***Amanda Bresnan MLA***
ACT Greens Health Spokesperson
Member for Brindabella

# Addressing Wood Heater Pollution in the ACT

## Exposure Draft Legislation: Environment and Construction Occupations Legislation (Wood Heaters) Amendment Bill 2012

## Consultation Paper

***1 June 2012***

# Consultation

The ACT Greens are seeking feedback on draft legislation: the **Environment and Construction Occupations Legislation (Wood Heaters) Amendment Bill**.

Members of the public, retailers, industry and any other interested parties are encouraged to comment.

How to Make a Submission

*Email*: Bresnan@parliament.act.gov.au

*Mail*: Amanda Bresnan MLA
ACT Legislative Assembly
GPO Box 1020
Canberra ACT 2601

**Closing date for submissions is close of business, 17 August 2012**. Please include your name and the name of your organisation (if any) with all submissions. Please specify if you do not want your response to be publicly available.

**An electronic copy of the draft legislation, and this discussion paper is available at:**

**http://www.legislation.act.gov.au/ed/db_45134/default.asp**

# Summary of the Draft Bill and Consultation Paper

The ACT Greens have released draft legislation called the **Environment and Construction Occupations Legislation (Wood Heaters) Amendment Bill** for community consultation. The changes proposed in the draft legislation are intended to reduce the problems associated with pollution from wood heaters in the ACT.

***KEY POINTS***

- **The draft Bill does NOT ban wood heaters or require anyone to replace existing wood heaters.**

- The draft Bill would establish new, stricter emissions and efficiency standards that wood heaters must meet before they can be sold in the ACT or installed in an ACT residence.

- Over time this would make an important contribution to reducing the particulate pollution created by wood heaters in the ACT, as well as the amount of wood needed for fuel.

- The standards would bring the ACT in line with jurisdictions that are leading the way in reducing wood smoke pollution to help address health and environmental problems.

    - The proposed 1g/kg emissions standard would reduce particulate emissions per kg of wood burned from the average new wood heater by approximately 34%;
    - The 65% efficiency standard would reduce total wood use over 15 years by about 10%;
    - The combined 1g/kg emissions standard and 65% efficiency standard would reduce particulate matter pollution over 15 years by up to 65%.

**The measures are necessary because of:**

- The negative health impacts caused by wood smoke pollution.

    - 70% of particulate matter pollution in Canberra comes from wood heaters – which is linked to lung disease, heart disease and other serious health problems.

- The negative environmental impacts caused by wood pollution.

    - The methane and soot in wood smoke is an acute problem contributing to climate change.

- Firewood use impacts on biodiversity and endangered woodlands, with only 5% of firewood sold to the ACT coming from sustainable plantations.

- Canberra is susceptible to wood smoke pollution problems.
    - Particulate matter levels in winter are 3 times higher than the warmer months, and increase to a degree significant enough to cause short and long term health problems for the population.

- Regulation of wood heaters in the ACT (and nationally) remains inadequate.
    - The national emissions standard for wood heaters allows 4 times as much pollution as the leading jurisdictions, and there is no national efficiency standard at all.

**This consultation paper recommends additional measures for addressing wood smoke pollution, including:**

- Introducing mobile air quality monitoring to inform and improve responses to the pollution problem;
- Improving local enforcement options to ensure people use wood heaters correctly;
- Improving the way air quality data and the health effects of wood smoke are communicated to Canberrans;
- Expanding the wood heater replacement program to include low emissions electric heating, and an increased subsidy.

**This consultation paper suggests several additional measures for community discussion, including:**

- Ensuring all new wood heaters are sold with information about the health impacts of wood smoke;
- Phasing out non-compliant wood heaters by setting a date by which all wood heaters in the ACT must meet a standard;
- Phasing out non-compliant wood heaters by requiring their removal upon the sale of the premises;
- Allowing the installation of new wood heaters only when they are replacing existing wood heaters, until such time as a new health-based standard has been developed for real-life emissions;
- Using market mechanisms to reduce wood heater emissions, such as a sales tax or licensing of wood heaters.

# 1. Why is this legislation needed?

## *1.1 Health Impacts of Wood Smoke*

The primary motivation for proposing this legislation is to reduce the negative health impacts caused by wood smoke pollution in Canberra.

Wood smoke contains particle matter pollution, also called PM10 (fine) and PM2.5 (ultrafine). PM2.5 is now considered the most health-hazardous form of air pollution, and it is thought to be responsible for about 20 times as many premature deaths as the next worst pollutant, ozone.[1]

> "Particle pollution from all sources, and especially from wood smoke, is harmful to our lungs.... Over many years, exposure has similar long-term consequences to environmental tobacco smoke, including the risk of lung cancer and heart disease." – *Dr James Markos, Australian Lung Foundation*

Wood heaters are responsible for the majority of PM pollution in Canberra. In 2010/11 they produced over 70% of PM pollution (the remainder mostly comes from motor vehicles).[2]

It is well established that PM pollution has serious impacts on human health,[3] including:

- increased mortality, particularly respiratory and cardiovascular diseases;
- inflammation of lungs;
- increased respiratory illness such as bronchitis and asthma;
- adverse effects on cardiovascular system;
- increased medication use and hospitalisation.

The risks from PM pollution are highest for children, older people, and people with heart disease or a lung disorder.[4] It is estimated that 1 in 5 Australians already have a lung disorder (including asthma, chronic bronchitis and emphysema).[5] Recent Australian research has demonstrated a direct link

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[1] Department of Environment, Climate Change and Water NSW, *Action for Air: Update 2009*, 2009, http://www.environment.nsw.gov.au/resources/air/actionforair/09712ActionforAir.pdf

[2] National Pollution Inventory, 2010-11 (http://www.npi.gov.au)

[3] For example, see: Department of Environment and Heritage, Australian *Government Health Impacts of Ultrafine Particles: Desktop Literature Review and Analysis*, 2004 (http://www.environment.gov.au/atmosphere/airquality/publications/health-impacts/pubs/health-impacts.pdf)

[4] For example, research shows that children who grow up with air pollution (including PM2.5 and elemental carbon) are less likely to develop full lung function: W Gauderman, et al, "Association between Air Pollution and Lung Function Growth in Southern California Children: results from a second cohort" *Am J Respir Crit Care Med 166,* (2002), 76; W Gauderman et al, "The effect of air pollution on lung development from 10 to 18 years of age"(2004) *NEJM 351,* 1057

[5] Dr James Markos, Australian Lung Foundation, *Submission to Review of the National Environment Protection (Ambient Air Quality) Measure –Air Quality Standards Discussion Paper*, 2010, http://www.lungfoundation.com.au/images/stories/docs/education/AAQ_NEPM_submission.pdf

between particle matter pollution caused by domestic wood heaters and respiratory illnesses.[6]

Numerous international scientific and medical studies have also identified a range of other potential impacts of wood smoke on human health, including:

- Increased risk of lung cancer due to DNA damage caused by compounds in wood smoke called 'polycyclic aromatic hydrocarbons' (PAH);[7]
- Increased cognitive decline, due to particulate pollution entering the brain;[8]
- Increased risk of stroke even from exposure to particulate matter pollution at levels that are generally permitted by authorities;[9]
- Genetic and epigenetic damage in babies and young children, and increased risks of attention/hyperactivity problems, anxiety and asthma due to exposure to PAH.[10]

For residents who live in the vicinity of wood smoke, it is very hard to avoid PM pollution. The particles in PM2.5 pollution are so small that it is very difficult to keep out of people's houses.

