

Environment Canterbury Clean Heat Programme

- An air quality improvement project for the urban environment

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Overview – Clean Heat Project

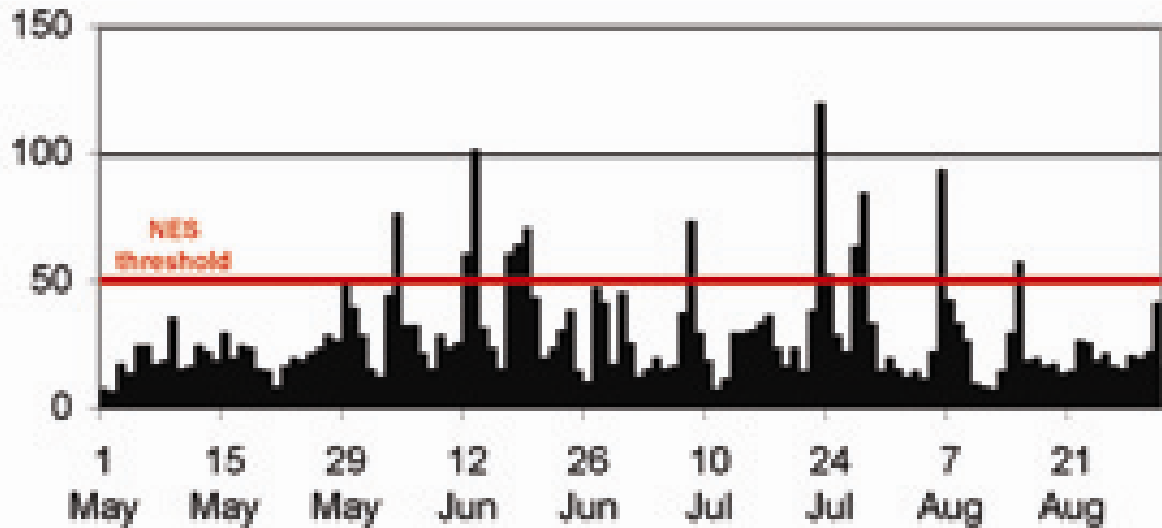
- Focus on meeting National Environmental Standard (NES) for Air Quality - by 2013
- Old, inefficient solid fuel heating appliances **OUT**
- **IN** Insulation + heating appliance
- Raises community awareness
- An air quality improvement project but...
- Poor building energy performance remains an issue (locally and nationally)



Air Quality Portfolio

1. Meeting NES for pollutant gases - CO, SO₂, etc
2. Converting to cleaner forms of home heating – to reduce **PM₁₀**
3. Meet NES for PM₁₀
4. Ensure environmental effects remain acceptable to community





**<< 2007 winter
air report - PM₁₀
- Christchurch**

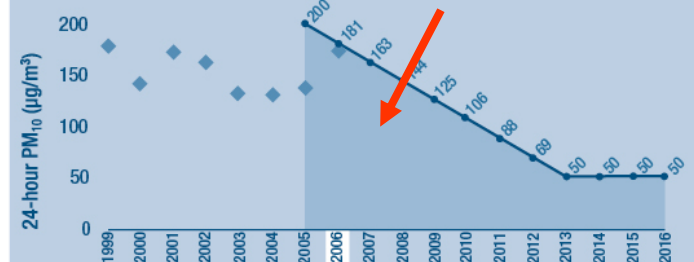
**Level of Service
performance measure –
in the target zone! >>**

PM₁₀ concentrations

KEY Actual 2nd highest PM₁₀ concentration Straight line path
 Target zone, where actual 2nd highest PM₁₀ concentrations should lie

PM₁₀ concentrations are measured in micrograms per cubic metre, in the 24-hour period from midnight to midnight.

