REDUCING EMISSIONS FROM WOOD HEATERS

DECISION REGULATION IMPACT STATEMENT

October 2015

FOREWORD

This Regulation Impact Statement (RIS) has been prepared in accordance with the Council of Australian Government (COAG) requirements to assess the impact on Australian governments, industry and the community of reducing emissions from wood heaters.

In particular, this document takes into account the COAG principles for preparing a RIS[1] that state that 'purpose of a final RIS for decision makers is to draw conclusions on whether regulation is necessary, and if so, on what the most efficient and effective regulatory approach might be'. This RIS has also drawn upon the guidance outlined in the Australian Government Guide to Regulation.

This RIS is structured as follows:

- Section 1 introduces the issues and outlines the context
- Section 2 outlines the problem that needs to be addressed
- Section 3 states the objectives for government action
- Section 4 outlines the options
- Section 5 outlines the assessment of options
- Section 6 outlines the consultation undertaken
- Section 7 summarises the RIS and makes a recommendation as to the preferred option
- Section 8 outlines the approach to implementation and review.

[1] Council of Australian Governments. (2007). *Best Practice Regulation: A Guide for Ministerial Councils and National Standard Setting Bodies Contents*. Retrieved March, 2015.

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GLOSSARY/ACRONYMS

- ABS Australian Bureau of Statistics
- AHHA Australian Home Heating Association
- BAU Business as Usual
- BREE Bureau of Resources and Energy Economics
- CBA Cost Benefit Analysis
- CoAG Council of Australian Governments
- g/kg grams per kilogram
- GMR Greater Metropolitan Region
- µmmicrometres (10-6 m)
- MRA Mutual Recognition Agreement
- NCAA National Clean Air Agreement
- NEPC National Environment Protection Council
- NEPM National Environment Protection Measure
- NPI National Pollutant Inventory
- NPV Net Present Value
- PM Particulate Matter
- PM10 Particulate Matter with a diameter less than 10 micrometres (µm)
- PM2.5 Particulate Matter with a diameter less than 2.5 micrometres (µm)
- PV Present Value
- RIS Regulation Impact Statement
- WHO World Health Organisation

EXECUTIVE SUMMARY

The problem

Exposure to particulate matter (PM) has been associated with a range of different health outcomes. The range of adverse health impacts of particle emissions are widely acknowledged by health experts to include:

- increases in total, respiratory, and cardiac mortality;
- increased hospital, surgery and casualty admissions for respiratory disease, bronchitis, asthma, cardiovascular disease and chronic obstructive pulmonary disease;
- increased limitations to functional activity, either as school or work days lost and other restrictions;
- increase in the daily numbers of respiratory symptoms; and
- pulmonary function decreases in healthy children or adults with obstructive airways problems.

In addition the WHO recently announced that outdoor air pollution, including PM, has been classified as carcinogenic to humans[2] . Current science indicates that there is no clear threshold of particle pollution below which health effects do not occur.

Wood heaters are a major source of air pollution in many regions of Australia during the cooler months of the year. In particular, cooler areas that are prone to temperature inversions and that have a local geography that inhibit the dispersion of pollution – such as Launceston (Tasmania), Tuggeranong (Australian Capital Territory) and Armidale (New South Wales) – suffer from higher numbers of high pollution events. Also, the density of population is a key factor in population exposure, making wood heaters in Australian cities of particular concern.

Approximately 1.2 million Australian dwellings used wood as a source of energy in 2011. Despite a downward trend in all states and territories in the use of wood as the main source of heating energy in dwellings, their use will remain as a significant source of air pollution over the analysis period to 2035.

State, territory and local governments are responsible for the regulation of air quality within their jurisdictions, including for the regulation of wood heaters. Emissions from wood heaters are regulated in two main ways:

- regulation of the quality of heaters sold; and
- regulation of the use of heaters by consumers ('in-service performance').

In 2014, new Australian Standards for wood heaters were released. Compared with the outgoing standards, the new standards require that new wood heaters be more

[2] International Agency for Research on Cancer. (2013). *Press release 221: Outdoor air pollution a leading environmental cause of cancer deaths.* Retrieved March 10, 2015,

efficient and have lower emissions. All jurisdictions support incorporating the new Standards – both for emissions and efficiency – as part of managing emissions from wood heaters.

However, the adoption of new, stricter wood heater emissions and efficiency standards by jurisdictions will not necessarily translate into similarly large reductions in ambient air pollution. 'Leakage', caused by poor compliance with standards and sub-optimal in-service use will reduce the likely effectiveness of the new standards.

