological footprint 40-80% smaller than a conventional building, because care is taken to minimise waste and use sustainable and recycled materials where possible.

The following are some typical actions to consider when renovating or renewing your home or business.

- 1. Passive solar design** Using passive design to orient glazing to the north increases both natural lighting indoors and make the space more thermally comfortable in all seasons.
- 2. Insulation** Ensuring wall, roof and under-floor insulation where relevant is one of the best ways to make your building thermally efficient and cheaper to operate. Look for an insulation rating of at least R3.0 for walls and R4.0 for ceilings.

- 3. Glazing** The price of double glazing and low emissivity glass has fallen dramatically. Glazing retrofits pay for themselves within 4-5 years and give immediate improvements in occupant comfort.

- 4. Lighting and décor** Interior designers who are aware of the impact on energy savings are increasingly devising 'enviro-chic' colour schemes and lighting systems. Use of lighter colours can reduce lighting energy by up to 50%. Significant HVAC energy savings are also being reported when changing the exterior colour of premises (including metal-fabricated storage facilities) and changing the glazing and entry systems for shop fronts.

- 5. HVAC** A well designed and oriented home with eaves and good cross ventilation should require minimal passive cooling. Look for the most energy efficient HVAC system (heating, cooling and ventilation system). Also ensure that the system installed allows rooms that are being heated or cooled to be closed off.

For more information on sustainable design, visit www.envirohub.com.au/9-sustainability-challenges/our-built-environment or www.yourhome.gov.au



Renewable energy technology is a growing source of energy for our larger residential and commercial buildings, such as this recent apartment block in Elwood.



Insulation helps to make a building more thermally efficient so it gains and loses less heat

REDUCING WASTE EMISSIONS

– SOME ACTION OPTIONS

Of the total waste Port Phillip residents send to landfill, around 32-40% is food, garden and other organic waste, which breaks down to form methane, a much more active greenhouse gas than carbon dioxide. Converting this food and green waste to home compost instead would equate to reducing Port Phillip's current greenhouse gas emissions by around 6,672 tonnes, or about 0.15 tonnes of carbon dioxide per average household.

A further 20% is recyclable material such as paper, cardboard, glass, aluminium and steel. This means that over 50% of the waste we currently send to landfill can easily be diverted into recycling or home composting.

1. Compost all green waste Composting all food scraps and peelings, spent flowers and garden clippings not only diverts a major waste stream from landfill but converts it in to fertiliser and mulch for your pots and garden. Even the smallest apartment with no balcony can compost all kitchen waste hygienically and without smells because there are some great composting alternatives just for this purpose.

2. Avoid food waste It is estimated that around 15-20% of all the food we buy each week is thrown away either because it is not used and spoils, or too much food was purchased/cooked.

3. Only buy what you need and want Avoid 'shopping therapy' and wasting money on things you or others won't use. It is estimated that, at any one time, the average home has over \$12,000 worth of items that are 'lost' in storage, not needed or not used!

4. Carry a shopping bag Avoid plastic bags and packaging when buying groceries, clothes, shoes and other items by carrying a couple of shopping bags with you. There are now shopping bags that not only contain smaller bags but fold up into a tiny purse that can be conveniently kept in your pocket, bag or pack.

5. Buy minimally-packaged items and food Reject heavily packaged and plastic-wrapped items. Instead, buy unpackaged fresh produce

and dried foods. When buying packaged goods, choose packaging that is either made from recycled materials or that can be refilled, re-used or recycled. If possible, buy all your food from bulk stores or markets. Minimise the use of single-serve convenience packaging and buy the largest size practical of regularly used items such as pasta, rice and oil. Choose products that have refills (e.g., certain ballpoint pens, some laundry detergents).

6. Minimise takeaway containers Minimise the use of disposable takeaway containers and bags. Simple ways include bringing a mug to take to your local café while at work and making your own lunch or eating lunch where you buy it.



Composting kitchen and garden waste reduces organic waste to landfill – a major contributor to landfill emissions.



A young resident feeds their worm farm.

REDUCING COMMUNITY TRANSPORT EMISSIONS – SOME ACTION OPTIONS

The categories of action presented in Figure 3.6 model broad scenarios to reduce emissions from personal transport use. Various modal shifts are presented based on the length of the trip. They apply commonsense assumptions; it is more likely that a shift to active transport (walking and bike riding) will occur for shorter trips and that for longer trips it will be more likely that any shift will occur to public transport.

The potential for personal transport with significant modal shift and mass take-up of action is shown as reduction action ‘wedges’¹². These wedges represent the likely reductions that can be achieved and how they combine to get close to the aspired 50% reduction in community emissions per resident by 2020.

The assumptions that underpin the ‘action wedges’ in Figure 3.6 are that:

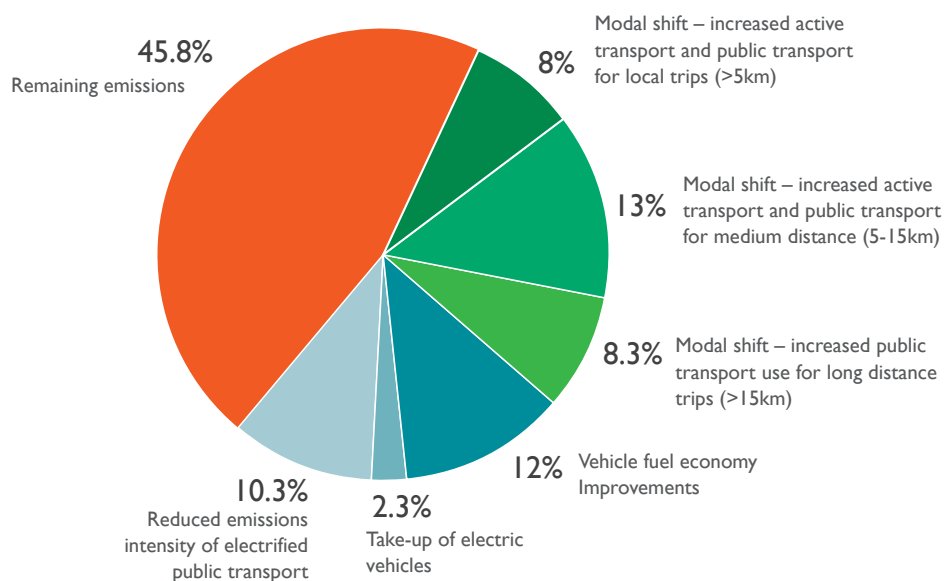
- for short distances (less than five kilometres), public transport trips increase by 15% and walking and bike riding trips increase by 50%

- for middle distances (5-15km), public transport trips increase by 30% and walking and bike riding trips increase by 15%
- for longer distances (15km+), public transport trips to adjoining municipalities increase by 20% and to further afield by 10%.

The aspirational 50% emissions reduction target also relies on public transport (including trams and trains) moving to green energy sources and commensurate policy and infrastructure investment by government.

This highlights the need for broader considerations and actions at several levels; from federal, state and local governments to transport providers and other key stakeholders, to personal action in our everyday travel patterns; to achieve the transport emissions reduction target.

Figure 3.6. Contribution of emissions reduction actions to achieving a 50% reduction in community transport emissions by 2020



Specific actions to achieve modal shift and use of efficient transport

Significant reductions in emissions from personal transport are possible through modal shifts to walking, bike riding and public transport for short, medium and longer trip ranges.

While electric vehicles and other vehicle efficiency improvements seem attractive, we should not depend on them to reduce greenhouse gas emissions. It would be far cheaper for the public to advocate to the government to reduce the emissions intensity of public transport.

To achieve these results, big improvements to the public transport network would be required. Council encourages the community with positive actions to improve transport connectivity and infrastructure, as well as provide disincentives to maintaining the status quo.

