

Climate Change Action Plan: 2010-2015



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Mayor's foreword

Climate change, water, drought, sustainability – we hear these words every day, in the paper, on the radio, television and online. Climate change, and the consequential threats to our water and economy, is one of the greatest challenges for our natural environment's sustainability. Future generations will remember us by our response.

Nillumbik Shire Council is committed to the implementation of practical measures to alleviate the impact of, and adapt to, climate change. We firmly believe that it is not what we do tomorrow that counts but what we do today.

Council has committed to reducing energy consumption throughout its operations by 2015. This goal will be achievable as we have already made great steps towards reducing our carbon footprint. Between 2007-2008, we had already more than halved the amount of greenhouse gas emissions from our 1996 levels.

The greenhouse gas emissions from Council's own operations include the energy and gas usage of our leisure centres, libraries and a myriad of other buildings. It also includes the energy used for the lighting of tennis courts, sports grounds and car parks, as well as weekly recycling and waste pickups, and Council vehicles such as mowers, graders and passenger vehicles. However these emissions account for only one per cent of the emissions of the Nillumbik community.

Our community has shown strong commitment in the past to tackle environmental challenges, and as we look towards the future, Council is confident that this strength and determination will continue.

Our GRO 3-bin system is a great example of our community's commitment to achieving environmental goals. We were number one in Victoria for waste reduction in 2007-2008. Nillumbik residents divert 64 per cent of household waste away from landfill through the green organics and recycling bins. We were the first Council in Victoria to collect food scraps in our green organics bin and are one of the few who collect all hard plastics for recycling. By reducing the amount of waste going to landfill, we are also reducing the amount of greenhouse gases emitted. Since implementing the GRO 3-bin program, Nillumbik residents have decreased their carbon dioxide equivalent greenhouse gas (CO₂-e) emissions by approximately two tonnes per participating household.

Whilst there have been recent issues with the delivery of the green waste service, Council is committed to ensuring that an effective system is established.

Council is committed to doing its part but needs local businesses and residents to take proactive action as well. We see this as an opportunity for everyone who lives and works in Nillumbik to work together to help achieve our emission reduction goals.

We are confident we can bring enthusiasm, innovation and action to the task of combating climate change. Australians have led the world in per capita carbon emissions; we now need to show similar leadership in reducing them.

Why do we need a Climate Change Action Plan?

It is widely believed that the earth is currently experiencing an increasing greenhouse effect that has resulted in changes to the world's weather patterns and climatic conditions. This increase in a naturally occurring phenomenon is believed to be a result of the burning of fossil fuels, deforestation and land degradation, which increases the concentration of greenhouse gases, especially carbon dioxide (CO₂) in the atmosphere.

With the predicted rises in temperatures, there will be more noticeable impacts on our climate. Sea levels rise as a result of melting snow and ice from glaciers and ice caps. Acidity of our oceans is believed to be increasing as CO₂ in the atmosphere is being absorbed into the oceans, resulting in a changing marine ecosystem.

Whilst changes in climate have and will continue to occur naturally, it is important to distinguish between natural climate variability and the results of human-induced climate change. It is thought that naturally occurring events such as drought, bushfire and flooding will still occur, however, the magnitude, duration and frequency of these events is likely to increase in areas where these events typically occur, and may occur in areas that don't currently experience these phenomena.

Our actions will determine how successful we will be in adapting to an environment experiencing uncertain climatic changes.

What is the science telling us?

The Intergovernmental Panel on Climate Change (IPCC) is the leading global scientific organisation in relation to human-induced climate change, and since 1990, has produced four reports that bring together existing scientific research and understanding into an overarching report.

The original IPCC report from 1990 outlined four emissions scenarios based on a combination of several global responses to economic, social and environmental change. The most extreme growth in emissions was associated with rapid population and economic growth, based on a continued dependence on fossil fuels.

Research by the world's leading scientists suggests that without actions to reduce greenhouse gas emissions, the earth's surface temperature is likely to rise by 1 - 6.4°C by the end of this century. Likely outcomes are reduced water availability, more heat waves, fewer frosts, less snowfall, more storms, stronger tropical cyclones and rises of 18 - 59cm in sea levels.

For Australia, the impacts of climate change will vary in each region. Estimates indicate that by 2030, Australia will face:

- around 1°C of warming in temperatures
- up to 20 per cent more months of drought
- up to 25 per cent increase in days of very high or extreme fire danger
- increases in storm surges and severe weather events.

Australia is very vulnerable to the impacts of climate change. If levels of greenhouse gases continue to rise, the resulting climate change could lead to serious impacts on coastal communities, iconic areas such as the Great Barrier Reef and the Kakadu wetlands, biodiversity, agriculture, water supplies, public health, transport and communications infrastructure.

For Victoria, the potential impacts from a high greenhouse gas emissions pathway will vary across the state. Commonwealth Scientific and Industrial Research Organisation (CSIRO) scientists have predicted that warming is likely to be higher in the northern regions and that drying is likely to be greater in the southern regions. Victoria's Climate Change Green Paper¹ outlines how climate change is likely to affect Victoria by 2030.

¹ Victorian Government Department of Premier and Cabinet, June 2009. Victorian Climate Change Green Paper.



- Average annual temperatures up to 1 - 2 °C higher than in 1990.
- More days where the temperature is above 35 °C.
- Less rain and fewer rainy days.
- Drier conditions across the state, including more frequent droughts.
- Significant reductions (of more than 30 per cent) in run-off for major water catchments.
- Increases of water temperatures and changes in flows and currents in inland and marine environments.
- More extreme weather events, such as severe storms, high winds and floods.
- More frequent bushfires, with the number of 'extreme' fire danger days increasing by between five per cent and 40 per cent by 2020 (relative to 1974-2003).
- Rising sea levels and an increase in storm surges.

In 2007, the fourth and most recent IPCC report stated that there is now an '...unequivocal greater than 90 percent chance that since 1950 the net effect of human activities has been warming'². In March 2009, the *Climate Change: Global Risks, Challenges and Decisions Congress* in Copenhagen defined six key messages (see Box 1).

Box 1: Climate Change: Global Risks, Challenges and Decisions Congress³

1. **Climatic trends** – worst-case IPCC scenario trajectories (or even worse) are being realised. There is significant risk that the trends will accelerate, leading to an increasing risk of abrupt and irreversible climatic shifts.
2. **Social disruption** – societies are highly vulnerable to even modest levels of climate change and temperature rises above 2 °C will be very difficult for contemporary societies to cope with.
3. **Long-term strategy** – rapid, sustained and effective mitigation based on coordinated global and regional action is required to avoid 'dangerous climate change' regardless of how it is defined.
4. **Equity dimension** – climate change is having, and will have, strong differential effects on people within and between countries and regions, on this generation and future generations, and on human societies and the natural world.
5. **Inaction is inexcusable** – there is no excuse for inaction.
6. **Meeting the challenge** – to achieve the societal transformation required we must overcome a number of significant constraints and seize critical opportunities.

² IPCC (2007) *Summary for Policymakers*. In *Climate Change 2007: The Physical Science Basis. Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, November 2008, page 5.

³ *ibid*

Foremost amongst these messages is confirmation that the worst-case, global climatic trajectories listed by the IPCC are now being realised or exceeded⁴. The remaining messages underpin and align with the need for a Climate Change Action Plan within Nillumbik that emphasises urgent and comprehensive action, and highlights that significant constraints will need to be overcome if large cuts in emissions are to occur across Council and the community.

What has been the world's response?

In 1994, the Convention on Climate Change came into force. The Convention sets an overall framework for intergovernmental efforts to tackle the challenges posed by climate change. It recognises that the climate system is a shared resource and its stability can be affected by emissions of carbon dioxide and other greenhouse gases. The Convention has near global membership, with 192 countries having signed-up. Under the Convention, governments:

- gather and share information on greenhouse gas emissions, national policies and best practices
- launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries
- cooperate in preparing for adaptation to the impacts of climate change.

In 1997, the Kyoto Protocol was adopted by the United Nations Framework Convention on Climate Change. The Kyoto Protocol is an international agreement that sets binding targets for 37 industrialised countries and the European community for reducing greenhouse gas (GHG) emissions. The major distinction between the Protocol and the Convention is that while the Convention encouraged industrialised countries to stabilise GHG emissions, the Protocol commits them to do so. The targets set by the Kyoto Protocol amount to an average of five per cent against 1990 levels over the five-year period between 2008-2012.

The Australian Government agreed to the Kyoto Protocol on 12 December 2007. This binds Australia to reducing greenhouse gas emissions.

What has been Australia's response?

In 1998 the Australian Government released the National Greenhouse Strategy, outlining Australia's response to the potentially adverse impacts of human-induced climate change. The key goals to this strategy are:

1. To limit net greenhouse gas emissions, in particular to meet our international commitments.
2. To foster knowledge and understanding of greenhouse issues.
3. To lay the foundation for adaptation to climate change.

After the publication of the IPCC's third report in 2001, the Australian Government investigated the need to adapt to climate change through the initiation of the National Climate Change Adaptation Programme (2004) and the publication of *Climate Change Risk and Vulnerability – Promoting an efficient adaptation response in Australia* in 2005.

The Council of Australian Governments requested the development of a National Adaptation Framework in February 2006 as part of its *Plan of Collaborative Action on Climate Change*. This Framework outlines the future agenda of collaboration between governments to address key demands from business and the community for targeted information on climate change impacts, and to fill critical knowledge gaps which currently inhibit effective adaptation. A key focus of the Framework is to assist decision-makers to understand and incorporate climate change into policy and operational decisions at all scales and across all vulnerable sectors. This outlines potential areas of action and timeframes for this action.

