



*International
Leading
Practices
2006*

2-3 November 2006, Rotorua, New Zealand

Greenhouse Action in Newcastle

Newcastle, Australia



Greenhouse Action in Newcastle Newcastle, Australia

**International Leading Practices Symposium 2006
2-3 November 2006, Rotorua, New Zealand**

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Local Government Data

Form of Government (e.g., council-manager, commission)	Local Government
Governance Body (e.g., 8-member council, separately-elected mayor)	12 Councillors
Population	143,000
Area (in square kilometres)	214 km ² (19.7% residential, 10% industrial, ≤1% commercial, 23% wetlands, 13.2% waterways)
Budget (in local currency)	\$140.8 million
Budget (equivalent in New Zealand dollars)	\$167 million NZD
Major Types of Revenue Sources in FY2005	\$77.8M Rates inc waste, \$13.3M grants, \$2.9M Building and Development, \$10.6M other revenue
Number of Employees	975 Full Time Equivalent
Socio-Economic Indicators (2001)	
Median Household Income (in local currency)	Newcastle-inner 2,012 \$32,917 Newcastle-remainder 50,436 \$31,215
Median Household Income (in New Zealand \$)	Newcastle-inner 2,012 \$39,234 Newcastle-remainder 50,436 \$37,206
Homeownership Rate (fully owned)	<i>fully owned</i> <i>being purchased</i> Newcastle-inner 437 - 23.5% 320 - 17.2% Newcastle-remainder 21812 - 39.8% 12929 - 23.6%
Percentage of University Graduates	8.6% graduating with a degree
Leading Employers (including names of employers and industry sectors)	Total number employed 55,244 Retail trade 16.1%, health and community services 13.6%, manufacturing 11.2%, property and business services 10.7%, education 8.9%
Other Distinguishing Characteristics	<ul style="list-style-type: none"> • As Australia's sixth largest city, Newcastle offers all the benefits and amenities of a large city but with all the friendliness of a regional town. • Newcastle is the second most populated Council area in the Lower Hunter region • Australia is the worlds largest exporter of coal, and Newcastle is the worlds largest coal export port shipping 80million tonnes of coal in 2005.

EXECUTIVE SUMMARY

The City of Newcastle is Australia's 6th largest city and is 160kms (100miles) north of Sydney in the state of New South Wales. It is located in the heart of the Hunter Region at the mouth of the Hunter River and bordered by a stunning coastline with beautiful beaches. The Greenhouse Action in Newcastle (GAIN) Plan 2001 – 2008 was developed by Newcastle City Council and its Greenhouse Action Partners¹ (GAP) to address the growing need for local government and the community to mitigate greenhouse emissions. The GAIN Plan provides the basis to achieve the City's vision to become an international testing ground for energy and resource management products and services. It was also constructed as part of Newcastle City Council's commitment to the Cities for Climate Protection Program² (CCP) and includes 88 targeted actions for Council and the community.

In order to measure the city-wide effectiveness of Council and community GAIN Plan projects, a web-based reporting tool known as www.ClimateCam.com was developed with the assistance of the CSIRO³. Data supplied by the Greenhouse Action Partners is converted into carbon dioxide equivalent emissions using formulated conversion factors. This world first "greenhouse gas speedometer" was launched in 2001 and reports emissions from monthly consumption data including electricity, water, waste to landfill, gas and a count of registered motor vehicles for the Newcastle local government area.

The actions identified in the GAIN Plan have initiated many pioneering projects including the Newcastle Green Energy and Water Project, Australia's first Biodiesel fleet, the award winning Newcastle and Hunter Cleaner Production Project (resource efficiency for the business sector), Community REFIT (low-cost, no-fuss energy and water saving kit for residents) and the Green Energy Project that includes the award winning Eco★Star™ Project (star-rating system for Council's parks, beaches, pools, libraries).

After a major review and retrofit of its ten largest facilities commencing in 1995, Council achieved a 40% (\$400,000 pa) reduction in electricity, a 25% (\$200,000 pa) saving in water bills and an overall reduction in greenhouse gas emission by 19%. In 1998 Council set up a business unit known as the Australian Municipal Energy Improvement Facility (AMEIF) to help the community use energy more wisely and to transfer Newcastle's knowledge and experience to other Council's and businesses around Australia and internationally.

Council is taking a long-term strategic approach to help the community and business sectors identify and implement smarter ways of using energy and resources. The challenge of mobilising the community towards a smart energy future is reduced because Council chooses to lead by example. Council actively repackages energy and resource initiatives based on the lessons learned during the delivery process in order to transfer the knowledge to other organisations, Councils and communities. Since 1998, AMEIF has worked with over 200 local governments and businesses in Australia and New Zealand, resulting in the duplication of many GAIN Plan initiatives.

¹ The Greenhouse Action Partnership is made up of local, state and federal government bodies and local energy, water and gas authorities.

² CCP is run by the International Council for Local Environmental Initiatives (ICLEI) and assists local governments and their communities to reduce greenhouse gas emissions. The Prime Minister, in his statement *Safeguarding the Future* in November 1997, funded the program through a commitment of \$13 million over 5 years.

³ CSIRO, the Commonwealth Scientific and Industrial Research Organisation, is Australia's national science agency and one of the largest and most diverse research agencies in the world.

PROBLEM ASSESSMENT/INITIAL POLICY ENVIRONMENT

Background and Drivers for Greenhouse Action

Newcastle City Council – Governance and Functions

Newcastle City Council was formed in April 1938 with the merger of 11 local Councils. Newcastle City Council has two main parts:

- **The elected Council** - (the popularly elected Lord Mayor and 12 Councillors) Councillors are elected to represent the interests of residents and ratepayers and provide leadership and guidance to the community. The elected Council comprises twelve councillors and the Lord Mayor. In Newcastle, the Lord Mayor is elected on a 'popular' vote for the entire four-year term of the Council. The Newcastle Local Government Area is divided into four wards, with each ward having three councillors.
- **The administration** - the General Manager leads the administrative arm of Council. The General Manager is responsible for the efficient and effective operation of the Council's organisation and for ensuring that the decisions of the Council are implemented.

Role of Council

Council is responsible for looking after public facilities and providing community services. Newcastle City Council provides more than 150 services such as:

- town planning
- construction and maintenance of local roads, streets and bridges
- preservation of historic places
- food and public health services
- waste management and recycling
- supervision of building and development control
- parking control
- maintenance of parks, golf courses, sporting fields, pools and beach facilities
- provision and servicing of libraries, community centres, theatres and art galleries
- pet registration and control
- tourism services
- promotion of economic development
- child care facilities
- fire prevention enforcement and many more...

Why local greenhouse action?