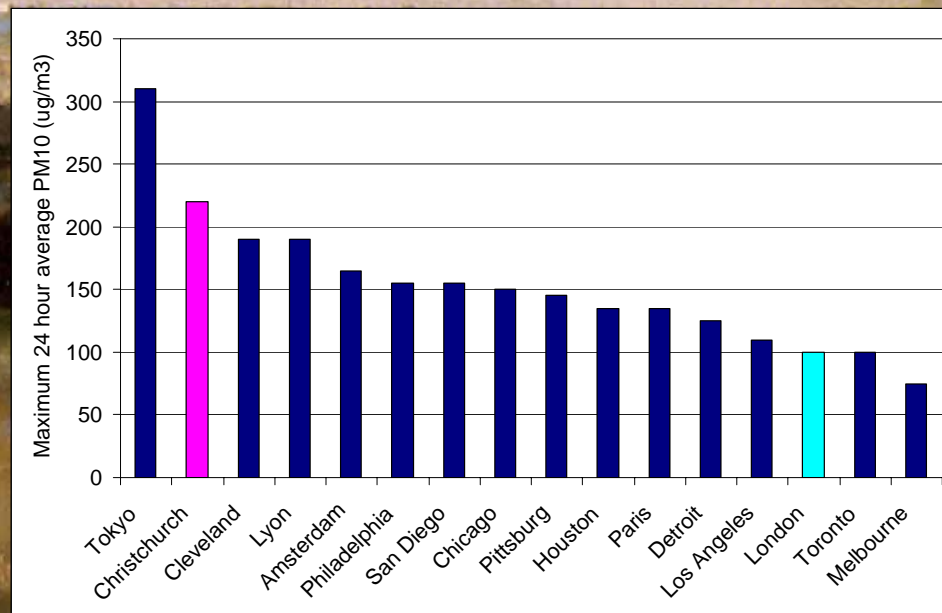
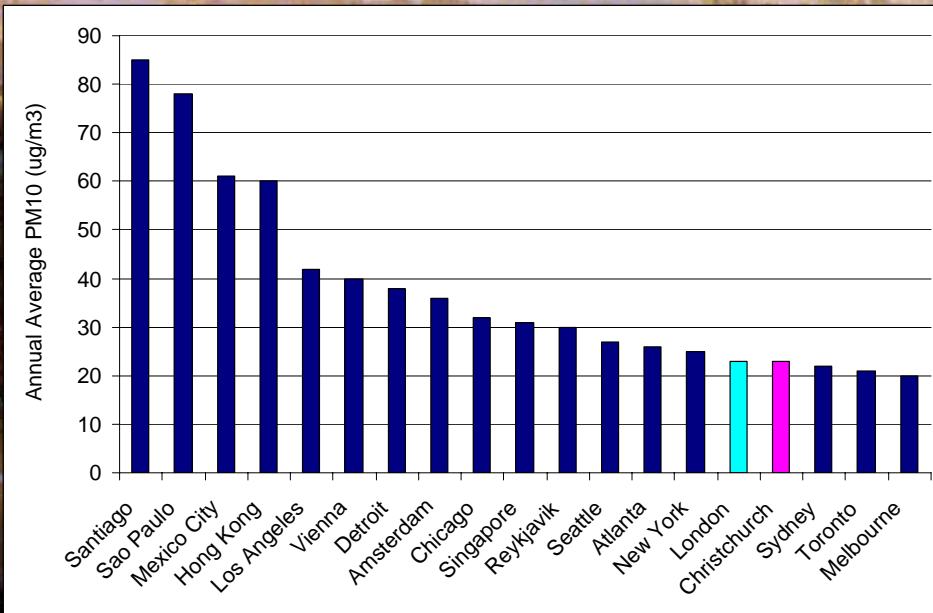
Christchurch



How does Christchurch really compare?

Annual average PM10 - average across whole year (c.f. London)

Maximum 24-hour average PM10 concentrations – worst day in a year



Objectives

- Voluntary scheme but financial incentives
- Facilitate conversion of polluting appliances
- Keep costs within budget (Long Term Council Community Plan)
- Encourage homeowners to install insulation



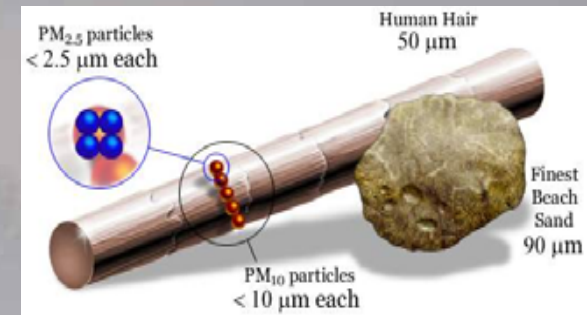
Principles

- Greatest assistance to those on low incomes
- Heating conversions – main living areas
- Suite of CHP approved appliances
- Resulting ‘warm home’ meets current codes/standards
- Fireplace removed or old appliance made inoperable



Barriers and Challenges

- Rejection of regulation (initially)
- Querying of scientific basis
- Project requirements set ahead of regulation
- All income brackets can participate
- A step towards a... 'home heating solution'?
- What is the real culprit – dirty air...or cold homes?