In 2007, the National *Greenhouse and Energy Reporting Act* was enacted. This legislation informs and directs the National Greenhouse Accounts, which is used for Kyoto reporting requirements.

Since December 2007, the Department of Climate Change has been established and one of the objectives is to develop a climate change strategy, however, the Australian Government has continued introducing complimentary measures to reduce GHG emissions and helping communities adapt to climate change without the finalisation of the strategy. Some of these complimentary measures include the rebates for solar panels and water tanks.

⁴ University of Copenhagen (2009) Key Messages from the Congress, accessed on 27 April from http://climatecongress.ku.dk/newsroom/congress_keymessages/

The Australian Government is currently establishing a Carbon Pollution Reduction Scheme (CPRS) as part of an effective framework for meeting its Kyoto Protocol targets.

What has been Victoria's response?

In 2002, the Victorian Government launched the Victorian Greenhouse Strategy and commenced a three-year program of actions to reduce greenhouse emissions across a range of industry sectors. In 2006, the government released the *Our Environment, Our Future – Sustainability Action Statement*, which provided over \$200 million for actions aimed at securing a sustainable environment for the state's future. Responding to climate change is a cornerstone of *Our Environment, Our Future*. Following the release of the action statement, the government released the *Renewable Energy Action Plan* and the *Energy Efficiency Action Plan*.

At the 2006 state election, the Victorian Government gave a commitment to introduce a Climate Change bill to ensure that actions taken on climate change are backed by legislation and protected under Victorian law. Since 2006, a number of the measures that were originally planned for inclusion in the bill have been delivered through separate state legislation (including feed-in-tariffs for solar panels for households and the *Victorian Energy Efficiency Target Act, 2009*) or through the emissions reporting requirements that will underpin the Australian Government's Carbon Pollution Reduction Scheme (CPRS). The Victorian Government's *Climate Change Green Paper* was released in early 2009.

How has Nillumbik Shire Council responded?

Council made a firm commitment to reducing greenhouse emissions by joining the International Council for Local Environment Initiatives (ICLEI) Cities for Climate Protection (CCP) program in 1999, an international program aimed at local governments reducing their greenhouse gas emissions and facilitating emission reductions within the community.

Via the CCP program, Council committed to reducing Council operations and community greenhouse gas emissions from 1997 levels by 20 per cent by 2015. In March 2003, Council endorsed the Community and Council Greenhouse Action Plan (GAP).

The GAP has coordinated Council's strategic approach to implementing GHG reduction actions across Council departments. The GAP has now been reviewed and will be replaced by this Climate Change Action Plan (CCAP).

In 2006 Council undertook a detailed greenhouse gas inventory that was funded by the Australian Government through ICLEI. Council operations' greenhouse gas emissions have reduced by approximately 1 per cent since last measured in 1997. By 2008 they reduced by 44 per cent from 1997 levels. This is largely due to Council's recent commitment to the ongoing purchase of GreenPower™.

Nillumbik Shire Council's greenhouse gas emissions (carbon dioxide equivalent, or CO₂-e) were last measured in 2008-2009. Council operations emitted 4,100 tonnes, while the Shire as a whole emitted 615,400 tonnes of greenhouse gas⁵. The wider community of Nillumbik emits 99 per cent of the Shire's total of greenhouse gas emissions.

In 2008-2009, Council's operation sector avoided 1,500 tonnes of greenhouse gas emissions through a combination of energy efficient and waste diversion actions. During the same year, Council assisted the community to avoid around 13,368 tonnes through waste diversion. The total amount of greenhouse gas emissions avoided was the same as removing over 3,458 cars off the road that year.

Key actions implemented included:

- Implementation of a number of energy efficiency projects through the Revolving Resource Conservation Fund (RRCF) framework.
- Review of the fleet policy to increase fuel efficiency.
- Membership of the Northern Alliance for Greenhouse Action (NAGA) and implementation of regional greenhouse reduction projects.
- Ongoing tree planting programs which soak-up carbon during growth.
- Purchase of 100 per cent accredited GreenPower™ for building use.
- A \$1 million project to install energy efficient lanterns on minor roads within the Shire (currently under way).

⁵ This figure excludes streetlight emissions as Council is not in "operational control" of the facility as per Section 11 of the National Greenhouse and Energy Reporting System (NGER). This figure also excludes council owned buildings whereby committees or committees of management take responsibility for the utility bill. Council is currently working toward including these buildings.

Where is Council currently placed?

Greenhouse gas emissions for local governments and the whole of Victoria were recalculated in 2006 using the following sectors to profile emissions:

- Stationary Energy
- Industrial Processes
- Transport
- Waste
- Agriculture
- Land use Change.

This data shows that Nillumbik's greenhouse gas emissions account for less than one per cent of Victoria's greenhouse gas emissions. The majority of emissions are from stationary energy, most of which can be attributed to electricity generation and use.

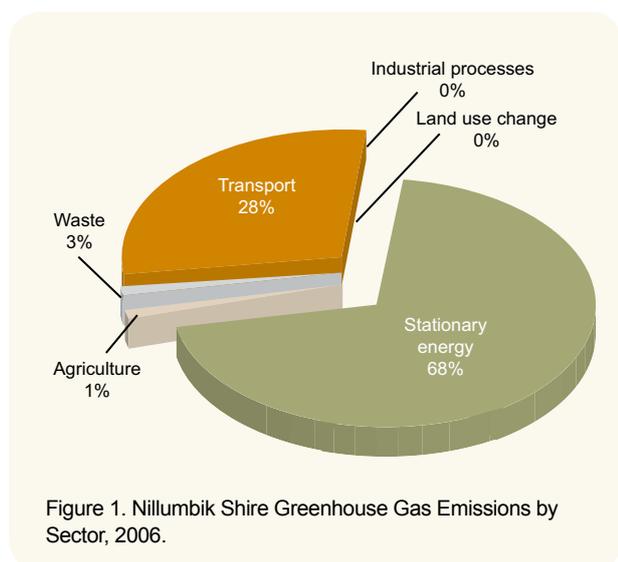


Figure 1. Nillumbik Shire Greenhouse Gas Emissions by Sector, 2006.

Table 1 shows the Shire of Nillumbik's percentage of emissions by sector compared to the whole of Victoria and the Northern Alliance for Greenhouse Action (NAGA) region. The NAGA region has been shown for comparative purposes, as Nillumbik Shire Council has formed part of this alliance since 2002. The NAGA region is made up of the municipalities of Banyule, Darebin, Hume, Manningham, Melbourne, Moreland, Whittlesea, Yarra and Nillumbik.

Within Nillumbik, the largest contribution to greenhouse gas emissions is the residential sector, with 41 per cent of total emissions. Non-freight road transport, essentially private vehicles, contributes 23 per cent of emissions, and the commercial sector contributes 17 per cent of emissions.

Table 1: Greenhouse gas emissions represented as percentage of total emissions for each region in 2006. Note: Land use change for Victoria is -4.19 Mt CO₂-e and is rounded to zero in the table below.

Sector	Victoria (%)	NAGA region (%)	Nillumbik Shire (%)
Stationary Energy	57.5	45.9	67.3
Industrial Processes	9.9	28	0
Agriculture	12.6	0.2	1.3
Waste	3.5	4.8	3.1
Transport	16.5	21	28.2
Land Use Change	0	0.1	0.1

Council's emissions

In 2006 Council undertook a greenhouse gas inventory that was funded by the Australian Government through ICLEI – Local Governments for Sustainability's Cities for Climate Protection program. It showed that of Council's 9,876 tonnes of emissions, the highest percentages were from Council buildings, streetlights and the vehicle fleet. Council has since purchased GreenPower™ to offset greenhouse gas emissions from all Council buildings and will soon be rolling out a streetlighting retrofit program, which will alter these percentages significantly.

Accurate emissions data has historically been very difficult to obtain and the figures should be viewed bearing this in mind. Council is working towards improving its data management system and hopes to greatly improve the quality and accuracy of emissions data in the future.

