

Yarra City Council

Carbon Neutral Action Plan

2010-2015

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1 Executive Summary

The impacts of climate change are being felt now and likely to become more severe. Mitigation action now reduces the cost and effort in adapting climatic changes and improves future environmental, social, health, and economic outcomes. This Carbon Neutral Action Plan provides a strategic approach whilst also setting the key actions and implementation strategy for Council to reach its endorsed greenhouse reduction targets, to:

- Become a Carbon Neutral organisation by 2012;
- Reduce Council energy use by 30% by 2012, 50% by 2015;
- Generate Renewable Energy to meet 10% of needs by 2012, 25% by 2015;
- Set environmental performance targets for all council owned and operated buildings and infrastructure; and
- Set processes to encourage and facilitate maximum environmental performance in all classes of buildings.

This Plan builds on other adopted strategies/plans including the 2004 and 2006 Greenhouse Action Plan (refer to Appendix 2), and links to significant community consultation and actions stemming from the Yarra Environment Strategy 2008 (refer to Figure 1).

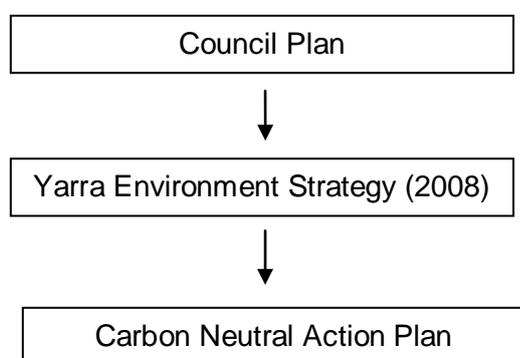


Figure 1: How the Carbon Neutral Action Plan fits in with other Council documents.

Council's total greenhouse footprint in 2008/09 was 16,136 tonnes CO₂ equivalent (tCO₂). Electricity is the most greenhouse intensive fuel source, with buildings (esp. Town Halls and Leisure Centre's) and Streetlights being the highest greenhouse producing areas. Whilst this is a significant footprint, This Plan (subject to obtaining funding and changes to our current practices) provides direction for Council to potentially achieve its targets. This will require greenhouse actions set out in this Plan to be driven across all levels and incorporated into key roles at Council. In total, this Plan details 57 key actions required to meet Council targets, including the process for implementation, responsible staff, budget needs, suggested timeline for implementation (subject to Council approving funding) and benefits. Funding is not being requested as part of this Plan but will be requested as part of Council's normal process of developing Council's future budgets particularly the Capital Works Program.

2 Climate Change and the City of Yarra

Climate change is real, impacts will be felt locally, and Yarra City Council is committed to playing its part in a cumulative world-wide effort to limit greenhouse gas emissions and their dangerous consequences for our environment, economy and society. This section briefly highlights the scientific and political context for action.

2.1 The Greenhouse Effect – science, impacts, and adaptation

The Greenhouse Effect is the natural climatic system that keeps the earth at a habitable temperature. The ‘Enhanced’ or ‘Human Induced’ Greenhouse Effect is the increased insulation of the earth as a result of a significant increase in greenhouse gases in the atmosphere from human activities. This is leading to an overall increase in global temperatures and disruption of weather patterns referred to as climate change. Actions to reduce the release of greenhouse gasses or absorb them on earth to prevent them reaching the atmosphere will reduce the severity of climate change.

With climate change widely accepted, scientists debating the severity of impacts depending on parts per million (PPM) of these greenhouse gasses in the atmosphere, and the reduction in associated emissions needed to avert ‘dangerous’ climate change.

Locally predicted changes for 2070 include increases in average temperatures of between 1.3 and 2.6°C (Melbourne is expected to have a climate similar to Adelaide’s by 2030¹) as well as:

- More severe, frequent and intense heatwaves², with an increased number of days over 35°C from 9 currently to 12 - 15 by 2070;
- More severe dry spells leading to declines in waterway flow of up to 50%³; yet an increase in the frequency and intensity of extreme rainfall events and flood potential; and
- A rise in the sea level of Port Phillip Bay with the potential to flood low lying areas especially during storms.

These changes are already occurring, with the 12 months to May 2010 being the hottest global temperatures on record⁴ as well as the hottest for Victoria⁵. Climate change will directly affect Yarra’s constituents in a variety of negative ways including:

- Financial (e.g. increased utility costs, natural disasters, costs to deal with impacts),
- Built environment (e.g. shifting soils in drought, increased storm and floods events),
- Environment (e.g. drought, flood, loss of species, heat stress),
- Social (e.g. Population shifts, increased energy costs),
- Health (especially in conjunction with heat waves and spreading of disease).

While efforts to adapt to climate change are being undertaken at Council, this Plan is focused on the reduction of greenhouse gas emissions.

¹ An average rise of 1°C and a 10-15% drop in rainfall (Bureau of Meteorology, Australia)

² For a detailed report on the impact of heatwaves see *Beat the Heat: City of Yarra Heatwave Adaptation Project Report*, City of Yarra, 2008.

³ www.dse.vic.gov.au, 2008

⁴ <http://climateprogress.org/2010/05/16/nasa-easily-the-hottest-january-and-hottest-jan-april-in-temperature-record/>

⁵ http://www.bom.gov.au/announcements/media_releases/ho/20100503.shtml

2.2 The Context for Action

As climate change has become accepted there has been a concerted move to targets and action. Emissions reduction has become a global effort with strategies and policies at all levels, from the United Nations to government at all levels, business, local communities, and individuals. Debate is still surrounding the targets governments should set in line with ability to meet targets in a financially responsible way and what is an acceptable level climatic change (and therefore the acceptable level to which humans can continue to pollute).

In October 2006 the Stern Report (written by Sir Nicholas Stern - head of the British Government Economic Service and former head of the World Bank), demonstrated that the costs of stabilising the climate are significant but manageable while to delay would be dangerous and increasingly more costly. *An investment of 1% of global gross domestic product (GDP) per year is required to avoid the worst effects of climate change. Failure to do so could risk having global GDP up to 20% lower than it otherwise would be*⁶.

In 2008, economist Professor Ross Garnaut released a report for the Australian Government showing significant future costs to the Australian economy from climate change and the economic imperative for early action. In 2009 the Australian Government proposed an emissions trading scheme (Carbon Pollution Reduction Scheme (CPRS)) including reduction goals by 2020 and an emissions reduction target of 60% of 2000 levels by 2050. Under the proposed CPRS the Municipal Association of Victoria suggested costs to Yarra Council in the order of \$460,000 per year, plus a doubling of the costs of waste collection (at a 'Carbon Price' of \$40 per tonne)⁷. There seems to be little doubt a price will be placed on carbon emissions in the future, however the proposed CPRS legislation is in a state of political flux creating uncertainty over the scheme design, and what and when the price signal will be⁸.

The Victorian State Government has set greenhouse reduction targets, developed an *Energy Future Statement*, and is in the process of developing a climate change green paper for Victoria. The paper looks at both mitigation and adaptive responses. There are also many actions that the State Government is undertaking to reduce community emissions and many ways that Council can support and improve the roll out of these actions. These include programs for businesses, community groups, homeowners, renters, the socially disadvantaged and the elderly.

Local Governments across Australia and internationally have also been especially active in greenhouse action for at least a decade, being uniquely placed to work with their local community and to provide leadership through reductions in Council operations.

Yarra City Council has a strong commitment to environmental sustainability and to reducing greenhouse gas emissions. This CNAP is the third Greenhouse Action Plan following the first in 2004 and a review in 2006. The original emissions reduction target to reduce Council emissions by 25% by 2010 has now been achieved - a year ahead of schedule. In the Yarra Environment Strategy (2008) this target was increased for Council to become Carbon Neutral by 2012, with a 30% reduction in greenhouse gas emission and 10% of energy from local renewable generation (refer to section 5.4). Council has also set the goal to become a Carbon Neutral Municipality by 2020, with existing community actions summarised in appendix 3.

To become carbon neutral Council will need to reduce emissions to the lowest level possible and offset the rest via purchase of renewable electricity, offsets and investment in electricity generation. Therefore, early investment in energy efficiency will save money on utility and offset expenditure to Council, with many asset decisions having an environmental and financial payback of the life of the asset.

⁶ www.adb.org/documents/books/economics-climate-change.../Chapter01.pdf

⁷ MAV Report - Financial Implications of Carbon Emissions Trading on Victorian Councils: May 2009

⁸ <http://www.new.dpi.vic.gov.au/energy-future>

2.2.1 Adaptive Assets policy

In response to the above imperative, Council adopted the Adaptive Assets program (in December 2007) to enable early investment in energy efficiency and deliver long term environmentally and financially positive outcomes. This program has accelerated Council action but is due for review.

The principles of the Yarra Council Adaptive Assets program as endorsed by Council are:

- (a) Any action that has a less than 10 year payback (based on expected future utility price rises and Greenpower purchases) will be implemented as soon as possible. These actions will be funded through loans, as they will be repaid by energy savings over the period of the loan and then be financially positive;*
- (b) Any action with a greater than 10 year payback will be proposed and actioned through the capital works planning process;*
- (c) Actions to be funded through this project will include (but not be limited to):*
 - (i) retrofits of Council assets (such as buildings and streetlights);*
 - (ii) additional sustainability component's of new council buildings; and*
 - (iii) investment in the generation of renewable energy.*

3 Greenhouse Gas Emissions from Yarra City Council

3.1 Greenhouse Emissions

This section provides an analysis of Council’s greenhouse gas emissions, looking at total emissions as well as analysing trends. Council has a significant greenhouse footprint of 8,189 tCO₂ (2008/09) reductions from GreenPower and Offsets are taken into consideration. The total Council carbon footprint (excluding GreenPower and offsets) in 2008/09 was 16,136 t ‘equivalent’ CO₂. This represents a decrease in total emissions of over 50%, but an ‘equivalent’ emissions reduction of just 684 tCO₂ emissions since the 2000/01 base year. Figure 2 shows that most emissions at Yarra are generated from the sources of buildings and streetlights, whilst figure 3 shows three leisure centre’s and three town halls represent the largest source of emissions from buildings.

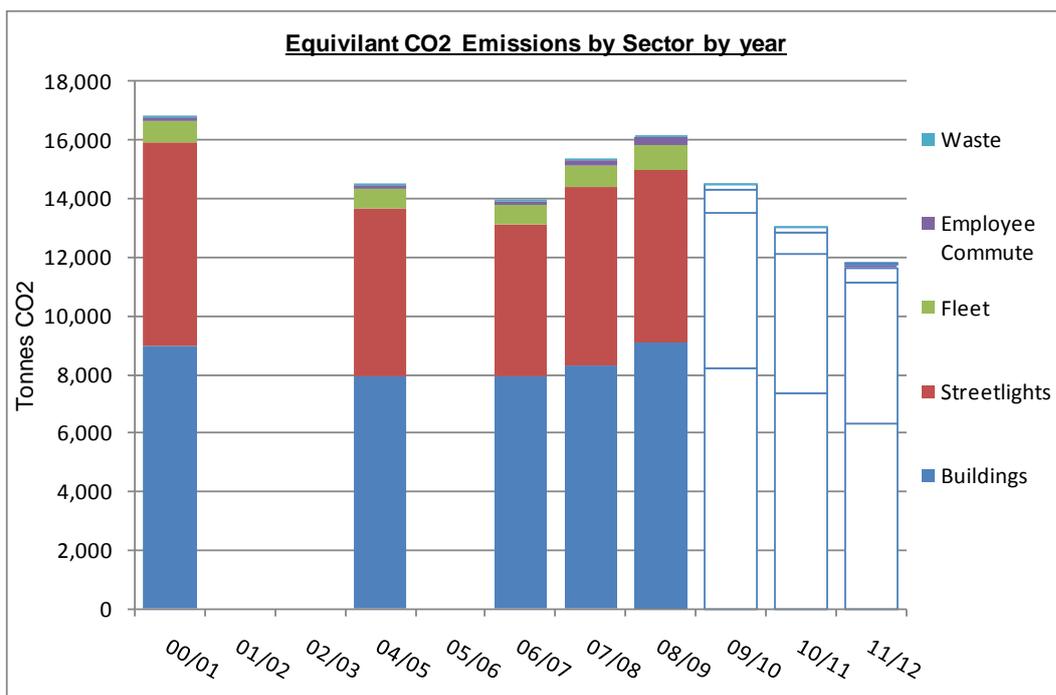


Figure 2: CO₂ emissions by Emissions Sector across Council – 2000/1 to 2008/09 (prior to emissions reduction from GreenPower and offsets). Outlined profiles indicate trend required to meet the 2012 30% reduction target.

