



# **The Gold Coast 2010 Cities for Climate Protection Program**

## **2001 Action Plan**

**Environmental Studies No 7**

**This Document represents the achievement of milestone 3 of the Gold Coast City Council's Commitment to the Cities for Climate Protection Program™ Australia.**



---

**Contact us:**

Environmental Planning  
Strategic and Environmental Planning Branch  
Planning, Environment and Transport Directorate

Tel: 5582 8844

Fax: 5582 8878

Email: [rmcnamara@goldcoast.qld.gov.au](mailto:rmcnamara@goldcoast.qld.gov.au)

PO Box 5042 GCMC Q 9729

© Gold Coast City Council 2001

Material in this document may be reproduced provided its source is acknowledged.  
This document should be referenced as follows:

Gold Coast City Council 2001, *The Gold Coast '2010' Cities for Climate  
Protection Program 2001 Action Plan*  
GCCC, Gold Coast City

---

**Disclaimer**

---

Any representation, statement, opinion and advice, expressed or implied in this publication is made in good faith but on the basis that the City of Gold Coast, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise), to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representations, statement or advice referred to above.

**ISBN 1 74057 012 X**

---

## FOREWORD

While the enhanced greenhouse effect is a global issue and the efforts of the Gold Coast alone will not solve these problems, we have a responsibility to play our part in the solution. Indeed, the Gold Coast has shown a determination to lead the way on this crucial issue in the local government arena.

As participants in the Cities for Climate Protection (CCP) campaign, the Gold Coast is making its contribution to this global issue. The research that underpins both our goals and the actions of the 2001 Action Plan, demonstrates that making a significant contribution to reducing greenhouse gas emissions can come through cost effective gains in energy efficiency and does not have to come at the expense of service. Saving energy and saving money can save the planet.

This 2001 Action Plan for greenhouse gas reductions from the Gold Coast builds on existing Council and community initiatives and strives to encourage reductions in Council emissions of 20% per resident, and of 10% per resident for community emissions by the year 2010.

I encourage you to read this CCP action plan and to adopt and support as many of the initiatives and strategies as you can. These will save you money, will reduce greenhouse gas emissions from the Gold Coast and will contribute to reducing the impacts of the enhanced greenhouse effect.

Councillor Gary J Baidon  
**Mayor**

---

Copies of this publication and other publications in the Environmental Studies Series are available at Gold Coast City Council Libraries and can be purchased from the Council Administration Centres at Bundall Road, Surfers Paradise and Nerang Southport Road, Nerang. These are listed hereunder:

- Number 1      State of the Environment Reporting
- Number 2      State of the Environment  
City of Gold Coast Benchmark '97
- Number 3      Use of GIS and the WWW in Community Based Planning
- Number 4      The Geology of the Gold Coast Region Environmental Studies No 4
- Number 5      The Provisional Soil Associations of the Gold Coast Region  
Environmental Studies No 5
- Number 6      S.E.E. the Future  
Society-Economy-Ecology
- Number 7      The Gold Coast '2010' Cities for Climate Protection Program  
2001 Action Plan

---

## EXECUTIVE SUMMARY

This plan promotes a '2010' greenhouse gas reduction strategy for the City of Gold Coast to the year 2010 with separate Council (20%) and Community (10%) reduction goals. These goals were calculated on a per capita basis to acknowledge the high rates of population growth in the City. The Plan also provides detail of the range of actions required to meet these targets. Many of the mechanisms to achieve these goals are already endorsed by Council such as:

- Purchasing 'green' electricity from renewable resources;
- Encouraging renewable energy projects in the City;
- Improving the efficiency of transport systems;
- Reducing the volume of waste sent to landfill;
- Containing methane produced at landfill sites; and
- Increasing energy efficiency in buildings and vehicles.

The greenhouse effect is a natural process that warms the earth so that life can exist. However increased levels of gasses such as carbon dioxide in the atmosphere result in an enhanced greenhouse effect that traps more heat leading to increased intensity of weather events and sea level rise. These impacts are likely to be catastrophic for coastal communities and may place an enormous burden on the Gold Coast. It is widely acknowledged that an enhanced greenhouse effect is being caused largely by human activities such as the burning of fossil fuels (coal and oil). Dealing with the impacts of the enhanced greenhouse effect may be the greatest challenge facing the world throughout this century.

The United Nations Framework Convention on Climate Change (UNFCCC) is a forum where Governments from around the world meet to discuss what can be done to address the issues associated with the enhanced greenhouse effect. The 1997 Conference of the Parties (COP3) to the UNFCCC took place in Kyoto, Japan. This round of negotiations resulted in the Kyoto agreement which, when ratified (expected 2002), binds all nations to a reduction in their greenhouse gas emissions. Australia has set an emissions target of no more than an 8% increase over 1990 emissions by the year 2010.

Part of the Kyoto agreement allows for a system of carbon trading along with a system to account for carbon sequestration or storage in carbon sinks such as actively growing forests. While it is too early to evaluate the detailed implications of any carbon trading systems that may arise, the Gold Coast community may be exposed to increased costs should it not move to reduce its greenhouse gas emissions through increased energy-use efficiency. Increased costs will be due to utilities offsetting emissions through the purchase of credits, essentially a carbon tax.

The Cities for Climate Protection (CCP) Program of the International Council of Local Environmental Initiatives (ICLEI) is an international program designed to assist local governments address the issues related to the enhanced greenhouse effect. The Gold Coast City Council (GCCC) joined the program in 1998 and has completed the first milestone, an inventory of greenhouse emissions and a forecast of their growth for the Council and the Community.

---

This strategy document provides a summary of the inventory and forecast of greenhouse gas emissions that the Gold Coast City Council and Community are responsible for (CCP Milestone 1). It details the Council's emission reduction goals and gives a broad action plan for both the Council and Community and thus completes Milestones 2 and 3 of the program. Milestone 4 of the program involves implementation of the 2001 Action Plan measures and Milestone 5 will involve the monitoring and reporting on greenhouse gas emissions and the success of measures implemented.

The 2001 Action Plan is a 'living' document which will be revised in regular reviews. This document provides a first overview of Council's commitment and ongoing actions to reducing greenhouse gas emissions that derive from activities within the Gold Coast City Council area. Future editions of the Action Plan will be more detailed including new initiatives, key actions, project priorities, performance indicators, timeframes and allocation of responsibilities. This information will derive from community feedback and regular review of this document.

Actions and measures within this strategy are designed to produce immediate benefits alongside significant greenhouse gas emission savings. Emphasis has been placed on a 'no regrets' policy that will bring benefits independent of the rate of global warming. Some actions will actually save money or defer significant capital costs however it is important that estimated financial savings not be incorporated into budgets until it is confirmed that the estimates have been realised and actual savings have been achieved. Benefits beside significant emission reductions include: lower energy bills for Council, businesses and families, potential for enhanced economic development and city image, reduced air pollution, decreased reliance on non-renewable resources and enhanced local partnerships.

As part of the CCP methodology greenhouse gas emissions are counted at the point of use (the demand side) rather than at the point of production. For example, actual air pollution and greenhouse gas emissions within Gold Coast are low and the city enjoys high air quality. However activities within the city use large amounts of electricity produced outside the area from the burning of fossil fuels, resulting in substantial emissions.

This strategy is based on per capita emissions, calculated by dividing the City's total emissions by the number of residents. While this approach is appropriate for cities with high rates of population growth, it can lead to apparent anomalies where this is coupled with high visitation rates. For example, at any given time our high tourist and visitor numbers distort the per capita figures and make the emission rates appear high compared to Australian national averages.

Trends indicate that in the absence of any actions taken to reduce growth in energy consumption (a business as usual approach) the emissions the Gold Coast Community is responsible for will more than double, increasing by around 112% between 1990 and 2010. The emissions the Council is responsible for are expected to increase by around 120% over the same period.

The 2001 Action Plan recommends a target reduction of 20% (based on 1997 level emissions) for council and 10% for the community, measured on a per capita basis, by the year 2010. Under the CCP program these goals may be revised and adjusted at any time during the Gold Coast '2010' Cities for Climate Protection Program period. The development of reduction targets on a per capita basis addresses both, Council's

---

responsibilities under the Cities for Climate Protection (CCP) program, and the realities of strong population growth expected for the Gold Coast. If the Gold Coast were to commit to a 10% reduction in emissions by 2010 based on the emissions the community was responsible for in 1997, without adjusting for population growth, each resident would be required to make a 50% reduction in emissions and therefore in energy consumption. This is far more than other nations and cities have been expected to commit to. Other cities with high levels of population growth have adopted similar per capita targets for greenhouse gas reduction, including the Saitama Prefecture and Kamakura City, in Japan.

To achieve the emission reduction goals a broad range of greenhouse gas reduction actions have been identified. These actions are largely based on existing programs. The 2001 Action Plan uses the Gold Coast's emissions inventory and forecast to highlight and quantify where major gains are possible. Analysis of the inventory and estimated reductions due to the actions indicate that the majority of the '2010' emission reductions for the council and community can be achieved by endorsed plans and strategies that are currently being developed or implemented.

Internationally, it is now common to talk about 'factor four' improvements - doing twice as much with half as much energy. Council actions can provide a strong cue to the community and other organisations on the Gold Coast. Council can clearly demonstrate and promote how to increase energy efficiency without sacrificing service. Energy efficiency is all about doing more with less, and the potential for cost-effective savings is enormous.

To maximise success Corporate actions have been developed with the collaboration of each of the directorates responsible for their implementation. The 2001 Action Plan strongly reflects the sustainability aspects of the Corporate Plan. The Community actions will be reviewed as part of the State of the Environment Reporting process. Council actions to reduce greenhouse emissions will be reviewed every year as part of the CCP program. Action Plan documents will be regularly reviewed to incorporate greater detail, community vision and to reflect new opportunities. Required adjustments will be made to this 'living' document to ensure the Gold Coast CCP Program's goals and actions remain relevant till 2010.

---

---

## TABLE OF CONTENTS

<b>FOREWORD.....</b>	<b>III</b>
<b>EXECUTIVE SUMMARY.....</b>	<b>V</b>
<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1 What is the Greenhouse Effect? .....	2
1.2 The Potential Impacts of Climate Change .....	3
1.3 Emissions Trading and Carbon Sinks.....	4
1.4 Why Council Needs to Respond to the Challenge .....	5
<b>2. GOLD COAST EMISSION'S PROFILE AND FORECAST .....</b>	<b>7</b>
2.1 Corporate Emissions Inventory Analysis .....	7
2.2 Community Emissions Inventory Analysis .....	8
<b>3. EMISSION REDUCTION GOALS.....</b>	<b>11</b>
3.1 Corporate Emission Reduction Goal .....	12
3.2 Community Emissions Reduction Goal .....	13
<b>4. 2001 ACTION PLAN .....</b>	<b>17</b>
4.1 Corporate 2001 Action Plan .....	18
4.2 Community 2001 Action Plan .....	21
<b>5. IMPLEMENTATION, REVIEW, REPORTING, AND MONITORING.....</b>	<b>31</b>
5.1 Cities for Climate Protection .....	31
5.2 Implementation .....	31
5.3 Program Review .....	31
5.4 Monitoring and Reporting .....	32
5.5 Financing the 2001 Action Plan .....	32
<b>6. CONCLUSION .....</b>	<b>35</b>
<b>7. BIBLIOGRAPHY.....</b>	<b>37</b>

---

---

## 1. INTRODUCTION

The greenhouse effect is caused by greenhouse gases trapping the sun's heat inside the Earth's atmosphere and warming the earth so that life can exist. However, significant increases in levels of greenhouse gas emissions are leading to an enhanced greenhouse effect which is thought to be responsible for a range of impacts, including climate change and sea level rise. These impacts are likely to force major expenditure on sewerage and stormwater infrastructure, water resources, and coastal works. Dealing with the impacts of the enhanced greenhouse effect may be the greatest challenge facing the world throughout this century. This Action Plan will guide the Council and assist the Gold Coast community in facing this challenge.

The United Nations Framework Convention on Climate Change (UNFCCC) is a forum where Governments from around the world meet to discuss what can be done to address the issues associated with the enhanced greenhouse effect. The 1997 Conference of the Parties (COP3) to the UNFCCC took place in Kyoto, Japan. This round of negotiations resulted in the 'Kyoto Protocol' which, when ratified (expected 2002), binds all nations to a reduction in their greenhouse gas emissions. Australia has set an emissions target of no more than an 8% increase over 1990 emissions by the year 2010.

