From: official information
Sent: Friday, 21 May 2021 13:56
To: [redacted]
Cc: official information
Subject: RESPONSE: LGOIMA 21116 - [redacted] - Carbon Footprint Archives
Attachments: 2005 Local Action Plan for Climate Change Milestone 3.PDF; CCP_GHG data Hamilton_ 2001 and 2010 data.XLS

Kia Ora,

I refer to your **information request below**, Hamilton City Council is able to provide the following response.

Please see the attachments for information regarding your request.

- Spreadsheet containing data from 2001 and 2010.
- Local Action Plan from 2005 which includes 2001 footprint, as well as targets and actions.

We are refusing your request relating to any information from the 1990's under s 17(e) of LGOIMA. Despite reasonable efforts to locate any information, no relevant information was found.

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Kind Regards,

Tatiyana | Official Information & Legal Support Advisor
Legal Services & Risk | People and Organisational Performance
Email: officialinformation@hcc.govt.nz

Hamilton City Council
Te kaunihera o Kirikiriroa

Hamilton City Council | **Private Bag 3010** | **Hamilton 3240** | **www.hamilton.govt.nz**
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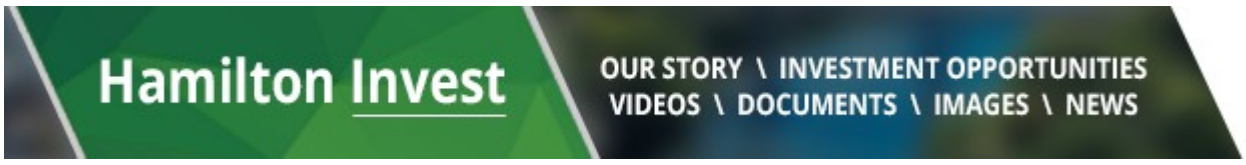


-----Original Message-----
From: [redacted]>
Sent: Monday, 5 April 2021 9:52 AM
To: "info@hcc.govt.nz" <info@hcc.govt.nz>
Cc: "Martin Gallagher" <Martin.Gallagher@council.hcc.govt.nz>, "Sarah Thomson" <sarah.thomson@council.hcc.govt.nz>, "Maxine Van Oosten" <maxine.vanoosten@council.hcc.govt.nz>, "Ewan Wilson"

<ewan.wilson@council.hcc.govt.nz>, "TOTI Charitable Trust" <info@toti.co.nz>
Subject: OIA re carbon footprint archives

Kia ora
Official Information Request re Hamilton's carbon footprint archives.
Could you please provide to me 'from the archives' council reports relating to Hamilton's carbon footprint. The city council began gathering this information when a member of ICLEI back in the 1990s-2000s and I am seeking information on the time period covered by the data gathering and reports with specific information relating to the city carbon footprint at this time.

Diana Shand was ICLEI's New Zealand co-ordinator in the early 2000s and my recollection is that she supervised the collection of city data by city council staff for some of these reports? Some may have been done in association with Waikato Regional Council who were also members of ICLEI at the time. :

I have copied some city councillors who have an interest in this topic, into this memo.
[redacted]

Hamilton City Council's
Communities for Climate Protection Programme

LOCAL ACTION PLAN

(MILESTONE 3)

Hamilton City Council
Te kaunihera o Kirikiriroa

This publication is produced by Hamilton City Council as a participant in the Communities for Climate Protection Programme.

The Local Action Plan on Global Warming is a mechanism for Council to achieve its reduction targets committed to in Milestone 2. It is Council's blueprint for putting together a set of effective and practical measures to use renewable energy, use energy more efficiently and to reduce greenhouse gas emissions generated from council operations and from the community, in line with NZ's international and national commitments.

It will help to improve the city's liveability through sustainable resource use, minimising our contributions to global warming, and infrastructure planning that accommodates climate change.

Contents

1. Introduction

Hamilton City Council, as a member of the Communities for Climate Protection-New Zealand Programme (CCP-NZ), is part of an international campaign to assist Councils worldwide to reduce greenhouse gas emissions. CCP-NZ is a New Zealand government initiative delivered by the International Council for Local Environmental Initiatives (ICLEI).

Hamilton City Council resolved to participate in the CCP-NZ Programme in October 2004. The achievement of the following five milestones was endorsed in this resolution:

- Milestone 1 – Conduct an inventory and forecast for community and corporate (council) greenhouse gas emissions
- Milestone 2 – Establish emission reduction goals
- Milestone 3 – Develop and adopt a local action plan
- Milestone 4 – Implement the local action plan
- Milestone 5 – Monitor and report on achievements

Each milestone has an internal corporate component and a community component. Hamilton City Council has currently achieved Milestone 1.

Hamilton was one of the first local governments in New Zealand to join this international programme.

2. Climate Change – a background

Climate change or global warming refers to the progressive gradual rise of the Earth's average surface temperature thought to be caused in part by increased concentrations of greenhouse gases (GHG's) in the atmosphere which trap some of the heat the earth radiates back into space.

Concentrations of these atmospheric gases remained approximately constant for thousands of years. The sharp increase reported in concentrations of greenhouse gases is due to human activities, especially during the last century.

Table 1 shows the main greenhouse gases of concern and the human activity related source.

Greenhouse gas	Major anthropogenic sources
Carbon dioxide (CO2)	Fossil fuel combustions, land use conversion, cement manufacture
Methane (CH4)	Fossil fuels, organic waste, livestock
Nitrous Oxide (N20)	Fertiliser use
CFC-12	Liquid coolants/refrigerants, foams
HCFC-22	Liquid coolants/refrigerants, foams
Perfluormethane (CF6)	Production of aluminium
Sulphur hexafluoride (SF6)	Dielectric fluid

The third scientific assessment report of the Inter Governmental Panel on Climate Change (IPCC) found that:

- The global average surface air temperature has increased approximately 0.6°C since 1861 (when instrument records began)

- The 1990s were the warmest decade and 1998 the warmest year on record

- The average global surface temperature is projected to increase by a further 1.4 – 5.8°C relative to 1990 by 2100. This rate of warming is greater than earlier projections, is much greater than observed changes during the 20th century and is very likely without precedent during the last 10,000 years

Since the Industrial Revolution, the concentration of these gases, most notably carbon dioxide, has been increasing rapidly. The clearing of vast areas of vegetation has reduced nature's ability to remove carbon from the atmosphere and store it in the soil and as biomass.

Although occurring in much smaller quantities than carbon dioxide, other gases produced by human activities, such as methane, nitrous oxide and chlorofluorocarbons, have a much greater potency or 'global warming potential'. For example, methane, which is generated from waste landfills and agricultural activities, has a global warming potential 21 times that of carbon dioxide.

The lifetime of each gas in the atmosphere also determines its contribution to global warming, with some gases continuing to affect our climate hundreds of years after being released. Therefore, regardless of future emission levels, some global warming will occur due to past and current greenhouse gas emissions.