Actions that would contribute to achieving the 50% reduction in per capita emissions from transport include:

- **Walking infrastructure improvements** Implementing pedestrian priority treatments in our local streets and as part of the bike network to create direct connections between destinations will increase the convenience and perceived safety of walking and make the walking environment more accessible to all members of the community.
- **Bike network improvements** Connecting bike routes to link different parts of the network including off-road routes, local routes on quieter residential streets and high quality, segregated commuter routes, will improve the perceived safety and convenience of bike riding and encourage more short-distance trips.
- **Building end-of-trip bike riding facilities** Adding high-quality bicycle parking within or close to destinations and public transport services will encourage riding for more types of trips.

- **Lowering residential speed limits** Council is progressively rolling out speed-limited residential areas and lower speed limits along shopping strips. This will improve safety for bike riders and pedestrians and make these streets more attractive for walking and bike riding. (These changes would have little to no negative impact on car travel times.)
- **Community-focused programs** These are programs that provide skills, encouragement, incentives and awareness for community members, including school children, to walk and ride a bike safely. It is also about developing a sense of respect across community members that will help to influence changes in travel choices and greater use of the infrastructure improvements that Council is implementing in parallel with these programs.
- **Public transport service improvement** Council will continue advocating to the state government that key infrastructure gaps need to be addressed, such as the Park Street tram link. Increased service frequency and operating hours would improve public transport appeal and competitiveness with private car travel. The existing network in Port Phillip is already extensive, but key service and infrastructure gaps need to be addressed to improve services linking Port Phillip to distant middle and outer suburbs.
- **Traffic signals prioritising public transport, walking and bike riding** Council will work with VicRoads to alter existing traffic signals and implement new signals on walking and bike riding lines that provide priority to pedestrians and bike riders.

Existing traffic signals on major roads should provide a green light for pedestrians and bike rider signals such as dwell-on-red and bike rider early starts. More responsive signals will encourage bike riding and walking. Tram-activated traffic signal priority on key tram routes, beginning with route 96, will improve tram travel times and reliability.

- **Accessible public transport stops and stations** Council will continue to advocate for the implementation of raised tram platform stops, bus stops and accessible train stations to increase the efficiency and reliability of tram, rail and bus services. Better access will reduce dwell times, improve travel times and provide more reasons to use the public transport network.
- **Encourage car sharing** If we provide more car share vehicle spaces through car scheme operators within Port Phillip we can help to reduce car ownership, thereby reducing the demand for on-street parking, encouraging less car travel and increasing use of public transport, walking and bike riding.
- **Parking permit fees and availability** Increasing overall parking permit fees and limiting the number of permits that can be issued to an individual or business will decrease vehicle ownership, but may raise social equity issues. Fees linked to vehicle CO2 emissions may be more equitable and could have a significant impact in the medium term. Even within a particular vehicle class, emissions can vary up to 50%.
- **Parking charges and availability** Increased parking charges, commensurate with off-street parking fees, combined with reduced parking availability will help to encourage alternative travel modes. Where parking is provided, it will be priced and restricted based on proximity to destinations. Priority will be given to allocating kerbside space to sustainable travel modes consistent with the hierarchy of parking need.
- **Local area traffic management** Local area traffic management devices, such as one-way streets and road closures, will promote local access and discourage through traffic by forcing vehicles onto peripheral arterial roads. The moderate increase in fuel costs and inconvenience would shift more short to medium trips to walking and bike riding.
- **Reduced emissions intensity of electricity to power public transport** Victoria's electricity grid is emissions intensive, which means that public transport, while more efficient than private car travel, is far from emissions neutral. Initiatives to buy some or all electricity for electrified public transport from renewable sources would significantly reduce emissions, even in the absence of mode shift (because of the relatively high public transport share).



Sustainable transport has multiple benefits, including environmental, financial and health benefits.

TAKING ACTION THROUGH THE COMMUNITY CLIMATE ACTION PLAN

An energy and travel smart, and waste wise community plays the biggest role in influencing greenhouse gas emissions. Not only does the local community have great capacity to reduce emissions at home and from personal travel, it is what happens on neighbourhood streets, in cafés and local shopping strips that can engender a sustainable local culture and economy.

The Greenhouse Plan provides some key information to facilitate an understanding of where some of our emissions come from and the intensity of different emissions sources.

Section 3 has modelled a series of 'action wedges' to achieve a 50% per capita reduction in community emissions by 2020. These reduction wedges and their resulting analysis are a high-level starting point for considering which reduction actions suit your household or business. These actions will be outlined in the Community Climate Action Plan (CCAP), which is scheduled for release at the end of 2012.

The CCAP will provide community action plans for the key areas of:

- greenhouse gas abatement
- water conservation and reuse
- waste minimisation
- building community resilience to a changing climate.

It will be an interactive plan that focuses on community actions to reduce greenhouse gas emissions and how to implement them, including access to do-it-yourself information, community programs, local action groups, events and online discussion and solution forums.

*Your participation helps to develop and implement a **Community Climate Action Plan** that is more likely to work for your household or business, your street or apartment block, and your community.*



Taking part means talking and getting your hands dirty!



SECTION 4

Council's greenhouse gas reduction plan

This section provides the key actions that Council will take to reduce its emissions and achieve its 2020 zero emissions target.

A range of measures will be used to achieve Council's zero emissions target by 2020. These include efficient technologies, alternative renewable energy sources (e.g. solar or wind power), and policy initiatives that reduce the emissions intensity of our energy sources and drive the purchase of low embodied goods.

To achieve its targets, Council will have to work unceasingly. Short and medium-term strategies and actions will be needed to produce fast and permanent energy and fuel use reductions. As savings are gained and as new technology and approaches emerge, the actions being taken to achieve our targets can be reviewed and modified.

For its 2020 target, Council will be aiming to reduce emissions from:

- stationary energy consumption (electricity and gas)
- transport energy consumption
- waste sent to landfill.

Waste to landfill emissions will not be verified and included until Council completes comprehensive waste audits in 2011/12. Once this baseline is established, Council will develop and implement waste emission reduction actions as part of its 2020 target.

These are not all of the possible sources of emissions resulting from Council activities, just those that will be contributing to the target.

Council's total carbon footprint also includes indirect emissions from other activities related to its operations, such as:

- contracted works for road and footpath replacement or emissions from contractor fuel, energy and materials use
- staff travel to and from work
- the embodied energy of key materials and goods purchased.

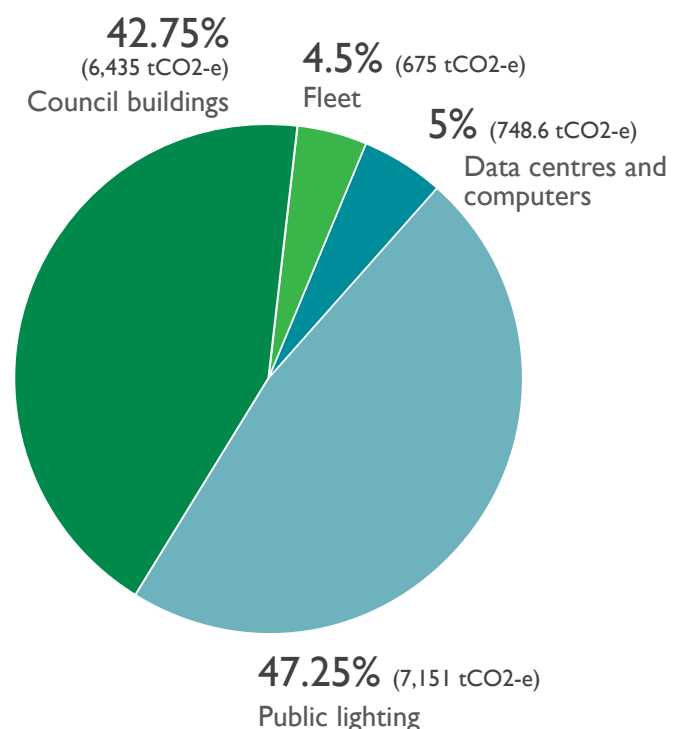
Emissions from contractors and embodied emissions may not be under Council's direct control, but Council can influence these sources through its contracting and procurement processes. This is known as carbon supply chain management.