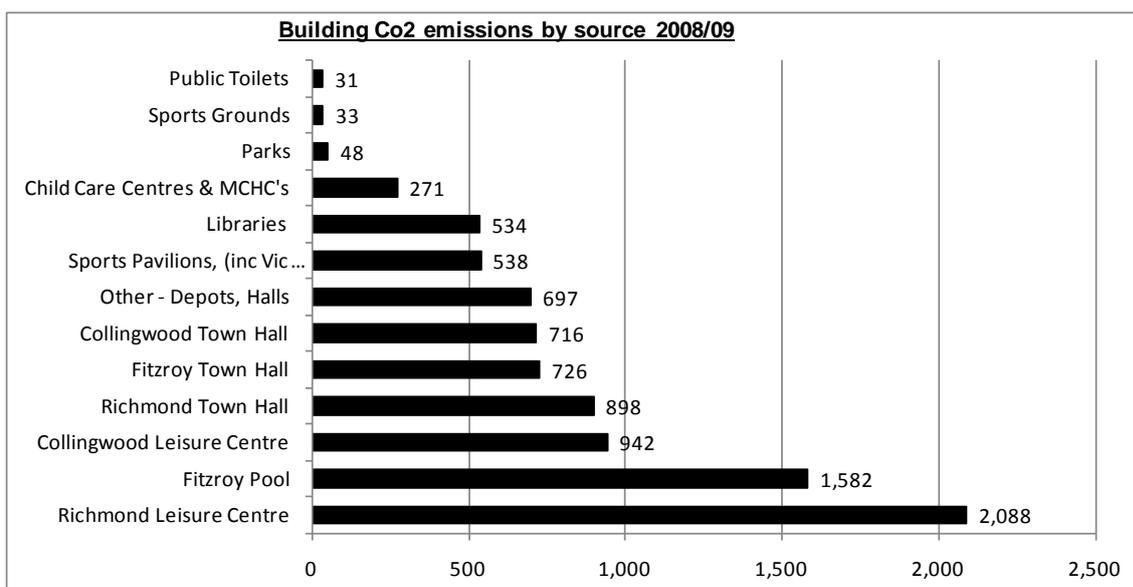


Figure 3: Building CO₂ emissions by source for 2008/09 (prior to emissions reduction from GreenPower and offsets)

While this reduction in greenhouse gas emissions since the base year may seem modest, it represents a profound shift against increasing population, services, and community service

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standards. For example, since 2000/01 there has been a 49% increase in Council staff numbers and patronage at Council's Leisure Centre's by almost 35% since 2005. For example the opening of the Fitzroy Town Hall and the Fitzroy Swimming Pool over winter represents 1,300 tonnes additional CO₂ emissions.

3.2 Key Greenhouse Reduction Actions

Council has taken many actions to reduce greenhouse gas emissions since the first Greenhouse Action Plan was endorsed in 2004. Quantified emissions reductions achieved to 2008/09 are over 10,000 tonnes CO₂ (including Greenpower and offsets), however many more actions cannot be confidently calculated and therefore are not included in this tally. Steps by Council to collect better data to target actions and assess value of actions include the employment of a Greenhouse Accounting Officer, and better tracking and reporting on Utility Bills from *Utility Tracker* software and *Webmetering* for Council's 8 largest sites. Key Council actions have included:

- Town halls: Efficient lighting, installation of loft insulation at RTH and FTH, and upgrade of the air-conditioning system at Fitzroy Town Hall providing greater system control including a 'deadband' temperature range so the mechanical heating and cooling is not always running to achieve a fixed temperature setting. Installation of Voltage Reduction Unit at Richmond Town Hall;
- Leisure Centres: Energy Audits and installation of low flow tapware, and showerheads to reduce hot water use, and variable speed drives at all Leisure Centres, and works at Richmond Recreation Centre close the upper roof that was previously permanently open, installation of a pool blanket, and Voltage Reduction unit;
- Other Buildings: Solar electricity (PV) panels at 13 sites (subsidised by government grants), Solar Hot Water and efficient Heat Pump systems at 5 sites, Energy Audits of 16 sites with lighting and other retrofits at 5 of these to reduce energy and improve natural thermal comfort, and major retrofit works at Holden Street Neighbourhood House (subsidised by government grants) turning this into a community demonstration facility.
- Information Services: Actions to put computers and other devices into 'sleep' mode when not in use;
- Waste: Introduction of a waste 'split bin system' to increase recycling levels and allow for composting at the Fitzroy and Richmond Town Hall's.
- Fleet: Downsizing of vehicle engine size and numbers, trial of hybrid vehicles, and the use of staff bikes and electric bikes to reduce some short vehicle trips.
- Offsets: Purchase of 65% of all electricity from accredited GreenPower and accredited offsets for other emission sources in 2009/10.

4 Achieving Council's Greenhouse Targets

In the 2004 Greenhouse Action Plan Council set the goal to reduce Council's own emissions by 25% by 2010. Section 2 showed that this was achieved ahead of time in 2008/09 (52%) – largely through the purchase of Greenpower. Further corporate greenhouse emissions targets were set in the Yarra Environment Strategy (2008), as can be seen in Table 1. This section investigates each of the targets, a translation of what the achievement would mean, and details the actions needed for targets to be achieved.

Table 1: Council greenhouse targets, and a translation of what achievement looks like.

#	Target	Baseline	2012 Target	2015 Target
1	Become a Carbon Neutral organization	16,820 tCO ₂	0t CO ₂	0tCO ₂
2	Reduce Council energy use by 30% by 2012	16,820 tCO ₂	11,774 tCO ₂ (5,046 tCO ₂ reduction)	
3	Reduce Council energy use by 50% by 2015	16,820 tCO ₂		8,410 tCO ₂ (8,410 tCO ₂ reduction)
4	Generate Renewable Energy for 10% of needs by 2012	11,169 tCO ₂	1,117 tCO ₂ generation	
5	Generate Renewable Energy for 25% of needs by 2015	7,978 tCO ₂		1,995 tCO ₂ generation
6	Establish strategic process and targets for ESD incorporation and improvements for all Council buildings and infrastructure by 2012		Establish and implement	
6*	Processes to encourage and facilitate maximum environmental performance in all classes of buildings		Processes established	

Assumptions used in calculating potential to achieve Council targets

- Cost, savings, and approximate CO₂ reductions are based on best estimates available at time of writing, from key consultant reports and Yarra specific information sources (detailed in Attachment 1), and from Council staff experience and information gathered from across local government.
- Payback periods have been estimated from the above information sources and knowledge, and aim to be as accurate as possible in accounting for all up-front costs and potential savings.
- Reductions from existing Council actions have been included in the calculations.
- Actions outside Council control, such as state-wide electricity becoming more efficient, will occur and should aid in supporting emissions reduction irrespective of Council action. The value of this efficiency cannot be confidently ascribed, and as such has not been provided. Council will monitor this on an annual basis.
- Whilst Council will aim to reduce impacts from all actions, some activities involving Council could increase emissions. The value of this efficiency cannot be confidently ascribed, and as such has not been provided. Council will monitor this on an annual basis.

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- Calculation of costs, paybacks, and savings from solar PV is variable, largely due to the design of the State Government Premium Solar Feed in Tariff (FiT)⁹, costs of systems, and the value of government rebates. The FiT offers a guaranteed credit of at least 60 cents per kilowatt hour (currently \$0.68 for Council) for excess electricity fed back into the grid. Different sites will contribute differing percentages of total production to the grid, largely based on site use and PV array size, vastly influencing paybacks as detailed in Table 2. Mid-range values have been used to calculate the actions in this Plan and potential to achieve Council targets.

System	Cost	CO ₂	\$ Savings 0% FiT	Savings 70% FiT	Avg Savings (35% FiT for PV)	Avg Payback (yrs) 35% FiT	Avg. payback – with 50% rebate
5KW PV	\$25K	7t	\$1424	\$3649	\$2394	10.4	5.2
Solar Hot Water: Gas boost (replace elect.)	\$8K	6t	NA	NA	\$2000	4	
Solar Hot Water: Gas boost (gas originally)	\$7K	4t	NA	NA	\$1000	7	
Solar Hot Water: Heat Pump	\$5K	3t	NA	NA	\$800	6.25	

Table 2: Costs and paybacks for small scale renewable energy. Assumptions: Peak electricity (inc. GreenPower costs 0.23c). Feed-in-Tariff (FiT) = 0.68c. 5KW elect production = 6169 kWh p/a (1kW producing avg. 3.38 kWh p/d)

4.1 Target 1: Carbon Neutrality by 2012

Through existing actions and those outlined in this plan the target for Council to become carbon neutral by 2012 is on track (refer to figure 5). Achieving carbon neutrality will have substantial benefits for the whole community and will position Council as a leading sustainable organisation. The methodology used in this plan and future inventories follows the methodology from the Federal Government’s National Carbon Offsetting Standard (<http://www.climatechange.gov.au/government/initiatives/carbon-offset.aspx>).

⁹ Source: <http://new.dpi.vic.gov.au/energy/energy-policy/greenhouse-challenge/feed-in-tariffs/premium-feed-in-tariff-for-solar>

Translation of this target:

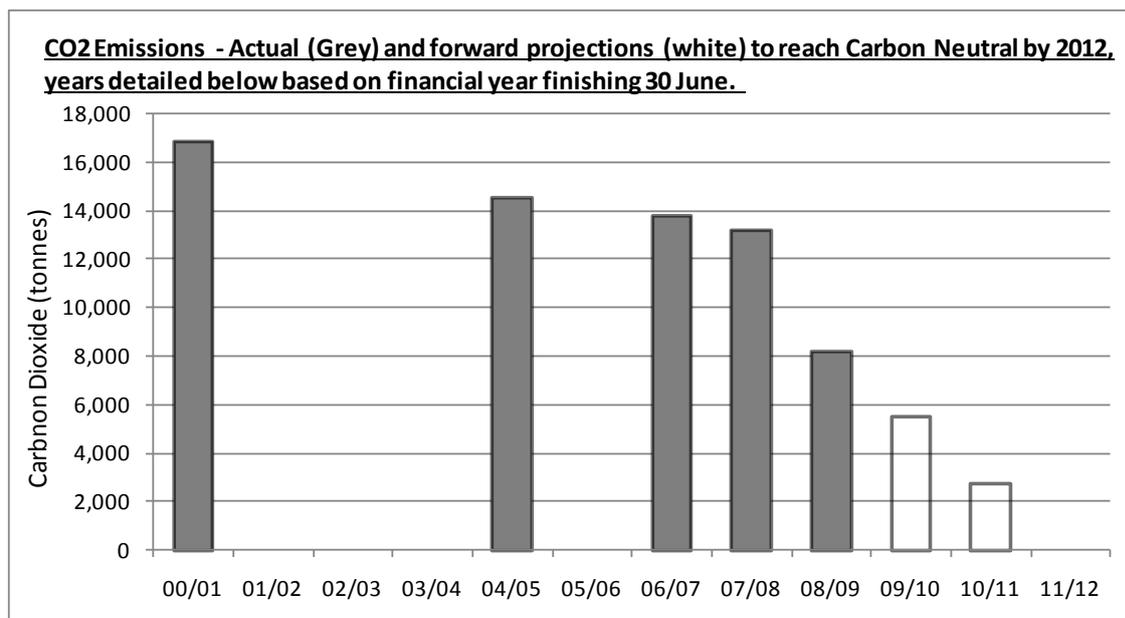


Figure 5: Current total greenhouse emissions and reduction needed to reach zero by 2012

Actions to meet this target

Carbon neutrality can be achieved by 2012 by simply purchasing 100% offsets (investing in external emission reductions or sequestration to remove greenhouse emissions from the atmosphere) and GreenPower (accredited renewable electricity generated externally). However, larger actual emissions reductions provide greater savings to Council and the community. To achieve Carbon Neutrality by 2012 in accordance with the energy hierarchy and Triple Bottom Line (TBL) criteria the steps to follow are:

1. **Avoidance / Efficiency** – Significant reduction in energy use and organic waste to landfill – esp. electricity consumption as the greatest source of emissions and cost to Council. **The majority of the actions within this CNAP focus on this step as the most important criteria for ongoing emissions reduction and to save council money.**
2. **Generate Renewables** - The generation of renewable and low emissions energy at Council facilities, such as from solar power (electricity and hot water), and cogeneration. **Actions 44-48 in this Plan relate to this step.**
3. **Invest in Renewable** - The purchase of GreenPower. Council has resolved to increase from 65% in 2009/10, to 80% in 2010/11 and 100% in 2011/12 and beyond. **Action 10 in this Plan relates to this step.**
4. **Offset Residual** - Purchase of Offsets to cover Council’s remaining emissions from gas, fuel, and waste emissions (increasing percentages as above for GreenPower). **Action 10 in this Plan relates to this step.**

4.2 Target 2: 30% Reduction in Council energy use by 2012

The target to reduce Council energy use by 30% by 2012 was put in place to run alongside the carbon neutral goal to ensure that emissions reduction was not only occurring through external purchase of GreenPower and Offsets. Therefore, to track toward this target Council needs to confirm what ‘energy use’ means - as this target could be stated in gigajoules (GJ) of energy, electricity (kWh), or ‘equivalent’ greenhouse gas (GHG) emissions.

Translation of this target:

Option 1: express ‘energy’ reduction in gigajoules

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Gigajoules is a coefficient of energy that includes both electricity and natural gas. However, to express the 'energy' reduction in gigajoules (GJ) would not be accurate to the intent of the target as natural gas uses more GJ of 'energy' than electricity yet produces less CO₂ emissions to undertake the same outcome as electricity. Therefore tracking energy in GJ would potentially increase as Council promotes use of natural gas over electricity. This target would also exclude non-buildings and streetlight related emissions.

Option 2: express 'energy' reduction in kWh electricity

To express as a reduction in kWh electricity is much closer to the intent of the goal – being reducing use of this inefficient fuel source. However, this would also provide an inaccurate figure as a move from electricity to natural gas does not remove emissions altogether (as it would seem in calculations from these actions). Also, a significant portion of Council's greenhouse gas emissions are generated from natural gas – especially at the leisure centres which 50% of building emissions alone – and any emissions increase / decrease from gas usage would not be captured in calculating progress towards this goal. This target would also exclude non-buildings and streetlight related emissions.