Scientists predict that even relatively small increases in the average atmospheric temperature, for example, in the order of two degrees Celsius (2^0C), could lead to significant social, environmental and ultimately economic consequences. The environmental consequences of climate change is being witnessed more repeatedly in more frequent and severe storms, coastal flooding and erosion, damage to coastal ecosystems and infrastructure, and the spread tropical insect pests, weeds and mosquito-borne diseases. These events often lead to additional costs for water supply, sewerage and stormwater systems, flood mitigation and building construction.

The potential for extreme weather to impact on the bottom-line has seen climate change emerge in recent years as a vitally important consideration for investment analysts when developing financial models – especially those covering the most vulnerable sectors of tourism, agriculture, energy and insurance.

2.1 Policy Framework

Undoubtedly, greenhouse emissions will continue to grow without vigorous action by local governments, the commercial and industrial sector and individuals.

The New Zealand Government has ratified the Kyoto Protocol and committed to an objective of setting NZ's total gross emissions towards a permanent downwards path by 2012. The Kyoto Protocol aims to stabilise greenhouse emissions at levels below those that are predicted to cause dangerous interference with the global climatic system. Most Kyoto Protocol nations have agreed to reduce greenhouse emissions by at least 5% relative to 1990 levels within the period 2008 – 2012.

New Zealand's target is to reduce its greenhouse gas emissions to the level they were in 1990, or take responsibility for excess emissions. Achieving this target requires a substantial improvement in current performance given that New Zealand's greenhouse emissions have increased by 22.5% since 1990.

Hamilton City Council has officially adopted the principles and practices of Agenda 21 and these now underpin the Environmental Policy and the LTCCP. As a guiding document, this policy refers to "making sustainable use of natural resources and conserving non-renewable resources through efficient use and careful planning" and also "minimising the creation of all forms of waste and, at all times, viewing waste as a resource with the potential for reuse and recycling". Hamilton City Council has made a formal commitment to actively participate in specific programmes managed by, and as a member of ICLEI and in particular, the Communities for Climate Protection (CCP) - New Zealand Programme.

2.2 The local context

The New Zealand Climate Change Office (NZCCO) has been established as a business unit within the Ministry for the Environment responsible for leading the development, coordination and implementation of whole-of-government climate change policy. Climate trends are monitored by the NZCCO, which has predicted impacts of a moderate rate of climate change for the Waikato, including changes in average temperature, sea level rise and rainfall patterns. In general, Waikato, like much of the west coast of New Zealand, is likely to become warmer and wetter. Changes to climate include:

- Average temperature increases of 0.5 – 0.7°C, strongest warming in winter, temperatures up to 3°C warmer over the next 70 – 100 years

- Up to 20% wetter with more varied rainfall patterns and flooding up to four times as frequent by 2070

- Snow cover will decrease, snowlines rise and shortened duration of seasonal snow lying

- An increase in the mean westerly wind flow across New Zealand

- Sea level rises of 30-50 cm (New Zealand average) between 1990 and 2100, accelerating the historical trend and an increased frequency of heavy sea swells in regions exposed to prevailing westerlies

2.3 Why Hamilton Needs to Respond to the Challenge

Hamilton's total and per capital energy use and its contribution to national and global greenhouse gas emissions are relatively high and increasing. The major contributor to greenhouse gas emissions in the Hamilton is the combustion of non-renewable fossil fuels.

There are real risks to the welfare of the New Zealand community and to the natural environment if these issues are not addressed. In the short term, the costs are in the form of pollution, economic inefficiency and environmental damage. In the medium to longer term, the major potential hazards arise from the enhanced greenhouse effect and global climate change.

Council can exert a major influence on energy use and greenhouse gas emissions within Hamilton City.

3. Greenhouse Gas inventory: baseline (2000/01) and forecast emissions profile

In order to set targets and track progress, it is necessary to undertake an initial inventory of greenhouse gas emissions. The 2000/01 financial year was chosen as Hamilton's baseline year and emissions were categorised as either 'corporate' (directly from Council activities) in origin or 'community' in origin. This milestone was achieved and awarded 26 July 2005.

The corporate audit detailed the emissions from council operations including landfill, business units, swimming pools, streetlights and council vehicles. The community analysis assessed the community's greenhouse gas emissions resulting from transport, waste generation as well as industrial, commercial and residential energy use.

Combining this data with predictions about changes in population, energy use and waste generation allowed a forecast up to 2009/10, of where and by how much greenhouse gas emissions are likely to increase without intervention (business as usual).

The baseline data will enable the emissions savings to be measured once actions are implemented.

3.1 Corporate (Hamilton City Council) Emissions

As one of the largest electricity consumers in the Waikato, in 2001 Council used around 145 terajoules (TJ) of fossil energy, mainly as electricity (62%) and gas (28%) with the balance petroleum fuels (7%).

Council makes a significant contribution to the city's greenhouse emissions. Analysis undertaken showed that Council's greenhouse gas emissions were 9,000 tonnes of carbon dioxide equivalent (CO_2e) in 2000/01 (Figure 1).

Based on a 'business as usual' scenario, it is estimated that by the year 2010 council activities will be responsible for greenhouse gas emissions of almost 17,400 tonnes CO_2e - a 93% increase (Figure 2).

The treatment and delivery of water, sewage pumping and treatment were the largest contributors to Council's emissions (32%), followed by Council buildings (26%), street lighting (18%) and waste (12%). Vehicles contributed 10% to Council's emissions.

The relative contribution of each operation's area to total emissions has altered since 2001, reflecting a significant increase in emissions from the Water/Sewerage sector arising from an upgrade to Council's wastewater treatment facility. Despite this, total emissions relative to a Business As Usual (BAU) basis have reduced due to the ongoing success of Council's Corporate Energy Management Programme started in late 1999.

The Energy Management Programme's range of energy efficiency initiatives and the supply of non-fossil electricity from a generation plant at Horotiu landfill and the city's wastewater treatment plant have reduced greenhouse gas emissions by 9,950 tonnes of CO_2e over the last 6 years. For the 2004/05 year a 28% reduction in emissions was achieved against forecast.