Resource management and local greenhouse action are not typical features of Australian local government activities. In 1992 the Rio Earth Summit established that the actions of local cities and towns were the most likely to make a real difference to saving our environment. As a five year follow up to the Rio Earth Summit, Newcastle hosted the international Pathways to Sustainability – Local

Initiatives for Cities and Towns Conference in 1997. Over 1,000 delegates from 54 countries attended to contribute ideas and information about how to minimise our impact on the environment. The conference followed the announcement in April 1997 that BHP Steelworks would be closing its doors by 1999. As the Hunter Region's largest employer, the steelworks had been the heart and soul of Newcastle since 1915. It was at this crossroad that Newcastle took the opportunity to direct future growth in a more sustainable way and set a vision to become an internationally recognised centre for the application of smart energy and resource technologies and practices.

Started with Council Facilities

Prior to the Pathways to Sustainability Conference, Council set about cleaning up its own backyard by finding smarter ways to use energy and resources. Between 1995 and 1997 Council undertook ad hoc energy audits and retrofits at the works depot and successfully began reducing its electricity bill. The conference provided a taste of the sustainable future Council desired and as a result a revolving energy fund was introduced in November 1997 to fund further energy efficiency work throughout the organisation. The fund was modelled on the Phoenix Arizona concept. After a major review and retrofit of its ten largest facilities Council achieved a 40% (\$400,000 pa) reduction in energy, a 25% (\$200,000 pa) saving in water bills and an overall reduction in greenhouse gas emissions of 19%.

Transferring the Knowledge

The next step for Council was to help the community and other Councils learn new ways to use resources and capture the associated environmental and financial benefits. The Australian Municipal Energy Improvement Facility (AMEIF) was set up in 1998 as a self funding business unit of Council, to transfer Newcastle's practical knowledge and experience to other Councils and businesses around Australia and internationally on a fee for service basis. AMEIF worked with the Australian Greenhouse Office to deliver a series of Green Energy Learning Programs (GELPS) with 160 councils throughout Australia.

Community Consultation

In July 2000, Council hosted Australia's first Energy Town Meeting (ETM1) with the help of Amory Lovins and his US based Rocky Mountain Institute⁴. Over 900 people (*see Picture 1*) from throughout the Hunter Region attended and asked Council for three key things:

1. A local action plan that had targets to reduce greenhouse gas emissions
2. Help to make their homes and businesses more energy efficient
3. Some way to measure the collective impact of individual actions across the City of Newcastle

The Action Plan

At the City's second Energy Town Meeting in July 2001 Council delivered what the community asked for. In the lead up to Energy Town Meeting 2 (ETM2), a series of Community Energy Workshops (*see Picture 2*) were run with over 400 people. The energy saving ideas from these workshops helped the

⁴ Rocky Mountain Institute (RMI) is a non profit organization established in 1982 by resource analysts L. Hunter Lovins and Amory B. Lovins.

development of the Greenhouse Action in Newcastle (GAIN) Plan 2001-2008 and ClimateCam, the world's first greenhouse gas speedometer. Both the GAIN Plan and www.ClimateCam.com were launched at ETM2 in July 2002 which was attended by over 600 people.

The GAIN Plan provides the basis to achieve the City's vision to become an international testing ground for sustainable energy and resource products and services. It was also constructed as part of Newcastle City Council's commitment to the 5-milestone Cities for Climate Protection Program (CCP) and includes 88 clear actions for Council and the community. GAIN Plan projects are all developed based on the identified actions and all work towards mobilising the community and reducing greenhouse gas emissions.

The following greenhouse gas reduction targets were set in the GAIN Plan (*see Figure 1*):

- Council- 30% reduction in greenhouse gas emissions below 1995 levels
- Community- 25% reduction in greenhouse gas emissions below the projected 2008 business as usual scenario.



Picture 1 Newcastle's first Energy Town Meeting, July 2000



Picture 2 Community Energy Workshops, January 2001

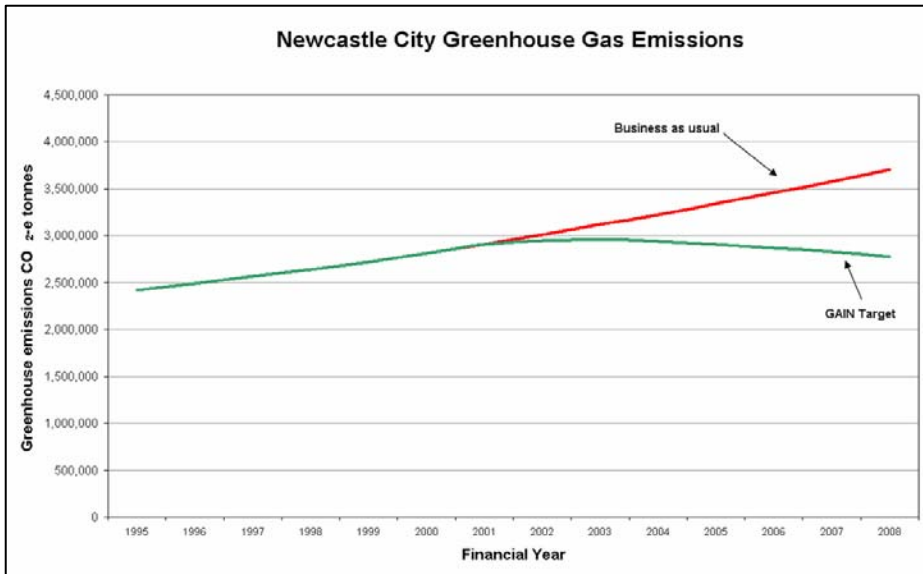


Figure 1 Greenhouse gas reduction targets for the City of Newcastle

The Political Context

When Council first started on the path of energy and resource efficiency and greenhouse action there was no state or federal legislative requirements. Council quickly became a leader in the industry renowned for innovative yet practical energy and resource solutions that made good financial sense. Since then, there have been a number of political developments that have boosted community awareness and motivated other corporate and government bodies to start resource efficiency activities. Some examples of recent political developments at both the state and federal level include:

- The Federal Government’s white paper “Securing Australia’s Energy Future” established a **policy framework** for ensuring access to competitively priced energy, optimising the value of energy resources and managing environmental issues;
- The Federal Government now requires companies consuming more than 0.5 petajoules of energy per annum. to **publicly report** on assessment and implementation of Energy Efficiency Opportunities (EEO);
- The NSW Government has mandated the development of **Energy Savings Action Plans** (ESAP’s) for all large energy consumers by 31 Dec 2006. A \$40Million per annum Energy Savings Fund was also announced to assist ESAP implementation. The second round of funding was announced in October 2006 and includes the Public Facilities Program, which has been introduced to promote energy savings in public and educational facilities;
- From 1 July 2006, Australian companies receiving fuel excise credits of >\$3 million will be required to participate in the federal governments **Greenhouse Challenge Plus**⁵;
- From 1 May 2006, minimum **energy efficiency standards** for office, retail, car parks,