Part of the Kyoto Protocol allows for a system of carbon trading along with a system to account for carbon sequestration or storage in carbon sinks such as actively growing forests. While it is too early to evaluate the detailed implications of any carbon trading systems that may arise, the Gold Coast community may be exposed to increased costs should it not move to reduce its greenhouse gas emissions through increased energy-use efficiency. Increased costs will be due to utilities offsetting emissions through the purchase of credits, essentially a carbon tax.

The following sections of Chapter 1 provide a brief background to the greenhouse effect and further detail on potential impacts upon coastal communities. It also outlines the reasons why Council needs to respond to the challenge of reducing greenhouse gas emissions.

The Cities for Climate Protection (CCP) Program of the International Council of Local Environmental Initiatives (ICLEI) is an international program designed to assist local governments address the issues related to the enhanced greenhouse effect. The CCP software and methodology has been used to collate and analyse the Gold Coast's Community and Council emissions profile and forecast to highlight where major emission reductions are possible. A summary of the emissions inventory and business-as-usual forecasts (CCP Milestone 1) for the Council and the Community of the Gold Coast are presented in Chapter 2.

Using energy more efficiently and reducing reliance on sources of energy that produce large amounts of greenhouse gasses are essential to address the greenhouse challenge. This challenge can be met through a range of measures across a number of sectors on the Gold Coast without affecting quality of service. Investigating the feasibility of measures and assessment of their potential for emission reduction can be used to develop the reduction goals (CCP Milestone 2) and contribute to developing an Action Plan (CCP Milestone 3). Chapter 3 uses this approach to derive Council and Community emissions reduction goals. Chapter 4 outlines the measures of Council's Corporate Action Plan and those of the Community Action Plan.

All Strategies require implementation (CCP Milestone 4) and financing and a process for reporting and monitoring of their progress (CCP Milestone 5). Chapters 4 and 5 provide a summary of how it is proposed that these milestones will be achieved.

### **1.1 What is the Greenhouse Effect?**

The greenhouse issue arises from concern that the natural greenhouse effect is being enhanced by human activities resulting in increased global temperatures, climate change, sea level rise and long-term changes to the environment that may make human survival more difficult. The greenhouse effect is a natural process that keeps the Earth's surface at a temperature suitable to support life.

Human activities, principally burning fossil fuels, results in increased levels of greenhouse gas being emitted into the atmosphere. These increased levels of greenhouse gas trap more heat leading to an enhanced greenhouse effect. The enhanced greenhouse effect has the potential to lead to global warming, climate change and long-term changes to the environment that could have an overall negative impact on human and other life.

The greenhouse effect occurs when radiant energy from the sun reaches the Earth's surface and warms it. Some of this heat is re-radiated back into space, but the rest is absorbed by 'greenhouse' gases, keeping the lower levels of the atmosphere warmer than the upper levels.

The greenhouse gases with most relevance to climate change and which are significantly influenced by human activity include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (NO<sub>x</sub>), and chlorofluoro-carbons (CFCs). The various greenhouse gases have a different contribution to global warming related to both their potential for trapping radiation and to the volume emitted from human activities (see Table 1). These gases do not remain in the atmosphere indefinitely, for example carbon dioxide is absorbed by plants as they grow and by the oceans. These carbon dioxide absorbers are called carbon sinks.

**Table 1: Characteristics of Greenhouse Gases**

<b>Greenhouse Gas</b>	<b>Source</b>	<b>Proportional Contribution</b>	<b>Global Warming Potential *</b>
Carbon Dioxide	<ul style="list-style-type: none"> <li>• Burning fossil fuels</li> <li>• Cement manufacture</li> </ul>	64%	1.0
Methane	<ul style="list-style-type: none"> <li>• Waste decomposition without air</li> <li>• Coal mining</li> <li>• Leakage of natural gas</li> <li>• Grass digestion by grazing animals</li> <li>• Burning of biomass fuels</li> </ul>	20%	21
Nitrous Oxide	<ul style="list-style-type: none"> <li>• Decomposition of Nitrogen fertiliser in soil</li> <li>• Burning of petroleum products</li> </ul>	-	310
Chlorofluoro-Carbons and substitutes	<ul style="list-style-type: none"> <li>• Leakage from refrigeration and air conditioning systems</li> <li>• Aluminium smelting</li> </ul>	-	CFC-12 8,500 HCFC-113 93 HFC-134a 1,300

\* Warming potential (per Kg of gas) equivalent kg of CO<sub>2</sub>. Adjusted from BCC 1999

Before the industrial revolution about 200 years ago the level of greenhouse gases in the atmosphere was relatively constant. However, since then the expansion of industrial activity, increased reliance on fossil fuels and increasingly intensive agriculture have resulted in far greater rates of greenhouse gases being released. The burning of fossil fuels (coal, oil and natural gas) and land clearing are the main causes of a 30 per cent increase in carbon dioxide concentration in the atmosphere over the past 200 years.

## **1.2 The Potential Impacts of Climate Change**

Many scientists agree the impacts of climate change have already been experienced including:

- An average global warming of 0.3°C – 0.6°C with seven of this century's hottest years in the 1990's;
- Sea level rise of 10-25 centimetres over the past century;
- Extreme weather events occurring more frequently and causing considerable property damage and loss of life. In the United States damage from storms and flooding costing a record \$140 billion during the last decade and a period of very high temperatures led to 187 deaths (DFAT 1997, BCC 1999);
- The thinning of the Arctic ice sheet. Scientists who recently visited the North Pole found Arctic ice had shrunk alarmingly, and at the Pole they found a stretch of at least 1.6 kilometres of open water, ice that covered it had melted (Kettle 2000).

Other environmental consequences have the same level of high regional variability as changes to climate. More locally the Department of Foreign Affairs and Trade (1997) have detailed the likely consequences of climate change in Australia, including:

- Severe coastal erosion and damage to coastal ecosystems and infrastructure;
- Higher storm surges and more frequent flooding;
- Increasing days of high fire danger;
- Increasing weed and other pest outbreaks;
- Spread of mosquito borne viral diseases such as Malaria, Denge Fever, and Ross River Fever;
- Significant survival pressure placed on species and ecosystems already struggling to cope with habitat fragmentation where climate changes faster than species or ecosystems can adapt.

The impacts will have particularly broad and costly implications for coastal communities such as the Gold Coast. Climate changes of the magnitude described above could necessitate major spending on water resources, sewerage and stormwater infrastructure, coastal works, natural resource management, and environmental health. Understanding the implications of climate change and sea level rise already form part of Council's strategies for dealing with flood prevention in the City.

### **1.3 Emissions Trading and Carbon Sinks**

The Kyoto Protocol allows for a system of trade in carbon credits and emissions to be developed. Such a system is expected to provide a market pricing mechanism for carbon emissions and sequestration (storage) by industry. This system is generally preferred to the imposition of a Carbon tax and is based on successful examples from the United States related to Sulfur emissions.

Market-based approaches such as emissions trading can be a powerful tool for achieving environmental goals. They put a 'price' on environmentally damaging activities and leave market participants free to re-balance their production or consumption patterns in a way that economises on the full set of resources that they use. Whereas a taxation arrangement puts an explicit price on pollutants, an emissions trading system allows the market to set the price for emissions which, due to the operation of the Protocol, may be in restricted supply.

The concept of the market is generally based on a 'Cap and Trade' model. That is Governments license industry to emit certain levels of greenhouse gases. These levels are often determined based on current levels of emissions. These Industries can then claim a credit for each tonne of Carbon, or equivalent, they prevent from entering the atmosphere. This can be done through redesign of systems, new equipment, or conversion of a high impact gas to one of low impact as in flaring methane to produce carbon dioxide, or possibly through carbon sinks such as forest sequestration projects. Credits that are proven can then be traded to new or expanding industries who will be required to purchase these credits in order to be able to emit.

The price of a tonne of carbon will depend on the cost of alternatives to creating any emissions, such as alternative fuels and new processes, and the number of competing buyers in the market.

At the moment no system of trading has been established and is unlikely prior to ratification of the Protocol. However, speculators are developing potential credit projects such as the arrangement NSW forestry has with Japanese power companies. This speculation has led to quotes for a tonne of carbon to vary wildly, from US\$1 up to US\$300. Most recent quotes appear to be toward the lower end of the range.

None-the-less, carbon trading is likely to be established and will lead to an increase in the price of fuels and energy and consequently for many goods and services. The more a community relies on industries that need to purchase large amounts of credits the greater its exposure to increased costs. Industries that act early to decrease their reliance on high carbon energy and resources through increases in efficiency will be better placed to meet these challenges and remain competitive.

The detail of a program for emission trading is currently being considered in international negotiations. Acceptable procedures for estimating emissions from various activities are being proposed and refined, and rules for flexibility mechanisms such as international emissions trading, joint implementation and the Clean Development Mechanism, are currently subject to negotiation. Successfully reducing greenhouse gas emissions globally without sacrificing economic growth will require innovative and flexible approaches with a coordinated and cooperative international effort. Given the current state of these and other factors, few countries have moved to legally bind themselves to the Protocol.

An array of issues guided by decisions taken at the international level will dictate the final form of Australia's own national emissions trading system. If Australia ratifies the Kyoto Protocol, and it subsequently enters into force, national emissions will be significantly constrained from 2008 through an emission trading system. Companies and organisations within Australia will be able to obtain emission credits through abatement activities by international trading (Clean Development Mechanism and Joint Implementation) or by buying credits from organisations that sequester carbon.

However, due to the complexity of assessing the carbon sequestration potential of carbon sinks and the range of models for accounting there are vast uncertainties concerning reducing emissions in this manner. The carbon sequestration potential of different species and vegetation types is highly complex and has not yet been determined by the IPCC. Furthermore the detail of sequestration accounting has not been established and there is wide-ranging debate over appropriate models. Therefore at this stage of the Gold Coast '2010' Cities for Climate Protection Program, Carbon trading, credits and sinks have not been included.

#### **1.4 Why Council Needs to Respond to the Challenge**

There is a range of strong reasons guiding Council's response to the challenge of significantly reducing greenhouse gas emissions.

These are:

- The Council's role as a leading corporation within the city imparts a responsibility to demonstrate how local companies and organisations can become more energy efficient, increase environmental performance, and save money without sacrificing service.
- The impacts of climate change and sea level rise on a coastal community such as the Gold Coast may prove catastrophic and extremely costly in areas such as coastal works, sewerage and stormwater infrastructure, water resources, and environmental health.
- The proposed measures of this Action Plan are consistent with a 'no regrets' policy which will bring a wide range of benefits to the City that are independent of the rate of global warming and climate change.



## 2. GOLD COAST EMISSION'S PROFILE AND FORECAST

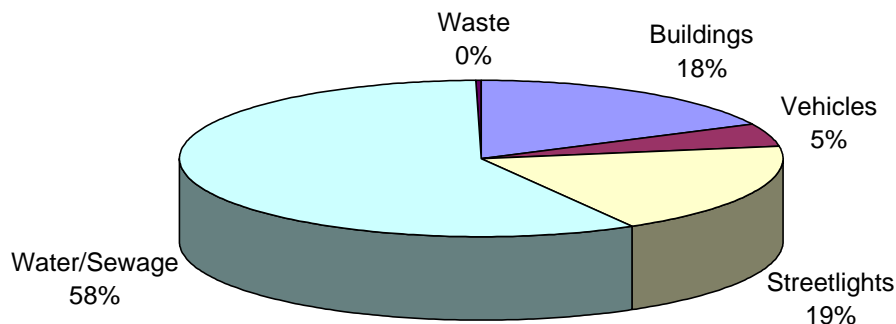
This section represents a profile of the emissions that the Gold Coast City Council and Community is responsible for. It also details a forecast of emissions trends to the year 2010 assuming a business-as-usual approach. The information is derived from the Australian Bureau of Statistics, Queensland Government, Energex and Gold Coast City Council data and reports. The inventory was compiled using Australian Greenhouse Office approved software and methodology supported by extensive training and advice through the CCP program. However, slight adjustments to the data may be required in the future as the science of carbon accounting is refined, and a better understanding is gained of the Gold Coast community's emission sources.