All states and territories that legislate and/or regulate wood heaters undertake some level of compliance activities of retail models. The Consultation RIS noted that these activities varied significantly in extent, frequency and nature and so far have provided little incentive to ensure only certified wood heaters are made available to the market.

Experience from successful wood heater emissions reduction programs suggests that scope exists for improvements to compliance and in-service use.

Objectives

The objectives in improving the management of wood heater emissions are to:

- Reduce the adverse impacts of wood heater emissions on human health;
- Increase the effectiveness of application of the new Standards, policies, programmes and practices across Australia, and
- Ensure that any approach provides a net benefit to the community and meets the objectives of the Australian Government's deregulation agenda by minimising the impact and costs on business to the extent possible while still meeting objectives 1 and 2.

Options

All options include the implementation of the new wood heater performance standards in the baseline.

- Option 1: No Policy Change. Adoption and implementation of the new Standards for wood heaters by all States and Territories;
- Option 2: In addition to the adoption and implementation of the new Standards for wood heaters, States and Territories adopt the better practices evident across jurisdictions of stronger compliance and improved in-service measures;
- Option 3: As with Option 2, but with the additional implementation of a National Wood Heater Star Rating Scheme; and
- Option 4: As with Option 2, but with the additional implementation of a nationally coordinated audit programme and education programme.

Consultation

Extensive consultation with stakeholder, including government industry and the community, was undertaken in 2013 as part of the Consultation RIS process. Consultation included public meetings, one-on-one meetings and facilitation of a formal response to the Consultation RIS process. The main themes emerging from the consultations with stakeholders were:

- Community groups and governments tended to emphasise the continuing need for action to reduce emissions from wood heaters, particularly to address areas of greatest concern (locality, frequency and concentration);

- Industry in particular tended to emphasise the need for consistency across states and territories in the application of the standards, policies, programmes and practice because inconsistency increases their compliance costs and reduces the size of their market; and

- Governments, industry and community groups tended to emphasise the need to continue to educate users about the standards and the correct use of wood heaters.

Impact analysis and conclusion

The adoption of the new Standards and continuation of current polices of the states and territories (Option 1, no policy change) is likely to result in significant reductions in the level of emissions from wood heaters over the forecast period.

The alternative options 2-4 share key measures - auditing, education, wood heater replacement incentives and in-service programmes. They all provide for the sharing of better practices across jurisdictions on a more consistent and systematic basis. This would streamline the process whereby programmes effective in one jurisdiction would be able to be replicated in other jurisdictions through the sharing of policy, practice and procedural documentation and experience in implementation. This would provide for cost effective transfer of successful programmes while maintaining the ability to tailor for local conditions and priorities.

Option 2 is the lowest cost alternative option as it comprises fewer of the elements of the other alternative options. Relative to Option 2, Option 3 also includes a National Star Rating Scheme, while Option 4 incorporates elements of national co-ordination but excludes the National Star Rating Scheme. Therefore, costs (to industry and government) vary across the alternative options ranging from $41 million for Option 2 to $51 million for Option 3 (see Table).

Present value of costs 2015 - 2035 ($m – 2013)

Costs included in this table are indicative, and would depend on how the relevant programs are implemented. For details on the cost assumptions, see BDA Group. (2014). *'*Cost benefit analysis of national measures to control wood heater emissions' Prepared for the Australian Government Department of the Environment, December.

	Option 2 Better Practice	Option 3 Better Practice and a National Star Rating Scheme	Option 4 Better Practice and National Co-ordination
Costs to Industry*	8.6	8.7	9.9
Costs to Government	32.5	42.4	33.0
Total Cost	**41.1**	**51.1**	**42.9**

* Total maximum additional cost imposed by the option on industry, some or all of which industry may pass on to consumers

It is difficult to confidently predict the impact of each of the alternative options on further emission reductions (that is, on emission reductions over and above the no policy change scenario). However, given that further emissions reductions of around 0.1 per cent would deliver sufficient health benefits to outweigh the costs outlined above, it is likely that each of the Options 2-4 would deliver a higher net benefit to the community.

The RIS identifies the importance of addressing the 'leakage' in emissions that are likely to occur despite the introduction of stricter wood heater performance standards. In particular, poor compliance with performance standards and sub-optimal in-service use by consumers were considered likely to reduce the potential gains from the newly published performance standards.

All three options contain measures targeting poor compliance and in-service use that can be targeted to areas (urban or regional) where emissions from wood heaters have the highest health impacts. As such, all three options are likely to address in part the 'leakage' described in the problem section.

In addition to these measures, Option 3 includes a National Star Rating system for wood heaters that would guide consumers towards purchasing models with a higher certified performance. While arguably this would further reduce emissions, it does not directly impact the compliance and in-service performance issues identified in the problem section, and as a national program cannot be targeted to the geographic areas of highest concern.

