



**Cate Faehrmann MLC  
Briefing Paper  
November 2012**



## **Options for wood smoke control in NSW**

The Environment Protection Authority (EPA) is consulting councils and the general public and on a Discussion Paper: Options for Wood Smoke Control in NSW. Wood heaters cause particle (PM2.5) pollution which is considered to be the most dangerous air pollutant, responsible for 10-20 times as many premature deaths as the next worst pollutant, ozone. The latest NSW emissions inventory (2008 data) estimates that wood heaters, used by less than 4% of households in Sydney are responsible 51% of all man-made PM2.5 emissions in Sydney. Therefore, wood heaters contribute a substantial proportion of the pollution that leads to the 643 to 1446 premature deaths attributed to particle pollution each year in Sydney.[1]

The EPA discussion paper is an opportunity to introduce much-needed controls to reduce the health impact of wood heater pollution in urban areas. This paper is provided to assist you in making a submission – it contains background information and then suggested responses to the discussion paper.

### **Discussion Paper:**

The discussion paper is at

<http://www.environment.nsw.gov.au/resources/woodsmoke/120267WoodSmoke.pdf>

Submissions are due **30 November** and should be sent to [woodsmoke.reduction@epa.nsw.gov.au](mailto:woodsmoke.reduction@epa.nsw.gov.au) or submitted using the on-line form at: [www.environment.nsw.gov.au/woodsmoke/WoodSmokeOptions.htm](http://www.environment.nsw.gov.au/woodsmoke/WoodSmokeOptions.htm)

## Background:

- The UN Environment Program (UNEP) recommends phasing out wood heaters in developed countries to reduce methane and black carbon emissions (which cause a substantial proportion of global warming as well as ill health - <http://woodsmoke.3sc.net/greenhouse>).
- PM2.5 pollution is considered to be the most dangerous air pollutant, responsible for 10-20 times as many premature deaths as the next worst pollutant, ozone. PM2.5 pollution causes the premature deaths of thousands of Australians every year.
- Wood smoke, described in a scientific publication as a “witch’s brew of carcinogens”[2], is linked to many health effects, e.g. middle ear infections in young children, genetic damage in babies, behavioural problems and reduced IQ when children start school (<http://woodsmoke.3sc.net/pah>).
- There is no safe level of PM2.5 pollution. Most premature deaths linked to PM2.5 pollution occur at levels below the current advisory “standard” of 25 ug/m<sup>3</sup> [3, 4]. The update to Australian National air quality standards for PM 2.5 pollution, scheduled for 2005, has not yet been completed.
- New product standards drastically reduced emissions from other PM2.5 sources, e.g. diesel sports utility vehicles. Although adding about \$980 to the price of the average diesel SUV, the latest Euro5/6 standards – [are considered well worth the \\$1.5 billion saving over the next 20 years in health costs for Australia](#). A SUV travelling 20,000 km per year must emit less than 0.1 kg PM2.5.
- CSIRO’s real-life emissions tests show that real-life emissions of wood heaters are much higher than when they are tested under perfect operation in the laboratory. Although heaters are required to emit no more than 4 g PM2.5 per kg of wood burned in the lab tests, real-life emissions average about 10 g per kg wood[5]. In real-life, a brand new wood heater in Sydney is likely to emit 19 kg of PM2.5 pollution per year (190 times as much as a new diesel SUV) with health costs of \$4436 per year (Table 2).
- Consumers expect governments to regulate emissions and ensure products are safe, as they did for diesel SUV emissions.
- In 2007, the Australia/NZ Standards Committee tried to update the wood heater standard to make it closer to the limit of 1.5 g/kg required by the NZ Government for all urban areas that have not introduced even stricter limits. The Committee recommended (15 votes to 4) a limit of 2 g/kg for all Australian/NZ wood heaters, as an interim measure until a new test reflecting real-life emissions could be developed. This was vetoed by the Australian wood heating industry and could not be implemented. After this, the standard-setting process and the development of a new emissions test were both abandoned.
- Although the EPA's discussion paper provides estimates of costs and benefits, the questions appear to have been written by someone who does not understand the distinction between real-life emissions of new wood heaters and the results of an artificial test bearing little or no relation to real-life emissions.
- Respondents are therefore urged to make sure their answers highlight the difference between laboratory test results and real-life emissions, and that the most effective strategy is a moratorium on the installation of new wood heaters until an acceptable health-based standard based on real-life emissions has been developed.
- The only exceptions to this (as in Christchurch, New Zealand) should be for models with emissions ratings less than 1.0 g/kg (and real-life emissions of 6.4 g/kg – see Table 2).