As part of the CCP methodology greenhouse gas emissions are counted at the point of use (the demand side) rather than at the point of production. For example, electricity consumed on the Gold Coast generated greenhouse gas emissions at the power station. These emissions are allocated to the contribution of Gold Coast residents to the enhanced greenhouse effect under the methodology. By the same reasoning responsibility for methane generation has been allocated to the community as the user determines the volume of landfill, and the GCCC merely manages the sites.

Actual air pollution and greenhouse gas emissions within Gold Coast are low and the city enjoys high air quality. However activities within the city use large amounts of electricity produced outside the area from the burning of fossil fuels resulting in substantial emissions. Therefore Gold Coast emissions may be very high without noticeable deterioration of local air quality. Nonetheless the local user of electricity is responsible for these emissions.

### 2.1 Corporate Emissions Inventory Analysis

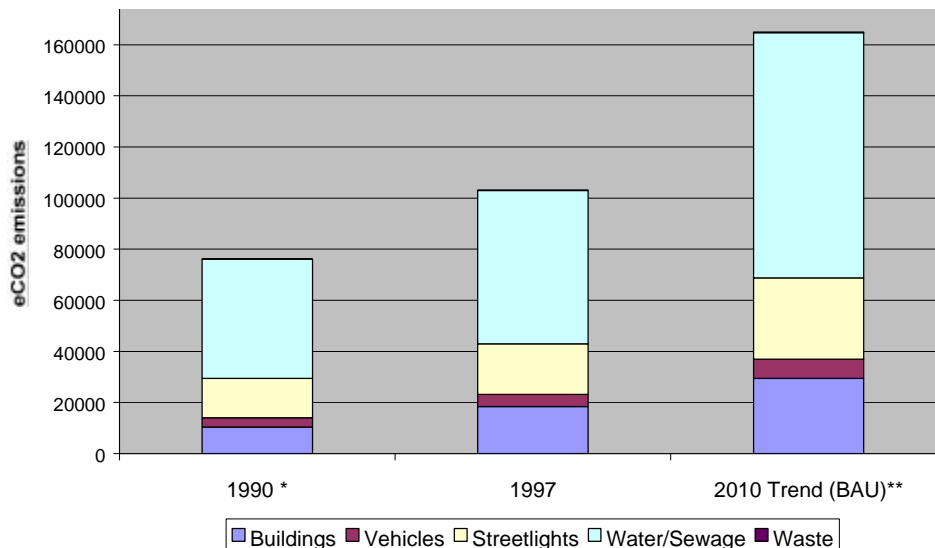
The corporate inventory of greenhouse emissions is based on 1997-98 Energex account data, some energy audit data, and information obtained from utilities. The corporate inventory indicates that the water/sewage sector is the main source of emissions (58%), mainly due to the pumping required for the delivery of these services across the relatively flat area where the bulk of the community reside. The next most significant source of emissions is streetlights (19%) and buildings (18%) (Figure 2.1). The corporate inventory indicated that electricity consumption is by far the major source Council's emissions (95%). The total corporate emissions of 103,000 t eCO<sub>2</sub> (calculated with CCP methodology) represent only around 1% of the City's total emissions.



**Figure 2.1: Gold Coast City Council Corporate Greenhouse Emissions (1997)**

If council continues on a business-as-usual (BAU) path CO<sub>2</sub> emissions are forecast to grow to around 164,500 tonnes/year by 2010 (Figure 2.2). In the absence of any actions taken to reduce the growth in energy consumption, emissions Council is responsible for will more than double, increasing about 120% between 1990 and 2010.

**Figure 2.2: Council Emissions for 1990, 1997, and 2010 Business-as-Usual Forecast**

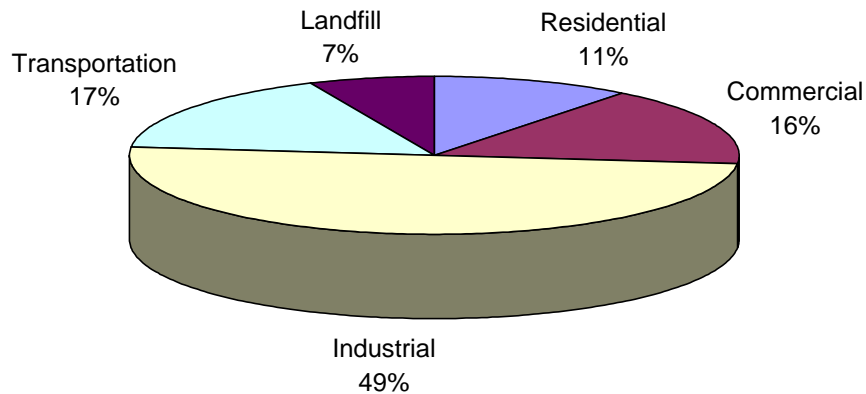


## 2.2 Community Emissions Inventory Analysis

The community inventory of greenhouse emissions is based on Australian bureau of Statistics (ABS) data on population, number of households, establishment, and number of employees in each of the standard ANSIC classifications used for commercial and industrial enterprises. Where necessary, state averages of energy use per employee in each of the ANSIC classifications was used along with state averages for household consumption and dwelling estimates.

This data provides a useful first measure of the greenhouse emissions from the Gold Coast but will be refined as more locally specific data becomes available. Vehicle kilometres travelled data was obtained from the Gold Coast City Transport Plan Strategic Scoping Study by Veitch Lister (1997) based on 1995 data. Data compiled for the State of the Environment Report (GCCC 1999) was used to determine waste sector data.

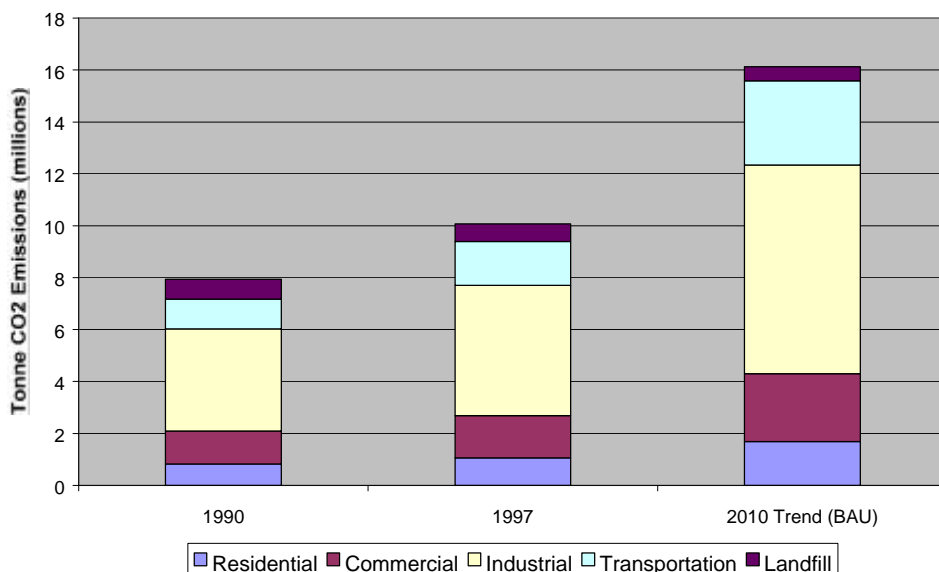
As shown in Figure 2.3 the industrial sector is responsible for by far the largest share of the total Gold Coast greenhouse gas emissions at 5,000,000 t eCO<sub>2</sub> tonnes/year (49%). Whereas transportation (17%) and commercial sectors (16%) each account for around one fifth of total emissions. The residential sector follows with 11% of emissions for the city. Methane produced from landfill waste accounts for 7% of the emissions that are the community's responsibility.



**Figure 2.3: Gold Coast Community Greenhouse Emissions (1997)**

CO<sub>2</sub> emissions across the Gold Coast arise mainly from the consumption of electricity for residential, commercial and industrial use (71.3%) and transportation fuels used for trucks, buses, passenger and light commercial vehicles. Petrol consumption accounts for 12% of equivalent CO<sub>2</sub> emissions followed by Diesel and Natural gas both at 6%. Therefore electricity consumption across the municipality is a high priority target area for measures to reduce greenhouse gas emissions.

The emissions that the wider community is responsible for were estimated to be 10 million tonnes of equivalent CO<sub>2</sub>/year in 1997 (calculated with CCP methodology). If the community continues on a business-as-usual path CO<sub>2</sub> emissions are forecast to grow to around 16 million tonnes/year by 2010. Trends indicate a 112% increase in the Gold Coasts greenhouse gas emissions by 2010 compared to 1990 levels (See Figure 2). Whereas trends for emissions Brisbane is responsible for indicate a 65% increase over the same period (BCC 1999:12) reflecting the expected slowing of growth in that city. Total emissions that Brisbane City is responsible for were calculated in a similar manner to the Gold Coast, revealing that as of 1997 emissions were 15.0 million tonnes of carbon dioxide per year (BCC 1999:9).



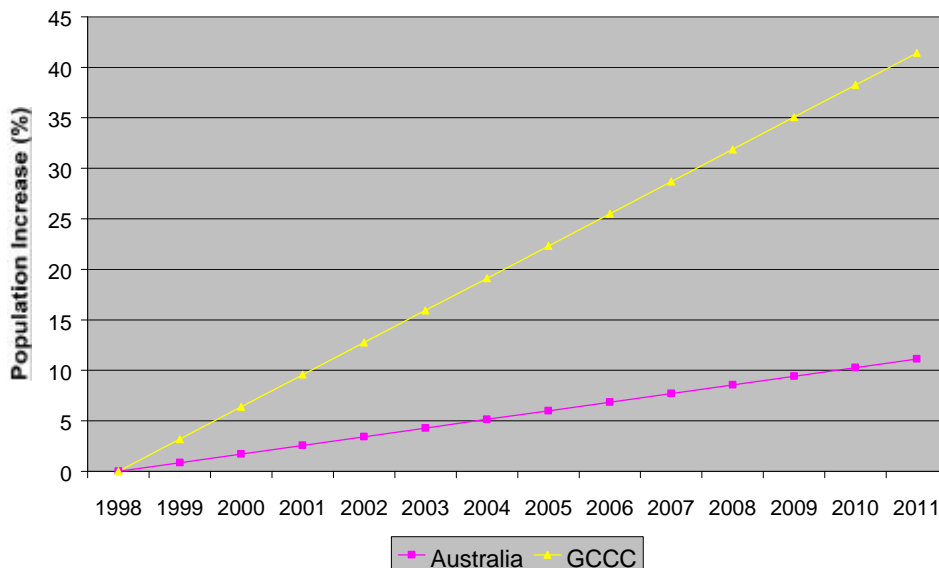
**Figure 2.4: Gold Coast Community Emissions for 1990, 1997, and 2010 Business-as-Usual Forecast**



### 3. EMISSION REDUCTION GOALS

Australia’s agreed target in the Kyoto Protocol is for no more than an 8% increase in emissions over 1990 levels by 2010. The City of Gold Coast’s goals need to be both realistic and demonstrate a clear commitment to the national target. To ensure these objectives are met, participating CCP council’s have identified a range of achievable actions, and recognised local characteristics when developing their reduction goals. For example the rapid rate of population growth of the Gold Coast will have a significant influence on the development of goals for this City. In addition, council’s proactive stance has seen a range of actions already underway or completed such as the City Transport Plan, Waste Management Strategy, and energy efficient building and vehicle fleet upgrades. These actions are eligible to be accounted toward achievement of the reduction goals. This Chapter details the methodology used to develop goals specific to the Gold Coast.

The City of Gold Coast is one of Australia’s fastest growing areas. Figure 3.1 compares the Gold Coast’s projected population increase of 40% between 1998 and 2011 (GCCC 1998), with the national population increase of around 11% for the same period (ABS 2000). Nearly 8 out of every 10 Gold Coast residents have migrated to the City, mainly from other areas in Australia.



**Figure 3.1: Australian and Gold Coast Projected Population Increases**

Source: ABS 2000, GCCC transport Plan 1998.

In addition the number and use of vehicles in the City is expected to grow at a faster rate than the population further adding to the expected growth in emissions. Total vehicle kilometres travelled (VKT) are forecast to increase by around 81% between 1998 and 2011 (GCCC 1998). These trends will lead to significant increases in greenhouse gas emissions of the residential, commercial, industrial, transport, and waste generation sectors and also increase energy used in the provision of Council’s services.