The health impact of wood smoke has a corresponding economic impact. The annual health cost of wood heater emissions in the ACT is estimated at $56 million.[11] A recent economic analysis commissioned by the NSW Government concluded that use of wood heaters in NSW entails costs of more than $8 billion - more than $22,000 for every wood heater in the state over its anticipated years of use.[12]

These health costs are extremely high because of the limited progress in reducing wood heater emissions compared to other sources of pollution. Over the past 20 years, as research has shown that the health effects of PM2.5 pollution are much more serious than previously believed, new standards have

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[6] The study showed how the number of GP respiratory cases was related to the level of particulate pollution: L Khan, K Parton, D Howard, "Economic Cost of Particulate Air Pollution in Armidale: Clinical Event Survey" (2007) *Environmental Health* 7(2), 11

[7] Pernille Høgh Danielsen, et al, "Oxidative stress, DNA damage, and inflammation induced by ambient air and wood smoke particulate matter in human A549 and THP-1 cell lines"(2011), *Chemical Research in Toxicology*, 24(2), 168

[8] Jennifer Weuve, et al, "Exposure to Particulate Air Pollution and Cognitive Decline in Older Women" (2012), *Arch Intern Med 1*72(3), 219

[9] Gregory A. Wellenius, et al, "Ambient Air Pollution and the Risk of Acute Ischemic Stroke" (2012) *Arch Intern Med* 172(3), 229

[10] F P Perera, et al "PAH/Aromatic DNA Adducts in Cord Blood and Behavior Scores in New York City Children" (2011) *Environ Health Perspect* http://ehp03.niehs.nih.gov/article/info:doi/10.1289/ehp.1002705; F P Perera, et al "Relation of DNA Methylation of 5-CpG Island of ACSL3 to Transplacental Exposure to Airborne Polycyclic Aromatic Hydrocarbons and Childhood Asthma" (2009). *PLoS ONE 4(2):* e4488. doi:10.1371/journal.pone.0004488

[11] DL Robinson, "Air pollution in Australia: review of costs, sources and potential solutions" (2005), *Health Promotion Journal of Australia* 16(3), 213. Estimations of the health impact vary. A federal Government scoping paper on wood heaters also said that the health impacts arising from wood heater particle emissions are 'conservatively estimated to be $190 million per annum': Environment Protection Heritage Council Briefing Document, *National Approach to Reducing Woodheater Emissions Scoping Paper on Regulatory Options* (Reproduced at Australian Air Quality Group Website: http://tinyurl.com/7omeon4)

[12] Economic appraisal of wood smoke control measures, *Report by AECOM commissioned by the NSW Government* , 2011 http://www.environment.nsw.gov.au/resources/air/WoodsmokeControlReport.pdf

been introduced for vehicle emissions.[13] These have not been matched for wood heaters, despite the average wood heater in the ACT emitting 46kg of PM2.5 per year - as much as 460 new diesel cars each travelling 20,000 km.[14]

### 1.1.1 Statements from experts about the health impacts of wood smoke

"Smoke from wood fires can have a significant health impact particularly in people with pre-existing lung conditions. Pollution adversely affects asthmatics, particularly children, and it also has a significant impact on people with Emphysema and Chronic Bronchitis (COPD).

This effect on COPD was very well shown in Launceston and reducing the number of wood fires there has been of significant benefit. It would be good if we could do the same in the ACT. "

***Dr Mark Hurwitz, Clinical Associate Professor and Director of Respiratory and Sleep Medicine at The Canberra Hospital***

"Wood smoke contains particulate matter and gaseous pollutants such as carbon monoxide and oxides of nitrogen which adversely affect respiratory health.

Wood smoke exposure can cause acute exacerbations in people with asthma and Chronic Obstructive Pulmonary Disease. Further, wood smoke exposure can initiate cough and chronic bronchitis and also may affect the normal lung development in children.

Minimizing wood smoke exposure for Australian communities will have a positive impact on current & future health of those communities."

***Professor Richard Ruffin AM, Emeritus Professor of Medicine, University of Adelaide***

[13] For example, the Euro 5 standard of 0.005 g/km requires a diesel car travelling 20,000 km per year to emit just 0.1 kg of PM2.5: http://en.wikipedia.org/wiki/European_emission_standards
[14] D Robinson, Australian wood heaters currently increase global warming and health costs (2011), *Atmospheric Pollution Research 2*, 267

"Smoke from wood heaters … is a real and significant health hazard…[we] recommend using alternative methods for climate control."

***The Australian Lung Foundation***

"Exposure to wood smoke can cause significant breathing problems for people with asthma. We support working with the community to minimise exposure to wood smoke to help people breathe better."

***Debra Kay, CEO Asthma Australia***

### 1.1.2 Statements from Canberrans about the health impacts of wood smoke

I am 73 years old and suffer from C.O.P.D. (Chronic Obstructive Pulmonary Disease). I am on home oxygen for approximately 16-18 hours a day. I lead as full a life as possible in order to remain connected to the community and it is important given my lung condition that I remain as active as possible in order to keep my lungs functioning to a level that will make my life liveable and maintain my independence.

However, many of the activities I enjoy in summer are curtailed in winter, which in turn has an adverse effect on my health. Due to the pollution during winter and in particular, wood smoke, my breathing difficulties are exacerbated. There are a number of homes using wood heating in my area, which means that I can't leave windows open in my house because smoke, even if I can't see it, is evident by my limited breathing capacity. Therefore I need to use more oxygen, via an oxygen concentrator, in order to breathe. This increased dependence on oxygen limits the time I can be away from home, and seriously limits my social contacts.... To quote the Lung Foundation; "When you can't breathe, nothing else matters".

***Tuggeranong resident***

"As a child and teenager I had sarcoidosis of the lungs leading to other long-term health issues best dealt with by healthy living. As often as possible I like to exercise in fresh-air. In the mid 1970's I moved to the Tuggeranong Valley with its mountain views and clean air. Now, under certain atmospheric conditions, the smell of wood smoke is acrid. During the wood smoke season I experience coarse irritation and burning sensations in the upper respiratory tract, sinus and eyes. This noticeably disrupts my social activities, reading and work. The sooty particles also deposit on the roof and bonnet of my car."