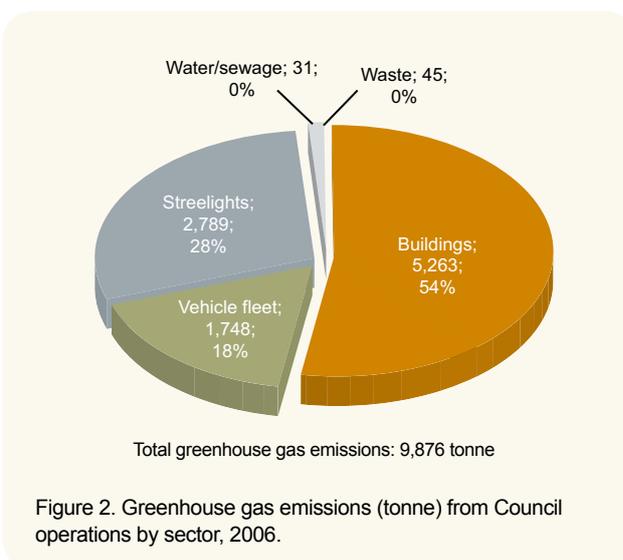
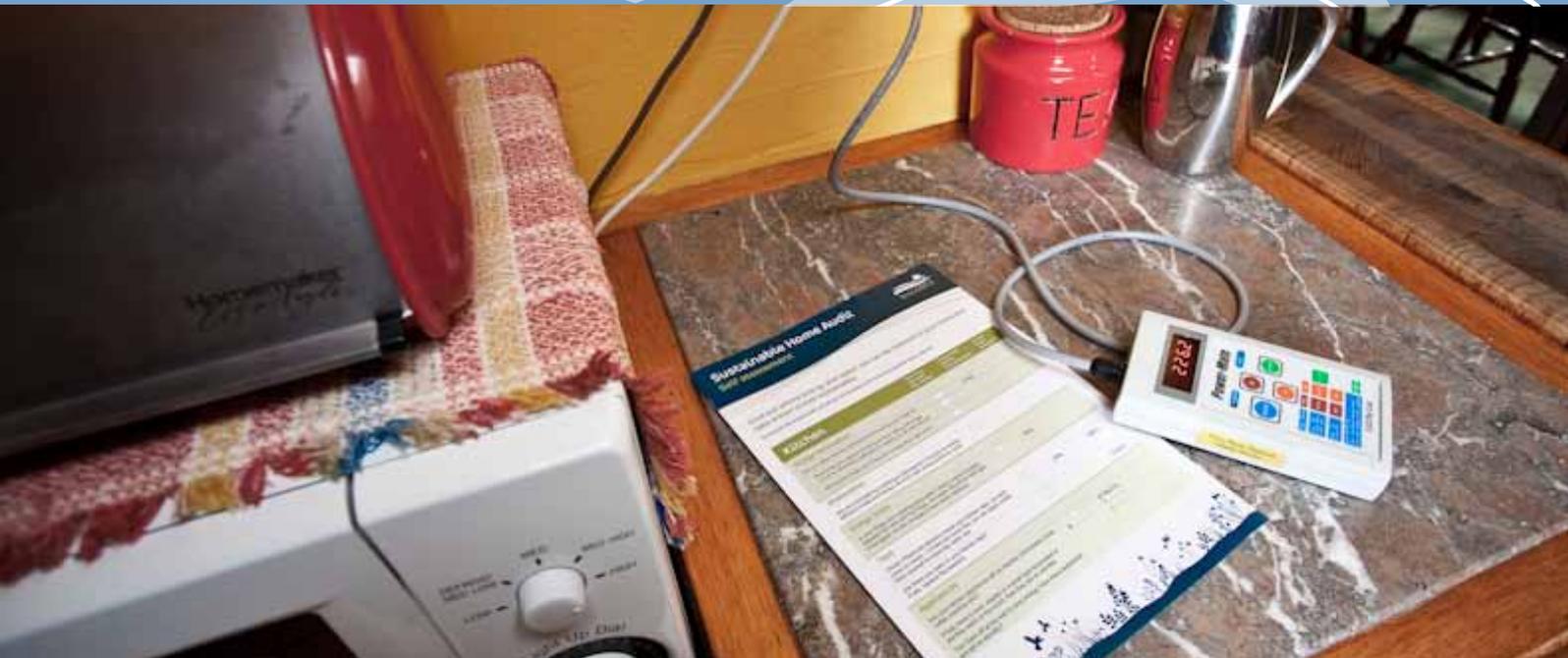


Figure 2. Greenhouse gas emissions (tonne) from Council operations by sector, 2006.



What can we do?

Council has a significant influence on energy consumption and greenhouse emissions within the Shire as an energy user, waste manager, and community and business leader. Council provides a diverse range of services. Core functions include the operation of council buildings and community facilities, road works, public lighting, council vehicles and waste management. Council is in a good position to lead by example with regard to greenhouse reduction by facilitating community involvement and education, and encouraging appropriate infrastructure such as sustainable transport.

The goals first established within the Greenhouse Action Plan (GAP) in 2003 via ICLEI's Cities for Climate Protection program have also been revised. The goals now aim toward significant cuts in greenhouse gas emissions in both Council operations and the community sector.

- **To reduce Council operations' reliance on fossil fuels by 2015.**
- **A Nillumbik community that has low reliance on fossil fuels.**

The CCAP community goal does not have a set date – Council will continue to advocate to government and support and encourage the community on the path of reduced reliance on fossil fuels. It will take a commitment not only from Council and state and federal governments, but also from every individual, household, business, industry and community group in Nillumbik to achieve a low reliance on fossil fuels.

The time in which the community will achieve this goal is also dependent on the implementation of state and federal government measures to assist communities in this regard. For example the implementation of an emissions trading scheme, minimal energy efficiencies for general household appliances and investment in renewable energy sources. With the implementation of these state and federal government initiatives, it has been estimated that the greenhouse gas emissions from the residential sector will decline to 34 per cent of the current levels by 2020⁶.

Despite not having a set date for the CCAP community goal, Council has set timeframes for Council-led actions. These include actions such as assisting schools and households to obtain solar systems, homes and businesses to become more efficient and less reliant on fossil fuels, and improving sustainable travel behaviour.

⁶ Northern Alliance for Greenhouse Action (2009) Towards Zero Net Emissions for the NAGA region. Final report.



Our plan for action

The Climate Change Action Plan provides a response to climate change with a focus on the roles and responsibilities of Council. This includes actions Council will take relevant to its operations and services and what it can do to support resident and business responses. These responses are based on a simple carbon management principle, outlined in Box 2.

Nillumbik's Climate Change Action Plan vision

Nillumbik's CCAP aspires to a long-term vision where our community is no longer reliant upon fossil fuels and we are not polluting the atmosphere with greenhouse gases. Council has based the CCAP's greenhouse reduction goals on the need to cut greenhouse gas emissions to reduce reliance on non-renewable fuel sources.

Box 2 Carbon Management Principles⁷

1. **Avoidance** – strategies to avoid the generation of emissions.
2. **Reduce (Modify-Recover)** – strategies to reduce the generation of emissions.
3. **Switch (Renew-Exchange)** – strategies that switch energy sources so they are less greenhouse intensive.
 - a. Built form renewable energy, e.g. installation of building solar panels.
 - b. Purchasing of renewable energy from an accredited retailer through GreenPower™.
 - c. Exchange of fossil fuel energy source to one with lower carbon content i.e. coal fired to natural gas generation.
4. **Offset** – strategies to offset residual GHG emissions.

⁷ Victorian Environmental Protection Authority (2008) Carbon Management Principles

CCAP operations goal

To reduce Council's operations' reliance on fossil fuels by 2015.

Council commits to further reducing its own reliance on fossil fuels by 2015.⁸ To achieve this Council has committed to the following strategic goals to ensure we reach our overall goal of reduced reliance on fossil fuels.

1. Achieve a 20 per cent reduction in building, electricity and gas consumption by 2015 compared to 2006 levels.
2. Achieve a 20 per cent reduction in vehicle and plant fleet emissions by 2015 compared to 2006 levels.
3. Achieve a 70 per cent reduction in streetlighting energy consumption by 2015 compared to 2006 levels.
4. Purchase 100 per cent accredited offsets for building use each year.
5. Purchase 100 per cent accredited offsets for public lighting energy consumption from 2015 onwards.
6. Establish offsets for all vehicle fleet fuel use from 2015 onwards.
7. Develop and implement a Climate Change Adaptation plan.

CCAP community goal

A Nillumbik community that has low reliance on fossil fuels.

Council commits to supporting the community to reduce its reliance on fossil fuels. The Shire of Nillumbik (including Council emissions) emits approximately 615,000 tonnes of greenhouse gases every year. One tonne of greenhouse gas emissions equals the volume of an average Victorian home, or fuel 156,000 cars for a year. Council operations contribute approximately one per cent of these total emissions. This makes it clear that supporting the community to reduce emissions needs to be a key agenda item for Council.

Reducing reliance on fossil fuels for Nillumbik communities is an ambitious goal that will require dedicated input from Council, state and federal governments, individuals and community groups. To help our community in this endeavour, Council has set itself a number of strategic goals.

1. Achieve a 15 per cent increase from 2006 in renewable energy installations (e.g. solar hot water, photovoltaic systems) across our community by 2011, to be undertaken independently or through partnerships with other councils (e.g. bulk buy schemes, Carbon Rationing Action Groups – CRAGS)
2. Help 100 homes or businesses have energy efficient operations (by using programs such as *Towards Zero Net Emissions*), starting in 2010.
3. Help establish and sustain the Walking School Bus at 12 local schools by 2015.
4. Achieve 50 new developments committed to the STEPS/SDS sustainable development program, which commenced in 2008.
5. Implementation of programs to educate, inform and empower the community to make changes in their homes and neighbourhoods, and influence political decision makers.
6. Ongoing advocacy to the state and federal governments regarding issues relating to the community energy use sector (i.e. public transport, emissions trading schemes, Victorian energy efficiency targets and voluntary carbon markets), individually or through regional alliances such as Northern Alliance for Greenhouse Action (NAGA).

The actions to achieve these strategic goals were developed with comprehensive input from the community, Councillors and Council staff. They adhere to the Carbon Management Principles of prioritising energy conservation, then implementing efficiency measures, followed by investment into renewable energy and finally, offsetting residual emissions. Also, through active involvement in groups such as NAGA, we will investigate ways to reduce consumption of electricity within Council and our community and research opportunities to offset emissions through forestry, co-generation and wind farms.

⁸ In 2003, via participation in the CCP program, Council committed to reducing Council and community 1997 greenhouse gas emissions by 20% by 2012. This goal was achieved in 2007. As part of this Plan, Council chooses to amend these goals to reflect the consensus for more decreases in emissions.

How will the Climate Change Action Plan work?

The Climate Change Action Plan fits into an already existing policy and planning framework within Council. The following outlines where the plan will sit within this framework, how it will be implemented; costs associated with implementation, and monitoring and reporting requirements that will be required to provide information back to Council and members of the community on the success of the plan.