Figure 1 - Hamilton City Council greenhouse gas emissions (actual)

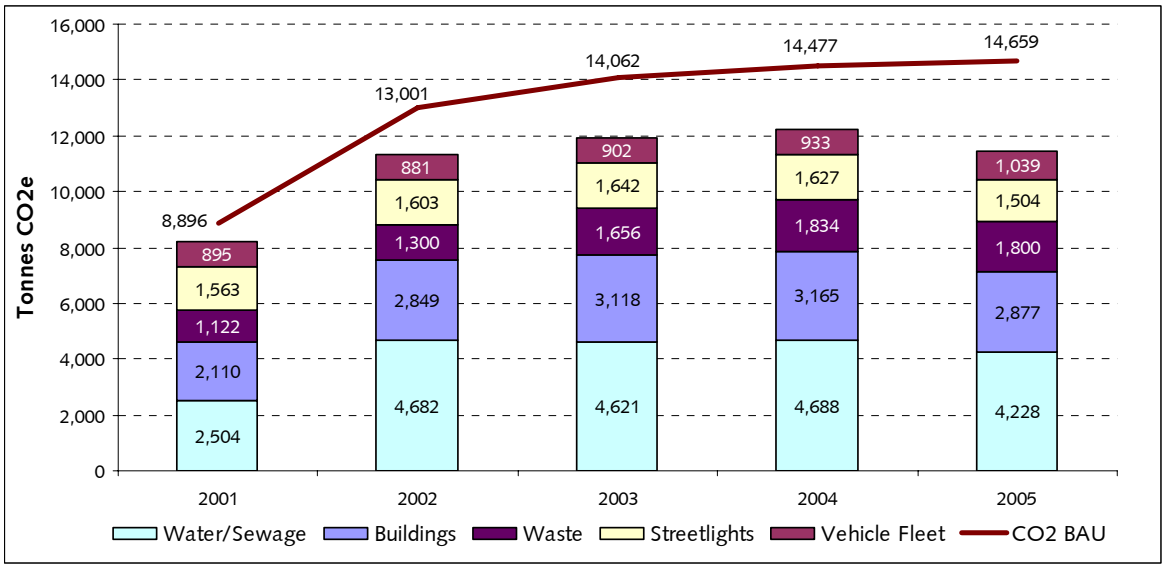
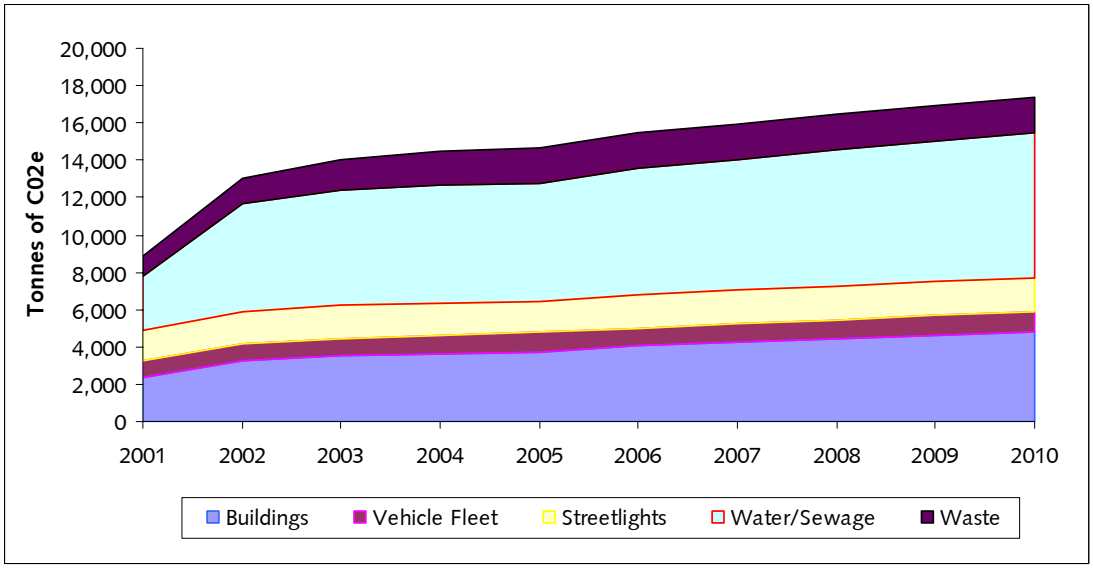


Figure 2 - Hamilton City Council greenhouse gas emissions (forecast)



3.2 Community

Hamilton's increasing total and per capita energy consumption is the major pressure leading to increasing greenhouse gas emissions and other environmental impacts associated with fossil fuel use. Factors contributing to this include:

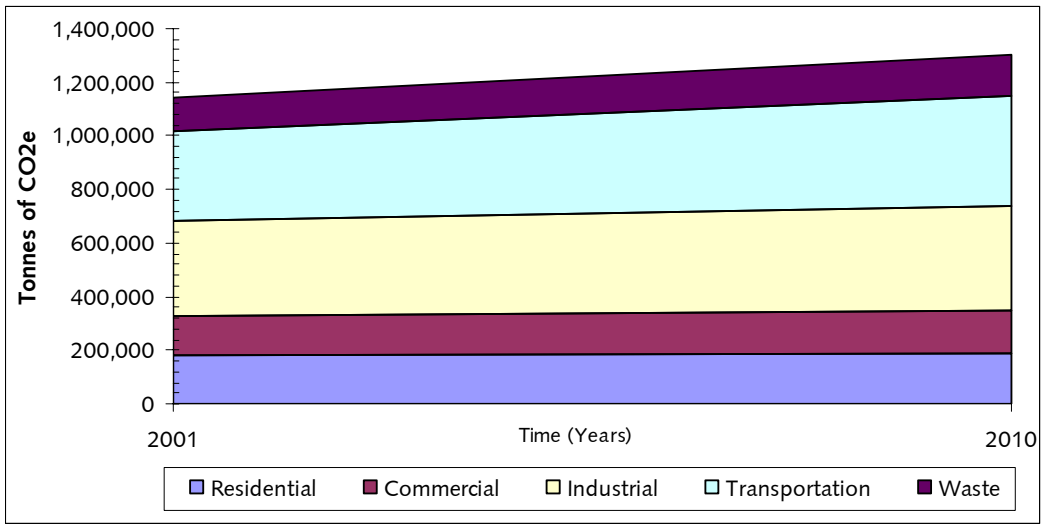
- Population growth
- Sustained economic growth
- Relatively low cost energy
- Increasing usage of private motor vehicles and freight vehicles
- Limited use and development of new renewable energy sources

- Social and cultural factors and a lack of public awareness of the impacts of energy use
- Increasing use of appliances, for example air conditioners and computers

For the community, greenhouse gases generated through the use of electricity, gas and transport fuels generated an estimated 1,144,000 tonnes of carbon dioxide equivalent (CO_2e) in 2000/01.

Based on a 'business as usual' scenario, statistical information indicates this is likely to rise to 1,301,000 tonnes of CO_2e in 2009/10 – a 14% increase (Figure 3).