Council's carbon footprint

As at January 2011, Council's calculated emissions inventory, excluding waste, totalled 15,010 tonnes carbon dioxide equivalent (tCO₂-e) a year.

The bulk of these emissions come from public space lighting and Council buildings, with smaller contributions from fleet and information technology. These are presented in Figure 4.1¹³.

Figure 4.1. Council's measured greenhouse gas emissions sources by sector



OTHER DRIVERS FOR REDUCING EMISSIONS

Electricity, gas and fuel prices have been rising steadily over the past five years. This trend will continue, with Council's total energy and fuel bill estimated to rise by more than 50% by 2020. Much of this increase will be driven by factors such as overdue upgrading of electricity infrastructure, metering and transmission lines and new sources of generation.



St Kilda Town Hall, above, is Council's largest building and highest energy using site.

Only a small proportion of this likely rise will be due to factors such as the proposed carbon price. The cost difference between coal-fired electricity and electricity from renewable sources will actually decrease with a rise in a federal carbon price, primarily because the carbon price will make renewable energy sources more cost competitive.

The rate of technological growth and change is already demonstrating that many of today's emerging technologies (light emitting diode lighting, solar panels, wind generators, and some heating and cooling systems) will be much more efficient and cost competitive within the next few years.



Council has started to retrofit its public and street lights with much more energy efficient alternatives

COUNCIL'S APPROACH TO REDUCING ITS EMISSIONS

The greenhouse management hierarchy informs Council's approach to achieving its 2020 target of zero emissions. It will guide asset maintenance and capital works, energy use, energy and fuel sourcing, and local policy (see Figure 4.3).

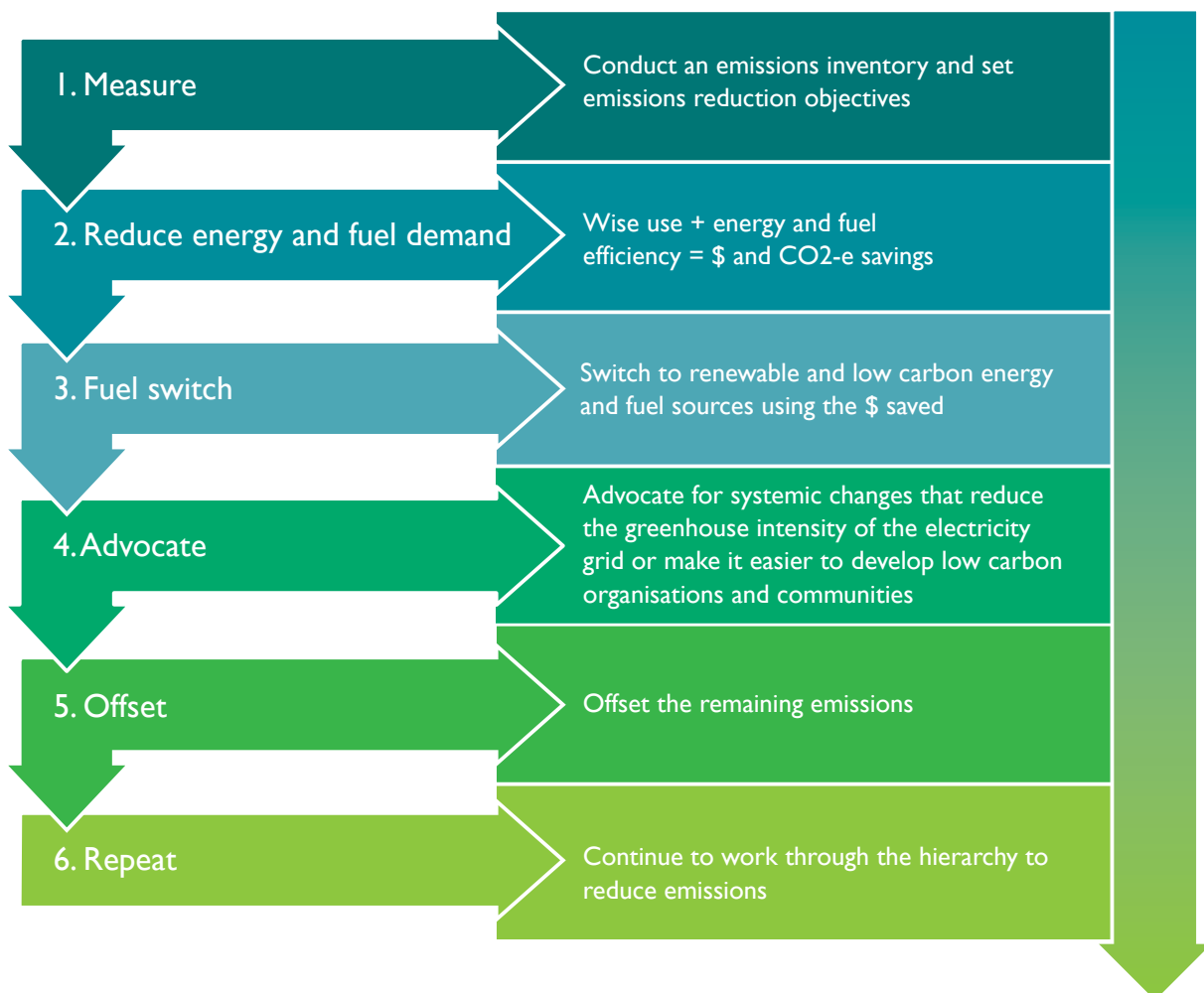
The focus for the short term is to achieve significant efficiency gains as quickly as possible in some core operations.

This will reduce the total amount of energy and fuel used and the amount of GreenPower purchased. The savings can be used to switch to alternative renewable sources.

The greenhouse management hierarchy also looks at how Council procures materials and goods and contracts for its maintenance works and asset upgrades.

As the city's population increases and there is more demand for Council assets and services, total Council emissions will rise. The greenhouse management hierarchy assists Council to anticipate and manage how it expands buildings and services while continuing to reduce its greenhouse emissions.

Figure 4.3. Greenhouse gas management hierarchy



TRENDS FOR COUNCIL EMISSIONS

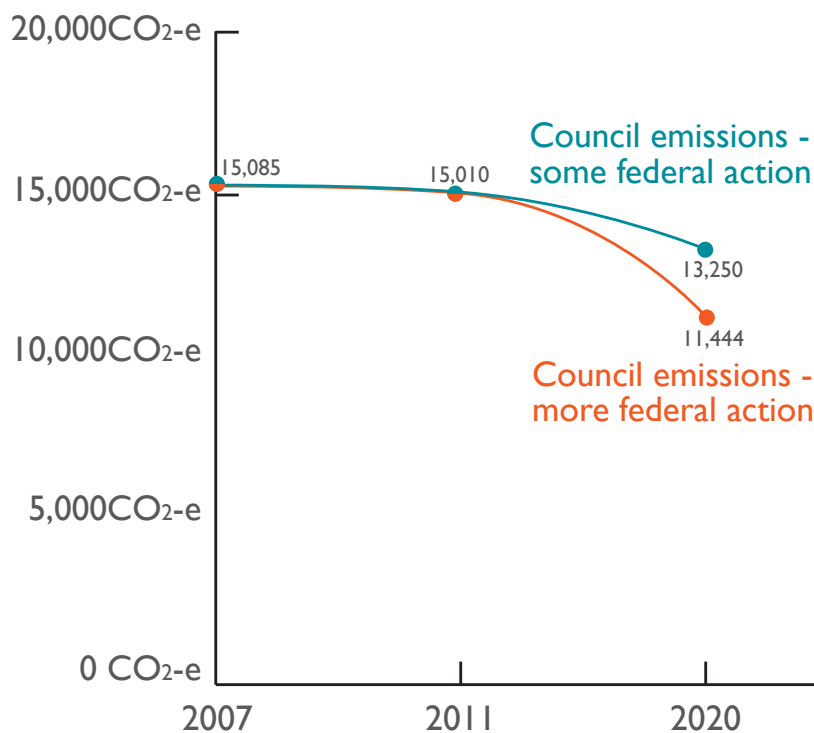
Council's total net annual greenhouse gas emissions (as calculated at January 2011) are 22% lower than in 2007. Gross emissions have remained relatively steady, decreasing by only 0.5% over this time primarily because of GreenPower purchases.