***Tuggeranong resident***

Wood fire smoke makes me feel unwell. I live in Campbell and most homes in the neighbourhood have chimneys which belt out smoke on any Autumn and Winter night. What I hate most is waking up in the middle of the night coughing and/or having an asthma attack as the smoke enters my home. This happens every time one of my neighbours lights their fire. My child suffers from asthma and allergies and he is affected as well; his eyes in particular burn and sting. I am not able to seal my home and make it airtight so I have no chance of keeping the smoke out. The smoke invades my whole bedroom and sometimes I can smell it on my soft furnishings, bedding, clothes and towels for days after. I can compare it to having a smoker in my home, it is that unpleasant!

***Campbell resident***

"Our members are particularly affected by air pollution in the cooler months. The smell of wood smoke makes it hard to breathe, and limits the time our members can be outside and the activities they can be involved in. When their breathing is affected by smoke, it can be hard for them to look after their active young children or grand children.

In most cases in our group, people affected by wood smoke have modified their lives, sealed their houses as well as they can, and limited the activities they do. But that shouldn't have to happen.

It is a worry to us that wood smoke affects the lungs so that they are not working as effectively. We also know that each time we are affected - and maybe even hospitalised - our lung function decreases. We already have breathing difficulties and do not want to exacerbate it."

***Statement from the Canberra Lung Life Support Group***

## *1.2 Canberra is susceptible to wood smoke pollution problems*

As an inland region with populated valleys, cold winters, and a significant number of residential wood heaters, Canberra is particularly affected by wood smoke pollution. In areas like the Tuggeranong Valley wood smoke becomes trapped by temperature inversions which causes it to linger close to the ground and increases its concentration.

The National Environment Protection Council, which is the Federal body responsible for air quality, accepts that Canberra has a winter particle pollution problem due to wood heater emissions.[15] This is clearly demonstrated by continued PM2.5 monitoring, which shows particle levels during the colder months of the year are about 3 times higher than the warmer months.[16]

Due to the toxicity of PM pollution, this increase is enough to cause serious impacts on Canberrans' health. A 2012 study indicated that increasing PM2.5 concentrations by 3 micrograms per cubic meter of air (approximately the same amount as Canberra's increases during winter months) was associated with a 9% increase in deaths from ischemic heart disease and 3-4.5% increase in all deaths.[17]

Analyses of the air in Tuggeranong (from the Monash air monitoring station) also show that the advisory standards for PM2.5 and PM10 pollution[18] have been exceeded on numerous occasions due to wood smoke pollution.[19]

Although, Canberra's stationary air monitoring stations record a generally good level of air quality, there are particular locations that are pollution 'hotspots' due to higher numbers of wood heaters and nearby topography that prevents the dispersal of smoke. In order to get the full picture of PM pollution in Canberra, the ACT Government should also employ mobile air monitoring to establish patterns of air pollution and identify potential hotspots. This can be done using a mobile nephelometer (a measuring device for PM pollution), which can be attached to a car.

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[15] NEPC, *Annual Report 2007-08*, p192.
[16] Howard Bridgman for ACT Health, *Preliminary Assessment of Wintertime Air Quality in the Tuggeranong Valley, ACT*, December 21, 2009
[17] D Crouse, et al, "Risk of Non-accidental and Cardiovascular Mortality in Relation to Long-term Exposure to Low Concentrations of Fine Particulate Matter: A Canadian National-level Cohort Study" (2012) *Environ Health Perspect* 120(5). Note that Qebec, Canada, has a similar composition of PM2.5 pollution to Canberra, suggests that similar changes to mortality could be expected in Canberra due to wood heaters.
[18] The standards are called the 'National Environment Protection Measures' and are set by a Federal body called the National Environmental Protection Council.
[19] See for example: Howard Bridgman for ACT Health, *Preliminary Assessment of Wintertime Air Quality in the Tuggeranong Valley, ACT*, December 21, 2009; NEPC, *Annual Report 2007-08*, p192; NEPC Annual Report 2009-10, p196. Exceedances include 11 in 2009 and 5 in 2007.

Mobile monitoring will provide more meaningful spatial pollution information, which can be used to inform policy responses to wood smoke problems. It could inform the government about the best areas to target education campaigns. If (as discussed below) the ACT adopts additional controls on wood heaters, such as restricting their installation in particular areas, this spatial pollution data will guide these policies. As discussed below, the initiatives proposed in the draft legislation (increasing the efficiency and emission standards of wood heaters) would significantly reduce the particulate emissions from wood heaters in the ACT, with a corresponding improvement to Canberrans' health.

## *1.3 Environmental Impacts of Wood Heaters*

### 1.3.1 Wood heater emissions are a short term climate forcer

Introducing the emissions and efficiency standards proposed in the draft legislation would make important improvements to the environmental problems caused by wood heaters. Primarily, these improvements are a reduction in the amount of greenhouse gases emitted (including emissions that cause rapid atmospheric warming) and a reduction in the amount of wood required for fuel.

It is sometimes claimed that compared to other types of heating, wood heaters

contribute less to atmospheric temperature rise, and therefore will cause less climate change impacts. However, the relationship of wood heaters to climate change is complex. It depends on various factors such as where the wood is sourced, the efficiency of the wood heater, and the level of emissions of the different kinds of greenhouse gases.

$CO_2$ is the principal greenhouse gas. If firewood is only harvested from a sustainable source, it can be considered to be $CO_2$ neutral. Unfortunately, most firewood in the ACT does not come from sustainable sources (see below). In addition, without an existing standard for wood heater efficiency, many heaters require a large amount of wood, which amplifies their contribution to $CO_2$ emissions.

**The United Nations recommended urgent action on 'short term climate forcers' such as black carbon and methane emissions, in order to prevent dangerous, rapid global warming.**

**One of its key recommendations is to *phase out wood-burning technology in industrialised countries like Australia.***

In addition to $CO_2$, wood heaters produce black carbon (or soot) and methane. These are known as 'short-lived climate forcers'. A new understanding has emerged about the serious impact these emissions have on global warming. The main problem is that they cause rapid changes to temperature, pushing the climate towards dangerous tipping points before we have a chance to reduce longer term greenhouse gases such as $CO_2$. A 2009 study indicated that black carbon emissions from industry, cars, farming and wood fuel burning have been responsible for half the total temperature increases in the Arctic in the last 130 years.[20] A Swedish study found that methane emissions from older–style Swedish wood–heaters (similar to newer wood heaters in Australia) could cause up to twice as much global warming as using oil–fuelled heating.[21]

Climate scientists are now calling for urgent action to curb emissions from black carbon and methane because it will have a rapid effect to reduce and delay temperature rises.[22] A 2011 United Nations report focused on the importance of reducing short lived climate forcers - especially black carbon and methane – and assessed over 2,000 measures. It recommended 16 key actions, including phasing out wood heaters that burn logs (compared to wood pellets which burn much more cleanly) in industrialised countries like Australia.[23] The report also recognised the public health benefits of taking this action.