Option 3 (recommended): express 'energy' reduction in equiv. GHG emissions'

To express as a reduction in the 'equiv. GHG emissions' is essentially the true greenhouse footprint from Council before any offsets or GreenPower purchases. This provides a true reflection of the results of Council greenhouse emissions reduction efforts, and comparison with the base year. This also provides an indication of reduction opportunities and cost liability of continued purchasing of GreenPower and offsets to make Council carbon neutral. **It is therefore the target for a 30% Reduction in Council energy use by 2012 be expressed in 'equiv. GHG emissions' as in table 1.**

Actions to meet this target

To achieve this target a number of actions are needed to be undertaken to reduce use of electricity, natural gas, fuel and waste production across Council. Table 3 summarises and quantifies the key actions required to meet this target, with the actions further detailed in Section 6 of the Plan. Assumptions used are listed at the front of this Section.

NOTE: Achievement of these actions are subject to Council's consideration and determination of its future budget commitments. Identification of these actions should not be seen as a funding commitment.

Table 3: Key Actions by 2012 to reach 30% energy reduction target

Action	Cost ('000)*	Payback **	Approx CO ₂ reduction p.a.	Link to CNAP Actions
Streetlighting MV80 replacement	\$250	9 yrs	1501t	#51
Behavior change, embedded decision making (e.g. Purchasing Policy, GreenTeam)	\$0		500t	#01-07
Cogeneration at FSP	\$508	9 yrs	478t	#25
Large Site HVAC improvements e.g. deadband, VSD's...	\$100	5yrs	500t	#19, 26, 34, 38
CLC Redevelopment (Assuming building 10% (100t CO ₂) reduction compared to existing, and Cogen 400t CO ₂ reduction)	\$0k	6 yrs	500t	#31
Bundled other actions at FSP, RRC, and existing CLC	\$165	10 yrs	350t	#20-24, 27-30, 33
Small-Medium facility (SSF) retrofits	\$100	8 yrs	150t	#41
Large site lighting retrofit (e.g. Delamp/ Halogen replacement)	\$100	5yrs	200t	#35, 37
Installation of two further voltage reduction devices	\$90	5 yrs	150t	#36
Efficient IT (i.e. Shutdown, purchasing, servers and printers)	\$0	0 yrs	100t	#15
Improve vehicle fuel economy and reduced emission of CO ₂	\$0	0 yrs	50t	#53
Waste wise and sustainable kitchens	\$0	15 yrs+	15t	#16,17

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Small scale renewable energy – 30kW solar PV, 10 new sustainable hot water installations.	\$100	9yrs	92t	#46,47
Existing actions (flow on benefits)			700t	
Total Reduction from Actions			5,286t	
Target Reduction by 2012			5,046t	
Tonnes above/below target			+ 240t	

* Total cost of the actions – irrespective of budget source or potential co-funding. ** ‘Payback’ is total approximate cost divided by likely annual savings such as from reduced energy and/or labor costs.

4.3 Target 3: 50% Reduction in Council energy use by 2015

The energy reduction target for 2015 was set as a 50% reduction in Council energy use.

Translation of this target:

As explained in Section 5.2 above it is recommended that this target also be translated as a reduction in ‘equiv. GHG emissions’ as in Table 1.

Actions to meet this target

The key actions from this Plan to reach the target have been summarised in Table 4. Assumptions used are listed at the front of this Section. Providing these figures allows prioritization of actions, and highlights implications of not undertaking key actions. Costs and other details of each project will be refined at time of budget submission.

NOTE: Achievement of these actions are subject to Council’s consideration and determination of its future budget commitments. Identification of these actions should not be seen as a funding commitment.

Table 4: Key Actions to reach 2015 energy reduction target

Action	Cost* (\$’000)	Payback**	Approx CO ₂ reduction p.a.	Link to CNAP Actions
Trigeneration or Cogeneration at RRC	\$700	8 yrs	820t	#18
Streetlighting refit – changing non MV80s to efficient lighting	\$200	8 yrs	310t	#51
HVAC replacement of old systems at RTH	\$1000	10 yrs	420t	#19
New buildings built more efficient than existing	\$0		320t	#12, 45
Other streetlight efficiency Actions	\$0		200t	#51
Installation of three further Voltage reduction devices	\$100	5 yrs	150t	#27, 33, 39
Further reduction in fleet vehicles and improved economy	\$0	0 yrs	50t	#53
Existing actions	N/A	N/A	5,286t	
Total Reduction from Actions			7,556 t	
Target Reduction by 2015			8,410 t	
Tonnes above/below target			- 854 t	

* Total cost of the actions – irrespective of budget source or potential co-funding. ** ‘Payback’ is total approximate cost divided by likely savings such as from reduced energy and/or labor costs.

4.4 Target 4: 10% Renewable Energy Generation by 2012

Council has a target to produce 10% of Council’s energy requirements sourced from low carbon local energy generation by 2012.

Translation of this target:

The terminology of ‘energy’ can be calculated in the different ways in relation to the generation and the comparison energy total, as can renewable energy or ‘low emissions sources’. The intent of the target is for 10% Council’s energy use to be offset by local generation that has significantly less or no emissions. It is therefore recommended that:

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- ‘Energy’ to be calculated in ‘equiv. CO₂ emissions’ (as detailed in Section 5.2).

To base this target on kWh electricity generation would not take into account solar hot water or cogeneration and would unnecessarily limit options available to reach the target.

- The comparison energy total is based on ‘equiv CO₂ emissions’ from the target year – and only from electricity and natural gas emissions.

There are no energy generation sources for fuel or waste, and as such to include these in the base emissions would miss-represent the intent.

- ‘low carbon energy generation’ include energy generated from nature or by-product of other means to offset grid based electricity or natural gas use - and translated to ‘equiv CO₂ reduction’.

This allows easy comparison of actions and translation of progress toward the target, especially for actions such as cogeneration where gas usage may increase.

Therefore, the target has been stated as ‘equiv. GHG benefit’ against the total ‘equiv GHG emissions’ from electricity and natural gas is translated in Table 1.

Actions to meet this target

Key actions required to reach the target have been summarised in Table 5. Assumptions used are listed at the front of this Section. Providing these figures allows prioritization of actions, and highlights implications of not undertaking key actions. Costs and other details of each project will be refined at time of budget submission.

NOTE: Achievement of these actions are subject to Council’s consideration and determination of its future budget commitments. Identification of these actions should not be seen as a funding commitment.

Table 5: Key actions to reach 2012 energy generation target

Action	Cost* (\$’000)	Payback**	Approx CO ₂ benefit p.a.	Link to CNAP Actions
Cogeneration at FSP	\$508	9 yrs	478t	#25, 44
Cogeneration at CLC	\$400	7 yrs	400t	#31, 44
30kW new Solar PV by 2012	\$150	10 yrs	42t	#45, 46
10 further facilities with sustainable hot water by 2012	\$100	8 yrs	50t	#47
Existing Renewable energy generation (27kW solar PV, 6 x solar hot water)	N/A	N/A	60t	
Total Reduction from Actions			1,030 t	
Target Reduction by 2012			1,117 t	
Tonnes above/below target			- 87 t	

* Total cost of the actions – irrespective of budget source or potential co-funding. ** ‘Payback’ is total approximate cost divided by likely savings such as from reduced energy and/or labor costs.

4.5 Target 5: 25% Renewable Energy Generation by 2015

Council set the target for 25% of Councils energy requirements sourced from low carbon local energy generation by 2012.

Translation of this target:

As set out in section 5.4 above, it is recommended that this target be translated as ‘equiv. GHG benefit’ against the total ‘equiv GHG emissions’ from electricity and natural gas (refer to Table 1).

Actions to meet this target

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Key actions required to reach the target have been summarised in Table 6. Assumptions used are listed at the front of this Section. Providing these figures allows prioritization of actions, and highlights implications of not undertaking key actions. Costs and other details of each project will be refined at time of budget submission.

NOTE: Achievement of these actions are subject to Council's consideration and determination of its future budget commitments. Identification of these actions should not be seen as a funding commitment.

Table 6: Key actions to reach 2015 energy generation target

Action	Cost* (\$'000)	Payback**	Approx CO ₂ benefit p.a.	Link to CNAP Actions
Trigeneration or cogeneration at RRC	\$640	10 yrs	800t	# 18, 44
45 kW new small renewable by 2015	\$225	10 yrs	63t	# 46
15 further facilities converted to solar hot water p/a	\$150	8 yrs	75t	# 47
Other new technology opportunities	\$200	15 yrs	100t	#45, 48
Existing Renewable E generation			1030t	
Total Reduction from Actions			2,068 t	
Target reduction by 2015			1,995 t	
Tonnes above/below target			+ 73 t	

* Total cost of the actions – irrespective of budget source or potential co-funding. ** 'Payback' is total approximate cost divided by likely savings such as from reduced energy and/or labor costs.

4.6 Target 6 & 7: Establish ESD policy that states targets for ESD incorporation and improvements for all Council buildings and infrastructure by 2012.

The Yarra Environment Strategy (2008) included two targets relating to sustainability of Council buildings and infrastructure, and one key action to be achieved by 2012. These are:

- (a) TARGET: *Recognised environmental performance targets for all council owned and operated buildings and infrastructure;*
- (b) TARGET: *Processes to encourage and facilitate maximum environmental performance in all classes of buildings; and*
- (c) ACTION: *Establishing guidelines and checklist to mandate that all works to council buildings increase environmental performance and address impacts of climate change.*

These targets be can be encapsulated by the objective to: *Establish ESD policy that states targets for ESD incorporation and improvements for all Council buildings and infrastructure by 2012.*

Actions to meet this objective

The key recommended action to meet this target is the development of a Yarra ESD Buildings Policy. The aim is to develop one or more policies/ strategies to guide incorporation of sustainability (ESD) into new and existing buildings, and other major infrastructure. The policies/ strategies must be:

- comprehensive
- easy to understand and implement
- translatable to Key Performance Indicators and reporting

Along with the strategy it will be important that key staff are involved and provided with the required capacity building and skills development where needed. Additional tools or materials may be required to ensure strategy implementation. Council endorsed to develop a Yarra ESD Buildings Policy by February 2011, aimed at achieving carbon neutrality in Council's new buildings.

The steps to develop an ESD Buildings Policy are:

- 1) Establish project manager, working group, timelines and budget. Ensure all relevant units represented and engaged in policy development, and links to others key processes.
- 2) Review existing council targets and processes, and strategies at other Councils.
- 3) Develop ESD Buildings Policy to include new and existing buildings (large and small), routine and programmed maintenance, and ESD upgrades.
- 4) Policy to cover
 - o all relevant processes to be followed from start to finish (including project initiation), and tools / checklist/ technotes/ design statements developed to support where interventions are needed;
 - o minimum standards and targets to be achieved based on project size and/or class;
 - o minimum budget to be allocated, incorporating Life Cycle Costing and the Adaptive Assets policy; and
 - o reporting protocol to report against achievement of targets and ESD outcomes.
- 5) A capacity building program developed for all staff and contractors expected to follow the Yarra Sustainable Buildings Policy, or to implement specific actions.

5 Action Plan

The previous sections of this Plan have detailed Council targets and overarching actions required to meet them, this section provides further detail and other key actions to meet council targets, including the process for undertaking the action, and responsible Council units, timeline, cost and benefit.

Achieving the necessary emissions cuts requires a cultural shift for the organisation, which can be a source of pride for Council, staff and community. All staff can play their part by reducing electricity and gas usage in the workplace, undertaking work travel and commuting in a more efficient way, and limiting organic waste to landfill.

This Action Plan has been developed based on current knowledge of technology, regulation and political (from local to international) status. With significant movement in this area likely, there is need for diligent and regular review to ensure Council is achieving targets covered by this Plan. Significant changes will be identified in annual reviews, with the CNAP to be fully updated by June 2013 to detail progress and action required to reach the 2015 Council targets. The majority of these actions focus on step 1 of the Energy hierarchy – Avoidance/ Efficiency - as the most important criteria for ongoing emissions reduction which will save council money.

Section 6.1 provides a summary of all recommended actions. Details of each action, including the process for achievement, are provided in Section 6.2.

It is important to note that actions identified for 2010/2011 are funded whilst actions for 2011 – 2015 are subject to Council approving funding when developing Council Budgets each financial year. Officers will submit budget submissions for these actions each year as part of Councils normal process for developing budgets. Achievement of these actions will be subject to Council's consideration and determination of its future budget commitments. Identification of these actions should not be seen as a funding commitment.

The estimate reduction of tCO₂ detailed in this Plan has been developed based on best information at the time of the preparation of this Plan. Council should therefore monitor the Plan's performance each year (via an Officers report in August) and modify its approach if a particular action is not achieving the desired outcome. This will be done as part of Council's Business Planning and Budget preparation approach.