Strategic framework

Nillumbik's CCAP builds on existing strategies and plans including the Council Plan, the Nillumbik Environment Strategy, Greenhouse Action Plan, Nillumbik Integrated Transport Strategy and the Asset Management Plan. CCAP ensures that future strategies, plans and actions of Council are consistent with its overall goals. The strategy is also consistent with work completed through Council on the Cities for Climate Protection (CCP) Program and Towards Zero Net Emissions Strategy.

CCAP actions were developed using:

- the Nillumbik Shire Community and Council Greenhouse Action Plan 2003
- input from the community during the Greenhouse Action in Nillumbik: Have your say (GAIN) workshops in February and March 2007
- input from relevant Council Sections and Units during a series of meetings and workshops
- input from the community during the preparation of this Plan
- input from the Environment Advisory Committee and Councillors.

CCAP is guided by the vision, strategic objectives and strategies that have been outlined in the Council Plan 2009-2013.

Nillumbik Shire Council Vision

The vision for Nillumbik is a Shire which has:

- safe, healthy and engaged communities
- a sustainable and well-managed natural and built environment
- a vibrant local economy
- a respected and accountable Council, committed to innovative and continuous improvement.

Council Plan Objectives

The following are the objectives outlined within the Council Plan that are most relevant to the CCAP.

- 2.1.5 Encourage and inform the community regarding waste minimisation, energy reduction and water conservation and reuse through education programs.
- 2.1.6 Continue to improve Council's waste management programs and reduce our energy and water consumption.
- 2.1.7 Consider and respond to the impacts of climate change on Council and community programs and services.
- 2.1.8 Implement sustainable maintenance practices for Council assets.

The most relevant strategic indicator to monitor the implementation of the above objectives will be greenhouse gas emissions and energy use by Council and the community.



Implementation Framework

It is anticipated that the goals outlined within this Plan will put Council in a good position for reduced reliance on fossil fuels in the future. In 2008-2009, Council avoided emitting 1,500 tonnes of greenhouse gas via a range of energy and waste saving actions.

In 2008-2009 the community has avoided 13,368 tonnes of greenhouse gas emissions via waste diversion actions. Despite this effort, community emissions are estimated to have increased by approximately four per cent from 1997 levels. Council plays an integral role in supporting the Nillumbik community to reduce reliance on fossil fuels by enhancing the services we already supply.

Achieving the Plan's goals for Council operations by 2015 and supporting the community to reduce reliance on fossil fuels will require a holistic Council response. In order to achieve these goals, it is important to identify the areas of Council that can provide this support in and outside of Council. The chart on page 14 shows Council's

current organisational structure, with key CCAP actions for particular sections. Sections often have a range of Council operations and community responsibilities.

The Environment and Planning Services Group will be responsible for overseeing the implementation of CCAP. The responsibility given to these groups is designed to ensure that greenhouse gas reduction and adaptation to climate change is considered in all Council operations.

The majority of the CCAP action implementation responsibilities lie with the Environment and Planning Services Group. The remaining service areas at Council will all play a significant part in the implementation of the Plan.

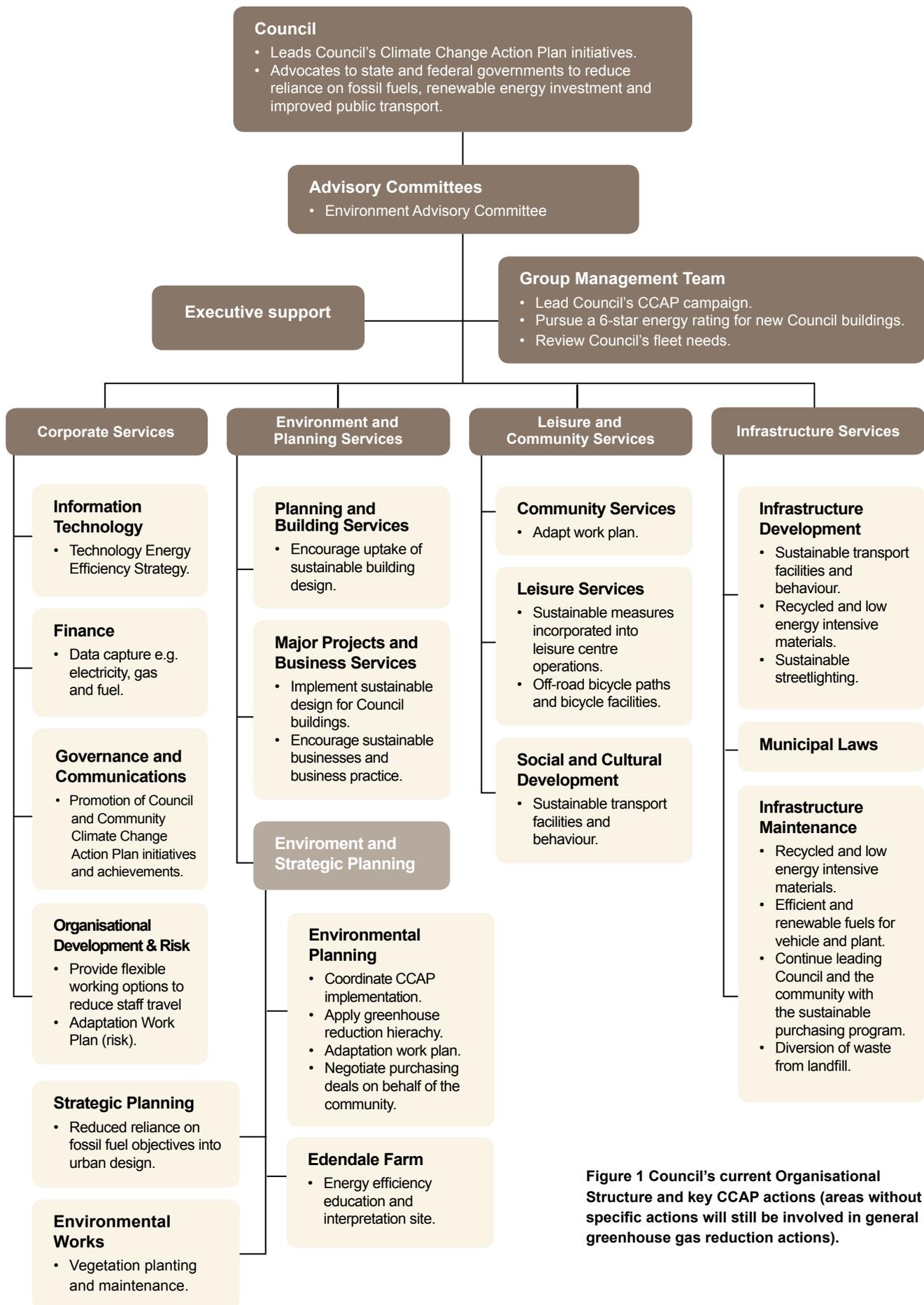


Figure 1 Council's current Organisational Structure and key CCAP actions (areas without specific actions will still be involved in general greenhouse gas reduction actions).



Costs and savings of Climate Change Action Plan

Reducing our reliance on fossil fuels for our operations will require further commitments on energy efficient technology and the continued purchase of accredited offsets such as GreenPower™ or other offsets that adhere to the National Carbon Offset Standard (NCOS).

Conversely, by reducing the energy consumed, Council will also save money on energy bills. Although it is difficult to calculate the exact cost and savings of implementing the CCAP for Council operations, estimates for streetlights, fleet and buildings have been developed in Table 2 (costs have not been developed for waste as the greenhouse gas emissions are not recorded separately for Council operational work). Some of these costs will only be incurred once, while savings will be ongoing. For example, replacing streetlights on minor roads with energy efficient lights will incur a one-off cost to Council of approximately \$375,000, but will ensure Council pays approximately \$40,000 less in energy bills each year.

It is estimated that annual costs to achieve the planned energy efficiency in buildings will cost \$100,000 per year. Annual energy savings for buildings, however, will amount to \$215,901. Despite energy efficiency efforts for buildings, a portion of building emissions will have to be offset by purchasing an estimated \$185,517 worth of accredited offsets e.g. GreenPower™ each year.

Council recognises that we are funded by a relatively small rate base and will continue to pursue external funding to implement actions within the CCAP.

Table 2 Estimate of cost and savings of achieving reduced reliance on fossil fuels.⁹

Sectors	Annual costs for resource efficiencies	Annual offset costs (include GreenPower™)	One-off costs	Annual savings from resource efficiencies
Buildings	\$100,000	\$200,000		\$215,901
Fleet		\$24,838	\$144,000	\$42,037
Streetlighting			\$375,000	\$40,000
Water/sewage		\$1,120		
Totals	\$100,000	\$225,958	\$519,000	\$297,938

⁹ These costs and savings are estimates based on the implementation of actions within the CCAP, they do not include salaries for Council officers or contributions to regional programs.



Buildings costs and savings

One of Council’s Strategic Goals is to achieve a 20 per cent reduction in building electricity and gas use by 2015 compared to 2006. The costs outlined previously are based on this strategic goal. Funding sourced from the Revolving Resource Conservation Fund has reduced emissions in the building sector by approximately 410 tonnes per year since its implementation. This program will need to continue and expand to achieve this Strategic Goal, however, in order to reduce greenhouse gas emissions further, accredited offsets will need to be purchased.

Fleet costs and savings

Council is currently trialling efficiency options for its waste trucks and has already reduced the average cylinder size of the vehicle fleet in recent years. The costs and savings associated with the Council fleet are based on a strategic goal of a 20 per cent saving in emissions by 2015. Accredited offsets will need to be purchased to cover the remaining emissions.