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[20] John Vidal, "Al Gore calls on world to burn less wood and fuel to curb 'black carbon'", *The Guardian*, 28 April 2009, http://www.guardian.co.uk/environment/2009/apr/28/black-carbon-emissions

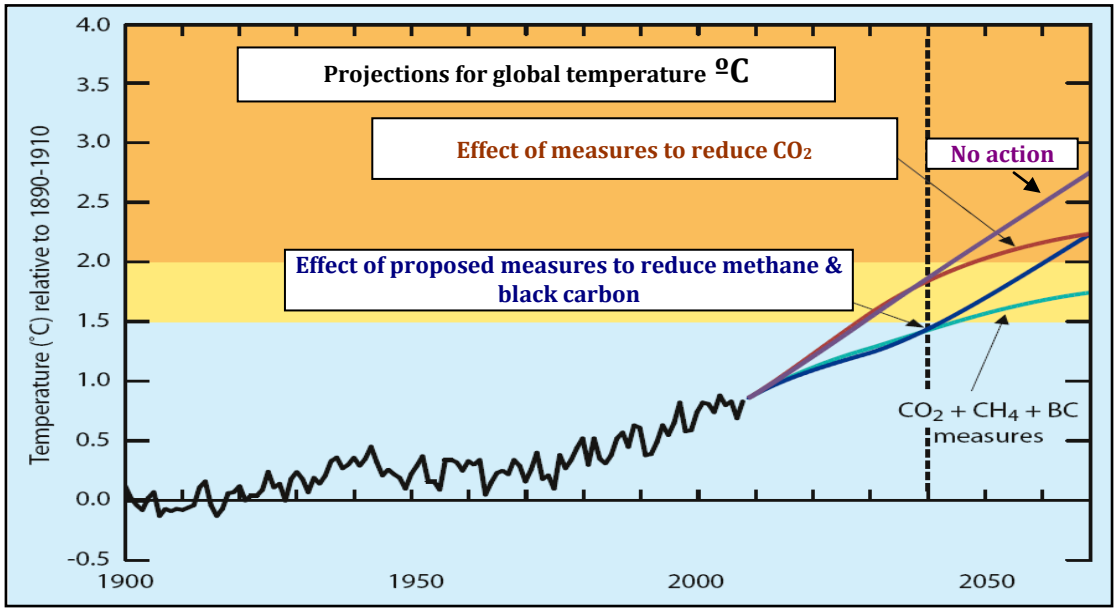
[21] LS Johansson et al, "Emission characteristics of modern and old–type residential boilers fired with wood logs and wood pellets" (2004), Atmospheric Environment 38, 4183 Cited in: D Robinson, Australian wood heaters currently increase global warming and health costs (2011), *Atmospheric Pollution Research 2*, 267.

[22] Above, n19, John Vidal.

[23] United Nations Environment Program, *Near-term Climate Protection and Clean Air Benefits: Actions for Controlling Short-Lived Climate Forcers*, 2011

According to the report, implementing these 16 measures to address black carbon and methane emissions could slow the increase in near term global warming by around 0.4°C by 2050. The graph below shows how implementing measures to reduce methane and black carbon (such as limiting wood heater emissions) is a critical step to delay temperature rises and allow time to reduce longer lived pollutants such as $CO_2$. Without these measures, the planet is likely to warm beyond 2°C by 2050, which risks triggering 'tipping points' such as the loss of polar and alpine environments and the melting of permafrost.[24]

As discussed below, the efficiency and emissions standards proposed in the draft legislation will make an important difference in reducing both the $CO_2$ emissions and the 'short term climate forcers' emitted by wood heaters.




### 1.3.2 Biodiversity impacts of using wood for fuel

In addition to emitting greenhouse gases, using wood for fuel has a negative impact on biodiversity. A minority of firewood used in the ACT comes from sustainable sources. A major source for ACT firewood is woodlands.[25] Woodlands are some of Australia's most threatened ecological communities, particularly as most have already been extensively cleared for agriculture and have slow growth rates. Using timbers harvested from sustainable hardwood plantations (or other 'waste wood' such as residues from eucalypt forestry operations) is an important way to reduce the impact on woodland communities, as well as reducing the overall greenhouse impact of using wood as fuel.

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[24] Keeping the global temperature at less than a 2 degree rise is the goal set by climate negotiators in Copenhagen, 2009, as a means to avoid the most devastating effects of global warming. Some climate scientists such as James Hansen argue that this is insufficient to prevent devastating climate impacts and we need to limit warming even further.

[25] Don Driscoll et al, Impact and Use of Firewood in Australia, 2000, p14

The ACT Commissioner for Sustainability and the Environment reported in 2007 that only 5% of the almost 13000 tonnes of firewood sold to the ACT was plantation timber. 40% was salvaged timber. 55% was non plantation timber.[26] Most of the non-plantation timber for firewood used in the ACT is sourced from outside the ACT, particularly from western and south-eastern NSW.[27]

Individual firewood collection by consumers also threatens biodiversity. Removing dead wood is recognised as a serious ecological problem as it destroys essential habitat for a variety of native animals. In Australia about 290 vertebrate species use tree hollows. Suitable hollows can take between 120 and 200 years to form in eucalypts. Removing dead wood also damages the soil by removing nutrients that are important to its health and the ecosystem.[28]

In 2005, the *Federal Threatened Species Scientific Committee* recommended that the 'continuing loss of native hollow-bearing trees and coarse woody debris due to firewood harvesting practices' be listed as a 'Key Threatening Process' under the *Environment Protection and Biodiversity Conservation Act 1999*. Despite this recommendation, the then Federal Minister for the Environment and Heritage did not agree to this change, stating that the existing mechanisms in place were sufficient.[29]

[26]http://www.environmentcommissioner.act.gov.au/publications/soe/2007actreport/indicators/harvestingnativespecies07
[27]http://www.environmentcommissioner.act.gov.au/publications/soe/2007actreport/indicators/harvestingnativespecies07
[28] NSW Government, *Removal of Dead Wood as a Key Threatening Process, An Overview,* http://www.environment.nsw.gov.au/resources/nature/factsheetKtpDeadwoodRemoval.pdf
[29] http://www.environment.gov.au/biodiversity/threatened/ktp/firewood-harvesting.html

**Examples of action taken in other jurisdictions**

* ***Waverly and Holyrod councils (Sydney)*:** banned wood heaters

* ***Various NSW local councils***: using development control plans to control or prevent wood heater installations in particular areas (eg Camden Council, the Hills Shire Council, Manooka Valley, the Oran Park and Turner Road Growth Precincts).

* ***Armidale Dumaresq Council (NSW):*** new wood heaters must meet an emissions standard of 3g/kg; 2.5g/kg for certain areas.

* ***New Zealand****:* From 2005, all wood heaters installed in the urban environment must meet an emissions standard of 1.5g/kg and an efficiency standard of 65%.

* ***Canterbury (Christchurch, NZ)****:* New wood heaters must meet an emissions standard of 1g/kg and an efficiency standard of 65%. In most areas, new wood heaters cannot be installed except as replacements for more polluting wood heater models. From 2010, the use of solid fuel burners that are 15 years or older is banned between 1 April to 30 September each year.

