

# 1. GREENHOUSE GAS EMISSIONS - CHRISTCHURCH CITY COUNCIL OPERATIONS

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The purpose of this report is to inform the Council of greenhouse gas emissions from the Council's operations and the setting of targets for the progressive reduction of emissions in the future.

## CONTEXT

The Council, at its meeting on 12 December 2001, considered a report on a Climate Change Consultation Paper entitled "Kyoto Protocol: Ensuring Our Future" and resolved as follows:

1. *That the Council support the principles behind the Kyoto Protocol but express its strong concern about the potential for damage to the economy if New Zealand moves to sign the Protocol in the absence of a commitment by our trading partners and competitors.*
2. *That a submission be made on the current consultation document, based on the attached draft.*
3. *That Local Government New Zealand be asked to consider preparing a sector wide submission on the policy options to be developed in Part II.*
4. *That the Council endorse the Government's policy on climate change.*
5. *That the Strategy and Finance Committee be asked to consider early in 2002 a proposal that the Council set targets, and decide on strategies and mechanisms, for the progressive reduction of carbon dioxide emissions from its own operations, subject to the inclusion of any required budget provision in the 2003 Financial Plan.*

This report addresses the matter raised in item 5 above in regard to direct greenhouse gas emissions.

It should be noted that to meet our obligations under the Kyoto Protocol, once signed and ratified, New Zealand would need to reduce national greenhouse gas emissions to 1990 levels on average over the 2008 to 2012 period.

## RELEVANT CURRENT POLICY

The Council has a number of policies that are relevant to greenhouse gas emissions, and more importantly to energy efficiency, which has a direct influence on such emissions. These include:

- *The Council, when developing new policies and projects, takes into account the effects of climate change where this is appropriate. Policies that initiate or support activities that counter the causes and effects of those changes, are to be preferred (26.04.1995).*
- *The Council will follow energy strategies that minimise energy consumption, select sustainable energy supplies and minimise impacts on the environment (26.11.1997).*
- *The Council is committed, in its operations, to the efficient use of energy and energy conservation (27.11.1996).*
- *For new projects and major retrofits with a significant energy component an Energy Efficiency and Sustainability Assessment must be carried out (27.11.1996).*

## SOURCES OF GREENHOUSE GAS EMISSION AS IT RELATES TO COUNCIL'S OWN OPERATIONS

Carbon dioxide (CO<sub>2</sub>) is one of the greenhouse gases. It is being released into the atmosphere as a result of burning a fossil fuel (such as gas, petroleum products, coal) for the purpose of extracting energy. Apart from the burning of fossil fuels, electricity is widely used at all Council's facilities. The process of generating electricity at thermal power stations is associated with CO<sub>2</sub> emissions, as well as the generation at geothermal stations. As electricity generated in New Zealand is a mix of hydro, thermal and geothermal energy, any electricity consumed is deemed to be associated with a certain amount of CO<sub>2</sub> emissions.

Paper usage can be considered another source of CO<sub>2</sub> emissions as energy is used in the process of paper manufacturing. However, this source was not included in the Council's account of emissions as, in the national/international emission balance, it would be allocated to the paper manufacturing industry. It has to be noted that CO<sub>2</sub> emissions resulting from paper usage by the Council are relatively insignificant in comparison with those resulting from energy usage by the Council's operations.

**ACTION TAKEN TO DATE**

Since 1994, the Council has been actively implementing policies and projects that, though never aimed specifically and solely at reducing greenhouse gas emissions, were progressively reducing CO<sub>2</sub> emissions from the Council's own operations.

There are three major directions as to how to reduce greenhouse gas emissions from the Council's own operations:

- improving energy efficiency;
- substituting energy sources of higher CO<sub>2</sub> emission factors with those having lower CO<sub>2</sub> emission factors;
- substituting fossil fuels with renewable (zero CO<sub>2</sub>) energy sources.

Energy efficiency and conservation is a universal and the most cost-effective means of achieving the goal of reducing greenhouse gas emissions. This is why the National Energy Efficiency and Conservation Strategy states the reduction of CO<sub>2</sub> emissions as one of its goals (along with the goals of reducing local environmental impacts, improving economic productivity, promoting industry development, improving economic resilience and improving health and welfare of people).