Streetlighting costs and savings

Council has allocated \$375,000 in the 2009-2010 budget, to implement a \$1,029,016 project to replace streetlights on minor roads with more efficient lights. These lights will reduce overall energy consumption in this sector by 68 per cent. This will substantively achieve the Strategic Goal of a 70 per cent reduction in streetlighting energy use by 2015 compared to 2006.

The total cost of the project is detailed below in Table 3.

Table 3 Indicative costs for the Streetlighting Retrofit Project

Nillumbik Shire Council	
Total cost (ex GST)	\$1,029,016.00
SP-Ausnet Contribution (ex GST)	\$246,764.00
Council resolved contribution (ex GST)	\$375,000.00
SV Funding contribution (ex GST)	\$407,252.78

Water/sewage and waste costs and savings

Support Melbourne Water and Yarra Valley Water to develop the best practice options to reduce emissions from wastewater and water pumping and offset these emissions.

Monitoring, indicators, reviews and reporting

Greenhouse emissions and actions will be monitored via:

- generation of greenhouse indicators
- annual reporting system which links all aspects of Council planning and reporting including the status of each action.

Climate Change Action Plan Progress Report

Council will utilise Council's Business Planning process to generate the annual Climate Change Action Plan Progress Report. The report will include information on how Council's greenhouse actions are progressing and a breakdown of Council and Shire greenhouse gas emissions.

Reporting to the community

Information generated for the Climate Change Action Plan Progress Report will be made available from www.nillumbik.vic.gov.au.

Review of Climate Change Action Plan

The Climate Change Action Plan will be reviewed every four years to revise goals, accommodate new actions and to revise existing actions. The community will be invited to have input into the review.



Climate Change Actions

The action plan has been divided into the following key areas:

1. Strategic
2. Industrial and commercial
3. Residential
4. Decarbonising the energy supply
5. Transport
6. Residual emissions

Other than Strategic actions, these key areas relate to the key source of emissions or targeted area of investment. Strategic actions are actions that involve advocacy and/or lobbying that may influence a number of different emission sources. Where relevant, the key action areas have been further divided into Council actions and Council-led actions. Council actions are actions that Council will undertake to influence the greenhouse gas emission reduction from Council operations. Council-led actions are actions that Council can undertake to influence greenhouse gas reduction from within the wider community, but will usually involve community participation.

These actions have been developed through considerable internal and external consultation and are designed to ensure effective implementation of the Plan. These actions will involve the community, Council and external organisations. All actions will be reviewed regularly and revised, where necessary.

These actions will need to be supported financially by Council. All efforts will be made to seek external funding or in-kind support where appropriate. Larger projects associated with the Plan will be included in Council's Strategic Resource Plan and Major Projects Plan to ensure appropriate budget allocations are provided.

Climate Change Action Plan actions will be incorporated into Group, Section and Unit work plans accordingly.

The development of this approach to mitigating greenhouse gas emissions has been guided by NAGA's Toward Zero Net Emissions Report.

The table of actions are separated into Number, Action, Timeline, Responsibility, and Secondary Responsibility.

Number: a number is assigned to the action for ease of reference.

Action: details the action to be undertaken.

Priority: refers to the priority Council has assigned to the action.

- **Ongoing** actions are projects that are currently regular (annual) activities or will become regular after initial implementation. The priority of the action may still remain high, for example, as their importance to greenhouse gas reduction remains.
- **High** priority actions require implementation to be undertaken in one to three years (2010-2013). These projects are considered new initiatives and funding would need to be secured.
- **Medium** priority actions require implementation to undertake between three to five years (2013–2015).
- **Low** priority actions are scheduled for consideration beyond five years (>2015).

Responsibility: Responsibility refers to the main Council Unit and/or external organisation that will be primarily responsible for implementing the specified action, including applying appropriate resources to ensure effective implementation.

Secondary Responsibility: This refers to other Council Units and/or external organisations that will play an important role in implementing the action.



Internal Sections and Units

Council	Whole of Council
Comms	Communications
CS	Community Services
E	Edendale Farm
ECG	Environment Coordination Group
EPS	Environment and Planning Services Group
EP	Environmental Planning
ET	EcoTeam
F	Finance
GMT	Group Management Team
OD&	Organisational Development & Risk
ID	Infrastructure Development
IM	Infrastructure Maintenance
IT	Information Technology
LS	Leisure Services
MPBS	Major Projects and Business Services
PBS	Planning and Building Services
SCD	Social and Cultural Development
SP	Strategic Planning
WM	Waste Management

The following abbreviations are for external organisations that will hold some responsibility or will be involved in the implementation of actions.

NAGA	Northern Alliance for Greenhouse Action
NCHS	Nillumbik Community Health Service

1. Strategic

Council is committed to sustainable environmental management. Council will continue partnering with other climate change stakeholders to ensure all opportunities to reduce greenhouse gas emissions are embraced. Council recognises the importance of playing an advocacy role to encourage the Australian and Victorian governments to increase and strengthen their climate change and renewable energy policies and strategies.

This includes advocacy on renewable energy and greenhouse gas emissions targets, and improving access to community energy data.

The majority of actions within the CCAP involve alleviation measures, but how we adapt to a changing climate is just as important. As our climate alters, it is important to assess the potential risk to Council operations and the community, and to have a clear and informed plan for adaptation.

Action	Priority	Responsibility	Secondary responsibility
1.1 Continue to actively support the Northern Alliance for Greenhouse Action (NAGA).	Ongoing	EP	
1.2 Continue ongoing research into world-wide best practice methods local governments have employed to reduce energy use, adopt renewable energy, and adapt to climate change. Aim to replicate methods wherever possible.	Ongoing	EP, NAGA	
1.3 Continue to investigate, trial, and adopt energy efficient technologies and practices, where applicable.	Ongoing	EP, NAGA	
1.4 Continue involvement in the Local Sustainability Accord, including updating Nillumbik's Priority Action Plan.	Ongoing	EP	ECG
1.5 Develop an Adaptation Work Plan (outlined in Section 3). Include: <ul style="list-style-type: none"> • research on national and international adaptation strategies • research on impacts of climate change in Victoria and Nillumbik • identification of key Council sections that have a role in climate change adaptation • identification of any gaps found in current Council structure • steps to reviewing Council policies, strategies and plans to accommodate adaptation strategies • a monitoring structure to ensure implementation. 	High	EP SCD	HR
1.6 Implement actions outlined in the Adaptation Work Plan.	Medium	EP, HR	Council
1.7 Integrate adaptation strategies into relevant Council policies, strategies and plans.	High, ongoing	Council	

2. Industrial and commercial

The 2006 Australian and New Zealand Standard Industrial Classification (ANZSIC) provides a framework for organising data about businesses. Local government is included in the commercial subsector.

Ninety-nine per cent of Victoria's business community is made up of small and medium-sized businesses (less than 100 employees). The greenhouse gas emissions from the industrial and commercial sectors within Nillumbik account for 26.5 per cent of the Shire's greenhouse gas emissions. The majority of these emissions are from stationary energy used at commercial premises.

The Shire of Nillumbik has no heavy industry and few manufacturing plants. Wholesale and retail trade represent the largest contribution to emissions from the

commercial sector, mostly in the form of strip shops rather than larger retail centres. There are challenges in addressing emissions from these businesses as there is a large diversity in the range of businesses, all with differing sources of emissions. These businesses often don't have the time or skills-set to implement energy efficiencies.

Nillumbik Shire Council has previously supported small to medium enterprises in reducing their greenhouse gas emissions through the *Vic 1000 Metro North* program undertaken by *Village Green* during 2007 and 2008.

Future Council-led actions proposed are focussed on capacity building and dissemination of information to support these businesses in progressing such changes.

Action	Priority	Responsibility	Secondary responsibility
2.1 Advocate to the Victorian and Australian governments to: <ul style="list-style-type: none"> increase the mandatory and Victorian renewable energy targets to stimulate investment in renewable technology establish generous 'feed-in tariffs' for renewable energy that is sold back to the electricity grid establish national and state carbon neutral emission reduction targets and strategies provide financial and stakeholder support for Council to access community energy data restructure the Fringe Benefits Tax to encourage less mileage and subsequent fuel use. 	High ongoing	Council	PBS, EP
2.2 Continue to encourage sustainable purchasing of products via the Ecobuy Program. Improve tracking of Council purchasing to strengthen sustainable purchasing processes.	Ongoing	WM	
2.3 Continue to undertake annual monitoring and auditing of Council operations and community resource use, greenhouse emissions and greenhouse reduction actions. Ensure that vehicle fleet emissions are separated into personal and Council use. Work with the Finance Unit to develop a monitoring and reporting system.	Ongoing	EP	F
2.4 Ensure the community has access to, and can give input into CCAP by: <ul style="list-style-type: none"> profiling the strategy and Nillumbik greenhouse indicators on Council's website featuring Council's carbon reduction journey in a local newspaper and Council website. 	High Ongoing	EP	Comms
2.5 Create an annual progress report on the CCAP for Council's Group Management team.	Ongoing	EP	Council
2.6 Review and revise CCAP every four years. Advertise for community input into the review.	Medium	EP	Council
2.7 Include the CCAP framework and relevant actions into the forthcoming management plans and strategies.	High	SP	EP
2.8 Include information on Council facilities greenhouse gas emissions in internal and public reports.	High, ongoing	EP	