Option 4, in addition to the measures described under Option 2, includes an agreement to develop nationally-consistent education programs, and a national audit program of the industry based certification procedures. Again, these initiatives would arguably further reduce emissions, but the national elements of this Option would not specifically be targeted at local emissions issues, which are covered by state based initiatives.

The adoption of better practice across jurisdictions (Option 2) provides a set of clear benefits with modest cost and regulatory implications. It targets the problem of emission 'leakage' identified in this RIS, and can be tailored to take account of local

conditions. Given the uncertainties around any additional benefits offered by Options 3 and 4 – and the fact that the implementation of the stricter wood heater performance standards are ongoing - it is recommended that States and Territories adopt the better practices evident across jurisdictions of stronger compliance and improved in-service measures (Option 2).

1 INTRODUCTION

In March 2008, the then Environment Protection and Heritage Standing Committee (EPHSC) agreed to an examination of the need for a nationally consistent approach to wood heater emissions management. Noting the existing regulatory framework for wood heater management in many jurisdictions, EPHSC requested the development of a Consultation RIS to inform a future decision on the preferred management approach.

In 2011, the Council of Australian Governments (COAG) identified air quality as a Priority Issue of National Significance.

The Consultation RIS, released in April 2013, concluded that the greatest net benefits were likely to be achieved via a national regulatory approach for managing wood heater emissions. It identified thirteen policy options under three major categories:

- wood heater design or performance standards
- measures to promote compliance of retail models against these standards, and
- measures influencing the in-service operational performance of wood heaters.

These measures could be delivered through a range of policy 'vehicles'. The policy delivery approaches examined were a voluntary national programme, a collaborative approach or a national regulatory approach.

Since then, new Australian Standards on wood heater emissions and efficiency have been developed, and all jurisdictions support the incorporation of the new limits.

On 15 July 2015, Environment Ministers discussed the new Australian Standards for Wood Heater Emissions and Efficiency (the new Standards) which had been published in August 2014. Following this discussion Ministers communicated their intention to make decisions about wood heater emissions by the end of 2015, subject to Office of Best Practice Regulation endorsement and approvals by all Australian governments.

This RIS updates the Consultation RIS and takes into account submissions and consultations undertaken to date, including:

- options to increase consistency and co-ordination across jurisdictions while recognising the roles and responsibilities of each level of government and the objectives of the Australian Government’s deregulation agenda.
- a revised cost benefit analysis to address the refined set of options.

2 THE PROBLEM

This Section:

- outlines the current understanding of the impact on human health of ambient air pollution;

- provides a summary of the wood heater industry sector in Australia, and the problem caused by emissions from this sector;

- describes the current regulation of wood heater emissions in Australia, including the introduction of new standards, and;

- highlights that poor compliance and sub-optimal use are likely to limit the effectiveness of these standards.

2.1 The impact of particulate matter on human health

PM consists of a mixture of solid and liquid particles suspended in the air. Particles can vary in size, composition and origin, with the particles of greatest concern to public health being those with a diameter of less than 10 micrometers (µm) (PM10) and particles with a diameter of less than 2.5 µm (PM2.5). PM can remain suspended in the air for some time, depending on the size of the particles[3] , with PM10 and PM2.5 particles tending to remain in the air for minutes to days, typically travelling a distance over 10 kilometres.

Exposure to PM has been associated with a range of different health outcomes. The range of adverse health impacts of particle emissions are widely acknowledged by health experts to include:

- increases in total, respiratory, and cardiac mortality;

- increased hospital, surgery and casualty admissions for respiratory disease, bronchitis, asthma, cardiovascular disease and chronic obstructive pulmonary disease;

- increased limitations to functional activity, either as school or work days lost and other restrictions;

- increase in the daily numbers of respiratory symptoms; and

- pulmonary function decreases in healthy children or adults with obstructive airways problems.

In addition the WHO recently announced that outdoor air pollution, including PM, has been classified as carcinogenic to humans [4]. The health costs associated with exposure to air pollution can be linked to:

- costs (financial and quality of life) to individuals experiencing mild or severe health impacts;