The business-as-usual (2010 trend) columns in Figures 2.2 and 2.4 demonstrate the extent of these increases. They show more than a doubling from 1990 with a 120% increase in emissions that are Council’s responsibility and a 112% increase for the community. These increases are large when compared to, Brisbane’s forecast emissions increase (65%) (BCC 1999), and to the national forecast emissions increase (43%) (AGO 1997) over the same period.

A massive reversal in trends for population growth, motor vehicle kilometres travelled and commercial activity would be required if the Gold Coast were to set a target in line with the Kyoto Protocol (ie an increase of only 8% over 1990 levels). Such a reversal could only be achieved with significant social and economic upheaval. As such they would not be consistent with the principles of ESD which include the needs of present generations as well as those of the future. Furthermore the magnitude of this reversal is far greater than other cities and nations expect.

However, reduction goals based on per capita emission rates can be consistent with the CCP program and more realistically reflect the nature of the City as it accommodates an increasing proportion of Queensland's and Australia's population. These goals should strive to bring per capita emissions of Gold Coast Residents to within the same order of magnitude that Australia would need to achieve under the Kyoto protocol. This will by no means be a simple task.

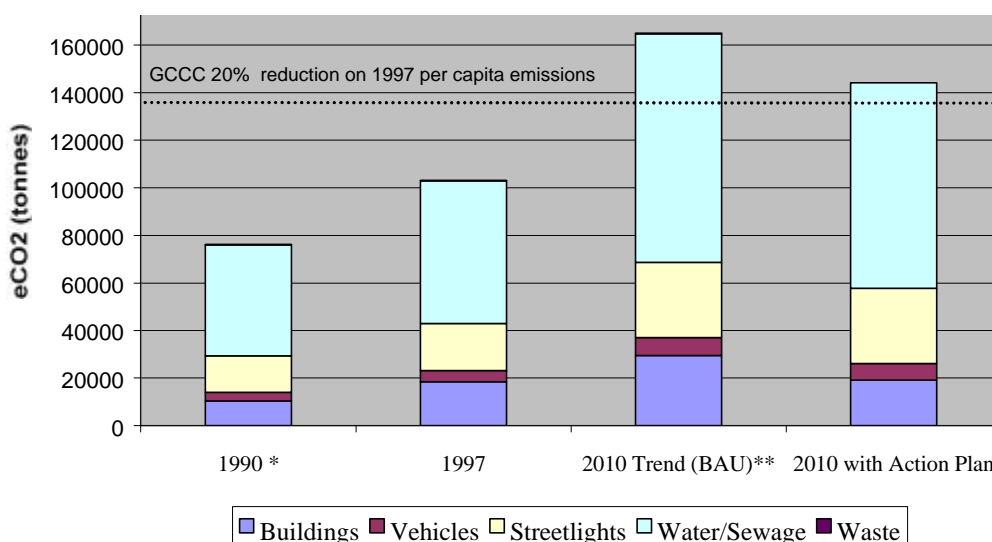
The Gold Coast may find that a range of new measures will enable greater emissions reductions or that unforeseen circumstances mean that the goals of the Gold Coast '2010' Cities for Climate Protection Program will not be met. The flexibility of the CCP program accommodates these circumstances by allowing revision and adjustment of goals at any time during the Program period.

### **3.1 Corporate Emission Reduction Goal**

The impacts on emissions of high rates of population growth were examined and quantification of achievable actions was undertaken to develop an emissions reduction goal for Council. Expected population increase in the City will place significant pressure on Council's services. This growth provides council with an excellent opportunity to demonstrate to the community how to improve energy efficiency and save money, without sacrificing service in a time of growth.

Internationally, it is now common to talk about 'factor four' improvements - doing twice as much with half the resources. Although Australian best practice in energy efficiency is among the best in the world these practices are the exception rather than the rule among Australian organisations. Council actions can provide a strong cue to the community and other organisations on the Gold Coast. Energy efficiency is all about doing more with less, and the potential for cost-effective savings is enormous.

Quantifiable actions give a guide to the potential for Council to reduce greenhouse gas emission and have been used to estimate the potential for reduction in greenhouse gas emissions (See Table 4.1). As shown on Figure 3.2 this analysis has indicated that a 12% reduction will be achieved through actions that are being implemented or already underway. The remainder of the 20% reduction goal will be achievable through expansion of existing actions and identification of new initiatives over the 10 years to 2010. This reduction Goal complements Councils commitment to 'The 20% Club for Sustainable Cities' which requires a 20% improvement over a range of factors in environmental performance.



**Figure 3.2: Council Emissions - Business-as-Usual Forecast, and 2010 with Actions.**

Council will work toward a 20% corporate emission reduction goal for the Council by 2010, based on 1997 level emissions, measured on a per capita basis.

Brisbane City Council’s goal - to aim for a 45% decrease in emissions from 1995 levels, seems more substantial than that for the Gold Coast, however Brisbane City has a far lower level of projected population growth (17%) (BCC 1999) when compared to the Gold Coast (40%) (GCCC 1998). Furthermore the vast majority of Brisbane City Council emissions reduction will derive from harnessing energy produced by capturing and burning landfill methane (BCC 1999). Whereas Gold Coast has considered methane from landfill as a community emission as it is the communities waste that is stored.

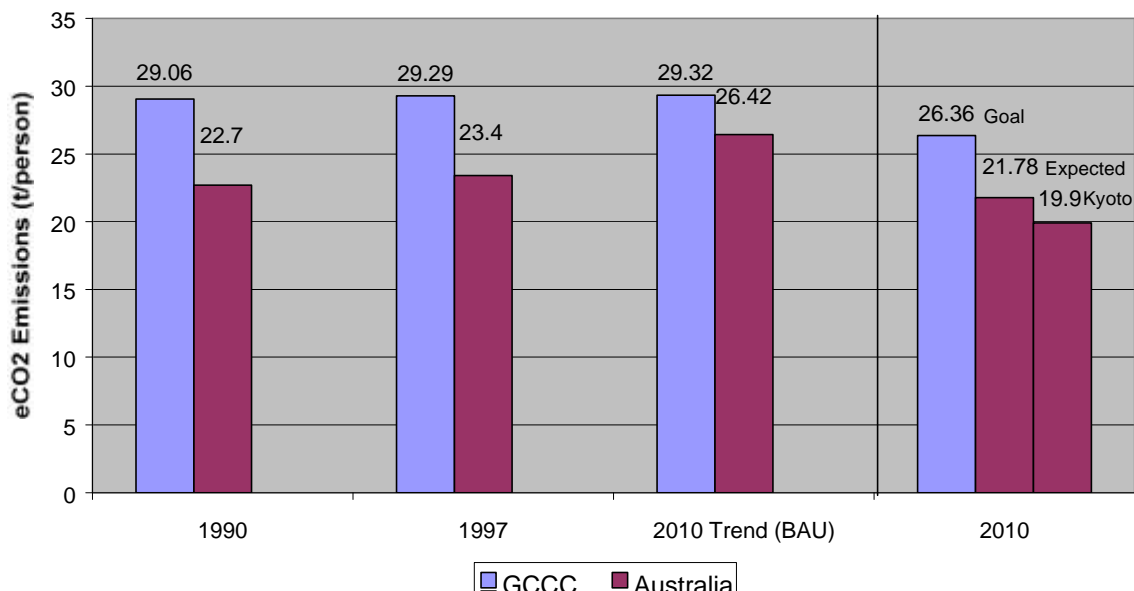
### 3.2 Community Emissions Reduction Goal

Many of the cities within the CCP program have set reduction goals on total emissions rather than setting goals on an efficiency, or per capita basis. However setting reductions on total emissions will make targets for the Gold Coast unattainable due to its rapid rate of population increase. Even a 10% reduction in total 1990 emissions that are the Gold Coast Community’s responsibility would require a 45% reduction on 2010 business-as-usual per capita emissions. That is, each resident would have to halve the amount of energy they use within the next 10 years. Such actions would not be sustainable in the given timeframe.

Emission reduction goals measured on a per resident basis is more appropriate for rapidly growing cities and regions. Internationally cities under the CCP program with high levels of population growth have adopted similar per capita targets for greenhouse gas reduction, including the Saitama Prefecture and the City of Kamakura, in Japan. Both aim to reduce greenhouse gas emissions by 20% per person with Saitama aiming to reach the target by 2010 and Kamakura by 2005. In contrast Brisbane City with only a 17% predicted population increase is aiming for stabilisation of community greenhouse gas emissions by 2010.

The fact that these goals are expressed on a per capita basis does not make them easier to attain, nor does it detract from their value in helping Australia reach its Kyoto target. Gold Coast’s per capita emissions (29.29 t/person) are higher than the national average (23.4 t/person). However as Figure 3.3 shows while the Gold Coast’s business-as-usual

per capita emissions are expected to remain relatively stable to 2010, national per capita emissions are expected to increase considerably. Figure 3.3 also shows that the Gold Coast will make a similar proportional reduction to the expected national reduction. Therefore the Gold Coast can meet its commitments by striving to achieve a 10% reduction in per capita community emissions by 2010. In doing so the Gold Coast will reach an achievable target, gain a far greater level of efficiency and be approaching the national Kyoto emissions-per-capita efficiency level (19.9 t/person).



**Figure 3.3: Per Capita Energy Efficiency Reduction Australia and Gold Coast**

Source: (AGO 2000a), (AGO 1997), Gold Coast Emissions Inventory.  
 For data and % increase see Appendix 2

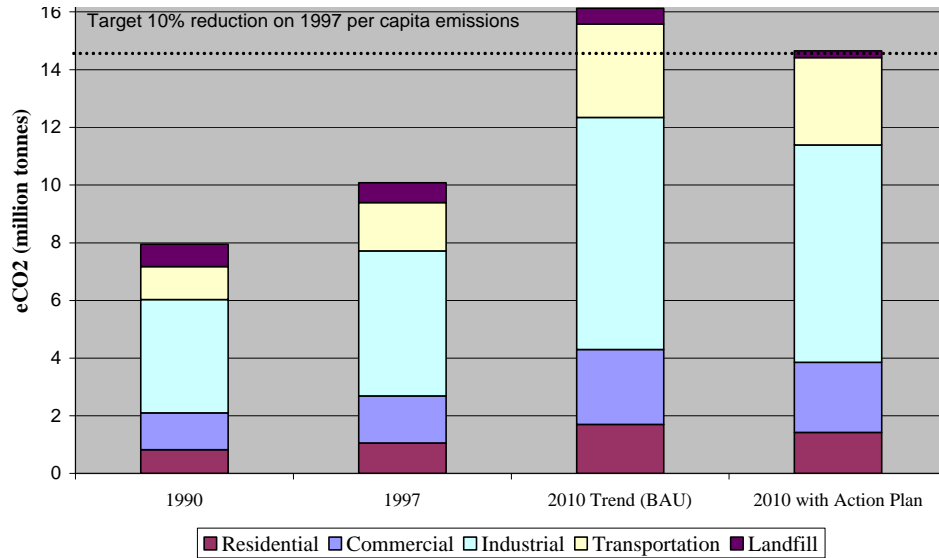
The apparent differences between the Gold Coast and Australia’s per capita data shown in Figure 3.3 are largely a result of the Gold Coast’s high tourist and visitor numbers. This strategy is based on per capita emissions, calculated by dividing the City’s total emissions by the number of residents. While this approach is appropriate for cities with high rates of population growth it can lead to apparent anomalies where this is coupled with high visitation rates. For example, at any given time our high tourist and visitor numbers distort the per capita figures and make the emission rates appear high compared to Australian national averages. Hence it is more important to focus on the per capita reductions being targeted than on the per capita rates themselves.

The Federal Government has committed substantial funds to a range of programs in order to reverse business-as-usual trends and achieve the Kyoto target. However current trends toward continued growth in greenhouse emissions calls into question whether existing programs will be sufficient for Australia to achieve the target. The expected level of emissions reduction has been added to Figure 3.3 to demonstrate that Australian Kyoto target efficiency levels may not be met.

