Department of Environment and Conservation

ENVIRONOTE No 4

Summary of the Perth Home Heating Survey 2004 Technical Report

AN INITIATIVE OF THE PERTH AIR QUALITY MANAGEMENT PLAN

The Perth Home Heating Survey was conducted in 2004 to provide the Department of Environment and Conservation (Previously the Department of Environment) with a greater understanding of wood heater usage and has identified motivators for change to alternative forms of heating. This has been the most comprehensive survey to date in Western Australia on home heating. While this survey focused mainly on wood heaters, it collected information on the usage of all types of heating and insulation. The results of this research will assist the Perth Air Quality Management Plan to meet its objectives.

Introduction

The major air pollution issue for Perth in winter is haze. Haze can be identified as a 'brown stain' on the horizon that reduces visibility.

During the early 1990s there was emerging community concern regarding the apparently increasing levels of haze. In response the Perth Haze Study was implemented and identified ambient particles from wood smoke (domestic wood heaters) as the major contributor (40%) to haze formation [1].

National and international health studies have shown that haze is associated with increased hospitalisation, respiratory problems, aggravated asthma and premature deaths. The elderly and young have been found to be most at risk. The World Health Organisation (WHO) recognises no safe threshold for ambient particle levels [2].

The Perth Air Quality Management Plan (AQMP) is a 30-year plan developed to ensure that clean air is achieved and maintained throughout the Perth metropolitan region. In 2004 the winter 'Halt the Haze' campaign was expanded to include a comprehensive survey of wood heater use in the Perth metropolitan region, a Wood Heater Replacement Program and the Schools Network for Air Quality (SNAQ) on Haze. Collectively this work has contributed to the further strategic development of the AQMP Haze Reduction Initiative.

This document summarises the major finding of the Perth Home Heating Survey 2004 Technical Report.

Methodology

The survey was undertaken between May and September 2004 in the City of Melville, City of Joondalup and Town of Kwinana. These local government areas (LGAs) also participated in the Wood Heater Replacement Program. Householders were randomly selected to complete the survey. Approximately 3.3% of the sample population were interviewed, making this the largest survey targeting home heating in Australia. In total 3,114 surveys were completed.

Results

The key findings from this survey were:

Heating options in homes

1. Natural gas was the most common heating source followed by electric and wood heating. Unflued gas heaters were the most common form of primary heating (see Figure 1).

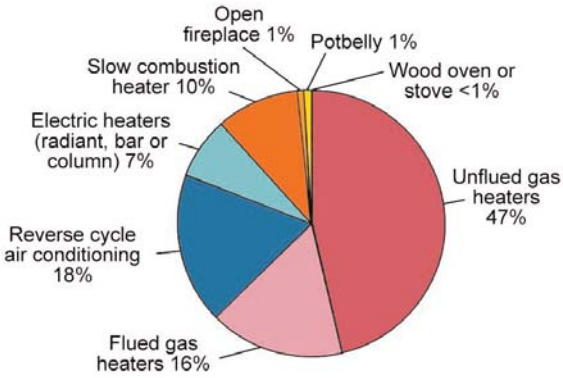

Figure 1: Primary heating types for gas, electric and wood for Perth in 2004.

2. Portable electric heaters were the most common form of secondary heating (see Figure 2).

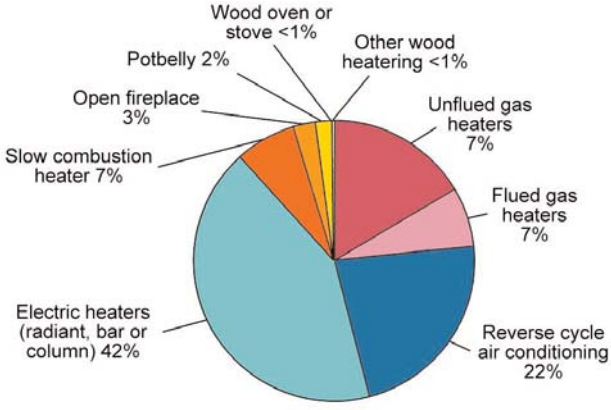

Figure 2: Secondary heating types for gas, electric and wood for Perth in 2004.