Below is a legend for the table column headings for both sections:

Legend for Action Tables (sections 6.1 and 6.2)

- **Action:** Action Number and Title for the given action. The Detailed Action plan also provides a description of the action and what achievement would constitute.
- **Lead Unit:** Lead unit refers to the particular work unit responsible for coordination of the action. The Environmental Unit will provide facilitation support and assistance to the Lead Unit to enable the action to be completed.
- **Support Unit:** Support units are those integral in undertaking the action and making it a success.
- **Timeline/ Budget:** Where there is \$dollar figure given (including \$0) it represents the year of action and cost for that year. 'x' refers to no action. ***Note that these actions are subject to Council approving funding as part of developing future Council Budgets.***
- **Benefit:** The benefit of undertaking each action is listed in tCO₂ reductions possible as: High (H) >50t CO₂, Medium (M) 15-50 tCO₂, or Low (L) <15t CO₂. Where the actions have a direct and quantifiable benefit this has also been listed in the exact tCO₂ reduction possible.

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5.1 Estimated Financial implications and Greenhouse Benefits of the Carbon Neutral Action Plan (actions subject to future funding by Council)

Action	Lead Unit	Support Units	2010/11 (\$'000)	2011/12 (\$'000)	2012/13 (\$'000)	2013/14 (\$'000)	2014/15 (\$'000)	Benefit
Council-Wide/ Policy			\$687	\$700	\$642	\$603	\$588	
01. Greenhouse Steering Committee	Env Mgmt		\$0	\$0	\$0	\$0	\$0	M
02. Council Reports	Governance	Env Mgmt	x	\$0	\$0	\$0	\$0	H
03. Capital Works	Capital Works, Strategic Assets	Env Mgmt	\$0	\$0	\$0	\$0	\$0	H
04. Sustainable Purchasing	Purchasing	Env Mgmt	\$0	\$0	\$0	\$0	\$0	H
05. GreenTeam	Env Mgmt	Org. Dev., Comms	\$0	\$10	\$10	\$10	\$10	M
06. Broadening Responsibility	Env Mgmt & Org. Dev	SMT	\$0	\$0	\$0	\$0	x	M
07. Culture Change Program	Env Mgmt	Org. Dev, GreenTeam	x	\$10	\$0	x	x	H
08. Funding for Sustainability Actions	Env Mgmt		\$250	\$250	\$250	\$250	\$250	H
09. Data Collection / Management	Env Mgmt	Strategic Assets, Building Services	\$5	\$10	\$0	\$0	\$0	M
10. Renewable Electricity and offsets*	Env Mgmt	Finance	\$420	\$408	\$370	\$331	\$292	H
11. Membership of external bodies	Env Mgmt		\$12	\$12	\$12	\$12	\$36	H
Overarching Building Actions			\$0	\$0	\$0	\$0	\$0	215
12. ESD Buildings guidelines and targets.	Env Mgmt/ Strategic Assets	Building Projects, Building Maintenance	\$0	\$0	\$0	\$0	\$0	H
13. HVAC / Thermal Comfort Policy	Building Maintenance	Env Mgmt, OHS, Facility Management, Building Projects	\$0	x	x	x	x	100
14. Energy Performance Contracts.	Env Mgmt, Strategic Assets.	Building Projects	\$0	\$0	x	x	x	H
15. Sustainable IT	Information Services	Env Mgmt	\$0	\$0	x	x	x	100
16. Waste Wise	Eng Operations	Env Mgmt	\$0	\$0	x	x	x	10
17. Sustainable kitchens	Civic Facilities	Env Mgmt, Building Maintenance	\$0	\$0	x	x	x	5
Richmond Rec Centre Action Plan			\$20	\$241	\$22	\$300	\$300	1245
18. Cogeneration	Env Mgmt	Leisure Services, Building Projects	x	\$40	\$0	\$300	\$300	800
19. HVAC efficiency	Building projects	Env Mgmt, Leisure Services, Building Maintenance	\$10	\$150	x	x	x	225
20. Domestic Hot water	Building projects	Leisure Services, Env Mgmt, Building Maintenance	\$0	x	\$22	x	x	90
21. Management of UV system	Leisure Services		\$0	x	x	x	x	30
22. Lighting	Building Maintenance	Leisure Services, Env Mgmt	\$10	\$20	x	x	x	60
23. Gym/ Sauna Usage	Leisure Services	Env Mgmt	x	\$30	x	x	x	40

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<u>Action</u>	<u>Lead Unit</u>	<u>Support Units</u>	<u>2010/11</u> <u>(\$'000)</u>	<u>2011/12</u> <u>(\$'000)</u>	<u>2012/13</u> <u>(\$'000)</u>	<u>2013/14</u> <u>(\$'000)</u>	<u>2014/15</u> <u>(\$'000)</u>	<u>Benefit</u>
24. Promote user efficiency	Leisure Services	Env Mgmt	x	\$1	x	x	x	L
Fitzroy Swimming Pool Action plan			\$355	\$270	\$50	\$0	\$0	615
25. Cogeneration	Building Projects	Env Mgmt, Leisure Services	\$350	\$170	x	x	x	450
26. HVAC efficiency	Building Maintenance	Env Mgmt, Leisure Services	\$5	\$50	x	x	x	60
27. Voltage Reduction	Building Maintenance	Leisure Services Env Mgmt	x	x	\$50	x	x	30
28. Lighting	Building Maintenance	Leisure Services Env Mgmt	x	\$20	x	x	x	30
29. Domestic Hot water	Building Maintenance	Env Mgmt, Leisure Services	x	\$30	x	x	x	25
30. Pool Temperatures	Leisure Services	Env Mgmt	x	\$0	x	x	x	20
Collingwood Leisure Centre			\$0	\$50	\$40	\$0	\$0	550
31. ESD Re-development	Building Projects	Planning, Env Mgmt, Leisure	\$0	\$0	x	x	x	500
32. Action Plan	Building projects	Env Mgmt, Leisure Services, Building Maintenance	x	\$0	x	x	x	M
33. Existing Building	Building Maintenance	Leisure, Env Services	x	\$50	\$40	x	x	50
Town Hall Action Plan			\$50	\$220	\$0	\$0	\$1000	250
34. HVAC Efficiency	Building Maintenance / Building Projects	Env Mgmt, Civic Facilities, OHS	\$5	\$100	x	x	\$1000	100
35. Lighting Efficiency	Building Maintenance	Env Mgmt, Civic Facilities	\$15	\$60	x	x	x	150
36. Voltage Reduction	Env Mgmt	Building Maintenance	\$30	\$60	x	x	x	
Richmond Library Action Plan			\$5	\$100	\$60	\$0	\$0	110
37. Lighting Upgrade	Building Maintenance	Env Mgmt, Library Services	\$5	x	x	x	x	50
38. HVAC	Building Maintenance	Env Mgmt, Library Services	x	\$100	x	x	x	25
39. Voltage reduction	Env Mgmt	Building Maintenance	x	x	\$30	x	x	30
40. Kitchen and toilets	Building Maintenance	Env Mgmt, Library Services	x	x	\$30	x	x	5
Small to Medium Sized Facilities			\$20	\$50	\$20	\$0	\$20	150
41. Sustainable Community Facilities	Env Mgmt	Building Maintenance, Family and Children's Services, Recreation	\$20	\$20	x	x	x	150
42. Demonstration Sites	Env Mgmt	Building Maintenance, Family and Children's Services, Recreation, Comms	x	\$10	\$10	x	\$10	L
43. Sustainable Sport Facilities	Env Mgmt	Building Maintenance, Family and Children's Services, Recreation	x	\$20	\$10	x	\$10	M

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<u>Action</u>	<u>Lead Unit</u>	<u>Support Units</u>	<u>2010/11</u> <u>(\$'000)</u>	<u>2011/12</u> <u>(\$'000)</u>	<u>2012/13</u> <u>(\$'000)</u>	<u>2013/14</u> <u>(\$'000)</u>	<u>2014/15</u> <u>(\$'000)</u>	<u>Benefit</u>
Renewable Energy Generation			\$20	\$150	\$100	\$125	\$125	0
44. Cogeneration	Env Mgmt	Building Projects	x	x	x	x	x	H
45. New Building Opportunities	Building Projects	Env Mgmt	x	x	x	x	x	H
46. Solar PV program	Building Projects	Env Mgmt, Building Maintenance	x	\$100	\$50	\$75	\$75	H105
47. Hot Water rollout program	Building Projects, Building Maintenance	Env Mgmt	20	\$50	\$50	\$50	\$50	H125
48. Grants and Innovative Approaches	Env Mgmt		x	x	x	x	x	M
Sustainable Public Lighting			\$250	\$0	\$320	\$10	\$10	1501
49. Update Public Lighting policy	Env Mgmt, Transport	Urban Design, Open Space, Recreation	x	\$0	\$0	x	x	H
50. New Lighting Approval Processes	Env Mgmt, Transport	Urban Design, Open Space, Recreation	x	\$0	\$0	x	x	M
51. Bulk lighting changeover	Env Mgmt	Transport, Urban Design, Finance	\$250	x	\$310	x	x	1701
52. New Lighting Technology Trials	Env Mgmt	Transport, Urban Design, Open Space	x	x	\$10	\$10	\$10	M
Transport: Fleet / Employee Commute			\$0	\$0	\$0	\$0	\$0	50
53. Sustainable Fleet Purchasing and Utilisation Policy	Fleet Management	Org Dev, HR, Parking, Transport, Env Mgmt.	\$0	x	x	x	x	100
54. Update Staff Green Travel Policy	Transport	Env Mgmt	\$0	x	x	x	x	L
55. FBT	Env Mgmt	HR, Fleet Management	\$0	x	x	x	x	L
56. Specifications for Contractor Fuel Use	Contract Management	Fleet Management, Env Mgmt	\$0	x	x	x	x	M
57. Shuttle Bus	Community Services	Fleet Management, Env Mgmt	x	\$0	x	x	x	L
Summary			2010/11	2011/12	2012/13	2013/14	2014/15	Benefit (tCO₂)
Total Budget Implications (\$7,523,000)			\$1,407	\$1,781	\$1,254	\$1,038	\$2,043	4,886

* Action 10 Renewable Energy and Offset Assumptions: (a) Council reduction targets are reached and energy decreases across all areas accordingly (b) Renewable Energy Offsets cost \$50 per tonne (c) Offsets cost \$25 per tonne (d) 80% renewable energy/ offsets purchased for Year 1, 100% Years 2-5.

5.2 Strategies and detailed Action of the Carbon Neutral Action Plan

5.2.1 Overarching, Council-Wide Actions

Context: These actions influence all of council, including cross-council / strategic type actions, actions to support staff engagement, and tracking GHG emissions. Robust organisational processes are critical to the success of any action plan. This is particularly important as the CNAP internalises the costs of offsetting emissions. To be able to most effectively implement greenhouse reductions across Council, staff needs to be empowered to act; to know what to do, how to do it and have the support and resources available if they don't. Whilst not directly quantifiable benefits, if these systems and processes are in place this will have greatest long-term greenhouse benefit (indicated by their priority ratings generally High and Medium).

	Action	Lead Unit	When
1.	Greenhouse Steering Committee: Establish an internal Greenhouse Steering Committee with Executive and relevant staff. Ensure top down support and ownership necessary to strategically drive actions.	Lead: Env Mgmt	2010/11
2.	Council Reports: Regularly review the Council Reports template and approvals process to ensure reports to Council adequately assesses all greenhouse implications of decisions - including total greenhouse impacts, attempts to reduce the impact, and how it accounts for long-term climate change adaptation risks. Ensure staff. Links to the YES action " <i>Establishing quadruple bottom line reporting across all units and services based on staff roles and council systems</i> "	Lead: Governance Support: Env Mgmt	2011/12
3.	Capital Works: a. Review the Capital Works development process to ensure that greenhouse criteria provide more strategic assessment of outcomes as early as possible - including total greenhouse impacts, attempts to reduce the impact, and how the works account for long-term climate change adaptation risks. Educate staff. Links to YES action " <i>Ensuring that assessment criteria for capital works account for climate change impacts and that guidelines are developed to guide design and construction of all buildings and infrastructure</i> " b. Incorporate sustainability actions into asset management plans and ensure that sustainable design is seen as part of core business when budgeting rather than an add-on that needs further funding to implement.	Lead: Capital Works, Strategic Assets Support: Env Mgmt	2010/11
4.	Sustainable Purchasing: Links to YES Action " <i>Ensure that sustainability is a core basis of any future purchasing policy reviews, and refine processes to ensure that goods and services are obtained from sustainable sources and suppliers committed to sustainability.</i> " a. Include a policy for sustainable purchasing in the procurement policy. Potentially incorporate an allowance for a set extra percentage additional cost to be allowed for environmentally preferable products b. Investigate ways to update the purchasing system to ensure the greenhouse implications of decisions made are factored into every purchase. c. Update the contracts and tendering process and manual to ensure greenhouse implications are incorporated in documentation and evaluation. Develop and include a carbon emissions questionnaire (<i>Env Mgmt to lead</i>). d. Continue to promote electronic tender downloads and look to move to electronic submissions as opposed to hardcopy drop offs to reduce paper wastage.	Lead: Purchasing Support: Env Mgmt	2010/11