Although Council has taken some initial energy-saving actions between 2007 and 2010, most of these savings were negated by corresponding increases, particularly in building emissions. This trend reflects a slight increase in staff numbers and building users over this time, plus increased use of electrical appliances and heating or cooling of internal spaces.

What would Council's emissions be in 2020 if no further action was taken? The blue line in Figure 4.2 illustrates that, in fact, Council's emissions would decrease by 12%. This decrease will be a result of the federal government's commitment to achieve a renewable energy target (RET) of 20% by 2020, changes to lighting regulations, and a gradual improvement in the efficiency of technology and equipment¹⁴.

The red line in Figure 4.2 illustrates a scenario in which federal and state governments are more proactive, such as a 30% RET by 2020. It shows that Council's emissions would be around 23.5% less than in 2007 with no direct action by us.

Figure 4.2. Potential business as usual trajectories for Council emissions under two scenarios, contrasted with Council's zero emissions target



WHAT THE TRENDS TELL US

Strong government action can make a significant difference to the level of action Council has to take to reduce its emissions.

Increased federal and state action to introduce new renewable energy sources, energy efficiency targets, minimum building and planning standards, appliance labelling, regulations and a price on carbon will all reduce Council's carbon footprint.

This means that a strong advocacy agenda from Council (and other Australian local councils) for proactive federal and state government action needs to be a key plank of our greenhouse management plan.

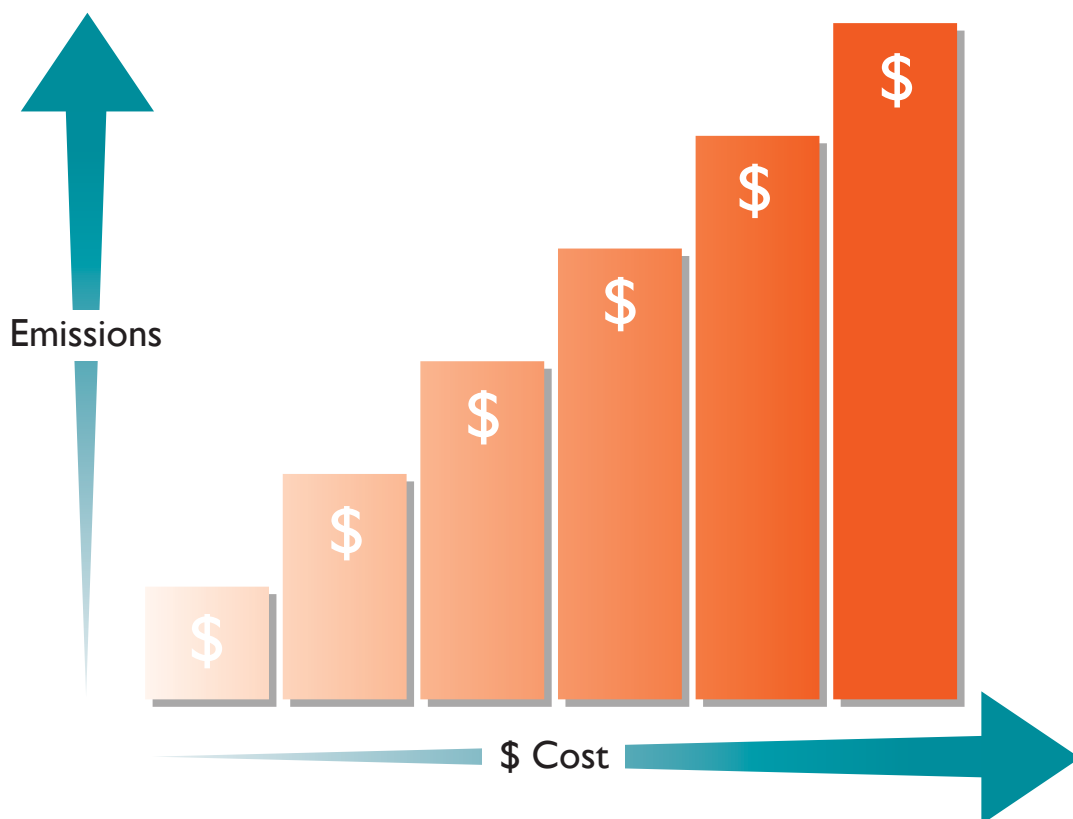
The anticipated cost rises in energy and fuel mean that inaction is not an option.

Reducing emissions makes economic sense. Shrinking Council's energy use also means permanently reducing costs and minimising future energy and fuel use spikes. Unless Council takes action to fundamentally change the amount of energy/fuel used and how it is used, we will face continually rising costs.

Taking effective action means working with opportunities and challenges.

The rising costs of energy and fuel, the level of government action, and the relevance and capacity of emerging technology mean that Council faces several uncertain opportunities and challenges in acting to meet its zero emissions target.

Council needs to be smart and strategic in managing these opportunities and challenges so that significant and permanent emission reductions will be achieved.



The relationship between emissions and costs means reducing emissions makes economic sense.

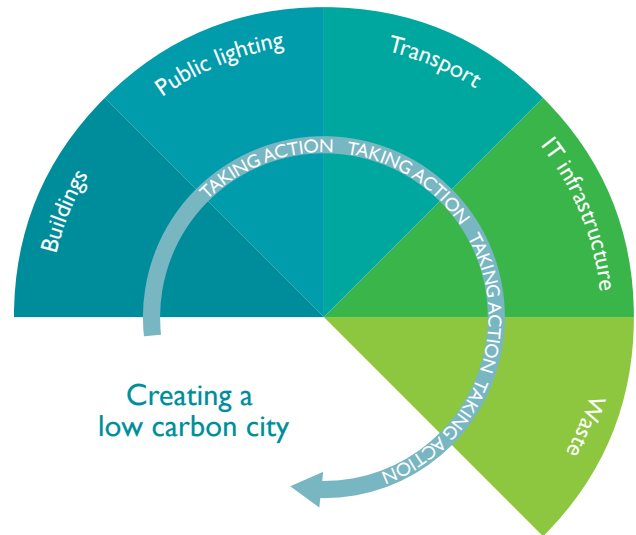
'ACTION FRAMEWORKS' TO IMPLEMENT REDUCTION ACTIVITIES

To meet its multiple greenhouse gas reduction objectives, Council has developed 'action frameworks' to implement its activities for each emissions source. There are five action frameworks (see Figure 4.4), one for each emissions source contributing to our target: buildings, public lighting, transport, IT infrastructure and waste.

Each action framework integrates a range of programs that incorporate strategic and policy initiatives, capital and maintenance works, building capacity of staff, monitoring and communications. Together, each of these frameworks summarise all of the actions to be taken to reduce emissions.

Each action framework outlines a series of paths that are ordered according to their priority in the greenhouse management hierarchy. This Greenhouse Plan does not provide a detailed breakdown for all abatement actions to 2020. The key strategies will be delivered through a range of implementation plans, current and proposed, that are outlined in the action frameworks.