⁵ Greenhouse Challenge Plus enables Australian companies to form working partnerships with the Australian Government to lead the challenge against climate change by improving energy efficiency and reducing greenhouse gas emissions.

manufacturing/processing and public buildings were added to the Building Code of Australia⁶;

- Development applications for residential dwellings including alterations are now required to be lodged to local councils with a **Building and Sustainability Index** known as BASIX Certificate⁷ that measures the energy and water performance of the residential dwelling. BASIX requires a 40% reduction in water and 25% reduction in energy;
- Cities for Climate Protection (CCP) Australia is a **voluntary program for local government**, delivered by the International Council for Local Environmental Initiatives (ICLEI) –in collaboration with the Australian Greenhouse Office. To participate in CCP, councils commit to achieving an initial five milestones to reduce their organisational (corporate) and community greenhouse gas emissions.

⁶ In agreement with the building sector, the Australian Government has resolved to eliminate worst energy performance practices through a national standard approach to minimum performance requirements for buildings.

⁷ BASIX is an online program that is free and accessible to anyone. The user (usually the building designer) enters data relating to the house or unit design - such as location, size, building materials etc - into the BASIX tool. BASIX analyses this data and determines how it scores against the Energy and Water targets. The design must pass specific targets (which vary according to location and building type) before the user can print the BASIX Certificate.

PROJECT OVERVIEW

Greenhouse Action in Newcastle (GAIN) Plan Projects

Since 1997 local greenhouse action has evolved and is now a core business function managed by a business unit⁸ of Council. The GAIN Plan includes many unique and pioneering actions in its objective to reduce the City's greenhouse gas emissions. It is broken into two parts that outline sets of actions for both the community and for Council facilities. Council areas for action include electricity, street lighting, traffic signals, waste, transport and water. Community areas for action include electricity, natural gas, waste, transport, water and vegetation.

The GAIN Plan was developed by Council officers and their Greenhouse Action Partners (GAP) that include the University of Newcastle, University of New South Wales, CSIRO⁹, EnergyAustralia¹⁰, Hunter Waste Planning and Management Board, Hunter Water Corporation¹¹, Roads and Traffic Authority¹², Newcastle Master Builders Association¹³, Australian Greenhouse Office and Cities for Climate Protection Australia.

GAIN Plan actions have initiated many "firsts" such as Australia's first solar fountain, Australia's first biodiesel fleet and the world's first greenhouse gas speedometer, ClimateCam. ClimateCam provides an accurate, computer based measuring tool that tracks greenhouse gas emissions for the City and reports monthly on the effectiveness of actions implemented from the GAIN Plan. With the assistance of Council's Greenhouse Action Partners who provide monthly resource consumption data, this computer based program converts data into carbon dioxide equivalent emissions (CO₂-e) for consumption of electricity, water, gas, waste to landfill, trees planted and a count of registered motor vehicles in the Newcastle local government area.

Council Projects

The following projects aim to achieve the Council actions and greenhouse emission reduction targets as identified in the GAIN Plan:

- **Green Energy and Water Project** – increase the energy and water efficiency for all council facilities
- **Eco★Star**™- star rating system for Council's facilities
- **'Flower Power' Alternative Fuels Program** - that includes Biodiesel maintenance and emissions study and trial
- **Landfill Gas Management** – converting methane to electricity
- **Water Harvest** – harvesting ground and roof water to supplement irrigation

⁸ Australian Municipal Energy Improvement Facility (AMEIF) was established in 1998.

⁹ CSIRO, the Commonwealth Scientific and Industrial Research Organisation, is Australia's national science agency and one of the largest and most diverse research agencies in the world

¹⁰ EnergyAustralia is a local energy authority that operates an electricity network of around 22,275 square kilometres.

¹¹ Hunter Water Corporation is a statutory state owned corporation that provides water and wastewater services to almost half-a-million people from five local government areas.

¹² The RTA is the NSW State Government agency responsible for improving road safety, testing and licensing drivers and registering and inspecting vehicles and managing the road network.

Community Projects

The following projects aim to achieve the community actions and greenhouse emission reduction targets as identified in the GAIN Plan:

- **www.ClimateCam.com** – the world’s first greenhouse gas speedometer
- **ClimateCam™ for Schools** – helping schools become energy learning centres
- **ClimateCam™ Billboard** – city wide power meter displaying actual community electricity consumption from across 14 zones
- **Community REFIT** - low-cost, no-fuss energy and water saving kit for residents
- **Financial Loss Control** – 14-step in-business mentoring for strategic resource efficiency
- **Cleaner Production** - resource efficiency for the business sector

¹³ Master Builders is the major Australian building and construction industry association

PROJECT DESCRIPTION, FINANCIAL COSTS, RESULTS ACHIEVED

Council Projects

Council projects have been developed with the overall aim of increasing the energy and resource efficiency of council facilities and operations and reducing Council's greenhouse gas emissions. Detailed below are the descriptions, costs and outcomes for the following council projects:

- **Green Energy and Water Project** – increase the energy and water efficiency for council facilities
- **Eco★Star™**- star rating system for Council's parks beaches and pools
- **'Flower Power' Alternative Fuels Program** - that includes Biodiesel maintenance and emissions trial
- **Landfill Gas Management** – converting methane to electricity
- **Water Harvest** – harvesting ground water to supplement irrigation

<i>Project</i>	<i>Green Energy and Water Project</i>
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Background Ad hoc energy efficiency work in Council facilities began at the Works Depot in 1992-93. Electricity usage at the Depot was cut by almost 40% by replacing inefficient and unserviceable centralised compressed air systems, lighting systems and by controlling its water and space heating systems. In 1994-95 over 400 down lights in the City Hall were retrofitted with compact fluorescent lamps which immediately cut consumption on the lighting system by 75%.

Based on the confidence established in these early projects, Council initiated the Newcastle Green Energy Project in December 1995 and adopted an internal revolving energy fund in November 1997 to accelerate projects that had an internal rate of return of 5 years or less. The experience gained through the energy savings program prompted the idea that a similar methodology could be applied to Council's \$800,000 annual water consumption to achieve savings in this area. The Green Energy Project was expanded to include water in 2000-01 and became the Green Energy and Water Project.

Description The Newcastle Green Energy and Water Project is a self funding resource conservation project aimed at reducing Council's electricity, water, fuel consumption and resultant greenhouse gas emissions as well as demonstrating sustainable practices in the operation of Council buildings and assets.