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	Action	Lead Unit	When
	<p>e. Continue membership of ECO-Buy, and play an active role through attending networking meetings, and utilising ECO-Buy resources and support.</p> <p>f. Promote sustainable purchasing to staff.</p>		
5.	<p>GreenTeam: Re-start Council’s GreenTeam as a mechanism to focus cross-council staff engagement supporting sustainability. GreenTeam members to act as site/content based ‘champions’ to support and educate other staff how to do be more sustainable through dialogue and development of a GreenTeam Action Plan with specific and achievable actions. Ensure coordination is adequately resourced. Links directly to YES Action “<i>Maintain the staff “Green Team” to improve environmental performance of staff across the organisation.</i>”</p>	<p><i>Lead:</i> Env Mgmt <i>Support:</i> Org. Dev., Comms</p>	2010/11
6.	<p>Broadening Responsibility: Integrate actions from this CNAP into relevant Branch Service Plans and translated as Key Performance Indicators for staff - reviewed as part of the Performance Development and Review.</p> <p>a. Development of organisational KPI’s from CNAP and other key environmental strategies. Translate actions from CNAP into Branch Service Plans and into organisational KPI’s. Investigate potential to link to ‘Interplan’ software for corporate planning and organisational goals. These can be high level actions or targets, or specific actions. Links directly to YES Actions: “<i>Reviewing council’s capacity to be a leader in environmental sustainability ...potentially via a training program to support the inclusion of KPIs for environmental performance in branch plans</i>” and “<i>Aligning KPIs in Council Plan, Branch Service Plans, and individual work plans</i>”.</p> <p>b. Develop an environmental charter to be used as a guide/resource for setting branch and individual plans. The charter could outline targets to be reported on, specific strategies that teams or individuals can implement, and include commitment to minimise personal environmental footprint at work.</p> <p>c. Ensure the statement / examples for “Sustainability” are in included in all Position Descriptions, reviewed annually.</p>	<p><i>Lead:</i> Env Mgmt and Org. Development <i>Support:</i> SMT</p>	2010/11
7.	<p>Culture Change Program: Develop greenhouse/sustainability behaviour change training program/rewards for all staff, targeted at a number of levels. Links directly to YES Actions: “<i>Reviewing council’s capacity to be a leader in environmental sustainability and ensuring that staff is trained to deliver all aspects of this action</i>” and “<i>Promote the environmental values of the organisation through information sheets for new staff</i>”. Opportunities include:</p> <p>a. Targeted training sessions and support specific staff, work areas, and/or support Team Leaders to be able to support their team, to develop training to meet their needs. Initially to focus on development and implementation of the Yarra ESD Buildings Policy (Action 12).</p> <p>b. Presentations at Corporate Induction and/or site visits.</p> <p>c. Develop organisation-wide sustainability capacity building program, potentially through online self directed learning (e-learning), Foundations of management, or other opportunity (joint with Organisational Development).</p> <p>d. Develop Awards for staff supporting greenhouse reduction. Link to the Reward and Recognition process.</p>	<p><i>Lead:</i> Env Mgmt <i>Support:</i> Org. Dev, GreenTeam</p>	2011/12
8.	<p>Funding for Sustainability Actions: Council endorsed policy to invest in any actions with a less than 10 year payback. Links to YES Action “<i>Establish a mechanism to fund council sustainability initiatives with a (maximum) 10 year payback period (or alternative agreed criteria)</i>”</p> <p>a. Review status of Adaptive Assets program and endorse specific Policy by June 2011 (refer Section 3.2)</p> <p>b. Develop communications materials, and promote the policy widely across Council. The greatest impact will occur where relevant staff</p>	<p><i>Lead:</i> Env Mgmt</p>	2010/11

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	Action	Lead Unit	When
	<p>propose opportunities to be actioned through this initiative.</p> <p>c. Develop info sheet on Council’s utility costs to be used in all calculations by staff and consultants of payback periods.</p> <p>d. Develop program of works for capital funding consideration by council for 2011/12 and annually after this.</p>		
9.	<p>Data Collection / Management: Monitor, track, and report annually on utility usage and greenhouse emissions</p> <p>a. Further improve processes to monitor and track utility/other data related to Council’s greenhouse emissions through easy to use/ existing systems including: Utility Tracker, MATE, and web-metering. Include from sectors not currently captured. Continue to capture data on employee commute - via TravelSmart Workplaces survey, and other means where needed.</p> <p>b. Provide quarterly utility report to Executive and yearly report to Council, including waste, fuel, employee commute, water, and greenhouse gas emissions. Establish reporting structure established requiring signoff / explanations for site specific energy consumption by site managers.</p> <p>c. Promote and support staff to understand the emissions at their site, including web-metering (large site) and Energy or smart meters (small site), and monitoring equipment such as temperature data loggers, lux meters, and energy meters. Use Council’s data Logger and/or check meters to better assess utility usage within key sites. Links to YES Action “<i>Encourage all Yarra business units to reduce materials use and energy consumption</i>”.</p>	<p><i>Lead:</i> Env Mgmt</p> <p><i>Support:</i> Building Services, Strategic Assets</p>	2010/11
10.	<p>Renewable Electricity and Offsets: Council has endorsed to purchase accredited renewable electricity (GreenPower) and accredited greenhouse offsets to meet 80% of emissions for 2010/11 and 100% beyond this date, in the most environmentally and financially and sustainable manner.</p> <p>a. Utilise the existing electricity contract or tender for the GreenPower component separately.</p> <p>b. Develop policy for types of Accredited Offsets to purchase and process for doing so, to meet offset targets.</p>	<p><i>Lead:</i> Env Mgmt</p> <p><i>Support:</i> Finance</p>	2010/11
11.	<p>Membership of external bodies.</p> <p>a. Continue participation in the Northern Alliance for Greenhouse Action (NAGA), and nominate annually for a Councilor involvement on the NAGA Executive Committee, Council Officers to attend the Steering Committee and Working Groups (esp. Streetlighting and Sustainable Buildings).</p> <p>b. Continue membership of ICLEI – Local Governments for Sustainability. Review participation in the Cities for Climate Protection program for 2011/12.</p>	<p><i>Lead:</i> Env Mgmt</p>	2010/11

5.2.2 Overarching Building Actions

Context: Council’s buildings are the major source of emissions, accounting for approximately 56% - mostly from the consumption of electricity. This means that actions targeted at buildings will provide significant sources of reductions. A lot of work has already been done including audits of major facilities, however significant reductions are still required to reach Council Goals. Links directly to YES Action “*Reducing consumption and increasing energy efficiency at leisure centers, town halls, and smaller sites*”

	Action	Responsible Unit/ Branch	Due
12.	<p>ESD Buildings guidelines and targets. Develop strategic process and targets to improving the sustainability of new and existing Council buildings. Achieve YES Actions ‘<i>Establishing guidelines and checklist to mandate that all works to council buildings increase environmental performance and address impacts of climate change</i>’ and “<i>Environmental performance targets for all council owned and operated buildings and infrastructure</i>”</p> <p>a. Develop Yarra ESD Buildings Policy (refer to section 5.6)</p> <p>b. Continue regular Sustainable Buildings Working Group meetings with relevant staff, and liaise with Sustainable Infrastructure Network.</p> <p>c. Incorporate environmental sustainability of council assets in the process to update the Asset Management Plan. Ensure Environmental Services is on the project team from the start.</p> <p>d. Use New buildings (large and small) as opportunity to reduce emission and showcase new technologies. Upcoming new buildings include: Large - North Fitzroy Hub, Abbotsford Community Hub, Small - various pavilions.</p>	<p><i>Lead:</i> Env Mgmt / Strategic Assets</p> <p><i>Support:</i> Building Projects, Building Maintenance</p>	2010/11
13.	<p>HVAC Review and Thermal Comfort Policy. For all site types the use of mechanical heating and cooling is a major contributor to their greenhouse gas emissions. There is a need to review how this is managed to aim to reduce emissions, without negative impacts on staff or plant operation.</p> <p>a. Create a Thermal Comfort Policy. This is necessary to ensure staff comfort and OHS needs are set and understood by all, with optimal heating and cooling processes to fall within these parameters. This should be set based on Summer and Winter set points, and provide a set deadband allowing temperatures to fluctuate without the need for mechanical cooling. Implementing this policy will require significant staff consultation and support, as well as use of data loggers and personal thermometers to ensure calibration.</p> <p>b. Review systems which do not allow deadbands to be set and monitored and put forward capital works program for upgrade, considering replacement and planned works. Ensure that when a new HVAC system is to be installed this is the most efficient possible. Develop HVAC Technotes or Preferred Products list if required.</p> <p>c. Review start and stop times of the various systems and controllers and ensure mechanical heating and cooling is used as little as needed.</p> <p>d. Review split system A/C’s and look to remove or place on timers (especially in meeting rooms).</p>	<p><i>Lead Building Maintenance</i></p> <p><i>Support Env Mgmt, OHS, Facility Management, Building Projects</i></p>	2010/11
14.	<p>Energy Performance Contracts. Investigate potential to enter into an Energy Performance Contract (EPC) for Council’s largest facilities. Under an EPC, a chosen company would audit one or more of Council’s facilities and provide a list of actions they would undertake and the guaranteed savings that would be achieved from undertaking these. Council would not need to pay anything upfront but would pay for the installation of the action overtime through savings.</p>	<p><i>Lead:</i> Env Mgmt, Strategic Assets</p> <p><i>Support:</i> Building Projects,</p>	2011/12

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	Action	Responsible Unit/ Branch	Due
		Building Maintenance	
15.	<p>Sustainable IT: Reduce energy demand through purchasing the most efficient technologies, such as photocopiers and computers, and ensure the energy saving settings are enabled as default.</p> <ol style="list-style-type: none"> Assess the most sustainable options when purchasing new equipment (set minimum standards) and interaction with bulk purchasing arrangements. Set agreed energy saving settings for computers/ printers etc, and undertake audit to ensure (i.e. Energy Star) are enabled. Currently All Copiers and printers are set to go into standby after 1 hour inactivity, and 'night watchman' software. Similarly ensure eligible printers are set to default double sided, "two per page" printing is available for all applicable programs and printers and communicated to staff. Assess paper use by department, to reduce where printing can be substituted by electronic means, and assess if any single sided printing is deemed necessary (i.e. from Contracts, Records, or Governance) or can be avoided. (Env Services). Audit existing printers to determine if any are redundant or 'convenience' printers. Review Council's servers and server rooms for most efficient hardware, software, HVAC, and lighting solutions. 	<p><i>Lead:</i> Information Services <i>Support:</i> Env Mgmt</p>	2010/11
16.	<p>Waste Wise: Implement council actions to reduce organic waste, especially where linked to in Council Waste Wise Action Plan (2009) (WMP). Links to the YES Objective: <i>Reduce the quantity of resources consumed in council operations and where council has direct influence or control.</i></p> <ol style="list-style-type: none"> Strengthen and better promote "waste wise" initiatives across (WMP Actions). Remove all individual bins and provide central split bin system in all Town Halls (inc commercial kitchen facilities), and large other facilities where possible. When developing/ refurbishing building ensure they are designed to be waste wise. Investigate introduction of tumbler composting (or wormfarms) facilities at selected Council buildings – small and large (WMP Action). Ensure 'Champion' are present at each site to manage successful usage. Investigate how to reuse paper that has only been printed on one side before it's recycled. 	<p><i>Lead:</i> Eng Operations <i>Support:</i> Env Mgmt</p>	2010/11
17.	<p>Sustainable kitchens:</p> <ol style="list-style-type: none"> Investigate waste impact from small internal events/ large workshops. E.g. Purchase of light but sturdy reusable plastic items for each town hall to use rather than disposable crockery and cutlery. Facilities to purchase and promote internally. Links to WMP Action "<i>Facilities Managers to review hall hiring and catering contracts and arrangements with a view of reducing waste</i>". Review successful actions to decrease use of take-away mugs from coffee shops, and disposable mugs from Council sites, and develop new strategy (Env Mgmt). Only use the dishwasher when full. Perhaps use the 2 drawer system at FTH to have a dirty tray and clean tray (have a sign that labels which is which). Review use of 'Zip' boilers and free standing water chillers, with aim to engage energy efficient mode or timer. May need replacement with dual boiling/chilled water taps. Review use of 'internal use' soft drinks fridges, potential to remove or place on timers with approval from the companies (Social Club). Review use and management of unnecessary fridges, increase fridge temperature settings if possible, turn off 'catering' fridges' when not 	<p><i>Lead:</i> Civic Facilities/ Env Mgmt <i>Support:</i> Infrastructure, Env Mgmt Building Maintenance, Social club</p>	2010/11