Table 4.2 summarises the quantifiable community actions that have been used to estimate the potential for reduction in greenhouse gas emissions. This analysis indicates that a 10% reduction goal is achievable as displayed in Figure 3.4

On this basis the Community goal is for a 10% emission reduction goal by 2010, based on 1997 level emissions, measured on a per capita basis.

While The Gold Coast ‘2010’ Cities for Climate Protection Program will deliver significant improvements in energy efficiency per Gold Coast resident and will contribute to Australia's target for energy efficiency, it is important that the City strive to overtake national efficiency levels and look for further gains beyond 2010. To that end the Gold Coast should set a stretch goal, beyond ‘2010’ of around 35% reduction from the current 29.3 to 19.9 tonne CO<sub>2</sub>/person.



**Figure 3.4: Community Emissions Inventory and Trends 1990-2010 with and without Action Plan.**



## 4. 2001 ACTION PLAN

This section details Gold Coast Council and Community actions required to achieve the Goals. Council has already initiated a number of strategies, policies, plans and activities that deliver significant reductions in emissions that can be included in the 2001 Action Plan. The goals described above have been strongly based on the quantification of the following actions and have a focus on increased efficiency without loss of service.

It also needs to take account of the relevant strategies that have been adopted since 1996-97. Although Council has implemented a wide range of actions which have reduced greenhouse gas emissions only those commenced after 1996-97, the base year of CCP reporting, are eligible for inclusion in the city's emission reduction efforts. Actions existing prior to 1997 form part of the business-as-usual scenario. However, many of these actions will still help to increase awareness and lead to continued reduction in emissions.

Actions and measures within this strategy can be designed to produce immediate benefits as well as long-term solutions to global warming. This is often called a 'no regrets' policy that will bring benefits independent of the rate of global warming. The benefits meeting this definition are numerous and include:

1. **Enhanced economic development** – corporations are more likely to relocate or build in communities that provide an attractive environment and high quality of life-style for the company's employees. For example, attracting renewable energy generators to the Gold Coast can boost the city's industrial and commercial sectors.
2. **Enhanced City Image** – Tourism has been boosted in areas with renewable energy generators. Sustainable energy adds to the cities natural, clean and green image.
3. **Reduced air pollution** – Climate protection strategies reduce the pollutants that create ground level ozone and other air pollutants.
4. **Cost-effective electric power service** – demand side energy and resource conservation help avoid the need for energy companies to build additional plant.
5. **Decreased reliance on non-renewable or finite resources** with decreased use of fossil fuels.
6. **Lower energy bills for businesses and families** through energy efficiency measures and house design.
7. **Enhanced partnerships and international profile** with federal agencies, state departments, other municipalities, Universities and international agencies such as ICLEI and local private interests.

All Actions developed from 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 beneficial in areas other than greenhouse gas reduction (such as energy savings);
- Supportive of the important role of partnerships between spheres of government, the private sector and the community;
- Equitable and should meet the broad needs of the whole community; and
- Complementary to the National Greenhouse Strategy and the Queensland Implementation Plan.

#### **4.1 Corporate 2001 Action Plan**

The following actions contribute toward the achievement of the 20% Community emissions reduction Goal. Council's role as a leading corporation gives it the opportunity to showcase its success at reducing costs through energy efficiency gains, alongside reducing greenhouse gas emissions and maintaining service levels. It can also demonstrate environmental corporate leadership by purchasing renewable energy and encouraging the production of renewable energy on the Gold Coast. Table 4.1 outlines the quantifiable measures Council intends undertaking.

Significant energy and ongoing budget savings can be attained by improving the energy efficiency of Council buildings through changing lighting and other equipment such as air conditioning. The Building Management Section of Council have costed the retrofitting of energy efficient lighting for the Nerang Administration Centre and energy audits have been completed for the Arts Centre, the Nerang and Surfers Paradise administration centres. Council's implementation of these and future energy audits on other office buildings, community centres, town halls, swimming pools, sporting facilities, vehicle fleet depots, garages, and outdoor lighting will lead to greater levels of saving and reductions in greenhouse gas emissions. However estimates of financial savings are preliminary estimates only and should not be incorporated into budgets until they are confirmed and have been realised and quantified as actual savings.

Energy savings can be achieved by cultivating energy awareness throughout the Gold Coast City Council as part of its 'Commitment to the Environment'. This requires encouraging behavioural and organisational change and ensuring that all people are aware of the importance of greenhouse concerns and their role in improving energy efficiency. Such an action is consistent with 'Council's Commitment to the Environment' and the associated training for staff that is already envisaged. For example a significant energy saving for some councils has been achieved through encouraging staff to set energy save on personal computers and group equipment such as photocopiers and printers.

Further reductions in greenhouse gas emissions can be achieved without implications for budgets by reinvesting savings made from efficiency gains into further efficiency initiatives and the purchase and promotion of renewable energy generation. A premium may be paid to electricity suppliers for what is termed 'Green Power'. The premium is used to fund the additional costs of developing renewable rather than non-renewable energy generation infrastructure. The purchase of 'Green Power' will send a clear message of Council's commitment to reducing greenhouse gas emissions to electricity generators, residents, and industry. To maximise benefits of this investment the Council can support the establishment of renewable energy generators and manufacturers of renewable energy products and services within the Gold Coast area. This support can ensure the Gold Coast City Council is associated with strong positive images of a city at the forefront of innovation and sustainability.

The Water and WasteWater sector accounts for the majority of council's emissions (58%). Gold Coast Water has committed to reducing energy demand by 2% per year, for five years, over the total energy consumption for their operations. Furthermore Gold Coast Water will purchase 'Green Power' over 10% of the power consumed from five of its major sites, including the Evandale complex and the Arts Centre. Encouraging more efficient use of water within households, industry and commercial operations can bring further significant energy savings for Gold Coast water.

Council's Fleet Management branch is undertaking trials of switching fuel in the vehicle fleet to LPG. Every vehicle converted from petrol to LPG produces 13% less CO<sub>2</sub> (measured from the exhaust pipe) immediately, due to its lower carbon content (AGO Fact Sheet: Fuel Substitution 1999). Council can extend fleet efficiency by purchasing a smaller/lighter/more fuel efficient/alternate fuel vehicle fleet.

### **Actions Underway or Completed**

- Boral Energy Audit undertaken for council administration buildings and the Arts Centre. Energy efficiency building retrofits to be undertaken.
- Gold Coast Water committed to purchasing 10% of its contestable energy over five sites using 'Green Power' (energy generated from renewable sources).
- Council has purchased a number of LPG fitted utilities and converted a street sweeper to run on LPG. Trials have been instigated to determine efficiencies in both fuel and operational usage. If these prove successful, other vehicles may be subsequently converted and/or purchased.
- Reducing the level of organic waste taken to landfill by composting or incineration of wood waste and garden waste in co-generation facilities such as the Rocky Point Sugar Mill. This action displaces energy produced from coal power stations as well as reducing landfill methane production.

### **Complementary Programs**

- Federal Government AGO program provides a 50% subsidy on costs for the conversion of vehicles to LPG.
- Federal Government AGO program provides rebates for purchase of photovoltaics on community buildings<sup>1</sup>.

### **Future Actions**

- Further developing and implementing the Waste Management Strategy.
- Ensure continuation of existing, emerging, and new strategies by developing a communication strategy.
- Review Council's purchasing policy to emphasise products made from recycled materials and companies that account for life-cycle energy consumption of products.
- Any construction of new council buildings should showcase energy efficiency in construction, design and operation.
- Investigation of 'Green Fleet' (planting trees to offset fleet emissions).
- Undertake a program to install low power standby on all council computers and on all new additions to the computer stock. This measure can increase efficiency by up to one half the level of screen saver power standby.
- Support and encourage the establishment of renewable energy generators and manufacturers of renewable energy products and services within the Gold Coast area by purchasing 'green energy' and displaying renewable electricity generating devices on council assets.

---

<sup>1</sup> The rebate for eligible systems is \$5.50 per watt of PV (solar cells) installed. The minimum amount of panels is 450 watts (or about 6 to 8 panels), which equals a \$2475 rebate. The maximum is 1500 watts, which equates to a \$8250 rebate. With higher rebate opportunities for community buildings such as schools and community centres.

**Table 4.1: Summary of Quantifiable Actions Contributing to the 20% Council Emissions Reduction Goal**

Sector (% of council Emissions)	Action(s)	Estimated Implementation Cost (\$)	Estimated annual savings on completion (\$/year) <sup>#</sup>	Emissions Reduction from 2010 BAU trend (tonnes CO <sub>2</sub> / year)	Contribution to 20% Goal	Council Directorate Responsible
<b>Council Buildings</b> (18%)	Efficient equipment and Lighting and reinvesting in Green Energy.	\$344,800 one off, \$91,000/year allocation for 'Green Power' purchase	\$198,197	10,424	6.3%	Organisational Services CorTechS
<b>Council Fleet</b> (5%)	Fuel switch in light and heavy vehicles (LPG trial)	\$96,000 one off	\$123,071	541	0.33%	Fleet and Plant Management
<b>Water and Sewerage</b> (58%)	2% energy efficiency gain each year over 5 years (10% on completion)* and purchase green energy over 4 sites	\$33,850 p.a.* + TBA  Y2000 price for peak electricity	\$360,826* (after 2006)	8887*	5.4%*	Gold Coast Water
<b>Waste Management</b> (1%)	Recycle office paper	Not determined	Not determined	30	0.02%	Organisational Services
<b>Streetlights</b> (19%)	No action identified to date TBA	TBA	TBA	TBA	-	Organisational Services
<b>Other</b>	Tree Planting and Revegetation	TBA	0	TBA	-	Bushland Management
<b>Totals</b>		Approx. \$440,800 <sup>#</sup> one off and. \$129,850 <sup>#</sup> p.a.	\$682,094 <sup>#</sup> p.a.	20,159	12%	
<b>Goal</b>	20% reduction on 1997 Per Capita Emissions			33,000	20%	

\* To be confirmed pending energy audit.

<sup>#</sup> Costs and savings are preliminary estimates only and should not be incorporated into budgets until it is confirmed that the estimates have been realised and the actual savings and costs have been quantified.

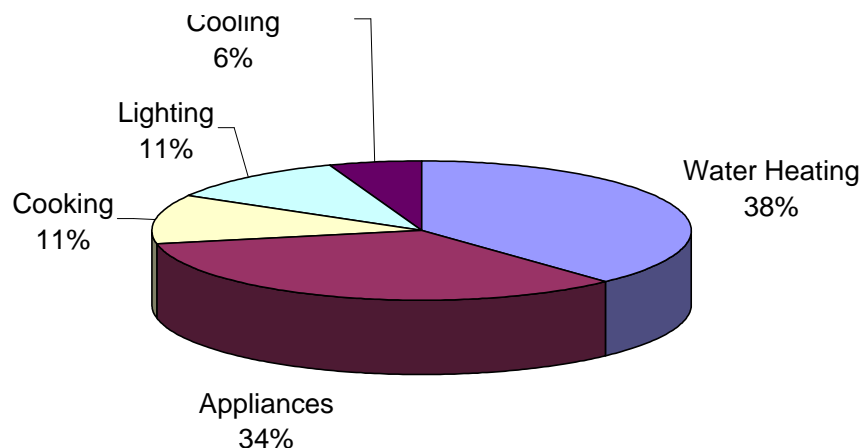
## **4.2 Community 2001 Action Plan**

The following actions will facilitate achievement of the 10% Community emissions reduction Goal. Assumptions for quantifying emission reduction potential for the community actions have been largely based on expected and actual adoption rates for national programs. The actions are grouped by sectors. These are the Residential, Renewable Energy, Industrial and Commercial, Waste Management, and Transportation sectors. Not all the actions will have quantifiable results although they are likely to have a significant impact upon behaviour. Table 1 provides a summary of the quantifiable Actions that contribute to the community 10% emission reduction goal.

### **Residential Sector**

Energy used in the residential sector includes energy embodied in the building materials and construction, space heating and cooling, water heating, cooking, lighting, and various electrical appliances. The residential sector represents 11% of total equivalent Carbon Dioxide produced on the Gold Coast. ‘Embodied energy’ accounts for around 85% of the energy used in building construction (Mills, Stock and Lowe, 1999). This can be reduced through the use of recycled building materials.

Figure 4.2 displays the results of a study investigating a breakdown of electricity usage within a typical Queensland house, post construction (SRC in Stock and Wiltshire 2000).