Although this level of emissions is hardly acceptable and a much better option is to replace wood heaters with gas, electric or solar heating, as happened in the vast majority of Christchurch households, switching to a slightly cleaner model is preferable to continued use of an older, even more polluting wood heater.

- Table 1 below shows the health benefits and costs of different wood smoke control options in NSW.

**Table 1. Estimated health benefits and costs of woodsmoke control options in NSW**

	Health Benefit \$million	Cost \$million	Net Benefit \$million
4) Phase out at sale of house	\$4,015	-\$36	\$3,978
2) Ban on heater sales	\$2,206	-\$134	\$2,071
7) Licensing fees	\$1,267	\$11	\$1,278
6) Sales tax on new wood heaters	\$1,049	-\$1	\$1,048
9) Cash incentive phase out	\$879	-\$12	\$867
8) Levying an excise/tax on biomass fuels	\$419	\$36	\$455
5) Fuel moisture content regulations	\$399	-\$33	\$366
3) Emission standards (3g/kg, 60% efficiency)	\$301	-\$3	\$298

Source: Tables 26 and 28, AECOM Office of Environment & Heritage: Economic Appraisal of Wood Smoke Control Measures - Final Report, 29 June 2011

## Points to include in your submission:

NSW councils should not permit new wood heaters to be installed until an acceptable health-based standard is available, except possibly models rated less than 1 g/kg (and real-life emissions of 6.4 g/kg) as replacements for more polluting heaters. Because real-life emissions of 6.4 g/kg is not an acceptable level of pollution, 'polluter pays' licensing fees on wood heater use should also be introduced to encourage people to switch to less polluting heating, as well as provide funds for woodsmoke-reduction and education programs on the health effects of woodsmoke.

The Discussion paper asks a series of questions. Here are some suggested responses:

### Current wood smoke control framework

*Q1. How effective do you think the current wood smoke controls are for managing wood smoke (refer to Section 2.3 of the discussion paper)?*

**Comment:** the current control options have led to a situation where the estimated health cost of the average new wood heater installed in Sydney is \$4436 per year (Table 2). This demonstrates that the current control options are totally inadequate.

### Wood smoke Control Option 1:

"Permitting the installation of only low-emission, high-efficiency wood heaters in designated areas – wood heaters would have maximum emissions of no more than 2–3 grams of particles for each kilogram of wood burnt and operate at a minimum efficiency standard of 65–70%."

*Q2. Would you support implementation of this wood smoke control option in your local area?*

Q3. What impact would implementation of this wood smoke control option have on your business or operations?

Q4. Currently emissions from all wood heaters sold in NSW must not exceed 4 grams of particulate matter for each kilogram of wood burnt. However they are not required to meet an operational efficiency level. If you could modify the emissions and efficiency of wood heaters sold in NSW, what levels would you like to see?

Q5. Any further comments on this wood smoke control option?

Comment: Permitting installation of only low-emission wood heaters in designated areas should be strongly supported. The discussion document notes such measures were successful in Christchurch: *"In the Canterbury Region of New Zealand, only low emission, high efficiency wood heaters may be installed and only then as a replacement for an existing wood heater. This policy resulted in a 70% reduction in PM10 emissions in Christchurch between 2002 and 2009"* (p11-12).