Figure 3 - Hamilton City (Community) greenhouse gas emissions (forecast)



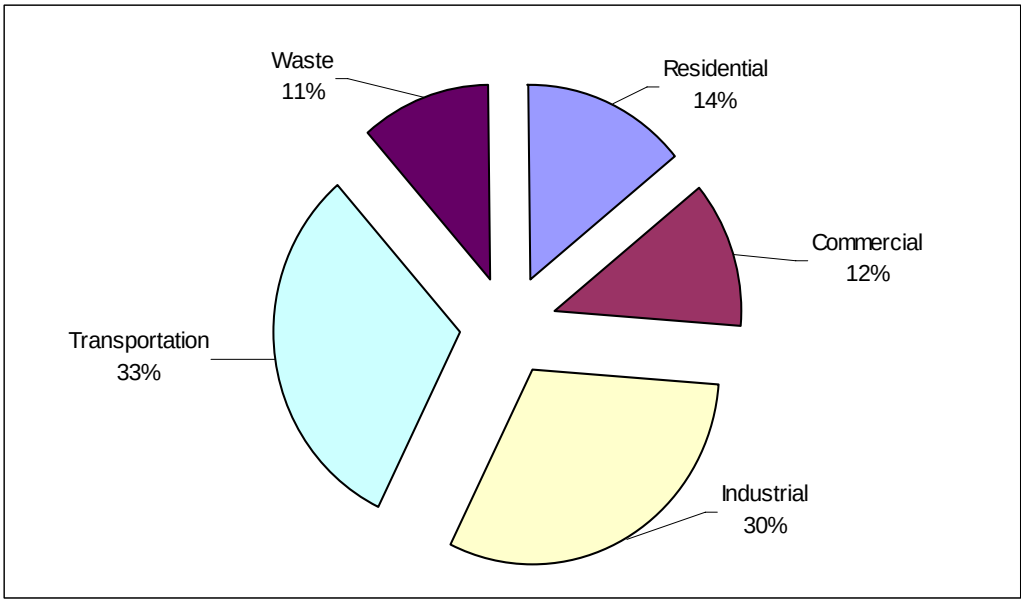
This contrasts with New Zealand's objective of a permanent downwards reduction in greenhouse gas emissions by 2010.

Figure 4 shows Hamilton's estimate of greenhouse gas emissions in 2001 included:

- 16% from electricity, gas, LPG and coal consumed in households citywide
- 12% from electricity, natural gas, coal, LPG and fuel oil consumed at commercial premises
- 32% from electricity, natural gas, coal, diesel, petrol, fuel oil and LPG consumed at industrial operations and premises
- 29% from petrol, diesel, CNG and LPG consumed by private, commercial, freight and public transport operations
- 11% from household and commercial waste sent to the Horotiu landfill site

The industrial and transport sectors are the largest contributors to overall emissions, reflecting Hamilton's role as a major manufacturing and primary processing centre and a transport and distribution hub.

Figure 4 - Hamilton City (Community) greenhouse gas emissions by source



4. Reduction goals

Having determined the quantity of greenhouse gases emitted by Hamilton city corporate and community activities, emissions reduction targets were established for both sectors as follows:

- By 2010 slow the rate of greenhouse gas emissions from Council (corporate) activities to 11% increase 2001 levels, compared to the 62% increase in 2004. By 2020 achieve a 20% reduction on 2001 levels.

- Stabilisation of greenhouse gas emissions for the community of Hamilton at 2001 levels by 2020.

The targets were chosen to present significant challenges and represent valuable reductions in emissions, while remaining attainable.

4.1 A greenhouse target for Hamilton City Council

Council intends to slow the rate of greenhouse gas emissions from Council (corporate) activities by 2010 to 11% increase 2001 levels, and by 2020 achieve a 20% reduction on 2001 levels.

It is likely that the first stage of the target can be achieved by utilising landfill gas and wastewater methane and through reduction initiatives across Council divisions.

In achieving an overall reduction of greenhouse emissions, Council intends to increase its production and purchase of renewable energy. Utilising waste resources, promoting energy efficiency and developing other sources of renewable energy will enable Council to continue providing leadership for the community by significantly reducing its own emissions of greenhouse gases.

It should be noted that greenhouse emissions could be affected by structural changes in Council operations, such as additional services, discontinuation of services or out-sourcing of services to the private sector. Transparent corrections to exclude the effect of such changes will need to be introduced.

4.2 A greenhouse target for Hamilton (Community)

Council intends to stabilise emissions from Hamilton at 2001 levels by 2020.

For Hamilton to limit it greenhouse emissions in line with the Kyoto target, it would require a major reversal in current trends of population growth, vehicle use, and commercial and manufacturing activity

Population growth leads to more energy being used for transport, commercial, industrial and residential activities. According to census data, the population of Hamilton is projected to grow from 120,900 in 2001 to approximately 166,600 by 2021. This is an increase of 38%.

5. Actions and policies implemented since base year (2001)

5.1 Improving the energy mix

Council and its partner WEL Green Energy, successfully installed a landfill gas powered engine at the Horotiu Landfill in October 2004. The engine drives an electricity generator (920kW) that provides power to a range of Council facilities.

A Wastewater Treatment Plant Cogeneration Facility, installed in 2003, blends bio-gas (produced by the wastewater treatment plant digestors) and natural gas to run two gas engines at Council's Wastewater Treatment Plant (WWTP). This plant has secured low cost power and heat for the site while maximising use of a renewable resource.

RESULTS
To the year ending June 2005, Council purchased over 4,000,000kWh of renewable electricity from WEL Green Energy, representing 16% of Council's total electricity requirements.
A new record was achieved this year at the Wastewater Treatment Plant Cogeneration Facility with over 33,000GJ of bio-gas being used in the gas engines. This is a 24% increase over the previous year's bio-gas production and bio-gas supplies almost 40% of the plant's energy requirements.

5.2 Buildings

Council has identified and implemented a wide range of energy efficiency and conservation measures in the past and considerable opportunity remains.

Past and ongoing initiatives include:

- retrofit of T8 fluorescent light fittings with T5 fluorescents, electronic ballasts and reflectors
- upgrading and enhancing lighting controls by installing additional switches and signs, use of daylight sensors, and intelligent lighting control
- optimised start for air-conditioning plant
- peak demand load shedding
- adjusting manual run time schedules
- adjusting air-conditioning set points according to the season
- fitting modulating control to gas boilers
- replacing diesel fired boilers with gas fired boilers
- specifying condensing gas boilers for new installations
- installation of pool covers
- an LPG fired condensing boiler to provide hot water for the Hamilton Zoo chimpanzee enclosure
- use of hot-bloc concrete to increase thermal insulation of the chimpanzee enclosure
- energy efficient design specification for the Waikato Emergency Management Centre including T5 fluorescent lighting, additional insulation, and use of natural ventilation where appropriate.

In 2003, Council's procurement policy was extended to include environmental considerations. In accordance with Council's Environmental Policy, goods and services supplied must meet high environmental standards in their production and operational performance. The overall environmental performance of the company concerned is also being taken into consideration. In addition to this, environmental considerations are also included in the selection process when seeking Request for Proposals (RFP). Council developed an RFP for cleaning services and

consumables which put a great deal of emphasis on evidence of sound environmental management by the respondents including packaging, bio degradable and environmentally friendly cleaning products and the disposal of them, conformity to Councils recycling systems and adherence to ISO 14001. It also focused on the lighting used during the cleaning process and asked respondents to identify cleaning regimes that will reduce consumption.

