

4. CLEAN AIR AND ENERGY EFFICIENCY INCENTIVES PROGRAMME

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The purpose of this report is to inform the Council of the results of the implementation of the Clean Air and Energy Efficiency Programmes to date and their impact on reducing winter air pollution in the City.

BACKGROUND

Following submissions from citizens on the Annual Plan, the Council decided in 1997 to allocate a sum of \$2.42M over five years to encourage householders to replace the most polluting domestic heating appliances with cleaner heating alternatives. Provision was subsequently made in the Annual Plan and Budget for the following sums:

Table 1

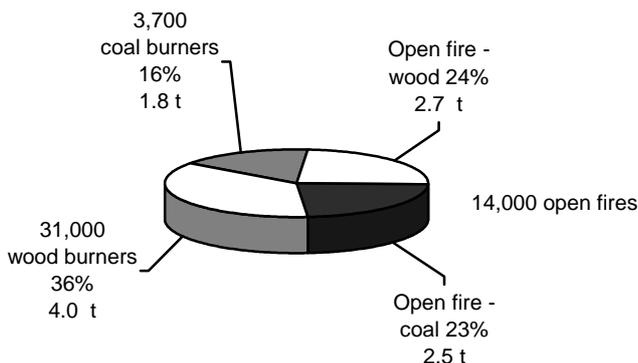
Financial year	Clean Air Grants	Energy Efficiency Grants
1997/98	\$500,000	EECA funds
1998/99	\$500,000	EECA funds
1999/2000	\$670,000	\$50,000 + EECA funds
2000/01	\$670,000	\$150,000
2001/02	\$80,000	\$50,000

The Canterbury Regional Council stated in its publication “We’ve Got A Plan To Clean Up The Air...” dated July 1998:

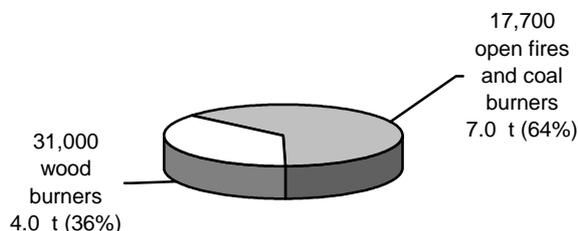
“Careful research of the sources of this contamination in Christchurch has demonstrated that 90% of our suspended particulate is from wood and coal burned in open fires and burners. On a typical winter’s night there are about 14,000 open fires, 3,700 enclosed coal-burning devices and 31,000 wood burning devices used in Christchurch. Together these generate 11 tonnes of particulate each day, most of it at night when there is little dispersion.”

Further, the Canterbury Regional Council, in the above mentioned and other publications, provided the following information on sources of smoke by method of home heating:

Graph 1: Situation as at July 1998
Total particulate emissions from domestic heating 11 tonnes/day



Therefore the City Council, after considering the information provided by the Canterbury Regional Council as part of its Air Plan preparation, decided that incentives should be provided to householders



who close off or remove open fireplaces or remove coal burning appliances. These, the most polluting devices, accounted for the majority (nearly 64%) of the total amount of particulate from home heating while, in terms of the numbers of air polluting devices to deal with, this burner category represented a minority, as shown on Graph 2 below.

Graph 2: Situation as at July 1998 - benchmark

Total particulate emissions from domestic heating 11 tonnes/day

A detailed programme implementation plan based on the objectives was developed to encourage householders to replace their open fireplaces and coal burning appliances with cleaner heating appliances. The programme also developed incentives encouraging householders to install measures that would make their homes more energy efficient so they would need to burn less fuel to heat their homes. The first objective was to be funded from the Council's budget (Table 1 above) and the second from money available from the Energy Saver Fund (ESF) administered by the Energy Efficiency and Conservation Authority (EECA) in 1997-2000 and then from the Council's budget in 2000/01 and 2001/02.

The programme was seen to be a community initiative, led by the Christchurch City Council, but largely operated in the community by the community. It was considered important that retailers and installers of energy equipment be involved. Not only were there administrative advantages in this arrangement but it also enabled wider publicity to be given from more sources with minimal cost to the programme.