**Figure 4.2 Breakdown of Electricity Use in a Typical Queensland Home**

Although water heating is the largest user of electrical energy in the home currently only 6% of households in Queensland have a solar hot water system installed. This figure does not compare favourably with Western Australia and the Northern Territory who both have over 20% of their water heating requirements sourced from solar energy (Stock and Wiltshire 2000). Savings of up to 5 kwh/day or 85% (of water heating costs) can be made if a solar instead of an electric hot water system is installed (ANZES 1991 in Stock et al 2000). Council in conjunction with the Office of Sustainable Energy (DME) will reduce greenhouse gas emissions of the residential sector through education programs to encourage the use of energy efficient hot water systems such as solar or heat pump technology. The State Government is providing rebates<sup>2</sup> on Solar Hot Water

<sup>2</sup> The scheme provides for rebates up to \$750 on the cost of a new solar hot water system, depending on the area of panels installed. Rebates up to \$300 for the replacement of component parts (panels and tanks) of existing solar hot water systems are also available. Under the Renewable Energy Certificates scheme an additional \$600 approx saving can be made on hot water systems.

Systems. Each solar hot water system installed will result in a reduction in carbon dioxide emissions by an average of 2.5 tonnes per year (DME 2000a).

Subdivision and building design can significantly decrease the number of days/year that space heating or cooling is required. Solar passive design can substantially increase thermal comfort of houses and can make air conditioning unnecessary. Designing for thermal comfort and energy efficiency in summer requires reduced heat radiation from sun exposed roofs and walls, adequate shading of windows and doors and facilitation of cross-ventilation. Whereas in winter designs should account for solar access inside the home to heat spaces and thermal mass, and heat loss through the roof, walls, vents and glazed surfaces. Features that can have a dramatic effect on thermal comfort include;

- Subdivision design - block size and orientation;
- Orientation of the house and its rooms relative to North;
- Type of building materials used in external walls, roof and floor;
- Use of insulation;
- The colour of external walls and roof;
- Type, location and area of glass windows and doors;
- Width of eaves, landscaping and other external shade devices, particularly to the west;
- Provision of overhead fans; and
- Facilitation of cross ventilation through vents, doors and windows.

Council can have substantial influence on residential energy use and thermal comfort through Council requirements for subdivision design, and development approvals.

Council can encourage and support development of homes that display architectural innovation as a demonstration of energy efficiency levels that can be achieved. It is important however that energy efficiency measures are encouraged across a range of affordability levels and housing styles and that changes in building industry practices are encouraged. Several houses within the Gold Coast are currently showcasing energy efficient residential design including water and wastewater efficiency measures, recycled building materials, and solar passive design.

Private photovoltaic systems are a form of renewable energy that can substitute for high emission sources of electricity generation. Any excess energy generated can be sold back to the electricity supplier through the grid. Rebates from the Queensland Government are making these Solar Photovoltaic systems more financially attractive for many customers (DME 2000b).

#### **Actions Underway or Completed**

- Council has supported and participated in the development of the 'Healthy Home' at Broadbeach which has demonstrated energy, waste water, and water efficiency in a livable home at Broadbeach providing significant education of the Gold Coast community.
- The Wolfedine home is another example of the Gold Coast City Council assisting in partnership with the Queensland University of Technology the development and energy efficiency assessment of homes with innovative energy saving measures.
- Development of the Matheson Constructions and Master Builders display home at Arundel demonstrates how a suburban home can achieve a five star rating under the

BERS rating system educating and providing energy efficient housing options for Gold Coast Residents.

- Gold Coast City Council has introduced a public education program to promote saving practices.
- Introduction of water meters for residents and charging for water based on a user pays system as of the year 2000/01 has reduced water consumption.
- Council has undertaken consultation on options to develop policy for residential subdivisions and energy efficient housing through an Industry Working Group.

#### **Complementary Actions**

- The Federal government requires energy suppliers to buy a minimum of 2% of their electricity from renewable sources to supply to the grid as 'Green Power'. The council will actively encourage residents to purchase this 'Green Power' to promote the development of renewable energy generation on the Gold Coast.
- The Office of Sustainable Energy (developed within the Queensland Department of Mines and Energy) will provide an information service of energy efficiency in household design, construction, and operation. Furthermore this body provides rebates for solar hot water systems and photovoltaic electricity generation systems for householders and community buildings.
- The Federal Government through its Australian Greenhouse Office has reviewed its program for energy labelling of appliances and has started work on energy efficient housing provisions to be included in the Building Code of Australia.
- The Energy Smart Home Designer CD has been produced by the State Government. It is an interactive CD recently released to help homebuilders design homes to use less energy.
- The federal government through Building Codes Australia is introducing a new code on energy efficient housing.

#### **Future Actions**

- Develop as part of the broader education campaign information on construction and retrofitting energy efficient homes, water use, installation of solar and heat pump hot water systems, star rating of appliances etc. eg assessment system for home buyers to calculate a star rating for a house they are looking at buying.
- Develop a code for energy efficient subdivision design considering size and orientation of blocks and location of streets, topography etc.
- Develop a code or policy for energy efficient building including solar passive design techniques.
- Develop a code, policy, or education program relating to the installation of efficient hot water systems for example solar, heat pump technology.
- Develop a code, policy or education program facilitating and promoting the use of photovoltaic cells.
- Continue to support the development of energy efficient display houses and innovative examples of energy saving designs and materials.

## **Renewable Energy Sources**

Nearly all power users on the Gold Coast rely on electricity supplied from coal power stations through the power distribution grid. There are benefits of utilising power or heat that has been generated on-site. However the purchase of 'Green Power' which will eventually be sold by all power suppliers is at present a more practical option.

Using and encouraging renewable energy generation facilities on the Gold Coast can impart a strong positive image of the Gold Coast at the forefront of sustainability as well as stimulate commercial activity. Council can play a strong role as a leader to encourage the production of renewable energy by participating and purchasing energy through 'green energy' schemes. These schemes refer to a process where electricity utilities offer a product designed to accommodate customers whose purchasing patterns are influenced by environmental concerns. The customers are asked to pay a premium on their electricity bills so as to facilitate the purchase of renewable energy.

The cost of renewable energy, such as photovoltaics is continuing to decline as the technology is refined. Council can assist in the early adoption of new technology for applications in which renewable energy sources are financially viable, or approaching financial viability.

The Federal Government has mandated that all electricity suppliers source a minimum 2% of their energy from renewable energy generation sources. This program gives the Gold Coast a significant opportunity to harness the investment of the electricity generation sector. Beside benefits of encouraging industrial and commercial interests to establish on the Gold Coast, Council can harness the sustainability image that is associated with development of renewable energy generation capacity. Furthermore some renewable energy generation devices such as the 'Windy Hill Farm' wind generation system have recently been shown to be of significant interest to the tourism market (DPI 2000).

### **Actions Underway or Completed**

- Supporting a program for reducing organic waste sent to landfill encouraging the development of the Rocky Point Co-generation Sugar Mill project.

### **Complementary Programs**

- Federal Government AGO program provides rebates for purchase of photovoltaics on community buildings.
- Encouraging the production of energy from renewable sources such as the tidal energy-harnessing project developed by 'Tidal Energy'.
- The Federal Government has mandated a minimum 2% of electricity suppliers energy must be sourced from renewable energy sources.

### **Future Actions**

- Commission a study by Griffith University into life cycle analysis, costs and return on investment of photovoltaics. If results prove positive move to install photovoltaics in prominent positions for powering Council's buildings.
- Commission a study by Griffith University into tidal energy production for the Gold Coast.
- Encouraging establishment of renewable energy generation sites on the Gold Coast

## **Industrial and Commercial Sectors**

The industrial and commercial sectors together represent around 70% of the Gold Coast community's greenhouse gas emissions making it the major contributor of greenhouse gas emissions.

Council's successes at increasing energy efficiency and saving money, without sacrificing service should be promoted as an example to local companies and organisations. A priority for Council will be to join the Australian Greenhouse Office's Greenhouse Challenge and Greenhouse Allies programs to assist local industry to undertake initiatives to reduce greenhouse emissions and save money. Greenhouse Allies is a voluntary program designed as part of the Greenhouse Challenge to:

- Improve Energy Management in small enterprises;
- Enhance the environmental awareness of these enterprises; and
- Encourage sound greenhouse practices.

Once Council has achieved Milestone 3 of the CCP program council is able to join the Greenhouse Challenge program, provide a leadership role and facilitate other local organisations to achieve similar gains through the Allies program.

The effectiveness of programs that demonstrate pathways toward greater sustainability has been demonstrated in Portland, Oregon with the Businesses for an Ecologically Sustainable Tomorrow (BEST) program. Initiatives to be taken up by businesses in the BEST program included educational, technical and financial assistance to local businesses. Practices that need to be adopted before a company is a BEST performer may include efficient use of energy and water, the reduction of wastes through recycling, and the utilisation of clean and efficient transportation. The program facilitates access to a variety of assistance and incentive programs available to businesses from federal and state governments and from power utilities. Awards can then be given in each major category area and give businesses greater exposure.

### **Complementary Actions**

- The Environmental Protection Agency has initiated a 'Cleaner Production Partnerships' grant scheme and the 'Industry Eco-smart Program' the later solely to encourage business and industry 'to save energy and water and reduce waste'. Funding is available for applicants seeking to become more environmentally and economically sustainable through more efficient resource usage and waste disposal<sup>3</sup>.
- The AGO provides assistance in the implementation of the Greenhouse Challenge and Greenhouse Allies programs.

### **Future Actions**

- Become a greenhouse Partner under the Greenhouse Challenge Program and facilitate commercial and industrial organisations to either join the Greenhouse Challenge or become a Greenhouse Ally.
- Examine options for project administration and project financial support from the AGO for such a program.

---

<sup>3</sup> Initial funding of up to \$1000 for an eco-efficiency assessment and potential follow-up funding of up to \$10,000 to implement eco-efficiency recommendations. Priority will be given to businesses in agriculture, mining, tourism, manufacturing and transport. Energy efficiency projects are listed as example projects.

- Encourage and recognise sustainable business practices that use energy efficiently, reduce water consumption, produce less waste and promote efficient transport

### **Waste Management Sector**

Landfill represents 7% of greenhouse gas emissions produced on the Gold Coast. Methods for reducing the impact of this sector on the enhanced greenhouse effect include reducing, reusing, and recycling waste and reducing the impact and level of methane released from 'waste in place'.

Organic waste buried in landfill decomposes in the absence of oxygen to produce a mixture of gases called biogas consisting mainly of methane and CO<sup>2</sup>. Methane is a potent greenhouse gas with 21 times the greenhouse warming capacity of CO<sup>2</sup>. A typical biogas mixture is significantly more detrimental to the greenhouse effect than CO<sup>2</sup> which is produced when waste is decomposed or burned in the presence of air.

The Gold Coast has approximately 9,361,000 tonnes of 'Waste in Place' as of 1997 with 343,000 tonnes of waste going to landfill each year. Organic waste accounts for around 70% of the total waste load. The following calculations have been undertaken using Brisbane City Council estimates of gases produced from waste. At 1997 levels around 240,100 tonnes/year of organic waste (paper, plant materials, wood and food wastes) were deposited to landfill on the Gold Coast. This is estimated to produce about 120,000 tonnes of biogas. The greenhouse impact of this level of biogas will be:

- Equivalent to 818,181 tonnes of CO<sup>2</sup> if the biogas escapes to the atmosphere; or
- Equivalent to 185,454 tonnes of CO<sup>2</sup> if the biogas is collected and burned.

A further CO<sup>2</sup> saving can be made where it is feasible to generate electricity.

Currently waste produced within the Gold Coast area is sent to Tugun, Reedy Creek, Suntown, Runaway Bay, Molendinar, Jacobs Well, and Staplyton landfill sites. Initial investigation of these sites has revealed that collection or energy production from methane trapping is not feasible due to the landfill size and age of the sites. Council is currently investigating the viability of flaring biogas from these sites.

Reducing the amount of waste that enters landfill has been a priority of council for some time. An estimated 30,000 tonnes of green waste is now composted and sold for a range of uses including garden products. Removal of combustible material from the waste stream has the potential to treble the lives landfills. Much of this combustible material will further contribute to offsetting electricity generation from coal fired power stations when the Rocky Point Co-generation Sugar Mill project is completed.