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	Action	Responsible Unit/ Branch	Due
	<p>a. Review success removing heating of men’s wet-side change rooms from the boiler by installing domestic hot water system.</p> <p>b. Hot water for the gym (dry side) change rooms is provided by two 300L storage gas hot water heaters and a ring main system. The Energy Doctor 2006 audit recommended that High efficiency evacuated tube solar hot water systems should be implemented.</p>	<p><i>Support:</i> Leisure Services, Env Mgmt, Building Maintenance</p>	2012/13
21.	<p>Management of the UV filtration system In 2009 Council installed a 10kW UV system on the main pool to remove combined chlorine from the water and reduce the need for as frequent backwashing, to add to the 4kW system on the toddlers and smaller unit on the spa. The system needs to be managed to reduce the hours of use. Recommendation is that Yarra Leisure staff are responsible to turn on and off (recommend on at night only as this saves Council money using off peak power) or else simple time switch or system to turn on only when combined chlorine levels are high.</p>	<p><i>Lead:</i> Leisure Services</p>	2010/11
22.	<p>Lighting. There are significant opportunities to improve lighting at RRC, which provides significant CO₂ reduction and a payback of 7 years (<u>Actions from CarbonetiX assessment 2010</u>). The following actions are to be considered in the maintenance schedule for the RRC for the next 24 months:</p> <ul style="list-style-type: none"> - Replace 24 X 50 watt halogen lights around entrance, reception and shop areas with 15 watt CFL downlights (\$1.5k, 8t) - Replace 25 x 400 watt mercury vapor fittings in gym with 250 watt metal halide fittings (\$17k, 16t) - Upgrade 30 x 400 watt mercury vapor light fittings in pool hall to 250 metal halide lights (\$21k, 17t) - Replace 6 x 80 watt mercury vapor wall light lamps with 25 watt CFL lamps (\$500, 2t). - Delamp 18 x double 18 watt CFL downlights outside gym and upstairs outside Yoga room (\$200, 2t). - Upgrade of EXIT signs with LED versions as they fail (15 estimated) (\$0, 3t). - Link pool hall lights to Lux sensor to better control lighting requirements (\$1.5k, 7t) - Install occupancy sensors in change rooms, exercise rooms, lunch room etc (\$3.5, 4t) 	<p><i>Lead:</i> Building Maintenance <i>Support:</i>, Leisure Services Env Mgmt</p>	2010/11
23.	<p>Gym and Sauna efficiency</p> <p>a. The gyms use electricity from the many large TV’s. It is recommended that Council purchase the most energy efficient TV’s as electricity consumption of these devices is increasing. Gym equipment may also be used to create electricity with new products coming onto the market which should be investigated.</p> <p>b. Review potential to retrofit a ‘Magnetite’ double glazing solution to reduce energy use by 5-10%. Also review potential to replace electric heating element with infrared to reduce emissions by a further 10-20%.</p>	<p><i>Lead:</i> Leisure Services <i>Support:</i> Env Mgmt</p>	2011/12
24.	<p>Promote user efficiency: Promote to the users of the Leisure Centres how they can assist to improve sustainability.</p> <p>a. Establish a steering committee for implementing this across the Leisure Centres.</p> <p>b. Develop a community communications plan to communicate the monthly greenhouse gas emissions and water consumption, such as a large board. Advise on utility consumption, promote / educate on efficiency actions undertaken and the purchase of GreenPower / offsets, and community sustainability information.</p> <p>c. Extend the community education capacity of the Centres, such as being a point for showerhead exchange, mobile phone deposit, and</p>	<p><i>Lead:</i> Leisure Services <i>Support:</i> Env Mgmt</p>	2010/11

Action	Responsible Unit/ Branch	Due
distribution of environmental information		

5.2.4 Fitzroy Swimming Pool (FSP)

Action	Responsible Unit/ Branch	Due
25. Cogeneration: Implement a Cogeneration plant at FSP to produce hot water and energy from a clean burning gas turbine.	<i>Lead:</i> Building Projects <i>Support:</i> Env Mgmt and Leisure Services	2010/11
26. HVAC efficiency: Review Heating Ventilation and Air Conditioning (HVAC) to ensure plant and usage is most efficient. <ul style="list-style-type: none"> a. Engage expert to review existing system and usage, including plant room and individual units, and put forward a strategy for increased efficiency and reduced usage. There is a specific issue with heat load and associated mechanical cooling needed in the gym which need to be reviewed, with actions including: <ul style="list-style-type: none"> - Adding open able windows (louvers south side 10/11) - Reducing heat gain from north via tinting the windows, external shad awnings on the façade and/or Painting the roof and façade with heat reflective paint (11/12) b. Review the mechanical plant to ensure efficiency and sized correctly especially considering admin support at FSP has increased. Update plant with more efficient technology when planned renewal occurs, or brought forward if warranted. 	<i>Lead:</i> Building Maintenance <i>Support:</i> Leisure Services, Env Mgmt,	2010/11
27. Voltage Reduction: Assess potential to install voltage unit, reducing the energy consumed by between 8-15% emissions. This will also improve the life at the assets.	<i>Lead:</i> Building Maintenance <i>Support:</i> Env Mgmt and Leisure Services	2011/12
28. Lighting Review existing lighting and retrofit with more efficient stock where possible	<i>Lead:</i> Building Maintenance <i>Support:</i> Env Mgmt and Leisure Services	2011/12

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	Action	Responsible Unit/ Branch	Due
29.	<p>Domestic Hot water:</p> <p>a. Reduce energy used to heating water for change rooms. There are currently instantaneous hot water systems with potential to add solar hot water pre-heat (place on Gym not change room roof). The planned Cogeneration system won't heat change room water.</p> <p>b. Disconnect the hot water unit in the boiler room / put on a timer, and improve the insulation on the hot water pipe work outside the female change room</p>	<p><i>Lead:</i> Building Maintenance, <i>Support:</i> Env Mgmt, Leisure Services</p>	2010/11
30.	<p>Pool Temperatures:</p> <p>Develop a policy of the pool temperature management based on service requirements and environmental and financial impacts.</p>	<p><i>Lead:</i> Leisure Services <i>Support:</i> Env Mgmt,</p>	2011/12

5.2.5 Collingwood Leisure Centre

	Action	Responsible Unit/ Branch	Due
31.	<p>ESD Re-development. Support re-development of CLC. Key actions included in the specifications include Cogeneration for pool and shower water, Variable Speed Drives, efficient HVAC, pool blanket, efficient glazing and external shading, and renewable energy generation.</p>	<p><i>Lead:</i> Building Projects <i>Support:</i> Planning, Env Mgmt, Leisure</p>	2010/11
32.	<p>Action Plan: Ensure the development of an ESD action plan is incorporated into the operations and maintenance manual for ongoing sustainable operation of the site post construction and fit-out phase, and strong handover is provided to Centre and Maintenance staff.</p>	<p><i>Lead:</i> Building Projects <i>Support:</i> Leisure Services, Building Maintenance</p>	2011/12
33.	<p>Existing Building: Review the areas at CLC which is not being upgraded and implement actions to improve the sustainability of these areas, including review of <i>Energy Doctor 2007</i> recommendations and installation of voltage reduction technology.</p>	<p><i>Lead:</i> Building Maintenance <i>Support:</i> Leisure, Env Services</p>	2011/12

5.2.6 All Town Halls Action Plan

	Action	Responsible Unit/ Branch	Due
34.	<p>HVAC Efficiency. Review the Heating Ventilation and Air Condition (HVAC) at each site and develop a forward plan for upgrade. Refer to action 19. Undertake staff communications and education.</p> <p>a. Review insulation, glazing, shading, and draft proofing across all facilities to limit heat gain/loss and reduce need to mechanically heat/cool. Similarly, include increased heat loads from internal systems (such as lights and computers) in Life Cycle Costing/ payback calculations at time of HVAC review/ purchase. Where plant is roof mounted, review ability to paint with ‘thermoshield’ or similar product to improve summer plant efficiency. Link to the review of the Building Asset Management Plan.</p> <p>Richmond Town Hall Specific Actions</p> <p>a. Renew plant and implement a Building Management System with energy saving features to allow greater monitoring and regulation of the temperatures and setting of deadband when due for upgrade (by 2014/15 – subject to funding).</p> <p>Fitzroy Town Hall Specific Actions</p> <p>a. Main Hall: Install loft insulation. Review the entry point of Main Hall in attempt to provide an air lock. b. Review entry procedure for reading room to provide air lock, and remove need to have door constantly open. c. Review any ‘unnecessary’ wall vents in the Library which makes the HVAC work harder than necessary.</p> <p>Collingwood Town Hall Specific Actions</p> <p>a. Install loft insulation throughout the Town Hall and draught stopping around the door of the main hall (following the HVAC upgrade works post July 2010).</p>	<p><i>Lead:</i> Building Maintenance/ Building Projects</p> <p><i>Support:</i> Env Mgmt, Civic Facilities, OHS</p>	2011/12
35.	<p>Lighting Efficiency:</p> <p>a. Review the use of lights across the town halls to reduce lighting use and improve the efficiency of the technology used. Develop lighting efficiency plan and technotes for Maintenance staff and contractors to follow systematically as lights fail and need to be replaced. Key efficient lighting opportunities include:</p> <ul style="list-style-type: none"> - <i>50W Halogens globes:</i> Replace with LED (6W), CFL (12W) or Iron Core Ballast (IRC) globes (20/35W) - <i>Candelabras:</i> Replace current incandescent globes with the same style CFL globes - <i>Twin-fluorescent tube (T8) fittings:</i> Replace whole fitting with T5 Tube, or delamp with reflector - <i>Security lighting:</i> Replace with new more efficient low wattage globes dependent on light levels and style <p>b. Undertake staff communications and education.</p>	<p><i>Lead:</i> Building Maintenance</p> <p><i>Support:</i> Env Mgmt, facilities</p>	2010/11
36.	<p>Voltage Reduction: Assess potential to install voltage units at Collingwood and Fitzroy Town Halls, reducing the energy consumed by between 8-15% emissions. This will also improve the life at the assets.</p>	<p><i>Lead:</i> Env Mgmt</p> <p><i>Support:</i> Building</p>	2011/12

		Maintenance	
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5.2.7 Richmond Library Action Plan

	Action	Responsible Unit/ Branch	Due
37.	<p>Lighting Upgrade Undertake a lighting upgrade based on the following principles:</p> <ul style="list-style-type: none"> a. Retrofit over 200 fluorescent tube fittings to reduce energy consumption, ensuring Australian standards for catalogue and reading lighting levels in libraries is exceeded. As well as reducing over lighting, this action will reduce heat load generated by the lamps so the HVAC will run more efficiently. b. Remove recessed twin-CFL's above the kids reading corner where pendant lighting already exists (and retrofit 20W to 8W globes) c. Ensure only necessary outdoor lighting is on, and only when necessary. 	<p><i>Lead:</i> Building Maintenance</p> <p><i>Support:</i>, Library Services, Env Mgmt</p>	2010/11
38.	<p>HVAC: review Heating Ventilation and Air Conditioning settings, usage and plant</p> <ul style="list-style-type: none"> a. Ensure set-point is not to low/high in Summer/winter and a deadband is set in line with the agree Yarra Thermal Comfort Policy (Action 19). b. Ensure building is thermally proofed as possible, including loft Insulation, draft proofing where needed, and external shading and/or window tinting to reduce heat gain. Upgrading and reducing the numbers and wattage of lights will also remove a heat source, increasing HVAC efficiency. 	<p><i>Lead:</i> Building Maintenance</p> <p><i>Support:</i> Env Mgmt, Library Services</p>	2011/12
39.	<p>Voltage reduction: Assess potential to install voltage units, reducing the energy consumed by between 8-15%. This will also improve the life at the assets.</p>	<p><i>Lead:</i> Env Mgmt</p> <p><i>Support:</i>, Building Maintenance</p>	2011/12
40.	<p>Kitchen and toilets: Upgrade fittings and features as part of library refurbishments.</p> <ul style="list-style-type: none"> a. Upgrade bathroom fittings to include low flow and push button, change single flush toilets to dual-flush, and install waterless or low-flow urinals. b. Upgrade kitchen facilities to reduce energy consumption, including either an efficient hot water boiler or place a timer on the existing. 	<p><i>Lead:</i> Building Maintenance</p> <p><i>Support:</i> Env Mgmt, Library Services</p>	2012/13

5.2.8 Small to Medium Sized Facilities

	Action	Responsible Unit/ Branch	Due
41.	<p>Sustainable Community Facilities: implement Sustainable Community Facilities program (based on the 2009/10 Sustainable Small Facilities (SSF) program).</p> <ul style="list-style-type: none"> a. <i>Review and rate sites:</i> Use ESD Rating Tool for all Council’s medium sized facilities. b. <i>Initial Retrofit:</i> Implement small retrofit actions during rating inc. lighting, low flow water fixtures and draught proofing. c. <i>Holistic retrofits:</i> Recommended future actions for each facility and ‘potential’ ESD rating which can be reached. d. <i>Implementation:</i> Input ESD Ratings and recommended actions into Forecaster / MATE. Prioritise retrofits to ‘biggest bang for buck’ or actions which reduce heat load in summer and cold over winter. e. <i>Target:</i> Set target benchmark score to reach for each site by year and following site actions. f. <i>Review Biannually:</i> Undertake process to link ESD Rating Tool to Building Condition Reviews, to either merge or undertake at the same time. Ensure data captured is incorporated into forecaster (or MATE). g. <i>Star Rating:</i> Develop process to communicate site ratings and actions to the community. 	<p><i>Lead:</i> Env Mgmt</p> <p><i>Support:</i> Building Maintenance, Family and Children’s Services, Recreation</p>	2010/11
42.	<p>Demonstration Sites: Promote small facilities as sustainability demonstration sites. Links directly to YES Action “<i>Establish demonstration projects in public buildings (neighborhood houses, sports pavilions, schools, etc) and develop accompanying education materials and programs to guide residents in: reducing their eco-footprint and improving the environmental performance of their homes</i>”</p> <ul style="list-style-type: none"> a. Aim to have a limited number of sites where sites are accessible to the public (at specified times/dates) to show the public means for reducing eco-footprint of the building. Develop communications materials and ensure sites are accessible in manner that is least disruptive. Potential to take part in or run ‘sustainable house’ type days. Link to the Sustainable Walking Map where possible. b. 13 sites had Solar PV installed between 2008-2010 (mostly children’s centres) and grant funding stipulated significant community education and communication. Follow individual action plans to convert each site to a mini-demonstration site, and link to the Sustainable Community Facilities program (Action 41). 	<p><i>Lead:</i> Env Mgmt</p> <p><i>Support:</i> Building Maintenance, Family and Children’s Services, Recreation, Communications</p>	2011/12
43.	<p>Sustainable Sport Facilities: Develop strategy to improve the sustainability of Council’s sporting assets – reducing greenhouse emissions, water use, and waste.</p> <ul style="list-style-type: none"> a. Link to the Sustainable Community Facilities program (Action 41), and ensure new sites and re-developments incorporate significant ESD elements, potentially becoming demonstration sites (action 42). Include sports lighting efficiency. b. Investigate ways to charge users for the energy and water they consume, providing an incentive to reduce energy. c. Vic Park – As one of councils largest sites, undertake a sustainability audit to develop an action plan for efficient operation for Victoria Park 	<p><i>Lead:</i> Env Mgmt</p> <p><i>Support:</i> Building Maintenance, Family and Children’s Services, Recreation</p>	2011/12

5.2.9 Renewable Energy Generation Actions

Context: Council has a target to produce 10% of energy from local low emission sources by 2012. This will require a strong emphasis on ensuring low carbon energy generation sources are incorporated into new building and capital projects, and a renewal program for retrofitting onto existing buildings.