Objectives

Short Term

- Reduce electricity consumption and costs
- Reduce liquid fuel consumption and costs
- Reduce water consumption and costs
- Reduce greenhouse gas emissions
- Lead by example

Long Term

- Create Newcastle as a testing ground for the world's best energy and resource conservation technologies and practices
- Foster the in-house knowledge and commitment of Newcastle City Council toward a culture of continuous improvement in the way we use energy and natural resources

Timing 1995 – current

Stakeholders The Green Energy and Water Project consists of two multi-functional teams that draw on the expertise of a wide range of council personnel on an ongoing and on an as-needs-basis.

The Green Energy Team is a cross-divisional team made up of representatives from the Electrical Services team, Accounting Services, AMEIF, Communications Unit and Major Projects. The Water Conservation Team is a cross divisional team made up of representatives from AMEIF, Development and Environment, the Plumbers section, Building Services, and Accounting Services.

Funding Council's electricity bill had reached \$1million in 1995. The Council agreed to apply a revolving energy funding model¹⁴ where projected savings were loaned to the project from reserves for a period of three years. It was explained to Council at the time that significant savings were to be made through purchasing electricity in the newly deregulated market where it was predicted that energy retailers would be keen to maintain market share. It was proposed that these savings would be short lived and that Council should reinvest these savings and those from energy efficiency into ongoing projects that would further cut electricity consumption. This proposal was adopted unanimously by Council.

Investment Energy Projects

Between 1995/96 and 2005/06 a total investment of \$1.6million has been made in energy conservation projects.

Investments were made across a number of sites and initiatives include:

- ongoing energy audits
- power factor correction
- lighting retrofits and intelligent control
- building management systems
- installation of windows with double glazed smart glass
- installation of variable speed drives
- ceramic heat rejecting paint on roof tops
- timers of hot water systems, auto boilers and chilled water fountains
- electricity tariff changes

¹⁴ developed in Phoenix Arizona.

Water Projects

Between 2000/01 and 2005/06 a total investment of \$262,000 has been made in water conservation projects. Investments were made to:

- conduct a full audit of all 500 water connected sites resulting in \$100,000 worth of savings per annum from simply changing meter sizes and from contesting what Council believe are inappropriate discharge factors with the local water authority.
- systematic conversion of all showers and hand basins to low flow controlled systems

Outcomes

Energy

The total investment of \$1.6million has achieved savings of \$3.5million (excluding Net Present Value) against business as usual practices.

In 2000/01 a reduction of \$400,000 or 40% had been achieved. However in 2001/02 the costs increased significantly because the consumption of two additional large facilities¹⁵ was included in the total consumption figures. In 2005/06 the total consumption is at its lowest since 2001/02 however the cost of electricity has increased by 2% since 2004/05 (*see Figure 3*).

Water

Total investment of \$262,000 has achieved a \$120,000 per annum saving which equals a 2.2year payback period.

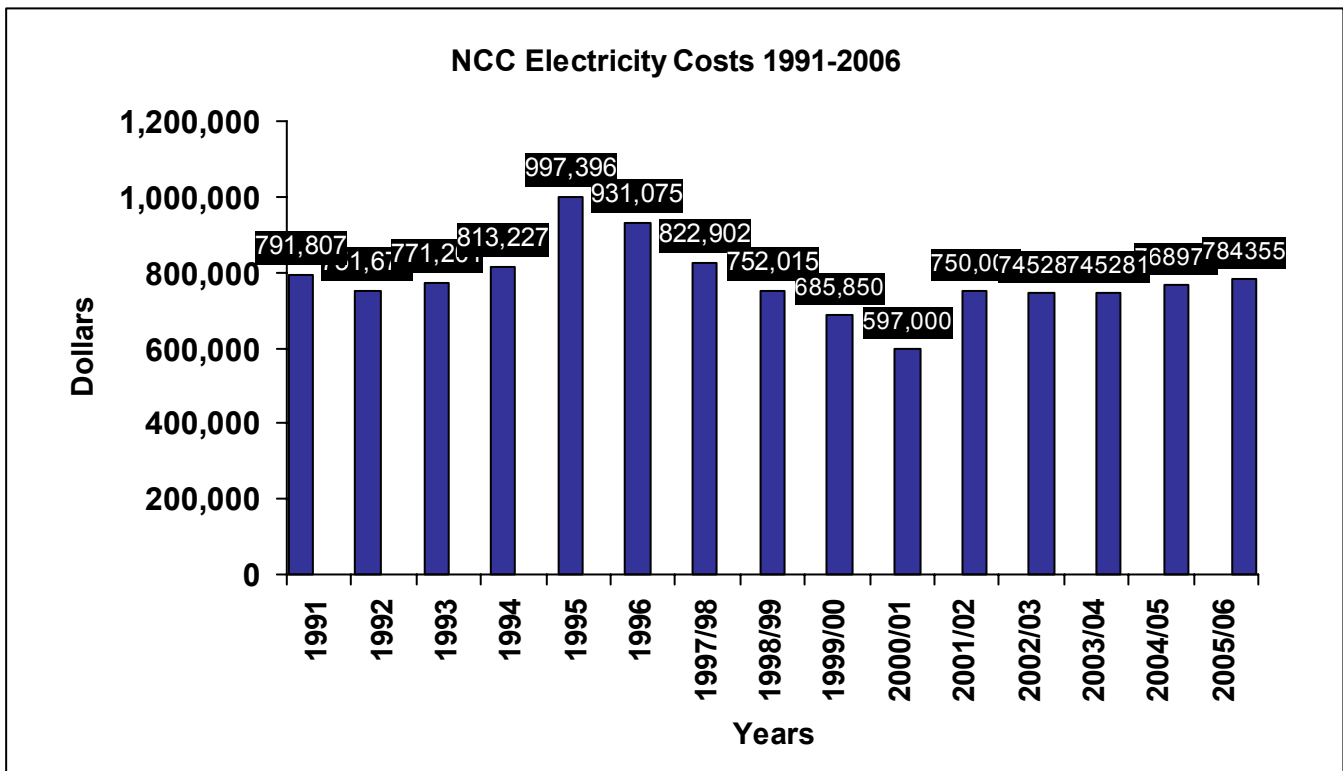


Figure 2 Total Electricity Consumption costs for Newcastle City Council facilities 1991-2006

¹⁵ The Civic Theatre and an additional administration centre known as the Fred Ash building.

Example

City Administration Centre

The energy efficiency works undertaken at Council’s main administration building are a good example of the cost savings that can be achieved. A 63% reduction in electricity costs was achieved in 2002/03 for the City Administration Centre (see Figure 3). The increases from that point are attributed to increased unit costs of electricity.