Figure 4.4. Council frameworks for reducing emissions are aligned with key emission sources



Ross Place, South Melbourne, Best Sustainable Development, 2010 City of Port Phillip Design and Development Awards. Architects: Jackson Clements Burrows. Features Include: On site water retention and re-use, double glazing, sunshading and strategic integration of thermal mass, cross ventilation, generous bicycle parking and interactive digital building user guide.

COUNCIL BUILDINGS ACTION FRAMEWORK

Council's 211 buildings include its town halls, libraries, childcare centres, the resource recovery centre and operations depot, the South Melbourne Market, sports pavilions, and public amenities in our open spaces and foreshore.

Council buildings are responsible for 42.75% of total calculated emissions. Nine of the largest buildings are responsible for about 86% of total building emissions¹⁵. They will be the key focus of activities to reduce emissions in the buildings sector.

Within St Kilda Town Hall, a key building housing Council staff, greenhouse emissions per square metre of floorspace are about 240 Co2-e/M2. While this figure suggests that St Kilda Town Hall has slightly above average efficiency compared with other town halls, it is difficult to benchmark Council buildings as

a sector because the design and functionality of each town hall may be quite different.

Other buildings can be benchmarked (see Table 4.1). St Kilda Library, for example, is producing more emissions per square metre than other libraries.

Around 49% of Council buildings (103) are leased out or separately managed. Council has some capacity to influence how these buildings are used or maintained by adding environmental requirements to leasing agreements.

Council also uses many contractors and consultants to maintain and renew its buildings. Therefore, a key implementation strategy will be to progressively develop contract specifications and minimum efficiency requirements in contracted works and leases.



Council buildings include some iconic local landmarks.

Table 4.1. A comparison of building emissions

Libraries	kg.CO2-e / m2
St Kilda	212
319 Montague Street	126
195 Bank Street, South Melbourne	111
Community centres	
1-5 Howe Crescent, South Melbourne	187
67 Argyle Street (Betty Day)	127
154 Liardet Street	123
Childcare centres	
71 Argyle Street, St Kilda	164
107 Clarke Street, Port Melbourne	142

REDUCING COUNCIL BUILDING EMISSIONS – SOME ACTION OPTIONS

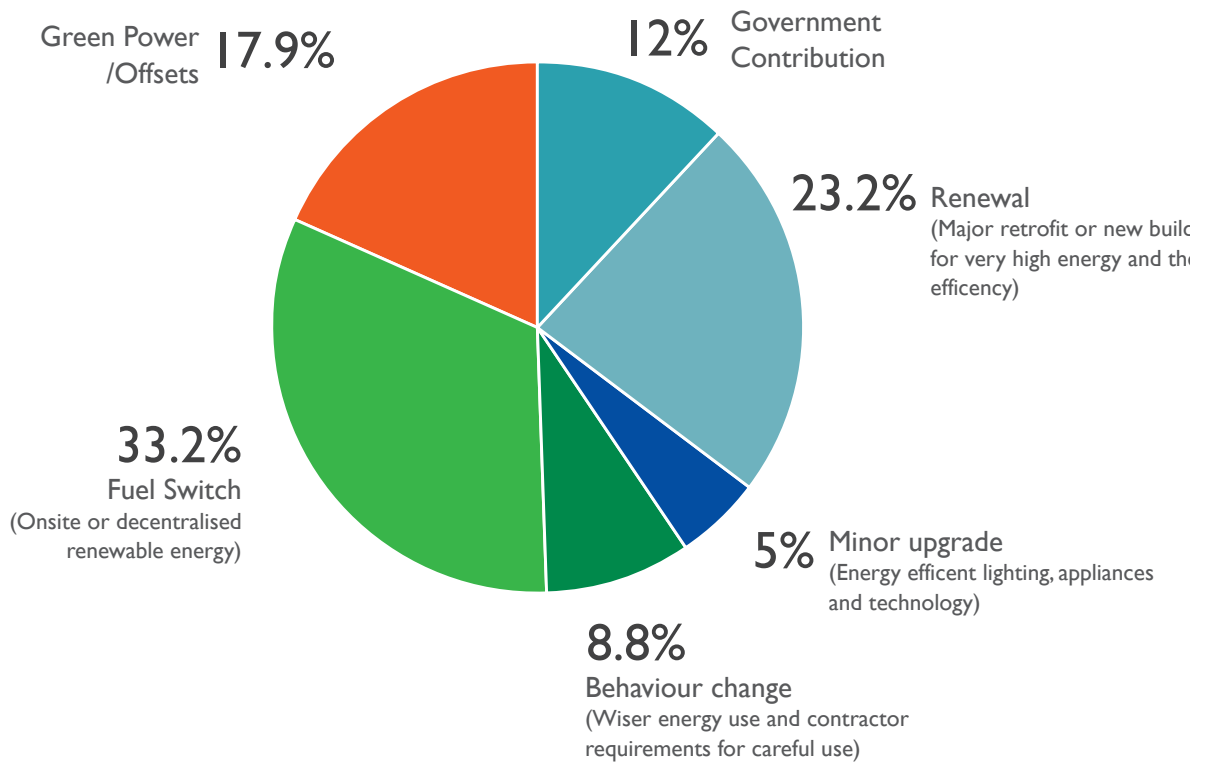
Figure 4.5 demonstrates the potentially significant building emission reductions available. Each wedge shows the level of greenhouse abatement Council can potentially achieve.

These action paths form Council's plan for integrated greenhouse management of building sector emissions through the buildings action framework.

Figure 4.5 demonstrates:

- **Government contribution** – As described in Figure 4.2, there is some reduction in building emissions due to action at other levels of government to lower the emissions intensity of energy used in council buildings.
- **Renewal and minor upgrades** – This is represented in two wedges of the pie, major upgrades or renewal of Council's nine main buildings, and minor upgrades to all its other buildings which includes basic energy efficiency and appliance upgrades. These reductions assume that Council monitors and maintains the new standards of efficiency at each site.
- **Behaviour change** – Wiser energy use and contractor requirements for careful use are a great no cost way to gain significant reductions. This wedge assumes Council introduces behaviour change and capacity-building programs aimed at staff in key service units, and a range of new contract specifications and minimum requirements. It further assumes that staff capacity building is continuous, as is the development of contract specifications and monitoring contractor practices.

Figure 4.5. Contributions of various actions to reducing emissions from Council buildings



- **Fuel switch** – Significant reductions in building emissions are available if Council focused on installing onsite renewable energy systems at 2-3 of its main sites, and considered some other decentralised energy systems. This assumes Council initiates opportunities assessments and finalises feasibility studies ahead of implementation from 2016. Fuel switching should only occur once a thorough program of building upgrades has been undertaken.
- **Advocating for more federal and state action** and building/planning regulation will result in fewer total building emissions. As the orange 'business as usual' line on Figure 4.2 demonstrates, more government action such as a 30% RET target by 2020 might actually decrease the total remaining emissions to less than expected for GreenPower or other offsets purchase.

- **GreenPower and offsets** – Any remaining emissions are abated with GreenPower purchase and offsets. There will still be residual emissions to abate even after Council takes action in all other action paths.

The buildings action framework integrates Council's key strategies for making the transition to a buildings sector with zero emissions by 2020. It provides current and proposed actions and shows how Council intends to achieve emissions reductions in each action path (see Table 4.2).