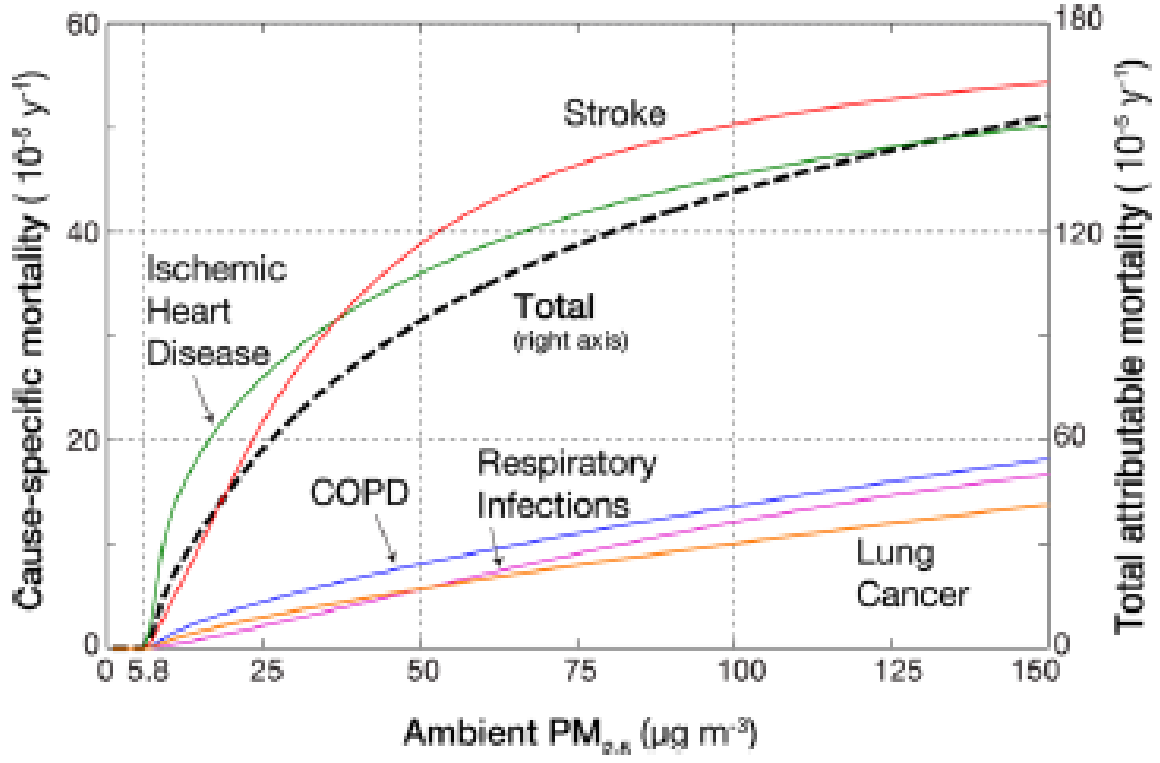
- direct costs to the health system (hospital admissions and visits to the doctor); and

[3] World Health Organisation. (2006). *Health risks of particulate matter from long-range transboundary air pollution.* Retrieved March 10, 2015.
[4] International Agency for Research on Cancer. (2013). *Press release 221: Outdoor air pollution a leading environmental cause of cancer deaths.* Retrieved March 10, 2015.

- costs to businesses for reduced productivity and absenteeism.

Current science indicates that there is no clear threshold of particle pollution below which health effects do not occur. This means that adverse health effects may be observed at the concentrations currently experienced in Australian cities, even where these are below the current air quality standards (see Box 1). While there is no data available on the health impacts in Australia directly attributable to PM emissions, there are some recent studies that indirectly quantify the health effects of particulate pollution. For example, in Sydney, Melbourne, Brisbane and Perth, annual mortality attributable to current long-term PM2.5 exposures above background is estimated to be equivalent to approximately 1590 deaths at typical ages [5].

Box 1: Health impacts of PM2.5 at different ambient pollution levels.



This figure represents global concentration-mortality relationships for ambient PM2.5 for five individual endpoints (solid lines, left axis), and for the total of five causes (dashed line, right axis). The vertical axes indicate per-capita mortality rates attributable to PM2.5 for a hypothetical global population uniformly exposed to a given level of PM2.5.

What is important to note is the shape of the concentration-mortality relationship. It shows that there are health impacts right down to very low levels of pollution, and that even at very high levels marginal increase in pollution is likely to increase mortality.

[5] University Centre for Rural Health, North Coast (2013), *Summary for Policy Makers of the Health Risk Assessment on Air Pollution in Australia*, Prepared for the NEPC, Canberra, Australia.

For comparison, peak daily PM2.5 levels in Australian capital cities are commonly in the range of 20-50ug/m3 [6].

This illustrates the current scientific view that additional ambient air pollution is likely to be harmful, regardless of the current pollution level.

Source: Apte, J., Marshall, J., Cohen, A. and Brauer, M. 2015, 'Addressing Global Mortality from Ambient PM2.5', Environmental Science and Technology, 49, pp. 8057−8066.