3. The prevalence of unflued gas heaters and portable electric heaters may be associated with the cheaper purchase price.
4. 25% of homes in the survey area had a wood heater and 11.5% of homes used a wood heater as their primary source of heating.
5. Slow combustion wood heaters were the most common form of wood heating.
6. The most popular wood heater makes were Kent, Masport and Jarrahdale.

Insulation

7. The majority of homes with any form of heating had at least one form of insulation, the most popular form being ceiling insulation.

Wood heater pattern of use

8. Wood heating use had decreased in recent years. Reasons for this decline were found to be inconvenience, decreased availability of wood, increased cost of purchasing wood and the availability of gas.
9. A third of all wood heaters found in homes were not used.
10. Greater proportions of Kwinana residents had and were more likely to use their wood heater as the primary heating source. Kwinana residents also placed a higher importance on their wood heater.
11. Most commonly, active wood heaters were used a few times per week (36%) or everyday (31%).
12. Almost three quarters (73%) of wood heater owners used their wood heater only in the evenings and 15% used their wood heater in the evening and overnight.

Main reasons for using a wood heater

13. The main reasons for using a wood heater over other forms of heating were the aesthetics and the nature of the heat (radiant). Other reasons included other heating considered too expensive, warmth generated, efficient heating and the wood heater being the only heater available (see Figure 3).

14. Restricted access to mains gas was a significant reason for the above average wood heater usage in Kwinana.

15. A fifth of respondents who had removed their wood heater reported that the reduced availability of wood had contributed to their decision. This may indicate that those who continue to use wood heaters have access to a supply of free or cheaper wood.

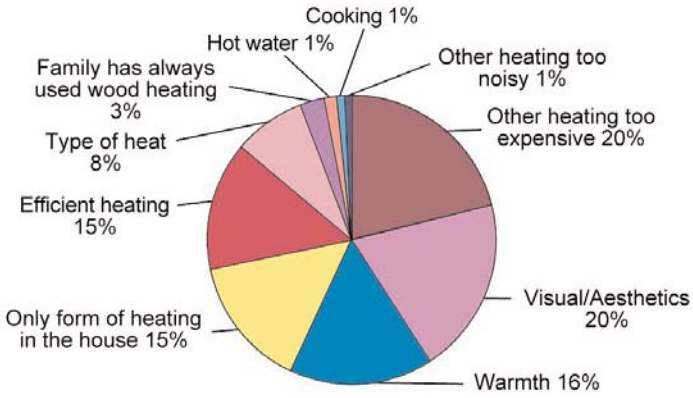

Figure 3: Total response when asked 'What is the main reason for using your wood heater?'

Age of wood heaters in homes

16. The average age of wood heaters across the Perth metropolitan region was 15.5 years. The majority of wood heaters are at the end of their recommended working life (15-20 years) and declining in their operating efficiency. This indicates that home-owners may be in the market to replace their ageing wood heater in the near future.

17. 92% of slow combustion wood heaters in homes did not meet the current Australian Standard (AS/NZS 4013:1999) for wood heater emissions (see Figure 4).

18. 71% of people who inherited a slow combustion wood heater with the purchase of their home used the wood heater as the primary source of heating.

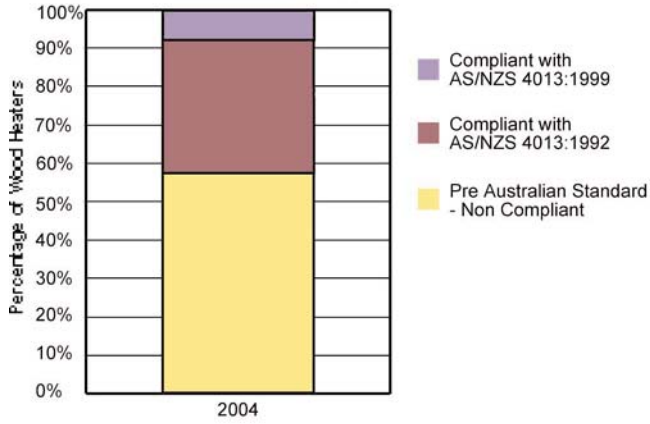

Figure 4: Age composition of slow combustion wood heaters in 2004, showing the proportion of wood heaters likely to be compliant with the Australian Standards.

Drivers for change away from wood heating

19. Almost half of the wood heater users indicated that they would be influenced by targeted programs, including cheaper price of alternative heating, rebates and availability or access to mains gas.