Curbside recycling has been successful at diverting around 25,000 tonnes of waste material each year from landfill sites. Greenhouse gas reductions associated with recycling can be made in both energy required to manufacture the product and in the reduced impact the product has on landfill methane generation.

### **Actions Underway or Completed**

- Supporting a program for reducing organic waste sent to landfill encouraging the development of the Rocky Point Co-generation Sugar Mill project.
- Curbside recycling has significantly reduced waste sent to landfill.

### **Complementary Actions**

- The Queensland Environmental Protection Policy Waste requires that methane emissions from licensed landfill sites be captured and managed.

### **Future Actions**

- Further development of The Waste Management Strategy
- Depending on feasibility, undertake capture, and use or flaring of landfill Methane.
- Encourage and Recognise sustainable business practices that reduce landfill waste.

### **Transportation Sector**

The transport sector accounts for 18% of greenhouse gas emissions emitted within the Gold Coast area. Transportation is likely to be the sector with the greatest growth in emissions until 2010. The total vehicle kilometres travelled each day are projected to increase 93% from 8 million in 1995 to 15 million by 2011. This increase is due to:

- Continuation of the trends (of the last 15 years) for average traffic increase on the city's roads of 4.3% per year;
- Continuation of the trend to an increase in travel times of 2.6% per year;
- Increasing car ownership rates, trip length, duration (due to congestion), and the proportion of trips made by private car;
- Vehicle travel outstripping population growth; and
- Increases in public transport ridership slower than population increases (GCCC 1998).

Impacts of increasing levels of vehicle kilometres travelled include air pollution, health impacts, land consumption, water pollution financial costs, accidents, congestion, social disruption, and resource depletion (GCCC 1998).

The Gold Coast City Transport Plan (GCCC 1998) states that on current trends, the system would have to cope with almost twice its current load in about 15 years time. Within the Transportation sector single occupancy vehicles are the major contributors to air pollution, congestion and greenhouse gas emissions. Developing and encouraging alternative transport options will offset greenhouse gas emissions.

The Gold Coast City Transport Plan has set a target reduction for the number of private vehicle trips from the expected trend of 81.8% of trips down to 73% in 2010. Of this reduction 4% is to be taken up by public transport and 5% is to be taken up by non-motorised trips. Both these modes have the potential for significant greenhouse emissions reduction. Other measures include;

- Targeting and giving priority to more sustainable transport options in upgrading the transportation infrastructure;
- Improving public transport by increasing the quality of service and coverage;
- Using Travel Demand Management techniques;
- Integrating land use and transport planning travel demand and traffic management;
- Encouraging greater use of public transport, walking and cycling; and
- Improving vehicle fuels efficiency and fuel Technologies.

### **Actions Underway or Completed**

- The 'Gold Coast City Transport Master Plan 1999 to 2030' (Gold Coast City Council 1998) includes stronger commitment to public and non-motorised transport

**Complementary Actions**

- The State Governments Integrated Regional Transport Planning process has set a vision for 2007 for transportation in the SEQ region and has set targets, to be met by 2011, for a modal shift from single occupant cars to car pooling, public transport, cycling and walking. This strategy will encourage travel behaviour change for Gold Coast residents and has significant potential to reduce greenhouse gas emissions.
- Queensland rail extending its rail link from Robina to Coolangatta.

**Future Actions**

- Implement the Gold Coast City Transport Master Plan 1999 to 2030.
- Develop programs to encourage cycling, walking, public transport, ride sharing and other alternatives to private vehicle use.

**Table 4.2: Summary of Quantifiable Actions Contributing to the 10% Community Emissions Reduction Goal**

Sector (% of City emissions)	Action(s)	Emissions Reduction from 2010 BAU trend (tonnes CO <sub>2</sub> / year)	Contribution to 10% Goal	Council Directorate Responsible
<b>Residential</b> (11%)	Purchase of Green Energy (based on national adoption rates of 1%) Energy Efficient Appliances, Equipment and Hot water Systems on all new houses.	280,000	1.7%	Planning Environment and Transport
<b>Commercial</b> (16%)	Promoting council's success in achieving energy efficiency to encourage the commercial sector toward a 20% emissions reduction through energy efficiency measures. (Target - 50% of operators)	162,432	1%	Planning Environment and Transport and Economic Development and Major Projects
<b>Industrial</b> (49%)	Promoting council's success in achieving energy efficiency to encourage industry toward a 20% emissions reduction through energy efficiency measures. (Target - 50% of operators).	502,766	3.1%	Planning Environment and Transport and Economic Development and Major Projects
<b>Transportation</b> (17%)	Implementation of City Transport Plan	220,000	1.4%	Planning Environment and Transport
<b>Landfill Waste</b> (7%) Other Initiatives*	Waste Management and Co-generation Methane Flaring To Be confirmed these are approximates - High Estimate - Low Estimate	15,000  632,727** or 324,161***	0.1%  4% or 2%	Community Services
<b>Revegetation</b>	Community-based revegetation projects		TBA	Community Services
<b>Total 100%</b>	<b>Using Low Estimate</b>	<b>1,504,359t<sup>#</sup></b>	<b>9.3%</b>	
<b>Goal 10% reduction on 1997 Per Capita Emissions</b>		<b>1,623,500</b>	<b>10%</b>	

\* Estimates of reductions from methane flaring could lead to 11% reduction of community greenhouse gas emissions on their own based on comparisons with other Cities. This resource needs to be proven and estimates are preliminary at this stage.

\*\* using BCC figures

\*\*\* calculated using CCP

# Estimate depends on the level of program uptake of Solar hot water and industrial and commercial energy efficiency measures

## **Revegetation Sector**

The Revegetation sector deals with Community tree planting projects such as Natural Heritage Trust revegetation projects, 'Gecko Regen', Greening Australia. Greenhouse Accounting Methodologies appropriate to revegetation projects are still being finalised but it is recognised that revegetation and vegetation management can play a significant role in reducing Greenhouse Gas emissions.

### **Actions Underway or Completed**

- Gold coast based Greening Australia officer and projects.
- Glossy Black Cockatoo NHT revegetation project.
- 'Gecko Regen' landfill revegetation project.
- Nature conservation Strategy implementation.

### **Complementary Actions**

- State government Farm Forestry initiatives.

### **Future Actions**

- Continuation and expansion of existing programs.

## **5. IMPLEMENTATION, REVIEW, REPORTING, AND MONITORING**

### **5.1 Cities for Climate Protection**

Cities for Climate Protection is an international initiative of the International Council for Local Environmental Initiatives (ICLEI) that provides a program framework to support Local Government contribute to reducing greenhouse gas emissions. In 1998 the Gold Coast City Council endorsed its involvement in the CCP program and committed to achieving five milestones:

1. Establish an inventory and forecast for key sources of greenhouse gas emissions in the council and community.
2. Set an emissions reduction goal.
3. Develop and adopt the Gold Coast '2010' Cities for Climate Protection Program and its first Action Plan to state to work toward achieving the reduction goals.
4. Implement the 2001 Action Plan.
5. Monitor and report on greenhouse gas emissions and on the implementation of the actions and measures of the Program.

To date Council has completed Milestone one. This 2001 Action Plan represents completion of the Cities for Climate Protection milestones two and three.

### **5.2 Implementation**

Once this action plan has been approved Council will rapidly move on to milestone four - implementation of the 2001 Action Plan. Implementation should be rapid because most of the actions within the 2001 Action Plan are existing programs and many have already been allocated substantial funding. To be effective at addressing greenhouse gas reduction targets, and ensure behavioural and organisational change occurs, this 2001 Action Plan will need to involve the support of a wide range of branches within council as lead agencies for implementation of certain actions. Council will use existing coordination processes to provide maximum benefit for those branches participating in formulating, implementing and coordinating these programs with other council initiatives. In the future as Council may be required to make further cuts to emissions and adopt new technology this process will provide useful reference for additional measures.

### **5.3 Program Review**

The 2001 Action Plan is the first action plan of the Gold Coast '2010' Cities for Climate Protection Program. It is a 'living' document which will be revised as part of an annual review. This document provides an initial overview of Council's commitment and ongoing activities to reducing greenhouse gas emissions that derive from activities within the Gold Coast City Council area. More detailed action plans that will include new initiatives, key actions, project priorities, timeframes and allocate responsibilities will derive from the annual review of this document and the program. Future action plans will incorporate and reflect community and stakeholder feedback along with new opportunities and technology as they arise, reflecting the 'living' nature of the action plans. Program review will ensure that the Gold Coast '2010' Cities for Climate Protection Program remains relevant till the year 2010.

#### **5.4 Monitoring and Reporting**

To meet milestone five and ensure progress on the measures within the 2001 Action Plan regular reporting on the effectiveness of the implemented measures will occur. Individual measures will be reviewed and modified as necessary to reflect developments relevant to the particular sector. Monitoring and reporting on the implementation of community actions and measures will occur as part of the State of the Environment Reporting process every two years. Council's measures will be reviewed every year as part of the CCP program. Targets for Greenhouse emissions will be greatly affected by structural changes in council operation such as discontinuation of services, or additional services, or outsourcing of services to the private sector. Structural changes will be reported in a transparent manner and their impact will be excluded when calculations for the review and adjustment of the inventory, forecasts, and targets are undertaken.

Evaluation of measures to be developed from this 2001 Action Plan may be against a range of performance indicators including:

- Estimated greenhouse gas emissions from Council activities;
- Estimated greenhouse gas emissions from the Community of the Gold Coast;
- Amount of Council's energy consumption purchased or sourced from energy generated by renewable resources;
- Amount of energy generated within the Gold Coast City Council boundaries using renewable energy technology.

More specific indicators for branches within council may include;

- **Energy Efficient Council Buildings** – electrical energy used per square metre of building area.
- **Council Vehicles** – average per vehicle greenhouse gas emissions of vehicle fleet.
- **Waste** – Tonnes/employee of waste diverted from Landfill.
- **Water and Wastewater** -Greenhouse gas emissions per ML of water supplied.  
-Greenhouse gas emissions per ML of wastewater treated.

#### **5.5 Financing the 2001 Action Plan**

The '2010' goals set in this 2001 Action Plan are achievable based on a range of existing plans and strategies that have been adopted by council and are currently being implemented within current budgets. It is envisaged that programs promoting Council's actions to the community will not require significant additional funding.

Actions are designed to produce immediate benefits as well as long-term solutions to global warming at minimal additional cost. To ensure greenhouse initiatives have general support it is important that funding be justified on the basis of significant social benefits and not impose major additional costs on the community.

Options for sourcing additional funding for initiatives include;

- Linking with the Australian Greenhouse Office (Federal Government) funding for a range of programs. eg the Emissions Reduction Incentive Module - This module provides assistance to local governments to put some measures in place;
- Linking with State Governments - for example to access grants for solar hot water and photovoltaics;

- Allocating funds through normal budget processes; and
- Reallocating funds saved from energy efficiency gains to fund more costly initiatives that produce significant emission reductions.

Many of the initiatives of the 2001 Action Plan will yield significant indirect savings for Council. For example on-going reductions in water use defer the requirement for new dams and pumping facilities as well as save a substantial amount of energy required for pumping. Increasing energy efficiency in council buildings can provide significant savings on electricity bills.



## 6. CONCLUSION

If the enhanced greenhouse effect were to result in global warming and sea level rise the catastrophic impact on coastal communities would place an enormous burden on the Gold Coast Community and Council. It is important to minimise the risk of such scenarios by taking the opportunity the CCP program provides the Gold Coast to make a contribution toward Australia meeting its commitment to greenhouse gas emission reduction targets. This Action Plan has demonstrated that the '2010' goals for Council (20%) and the community (10%) can be achieved by a range of plans and strategies that are currently being developed or implemented. The actions emphasise a 'no regrets' policy by delivering short term benefits aside from the significant greenhouse gas emissions savings, with many of the actions saving funds or deferring substantial capital costs. The CCP program accepts review and adjustment of goals were the Gold Coast to exceed, or fall short, of its goals.