	Action	Responsible Unit/ Branch	Due
44.	Cogeneration: Prioritise and Incorporate Cogeneration plants to produce low-emissions electricity at FSP, CLC and RRC (Actions: 18, 25 and 31). For Council to meet the target to produce 10% Renewable Energy by 2012 and 25% by 2015, installation of these Cogeneration plants should be considered as they are by far the most significant large-scale low carbon energy generation option available. There is a very long lead-time on cogeneration or trigeneration projects, so scoping for RRC to begin ASAP to assess potential at this site.	<i>Lead:</i> Env Mgmt, <i>Support:</i> Building Projects	2010/11
45.	New Building Opportunities: Consider incorporating Cogeneration or other low emissions/ renewable energy generation technologies into any new buildings works through addition to new building standards (Action 12). a. Use any new large building as an opportunity to showcase new technologies and aim to produce a carbon neutral facility – producing more energy than it takes to run the site over the year. Different generation types will be most applicable depending on location, size and use – including cogeneration, solar, and wind. b. Any new ‘small-medium’ facility should consider including a minimum 2kW Solar PV system and solar hot water unit (where applicable). Aim to have facility carbon neutral – producing more energy than it takes to run the site over the year.	<i>Lead:</i> Building Projects <i>Support:</i> Env Mgmt:	2010/11
46.	Renewable Energy: Consider installing 15kW new solar PV (or other generation source) per annum (inc new facilities) starting 2011/12. Trial other new technologies such as wind or from exercise bikes in the Council Gyms as they come available. Focus initially on sites with low use- especially at ‘time of generation’ such as pavilions - to enhance the Feed-in-Tariff and paybacks. a. Develop a list of potential sites on Council facilities which are prioritised based on payback	<i>Lead:</i> Building Projects: <i>Support:</i> Env Mgmt, Building Maintenance	2010/11
47.	Sustainable Hot Water: Consider installing sustainable hot water such solar hot water or solar heat pumps to help Council reach its goal of 10% renewable energy generation by 2012. a. Develop a list of potential sites on Council facilities which are prioritised based on payback b. Install solar hot water or solar heat pumps on 5 facilities p/a (inc new facilities).	<i>Lead:</i> Building Projects <i>Support:</i> Env Mgmt, Building Maintenance	2011/12
48.	Grants and Innovative Approaches: a. Assess and utilise grants and rebates available to implement renewable energy technology. b. Investigate opportunities to invest in new large scale renewable energy generation options as they come available. c. Investigate potential to develop an Energy Park (as other Council’s have – e.g. Moreland (CERES), Brimbank), potentially based on “Future Energy’s” Hepburn model. d. Install solar powered public lights when technology, price, and installation context are appropriate (i.e. Parks).	<i>Lead:</i> Env Mgmt	2013-15

5.2.10 Sustainable Public Lighting Action Plan

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Context: Council managed Sustainable Public Lighting accounts for 36% emissions of Councils entire emissions. A very significant reduction will occur from the retrofit of the most common Mercury Vapour 80 Watt globes to more efficient low wattage globes, but beyond this there are still significant opportunities to retrofit other light types, optimise the lighting configuration and use, and implement further opportunities as they come available.

	Action	Responsible Unit/ Branch	Due
49.	<p>Update Yarra’s Public Lighting policy. Links directly to YES Action “<i>Implement the Sustainable Public Lighting Action Plan to improve the energy efficiency of public lighting in selected street areas and in individual sites like parks or major developments. Partner with host distributors and neighbor councils to implement site specific programs.</i>”</p> <p>Update Yarra’s Public Lighting Policy to incorporate new lighting standards, technologies and performance expectations, including specific light types / principles for different lighting needs E.g. Parks, roads, bike paths etc. Facilitate regular streetlighting working group meetings, and maintain contact with relevant distribution businesses.</p>	<p><i>Lead:</i> Transport, Env Mgmt <i>Support:</i> Urban Design, Open Space, Recreation</p>	2011/12
50.	<p>New Lighting Approval Processes: for new lighting works and installations.</p> <p>Re-asses the process of approval and standards for projects which involve new lights for the municipality. Develop Specifications / ‘tech notes’ for preferred lighting types and steps for installation to assist standardization and support staff and developers, and establish process to ensure they are followed.</p>	<p><i>Lead:</i> Transport, Env Mgmt <i>Support:</i> Transport, Urban Design, Open Space, Recreation</p>	2011/12
51.	<p>Bulk lighting changeover: Change current lighting stock to more efficient lighting options that meet relevant lighting standards and performance levels. Liaise with internal and external stakeholders to ensure funding, support and process to undertake bulk change of:</p> <ol style="list-style-type: none"> Mercury 80W lamps to energy efficient models in line with distribution business timelines (most were changed in 2010). Non-MV 80 lighting stock (once MV 80 changeover complete). Work with Vic roads to implement retrofits to non-residential lighting stock. 	<p><i>Lead:</i> Env Mgmt <i>Support:</i> Transport, Urban Design, Finance,</p>	2010/11
52.	<p>New Lighting Technology Trials: Work with lighting suppliers and Distribution Businesses to identify emerging lighting technologies and trial them in appropriate areas for their effectiveness and applicability, especially non MV80’s. Incorporate actions into capital works program.</p>	<p><i>Lead:</i> Env Mgmt <i>Support:</i> Transport, Urban Design, Open Space</p>	2012-15

5.2.11 Transport: Fleet and Employee Commute Actions

Council’s own fleet is responsible for nearly 1000 t CO₂, increasing in the last couple of years as more services are brought back in house. Council can also influence how Council employees travel to and from work, and these emissions are captured in the inventory. Significant action in this space has already occurred with a key role to develop / update goal, policies and procedures. Links to YES Objective “Reduce environmental impacts of transport from council operations and where council has direct influence or control in the community”

	Action	Responsible Unit/ Branch	Due
53.	<p>Sustainable Fleet Purchasing and Utilisation Policy: Develop a Fleet Purchasing and Utilisation Policy (linked within existing fleet policy and upcoming fleet review) that incorporates triple bottom line measures to assess suitability of the fleet selection. Include metrics such as utilisation, CO2 emission, fleet fuel efficiency, fleet travel (kms), percentage of staff using sustainable transport to get to work, cost/benefits and life cycle costs. Links directly to YES Action “Ongoing rationalisation of the vehicle fleet (reduce numbers and travel)”. Key actions include:</p> <ul style="list-style-type: none"> a. Fit for purpose vehicles (based on TBL criteria) for all ‘categories’ and uses, including Commuter, Pool and Package vehicles. b. Trial new vehicle technologies such as hybrid and electric, as a community leadership role. c. Investigate actions to increase bikes in Council fleet. d. Investigate actions to increase the number of available car share cars (i.e. not associated with a particular staff member) to reduce the need for Commuter or Package cars and improve community access to car share vehicles. e. Work with OD to find other ways to entice people to work at Yarra beyond getting a vehicle in their package (inc. financial incentives). Organisation will need to the appropriate number of cars needed for operational purposes for this to succeed. f. Improve end of use facilities for active transport users, including showers, lockers, and undercover parking for all bikes. g. Investigate alternative means to patrol clearways rather than needing to drive around constantly to check. 	<p><i>Lead:</i> Fleet Management</p> <p><i>Support:</i> Org Dev, HR Services, Parking Services, Transport, Env Mgmt</p>	2010/11
54.	<p>Update Staff Green Travel Policy. The existing Green Travel Policy was completed in 2005 and should be updated. Use data to show the benefits, and promote widely across Council. Links directly to YES Action “Continue to implement the staff Green Travel Plan to reduce the number of single occupancy vehicle trips to and from work and to reduce the impact of council’s fleet by facilitating staff travel by walking, cycling, and public transport.”</p>	<p><i>Lead:</i> Transport</p> <p><i>Support:</i> Env Mgmt</p>	2010/11
55.	<p>FBT: Advocate to the Federal Government to reduce the Fringe Benefits Tax incentive to promote financial benefits for staff that drive their cars a minimum of 15,000 kms per year.</p>	<p><i>Lead:</i> Evv. Mgmt</p> <p><i>Support:</i> Fleet Management, HR Services</p>	2011/12
56.	<p>Specifications for Contractor Fuel Use. Develop specifications for contractor sustainability when releasing tenders for Council contracts (i.e. Waste) such as ‘to reduce sustainability footprint where possible’ and to ‘monitor and report on utility consumption’. Incorporate figures into Councils’ Utility and Greenhouse Inventory where possible.</p>	<p><i>Lead:</i> Contract Management</p> <p><i>Support:</i> Fleet Management,</p>	2010/11

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		Env Mgmt	
57.	<p>Shuttle Bus: Ensure shuttle bus is efficient and used efficiently. Review the community transportation provided by council and existing policy.</p> <p><u>PROCESS:</u></p> <p>a. Continue the use of the Shuttle Bus between Town hall for ‘All of Yarra’ events</p> <p>b. Ensure bus is efficient when replaced.</p>	<p><i>Lead</i> Community Services</p> <p><i>Support:</i> Fleet management</p>	2011/12

Glossary

CNAP – Carbon Neutral Action Plan (This Plan)

CO₂ – Carbon Dioxide / Greenhouse Gas Emissions

CTH – Collingwood Town Hall

CPRS – Carbon Pollution reduction Scheme

ED – Energy Doctor (Consultants who undertook audit reports of large facilities – now called CarbonetiX)

ESD – Ecologically Sustainable Development (sustainability)

FiT - State Government Premium Solar Feed in Tariff

FTH – Fitzroy Town Hall

FSP – Fitzroy Swimming Pool

GAP – Greenhouse Action Plan (previous Council Plans to reduce emissions)

GDP – Gross Domestic Product

GHG - Greenhouse Gas (emissions)

GJ – Gigajoules

HVAC – Heating, Ventilation, and Air-conditioning

KPI - Key Performance Indicator

kW/kWh – Kilowatt/ Kilowatt Hours (electricity)

MAV - Municipal Association of Victoria

MEFL – Moreland Energy Foundation Ltd

MV80 – Mercury Vapour 80 Watt (streetlights)

NAGA - Northern Alliance for Greenhouse Action

PPM – Parts Per Million (greenhouse gas emissions in the atmosphere)

PV – Photo Voltaic (solar electric panels)

RTH – Richmond Town Hall

RRC – Richmond Recreation Centre

SSF – Sustainable Small Facilities

TBL – Triple Bottom Line

TCO₂ – Tonnes CO₂ Equivalent

VSD – Variable Speed Drive

YES – Yarra Environment Strategy (2008)

Appendix 1: Relevant Council Policies, Strategies, and Plans

Relevant Council Policies and Strategies

- Council Plan
- Yarra Environment Strategy (2008)
- Yarra Greenhouse Action Plan (2004) and Update (2006)
- Sustainable Public Lighting Action Plan (2007)
- Public Lighting Strategy
- Green Travel Plan
- Sustainable Small Vehicle Fleet Review
- Waste Management Plan
- Draft Sustainable Purchasing Policy 2007
- Adaptive Assets Policy
- Heatwave Strategy

Relevant Plans/ Consultants Reports

- Richmond Recreation Centre Energy Audit – Energy Doctor 2006
- Richmond Recreation Centre Walk through audit – CarbonetiX 2010
- Fitzroy Swimming Pool Energy Audit – Energy Doctor 2006
- Collingwood Leisure Centre ESD Redevelopment and existing site
 - Energy Doctor 2006, and RobLec 2009;
 - BRT Consulting, and Sustainable Built Environment
- Richmond Town Hall Energy Audit – Carbonetix 2008
- Collingwood Town Hall Energy Audit – Carbonetix 2008
- Fitzroy Town Hall Energy Audit – Carbonetix 2008
- Sustainable Small Facilities Sustainability Audits
 - Ironbark Sustainability 2009
 - Energy return 2010
- Richmond Recreation Centre Water Audit (WaterMAP) - Hydratech 2008
- Richmond Recreation Centre Water Audit - Hydratech 2008
- Fitzroy Swimming Pool Energy Audit (WaterMAP) 2008
- Collingwood Leisure Centre Energy Audit (WaterMAP) 2008
- Richmond Library walk-through audit, and lighting information supplied by Sustainable Solutions group
- Sustainable Public Lighting - Various reports and advice from Ironbark Sustainability
- Air-conditioning (HVAC) advice from Quirkier and CarbonetiX
- Solar Electricity (PV) information from monitoring of existing sites, and from Braemac Energy and The Environment Shop.
- Solar Hot Water information from monitoring of existing sites, and from SolarFlow