The public washroom at Middle Park Beach collects its own solar power and rainwater

Table 4.2. Action paths, strategies and activities for emissions reductions in the Council's buildings sector

Action paths	Key strategies	Actions and plans (current and proposed)
Measure	Measure building energy use patterns to understand reasons for emissions and develop retrofitting plans	Building monitoring – building sub-metering and monitoring annual usage trends and reasons at each site, building assessments by site
Building improvements	<p>Introduce measures to maintain buildings and new technology for optimal efficiency and performance</p> <p>Focus on a comprehensive retrofit and renewal of the nine main sites</p> <p>Focus on a 20-25% efficiency improvement upgrade for all other sites</p>	<p>Sustainable Design for Council Buildings – all building renewals to comply with a minimum five- star GreenStar rating or equivalent, and achieve a best practice rating in Council's Sustainable Design Scorecard</p> <p>Sustainable Building Improvement Plan – all building retrofits and upgrades to achieve between 20-40% reduction in energy use</p> <p>Appliance and whitegoods use and replacement program – assists staff to efficiently use appliances and whitegoods</p> <p>Green building procurement guidelines – ensure the procurement of low emission materials and goods</p>
Behaviour	<p>Capacity build key staff to ensure building maintenance and renewal achieve best practice efficiency standards</p> <p>Focus on assisting building managers to introduce and maintain building user standards</p> <p>Develop formats for incorporating stringent requirements and standards in all building user, maintenance, replacement and renewal contracts</p> <p>Introduce a Council green team that allows individuals to model and be rewarded for significant and small energy and fuel efficiency actions</p>	<p>Building user guidelines – assists building managers and users to use their building efficiently</p> <p>Green lease guidelines – develop guidelines for tenants in Council buildings</p> <p>Green contracts manual – assists staff to implement contractor specifications and requirements to ensure building use, maintenance and renewal activities are energy efficient and do not result in more Council building emissions</p> <p>Staff capacity-building program – assists key and general staff to become energy efficient in everyday work activities</p> <p>Eco buildings maintenance strategy – ensure that retrofitted buildings and new technology are efficiently operated for optimal building performance</p>
Fuel switch	<p>Assess the potential and cost-benefits for a variety of onsite and offsite renewable energy generation options</p> <p>Investigate revolving the savings generated from building retrofits into onsite photovoltaic or distributed energy options</p>	<p>Undertake study into decentralised renewable energy sources for Council buildings</p> <p>Investigate opportunities to install solar photovoltaic power at the South Melbourne Market and other key sites</p>
Advocate	Advocate to the federal government for a higher RET target, a high carbon price and the regulation and labelling of appliance efficiency	<p>With Council Alliance for Sustainable Built Environments (CASBE) councils, develop a more proactive and timeline-driven strategy for achieving higher building efficiency standards and planning design standards</p> <p>Develop an advocacy plan for councillors and key senior staff to gain more proactive federal government action</p> <p>Advocate for state government policy for ESD planning provisions.</p>
Offset	Continue to purchase a maximum of 25% GreenPower, with a view to progressively reducing this to 20% from 2014	Continue GreenPower purchase to account for 25% of building emissions until at least 2014 and then review (source to remain 100% new local wind power)

IT INFRASTRUCTURE ACTION FRAMEWORK

Councils information technology (IT) system includes hundreds of computers that are used by staff in the delivery of services, as well as data centres (servers) to store electronic information. This equipment, along with printers and other peripheral devices, contributes to greenhouse gas emissions.

Council IT staff are abreast of developments in energy efficient hardware and software and are implementing good practice technology in desktop and server units. However, there is no formal plan that covers the actions that Council can take to achieve best practice energy efficiency for IT infrastructure.

An audit of Council's data centres at St Kilda and South Melbourne town halls concluded that they are being managed and improved to achieve best practice for data centre management. Recent actions have included server virtualisation, which reduces the need for physical server units, and installing best practice technology in the backup server room, which has inbuilt cooling to minimise energy consumption.

There remain opportunities to increase the efficiency of the servers and the air-conditioning, which maintains optimum operating conditions. In addition to energy savings, there will be significant performance improvements available through hardware and software updates to data centre and user consoles, best practice user behaviour, and ongoing improvements in the air-conditioning (see Table 4.3).



Table 4.3. Action paths, strategies and activities for emissions reductions in the IT infrastructure sector

Action paths	Key strategies	Actions and plans (current and proposed)
Policy	Develop an energy efficient IT action framework	Develop energy efficiency IT actions, including sustainable procurement of technology
	Facilitate IT use in the field and at home to reduce travel emissions	Commit resources to develop and implement a staff mobility plan to ensure adequate IT support for mobile staff
Measure	Include server rooms in sub-metering network	Install metering and temperature monitors on server racks to reduce unnecessary cooling
Infrastructure improvements	Maximise the benefits of power management features	Leverage synergy between performance and efficiency – use IT strategy to improve the performance and efficiency of desktop and server units
	Consider a tiered IT structure Improve efficiency and performance of equipment	Match the size of a computing unit to the needs of the user to reduce wasted capacity As the stock of desktops computers, servers and printers is renewed, upgrade to equipment that has higher performance and uses less energy
Behaviour	Internal green office program to ensure best practice use of IT	Include efficient IT use and behaviour as part of staff induction and annual refresher courses
Advocate	Play an active role in the local government IT community	Commit resources to present Council as a leader in green IT within the local government sector and be a demonstration site for cooperative projects
Offset	GreenPower purchase	Continue GreenPower purchase to account for 25% until at least 2014 and then review (source to remain 100% new local wind power)

PUBLIC LIGHTING ACTION FRAMEWORK

Council manages more than 10,000 lights in streets, car parks, sports facilities, around buildings and in our open spaces. There are unmetered streetlights and metered public space lights (on footpaths, along the foreshore, in car parks and outside some buildings).

Public lighting as a sector is responsible for 47.75% of Council's total greenhouse inventory. Most public lighting emissions arise from electricity consumption in unmetered street lighting (98%), with Council's metered public space lighting accounting for around 2%.

Of the street lighting emissions, three lighting types are responsible for 79% of emissions (38% of Council's total emissions). These are: 80 watt mercury vapour lights (30%), 150 watt sodium high pressure lights (32%), and 250 watt sodium high pressure lights (17%).

Most of the lights are actually owned and managed by the power distributors operating in the municipality. Their maintenance and selection of lights is strictly governed by legislation. Therefore, a key implementation strategy will be to work closely with

the distributors and to encourage other levels of government to ensure that it is possible for our street lighting to be made more energy efficient.

Figure 4.6 shows the potential for emission reductions from actions that Council can take to increase the energy efficiency of street lighting¹⁷.

The public lighting action framework integrates Council's key strategies for making the transition to zero emissions from lighting by 2020. It provides current or proposed actions and shows how Council intends to achieve emission reductions in each action path (see Table 4.4).

Figure 4.6. Contributions of various actions to reducing emissions from public lighting

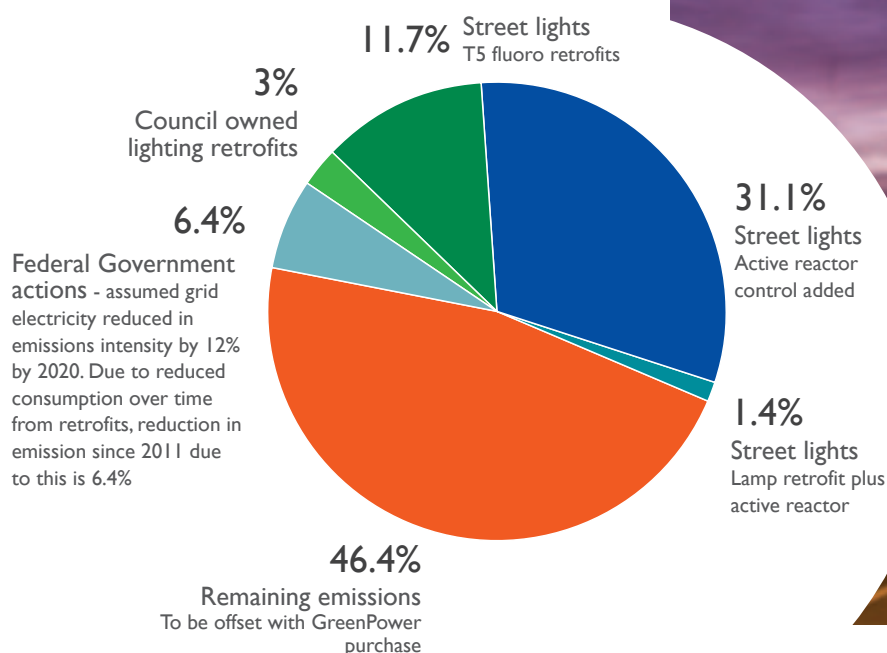


Table 4.4. Action paths, strategies and activities for emissions reductions in the public lighting sector