Project Cost

Energy efficiency initiatives undertaken at the administration centre include:

Initiative	Cost
• Installation of lighting control system	\$32,000
• toilet lighting control system	\$2000
• power factor correction	\$17,365

More details can be found in the City Administration case studies in Attachment A

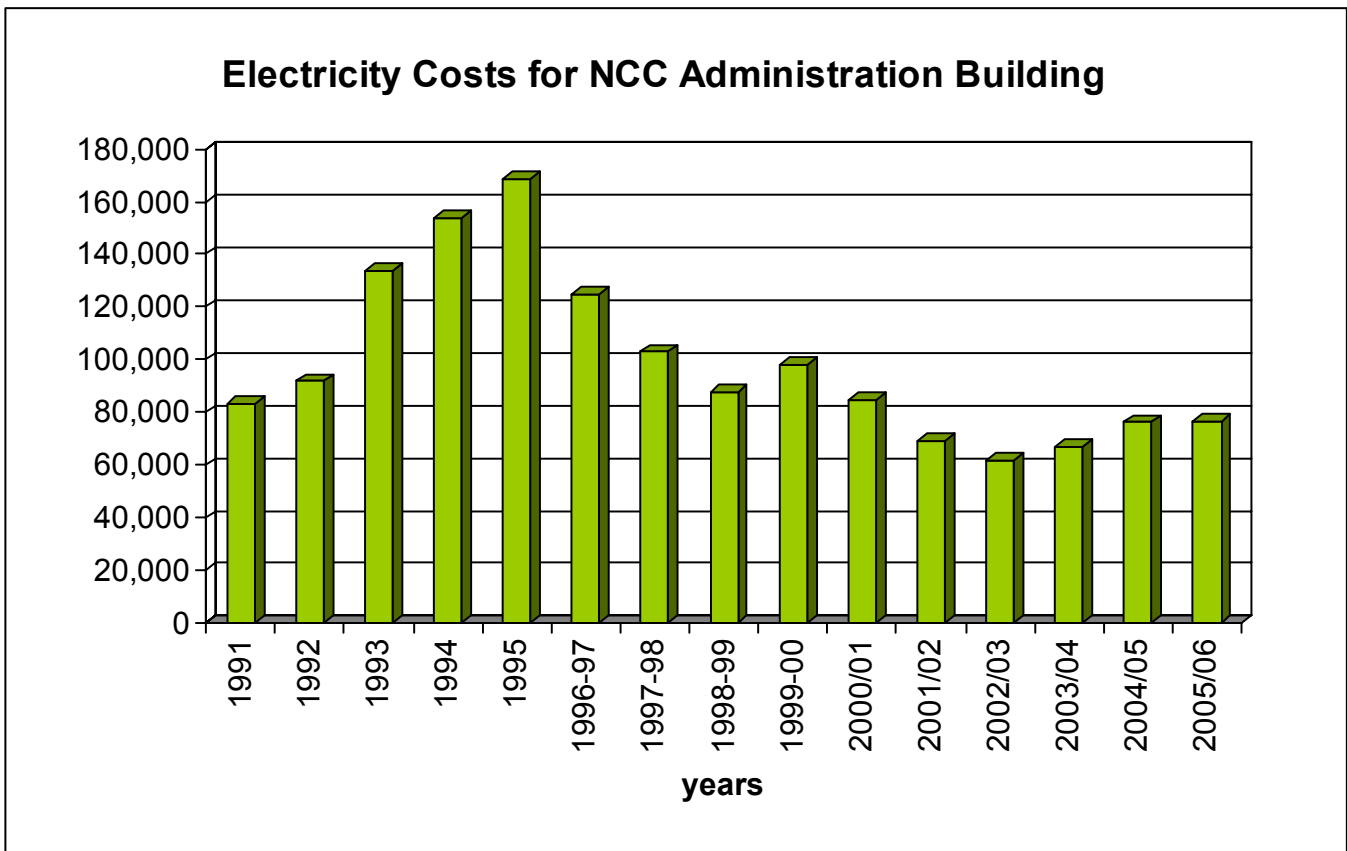


Figure 3 City Administration Centre Electricity Costs 1991-2006

Ongoing

In line with Council’s Quarterly Review process, a report called the Financial Loss

Monitoring Control - Energy Policy Report is presented to Senior Managers and Council as a line item in the budget process. The provision of this information at an executive level is imperative in the decision-making process to reinvest savings to fund further Council projects through a revolving energy fund.

Project *Eco★Star™*

Description The Eco★Star™ Program highlights the environmental performance of Council’s parks, beaches, pools and ocean baths, whilst also implementing sustainable resource use at the amenity blocks of these facilities. The first three years of the Eco★Star™ Program will install water saving devices, storage tanks, energy-saving hot water and lighting control systems and introduce on-site waste recycling at public recreation amenity blocks operated by Council. The second stage will include libraries, child care centres and community halls.

- Objectives**
- Publicly display the energy and water efficiency standards of Council’s parks, beaches and pools.
 - Highlight improvements as they are made at each facility by increasing the star rating on the publicly displayed plaque.

Timing 05/06 – 07/08 (Phase 1 project delivery is staged across three years)

Stakeholders Council, local community

Funding 05/06 \$250,000
06/07 \$250,000
Council

Outcomes Since the program started in 05/06 the following retrofits have occurred at Council’s parks, beaches and pools. These facilities are star rated and the following energy and water saving devices have been implemented to date:

AAA Showers and Taps + Dual Flush	
Shower heads retrofitted	186
Taps retrofitted	74
Toilets retrofitted	88
Smart Hot water + Smart Lighting	
Quantum Hot Water Installations	43
Push button time controls	30 sites
Smart Lighting	30 sites
Waste Recycling + Water Reuse	
Water Reuse Systems	7
Recycling Stations	5

Initial reports show an average energy saving of 30% per year for each amenity building that has been retrofitted.