On the basis of the work undertaken at the programme design stage, the total eligible market was estimated to be about 12,000 households (excluding government owned premises). It was determined by the consultant, based on his experience with other energy programmes overseas, that about 60% of the target market, or about 7,000 households, would be willing to participate in any incentive programmes.

The Clean Air and Energy Efficiency Programme (known as the *Helping Hand for Heating*) started on 1 May 1998. It provided the following financial assistance to its participants, with the home-owner meeting the balance of the costs: a \$500 grant towards the installed costs of a clean air certified solid fuel, LPG or diesel burner or a heat pump or, in case of a less expensive electric appliance, 80% up to \$300 towards the installation costs; \$3.00/m² for ceiling insulation; \$1.60/m² for under floor insulation.

From the design stage through its implementation, the programme received full and unconditional support from Environment Canterbury and EECA.

PROGRAMME UPDATE

The original budget (Table 1 above) was based on an estimated uptake rate and assumed that the programme would last until the end of winter 2001. Since the programme started in 1998, the annual budgets have been adjusted to match the actual uptake rate and actual annual expenditure. The actual uptake rate was higher than anticipated in 1997 and, as a result, the availability of funds budgeted for the clean air grants ended in February 2001 - about seven months earlier than originally planned.

It was planned that the programme would continue until June 2002 with insulation incentives available to those householders who close off or remove open fireplaces or remove coal burning appliances.

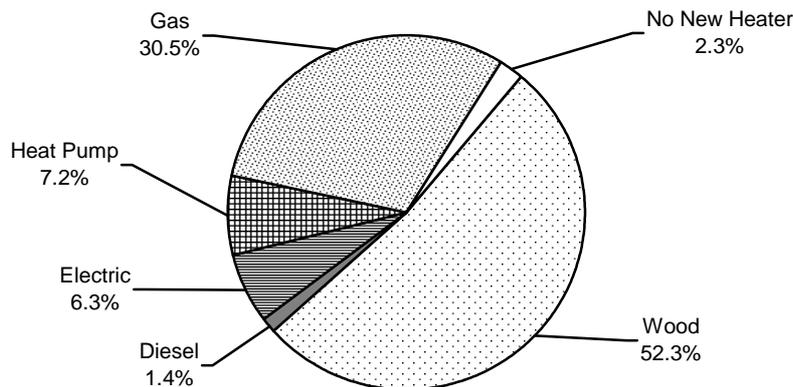
In line with this expectation a final date (28 February 2001) for clean air grants offering with heating appliance sales was set. Registered retailers and installers responded with unprecedented sales promotion activities. For example, one company was offering customers a gas appliance at a \$1,000 discount, in addition to the Council's grant of \$500; other companies were offering very attractive finance packages. The Helping Hand for Heating promotion in February was highly successful and resulted in over 900 installations completed or booked within one month, which was equal to what would normally happen over a six month period.

The number of sales by registered suppliers in February 2001 exceeded the programme administrator's estimates by about 450 which would result in an increase of use of clean air grants in the order of \$195,000 compared with the funds available. Some of the installations pending are likely to be completed only in June 2001 so payments of grants for these installations may be delayed until the next financial year. At the same time, the second component of the Helping Hand programme, energy efficiency grants, has unspent funds of \$149,000 in the 2000/01 financial year to date and another \$50,000 budgeted in the year 2001/02. As the planned number of clean air conversions has been effectively achieved, it is recommended that the payment of energy efficiency grants be at this stage stopped and all the unspent funds from the energy efficiency component of the programme be used to cover the increase in the use of its clean air component.

To date, 5,398 clean air grants have been paid or invoiced and 802 installations are pending. From the latter, not necessarily all installations would be eligible for the grants as they are subject to checks by the programme administrator in terms of their eligibility. It is expected that the programme administrator would finish the payment of clean air grants by July-August 2001 and a final financial report will be included in the Corporate Services report to the Annual Plan Working Party.