* ***Otago (NZ):*** by 1 January 2012, all wood heaters had to meet an emissions standard of 0.7 g/kg and an efficiency standard of 65% for new and existing heaters (or 1.5g/kg for heaters installed before 2007). This means old non-compliant heaters had to be removed.

* ***Lincoln County and Sacramento (USA):*** ban on wood heaters.

* ***Southern California*** – wood heaters not allowed in new houses.

* ***Mammoth, Washoe County and Oregon (USA)****:* phasing out wood heaters by removing them when the house is sold.

* ***Montreal, Canada***: Banned the installation of wood heaters (new or as replacements) from 2009.

Many firewood merchants have signed up to a 'Voluntary Code of Practice for Firewood Merchants' designed to improve the sustainability of the industry (though this program ended in 2011). There are still a number of improvements to be made, particularly in sourcing wood from sustainable sources, and this will require an increase in the amount of sustainable plantations. In the meantime, a strict efficiency standard – as proposed in the draft legislation – will assist in minimising the amount of wood that is used in wood heaters.

## *1.4 Regulation of wood heaters in the ACT (and nationally) remains inadequate*

### 1.4.1 Deferring to the national standard

Currently, the ACT defers to national standards that govern the use of wood heaters. The ACT mandates that wood heaters for sale must be certified to comply with the national emissions standard, which specifies maximum allowable particle emissions of 4g per kilogram of wood burnt (4g/kg). There is no minimum national efficiency standard.

These national standards are inadequate and do not address the health and environmental problems caused by wood heaters. They are the same standards that have been in place without change since 1999. The allowable emissions of 4g of particulate matter per 1kg of wood burned is over 4 times more than the emissions standards allowed in leading jurisdictions. The national standards do not set a minimum efficiency level for heaters despite leading jurisdictions adopting emissions standards of up to 65%.

Moves to strengthen the national standards have failed, making it imperative that the ACT takes action itself. In 2007, the majority of the Australian/New Zealand Standards Committee supported reducing the wood heater emissions standard from 4g/kg to 2g/kg.[30] It also proposed a minimum efficiency standard of 50%.[31] However, the policy of Standards Australia is that major stakeholders (such as industry or community representatives) can veto changes to a standard.[32] In this case, the wood heater industry representatives vetoed the proposed emission and efficiency limits, meaning no changes were made.[33] The need for a revised standard that actually reflects real-life emissions was also considered, but this work was abandoned, possibly due to industry veto.

This veto process obviously makes change at the national level very difficult. One way to overcome this obstacle and ensure ACT residents receive the health and environmental benefits of improved wood heater standards, is to take individual legislative action, such as the changes that are proposed in the draft legislation.

In recognition of the environmental and health impacts of wood heaters, some Australian councils have implemented standards that are stricter than the national standards. Various international jurisdictions have done the same, or banned wood heaters altogether (see sidebar, above).

New Zealand has already taken action, ignoring the emissions limit in the Australian/NZ standard and setting its own standards for wood heater emissions. All wood heaters installed in New Zealand's urban environment[34] must meet a minimum emission standard of 1.5 g/kg and efficiency of at least 65%.[35] Some regions of New Zealand go further. In Otago, from 1 January 2012, all wood heaters had to meet an emissions rating of 0.7 g/kg and a 65% efficiency for new and existing heaters (or 1.5g/kg for heaters installed before 2007). This means old non-compliant heaters had to be removed.[36]

### 1.4.2 Insufficient ACT measures

Since 2004,[37] the ACT Government has run a program which allows residents with wood heaters to receive a rebate for upgrading to gas heating ($800 for a ducted gas system and $600 for flued gas installations). ActewAGL funds the program.

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[30] Standards Australia Solid Fuel Burning Appliances Committee, *Minutes of Meeting 16 and 17 March 2007* (Reproduced at Australian Air Quality Group Website: http://tinyurl.com/7axeeav)
[31] Ibid
[32] Dr John Todd, "Regulation of residential woodsmoke in Australia" (2007) *Clean Air and Environmental Quality* 41(3), 15
[33] Environment Protection Heritage Council Briefing Document, *National Approach to Reducing Woodheater Emissions Scoping Paper on Regulatory Options* (Reproduced at Australian Air Quality Group Website: http://tinyurl.com/7omeon4)
[34] The standards apply to wood heaters installed on blocks less than 2 hectares in size.
[35] NZ Ministry for Environment: http://www.mfe.govt.nz/laws/standards/woodburners/
[36] Otago Regional Council: http://www.orc.govt.nz/Information-and-Services/Air/Clean-Heat-Clean-Air/
[37] http://www.hansard.act.gov.au/hansard/2008/week10/3778.htm

This rebate program offers an incentive for people to convert from wood heating to gas heating. It appears to have had a minor positive effect. According to Australian Bureau of Statistics data, the number of households in Canberra using wood heaters as the main source of heating has gone from 2.9% (2005) to 3.9% (2008) to 2.3% (2011).[38]

However, the program suffers several limitations. There is a strong case that it is not sufficient to address the problems posed by wood heater pollution in Canberra.

The program does nothing to prevent the installation of new wood heaters in ACT homes or to ensure that these heaters have appropriate emissions and efficiency standards. While some households are converting from wood heating to gas, other houses are buying and installing wood heaters in addition to their existing gas or electricity, or new houses are being built with wood heaters installed.

The reported increase in wood heater sales in recent years suggests this is the case.[39] The ABS data also suggests that the overall use of wood heaters as a secondary source of heating has changed little. Canberra households using "other" sources of energy inside the house (which includes "wood" and "oil") has gone from 7.8% (2005) to 8.4% (2008) to 7.6% (2011).[40] This suggests overall there has not been a significant reduction in the net number of wood heaters in Canberra. In addition, as wood heaters are not taxed under the Federal government's carbon price, there is a potential that more people will look to use wood heaters or keep existing ones.

A recent survey of Tuggeranong residents indicates that a rebate incentive program is insufficient for dealing with wood heater problems. 60% of surveyed households that currently have wood heaters said that nothing would motivate them to replace their wood heater (including rebates). Of the 39% who said a rebate might motivate them to replace their heater, only 40% said that the existing rebate was attractive.[41] This leaves just a small portion of the population that is receptive to the rebate: those who do not already have gas heating and the small percentage of those who are attracted to the existing level of rebate.

In this scenario it is very important that the ACT introduces appropriate emissions and efficiency standards for all new wood heaters.

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[38] However the ABS advises that the 2011 figure "has a relative standard error of 25% to 50% and should be used with caution". ABS, *Environmental Issues: Energy Use and Conservation*, March 2011

[39] See, for example, various newspaper articles discussing "a 20% increase in wood heater sales" and record firewood sales in 2011: Henrietta Cook, 'Warmth of Wood Key to Capital's Hearth', *The Canberra Times*, 1 May 2011, p1; Jacqueline Williams, "Where There's Wood, There's a Cosy Fire", *The Canberra Times*, 30 July 2011, p3

[40] ABS, *Environmental Issues: Energy Use and Conservation*, March 2011

[41] Survey conducted by ACT Government in December 2010: ACT Legislative Assembly, Select Committee on Estimates, 2011-12, *Answer to Question on Notice E11-403*, 20 June 2011

# 2. Proposals in the Draft Bill

The draft bill makes amendments to three pieces of existing ACT legislation.