Numerous projects have been successfully implemented at the Council's facilities which resulted in a significant overall reduction in energy consumption and, subsequently, in a proportional reduction of CO<sub>2</sub> emissions. To ensure that the most energy efficient solutions and technologies are applied at the Council's new facilities, an Energy Efficiency and Sustainability Assessment has been carried out since 1996 for every major project with a significant energy component. The assessment includes a comparative analysis of various energy sources for the new facility with respect to their impact on the environment (which includes greenhouse gas emissions).

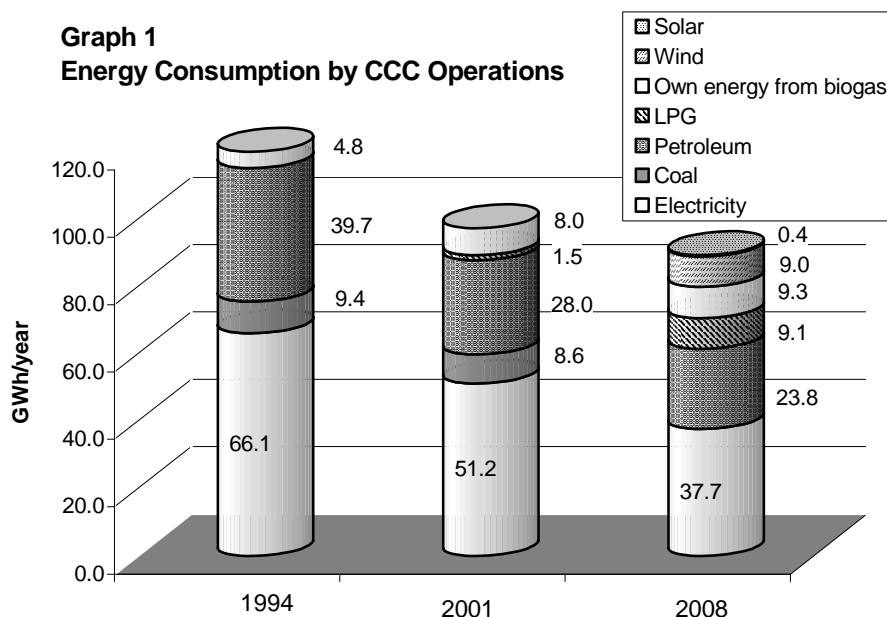
A coal-fired boiler at QEII Swimming Complex has been replaced with more energy efficient and less CO<sub>2</sub>-emitting heat pump and LPG-fired boilers.

In 1996, a new engine-generator has been installed at the Wastewater Treatment Plant to consume all the biogas produced there. The plant now generates over 16% of the total electricity consumption by the Council's operations. This energy is CO<sub>2</sub>-free. A contract for purchasing wind energy for the Council's operations was signed in 2001. The renewable CO<sub>2</sub>-free wind energy should be available in 2003 and would substitute 3.3% of electricity derived from CO<sub>2</sub>-emitting sources.

**COUNCIL'S CURRENT POSITION AND TARGETS FOR THE FUTURE**

A requirement of the Kyoto Protocol is that "demonstrable progress" towards meeting the commitments is to be achieved by 2005.

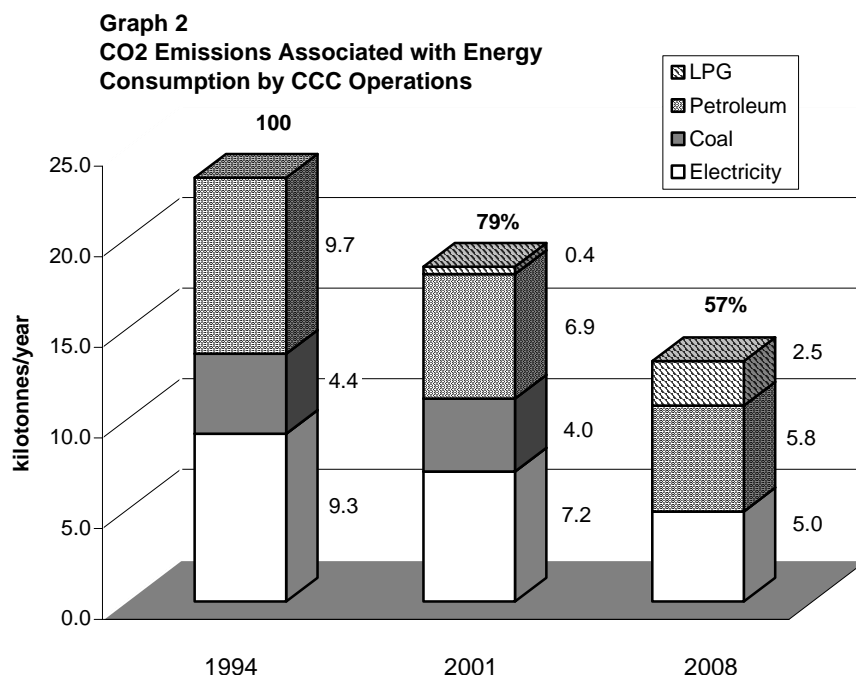
Graph 1 shows energy consumption in absolute numbers (millions of kWh/year) by the Council's operations in 1994 and 2001 respectively and a projection for 2008. As accurate historical data on energy consumption by the Council's facilities in 1990 is not available, all comparisons are based on 1994 levels. As the first commitment period under the Kyoto Protocol is to begin in 2008, that year is chosen for setting a target for the future.