Action paths	Key strategies	Actions and plans (current and proposed)
Measure		Undertake pilot trial at 5-10 sites to identify real costs for lighting upgrades and most cost-effective mode for full-scale rollout beginning in 2013
Policy	Articulate Council's requirements for design, maintenance and installation of energy efficient public lighting infrastructure. Develop a strategy to achieve this across the entire lighting portfolio	Develop and release an updated Sustainable Public Lighting Strategy Develop and release public lighting design guidelines that articulate the requirements Council has for design, maintenance and installation of high-quality, consistent, energy efficient public lighting infrastructure
Lighting improvements	Continue with retrofit of 80W MV with T5 fluorescents lamps for local streetlights as planned for 2011/12 and 2012/13 Retrofit all other unmetered lights where use is compatible with T5 fluorescent technology Retrofit other unmetered streetlights with active reactor controller, and with more efficient lamps where required Retrofit Council-owned public lighting with energy efficient lamps	Engage with distribution businesses – the contracts to upgrade 80W MV lamps to more energy efficient T5 fluorescents need to be negotiated each year for the lights to be retrofitted in that year Identify additional lights within bulk changeover area to also be upgraded, including the following: 50W and 125W mercury vapour, 70W and 100W high pressure sodium and 70W metal halide Engage with distributors – retrofit 150W HPS lights with active reactor controller. This is an expensive project. Beginning in 2015, it will be undertaken in three sections across the municipality, starting with lights in the Jemena distribution area followed by the CitiPower area Retrofit other unmetered streetlights – all other lights fitted with active reactor controller, beginning in 2018 Full-scale rollout of lighting upgrades to all Council-owned lights using approach identified in pilot trial beginning in 2014
Fuel switch	All Council-owned streetlight upgrades to be paired with suitable onsite or offsite renewable energy generation to create zero emissions public lighting projects	As discrete capital works projects relating to open space lighting arise, they will be assessed for the suitability of installing renewable energy on nearby facilities to offset lighting emissions
Advocate	Advocate to state and federal governments to ensure that appropriate technology is available for provision of energy efficient street lighting	Maintain a watching brief of the lighting load table and advocate to state government and distributors to get the active reactor on to the lighting load table Continue to advocate with the Municipal Association of Victoria (MAV) and other councils to state and federal governments to ensure that appropriate technology is available for provision of energy efficient street lighting Advocate to alter the lighting standards and regulations that require overlighting of public spaces and impede changes to public lighting regimes
Offset	Continue to purchase GreenPower for all public lighting within the municipality	Continue GreenPower purchase to account for 25% of public lighting emissions until at least 2014 and then review (source to remain 100% new local wind power)

TRANSPORT ACTION FRAMEWORK

Council has a fleet of passenger vehicles that are used by staff to perform work duties and a fleet of seven heavy vehicles that are used for the collection of litter bins and around the transfer station.

Emissions from the fleet are caused by the fuel consumed. Total fleet emissions in 2009-10 were 678 tCO₂-e and represent only 5% of Council's total emissions. Fleet emissions are a good news story as they have fallen by 12% since 2007, the base year for Council's Toward Zero targets.

The main actions are to reduce emissions through avoidance (avoid making the emissions) and increased efficiency (of equipment or equipment use).

Fuel switching is a viable option because the fleet can change to less greenhouse gas intensive fuels such as LPG or electric vehicles powered by GreenPower. To reach zero emissions from fleet, it will ultimately be necessary to purchase offsets equivalent to the residual emissions after all other actions have been taken.

Council intends to undertake the following actions to reduce emissions:

- reduce staff reliance on the fleet for travel
- further reduce the size of engines in fleet cars
- reduce the overall number of cars in the fleet
- reduce the number of cars provided as salary entitlements
- excise those emissions that result from staff travelling to and from work
- encourage greater take-up of the sustainable travel package.

These actions form the starting point for integrated greenhouse management through the transport action framework.

The transport action framework integrates Council's key strategies for making the transition to a zero emissions fleet by 2020. It provides current or proposed actions and shows how Council intends to achieve emissions reductions in each action path (see Table 4.5).



The 2010/11 electric vehicle trial proved very popular with staff

Table 4.5. Action paths, strategies and activities for emissions reductions in the transport sector

Action paths	Key strategies	Actions and plans (current and proposed)
Policy	Review the fleet policy	Alter quarterly reporting to include the cost of fuel consumed Establish a monitoring and evaluation regime for fleet emission reductions
Fleet improvements	Investigate a fleet of electric bicycles Reduce the average engine size of the fleet through progressive rollovers Continue to maintain vehicles and equipment to ensure they are running to their optimum fuel efficiency	Under the staff travel plan, develop the infrastructure and management support required to maintain the electric bicycle fleet at key Council sites Drive a shift towards lower emission vehicles by leveraging the purchasing policy and the requirement to consider lifecycle and environmental cost Under the staff travel plan , a high level of maintenance should be required of all vehicles in the fleet, including heavy vehicles, to ensure that vehicle emissions are minimised through optimum vehicle performance
Behaviour	Reduce requirement for staff to travel to the office Encourage staff to bike ride to and from work and during work hours to local meetings Increase availability of public transport tickets to all staff at all major sites	Develop a staff travel plan that increases the opportunity to work from home, including provision of adequate technological support to facilitate this Provide suitable staff shower facilities at all permanently staffed sites Provide secure undercover bicycle facilities at all Council sites Include a bicycle skills education program in the training that is offered to staff Require a minimum set of skills to be gained through an approved induction course before staff can take out pool bicycles Staff travel plan to include provision for expanded public transport ticket program
Fuel switch	Investigate options to convert Council fleet to alternative fuel, lower emission vehicles	Investigation is included in the staff travel plan
Advocate	Advocate to the state and federal government on issues relating to sustainable fleets	Advocate to the state and federal government to implement suitable infrastructure to allow increased use of electric vehicles Advocate for the state government to ensure that there will be adequate supply of GreenPower to offset the emissions of electric vehicles Advocate to reduce FBT encouragements to drive further
Offset	Monitor electric vehicle electricity consumption and purchase equivalent amount of GreenPower	All electric vehicles in the staff pool will run on 100% GreenPower purchased as decoupled Renewable Energy Certificates (RECs) to make them zero emission vehicles

WASTE ACTION FRAMEWORK

Council generates a significant volume of waste through corporate operations. Sources include the waste from council buildings and from some municipal activities such as street cleaning, beach cleaning and illegal dumping.

Whilst waste to landfill emissions is included in Council's 2020 zero emissions target, the actual level of emissions will not be verified and included until Council completes comprehensive waste audits in 2011/12.

Once this is established, Council will develop and implement waste emissions reduction actions as part of its 2020 target.

It is anticipated that the strategy to minimise waste emissions from Council operations will initially focus on minimising all waste streams, as well as ensuring all organic waste is diverted from landfill to composting or other reuse alternatives.

Waste actions to reduce emissions will be developed and added to Council's 2020 target once comprehensive audits are completed in 2011/12.