Action	Priority	Responsibility	Secondary responsibility
2.9 Continue to use the Revolving Resource Conservation Fund (RRCF) as a framework for greenhouse gas reduction.	2010 ongoing	EP	E
2.10 Develop a policy that any construction or renovation of large Council buildings will: <ul style="list-style-type: none"> • be six star energy-rated and include renewable energy (for residential-style Council buildings) • be six star Green Star and include renewable energy (for commercial buildings, including offices and swimming pools). 	2010	ESP, ECG	LS, ID, MPBS, EP, E
2.11 Apply environmental best practice including greenhouse emission reduction when making decisions about the future of the Civic Centre.	2010 ongoing	MPBS	
2.12 Apply environmental best practice standards to all surplus Council land prior to sale, through contract conditions such as 173 agreements for five star buildings or equivalent, and WSUD requirements.	2010 ongoing	MPBS	EP
2.13 Develop an Information Technology Energy Efficiency Strategy to ensure energy efficiency options are considered for Council technology such as computers and telephone systems.	2010	IT	
2.14 Continue Council's EcoTeam activities to reduce Council staff emissions, including travel, energy use and waste minimisation. Include these activities into induction processes.	2010	ET	EP, E, C, HR, LS, ID
2.15 Develop a code of practice for sustainability which must be followed by all staff and contractors. This code of practice should be included in all tender documents and form part of any contract documents with contractors.	ongoing		
2.16 Develop and implement environmental technical notes and product specifications for all Council assets: road construction and maintenance; lighting; buildings etc. Apply these across Council and to all design briefs, tenders, contracts and maintenance and repairs. Prepare a list of conservation options for various assets that include: <ol style="list-style-type: none"> 1. Identifying asset types and subsets. 2. Identifying sustainability options. 3. Specifying technical requirement options (include required standards for new developments). 4. Include an assessment of greenhouse and financial costs and savings. 	2010	EP	IS, ID, IM
2.17 Continually review any information available on recycled products and specifications for Council construction and renovation projects. Include focus on the greenhouse gas emissions of recycled building materials. Tie this into annual reviews of the technical manual (currently being developed) once they have been tested and approved.	2010 ongoing	EP	ID

Action	Priority	Responsibility	Secondary responsibility
2.18 Continue to reduce the amount of bitumen/concrete products on existing and proposed infrastructure by: <ul style="list-style-type: none"> • reducing road width as per the road and drainage construction Special Charge Scheme • limiting vehicle mass on selected roads which don't need delivery vehicles and service vehicles • using recycled product where appropriate. 	Ongoing	ID	
2.19 Continue to work regionally with the Northern Alliance for Greenhouse Action, ICLEI – Local Governments for Sustainability, Victoria Sustainability Public Lighting Action Group, distributors and other councils on sustainable public lighting.	Ongoing	EP	
2.20 Advocate a review of the Australian Standards for Public Lighting (ASPL) to include more requirements/options for greenhouse gas reduction through the AUSPEC Australian Standards Committee. Review Australian Specification (AUSPEC) once ASPL has been amended.	High	ID	Council
2.21 Complete a Sustainable Public Lighting Action Plan (or similar) to provide strategic direction on local actions to deliver sustainable public lighting including plans to achieve a 70 per cent reduction in streetlighting energy use by 2015 compared to 2006, inline with strategy goal 3. Include: <ul style="list-style-type: none"> • An audit of all Shire public lights and keep asset register up to date when new public lighting is installed e.g. parks, reserves, new subdivisions. • Replacement of Council's existing streetlights with energy efficient alternatives using internal and external funding, where possible. • Investigate ways to turn 50 per cent of streetlights off after midnight (Sun – Thurs) and 2am (Fri – Sat). • Installation of sensor lighting for all existing and new buildings, car parks and reserves. 	High ongoing	EP, ID, IM	
2.22 Investigate the possibility of adding six-metre high light specification to existing subdivision guidelines to reduce the number of streetlights needed to illuminate a street.	High	ID	
2.23 Advocate for VicRoads to install LED lights for all existing and new traffic signals, where appropriate.	High, ongoing	ID	
2.24 Investigate the opportunity to install LED lights for traffic signals that Council is responsible for and implement if deemed feasible.	High, ongoing	ID	
2.25 Continue to select tree species and investigate spacing requirements and light location that achieves the required level of illumination for a street or reserve and reduces the need for lighting, where appropriate.	High, ongoing	IM	ID
2.26 Continue to work with the <i>EcoTeam</i> on minimising Council waste to landfill.	Ongoing	IM	
2.27 Review the implementation of structure plans to ensure targets for consolidation around activity centres are being met.	High, ongoing	SP	
2.28 Specify the use of environmental products and environmental performance targets in future waste management contracts where appropriate.	High	WM	ECG



Council-led Community Actions	Priority	Responsibility	Secondary responsibility
2.29 As part of the development of the Edendale Farm Interpretation, Education and Learning Strategy, investigate how to redesign Council's school education programs to support the Australian Sustainable Schools Initiative (AuSSi) and facilitate this by continuing to work with the Teachers Environment Network (TEN).	High, ongoing	E	
2.30 Assist Nillumbik businesses to develop cooperative marketing to encourage residents to buy local (thereby assisting in the economic, environmental and social sustainability of businesses in the Shire).	High	MPBS	
2.31 Investigate business needs and best approaches to helping businesses to be more sustainable. Linking local businesses with existing opportunities and programs to reduce greenhouse emissions, for example, Grow Me the Money, and state and federal programs. Explore opportunities for local businesses to participate in an awards program for businesses that have reduced their ecological footprint.	High, ongoing	MPBS	EP
2.32 Investigate options for recycling for commercial premises.	High, ongoing	WM	
2.33 Advocate to the Victorian Government for the development of a construction and demolition (C&D) waste recovery program.	High, ongoing	WM	EP
2.34 Investigate the feasibility of facilitating/supporting urban and periurban agriculture programs or similar activities.	Med	EP	E

3. Residential

Residential stationary energy consumption is one of the highest contributors to overall emissions from the Shire (41 per cent). Energy consumption data (electricity and gas) sourced from energy retailers through the Department of Sustainability and Environment (DSE) has indicated that Nillumbik is one of the highest users of electricity per occupied dwelling of any local government area with mains gas connections in Victoria. This results from a significant number of properties not being connected to mains gas, the age of housing stock and higher than average occupancy of houses.

Table 4 outlines household energy use and greenhouse gas emission contribution¹⁰ for an average Victorian dwelling.

The majority of greenhouse gas emissions in the residential sector come from heating, water heating and electrical appliances such as televisions and other entertainment systems. It is interesting to note that in terms of greenhouse gas emissions, appliance use is the highest contributor at 45 per cent, yet in terms of energy use is only 17 per cent of a household.

Table 4: Household Energy Use and GHG emissions contribution¹¹

Household Activity	Energy use % household total	GHG emissions % household
Lighting	3%	9%
Appliance (cooking)	3%	4%
Appliance (fridge/freezer)	4%	12%
Appliance (other)	10%	29%
Water heater	21%	20%
Space heating and cooling	59%	26%

As a result, Nillumbik Shire Council has identified the importance of helping Nillumbik communities reduce their greenhouse gas emissions. Through the implementation of the following Council and Council-led actions, our goal of reduced reliance on fossil fuels can be achieved.

Action	Priority	Responsibility	Secondary responsibility
3.1 As part of the developments of the Edendale Farm Interpretation, Education and Learning Strategy, develop a separate long term plan of action/strategy for delivering the climate change and carbon neutrality message via education and interpretation programs including on-site demonstration projects.	High	E	
3.2 In accordance with the Edendale Farm Master Plan, introduce interactive environmental activities (both auditing and action) in modules for a range of audiences such as interest groups, general community and schools. Modules may comprise of: <ul style="list-style-type: none"> stationary energy use transport energy use (for example Council fuel efficiency and alternative fuel trials) waste home renovator program biodiversity and water sustainable urban design (working with the Strategic Planning Unit). Use the overarching, ongoing program theme/title of CCAP across all education and display projects and communications on greenhouse reduction.	High, ongoing	E	EP

¹⁰ Department of Primary Industries (2008) Proposed Victorian Energy Efficiency Target Regulations – Regulatory Impact Statement (Government of Victoria: Melbourne)

¹¹ *ibid*

Action	Priority	Responsibility	Secondary responsibility
<p>3.3 Where appropriate, through Living & Learning Nillumbik, and other partners run seminars and workshops to raise awareness about sustainability issues within the Shire, including promotion of what Council has achieved in order to lead the community in greenhouse gas reduction activities. Awareness sessions could include:</p> <ul style="list-style-type: none"> • energy and water efficiency measures • information about available rebates i.e. Australian and Victorian government (e.g. Victorian Energy Efficiency Target) • food miles e.g. workshops run by SGA regarding Yummy Yards programs • Promotion of Council ESD programs such as STEPS/SDS, Nillumbik Green Building List. 	High	EP	CS
3.4 Access government funding to improve interpretation and education programs at Edendale Farm.	High, ongoing	E	
3.5 Investigate opportunities for any new Edendale Farm buildings to be energy and water efficient, with demonstration and interpretation of features that contribute to sustainability.	Edendale Farm Masterplan priorities	E	
<p>3.6 Improve site maps, signage, and displays at Edendale Farm by providing a range of information accessible to both children and adults. Signage and displays will include:</p> <ul style="list-style-type: none"> • greenhouse gas emissions of site and community • ways to reduce community greenhouse gas emissions • current sustainability features at Edendale Farm • future sustainability features at Edendale Farm • information on energy efficiencies and water efficient and endemic plants • greenhouse emissions awareness trail • renewable energy. 	Edendale Farm Masterplan priorities	E	
3.7 Provide good effective take-home materials for the community on how to reduce greenhouse gas emissions. Make the materials accessible on Council's website.	High	E	EP
3.8 Support local Action Groups by assisting with promotion of key events and the facilitation of group networks, wherever possible.	Ongoing	EP	
3.9 Support the Practically Green Festival through both funding and staff allocation.	Ongoing	EP	Comms
3.10 Establish the Nillumbik AAA Building accreditation program for exceptional green residential and commercial buildings using STEPS and SDS as a framework. List accredited buildings on Council's website and database. Provide open day tours of buildings by arrangement with owners.	High	PBS	EP, ID
3.11 Continue to advocate to the Victorian Government for the incremental adoption of compulsory (rather than voluntary) environmental building standards for new buildings and renovations.	High, ongoing	Council	PBS, EP
3.12 Investigate options to extend structure planning to all lower order centres (neighbourhood centres) to ensure sustainable urban design outcomes are achieved at all levels in the Shire.	High	SP	