Project	'Flower Power' Alternative Fuels Project
Description	Council launched Australia's first biodiesel fleet in 2003. Biodiesel is a cleaner burning fuel made from renewable sources such as recycled restaurant oils and can be used in unmodified diesel engines. Currently 13 Council vehicles are participating in a maintenance analysis program that aims to identify benefits or drawbacks associated with the use of B20 biodiesel.
Objectives	<ul style="list-style-type: none">• To reduce greenhouse gas emissions resulting from NCC activities.• To help transform the alternative fuels market.
Timing	2003 - ongoing
Stakeholders	NCC, Biodiesel Industries Australia
Funding	03/04 \$100,000 04/05 \$50,000 05/06 \$75,000 NCC, state government grants
Outcomes	<p>The NSW Roads and Traffic Authority (RTA) have conducted comprehensive emissions testing on 13 Council vehicles. Testing included garbage trucks, passenger and light commercial vehicles. The emissions test results demonstrate a 30% reduction in black smoke and 39% reduction in particulates when using B20.</p> <p>The Council's Flower Power Kombi has been using biodiesel since the beginning of the trial, travelling over 95,000km with no drawbacks from the use of biodiesel identified.</p> <p>If used by the entire fleet, B20 would replace 20% of the approximate 1.2 million litres per annum of petroleum-derived diesel consumed by Council with a renewable fuel. This equates to a reduction in greenhouse gas emissions of approximately 540 tonnes per annum.</p>

Project	Landfill Gas Management
Description	Methane gas is 22 times more potent a greenhouse gas than carbon dioxide and accounts for a large proportion of the Council's greenhouse gas emissions. Council has begun flaring the harvested gas and in readiness for the installation of two 1MW electricity generators in early 2007. The installation of just one of these generators will produce electricity in excess of that consumed by all Council facilities.
Objectives	To reduce greenhouse gas emissions.

Timing	03/04 - ongoing
Stakeholders	Council, state government, EnergyAustralia, contractors
Funding	The electricity generation and carbon credit incentives makes this project financially viable.
Outcomes	Council meets its obligations to reduce greenhouse gas emissions through the flaring of gas, which results in a 75% reduction in greenhouse gas emissions from the site.

Project	Water Harvest Project
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Description	The project includes supplementing town water supply by accessing ground water for irrigation of four NCC facilities and implementation of efficient irrigation scheduling. Ground water is drawn and stored in five holding tanks (each at 35,000 litre capacity) where it is pumped through to feed sprinklers.
Objectives	To reduce potable water consumption and costs.
Timing	03/04 - ongoing
Stakeholders	Council, community
Funding	03/04 \$100,000 04/05 \$100,000 05/06 \$100,000 Council
Outcomes	As well as saving up to fifty megalitres of town water (plans to increase this to 75 megalitres are currently being implemented), the project is saving \$50,000 per annum on water bills and \$2,400 on electricity bills. For an initial investment of \$170,000, the project will pay for itself in less than five years and will continue to reduce Council's water consumption by up to 15% annually.

Community Projects

The GAIN Plan outlines actions over an 8 year period to address greenhouse gas abatement in both Council and Community actions. Ongoing partnerships with government and non government organisations as well as community education and engagement has seen the roll out of many innovative and diverse projects.

Based on the experience gained in the energy and water efficiency projects for Council facilities, Council is a firm believer in the motto of “if you can’t measure it – then you can’t manage it”. Detailed measuring and reporting is now an instrumental part of how Council approaches all greenhouse action activities and this is reflected in the way that Council approaches the GAIN community projects. Detailed below are the descriptions, costs and outcomes for the following community projects:

- **www.ClimateCam.com and the ClimateCam Billboard** – the world’s first greenhouse gas speedometer and city wide power meter displaying community consumption from 14 zones
- **ClimateCam for Schools** – helping schools manage their energy consumption
- **Community REFIT** - low-cost, no-fuss energy and water saving kit for residents
- **Financial Loss Control** – 14-step in-business mentoring for strategic resource efficiency
- **Cleaner Production** - resource efficiency for the business sector

<i>Project</i>	<i>www.ClimateCam.com</i>
<i>Description</i>	ClimateCam is the worlds first Greenhouse Gas Speedometer, providing an accurate computer based measuring tool that tracks and report the greenhouse gas emissions for the City of Newcastle. Over last 6 years the actual energy consumption and greenhouse emissions for the City of Newcastle have been recorded on Council’s online city-wide power meter, ClimateCam.
<i>Objectives</i>	To provide a mechanism that allows householders and businesses to determine if their individual greenhouse actions are having an effect on Newcastle’s overall greenhouse gas emissions.
<i>Timing</i>	2001 - ongoing
<i>Stakeholder:</i>	Council, Greenhouse Action Partners, community
<i>Funding</i>	2001-2006 \$120,000 Council, Environment Trust NSW, EnergyAustralia
<i>Outcomes</i>	Monthly consumption data is collected and involves monitoring energy, water, waste, gas consumption, trees planted as well as a count of registered vehicles. Recent figures show that over the last two years the community has achieved a total reduction in energy use of 97 Giga Watt hours which is like switching off 13,600 homes and greenhouse gas reductions of 89,000 tonnes which is enough to fill all the houses in Newcastle 1.5 times over .

Future plans

Ongoing plans for ClimateCam include:

- Expansion of data sets to include air quality and weather information;
- Installation of the ClimateCam Billboard that will provide live consumption data from Newcastle’s 14 electricity substations;
- Upgrade of website

Ongoing Monitoring

ClimateCam was set up as a tool to measure and report actual energy consumption trends and the city’s progression towards the GAIN Plan greenhouse gas reduction targets. The soon to be installed ClimateCam billboard will show the community how their individual actions contribute to city wide energy savings that benefit the environment.