The Actions include increasing energy efficiency, purchasing and promoting renewable energy, and managing methane produced from landfill. Community and commercial awareness will play a significant part in assisting the community reach its 10% reduction goal. Council can assist in increasing community awareness by promoting and demonstrating to the community how to become more energy efficient and save money. Council's successes and lessons can be used to demonstrate how industry can achieve greater energy efficiency and reduce production costs without affecting the quality of goods and services.



## 7. BIBLIOGRAPHY

- ANZES. 1991. *Energy Policy for Queensland: Prospects for Renewable energy Technologies*. Prepared by ANZES (Queensland Branch).
- Australian Bureau of Statistics (ABS). 2000. Australia Now - A Statistical Profile Population projections [www] <http://www.abs.gov.au/Ausstats/ABS>. Commonwealth of Australia.
- The Australian Greenhouse Office (AGO). 2000a. *National Greenhouse Gas Inventory: Analysis of Trends and Greenhouse Indicators 1990-1998*. Commonwealth of Australia.
- The Australian Greenhouse Office (AGO). 2000b. *National Greenhouse Gas Inventory 1998*. Commonwealth of Australia.
- Australian Greenhouse Office (AGO). 1999. *Carbon Trading - Emissions trading and carbon credits: General Questions*. [www] <http://www.greenhouse.gov.au/emissionstrading/qanda.html>. Visited 6/9/00
- The Australian Greenhouse Office (AGO). 1997. *Climate Change: Australia's Second National Report under the United Nations Framework Convention on Climate Change*. Commonwealth of Australia.
- Commonwealth of Australia. 1997. Climate Change: Australia's Second National Report under the United Nations Framework Convention on Climate Change. [WWW] [http://www.greenhouse.gov.au/policy/analysis\\_projections.html](http://www.greenhouse.gov.au/policy/analysis_projections.html)
- M, Kettle. 2000. *Arctic's Icy Pole Watered Down*. <http://www.theage.com.au/news/20000822/A18574-2000Aug21.html>. 2000-08-22 Washington.
- BCC Brisbane City Council. 1999. *Sustainable Energy and Greenhouse Action Plan: Discussion Draft for Stakeholder Consultation*. Natural Environment Branch; Urban Management Division.
- Boral Energy Ltd. 1998. Energy Survey: Gold Coast City Council Nerang Administration Centre. Brisbane.
- GCCC Gold Coast City Council. 1998. *The Gold Coast City Council Transport Master Plan: 1999-2030*. Transport Planning Branch.
- SRC Australia Pty. Ltd. 1991. Review and Assessment of Demand Management options for Queensland, Report Prepared for Tully-millstream Taskforce Inquiry, Department of the Premier Economic and Trade Development Queensland. In E, Stock and M, Wiltshire. 2000. *Residential Energy Efficiency and Thermal comfort In SEQ: Some Local Experiments*. Research paper to be published.
- E, Stock and M, Wiltshire. 2000. *Residential Energy Efficiency and Thermal comfort In SEQ: Some Local Experiments*. Research paper to be published.
- Department of Primary Industries and Rural Communities (DPI). 2000. *A Wind farm doubles as tourist attraction*. Queensland Government Media Statements Mailing List.

Department of Foreign Affairs and Trade (DAFT). 2000. *International Emissions Trading: Assignment of Liability A Discussion Paper*.  
[http://orpheus.dfat.gov.au/environment/climate/cc\\_liability.html](http://orpheus.dfat.gov.au/environment/climate/cc_liability.html).

Department of Foreign Affairs and Trade (DFAT). 1997. *Australia and Climate Change Negotiations – an Issues Paper*.  
<http://orpheus.dfat.gov.au/environment/climate/accn/002.html>. Commonwealth of Australia

Department of Mines and Energy (DME)a. 2000. *About The Solar Hot Water Rebate Scheme*. [WWW] <http://www.dme.qld.gov.au/energy/solar/solar.htm>. Visited 17/8/00.  
Office of Sustainable Energy, Department of mines and Energy, Queensland Government.

Department of Mines and Energy (DME)b. 2000. *The Photovoltaic Rebate Program (PVRP)*. [WWW] <http://www.dme.qld.gov.au/energy/solar/solar.htm>. Visited 17/8/00.  
Office of Sustainable Energy, Department of mines and Energy, Queensland Government.

Mills, D and Stock, E and Lowe, I. 1999. *Local Government Energy Efficiency and Greenhouse Policies: How Does Australia's Largest Local Government Compared With a Review of Best Practice*. Unpublished.

Veitch Lister. 1997. *Gold Coast City Transport Plan Strategic scoping study*.

## Appendix 1: Detail of Corporate Emissions Reductions Actions

Sector (% of council Emissions)	Action(s)	Estimated Implementation Cost (\$)	Estimated annual savings on completion (\$/year)	Emissions Reduction from 2010 BAU trend (tonnes CO <sub>2</sub> / year)	Contribution to 20% Goal	Council Directorate Responsible
<b>Council Buildings</b> (18%)	Energy Efficient equipment and Lighting	These measures have a 2 year pay back period (including an allocated \$50,000 for the TBA cost at Nerang)				Organisational Services
	Nerang – Pierlite 2000 quote. Less comprehensive more recent than Boral	TBA Further savings possible Imp. Costs not given.	\$18,156 per year	168	0.1%	
	Nerang – Boral	Overlaps with Pierlite				
	Surfers Admin - Boral	\$208,800 one off	\$112,063 at 0.0814 \$/kWh	1404	0.8%	
	Arts Centre - Boral	\$135,000 one off	\$46,349 at 0.0814 \$/kWh	581	0.3%	
	Computer Power Saver turned on	\$1,000 one off	\$21,629 at 0.0814 \$/kWh	271	0.16%	CorTechS
	Reinvest some of savings into funding a premium for Green Energy after payback period for implementation	\$91,000 per year at a premium of 1.2c/Kwh allowing the purchase of 7,845 Mwh Green Power. May allocate more depending on the % of Boral Audits implementable	0	8000	4.8%	Organisational Services
<b>Sub-Total</b>		<b>\$344,800 ONE OFF, \$91,000/year allocation for 'Green Power' purchase</b>	<b>\$198,197</b>	<b>10,424</b>	<b>6.3%</b>	

The Gold Coast 2010 Cities for Climate Protection Program

Sector (% of council Emissions)	Action(s)	Estimated Implementation Cost (\$)	Estimated annual savings on completion (\$/year)	Emissions Reduction from 2010 BAU trend (tonnes CO <sub>2</sub> / year)	Contribution to 20% Goal	Council Directorate Responsible
<b>Council Fleet</b> (5%)	LPG in heavy vehicles (trial)	\$54,000 one off if all six done (based on trial of street sweeper est. cost after rebate \$7,500)	\$80,424	471	0.3%	Fleet and Plant Management
	LPG in utilities (trial)	\$42,000 one off (based on change over costs for 70 utes and trial of 8 factory LPG utes each cost \$19,000)	\$42,647 (savings if trials successful)	70	0.04%	
<b>Sub-Total</b>		<b>\$96,000 one off</b>	<b>\$123,071</b>	<b>541</b>	<b>0.33 %</b>	
<b>Water and Sewerage</b> (58%)	2% energy efficiency gain each year over 5 years (totaling 10% by 2006)*	TBA (using Y2000 price for peak electricity)	\$360,826* (after 2006)	6000* (after 2006)	3.6%* (after 2006)	Gold Coast Water
	Purchase of 10% of electricity as renewables over the 4 sites in the Energex inventory and leaving out the surfers admin building	\$33,850 p.a.	0	2887  Current Undertaking	1.8%	Gold Coast Water
<b>Sub-Total</b>	<b>Using the Current Undertaking</b>	<b>\$33,850 p.a. + TBA</b>	<b>\$360,826</b>	<b>8887</b>	<b>5.4%</b>	
<b>Waste Management</b> (1%)	Recycle office paper	Not determined	Not determined	30	0.02%	Organisation al Services
<b>Streetlights</b> (19%)	TBA	TBA	TBA	TBA		Organisation al Services
<b>Other</b>	Tree Planting and Revegetation	TBA	0	TBA		Bushland Management Waste
<b>Total</b>	With Above Measures	Approx. \$440,800 <sup>#</sup> one off and \$124,850 <sup>#</sup> p.a.	\$682,094 <sup>#</sup> p.a.	20,159	12%	
<b>Goal 20% reduction on 1997 Per Capita Emissions</b>				33,000	20%	

\* To Be Confirmed Pending Energy Audit

<sup>#</sup> Costs and savings are preliminary estimates only and should not be incorporated into budgets until it is confirmed that the estimates have been realised and the actual savings and costs have been quantified.

## Appendix 2: Glossary and Abbreviations

**AGO** - Australian Greenhouse Office

**CCP** - Cities for Climate Protection

**GCCC** - Gold Coast City Council

### **Grandfathering**

An allocation mechanism that uses past emission performance (or other historical criteria) as a basis for distributing permits among existing emitters.

### **Kyoto target**

Represents the amount of emissions assigned to a country under the Kyoto Protocol for consumption, banking or trading for the period 2008-12. For Australia, this amount is equivalent to 5 x 108% of our estimated 1990 greenhouse gas emissions. This national allocation can be supplemented through eligible emission trading, sequestration or transfer mechanisms.

### **Sequestration**

Processes that remove carbon dioxide from the atmosphere and retain it in a carbon 'sink' (eg. trees).

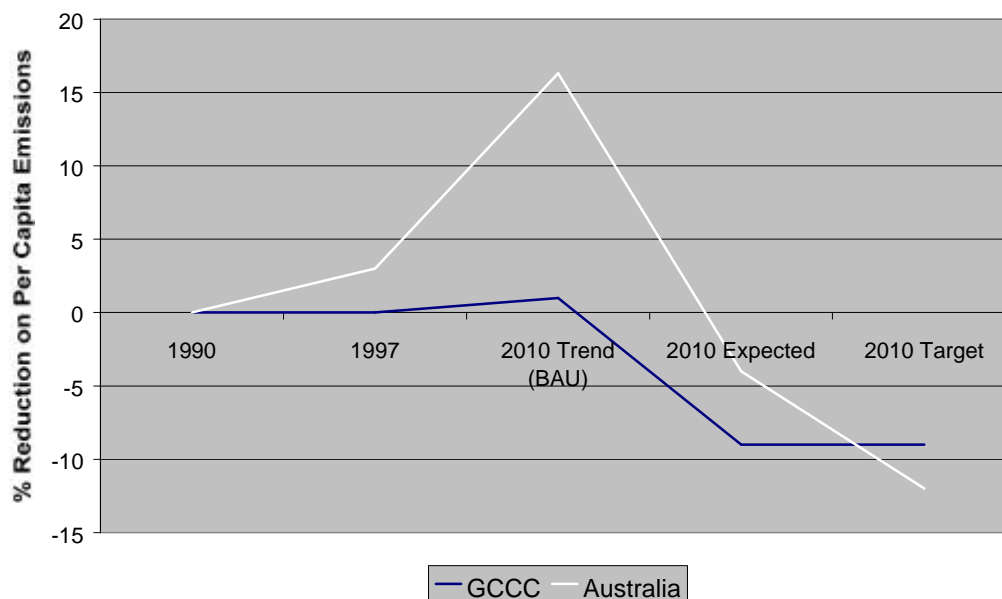
### **Sinks**

Any process, activity or mechanism which removes greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.

### **Sources**

Any process, activity or mechanism which releases greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere.

## Appendix 3



**Figure A.1: Per Capita Energy Efficiency - Australia and Gold Coast % Reductions**

Source; 1990 and 1997 data from National Greenhouse Inventory 1998 (AGO 2000a), 2010 data from Australia's Second National Report under the United Nations Framework Convention on Climate Change (AGO 1997).

Australia Data; 2010 trend - 552 Mt CO<sub>2</sub>-e estimated projection in the absence of measures to reduce emissions, 1990 level 386 Mt CO<sub>2</sub>-e, 2010 Kyoto target 108% increase 416 Mt CO<sub>2</sub>-e, Expected 2010 emissions with reduction measures 455 Mt CO<sub>2</sub>-e (AGO 1997), Population in 1990 around 17 million and projected in 2010 to be around 20.89 million (ABS 2000).

Gold Coast Data: 1990 - 10,074,546 tCO<sub>2e</sub>, 343,800 pop, 2010 - 550208 pop 16,130,848 tCO<sub>2e</sub>.