As there is no clear level below which adverse health effects from PM would not be observed, any reduction in ambient air concentrations of PM will improve health benefits and reduce population exposure and risk. Greater health benefits can be expected in areas of higher population density, where higher numbers of individuals are likely to be affected by any reductions in exposure. Similarly, improvements in air quality in regional areas are expected to realise improved health outcomes, albeit at a lower quantum.

2.1.1 Wood heaters are an important source of PM in Australia

Wood heaters are a major source of air pollution in many regions of Australia during the cooler months of the year. Emissions from wood heaters contain materials and compounds, such as PM and air toxics, which are detrimental to human health. Emissions can build up in many urban and regional centres to levels above mandated PM thresholds. ['Air toxics' are a diverse range of air pollutants, such as such as 1,3-butadiene, benzene, formaldehyde, isomers of xylene, polycyclic aromatic hydrocarbons (PAHs) and toluene, heavy metals and others, that are usually present in ambient air in relatively low concentrations but have characteristics such as toxicity or persistence that make them a hazard to human, plant or animal health.]

Major anthropogenic sources of PM include industrial activities such as mining and electricity generation, controlled burns, domestic wood heaters and motor vehicles. Major natural sources of inhalable particles include bushfires, windblown dust and sea salt. Based on data from the National Pollutant Inventory [7], domestic solid fuel burning (predominantly wood heaters) is among the top seven sources of PM10 in Australia. Domestic solid fuel burning contributes more PM10 emissions per year than motor vehicles. In Sydney, wood heaters account for 3 percent of total PM10 emissions in summer but 43 percent in winter [8].

[6] State of the Environment 2011 Committee 2011, *Australia State of the Environment 2011*, Independent report to the Australian Government Minister for Sustainability, Environment, Water, Population and Communities, Canberra DSEWPaC Australian Government 2011.
[7] National Pollutant Inventory link, accessed June 15, 2015
[8] NSW Department of Climate Change and Water 2010, *Current air Quality in New South Wales*, A technical paper supporting the Clean Air Forum, 2010.

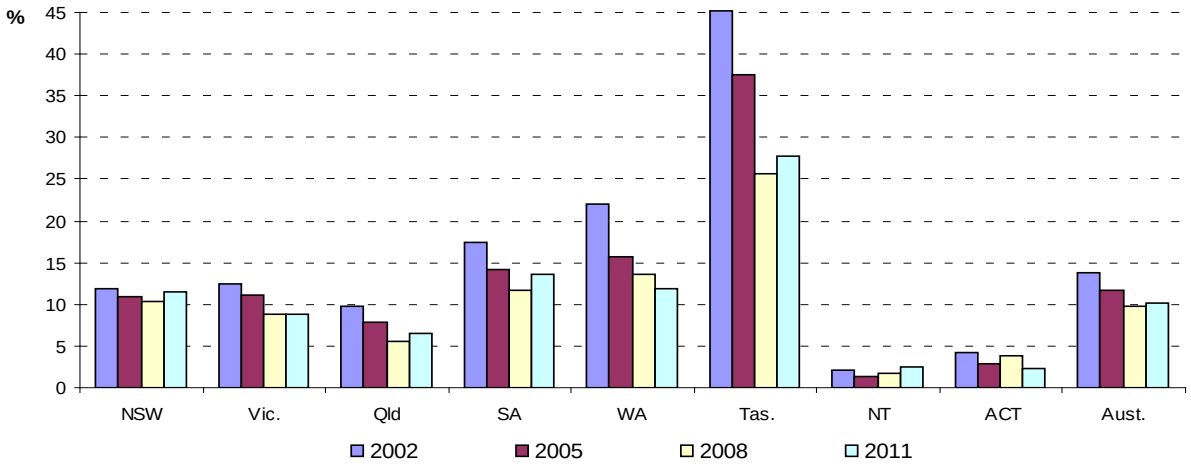
Ambient air pollution from wood heaters will also vary between areas due to climatic, meteorological, demographic and population exposure factors. In particular, cooler areas that are prone to temperature inversions and that have a local geography that inhibit the dispersion of pollution – such as Launceston (Tasmania), Tuggeranong (Australian Capital Territory) and Armidale (New South Wales) – suffer from higher numbers of high pollution events.

2.2 The use of wood heaters in Australia

Australian Bureau of Statistics data [9] indicates that approximately 1.2 million Australian dwellings used wood as a source of energy in 2011, while 878,400 households used wood as their main source of heating energy – representing 10.2 per cent of those Australian households that use heaters.

There has been a downward trend in all states and territories in the use of wood as the main source of heating energy in dwellings from 2002 to 2008. This trend halted in 2011, when national wood heater use rose marginally (Figure 2.1). ABS survey data and feedback from community consultations indicates that increasing electricity and gas prices have been an important consideration in a renewed interest in wood heating.