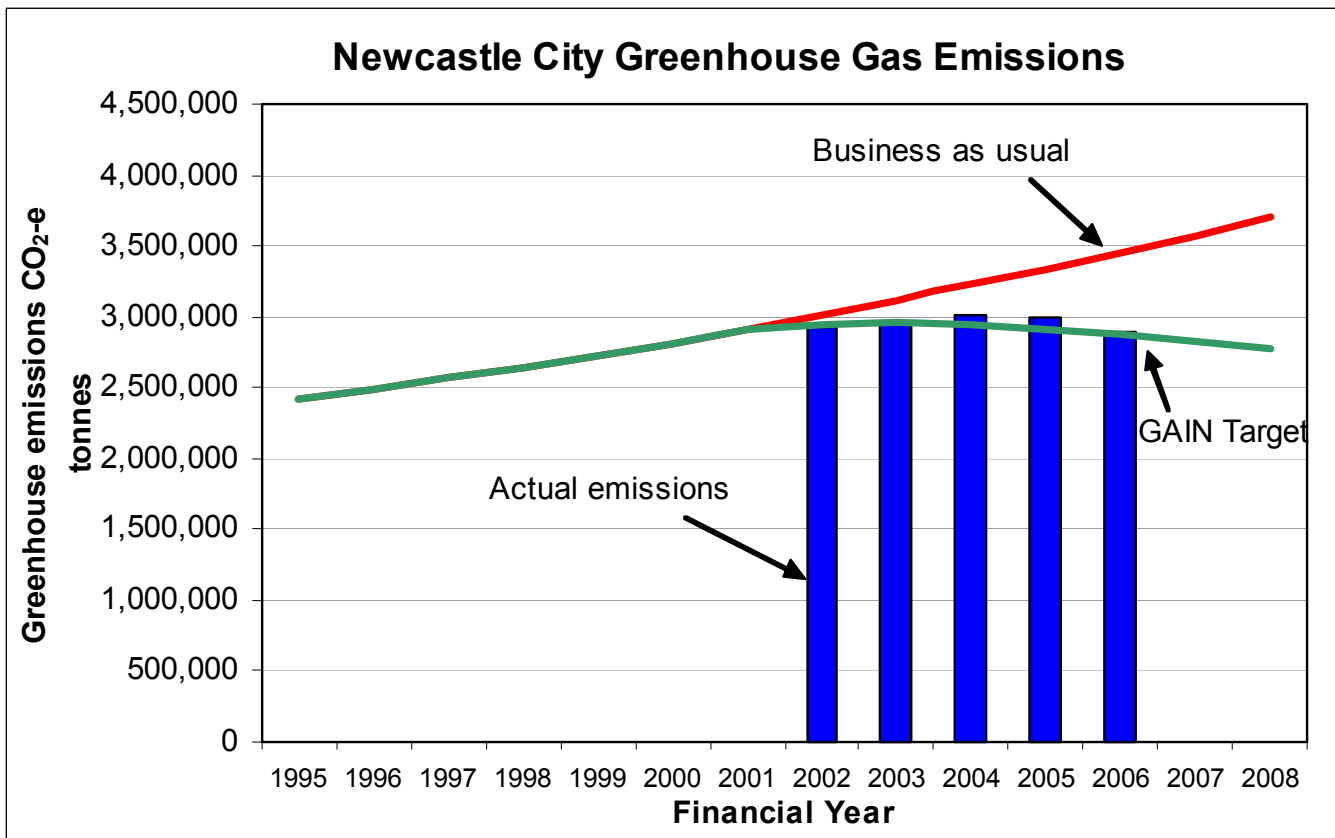


Figure 4 Greenhouse Savings for the City of Newcastle reported on www.ClimateCam.com

Project	ClimateCam for Schools
Description	ClimateCam for Schools is based on the philosophy “if you can’t measure it, you can’t manage it”. The program is supported by the local electricity retailer EnergyAustralia and their WebGraphs, an internet-based energy reporting program which can be used by students, teachers and administrative staff to measure and monitor the schools electricity consumption. WebGraphs helps to develop an understanding of the relationship between electricity consumption, carbon dioxide emissions and global warming
Objectives	Work with the education sector to assist the City in its endeavours to reduce energy and resource consumption.
Timing	05/06 – ongoing
Stakeholders	Council, NSW Department of Education and Training, Hunter / Central Coast Region, EnergyAustralia, community
Funding	05/06 \$5,000 06/07 – Environment Trust NSW grant and submission pending
Outcomes	ClimateCam for schools is currently being piloted with six schools within the Newcastle local government area. Examples of how WebGraphs is being used to relate everyday actions to the global problem of climate change include: <ul style="list-style-type: none"> • Callaghan College – Jesmond Campus, recently celebrated World Environment Day with a ‘Green Day’ and used information from WebGraphs to show students how much carbon dioxide the school produced on the previous day. Students were then challenged to show how much they could decrease their carbon dioxide production for the next day. • Callaghan College – Waratah Technology Campus, students are implementing an education program with school staff, encouraging them to minimise their energy use in the school. The students have written a piece for the school newsletter and designed signs to place in staffrooms encouraging energy conservation. • Callaghan College – Wallsend Campus, a year 9 geography class developed an action plan for using WebGraphs and have been devising slogans for reducing electricity consumption, to be printed in the staff and student daily newsletter. • Kotara High School, students are planning to conduct an energy audit to determine where the school is using the most electricity. • Lambton High School, a dedicated group of students from different years will also be conducting an energy audit, which will allow them to develop strategies to help the school use less electricity. • St Francis Xavier’s College – using WebGraphs to monitor electricity consumption

Project	Newcastle and Hunter Cleaner Production Project
Description	<p>This partnership project is managed by Council and involves working with organisations to reduce energy, water and waste consumption. Participants are from a range of industry sectors including steel manufacturing, shopping centres, coal mining, hospitality, media and transport.</p> <p>Cleaner Production offers a smarter way of doing business that involves taking a fresh approach to the way resources are used. It is an overall approach to business management that targets the reduction of energy, water, material waste and pollution. Cleaner Production encourages all levels of employee participation and identifies opportunities for ongoing savings.</p>
Objectives	To assist local businesses sector to reduce energy water and waste consumption.
Timing	03/04 – ongoing
Stakeholders	Council, local businesses, state government, business chamber, local energy and water authority
Funding	<p>03/04 \$87,000 04/05 \$211,500 05/06 \$150,000 06/07 \$96,000</p> <p>Source: Council's- Environment Levy, state government grants, company contributions and local water authority</p>
Outcomes	<p>Reductions of around 30,000 tonnes in greenhouse gas emissions and more than \$1.5million in annual savings have been identified by just 32 companies in the Newcastle and Hunter Region. Companies saved:</p> <ul style="list-style-type: none"> • over 7million KWh of electricity, • 2,000 GJ of gas, • 78ML of water • over 90 tonnes of waste was diverted from landfill

Project	Financial Loss Control- energy, water, waste
Description:	After Council reduced its energy and water consumption and greenhouse gas emissions in its own facilities, the AMEIF business unit developed a 14 step strategic implementation framework to assist other local governments and businesses to replicate energy and resource projects.
Objectives:	To develop and deliver an integrated package that assists organisations control financial losses by reducing resource consumption and greenhouse gas emissions.

Timing: 2003 - ongoing

Stakeholders Council, external organisations (including other local governments and businesses)

Funding: Council

Outcomes: AMEIF has worked with over 200 local governments and businesses in Australia and New Zealand, resulting in many success stories.

Project *Community REFIT Project*

Description The Community REFIT project provides Hunter households with a low cost, no fuss kit for reducing not only their energy and water bill, but also greenhouse gas emissions and water consumption. The REFIT Kit includes a fixed AAA-rated showerhead, garden hose trigger nozzle and six compact fluorescent light globes. The Kit is installed by a qualified tradesperson and includes an energy and water audit of the home to identify where further savings might be possible. The standard REFIT Kit is valued at over \$120, but is available to Hunter Residents for \$39. The REFIT Kit will quickly pay for itself as it reduces water and electricity bills by up to \$150 a year.

Objectives To assist the community to reduce energy and water consumption and to improve awareness.