- *Constructions Occupations (Licensing) Act 2004*
- *Constructions Occupations (Licensing) Regulation 2004*
- *Environment Protection Act 1997.*

## *2.1 New emissions standard and efficiency standard*

*(Clause 10 – amended sections 2.4(5)(b) and 2.4(5)(c))*

The key proposal in the draft Bill is to require that all new wood heaters sold or installed in the ACT meet new emissions and efficiency standards. This proposal will allow the continued sale and installation of wood heaters in the ACT. However, it will require that any new heaters have to meet design standards that will limit the amount of pollution they produce. The standard will also allow the use of wood pellet heaters.

The draft Bill proposes an emissions standard of "1g/kg". This means that a wood heater may only average 1g of particulate emissions for every 1kg of wood burned, under controlled testing conditions. This is ¼ of the current emissions standard applicable in the ACT, which allows 4g/kg.

The draft bill also proposes an efficiency standard of 65%. The efficiency standard refers to the percentage of fuel that is converted to heat by the wood heater. It is a key factor in the amount of wood smoke emissions that a wood heater produces. As high efficiency alone does not guarantee reduced emissions, it is important that this is paired with the emissions standard. The average current efficiency of the range of wood heaters on sale in Australia is approximately 60%.[42] However there is no current minimum efficiency rating nationally or in the ACT.

These proposed standards are much stronger than the existing standards that apply in the ACT. They would put the ACT on par with the most progressive jurisdictions around the world. The standard will be the equivalent of Christchurch, New Zealand (1g/kg emissions; 65% efficiency, where new wood heaters can be installed only as replacements for older models), and slightly below that of Otago (0.7g/kg emissions; 65% efficiency).

It is expected that the combination of these standards will make a significant difference to wood smoke emissions in Canberra. Based on previous analyses of emissions and efficiency standards it is estimated that:[43]

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[42] BDA Group, *Wood heater Particle Emissions and Operating Efficiency Standards: Cost Benefit Analysis*, June 2006

[43] BDA Group, *Wood heater Particle Emissions and Operating Efficiency Standards: Cost Benefit Analysis*, June 2006

- The 1g/kg emissions standard would reduce particulate emissions per kg of wood burned from the average new wood heater by approximately 34%;
- The 65% efficiency standard would reduce total wood use over 15 years by about 10%;
- A combined 1g/kg emissions standard and 65% efficiency standard could reduce particulate matter pollution over 15 years by up to 65%.

The proposed standards will make an important contribution to reducing pollution, its negative health and environmental impacts, and the amount of wood used for fuel. In choosing this standard, we have also taken into account the availability of wood heater technology that can meet these standards.

These standards should operate as an interim step towards stronger action. Pollution from wood smoke is unhealthy in any amount. As wood heater expert Professor John Todd writes, "We must develop a new generation of wood heaters that burn cleanly when used in people's homes. ... The next generation must be 1g/kg or less in order to achieve acceptable air quality in areas with a high proportion of wood-users, and ideally we should aim for a further order of magnitude improvement to 0.lg/kg".[44]

**Key considerations for comment:**

**- Is the emissions standard of 1.0g/kg appropriate?**
**- Is the efficiency standard of 65% appropriate?**

### 2.1.1 Will there be enough heaters that meet this standard?

**New Zealand already has 108 wood heater models on the market that would meet the efficiency and emissions standards proposed in this draft legislation.**

The technology to manufacture wood heaters that would meet the proposed standards already exists and is in wide use. Currently there are 10 approved wood heater models available on the Australian market that meet both the 1g/kg emissions standard and the 65% efficiency standard.[45]

The New Zealand experience provides an example of how rapidly the industry can adapt to changed standards in wood heaters. In February 2012, New Zealand has 128 wood heater models that meet its national standards of 1.5g/kg emissions and 65% efficiency. In addition, 108 models on the NZ market would already meet the standards

44 Dr John Todd, "It's Time for More Action on Reducing Wood-smoke" (2008),*Clean Air and Environmental Quality 42(4)*, 17

45 List of certified wood heaters from website of the Australian Home Heating Association: http://www.homeheat.com.au/certified.php

proposed in this draft legislation.[46] This demonstrates that the technology exists to make higher quality wood heaters, and that the wood heater industry can readily adapt.

**Key considerations for comment:**

**- What issues arise in relation to wood heater retailers and manufacturers?**

## *2.2 Enforcement of the standards: sales and installations*

The draft legislation proposes to enforce the new standards by regulating both the sale and installations of wood heaters. There will be new obligations for retailers selling wood heaters and for builders installing wood heaters. By regulating installation in addition to sales, it is hard to circumvent the legislation by importing non-compliant heaters from other jurisdictions. In the ACT, wood heaters can only be installed by a licensed builder and the installation must be certified by a building certifier.

### 2.2.1 Retailers

*(Clause 9, amended section 2.4 (1))*

The existing *Environment Protection Act 1997* makes it an offence for a person to sell a wood heater for use on residential premises unless the equipment complies with existing Australian Standard 4013 (which includes the emissions standard of 4g/kg).

The draft legislation amends this requirement so that a person may not sell a wood heater for use on residential premises unless the heater complies with the new 1g/kg emissions standard, and the 65% efficiency standard. The wood heater must also comply with the other elements of Australian Standard 4013.

If the legislation is passed into law, the ACT Government (through its Office of Regulatory Services - ORS) will need to undertake an education campaign for retailers, to ensure they are aware of their new obligations. ORS will also need to undertake compliance checks and enforcement once the legislation is operational.

### 2.2.2 Builders

*(Clause 4 – New section 87A; Clause 5 – new item 2.1.33)*

The draft legislation also amends the *Constructions Occupations (Licensing) Act 2004* and the Constructions Occupations (Licensing) Regulation 2004. It makes it an offence for a builder to install a wood heater on residential premises unless

46 http://www.mfe.govt.nz/laws/standards/woodburners/authorised-woodburners.html#list

the heater complies with the new 1g/kg emissions standard, and the 65% efficiency standard. Failure to follow this requirement means a builder could be fined a maximum of 10 penalty units ($1100), and non-compliance is a ground for occupational discipline under building licensing system (meaning the builder could lose up to 3 demerit points from their license).

If the legislation is passed into law, the ACT Government (through ACTPLA) will need to undertake an education campaign to ensure builders are aware of this new obligation. The new requirements would be managed by the Construction Occupations Registrar, who is already responsible for licensing and minor disciplinary matters relating to builders.