Christchurch's "low-emission" heaters satisfy much stricter limits (1.0 g/kg) than the "no more than 2-3 grams of particles" mentioned in Q2. [The heater shown on the front of this briefing paper is rated less than 2.5 g/kg.](#) Despite this, many of Christchurch's new "low emission" heaters were found to have unacceptable real-life pollution levels because the current wood heater test does not reflect real-life emissions. Consequently, new wood heaters are permitted only as replacements for more polluting ones. Indeed, the 70% reduction was achieved mainly by replacing wood heaters with other forms of heating - only 689 of 3454 replacements were for new wood heaters [6]. The replacements were part of a 'Clean Heat' package that included subsidies for insulation. The majority of households installed energy-efficient heat pumps to replace wood and supplementary heating. The increase in electricity use was miniscule (1%), implying that families saved considerable amounts of money compared with the cost of buying firewood. So, this is a win-win-win situation – a win 1) for the household budget, 2) for the environment by reducing greenhouse gas emissions and 3) a win for health.

The best option for NSW is therefore to adopt Christchurch's policy of a limit of 1.0 g/kg, but only as replacements for existing wood heaters, and provide incentives to switch to other heating.

### **Wood smoke Control Option 2:**

Removal of open fireplaces by the owners of dwellings in designated areas before the sale of the property – this would require owners to either block out fireplaces rendering them inoperable or convert the space for gas or electric heating.

Although open fireplaces tend to be rarely used and so contribute little to overall pollution emissions, they are inefficient and create drafts in the home, increasing the need for other forms of heating. Requiring fireplaces in urban areas to be removed when houses are sold is therefore a sensible option that will improve energy efficiency, reduce global warming and also lead to a greater reduction health costs of pollution than the benefits of using those fireplaces. Fireplaces may be rendered inoperable while retaining the heritage feature.

### **Wood smoke Control Option 3:**

Removal of older or high-emission wood heaters in designated areas before the sale of dwellings.

Table 2 shows "low emission" heaters rated 1.0 g/kg or less have real-life emissions of 6.4 g/kg and estimated health costs for of \$3167 per heater per year in Sydney and \$1567 per heater per year in rural areas. These costs are still unacceptably high, so arguably all existing wood heaters should be removed on sale, until a satisfactory health-based standard based on a test that

measures real-life emissions has been developed. Heaters that met the new health-based standard would then not need to be removed.

**Table 2. Comparison of lab-test and real-life emissions for new heaters, estimated health costs for a heater installed in Sydney and in colder rural areas, and the number of Diesel SUV required to produce the same amount of annual emissions.**

Lab-test	Sydney				Colder rural area		
	Real-life	Real-life	Health Cost	Diesel SUV	Real-life	Health Cost	Diesel SUV
4 g/kg	8.8 g/kg	18.6 kg	\$4436	186	39.2 kg	\$2188	392
3 g/kg	7.6 g/kg	16.8 kg	\$3992	168	35.3 kg	\$1970	353
2 g/kg	7.0 g/kg	14.4 kg	\$3420	144	30.2 kg	\$1687	302
1 g/kg	6.4 g/kg	13.3 kg	\$3167	133	28.0 kg	\$1562	280

Source: AECOM Office of Environment & Heritage: Economic Appraisal of Wood Smoke Control Measures - Final Report, 29 June 2011. Emissions by lab test rating, table 15 (9.8 g/kg for limit of 4 g/kg); table 18 (reductions of 10%, 22.9%, 28.6% and 34.3% for ratings of 3, 2 and 1 g/kg respectively). Table 24 - estimated Health costs for capital cities (\$235.26/kg PM2.5) and rural areas (\$55.82/kg PM2.5). Estimates are based on assumes average firewood consumption of 1.9 tonnes per year in Sydney and 4 tonnes per year (the average for Armidale, NSW and Canberra) in a cold rural areas.

#### **Wood smoke Control Option 4:**

Disallow the installation of open fireplaces in designated areas.

Comment: sensible for all urban areas. Very few modern houses have open fireplaces, because, as noted above, they reduce energy efficiency and contribute to pollution. It would therefore make sense to formally disallow the installation of open fireplaces.

#### **Wood smoke Control Option 5:**

Disallow the installation of wood heaters in designated areas

#### **Wood smoke Control Option 6:**

Disallow all new installations of solid fuel combustion heaters, such as wood heaters and open fireplaces, within the local government area.