Action	Priority	Responsibility	Secondary responsibility
3.13 Include all actions from Climate Change Action Plan in any review of the Waste Minimisation and Management Strategy.	Ongoing	WM	
3.14 Continue GRO 3-bin kerbside domestic waste and recycling to divert organics from landfill and pursue the following: <ul style="list-style-type: none"> • Continue quarterly reporting system on performance of waste and recycling (Interplan). • Continue to use recycled materials for bins. • Investigate the options of bin rationalisation as waste sorting technology evolves and is able to separate unsegregated waste into multiple streams at a waste management facility (reducing waste travel emissions). 	Ongoing	WM	

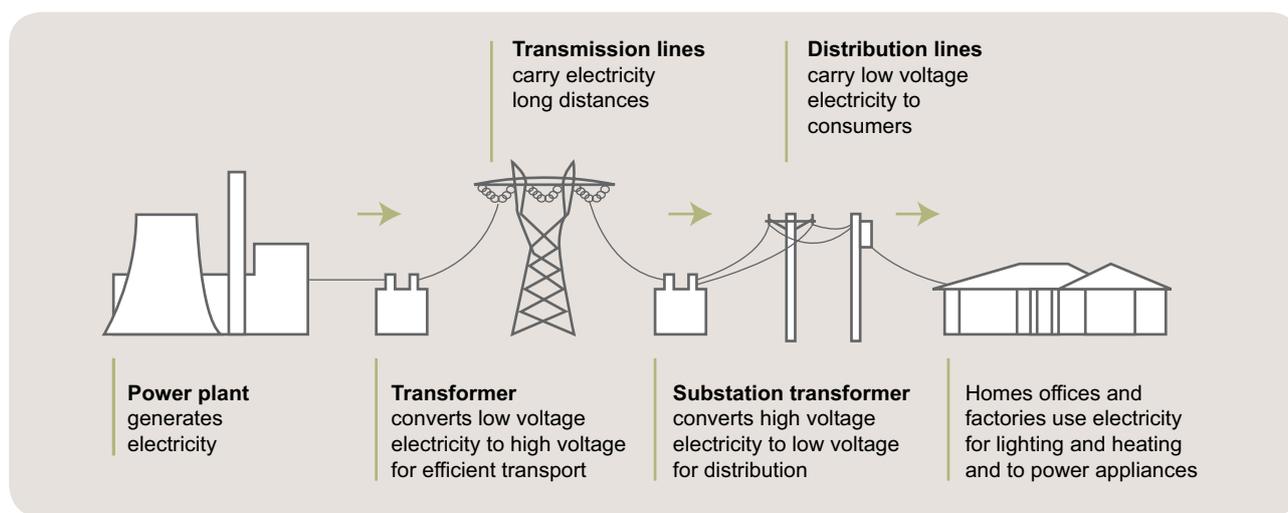
Council-led Community Actions	Priority	Responsibility	Secondary responsibility
3.15 Facilitate an opportunity for bulk purchasing of sustainable technologies throughout the community e.g. solar hot water system purchase program with Manningham City Council.	High	EP	
3.16 Continue to educate the community on how to minimise and manage waste, and purchase sustainable products via the WasteWise Program, an overarching program that includes a number of initiatives such as: <ul style="list-style-type: none"> • ResourceSmart • environmentally-friendly nappy program • plastic bag free town (Hurstbridge) • domestic GRO kerbside waste and recycling education. 	Ongoing	WM	EP
3.17 Continue to provide a free biannual green waste drop-off.	Ongoing	WM	
3.18 Work with other municipalities on Carbon Rationing Action Groups (CRAG) or similar programs.	High, ongoing	EP	

4. Decarbonising the energy supply

The majority of Victoria's energy supply is supplied through brown coal fired power generators (approximately 70 per cent of installed generation). Brown coal is the most greenhouse intense form of energy generation, with 1.2 tonnes of CO₂-e per MWh, compared to 0.75 tonnes of CO₂-e per MWh for NSW and Queensland black coal.

In addition to the greenhouse gas intensity of emissions associated with brown coal generation, a percentage of energy is lost to the network through the generation of heat during transmission from locations such as the La Trobe Valley and the subsequent distribution to the Shire of Nillumbik (refer to figure2). Typical transmission losses vary according to geographic location and other factors, however, typical losses are approximately 1.5 per cent and distribution losses 3.5 per cent.

Figure 2 Traditional Electricity Supply¹²



The greenhouse gas intensity of the Victorian stationary energy supply is a significant barrier to reducing emissions to low levels for both community and Council. While demand reduction and energy efficiency measures can reduce consumption energy, underlying pressures from an increasing population may, to a degree, extinguish the effect of these measures without a strategy that addresses the need to decarbonise the energy supply.

Essentially, a strategy to decarbonise the energy supply requires two approaches. One is to reduce the emissions from brown coal generation through various technologies, which is largely dependent on the decisions of the owners and operators of the generators, with little opportunity for Nillumbik Shire Council and its residents to have an influence. The second approach is the transformation of the energy supply to less carbon intensive forms, through increasing the level of low carbon and renewable energy within our Shire. This approach is where Council has decided to focus its actions.

The facilitation of low emission and renewable technologies is divided into two categories; those established within the built form i.e. as part of a building structure or within its basement, and stand alone

generation that is not part of a specific built structure. There are a number of technologies that may have the potential for application within Nillumbik including:

- solar photovoltaic e.g. grid connected northerly roof mounted PV, grid connected PV mounted on facades and shade structures and an array of solar concentrating PV
- wind e.g. vertical axis wind turbine, horizontal axis wind turbine
- cogeneration e.g. Biomass, Trigeration.

Solar photovoltaic, wind and cogeneration are all technologies that can be applied as part of the built form or as stand alone generators. Wind generation has been included as an option, but due to low reliability of wind within the Shire, wind power has limited application.

¹² Australian Energy Market Operator Limited (AEMO) (2009) *An introduction to Australia's National Electricity Market*, July 2009. Accessed 19 August 2009 from <http://www.aemo.com.au/corporate>



Action	Priority	Responsibility	Secondary responsibility
<p>4.1 Develop a Renewable Energy and Distributed Generation Uptake Plan – for both Council and the community with specific targets and indicators (taking advantage of external funding wherever possible). Include actions to achieve the CCAP Strategic Goals:</p> <ul style="list-style-type: none"> • Renewable energy installations on five local schools by 2015 (25 per cent of schools in area). • Renewable energy installations on 10 Council community facilities starting 2011. • Achieve 50 new developments by 2015 committed to the STEPS/SDS sustainable development program, including those that commenced in 2008. • Investigate options for aggregated local energy generation cooperatives e.g. solar panels on leisure centres, co-generation opportunities and wind farms. 	High	EP	
<p>4.2 Promote businesses who supply renewable energy (preferably local), by using their services and profiling them via Council communication avenues.</p>	High	EP	

5. Transport

Nillumbik Shire is served by a metropolitan train line which runs from the Melbourne CBD to Hurstbridge, and 15 metropolitan bus routes. There are four railway stations in the Shire – Eltham, Diamond Creek, Wattle Glen and Hurstbridge. The transport emissions calculated for the whole of Nillumbik comprise of non-freight road, freight road, rail freight and public transport emissions. Transport emissions account for 28 per cent of overall emissions from the Shire. Of these transport emissions, 82 per cent can be attributed to non-freight road transport, essentially passenger vehicles.

From 2006 census figures¹³, Nillumbik comprises a community that is highly dependent on the passenger vehicle as their only mode of transport. Opportunities

exist to minimise the emissions associated with transport by reducing the reliance on coal-based electricity for public transport and through incentives to encourage drivers to adopt more fuel efficient vehicles, such as hybrids and electric vehicles.

From a Council operations perspective, investigations into alternate fuel sources for pool vehicles and plant (e.g. tractors) and improving working from home options for employees will form part of our reduction strategy. From a whole community perspective advocating for more sustainable transport networks and behaviours and supporting the home business networks will be the focus to reduce our reliance on fossil-fuels in the transport sector.