A range of initiatives were undertaken in 2004/05, including two particularly innovative projects; the installation of enhanced controls to the wastewater treatment plant's aeration blowers and an extensive review of the heating systems at the Waterworld swimming complex.

Other 2004/05 initiatives included:

- Installation of high efficiency T5 fluorescents for under veranda lighting.
- Improved heating and ventilation controls at the Waikato Stadium.
- Enclosed Council's 24hr call centre, replacing central HVAC with standalone unit.
- Installed high efficiency T5 fluorescents at Hamilton Gardens Pavilion.
- In accordance with Councils' Procurement Policy, the request for proposal (RFP) for cleaning services, sanitation service and janitorial consumables was considered, and tendered on good performance on a range of sustainability issues, including energy efficiency and waste minimisation

RESULTS
The installation of enhanced controls to the wastewater treatment plant's aeration blowers is expected to lead to a reduction in energy use of 380,000kWh per annum. At the Waterworld swimming complex, improved burners and controls being installed in November 2005 are expected to save over 700,000kWh per annum.

5.3 Waste

The policy was endorsed and approved by Management Executive in June 2004. It is available on Council's intranet. The policy set a reduction target of 20% by September 2005 and a further 10% by September 2006. A six monthly audit programme was developed to monitor progress. An action plan was subsequently developed and identifies services, facilities and initiatives that will enable Council to address the key points of the policy; procurement, staff education, the development of simple recycling systems, diverting paper and cardboard from the rubbish, promoting electronic or paperless systems, and the establishment of a cross organisational forum. Reviewed the capacity of the waste water treatment plant to take additional high grade waste streams with a view to increasing bio-gas production.

RESULTS
To date a 38% decrease in internal waste has been achieved.

5.4 Transport

An audit undertaken in September 2002 was carried out on the Council fleet. Subsequently Council implemented a raft of measures including a data collection and management system. This has included reorganisation of the fleet to get better fit for purpose sized vehicles. More recently, fleet logs identify that from October 2004 short trips (under 5km round trip) account for 15.5% of those done by central pool vehicles.

Council staff take part in an annual Bike Wise week (12-20 February) by participating in the 'Bike to Work' day. Everyone who cycles into work enjoys a free breakfast. To motivate staff further, inter-unit Bike to Work challenges are organised.

RESULTS
As a trial, two bicycles were added to the fleet pool to enable Council to reduce vehicle usage for short trips and to lead by example. To be useful for business meeting, these bikes were equipped with carry parcels to hold materials such as documents for meetings. The bikes were given fleet vehicle numbers and are able to be booked using outlook, in the same way that cars are booked. A set of Hamilton City Council helmets has also been made available.

The Bike to Work day is consistently successful and a lot of fun, with more than 70 and 90 staff taking part in 2004 and 2005 respectively.

5.5 Community energy efficiency

Know It? …Live It! is a three-year community environmental education programme and is the primary vehicle to assist Hamilton City Council to encourage and empower the people of Hamilton to have positive impacts on the environment. The programme is being implemented through a series of campaigns targeting key issues such as energy, water, waste, transport and consumerism. The Energy booklet, 'a household guide to using energy more efficiently and saving money in your home' was produced in May 2005 and is intended as a tool to improve householder knowledge on the wide range of actions that can be taken to reduce power consumption while not compromising lifestyle. The booklet provides a local overview of where Hamilton's energy comes from, how we use it, and most importantly how it can be used more efficiently.

As part of the Know it?...Live it! Energy Booklet and campaign, Council's Sustainable Environment Team (SET) coordinated an energy promotion. Working in conjunction with the Huntly Energy Efficiency Trust (HEET) and located in the highly visited Warehouse on Ward Street, the aim was to raise awareness of energy efficient practices in the home and products that can be installed to make homes warmer, drier, and cheaper to run.

RESULTS
As part of the energy campaign, over a two week period in the school holidays between 600 - 800 people got free advice from the on-site energy expert and were encouraged to take away educational booklets and videos with tips on how to be energy efficient. Anyone who purchased an energy efficient product went into the draw for a whole home insulation retrofit valued at $2000. Generously donated by HEET, the insulation retrofit included a ground moisture barrier, underfloor double reflective foil, insulation in the ceilings and draught proofing the doors and windows. Jenny May and Ronnie from Classic Hits breakfast show surprised the winning household live on air.

5.6 Community transport initiatives

The third campaign of the Know it?…Live it! Environmental Education Programme was launched in February 2005. Following on from the release of the 'Water' and 'Waste' booklets, the 'Transport' booklet, a household guide to saving money, improving health and getting around Hamilton easier, was produced. It provides an overview of the pressures that vehicles are placing on our road network, from the pollution created by emissions, to parking and congestion problems, and prompts Hamiltonians to question their travel behaviour and choices. The booklet promotes carpooling, using the bus, cycling and walking, in an effort to convert one car trip each week into one of these sustainable forms of transport.

The Transport booklet and campaign have been used to highlight the work on ACCESS Hamilton and HARTS and have been supported with a series of learning activities and promotional opportunities, including a 'Commuter Challenge' involving the Mayor on his bicycle, citywide carpool cheerleading squads and other interesting events.

One such learning activity undertaken June 05 – July 06 is the Transport Choices for Families, a two month travel demand management trial. The aim of the family trial is to effect an ongoing shift in the eight families participating in the trial, from car-based transport to more sustainable forms of transport for at least ONE journey a week. If all commuters in Hamilton made ONE change to a sustainable form of transport, congestion could be reduced by up to 17%. The trial has involved working one on one with the eight households in a process that has included a survey to gather current transport patterns, daily documenting of transport choices and assessing the barriers and motivations to make change.

In 2004 Council appointed a Walking School Bus coordinator for the city. It is hoped this encourages more Hamiltonians to opt for cycling and walking as an alternative means of transport as road and route safety are improved in the city.

Hamilton City Council worked with Environment Waikato to put in a Chartwell express bus service that runs routes directly from new residential subdivisions into the CBD to encourage further modal shift.

RESULTS
A cycle survey, conducted by Council each year in March, showed the number of cyclists entering the CBD has increased by 30% to 392 compared to 300 in 2004. Similarly, the number of cyclists in selected suburban sites has increased by 44%, reaching 1062 compared to the previous four year average of 735. The surveys were initiated in 1980 to count the number of cyclists entering the CBD in the morning, and leaving in the afternoon.

Much of the cycling increase is made up of school students. Of the cyclists entering the CBD, 27% were school students compared to 25.5% in 2004. In fact, school cyclists constitute over half of the total cyclist numbers counted entering the CBD and suburban intersections in the morning of the survey compared to one third in 2004.

During 2004/05, five schools developed and implemented walking school buses and 2.9 km's of new/upgraded joint footpaths and cycle ways were completed through the city's parks, and approximately 5km on the city's roading network.