20. At the time of the survey an estimated 50% of wood heaters were potentially available for replacement through a rebate program.

21. Half of those households who indicated they would replace their wood heater if a rebate were offered indicated a $700 rebate would be appropriate. A significant proportion of these households were willing to replace their wood heater within a year.

22. There appears to be scope to encourage wood heater owners away from wood heating. The most preferred heating alternative is flued gas heating (63%).

23. Respondents who did not use their wood heater were hesitant to remove it, mainly because of aesthetic reasons. A minority stated that it was possible they would reactivate their wood heater in the future.

Community awareness of the impacts of wood heater use

24. Although the community recognised wood smoke as an air pollutant that contributes to winter haze and that there are associated health impacts, air pollution was not considered to be a major environmental issue in the Perth metropolitan region. Most people rated Perth's air quality as good or very good.

25. Previous ‘Halt the Haze’ campaigns appear to have increased the community’s awareness of the impacts of wood heater use on air quality. The next challenge is to assist the community to reflect on their behaviour and make sustainable changes.

26. Further community support is needed to raise the profile of the ‘Halt the Haze’ campaign in the future and to strengthen the community’s appreciation of the link between wood smoke and health impacts on the community.

Conclusions

The Perth Home Heating Survey has successfully achieved its objectives to: determine the number and distribution of heaters, specifically wood heaters; assess community understanding about the relationship between air quality, health and wood smoke; and identify motivators for people to switch from wood heating to other alternative forms of heating.

The survey provided insights into the main reasons people used a wood heater over other forms of heating and their motivators for changing to an alternative form of heating. The positive response wood heater owners had to considering change is encouraging for future programs. These findings reinforce the current direction of the AQMP Haze Reduction Initiative and will assist the Department of Environment and Conservation to develop and improve new and existing programs. Sustained behaviour change through targeted community education, legislation change, targeted replacement programs and support and promotion with industry partnerships will reduce the number of wood heaters in the Perth metropolitan region, improve winter air quality and community health.

More information

For a copy of the Perth Home Heating Survey 2004 Technical Report please contact the Department of Environment and Conservation Library on 08 6364 6510 or visit the Department of Environment and Conservation website (www.dec.wa.gov.au) under Air Quality > Publications.

So how does winter haze affect you?

For many Western Australians using a wood heater in winter is a way of life that we enjoy and the smell of wood smoke in the morning is familiar and comforting. Although during the day we enjoy relatively clean air, many of us don’t see or notice the air pollution that is created at night from incorrectly used or old wood heaters as most of us are inside at this time. If you can smell wood smoke you are inhaling fine particles which may adversely affect your health. Particles are associated with damage to your lungs, asthma attacks, strokes and premature deaths.

There doesn’t need to be a metropolitan wide haze event for these situations to occur. If your neighbour has a constantly smoky chimney it can affect you, your family and the people in the local area. The wood heater owner may not be aware that their chimney is producing extra smoke.

What you can do to operate your wood heater correctly

- Keep wood piles under cover
- Never burn green, wet or treated firewood
- Clean your flue annually
- Check your chimney for smoke regularly and open the air intake to reduce the smoke
- Start your fire with dry kindling and with the wood heater air control fully open
- Keep the fire burning brightly
- Contact the Australian Home Heating Association for advice on good wood heater operation. Telephone (08) 8351 9288 *or* email: homeheat@homeheat.com.au *or* see www.homeheat.com.au
- If you are considering buying a wood heater ask your wood heater retailer to show you how to operate the wood heater correctly and buy the right size wood heater for your home.

More information about operating your wood heater is available in the Wood Smoke - Store Right, Burn Bright, Breathe Alright brochure. Please contact the Department of Environment and Conservation Library on 08 6364 6510 for a copy.

What can you do if your neighbour has a smoky chimney?

Approach your neighbour politely and let them know the chimney is producing extra smoke.

Or

Contact your local council. Environmental Health Officers are trained to deal with these situations and can give advice on how to operate the wood heater correctly.

Domestic wood smoke is considered a nuisance under section 182 (11) of the *Health Act 1911*

Fines of up to $5000 may be issued.

[1] Department of Environmental Protection (1996) The Perth Haze Study 1994-1996: Summary and major findings, Government of Western Australia, Perth WA.
[2] World Health Organisation (1999) Guidelines for Air Quality, World Health Organisation, Geneva, Switzerland.