Figure 2.1: Proportion of Households using Wood as their Main Heating Source



Source: ABS 2011 (Catalogue 4602.0.55.001)

The decline in wood heater use to 2009 was likely to be due to a range of factors including:

- lifestyle changes (increasing numbers of dwellings and higher density housing, convenience);

- improved alternative heating options (gas central heating, reverse cycle air conditioning and heat pumps);

[9] Australian Bureau of Statistics. (2011). *Energy Use and Conservation* (Catalogue 4602.0.55.001).

- the relatively high purchase price of wood heaters and wood compared to other heating options; and

- government programmes such as buy-back or replacement schemes and 'don't light tonight' programmes.

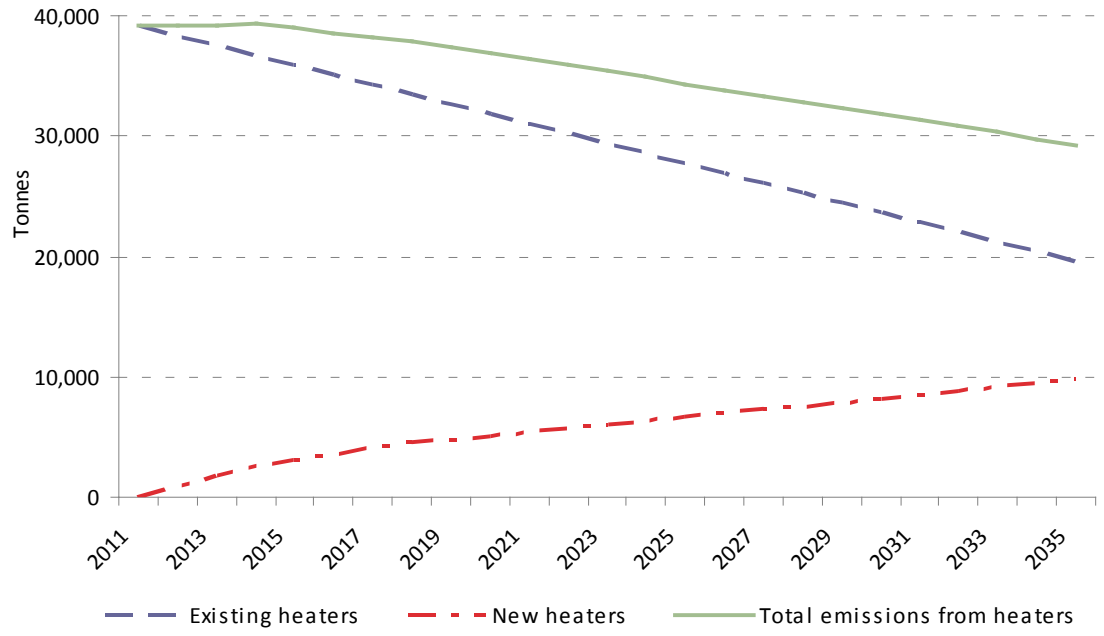
Despite the apparent trend away from wood heaters, their use will remain as a significant source of air pollution over the analysis period to 2035. Such use will add to ongoing detrimental health outcomes for these communities (Figure 2.2).

2.3 The Australian Wood Heater Industry

The Australian Home Heating Association (AHHA) is the peak industry body representing over 250 manufacturers, retailers, installers, maintenance companies and firewood suppliers. In 2013, wood heater manufacturers and importers had a turnover of $140 million [10] and are estimated to employ approximately 10,000 Australians [11].

The industry produces 246 certified models from 56 brand names [Excludes models which are uncertified, discontinued, not tested, tested with softwood, are a cooking appliance, no longer manufactured or the test information has been withheld. Retrieved May, 2014, from the AHHA website]. Australian wood heater manufacture is predominantly in NSW and Victoria. While there are 39 Australian manufacturers and importers, four companies account for approximately 80 per cent of sales [12]. Second and third tier industries, such as paint, glass and steel suppliers, also depend on the wood heater manufacturing industry.

Figure 2.2: Projected PM Emissions from Wood Heaters



[10] Australian Home Heating Association. (May, 2014). Title of submission [personal communication]
[11] Retrieved March 10, 2015, from the AHHA website.
[12] Barbeques Galore, AF Gason, Shamic Sheetmetal and Pecan Engineering

Source: BDA Group – Cost Benefit Analysis of National Measures to control Wood Heater Emissions - December 2014

The AHHA reported that wood heater sales had dropped from a peak of 120,000 units per year in 1988 to an average of 25,000 units per year by 2009 with a rise in sales to over 43,000 units in 2012-2013 [13]. Over 60 per cent of sales are estimated to be in NSW, the Australian Capital Territory (ACT) and Victoria. Sales are seasonal with nearly 50 per cent of sales occurring in the April to June quarter.