Processes

- Priority for ultra-low emissions / energy efficient appliances
- CHP does not recommend / endorse / provide advice
- Customer makes informed choice
 - Potential issue over pellet burner



Incentives options

Four packages:

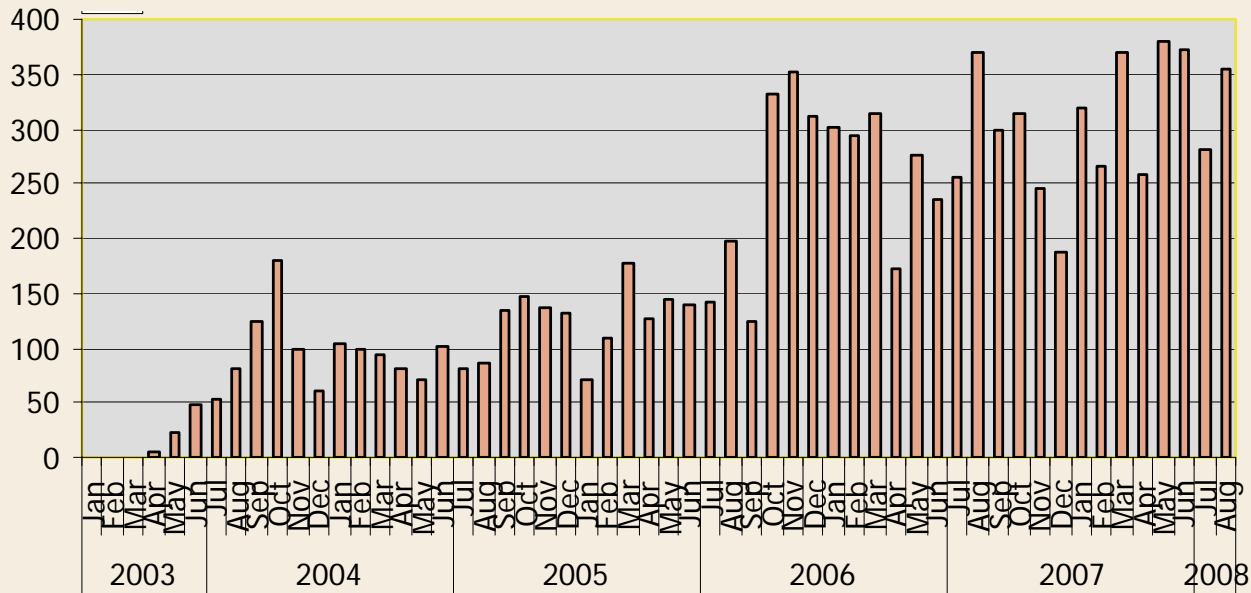
- Full assistance (100%)
- Subsidy (up to 30%)
- Landlord subsidy (40%)
- Loan (0% interest to homeowner)