5.7 Community waste initiatives

Hamilton City Council runs weekly residential kerbside collection for recycling throughout the city, which is paid for through city rates. Rubbish that gets taken to the Refuse Transfer Station is disposed of in the Horotiu landfill, which receives on average 90,000 tonnes of rubbish a year.

RESULTS
Kerbside recycling for Hamilton households was introduced in July 2002, and since then more than 38,000 tonnes of recyclables have been collected.

6. Reducing Emissions

The following section details actions to reduce greenhouse emissions from Council's and the community activities. The plan also acknowledges actions by central government and other organisations that will impact significantly on Hamilton's contribution to meeting New Zealand's greenhouse obligations.

All actions included in this plan are intended to be:

- Consistent with the principles of ecologically sustainable development (for example, actions should show a long-term full life cycle benefit)
- Affordable, cost effective and have other benefits (such as energy savings)
- Supportive of partnerships between spheres of government, business and the community
- Equitable and meet the needs of the whole community

6.1 Milestone 3 workshops

In May 2005, Hamilton City Council in conjunction with the Communities for Climate Protection - New Zealand Programme Coordinator, held a Milestone 2/3 workshop for staff. The workshop engaged staff from across the organisation and the purpose was to instigate discussion about potential activities the organisation could implement that would help achieve the corporate target set. The key areas identified were buildings, vehicle fleet, employee commute, streetlights, water/sewage, and waste.

The ideas suggested were documented, followed up with relevant staff, and have been used to develop the following section.

6.2 Energy Local Action Plan Actions

Action	Programme links	Timeframe
Fill vacent Energy manager Possition so that all the projects below can be fully coordinated	Hamilton City Council Energy Management Programme	2006
Increase the supply of 'green energy' (non-fossil fuel) by maximising biogas electricity generation and exploring options to utilise other renewable energy sources	Hamilton City Council Energy Management Programme CityScope	Ongoing
Continually review the operation of the Wastwater Treatment Plant to identify on-going energy savings (shifting loads and operational processes) and through upgrades	Hamilton City Council Energy Management Programme - Works and Services Plan	Ongoing
Ensure ongoing operation of the landfill gas to energy project to optimise landfill gas production	Hamilton City Council Energy Management Programme - Works and Services Plan	Ongoing
Assess energy efficiency for all new waste water pumping stations to ensure system efficiency is optimised	Hamilton City Council Energy Management Programme - Works and Services Plan	Ongoing
Consideration of energy efficiency given to all aspects of the CBD upgrade	Hamilton City Council Energy Management Programme - Works and Services Plan CityScope	Ongoing
Update Hamilton's Development Manual to reflect new lighting standards	Hamilton City Council Energy Management Programme - CPTED	June 2007
Large buildings to display their annual energy performance indicator in order to raise public awareness.	Hamilton City Council Energy Management Programme – Coroporate Energy Plan.	
Replace street lighting and under verandah lighting with energy efficient technology where possible as part of routine maintenance and upgrade.	Hamilton City Council Energy Management Programme - Works and Services Plan	Ongoing
Undertake annual audits of the museum,Waikato Stadium,	Hamilton City Council Energy Management Programme –	Ongoing

Claudelands events centre, libraries and theatres with a focus on reducing lighting costs	Community Services Plan	
Integrate energy efficiency technologies into design and all aspects of the Claudelands Events Centre Upgrade	Hamilton City Council Energy Management Programme – Community Services Plan	2007 -2010
Continually review the operation of leisure facilities to identify and invest in ongoing energy saving measures. Have installed pumps with variable speeds drives which use less energy, installed heat recovery units on boilers, less gas needed to heat water. Investigating North East facility having solar panels.	Hamilton City Council Energy Management Programme – Community Services Plan	2006-2010
Install power factor correction and Commission a complete energy audit of the BNZ Building	Hamilton City Council Energy management programme – Corporate Group Plan	2006-2007
Complete Energy audit of Transport centre and introduce new control systems.	Hamilton City Council Energy management programme – Corporate Group Plan	2006-2007
Initiation of staff education programme encouraging the reduction of energy use in the municipal building.	Environmental Education Programme	2007- 2010
Demonstrate where possible the use of passive solar gains and solar energy	Cityscope SMART subdivsion Hamilton City Council Energy Management Programme – Community Services Plan, Works and Services Plan	Ongoing
Consideration of solar water heating where possible as part of routine replacement of existing hot water supplies and new hotwater suplies	Hamilton City Council Energy Management Programme - Works and Services Plan	Ongoing
All tender processes to consider energy.	Corporate procurement programme	Ongoing

6.2.1 Transport/Fleet Local Action Plan Actions

Action	Performance measure/ Programme links	Timeframe
Develop and implement a corporate travel plan for Council. Reduction targets set and achieved.	Hamilton City Council Energy management programme Access Hamilton	2006-2008

Continue to promote the use of fleet bikes and monitor usage.	Hamilton City Council Energy management programme	2005-2010
Cycling support	Hamilton City Council Energy management programme Access Hamilton	Ongoing
Maximise fuel savings by enhancing the model/ mix of types, increasing utilisation and swapping vehicles for alternative forms of transport.	Hamilton City Council Energy management programme – Corporate Group Plan	Ongoing
Fleet fuel efficiency, annual travel, and utilization indicators will be developed, monitored, and reported on monthly. A six monthly review of these indicators will be undertaken to identify opportunities for fuel and cost savings.	Hamilton City Council Energy management programme – Corporate Group Plan	On going

6.2.2 Waste and Waste Water Local Action Plan Actions

Council is continuously providing higher levels of service and performance which, in some cases, lead to higher energy consumption.

Action	Performance measure/ Programme links	Timeframe
Develop actions from the Liquid Waste Management Plan which work to increase energy efficiency.	Liquid Waste Management Plan. Biosolids Strategy	2007 – 2010
Carry out the actions in the Water Demand Management Plan	Water Demand Management Plan	2007 –2010
Continue monitoring of the energy savings from the waste water treatment plant capability study.	Hamilton City Council Energy Management Programme - Works and Services Plan	
Develop performance indices to identify operating efficencies in the waste water treatment plant	Hamilton City Council Energy Management Programme - Works and Services Plan	2007 - 2008
Continue to initiate internal waste policy to reach target reduction	Hamilton City Council Waste Management Plan	2006 – 2010
Review Council's waste contract with a view to reducing waste.	Corporate procurement programme	2007 – 2008
Refuse Transfer Station upgrades to improve plant energy efficient		2006 – 2007

6.2.3 Biodiversity

Council plants over 65,000 native plants a year in the city's parks and reserves. Many of these are trees planted as permanent forests as part of a plan to restore the city's biodiversity, they also act as a carbon sink to counteract some of the city's carbon production.