Around 85 per cent of new heater sales are for homes in rural and regional areas and this is expected to continue. Replacement rates for wood heaters vary from 0.3 per cent in Adelaide to 3.5 per cent in rural and regional Tasmania. The average lifespan of a wood heater operated in Australia is estimated to be 15-20 years [14].

Further details of the Australian wood heater industry are contained in Appendix A.

2.4 Current Policy Settings in Australia

States and territories are responsible for the regulation of air quality within their jurisdiction, including for the regulation of wood heaters. Most states and territories are active in addressing the issues of managing emissions from wood heaters (see Appendix B) for further information). The Northern Territory is a clear exception reflecting its low population density, hotter climate and unique topography. The Commonwealth has historically promoted research and education, including commissioning the 2003 wood heater audit and studies on in-service wood heater emissions and alternative test methods.

The State and Territory governments regulate emissions from wood heaters in two main ways:

- regulation of the quality of heaters sold; and
- regulation of the use of heaters by consumers ('in-service performance').

The regulation of wood heaters across the jurisdictions is summarised in Appendix B.

2.4.1 Quality regulation

All states and territories, except SA and the NT, have legislation and/or regulation to ensure that only wood heaters that meet emission standards are sold within their jurisdiction.

- Victoria, WA and ACT have drafting elements in their regulations that automatically adopt the most recent standards.

[13] Australian Home Heating Association. (May, 2014). Title of submission [personal communication]

[14] Environmental Link and BDA Group. (2006). *Wood Heater Particle Emissions and Operating Efficiency Standards: Cost Benefit Analysis*. Commissioned by the Department of the Environment and Heritage. Canberra, Australia: Author

- NSW, Queensland and Tasmania cite the specific standard and will need updating.

- SA has a draft code of practice for environmentally responsible wood heater use which recommends the emission standard [15].

- NT has no specific wood heater statues other than “environmental nuisance” provisions in its pollution control act.

In 2014, new Australian Standards for wood heaters were released. Compared with the outgoing standards, the new standards require that new wood heaters be more efficient and have lower emissions (Box 2). All jurisdictions support incorporating the new Standards – both for emissions and efficiency – as part of managing emissions from wood heaters.

As a general principle, COAG has agreed to explore adopting trusted international standards, unless it can be demonstrated that there is a good reason not to [16]. Standards Australia processes consider international standards as part of their deliberations. Australians have a preference for wood heaters with large fireboxes compared to the fireboxes sold in New Zealand and Europe, and Australian wood heaters are designed to use hardwoods whereas wood heaters manufactured overseas are designed primarily to use softwoods. As a result, it was considered that Australian specific standards were required.

Box 2: Wood heater standards

Two key measures are typically used to characterise the performance of wood heaters: the operating efficiency and the emission level. The operating efficiency measures how much of the heat value contained in the wood is extracted and delivered into the living space. Emissions are measured in terms of particle mass (in grams) emitted for each kilogram of wood burnt under test conditions (and are measured as g/kg).

The new Australian Standards (the new Standards) that cover wood heater emissions and efficiency are:

- AS/NZS4012:2014 - Domestic Solid Fuel Burning Appliances – Method for determination of power output and efficiency

- AS/NZS4013:2014 - Domestic Solid Fuel Burning Appliances – Method for determination of flue gas emissions.

The new Standards are voluntary standards and include a standard test method that addresses fuel loading, operating procedures and sampling methods. The Standards will only apply to new heaters that are sold on the Australian market. Prior to the new

[15] SA EPA Codes of Practice Retrieved 8 July 2015. A 1994 SA air quality policy also cites “fuel burning equipment” and references British smoke charts published in 1969.
[16] COAG Communique, 10 October 2014

Standards in 2014 there was no efficiency standard but there was a requirement for efficiency to be shown on the certification label.

All jurisdictions support the incorporation of the new limits. Further information on the new Standards can be found at http://www.standards.org.au.