All packages include insulation



CHP - completions

No of Clean Heat Completions Trend



Housing, Insulation and Health Study

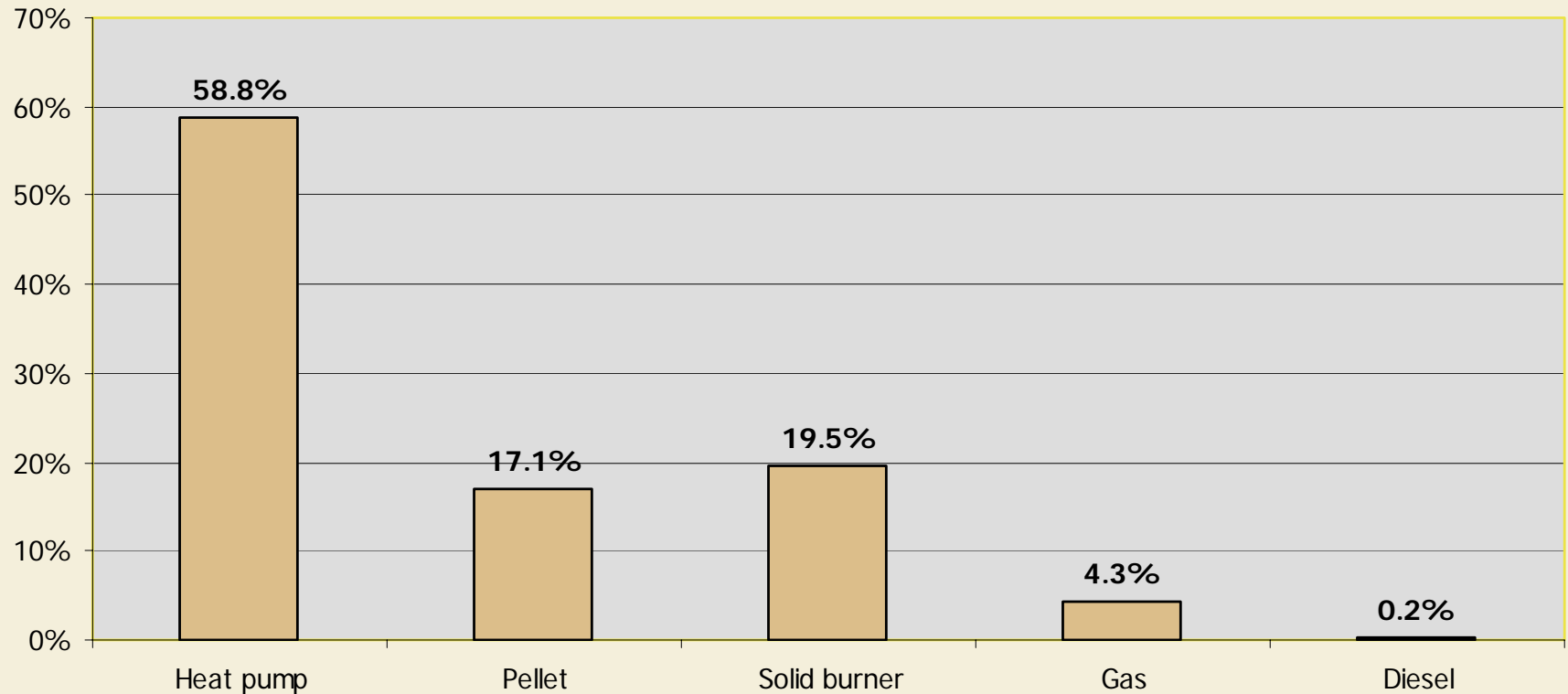
Wellington School of Medicine

- Avg temp increased 1-2 °C
 - people feel warmer
- Condensation reduced
- Less mould / odour
- Children
 - reduced asthma)
 - fewer episodes cold / 'flu'
 - less time off school (winter)
 - fewer visits to doctor