2.2.3 EPA must maintain list of compliant heaters
*(Clause 10 – amended sections 2.4(3) and 2.4(4))*

To ensure that it will be easy for retailers and builders to know which models of wood heater currently comply with the standards, the draft legislation requires the ACT Environment Protection Agency to create and publicise a list of compliant wood heaters at least every six months. This is similar to the approach taken in New Zealand, where the authority publishes an 'authorised list' of all wood heaters that meet the standard.

Under the draft legislation, it would only be an offence if a retailer or builder sold or installed a heater that did not comply with the standard and that was not on the list produced by the Agency.

2.2.4 Jurisdictional issues
*(Clause 6 – new section 167)*

Applying a standard to wood heaters in the ACT that differs from other jurisdictions raises issues under the *Mutual Recognition Act 1992* (Cth) (MRA) (and the equivalent ACT legislation). The MRA operates to ensure that goods which are legal to sell in one jurisdiction are able to be sold legally in any other Australian jurisdiction.

However, the MRA allows a jurisdiction to establish exemptions to this rule in certain circumstances. The ACT may unilaterally enact a temporary exemption (for one year) for a particular good, provided this is done for health, safety or environmental grounds. As the reason for introducing higher emissions and efficiency standards for wood heaters is for health and environmental reasons, the draft legislation declares a temporary exemption to the MRA. It declares the same for the *Trans-Tasman Mutual Recognition Act 1997* (Cth), which is the equivalent legislation governing the sale of goods between Australia and New Zealand.

Under inter-governmental arrangements, declaring an exemption under the MRA will trigger a process where the relevant Council of Australian Governments Ministerial Council must decide within 12 months whether to

resolve the issue by harmonising national standards, to allow a permanent exemption, or to revert to mutual recognition.[47] This is an additional benefit of enacting the draft legislation as it will stimulate national action regarding the introduction of appropriate wood heater standards.

### *2.3 Commencement after 1 year*

*(Clause 2)*

This draft legislation proposes a commencement date of 1 year after notification of the Act, at the latest. This is intended to provide sufficient time for retailers and industry to adapt to the changes.

**Key considerations for comment:**

**- Is one year an appropriate phase in time for the new standards?**

# 3. Additional options

The following proposals are not included in the exposure draft legislation. However, they have the potential to complement the proposals in the draft legislation, or to form the basis of future regulation of wood heaters in the ACT. We would appreciate any feedback or commentary on these options.

**Key considerations for comments:**

**- Please provide any comments about the additional options proposed below, including whether they should operate in conjunction with the emissions and efficiency standards proposed in the legislation.**

### *3.1 Option 1: Set a date by which all wood heaters in the ACT must comply with the efficiency and emissions standard*

This option would involve setting a 'sunset' date by which all wood heaters in the ACT (or in specified priority areas) must meet a particular standard. It would require the removal of heaters that are not compliant by a certain date: for example, in 5 years from now. The required standard could be the one proposed in the draft legislation, a new, stricter standard, or it could be the removal of wood heaters altogether. In this circumstance, consideration should be given to exempting rural properties without access to other forms of heating. In conjunction with this option, the Government may also recognise that certain areas of Canberra are not suitable for wood heaters at all (due to their urban density and inability to disperse wood smoke).

[47] P113-114 http://www.pc.gov.au/__data/assets/pdf_file/0007/85768/09-chapter6.pdf

This method of regulation has been applied in other jurisdictions, such as Otago, NZ, where old compliant heaters had to be replaced or removed by 1 January 2012. The phase out date may vary in different parts of Canberra; for example if a particular area has very high pollution, it may have a shorter phase out time.

The Government could immediately apply stricter standards for wood heaters to new developments such as the new Molonglo suburbs, as there are no dwellings there with existing wood heaters that need replacing. Similar controls are being used in new developments in NSW, where wood heaters are either not allowed, or need to meet stricter standards than the norm. Camden Council, the Hills Shire Council, Manooka Valley, the Oran Park and Turner Road Growth Precincts are examples.

## *3.2 Option 2: Phase out of non-compliant wood heaters at sale or premises*

Phasing out of wood heaters, or the phasing in of improved emissions and efficiency standards could be accelerated by a requirement to remove any non-compliant wood heater on the premises when the premises are sold. The new owners of the house would have the option of installing an alternative heating system, or installing a compliant wood heater. The average house in Australia is sold every 7 years, whereas the average wood heater lasts 17 years. A similar measure is in place in several counties in the USA (see above).

## *3.3 Option 3: Limit the installation of wood heaters to replacements for more polluting models, until a new health-based standard has been developed*

Under this proposal, new wood heaters could only be installed as replacements for existing, more polluting models. This is effectively a moratorium on new wood heaters in houses that do not already have them installed, until a new health-based standard for wood heaters has been developed.

The proposal recognises that the existing process for certifying wood heaters and measuring their emissions remains problematic. In 2008, the CSIRO conducted tests on different models of wood heater and found there was not a large distinction in emissions between wood heaters that were compliant with the existing standard and those that were not.[48] Research commissioned by the Federal Government has recommended developing a revised testing method for certifying wood heaters. The revised method is referred to as the 'real-world protocol' and takes account of the way that people operate their heaters in practice (rather than how wood heaters are tested in a laboratory). [49]

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[48] C Meyer et al, CSIRO Marine and Atmospheric Research, *Measurement of real-world PM10 emission factors and emission profiles from woodheaters by in situ source monitoring and atmospheric verification methods*. 2008, http://www.environment.gov.au/atmosphere/airquality/publications/emission-factor.html .

[49] Dr John Todd and Michael Greenwood, *Proposed Changes to AS/NZS 4013 – Determination of Particle Emissions Factors* (Commissioned study for the

A moratorium on new wood heater installations until a new method of testing and a new health-based standard are in place would be the strongest form of action to protect residents from unacceptable levels of pollution. It would be likely to stimulate action at the national level and in the wood heater industry for the introduction of new testing methods and new, stricter health-based emissions standards.

Technology to achieve a substantial reduction in emissions from wood heaters has been developed, such as temperature sensors to control the air flow, or natural gas boosted combustion to prevent smoky, smouldering fires.[50]

## *3.4 Option 4: Market mechanisms*

In addition to regulation of wood heaters, the ACT could introduce market mechanisms designed to reduce the levels of wood smoke pollution. These would require a thorough examination before introduction, including of the impact that price increases could have on lower socio-economic groups.

Possibilities include:

- introducing a sales tax on new wood heaters (potentially to increase the price of more polluting models compared to less polluting models, in recognition of the differing health and environmental impacts), or
- introducing a licensing fee for owners of wood heaters (which would increase the cost of owning and operating wood heating, providing an incentive to use other heating options. Licensing would also allow improved auditing, and could provide funds for wood smoke education programs and assistance for residents experiencing health problems because of wood smoke).