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- Various reports and information from Cities for Climate Protection, EcoBuy, NAGA, and MEFL.
- Voltage Reduction Devices: Monitoring of existing device at RRC and EOI responses from:
 - Exact Energy, Cockburn Powerstar, and Energy Wise
- Various Cogeneration Reports for Fitzroy Swimming Pool and Collingwood Leisure Centre from
 - Bridgewater Engineering, BRT Consulting, and Sustainable Built Environment
 - Materials provides through tours of operating cogeneration at Melbourne Sports and Aquatic Centre and City of Melbourne (CH2)

Appendix 2: Review of Actions from 2004, 2006 Greenhouse Actions Plans

<u>CCP Sector</u>	<u>Action</u>	<u>Responsible Branch /unit</u>	<u>Prio rity</u>	<u>Progress Update 2006</u>	<u>Progress Update 2010</u>
Buildings	Implement and maintain Utility Management System (UMS)	Assets	H	<i>Action outstanding</i> – The maintenance of the UMS is currently inefficient and not optimal from an organisational perspective. The process for maintaining and reporting on information about greenhouse emissions needs improvement.	Complete UMS updated but processes needs further review.
	Install energy efficiency computer equipment	Information Services	H	<i>Action outstanding</i> – All CRT monitors have been replaced with LCD flat screens, saving approximately 162.5 tonnes CO ₂ e each year.	Partially complete Need to action Energy Star, tendering
	Develop an ESD code / contract specification for new council buildings and renovations	Env Management, Assets	H	<i>Action outstanding</i> – budget item for 2006 – 2007. The aim is to develop an ESD policy that applies to all new council buildings and renovations, with standards for construction and demolition, energy efficiency, materials selection, water use, internal environment.	<i>Incomplete</i> To be actioned in this CNAP.
	Develop a Materials Policy	Assets	H	<i>Action outstanding.</i> The aim is to develop a standard building materials policy based on environmental performance and environmental impact criteria. This may be part of the ESD code described in above action.	<i>Incomplete</i>
	Assess the feasibility of implementing energy audits (RTH and CTH).	Assets	H	<i>Action outstanding</i> – Audits complete but some actions still need to be implemented as detailed in this CNAP.	Complete Implementation occurring
	Consider computerised energy management	Assets	M	<i>Action outstanding.</i> Aim to assess the feasibility of developing a computerised building energy system to trend power usage and efficiency of appliances etc for all buildings. Also consider incorporating “power correction factor” systems into energy supply contracts.	<i>Incomplete</i> Link to CNAP through HVAC, and Voltage Reduction actions
	Manage energy supply to Yarra buildings	Assets	H	<i>Action outstanding.</i> Aim to evaluate Yarra’s energy supply contract and investigate alternative arrangements such as energy performance contracts, aiming to improve the efficiency of council’s energy consumption.	Partly Complete EPC seen as unnecessary due to Adaptive Assets, but will be re-evaluated
	Investigate the potential for solar hot water heating in leisure centres	Yarra Leisure, Assets	M	<i>Action outstanding</i> –Energy audits of FSP and RRC identified solar heating as a viable action with long payback periods. The potential for cogeneration at these sites also increases the payback periods, seeing	Complete Long paybacks so other actions implemented first

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<u>CCP Sector</u>	<u>Action</u>	<u>Responsible Branch /unit</u>	<u>Prio rity</u>	<u>Progress Update 2006</u>	<u>Progress Update 2010</u>
				other actions as a greater priority.	
	Investigate potential for timers in all leisure centres	Yarra Leisure, Assets	M	<i>Action outstanding</i> – An energy audit of Fitzroy pool identified potential savings of timers on spa pumps, spa jets, steam room, sauna, and hot water circulation pumps. Timers have been installed, with estimated savings of 48 tonnes of CO ₂ e each year.	Complete
	Investigate thermal pool blankets for Collingwood and Richmond pools	Yarra Leisure, Assets	H	<i>Action outstanding.</i> Pool blanket for CTH	Complete CTH to be actioned as part of redevelopment
	Install external blinds at Richmond Leisure Centre	Yarra Leisure, Assets	M	<i>Action outstanding.</i> In place of blinds, windows have been tinted to block heat transfer. Difficult to estimate savings	Complete
	Audit air conditioning equipment	Assets	H	<i>Action outstanding.</i> An initial mechanical audit of air conditioning plant at the 3 town halls and Richmond library has identified the required capacity of new system. Energy efficiency needs to be considered closer to time of commissioning.	Partially complete. New system installed at Rich Lib. Underway for CTH. Planned in CNAP.
Vehicle Fleet	Finalise and implement green travel policy	Org Development, CEO	H	The green travel policy has not been formally adopted by council, but many actions have been implemented, including a staff car pooling system, provision of subsidised public transport tickets, and incentives for cycling to and from and for work.	Complete Planned for Update in CNAP
	Finalise the Passenger Fleet Vehicle Policy and Procedures	Executive	H	The suggested measures for reducing fleet size, reducing vehicle size, and minimising life cycle costs were retained in the Vehicle Fleet Policy.	<i>Incomplete</i> To be actioned through CNAP
Public Lighting	Prepare a comprehensive street lighting policy	Infrastructure Env Management	H	A policy was adopted by Council in February 2005 that included environmental and public health considerations, and promoted the investigation of using more energy efficient lighting.	Complete Planned for Update in CNAP
	Purchase Green Power for streetlights	Infrastructure	H	<i>Action outstanding</i> - Investigate the potential to increase the current level of 15% Green Power to 25% for streetlights	Complete Increasing to 100% by 2012
Waste	Revise the 1997 Yarra Waste Management Strategy	Environmenta l Management	M	<i>Action outstanding</i> – Incomplete. In the meantime, council offices have received accreditation under the Waste Wise program, and leisure centres will soon be audited as a	Complete

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<u>CCP Sector</u>	<u>Action</u>	<u>Responsible Branch /unit</u>	<u>Priorty</u>	<u>Progress Update 2006</u>	<u>Progress Update 2010</u>
				requirement for accreditation.	
Other	Assess the feasibility of creating a CCP™ officer or energy manager position	Executive	L	<i>Action outstanding</i> - options for energy management within existing resources are being tested.	Complete Greenhouse Accounting Officer employed in 2008.
	Increase staff awareness and action about greenhouse	Organisational Development	H	<i>Action outstanding.</i> It is intended that information energy efficiency at work be developed for staff induction kits, and signs about energy efficiency be placed around buildings and near appliances.	<i>Incomplete</i> To be actioned through CNAP as GreenTeam and Utility Reporting
	NEW from GAP review (2006)			Conduct walk-through energy audits of Council buildings	<i>Incomplete</i> To be actioned through SSF ratings
	NEW from GAP review (2006)			Plan to establish a model environmental demonstration centre	Partially complete Holden Street Neighbourhood Houses retrofitted, Burnley to come

Appendix 3: Yarra Community Greenhouse Programs

Programs underway (30 June 2010):

Yarra Energy Foundation.

Council is establishing the Yarra Energy Foundation to drive the wholesale community change needed for Yarra to become carbon neutral by 2020. Council is providing \$300,000 p.a. to establish the foundation to oversee and deliver greenhouse-related energy and water programs to the community. It is envisaged that it would target households and small to medium sized business initially, overcoming existing barriers to deliver targeted low cost audits and retrofits to these sectors. Together, these sectors account for about 50% of the greenhouse gas emissions from Yarra. The Foundation will develop targeted programs for low income households, renters, apartment dwellers, and those about to build or renovate.

Towards Zero Net Emissions for the NAGA Region

Towards Zero Net Emissions for the NAGA Region (TZNE) represents a major collaboration between the NAGA members (9 Council's & Moreland Energy Foundation). It aims to achieve significant reductions in carbon emissions in the fast-growing region of northern metropolitan Melbourne, in which 25% of the city's population live. The strategy details twenty actions to be implemented, of which Yarra is actively participating in 5. For more information See: <http://www.naga.org.au/naga/project/151/>

Greenhouse Savers 2 Program

The Greenhouse Savers 2 program is an expansion of the Greenhouse Savers pilot program run in 2009 (see below). Building on the Pilot Program *ecoMaster* will audit resident's houses; install and energy meter, and undertake a sustainability retrofit. Participants pay \$1,250 up front and receive 50% rebate after entering 12 months worth of energy consumption data. The program is aiming to recruit 100 households. Households in selected streets in Clifton Hill and Richmond received an invitation to the program and received a follow-up phone call.

Yarra Sustainability Awards

The Yarra Sustainability Awards are an annual Awards program (begun in 2010) to reward and celebrate the efforts of business, residents, community organisations, groups and architects and designers in their efforts towards environmental sustainability. In 2010, Council received 44 entries across five categories. Winners were announced at Council's World Environment Day event in June.

Energy Savers Household Retrofit Program - Council partnered with the City of Melbourne to engage a panel of providers to offer voluntary free/ low cost audits and retrofits for all interested residents. These programs are linked to the Victorian Government's Victorian Energy Efficiency Target (VEET) scheme and applicable Federal Government initiatives. Council's role was to promote the programs; the providers will deliver the retrofits.

Energy and Water Task Force- Residents who have a pension or healthcare card are eligible for even greater support to improve energy and water efficiency through Sustainability Victoria's Yarra & Darebin (south) Energy & Water Task Force. Providers, Low Energy Supply and Services (LESS), are offering a free comprehensive household retrofit to 800 low income households in Yarra. The City of Yarra is working closely with LESS to promote the program through Home and Community Care (HACC) and financial counselling services.

Talking my language

Yarra City Council is a partner in the Talking My Language program led by Darebin City Council. This project has been successful in obtaining Accord funding and will be rolled out in the second half of 2010. The project seeks to develop culturally specific information materials and resources for culturally and linguistically diverse communities.

Recent programs:

Greenhouse Savers Pilot Program – In 2009 EcoMaster delivered this pilot behavioural change program for Council. It involved household audits, managing minor retrofits, and modifying everyday practices around energy management. It was delivered to 60 households in Abbotsford selected to represent the demographics of Yarra. Detailed monitoring will provide a basis for a potential future large-scale roll out of the program. Council has contributed \$60,000 to this project.

Solar Yarra - After an expression of interest, Council engaged Eco-Kinetics to offer 1KW solar systems to Yarra residents at a reduced cost, based on the Federal Government rebate and bulk purchasing. Council's role was to promote the offer to residents, mostly through existing means, and Eco-Kinetics undertook all communications with residents and supported all stages of their installation.

Free efficient light globe and showerhead exchange - In June-August 2008 Council partnered with Low Energy Supply and Services (LESS) on a program offering free efficient light globes and a showerhead exchange. Council did not contribute any funds for this program. LESS operated the door-to-door program and financed it through sale of the greenhouse credits for the light globes. City West Water and Yarra Valley Water contributed the showerheads.

Water Savers - In 2006 Council partnered with City West Water and the Department of Sustainability and Environment to deliver minor retrofits and behaviour change coaching to households in North Fitzroy

Ongoing Education/ Information provision programs

Council showerhead exchange (ongoing) - free showerheads are offered from the Richmond and Collingwood Town Halls and the Collingwood Leisure Centre.

Worm Farms and Compost Bins – Residents can purchase (and have delivered) Worm Farms and Compost Bins from Council at Cost price. During composing month of May in 2009 and 2010, these have been offered to residents at a further discounted rate.

EASY Trailer – the Education About Sustainability in Yarra trailer, used for schools, other community groups, and at events free of charge to educate on waste reduction, sustainable transport, and sustainable purchasing.

Forums and Events – various events and seminars run and sponsored by Council on ways residents can reduce the environmental footprint.

Solar in Schools – Thirteen council buildings including eleven children's centres, north Carlton Library and Holden Street Neighbourhood House have had solar panels erected with assistance from State and Federal Funding. Council also contributed \$30,000 to the project. As well as contributing to Council's goal to contribute 10% renewable energy by 2010, the sites are being used to educate the community on renewable energy and sustainability.

Maternal and Child Health Services- Council is delivering environmental education sessions to new parents in Yarra through the Maternal and Child Health new parent groups and has developed an Environmental displays for each Maternal and Child Health Centre. The displays have also been erected in seven childcare centres.

Home and Community Care Services (HACC) - Council has trained Home and Community Care (HACC) home maintenance workers to be able to undertake basic environmental retrofits of HACC client homes. The Home maintenance service has been offering draught proofing and the installation of energy efficient light globes as part of their services.

Library Services- Yarra Libraries have increased their environmental resources which includes an expanded sustainable living book collection. Residents are also able to borrow a Power Mate (home energy auditing tool) and lux meter to assist them in reducing their household's greenhouse gas emissions. There are ten Powermates and two lux meters available to borrow from Yarra Libraries.

Environment Network for Community organisations

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Yarra City Council and North Yarra Community Health are co-convening an Environment Network for community organisations in Yarra. The Network aims to help resource and support organisations to address their own environmental impact as well as support the communities they work with.

Support for Business

Energise Business and GreenStar Business - Since 2007 Council has participated in these programs aimed at improving the sustainability of local small to medium enterprises (SMEs). These programs included behaviour change and retrofits for SMEs. They also included trials of the use of ESCOs (energy service companies) to deliver energy efficiency measures.