END NOTES

- i Refer to Appendix B of this plan at www.enviroehub.com.au for a comprehensive overview of Council's carbon inventory, methods and assumptions
- 1 Intergovernmental Panel on Climate Change, 2007. Fourth Assessment Report, Climate Change 2007: The Physical Science Basis. Accessed at: www.ipcc.ch/publications_and_data/ar4/syr/en/mains3-2-1
- 2 The Garnaut Climate Change Review, 2011. Australia's Emissions in a Global Context. Accessed at: www.garnautreview.org.au/chp7
- 3 For further information about the IPCC, visit www.ipcc.ch
- 4 Under the Kyoto Protocol, Australia negotiated to be allowed to limit its average annual greenhouse gas emissions over the period to 2012 to 108% of its emissions in 1990. See www.aph.gov.au/library/pubs/climatechange/governance/international/theKyoto
- 5 For examples of local government greenhouse reduction actions, visit www.iclei.org
- 6 For more information on heritage requirements, visit www.dse.vic.gov.au/planningschemes/portphillip/home
- 7 At the Port Phillip Speaks Community Summit (2007), and in two surveys conducted in the city in October/November 2009 and December 2010–January 2011, more than 85% of community respondents supported local greenhouse emissions reduction actions each time.
- 8 Toward Zero Sustainable Environment Strategy can be downloaded from www.enviroehub.com.au/council-policy-strategy/toward-zero
- 9 Australian Conservation Foundation Consumption Atlas. Go to: www.acfonline.org.au/consumptionatlas Accessed August 2011.
- 10 See 'Assumptions behind each action wedge' in Appendix A at www.enviroehub.com.au to gain detail on the type and level of action modelled.
- 11 See 'Assumptions behind each action wedge' in Appendix A at www.enviroehub.com.au to gain detail on the type and level of action modelled.
- 12 SKM, Community Travel Mode Shift Scenarios to Achieve Toward Zero Transport Strategy Targets – Final Report December 2010. Note that the SKM report is based on the VISTA database. It does not account for trips made by non-residents of the City of Port Phillip that originate or terminate within the municipality due to the difficulty of capturing these trips and the lesser capacity of Council to influence these trips. It also does not account for trips, notably those by commercial vehicles, made through the municipality without an origin or destination in the municipality.
- 13 Refer to Appendix B of this plan at www.enviroehub.com.au for a comprehensive overview of Council's carbon inventory, methods and assumptions.
- 14 Refer to Appendix A of this plan at www.enviroehub.com.au for a detailed overview of business as usual scenarios and costs.
- 15 These nine buildings are: St Kilda Town Hall, Betty Day Centre, South Melbourne Market, South Melbourne Town Hall, Port Melbourne Town Hall, the Depot, 228 Banks St, Albert Park Library, St Kilda Library
- 16 For a detailed breakdown of the assumptions behind each action path, refer to Appendix A of this plan at www.enviroehub.com.au
- 17 For a detailed breakdown of the assumptions behind each action path, refer to Appendix A of this plan at www.enviroehub.com.au

GLOSSARY

Alternative transport modes

Refers to all alternatives to driving a car or truck and usually includes public transport, walking and bike riding.

Business as usual (BAU)

In this document, 'business as usual' refers to the expected trajectory of carbon emissions if no change occurs within the City of Port Phillip (other than the projected population increase) and no new policies are implemented by state or federal governments.

Carbon dioxide or CO₂

Carbon dioxide is the greenhouse gas whose concentration is most directly affected by human activities. CO₂ also serves as the reference to compare all other greenhouse gases; this is referred to as the 'carbon dioxide equivalent' (CO₂-e).

Carbon footprint

An assessment of the total carbon emissions produced from activities and lifestyle inside the home (electricity and gas use, waste, transport fuel use) as well as outside the home (emissions produced from food consumed, goods and services purchased and flights taken). It can also be applied to a business.

Carbon neutral

One's carbon footprint (total or at home/work only) is calculated, then neutralised, by a combination of energy conservation, energy efficiency and switching to renewable energy sources to reduce emissions where possible, with remaining emissions balanced by purchasing carbon offsets.

Carbon price

The set price to be paid for emitting a tonne of CO₂. A carbon price is generally set by governments in the form of a tax or emissions permits.

Carbon tax

A tax on the emissions of carbon dioxide by the largest emitting businesses which couples reducing emissions with reducing business costs. Emissions allowed are unlimited, but all emissions have a set cost per tonne of carbon emitted.

Climate change

The medium to long-term changes in our climate patterns that result from global warming.

Decarbonise

To remove carbon from something. In this document, decarbonise is generally used to refer to the energy supply.

Distributed energy generation, also called localised or onsite energy generation

Small energy generators (such as solar panels or small wind turbines) are located close to where energy is consumed.

Embodied energy

Refers to the quantity of energy required to make and transport a material or item, from the mining and processing of natural resources to manufacturing, transport and product delivery.

Emissions intensity (also known as greenhouse intensity)

The volume of emissions generated in order to create power (e.g. burning coal creates more emissions than hydroelectricity to generate the same amount of power. Therefore, coal is said to be a high emissions intensity power source).

Emissions inventory

An assessment of the volume of greenhouse gas emissions and how they are created. An emissions inventory can be conducted by a household, organisation or country.

Emissions

Refers to the release of greenhouse gases into the atmosphere. Greenhouse gas emissions can occur naturally as well as being caused by human activities (such as burning coal for electricity).

Emissions trading scheme

A cap is placed on the total volume of emissions that can be produced. Permits are required to emit carbon. Permits can be sold by organisations producing less than their allocated volume of emissions to organisations wanting to produce more than their allocated volume of emissions.

Energy conservation (or saving)

Any behaviour that results in the use of less energy, such as turning the lights off when you leave a room and activating power-saving settings on a computer.

Energy efficiency

The use of technology that requires less energy to perform the same function. An example of energy efficiency is a compact fluorescent light bulb that uses less energy than an incandescent bulb to produce the same luminosity of light.

ESD

Ecologically Sustainable Development, which is designed to maintain ecological diversity and longterm quality of life.

Fuel switch

Moving from one type of energy supply to another. Some examples include changing a car from petrol to gas or powering some appliances by gas instead of electricity.

Fuel use spike

A sudden, short-term increase in fuel/energy consumption; for example, air-conditioner use in hot weather.

Greenhouse abatement/greenhouse mitigation

Refers to the reduction of greenhouse gas emissions. Abatement measures can be taken by an individual, household, company, industry sector or government.

Greenhouse gases

Gases in the atmosphere that trap radiant heat from the sun with the Earth's atmosphere. Carbon dioxide is the primary greenhouse gas.

Greenhouse Effect

A natural process that regulates global temperature. Increasing amounts of greenhouse gasses result in increasing global temperature or global warming.

GreenPower

The quality-assurance brand given to retail electricity from certified renewable energy sources.

Low carbon

Technology, fuels or systems that minimise carbon dioxide emissions from human activity.

Modal shift

To change a journey from one mode of transport (e.g. car) to another mode of transport (e.g. bicycle).

MV lamps

mercury vapour lamps use mercury in an excited state to produce light. MV lamps are commonly used for street lighting.

Offsets or carbon offsets

The purchase of emissions reduction elsewhere to compensate for one's own emissions.

Renewable energy

Refers to energy sources that regenerate naturally and relatively quickly. Examples include electricity and heat generation from solar, wind, tidal, wave, and hydroelectric.

Renewable Energy Certificate

A tradable commodity that certifies an amount of renewable electricity has been generated:
1 REC = 1MWh of renewable electricity generated.

Retrofit

The addition of new technology or other improvements to existing buildings or systems.

Solar panels

Devices that convert sunlight directly into electricity. Also called photovoltaics or PVs.

Sub-metering

Refers to the individual metering of businesses, residences, or even individual circuits within a larger building.

Voluntary abatement

Reduction of greenhouse gas emissions by an individual or organisation that is separate to, or additional to, any reduction of emissions that is mandated by government.

Zero net emissions

Emissions for a building, organisation, or area have been calculated and generally reduced before offsets are purchased to compensate for any remaining emissions.

FOR MORE INFORMATION

For more information about greenhouse action or other Council environmental plans, please visit www.enviroehub.com.au

For more information, requests, questions and feedback, please call ASSIST on [9209 6777](tel:92096777) or email assist@portphillip.vic.gov.au

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