## *3.5 Option 5: Provide health information with new wood heaters*

As part of its public education campaign, the ACT could require that all new wood heaters sold come with information about the health impacts of wood smoke. This could be in the form of an operating manual, although some kind of permanent label on the heater would be preferable. Operating manuals get lost and are unlikely to be passed on to the next tenant or owner of the house. It would be permissible for the ACT to introduce such a labelling requirement under its exemption to the *Mutual Recognition Act* (discussed above).

The Standards Australia Committee recommended in 2007 that wood heaters should be labelled with information about the health impacts of wood smoke.

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Commonwealth Department of the Environment and Heritage), 2006, http://www.environment.gov.au/atmosphere/airquality/publications/pubs/particle-emission-factors.pdf

[50] BDA Group, *Wood heater Particle Emissions and Operating Efficiency Standards: Cost Benefit Analysis*, June 2006; Environment Protection Heritage Council Briefing Document, *National Approach to Reducing Woodheater Emissions Scoping Paper on Regulatory Options* (Reproduced at Australian Air Quality Group Website: http://tinyurl.com/7omeon4)

However, this change was vetoed by the industry along with the proposed emissions and efficiency changes.[51]

# 4. Additional recommendations

The following are recommendations of actions the ACT should take regardless of whether the draft legislation or other proposed options are implemented.

## *4.1 Recommendation: Improve enforcement of and education about the correct operation of wood heaters*

The way a wood heater is operated makes a significant difference to the amount of pollution it produces. Even highly efficient/low emissions heaters can produce considerable pollution if operated incorrectly (eg by using unseasoned or treated wood).

It is important that the community is not only educated about how to minimise emissions from wood heaters and why this is important for our health, but that there are options to warn and penalise 'serial' offenders.

The NSW *Protection of the Environment Operations Act 1997 Act* provides an example of regulatory powers that local councils can use to enforce correct use of wood heaters. The council can issue Smoke Abatement Notices to a household where it has been given information on correct wood heater operation but has failed to take action to prevent excessive emissions. The penalty notice imposes a fine of $200 for individuals (with a maximum available fine of $3300 by a court).[52] This smoke abatement notice system was developed primarily for dealing with wood heater pollution.

Launceston, Tasmania provides another example of local enforcement action. Local Government authorities conducted targeted education 'smoke patrols' during which they surveyed the entire city every month and targeted households with smoky chimneys. In the first instance, a notification card was left in letterboxes, indicating that the time that unacceptable smoke levels were observed. This was followed by warning letters, with the possibility of fines for further breaches.[53]

The ACT lacks an appropriate mechanism for educating and potentially penalising residents who continue to use their wood heaters in a harmful way. The Government should make appropriate legislative changes and roll out a similar system of education/penalties as Launceston and NSW.

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[51] Standards Australia Solid Fuel Burning Appliances Committee, *Minutes of Meeting 16 and 17 March 2007* (Reproduced at Australian Air Quality Group Website: http://tinyurl.com/7axeeav);
[52] http://www.environment.nsw.gov.au/woodsmoke/smokeabate.htm
53 Australian Research Institute in Education for Sustainability (ARIES), A Review of Air Quality Community Education: Key Findings, http://aries.mq.edu.au/projects/airquality/files/Air_quality_brochure220807.pdf

A useful initiative to complement these new mechanisms would be to establish a 'smoke pollution hotline' for residents to report where wood heaters are being operated poorly. This would help the Government target its enforcement and education activities. Canberra residents consistently complain to Government about wood smoke pollution, with the Government receiving an average of 43 complaints a year (over the last 9 years), and some years it receives 50 or 100 complaints.[54]

## *4.2 Recommendation: Conduct mobile air quality testing*

As discussed above, Canberra has particular locations that are wood smoke 'hotspots'. In order to get the full picture of particulate matter pollution the ACT Government should employ mobile air monitoring to establish patterns of air pollution and identify potential hotspots. This can be done using a mobile nephelometer (a measuring device for PM pollution), which can be attached to a car. An example of a mobile nephelometer is pictured.[55] The Government may be able to purchase this equipment for ongoing use, or to borrow the equipment from another jurisdiction or a university.

Conducting this monitoring is important for providing meaningful spatial pollution information to inform policy responses such as where to target education and enforcement, and which areas (if any) to restrict wood heater installations.

## *4.3 Recommendation: Improve communication of air quality monitoring*

Given the importance of air quality to Canberrans' health and wellbeing, it is critical that the Government communicate air quality information to the public in a timely and comprehensible way.

Currently, the ACT Government only reports data on ACT air pollution annually.

This can be improved significantly by:

- Issuing PM10 and PM2.5 information on a daily basis (using the air quality index calculation used by NSW). This could be combined with

54 ACT Legislative Assembly, Answer to Question on Notice No.2307, May 2012
55 Picture from: Eleanor Setton, Mobile Air Quality: Targeting Local Issues (presentation), http://www.bc.lung.ca/association_and_services/documents/07Setton-MobileMonitoring.pdf

Bureau of Meteorology Data on low wind speeds, temperatures, and humidity to provide forecasts of days when poor air quality is expected.

- Providing ACT air quality measurements from the air measurement statements on-line and in real time, so that residents can check current information at any time.
- Providing health information and warnings in conjunction with the above forecasts and real time data to improve community awareness about air quality, particulate matter and wood smoke.

## *4.4 Recommendation: Expand the wood heater buyback subsidy*

The ACT Government's wood heater replacement subsidy - funded by ACTEW AGL - provides a rebate to households replacing wood heaters with gas heating. Given the importance of limiting the amount of wood smoke pollution in Canberra, this subsidy should be available for heating options other than gas.

Electric energy-efficient heat pumps or reverse-cycle air conditioners typically consume a third of the electricity of direct resistance heating, and generate a similar amount of greenhouse emissions as gas heaters with 'market leading' energy star ratings.[56] These forms of heating generally have a high up-front cost, but their greater efficiency leads to low running costs. This makes them a good option for a subsidy.

Given the results of its survey on the wood heater replacement subsidy, the Government should also increase the amount of the rebate. Only 20% of respondents said that the current $600-800 rebate was attractive, whereas 67% of respondents said that a higher rebate rate of $1200-1500 was attractive. Of the respondents who were attracted to a rebate to replace their wood heater, 83% said that if the rebate or incentive was attractive enough they would consider replacing their wood heater within 6 months to a year.[57] An increased rebate – even temporarily – may be an effective way to quickly replace a significant amount of wood heaters in Canberra.

Consideration should also be given to providing a subsidy to switch from wood heating to pellet heating, as a way of appealing to residents who want to keep some kind of 'combustion heating'. Pellet heaters usually have low emissions (1g/kg or less) but are also less susceptible to careless operating, meaning the emissions are usually low all the time.[58]

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[56] Based on information from the Federal Government's site for comparing heating options: http://www.energyrating.gov.au/compare-products/

[57] Survey conducted by ACT Government in December 2010: ACT Legislative Assembly, Select Committee on Estimates, 2011-12, *Answer to Question on Notice E11-403*, 20 June 2011

[58] Dr John Todd, *Training Handbook for Wood-Smoke Mitigation*, 2003