Options 5 and 6 are similar, because the entire LGA (or all urban areas in the LGA) could be the designated area. This is effectively what happens in Christchurch, except that heaters rated less than 1.0 g/kg can sometimes be installed as replacements for more polluting models. Not permitting the installation of new heaters in houses that do not already have them is the only sensible option until a new health-based standard has been developed. Even a heater rated 1.0 g/kg on the current test has estimated health costs of \$3167 per year in Sydney and \$1567 per year in rural areas (Table 2). This is not acceptable. Once a new health-based standard has been developed, people will be able to install new clean-burning heaters instead of the current

generation of excessively polluting ones. The introduction of new technology (e.g. gas-booster ignition and when the temperature falls below that required to burn off smoke particles) could substantially reduce emissions. The additional cost of such technology is only a tiny fraction of the estimated health costs. However, these improvements will not be made until required by law. NZ introduced a much more stringent standard than Australia over 7 years ago. The NZ industry quickly responded by developing much cleaner models.

## **Possible revised wood smoke control framework**

Q21. Given the information provided in the discussion paper, to what extent would you support a framework of optional controls to reduce wood smoke (refer to Section 3)?

State-wide controls are much more effective than controls by local councils, many of whom have no expertise in the health effects of air pollution. Air pollution in Sydney does not remain where it is emitted, but spreads out over the whole city. The latest NSW emissions inventory (2008 data) estimates that wood heaters, used by less than 4% of households in Sydney are responsible 51% of all human-induced PM2.5 emissions.

State-wide policies are therefore a much more cost-efficient option than each local council considering the same issues and because the health costs are born by the state. Some Sydney Councils have banned new wood heaters in some areas (e.g. Waverley, Holroyd) as has the State Government in Sydney's Oran Park and Turner Road Growth precincts. However, most local councils have no idea that the installation of a new wood heater in Sydney increased health costs by thousands of dollars per year. The estimated State-wide net benefits are \$3,978 million for phasing out wood heaters at sale of house and \$2,071 million for not allowing new heaters to be installed. These benefits are so large, compared to the costs that these policies should apply to all urban areas until a new health-based standard has been developed.

The third most cost effective option (licensing fees) should also be adopted on a state-wide basis, to provide funds for local and national woodsmoke-reduction programs including education and subsidies for removing heaters. The 4<sup>th</sup> most cost-effective option of a sale tax on new wood heaters should also apply to any new wood heaters installed to replace more polluting models until the new health-based standard has been developed. Although heaters rated less than 1 g/kg (and real-life emissions of 6.4 g/kg) are slightly better than the models they replace, there will be a much greater reduction in pollution if households replace wood heaters with other forms of heating. The fee structure should be designed to provide adequate funds for education about the health effects and toxic chemicals in woodsmoke and to resolve complaints about woodsmoke. All fees and requirements would be reviewed once the new health-based standard has been developed.

The current POEO Act should also be revised to provide better protection for neighbours. If a heater is causing health or other problems for neighbours, there should be mandatory arbitration to balance any advantages to the owner/polluter against the medical and environmental costs, and potential reduction in life expectancy, for the neighbour.

## **Conclusion:**

The NSW Government must prescribe a strict health-based wood heater standard and do so promptly. If industry had set its own standards, would asbestos have been removed from fibro cement and lead from petrol? Industries usually claim their products are safe, even when there is strong evidence to the contrary. 'Truth in advertising' legislation is needed to prevent the wood heating industry representatives, the AHHA, from misleading the public, e.g. by citing a document that reports a 27% reduction in outdoor pollution when all older-style heaters were removed and

replaced either by new wood heaters or (in some cases) non-polluting heating, as a massive 80% reduction in air pollution (see Appendix). Such claims are no more truthful than those of the tobacco industry, who, like the AHHA, put profits before people's health.

Given the compelling health benefits which are many times greater than estimated costs, we need State-wide adoption of options 2) and 4) – phasing out existing wood heaters and not allowing new ones to be installed, as well as licensing fees for all wood heaters in use, until a new health-based standard has been developed.

### Author:

This briefing was prepared for Cate Faehrmann by Dr Dorothy L Robinson, Australian Air Quality Group, woodsmoke.3sc.net

### References

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