Action	Priority	Responsibility	Secondary responsibility
5.1 Advocate to the Victorian and Australian governments, or work as a region to install a range of renewable fuel stations: <ul style="list-style-type: none"> • electric vehicle recharge stations • alternative fuel sources, starting with Operations Centre provision. 	High, ongoing	EP, NAGA, IM	
5.2 Investigate and pursue emerging technologies for fuels and vehicles, where appropriate by: <ul style="list-style-type: none"> • continuing trials of alternative fuel vehicles for: <ul style="list-style-type: none"> o passenger cars o waste trucks. • working with fuel suppliers to provide local alternative fuel sources (when alternative fuels meet Council needs) • keeping up-to-date with trials made by other councils and businesses. 	High, ongoing	IM	EP
5.3 Establish project support to develop a system to report on vehicle fleet emissions, greenhouse actions, and life cycle costs: <ul style="list-style-type: none"> • Match data of fleet composition with fuel usage. • Private versus Council vehicle usage modelling. 	High	IM	EP
5.4 Continue to favour fuel efficient cars and to apply an environmental levy for less fuel efficient passenger cars within Council's Fleet Policy.	High, ongoing	IM	
5.5 Annually review Council's vehicle needs with the aim of reducing the need for staff to utilise the Council fleet for work commitments e.g. by encouraging public transport, car pooling.	High, ongoing	IM	HR
5.6 Investigate the potential for reducing the greenhouse gas emissions of waste trucks by: <ul style="list-style-type: none"> • rescheduling rubbish collection times • advocacy to reduce packaging • promotion of home composting. 	High, ongoing	IM	

¹³ Sourced from Victorian Transport's Statistics portal on 20 August 2009 (www.transport.vic.gov.au/statistics). 76% of occupied dwellings house two or more vehicles. 66% of residents only use a car to drive to work. 55% of the working population travel to work beyond neighbouring LGAs.

Action	Priority	Responsibility	Secondary responsibility
5.7 Create onsite, overnight vehicle storage for Council fleet passenger vehicles, to provide flexibility of travel behaviour for staff.	High	IM	MPBS, HR
5.8 Investigate options to provide parking spaces near work sites for Operation Centre vehicles, particularly tractors.	High	IM	
5.9 Investigate the possibility of purchasing Council fleet bikes and associated equipment (helmets, locks, vests).	High	EP	
5.10 Continue to support work from home options in the Enterprise Bargaining Agreement to reduce unnecessary travel.	High	HR	
5.11 Investigate the appointment of a Sustainable Transport Officer (STO) to improve the sustainability of staff and community travel behaviour. Responsibilities would include, but not be limited to the following: <ul style="list-style-type: none"> Developing a strategy that enables and encourages staff to pursue sustainable travel options. Coordinate a sustainable transport alliance involving Nillumbik Community Health Service and Council to support and accelerate sustainable community travel behaviour. Provide biannual Council briefings on the progress of sustainable transport. Work with at least 10 local schools on TravelSmart programs by 2012, dependent on resource allocation. Ensure Council adopts policy to reference public transport options on information for Council events. 	High, ongoing	SCD & ID	NCHS, ID, SP, PBS, EP

Council-led community actions	Priority	Responsibility	Secondary responsibility
5.12 Advocate for sustainable transport provision and behaviour by: <ul style="list-style-type: none"> continuing participation in the Metropolitan Transport Forum continuing involvement in TravelSmart events. 	High, ongoing	ID	
5.13 Continue partnership with Transport Connections three-year initiative Getting Involved in Getting Around (2007-2009) (encourage more efficient use of current transport options for the community in remote areas of the Shire).	Ongoing	ID	
5.14 Continue the implementation of the Walking School Bus, pending continued funding from external parties and outcomes of feasibility studies with the aim of establishing and sustaining the Walking School Bus at 12 local schools by 2015.	Ongoing	ID	
5.15 Lobby the Victorian Government to improve public transport integration in Nillumbik, using the Nillumbik Integrated Transport Strategy to identify priorities. Priorities currently include but are not restricted to: <ul style="list-style-type: none"> Eltham Station and Diamond Creek Station better local bus connections to stations more trains on Hurstbridge line Smart Bus Program. 	High, ongoing	ID	

Action	Priority	Responsibility	Secondary responsibility
5.16 Continue to lobby the Victorian Government to improve the access and safety of bus stops through improved design or boundaries.	High, ongoing	ID	
5.17 Continue efforts to obtain grant funding for sustainable transport infrastructure (such as the Victorian Local Area Access Program).	High, ongoing	ID	
5.18 Continue to implement the Nillumbik Integrated Transport Strategy, when complete to support sustainable travel behaviour.	High, ongoing	ID	
5.19 Incorporate the Nillumbik Integrated Transport Strategy (NITS) and North Eastern Integrated Transport Strategy (NEITS) transport priorities for the surrounding transport network in Council Structure Plans for Activity Centres.	High, ongoing	SP	ID, MPBS
5.20 Continue to improve public transport facilities such as bus shelters and disability access.	High, ongoing	ID	
5.21 Continue to implement the Footpath Strategy with its regular program of expansion and upgrades. Include the following steps in the Footpath Strategy in order to prioritise more active and dense places before low density places in the Shire: <ul style="list-style-type: none"> • Conduct a pedestrian access study called a 'pedshed' within two kilometres of all Activity Centres, and 900 metres of all railway stations and major bus interchanges, to identify where links are needed. • Improve links where needed by constructing new footpaths and implementing a range of traffic calming methods including: <ul style="list-style-type: none"> o reduction of traffic speed limits in selected areas o modification of traffic light operations to favour pedestrians o expand kerb outstands and central median islands. 	High, ongoing	ID	LS
5.22 Continue advocacy and reports to VicRoads seeking improvement of bicycle networks.	Ongoing	ID	LS
5.23 Continue to maintain and improve the principal bicycle network and other cycling networks in partnership with VicRoads and other councils.	Ongoing	ID	
5.24 Continue advocacy to VicRoads to include priority lanes wherever possible for high-occupancy vehicles and public transport vehicles.	High, ongoing	ID	
5.25 Continue working with Bicycle Victoria, Metro and the Department of Transport to provide bicycle facilities such as: <ul style="list-style-type: none"> • bicycle docking stations • lockable bicycle containers at train stations • bicycle trails. 	Ongoing	LS	ID
5.26 Continue to maintain and expand off-road bicycle paths.	Ongoing	LS	ID



Action	Priority	Responsibility	Secondary responsibility
5.27 Investigate the use of parking precinct plans for the Activity Centres and for smaller centres. In doing so, link to the provision of sustainable transport and Park 'n' Ride parking facilities.	High	SP	
5.28 Continue to implement the following Transit Orientated Development (TOD) objectives for all Structure Plans: <ul style="list-style-type: none"> • walkability • higher density • access to public transport • access to daily needs (convenience shopping) • increase local employment within activity centres. 	Ongoing	SP	
5.29 Continue to increase opportunities for home-based and local employment by continuing to implement strategies outlined in Economic Development (ED) Strategy Goals 1-5.	Ongoing	MPBS	
5.30 Incorporate actions to emerge from the forthcoming Green Wedge Management Plan which relate to greenhouse gas reduction into the 2012 review of the Climate Change Action Plan. Include a focus on generation of local food to reduce the use of fossil fuel in food transport i.e. food miles.	High, ongoing	SP	
5.31 Provide farmers' markets for locally grown and organic produce, seedlings and seeds to decrease transport of both goods and consumers.	High, ongoing	E	

6. Residual emissions

Through this plan, Council will either avoid or reduce greenhouse gas emissions, or invest in renewable energy sources, but accepts that for Council operations there will be residual emissions. In order to achieve the best possible outcome for reducing Council's carbon footprint, Council will need a strategy to offset residual greenhouse gas emissions.

Carbon offsets (produced in CO₂-e units) are a generally accepted means of reducing emissions and are carried out by a third party. Purchasing carbon offsets is an expense to Council that needs to be undertaken with high standards and transparency. Any offsets purchased need to be undertaken using an accepted standard such as the Clean Development Mechanism (CDM). The CDM was one of three flexible mechanisms created under the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC). Offsets using CDM must meet the following criteria:

1. The project must be additional.
2. The project must be permanent.
3. The emission reductions must be able to be measured.

4. Project information and credit ownership must be transparent.
5. The emission reductions must be independently verified.

Council may be restricted in the type of offsets available if an emissions trading scheme is implemented. Purchase of offsets by Council will be undertaken to stimulate the renewable energy sector, in addition to a reduced emissions target.

Residual emissions could also be offset through the development or support of biosequestration (capture and storage of carbon dioxide by an increased volume or quality of photosynthesis) projects within the Shire. Studies into the feasibility of biosequestration projects within the Shire will be undertaken taking into consideration land values; feasibility to produce credits; environmental and ecological considerations, such as water requirements; the ability to support and develop biodiversity; compatibility with surrounding land uses, and the risks associated with bushfire safety.

Action	Priority	Responsibility	Secondary responsibility
6.1 Undertake the following: <ul style="list-style-type: none"> • Manage all CCAP accredited offset goals. • Investigate options to establish a Council-run, or regionally run carbon trading/GreenPower™ purchase program to support CCAP. • Develop a community accredited offset purchasing scheme, if deemed feasible. 	High, ongoing	EP, IS	GMT
6.2 Continue to encourage the community to support the retention of vegetation in the Shire and encourage expansion of vegetation on privately-owned land where appropriate and where not compromising bushfire safety.	Ongoing	PBS	EP, EW
6.3 Initiate the following principles into strategic documents: <ul style="list-style-type: none"> • conservation and enhancement of vegetation on public and private land (carbon sinks) • carbon sinks as a key principle in all strategies relating to vegetation • local renewable energy and technology generation • education on exemplary land management. 	Medium	SP	EP



Feedback and information

Nillumbik Shire Council welcomes your feedback. If you have any questions or comments please contact the Environmental Planning Unit on 9433 3111.

For more information about climate change science see:

www.greenhouse.gov.au/science/qa.index.html

www.ipcc.ch

www.metoffice.gov.uk/research/hadleycentre/ .

For information about Council, community and individual climate change actions see the Nillumbik climate change web pages which are accessible via:

www.nillumbik.vic.gov.au > Environment > Energy conservation.



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