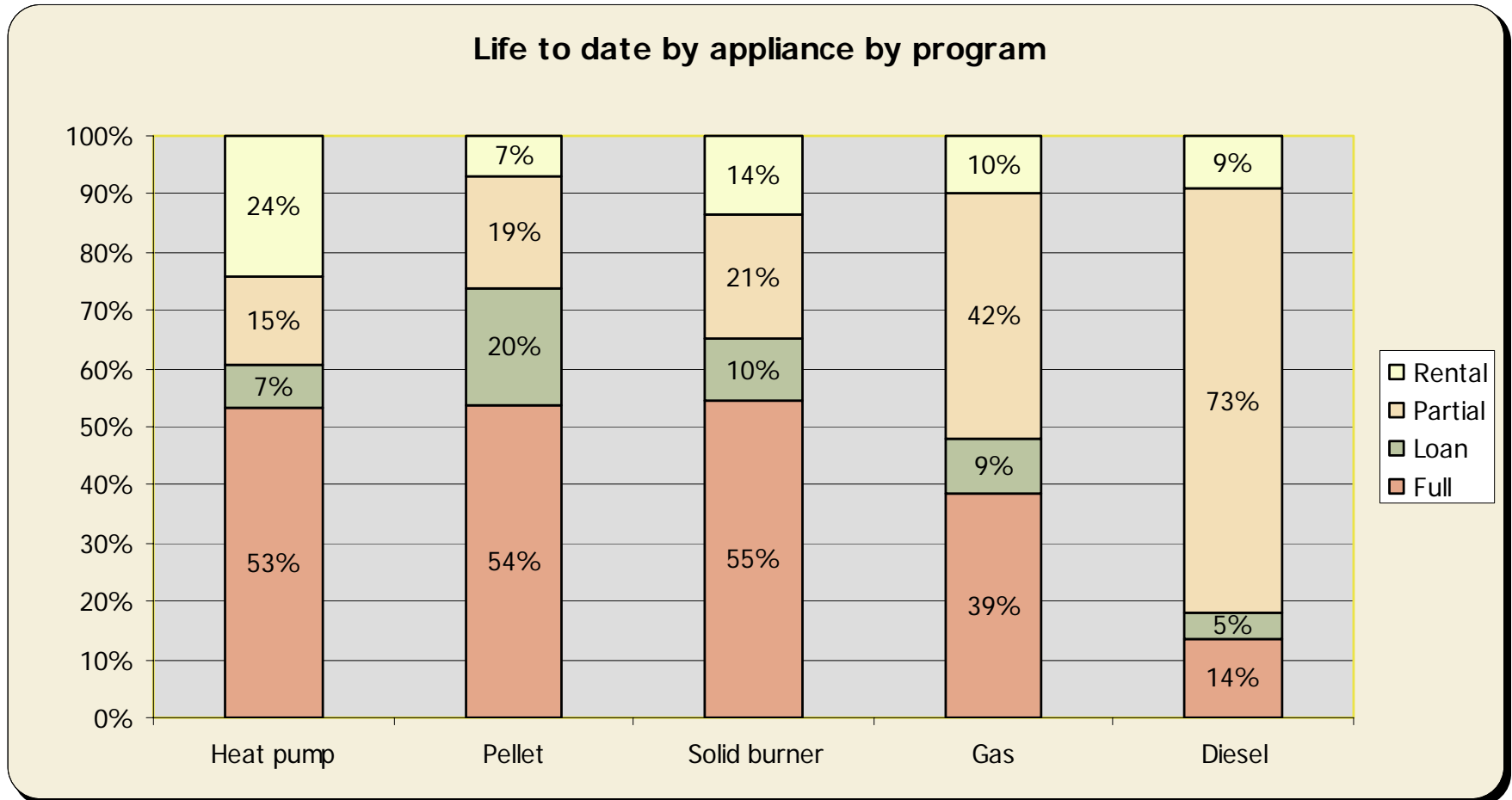


CHP – uptake by appliance

Life to date uptake by appliance



CHP – appliance by programme



Energy Portfolio

Investigations (I) Monitoring (II)



Policy making and planning (III)



Communications, education
and advocacy (IV)



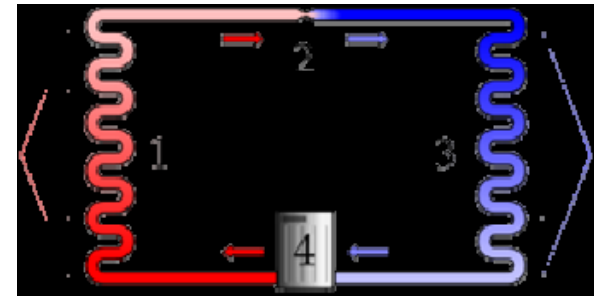
Residential housing - priority policy area

- People spend a lot of time in their homes!
- 80,000 homes in Canterbury 'below standard'
- Regional investment – insufficient and lack clarity of purpose
- Most retrofit packages limited to insulation
- Perverse outcomes



Air quality...or energy efficiency problem?

- Increased use of heat pumps – increased demand on grid
- The role of wood (waste) for space heating
- Pellet fires require electricity
- Matching fuel type with energy service



Equity and other issues

- CHP – an excellent model but...approx. 70% ratepayers don't benefit
- Closing the gap between air quality and energy policy
- NZ has a 'cult of cold'
- Emerging issue of 'fuel poverty'
- Need for a Warm Homes Standard?



Talking...or walking?

Myriad of programmes emerging

Household Sustainability
Programme
'Carbon neutrality'

SmarterHomes
GreenBuild

Sustainable building guidelines
Home Energy Rating Scheme

Practical advice (design oriented) -
e.g. Eco Design Advisors, Right
House



Regional Energy System – Canterbury

Vulnerabilities

Lack of premium energy resources
High transmission dependency
Water scarcity & competition
Air Quality



Opportunities

Consumer response
Fuel substitution/Heating
Reticulated gas
Offshore oil/gas prospects
Small/medium scale generation
Provision for future energy reserve options

STATUS QUO

- Mostly for heat generation
- Isolated areas: electricity generation (off-grid)

Examples:

- Solar water heaters
- Heat pumps
- Off-grid solar photovoltaics (very remote locations)
- Wood pellet burners
- Diesel/petrol generators

TWO-WAY NETWORKS

- Individual microgeneration users connected to a centralised system
- Power can flow in 2 directions
- Currently unusual in New Zealand

Examples:

- Residence on Waiheke Island with photovoltaics
- Energy 3 wind turbine in Canterbury

Established technology

Less

Degree of system connectivity

More

PATH BREAKERS

- Emphasis on self-sufficiency
- Currently expensive or developing technologies
- More emphasis on electricity production

Examples:

- Integrated systems combining a range of microgeneration technologies
- Increased use of micro-hydro, micro-wind, photovoltaics, hydrogen fuel cells, etc.

SMART WEBS

- Integrated systems linked by intelligent and responsive local energy systems
- Use sophisticated monitoring and control systems

Examples:

- Micro-grids
- Smart networks

Emerging technology

Acknowledgement: "Get Smart, think small", PCE (2006)