Timing: 03/04 – ongoing

Stakeholders The Community REFIT project is a joint initiative of Hunter Water, EnergyAustralia and Council. Maitland, Cessnock, Port Stephens and Lake Macquarie Councils are also project partners.

Funding 03/04 \$25,000
 04/05 \$70,000
 05/06 \$80,000
 06/07 \$80,000
 Project management costs are funded by the Councils - Environment Levy

Outcomes: 8305 kits have been installed with greenhouse gas savings of 46,000 tonnes over the life of the products (9136 tonnes pa), 249 million litres of water each year and 4569 tonnes of coal each year.

Future Community Project

<i>Project</i>	<i>Solar Newcastle</i>
<i>Background</i>	Council is constantly looking for opportunities to achieve the actions identified in the GAIN Plan and the Solar Cities program is one such opportunity. Newcastle and the Hunter are bidding for a share of \$75 million dollars in funding from the Federal Government aimed at creating a more sustainable future. Solar Newcastle is about bringing together innovative and practical ideas that help households and businesses use less energy.
<i>Description</i>	<p>The \$75 million Solar Cities Program is designed to test new ideas and products for efficient energy use in at least four Australian cities. Headed by Newcastle City Council, the Solar Newcastle Consortium brings together energy providers, local media, business, schools and government from across the Hunter to fly the flag as the sustainable energy capital of Australia.</p> <p>The irony is that while Newcastle has a track record of environmental leadership, the region produces over 40 percent of New South Wales' electricity and operates the largest coal exporting port in the world. It might seem a contradiction but Council believes it sends a strong message. Coal fired electricity will be used for a long time to come and Council with the Solar Newcastle partners intends to prove that an engaged community will be able to find smarter ways to use energy at home and work. Through 21 projects across a range of community sectors and specifically designed products, services, and support networks, the whole community is given the opportunity and empowered to be part of the Solar Newcastle solution.</p>
<i>Objectives</i>	<ul style="list-style-type: none">• To identify new ways for communities to think about energy use a• Providing energy prices that encourage the community to use electricity more wisely• Implementing smart energy technologies• Proving the financial and environmental benefits of being energy wise at home and work
<i>Timing</i>	There are 11 finalist and the winning cities will be announced from August 2006. The winning cities will implement their projects from 2007 until 2013.
<i>Stakeholders</i>	Council, community, state and federal governments. Solar Newcastle partners include representatives from across the whole community including the coal industry, energy providers, local media, business, schools and government.
<i>Funding</i>	Solar Cities is a dollar for dollar grant program. The total value of the project is \$30million
<i>Desired Outcomes</i>	To prove that an engaged community can reduce the projected growth in peak demand for the City of Newcastle by 10% for the Solar Cities period (to June 2013) and reduce demand for electricity by 10% on 2005 levels.

CONCLUSIONS

Leading by Example

Newcastle City Council takes a holistic, practical and strategic approach to local greenhouse action. By first cleaning up its own backyard, Council has been able to maintain 40% (\$400,000 pa) in energy savings and a 25% (\$200,000 pa) saving in water bills. Following the City's first Energy Town Meeting in 2000 the Greenhouse Action in Newcastle Plan (GAIN) 2001-2008 was created in partnership with the community and local energy and water utilities. The GAIN Plan identifies 88 actions for council and the community to save money by using resources more efficiently. The GAIN Plan provides the practical basis to achieve the City's vision to become an international testing ground for smart energy and resource management products and services.

The role of local government and community based greenhouse action can not be underestimated. As an honest broker, Councils are able to work with both the community and business sector to achieve benefits for the whole community. GAIN Plan projects are delivered in partnership with the community, industry and local energy and water utilities. ClimateCam is the world's first greenhouse speedometer that measures the effectiveness of community wide greenhouse action and essentially the effectiveness of GAIN Plan projects.

Sharing the Knowledge

In order to increase the success of GAIN Plan project implementation, Council took a retrospective look at the past decade of action to develop the Financial Loss Control 14 Steps. *Financial Loss Control- energy, water, waste* (FLC) is an easily transferable and strategic approach to energy and resource efficiency that can be applied to the implementation of all types of projects for local government and business. By following the FLC process to implement a range of projects within Council and also by working with over 200 local governments throughout Australia, Council understands that ongoing success in greenhouse action is readily achievable and profitable.

Lessons Learnt

Council never stops learning new and more efficient ways to lead by example and help the community use their resources more efficiently. Some of the key lessons learnt include:

- **Commitment**- make a long term commitment to greenhouse action
- **Policy**- document the specific energy and resource efficiency initiatives you are committing to
- **Communication** - engage your stakeholders, ask the community and businesses for their input and ideas
- **Benchmarking** – put a stick in the sand to measure your successes against
- **Monitoring**- opportunities for savings can not be identified without reliable consumption and cost data
- **Teamwork** – utilise the expertise you have within your organisation and community
- **Corporate Knowledge** – commit to sharing and growing the knowledge of the people within your organisation and/or community
- **Targets** – set realistic targets so you know what you are aiming for

- **Ideas Protocol** – capture and use the ideas that come from employees and community members
- **Low Hanging Fruit** – get some quick wins on the board to support your business case and maintain the momentum of the initiative
- **Pilot** – take the time to pilot all projects and initiatives and make any necessary adjustments
- **Implementation** – once tested go forth and implement the project
- **Monitoring and Reporting** – do not set and forget, make sure you use the consumption data to monitor the progress of each initiative
- **Case Studies** – celebrate the success of the initiatives and use it as an opportunity to acknowledge the people who were involved.

Be willing to think and act outside the square – there is no silver bullet to local greenhouse action!

Next Step -Building on Strong Track Record

Council is currently building on a solid track record and bidding for funding to fly the flag as Australia’s energy smart capital. The Federal Government’s \$75million Solar Cities program will run till 2013 and forms part of the Commonwealth climate change strategy.

As the world’s largest coal export harbour, Newcastle and the Hunter are at the hub of the largest energy generation and export industries in Australia. This makes the region an ideal location to become a model for sustainable energy use.

Using expertise across the whole energy cycle, including the energy generation and coal industry, the Solar Newcastle bid will show how valuable energy resources are and how they can be used more efficiently. Solar Newcastle is about exploring new ways to use energy more wisely, no matter where it comes from - the sun, wind, waves, coal, oil or gas.

There is no silver bullet for a sustainable energy future but Newcastle City Council will prove the benefits of working with the whole energy cycle to communicate a consistent and accurate message about smart energy use. Solar Newcastle has a unique ability to create a common conduit that communicates one consistent and accurate message throughout the energy cycle from coal mining, power generation, distribution, energy innovation to all end users in the community. This vital feedback loop will form the missing link in community attitudes between burning fossil fuels and switching on a light at home.

ATTACHMENT