Action	Performance measure/ Programme links	Timeframe
Hamilton is looking to host the V8 super cars. In order to minimise the greenhouse gas emissions of hosting the event, Council will work with organisers and using the CarboNZero certification will measure, manage and through a combination of the purchase of verified EBEX credits and supplementary plantings at Waiwhakareke Natural Heritage Park will mitigate these effects. This is inline with Kyoto compliance rules and the Permanent Forest Sink Initiative being developed by the NZ govt.	CCP- NZ Lake Waiwhakareke Management Plan	2008 – 2015

6.2.4 Accommodating Climate Change

The changing composition of the Earth's atmosphere is expected to cause significant climate changes in the early decades of the 21st century. Although specific impacts on Hamilton's climate cannot be accurately predicted, it is likely that climate changes may impact on public health through the insects, plants, animals and disease organisms living in Hamilton's environment. Council's stormwater and wastewater infrastructure may struggle to cope with an increased severity of storms and associated flooding.

Council can anticipate possible impacts on its facilities and future community developments by identifying areas at high risk.

Local Action Plan Actions

Action	Performance measure/ Programme links	Timeframe
Assess and plan for the impact of future climate change on design standards and district plan.		Ongoing
Civil defence and emergency procedures to take into account the impacts of the likely climate	Environment Waikato and Ministry of Civil Defence Emergency Management	On going

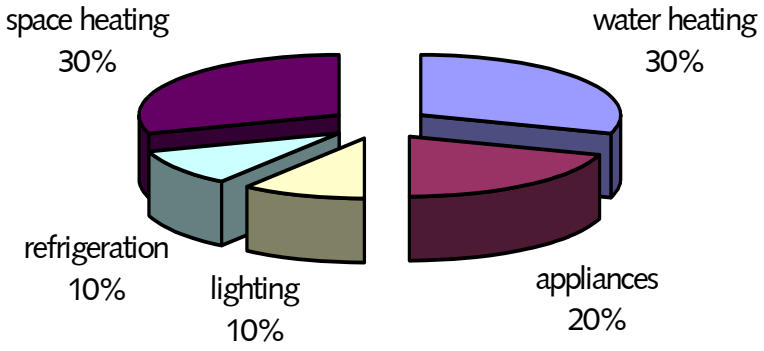
change including potential flooding.		

6.3 Energy efficiency

In 2001, households accounted for approximately 16% of Hamilton's energy consumption, corresponding to 184,000 tonnes of carbon dioxide equivalent emissions. The largest proportion of energy consumed was in the form of electricity (81%) with the remainder in the form of natural gas (14%), LPG (4%) and coal (1%).

Water heating accounts for the biggest portion of a household power bill. Another 30% goes on space heating and 20% running appliances (Figure 1).

Figure 1 - Typical household energy use



The choice of fuel to heat the household's water can have a substantial effect on overall greenhouse gas emissions produced. For example, replacing a conventional electric hot water heater with a typical solar water heater would reduce greenhouse gas emissions by about 1.4 tonnes/year. Over a 20-year lifetime this is an offset of approximately 27 tonnes.

The energy cost of keeping a home warm can be high. An un-insulated home can use up to 45% more energy to heat than a fully insulated home. Energy efficient house design can reduce heating and cooling requirements for houses. Orientating a house to maximise exposure to the afternoon sun, for example, can significantly reduce the amount of heating required to achieve a comfortable temperature in winter. Insulation likewise reduces heating and cooling demands by impeding the transfer of heat into and out of the house through its roof, walls, and floor. The New Zealand Building Code specifies minimum mandatory insulation standards for new houses, but there are many older inadequately insulated homes in the city. Becoming more comfortable by adding insulation is simple and has an instant positive effect.

Household appliances use 20% of a home's energy. Interestingly, about 5% of that goes on running appliances on stand-by. Even during the night, microwaves, TV's and videos are silently drawing power out of electrical sockets. If appliance lights and clocks are on, they're using power. The refrigerator is the single biggest household energy consumer. A typical fridge uses between 600 and 900kW a year.

In addition to energy used for water heating, significant amounts of energy are used for water supply and in treating wastewater produced by households. Utilising water more efficiently for bathing, laundering and toilet flusing reduces costs and energy for these services. In each of these applications, appliances are available that use much less water and energy than standard models.

In 2001, the commercial sector accounted for approximately 13% of Hamilton's energy consumption, corresponding to 142,000 tonnes of carbon dioxide equivalent emissions.
The largest proportion of energy consumed was in the form of electricity (52%) with the remainder in the form of natural gas (32%), coal (14%), LPG and oil (3%).

The industrial sector, on the other hand, accounts for 32% of energy use in Hamilton. The largest proportion of energy consumed was in the form of electricity (39%), followed by coal (27%), natural gas (24%) with the remainder in the form of diesel, petrol, light fuel oil, and petrol (11%).

Energy consumed in office buildings, hotels and other commercial buildings for air conditioning, ventilation, lighting, and other building services contributes to greenhouse gas emissions. While attention to energy efficiency at the design stage can significantly reduce the building's lifetime energy requirements, commercial buildings are often designed and constructed to minimise initial cost. Gains in performance however are feasible and can be achieved by raising awareness and through incentive programmes.

Opportunities exist for commerce and industry to reduce greenhouse gas emissions by employing small-scale integrated renewable energy generation and cogeneration plants to provide thermal and electrical energy needs. For example, the increased efficiency and reduced carbon intensity of natural gas fired cogeneration plants results in substantial reductions in greenhouse gas emissions when compared to traditional thermal fired power stations. The use of embedded or distributed generation has benefits including reduced transmission losses and improved security of supply. Distributed generation technologies while favourable from a greenhouse perspective, must overcome local environmental constraints, especially air quality and noise.

The industrial sector also presents opportunities for companies to use waste heat, steam, wastewater or other by-products produced by neighbouring industrial plants. Eco-industrial plants optimise such opportunities by co-locating industrial operations with complementary resource requirements and waste production. Local government support and appropriate land use is needed to enable the development of these projects.

Local government is also in a position to encourage reductions in greenhouse gas emissions and improve energy efficiency by raising awareness and providing advice and support. This is particularly true for small to medium size businesses that may lack internal expertise.

Local Action Plan – Energy Actions

Action	Performance measure/ Programme links	Timeframe
In partnership with BRANZ, employ an independent eco-adviser to work with residents and local building companies to improve performance ratings for Hamilton homes.	Environmental Education Programme (Urban Design) Cityscope	2006-2007

Deliver a community education programme to promote energy efficiency and water conservation practices.	Environmental Education programme (Know it?…Live it!) Hamilton City's Liquid Waste Management Plan	2005-2007
Promote excellence in urban sustainability through demonstration projects and awards for design	City scope SMART subdivision	2005-2007
Promote the EECA interest free loans for householders who purchase solar water heaters.	Environmental Education programme (Know it?…Live it!)	2006-2007
Incorporate urban design principles and elements into Hamilton City Council's Development Manual and District Plan.	City scope	2008-2010
Showcase business practices and technologies that use energy efficiently, reduce water consumption, produce less waste and promote transport alternatives	Hamilton City's Solid Waste Management Plan Waikato Waste Advisory Service	2005-2008
Work with industries to find more sustainable alternatives to traditional utility services, for example, localised energy generation, on-site treatment and re-use of waste and water and wider use of natural gas.		2008-2010
Encourage eco-industrial complexes and the interchange of cogenerated energy, steam and by-products within existing industrial developments. Aggressively promote adoption of zero pollution energy generation, for example wind energy, fuel cells and solar energy		2008-2010

6.3.1 Transport

In 2001, road vehicles travelling in Hamilton consumed an estimated 4.9 Peta Joules of energy (the equivalent of 144 million litres of unleaded petrol) and emitted 333,000 tonnes of greenhouse gas. This represents 50% of Hamilton's total energy consumption and 29% of greenhouse gases emitted within Hamilton.