For simplicity and fairer comparison, the numbers for 2001 and 2008 include energy consumption by City Care (in spite of the fact of its separation from the Council). The graph shows a 19% reduction in energy consumption (in absolute numbers of kWh) achieved by 2001.

It has to be noted that the reduction has been achieved in spite of the city growth (new street lights and traffic lights, new pumping stations, etc) and new substantial facilities such as swimming complexes, new Art Gallery and other buildings coming into operation since 1994. In accordance with the internationally accepted practice, the actual energy efficiency improvements should be expressed in relative indices (for example, kWh/capita) that would equate to a 26% reduction in energy consumption by the Council's operations over the 7-year period to 2001.

The Council's systematic efforts to improve energy efficiency of its own operations combined with successful projects that led to an increased share of renewable energy sources resulted in a substantial reduction in CO<sub>2</sub> emissions by 2001 (see Graph 2).



With a 21% reduction in CO<sub>2</sub> emissions already achieved and with further improvements projected to reduce the emissions by 2008 to an estimated 57% of 1994 level, the Council is well ahead of the national target.

**ISSUES FOR CONSIDERATION**

The emphasis is now to build on our current strong position in energy efficiency to become even better and provide a progressive transition to renewable (CO<sub>2</sub>-free) energy sources in the Council's operations. A substantial potential for improvement lies within the car fleet management (a separate report to the Strategy and Finance Committee on this matter is being prepared).

Apart from the Council's own operations, activities for reducing greenhouse gas emissions from Christchurch City include Energy Efficiency Advisory Service, Energy Efficiency Show Home and the Council's Helping Hand for Heating and Warmer Homes programmes.

Budget provisions for 2002/03 include funds for energy efficiency projects and wind energy. This seems to be sufficient at this stage and no additional provision is required.

#	CONDITION:	Meets condition ✓✓-x	HOW IT HELPS MEET CONDITION:
<b>The Natural Step</b>			
N1	Reduce non-renewable resource use	✓✓	<i>Reduction in the use of fossil fuels part of the process</i>
N2	Eliminate emission of harmful substances	✓	As above
N3	Protect and restore biodiversity and ecosystems	-	Neutral in a direct sense
N4	People needs met fairly and efficiently	N/A	<b>See People Step + Economic Step</b>

#	CONDITION:	Meets condition ✓✓-x	HOW IT HELPS MEET CONDITION:
<b>The People Step</b>			
P1	Basic Needs	✓	Providing energy for warmth and heating
P2	Developing full potential	-	
P3	Social capital	-	
P4	Culture and identity	-	
P5	Governance and participatory democracy	-	
<b>The Economic Step</b>			
E1	Effective and efficient use of resources <u>economic capital?</u>	✓✓	Cost benefits to both the Council and the community
E2	Job rich local economy	✓	New jobs created
E3	Financial sustainability	✓✓	Ongoing financial benefits

The Committee endorsed a suggestion by Councillor Anderton that opportunities for working in partnership with central government on an ongoing educational programme on energy efficiencies to encourage energy conservation was supported by the Committee as was a suggestion by the City Manager that an "Energy Tips" column be included in future editions of "City Scene".

- Recommendation:**
1. That the information be received.
  2. That the Council continue to develop and implement programmes and policies leading to energy efficiency improvements and greater use of renewable energy sources in association with the Ministry for the Environment and the Energy Efficiency and Conservation Authority.