Since programme implementation started in May 1998, a total of 5,547 open fires and coal burners have been permanently closed or removed. This includes 149 households that opted to install no heater and receive only the insulation incentives. From another 802 installations pending, it is estimated that at least 80% of them will meet the programme eligibility criteria. Therefore the total number of clean air conversions by mid-winter 2001 is likely to be about **6,200**. The following Graph 3 shows the percentage by type of clean air heating appliance installed.

Graph 3



Energy efficiency measures (mainly ceiling insulation and underfloor insulation) have been installed in 511 homes.

PROGRAMME RESULTS

As a result of the programme implementation whereby a substantial number of open fires and coal burners being disabled, changes have occurred in the amounts of particulate emissions. It seems expedient now to make an attempt to quantify these changes and assess the current PM₁₀ emission situation in comparison with the benchmark situation in 1998 (see Graph 2) when the programme started.

The programme database and other Council records (including records of building consents issued for the installation of new solid fuel burners and demolitions) present sufficient factual and documented data for making such an assessment. Environment Canterbury's reports and publications present sufficient data on emission factors from various types of air polluting heaters and these have been used in the assessment calculations. Where assumptions were necessary these were conservative so the position could be better.

It has to be noted that there are a number of factors that have not been taken into account in the analysis. These include major factors influencing the conversion to cleaner forms of heating in the City such as looming legislative measures. There were a number of other factors that may cause both positive and negative changes to the emission situation (such as weather, electricity and other fuels prices, growing awareness of energy efficiency, etc). As no factual and documented data is available on the impact of these other factors, they were not taken into consideration for the purpose of this assessment.

It will be noted that a substantial positive change towards cleaner heating has been made since 1998 by Housing New Zealand. About 1,500 open fires and coal burners have been removed from houses that belong to Housing NZ and several insulation projects have been implemented. The replacement heaters included clean air certified wood burners and electric heaters. This documented improvement is included in the assessment shown on Graph 4.

Other factors include open fires/coal burners removed as a result of demolition of older dwellings, negative effects of the installation of new solid fuel heaters and estimated effects of the clean air programmes continuation till winter 2002.

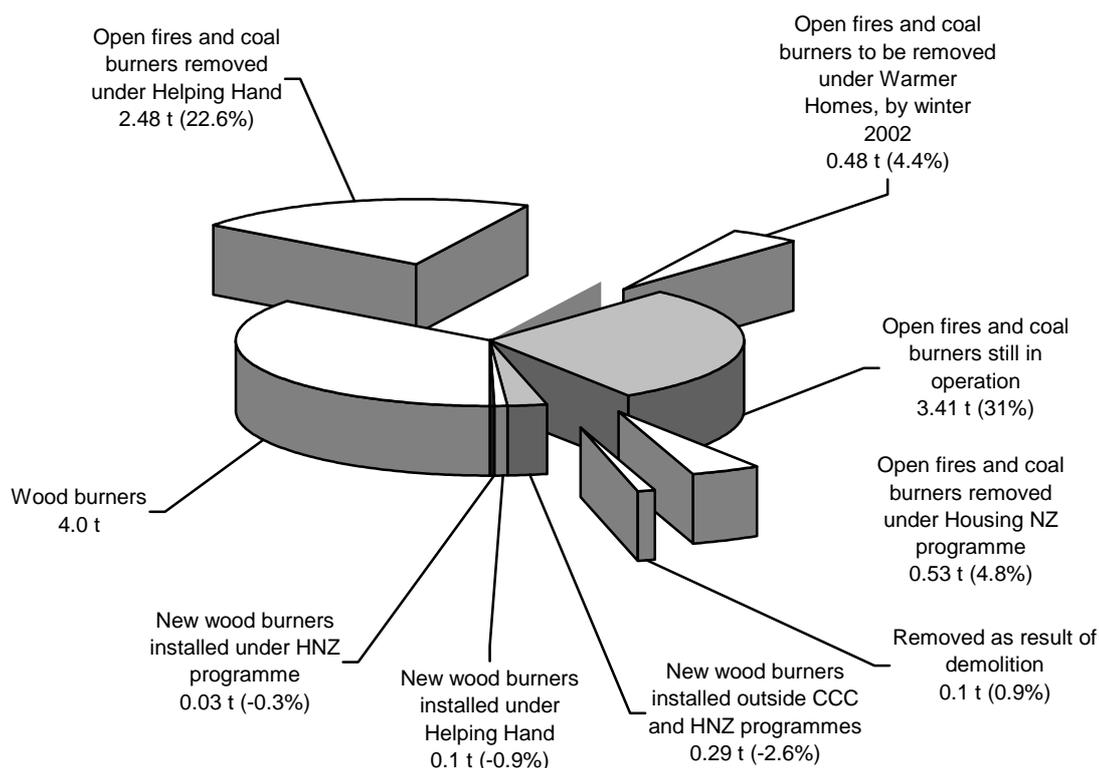
While the number of solid fuel heaters installed under the Helping Hand programme was relatively high, their environmental impact is relatively small (0.9% of the total particulate emissions from domestic heating) as all of them were clean air certified appliances with minimal emission factors.