Single occupancy vehicles are a major contributor to this problem. Private cars with one occupant, for example, produce approximately 29kg of greenhouse gases per 100kms travelled, compared to 2kg of greenhouse gases per 100 passenger-km for a bus with 50

passengers. Walking and cycling, on the other hand, consume no fossil fuels and cause no increase in greenhouse gas emissions. Developing alternative transport options will therefore be critical to maintaining the livability of Hamilton.

These issues are being addressed by comprehensive transport plans which have been developed at the regional and city level. Council's Access Hamilton strategy aims to provide a modern integrated transport system for Hamilton by:

- upgrading transport infrastructure for the benefit of public transport and high occupancy vehicles and to cater for growth

- improving public transport by increasing the coverage and services

- managing travel demand through community education and the rationalisation of parking

- improving urban amenity and community accessibility to local activities via walking and cycling.

Activities that emit greenhouse gases often affect local lifestyle and amenity. Road transport is a prime example of this, as it also places heavy demands on public land and infrastructure and is a major source of nitrogen oxides and hydrocarbon pollutants causing petrochemical smog. Actions to reduce greenhouse gas emissions therefore provide major co-benefits for the local community. Reducing private vehicle use, for example, will lessen the production of air pollution, reduce traffic congestion and minimise the huge proportion of land area and resources presently required for road transport. Council has identified opportunities on how to better integrate land use and transport within its Access Hamilton strategy.

Local Action Plan – Transport Actions

Action	Performance measure/ Programme links	Timeframe
Promote walking and cycling as an integral part of transport planning, addressing safety, facilities and infrastructure.	ACCESS Hamilton	2005- 2016
Promoting bus use over car use including increased direct commuter routes, priority bus routes and bus related infrastructure	ACCESS Hamilton	2005-2016
Setting up park and ride facilities on the outskirts of Hamilton	ACCESS Hamilton	2008-2011
Expanding the Walking School bus programme through out the city	ACCESS Hamilton	2005 Onwards
Safe Routes Programme exploring School Travel Planning	ACCESS Hamilton	July 2005- July 2007
Business Travel Plans and Hamilton City Councils Corporate Travel Plan	ACCESS Hamilton	2006 Onwards

6.3.2 Waste

Organic waste buried in landfills decomposes in the absence of oxygen and produces gas consisting of approximately 55% methane and 45% carbon dioxide. Methane is a particularly potent greenhouse gas with a global warming potential 21 times greater than that of carbon dioxide. In 2001, Hamilton's Horotiu Landfill site produced approximately 127,000 tonnes of greenhouse gas, or approximately 11% of total greenhouse gas emissions from the city.

Approximately 100,000 tonnes of domestic waste is deposited into landfill in Hamilton each year. This waste contains approximately 30,000 tonnes of carbon and will ultimately decompose to produce about 55,000 tonnes of landfill gas. The greenhouse impact of this gas depends markedly on how the gas is treated or used:

- if it escapes into the atmosphere, it will have the same greenhouse effect as 374,000 tonnes of carbon dioxide

- if collected and burned, it will produce 85,000 tonnes of carbon dioxide

- if utilised as fuel to generate electricity, it can displace fossil fired generation such as coal and natural gas which helps to reduce the use of these finite resources and may also lead to a reduction in net emissions.

Waste produced by Hamilton is landfilled at the Horotiu site. Since 1997, completed stages of the landfill have had gas collection systems installed and the gas has been flared. In 2004, a gas engine was installed to utilise the gas and produce electricity.

Currently aproximately 17,000 tonnes of green waste is diverted from landfill to a commercial composting operation. Since 2004, Council has operated a recycling collection service which has diverted aproximately 12,000 tonnes of waste from the landfill per year. The Horotiu Landfill will be closed in 2006 and the remaining stages will have gas collection systems installed with the gas being utilised in the gas engine.

Local Action Plan – Waste Actions

Action	Performance measure/ Programme links	Timeframe
Use Council education programmes, regulations, fees, charges and rates to overcome barriers and agressively promote waste avoidance, minimisation and recycling and implement programmes. Regularly research these barriers.	Know it, live it community education programme Hamilton City Council waste management plan Waikato waste advisory service Sustainable Business network	
Continue to expand the types of recyclables that can be collected through household recycling bins	Hamilton City Council Waste management plan Refuse Bylaw 2002	

6.3.3 Biodiversity

Vegetation absorbs carbon dioxide from the atmosphere as it grows. When vegetation is cleared, however, this carbon is released as it is burned or decomposes.

Much interest has developed in the last few years in tree planting to absorb carbon dioxide, thereby offsetting greenhouse emissions from various sources. Council is aware of the potential for urban vegetation to sequester carbon, and is investigating the size of Hamilton's urban carbon sink.

Local Action Plan – Biodiversity Actions

Action	Performance measure/ Programme links	Timeframe
Continue planting of reserves and gully areas to increase carbon sequestration	Council's community planting programme Gully Restoration Programme	2005-2010

7. Programme Management

This Local Action Plan recognises the major influence Council can exert on energy use and greenhouse gas production across the city and reflects Council's commitment to reducing the contribution Hamilton makes to New Zealands green house gas production. As an evolving document it will grow over time taking into consideration changes in technology, awareness and means for achieving greenhouse gas reductions.

This plan will be driven primarily by the Energy Manager who will work alongside key staff in Council to ensure all actions are taken up as part of the group energy plans. To ensure the effectiveness of the plan, all key staff will be involved in the development of their respective group energy plans and proposed actions.

As part of the feedback process an annual review will take place looking at the progress made towards achieving each of the actions, their effectiveness and whether they can be taken further. This process will also identify future priority areas and those areas which require additional action to be taken.

Ranking of the actions in the Group Energy Plans are based on:

- Annual savings of greenhouse gases
- Project cost
- Payback period
- Timescale of interconnected projects
- Other benefits (Economic, Social, Environmental)

In order to ensure major energy saving projects are not held up due to budget restriction Hamilton City Council has set up an internal energy management fund, to which project managers can apply to part fund projects.

Hamilton City Council will undertake a full review of the Local Action Plan in 2008 which will look at new legislation, new technology, funding and progress made towards Council's Milestone Two Reduction Goal.