An argument may be raised whether all of the open fires removed under the Helping Hand programme were actually in use on a typical coldest winter night. Though no incentive programme can guarantee a 100% effectiveness in this respect, reasonable efforts have been made at the programme design stage and through its administration process to ensure that non-essential open fires are excluded from being eligible for grants. The likelihood that an open fire is used (can be used) on a cold winter night appears to be reasonably high if this open fire is situated in the main living area of the house and is the only fixed heating appliance in this area. An open fire only situated in the main living area of a house that was the main source of heating could be eligible for the grant. A maximum of one grant per household could be available. A replacement heater must be installed in the same area were the open fire was removed from. It has to be noted that, in a number of cases, the Programme Administrator declined claims for payment of grants as those installations did not comply with the programme rules.

Another argument may be raised that a householder might re-open an open fireplace after receiving a clean air grant. Though no programme can provide a 100% guarantee against this, such a scenario seems unlikely after the household has already spent a substantial amount of money (in addition to the Council's grant) on the installation of an efficient fixed clean air approved heater to heat the same area of the house. In the majority of cases, replacement heaters have been inserted in the open fire (gas, solid fuel inserts and electric heaters) so such a scenario seems impracticable.

The assessment is presented on Graph 4 below. Negative percentages attributed to several segments mean "emissions added". The graph shows a net reduction in emission levels from domestic heating of **28.9%** compared with the 1998 benchmark.

Graph 4: changes in situation to date and by winter 2002, from 1998 benchmark (Graph 2). Total particulate emissions from domestic heating 7.83 tonnes/day



LOW INCOME HOMEOWNERS

With the view that the existing **Helping Hand for Heating** programme may not be sufficient to meet low income home owners ability to fund the conversion cleaner heating, the Council considered the introduction of another clean air programme (known as **Warmer Homes**) and decided at the October 2000 meeting to:

"...proceed with the implementation of the programme...from February 2001."

While the main objective of the **Helping Hand for Heating** programme was to reduce air pollution in Christchurch, the **Warmer Homes** programme for low-income home owners has a different objective of a more social nature. It will provide them with extended special monetary assistance to meet capital costs of conversion from polluting and inefficient forms of home heating to cleaner efficient ones, and also help to achieve healthier living conditions.

Warmer Homes provides:

- a free visit and energy check by a City Council energy adviser
- 100% of the cost of disabling an open fire or coal burner, up to \$135
- 100% of the cost of installing ceiling insulation, up to \$7.15 per square metre
- 100% of the cost of installing under-floor insulation, up to \$5.80 per square metre
- 80% of the installed cost of an electric, gas or diesel heating appliance, up to \$350.

Funding of \$1.16M has been provided over two years for this new initiative.

The **Warmer Homes** programme started in February 2001, and to date over 100 installations have been completed or booked.**4 Cont'd**

- Recommendation:**
1. That the Helping Hand for Heating programme, having achieved its goal, be wound up.
 2. That the unspent funds from the energy efficiency component of the programme be used to cover the increase in the use of its clean air component.
 3. That, as agreed at the Council meeting on 23 March 2001, the Warmer Homes programme be continued until June 2002 to ensure a smooth transition to the Environment Canterbury programme.

Chairman's

Recommendation: That the above recommendation be adopted.