Changes to the Australian Standards – 1999 to 2019

AS/NZS4012 Domestic Solid Fuel Burning Appliances – Method for determination of power output and efficiency			**AS/NZS4013 Domestic Solid Fuel Burning Appliances – Method for determination of flue gas emissions**		
1999	**2015**	**2019**	**1999**	**2015**	**2019**
No efficiency standard but reported on the label	55%	60%	4 grams of particulate matter (PM_{10}) emitted per kilogram of fuel burnt (4 g/kg)	2.5 grams of particulate matter (PM_{10}) emitted per kilogram of fuel burnt (2.5 g/kg)	1.5 grams of particulate matter (PM_{10}) emitted per kilogram of fuel burnt (1.5 g/kg)

2.4.2 In-Service Performance

Another major issue leading to higher emissions from wood heaters, even those meeting the new Standards, is incorrect use by consumers. Actual performance for a wood heater, as opposed to certified performance, depends on how the wood heater is operated (for example, the type of firewood used and whether it is dry; the size and spacing of logs; and whether the fire is burning brightly).

Some aspects of in-service use of wood heaters are regulated. All jurisdictions regulate the installation of wood heaters, and two jurisdictions regulate the quality of firewood.

In addition to regulation, education programmes have been partially effective in changing the behaviour of consumers and improving emission outcomes. While most jurisdictions have undertaken education programmes in the past there is a wide variety in content, focus and frequency of these education programmes. For example, some are strictly targeted to high emission localities; others are conducted at the local government level, while others are broad campaigns. There is some evidence that local campaigns can be very effective (e.g. Launceston) by being able to tailor the messages to the local population experiencing unique local conditions.

Incentive programmes to move consumers away from wood heaters to more emission efficient heating have also been implemented in several jurisdictions (Appendix C).

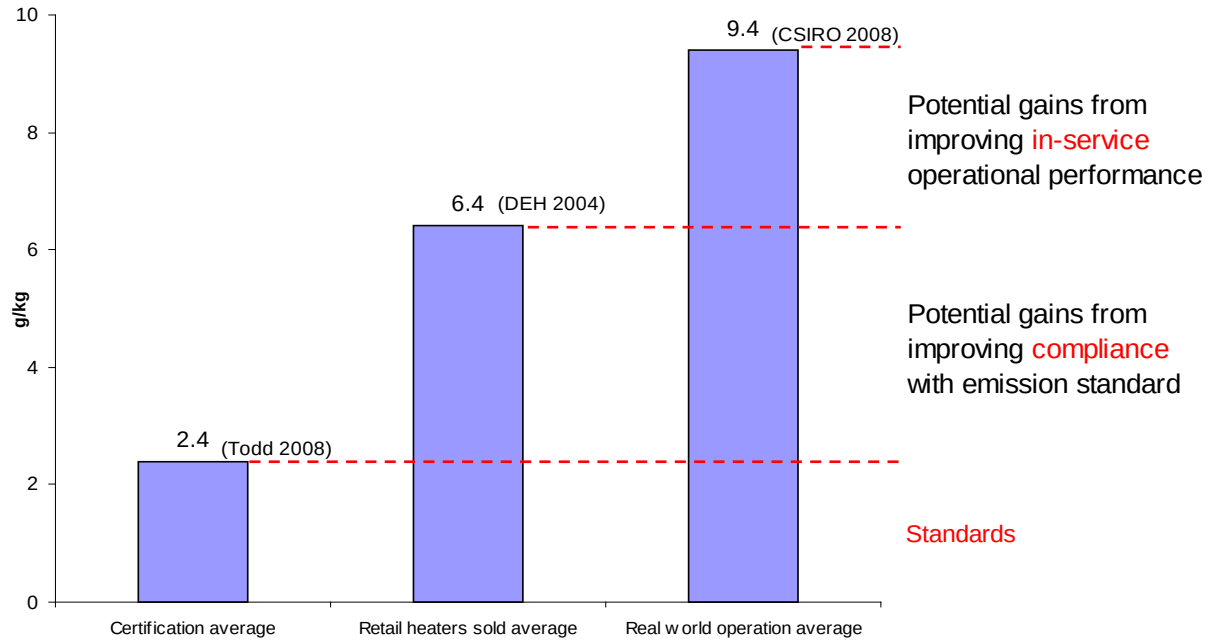
Examples include the ACT Wood Heater Replacement Program and the Launceston Wood Heater Replacement Program. Other jurisdictions have also used targeted grant programmes to provide incentives at the local government level for specific measures, or a mix of measures, aimed to reduce emissions. For example, the NSW Wood Smoke Reduction Program is a grant programme using replacement incentives, education and further local research to assist local councils to reduce emissions.

2.5 But new standards alone aren't going to fix the problem...

The adoption of new, stricter wood heater emissions and efficiency standards by jurisdictions will not necessarily translate into similarly large reductions in ambient air pollution. 'Leakage', caused by poor compliance with standards and sub-optimal in-service use will reduce the likely effectiveness of the new standards. Figure 2.3 gives an idea of the likely size of this leakage.

A study by Todd [17] shows that the average PM emissions of heaters certified since 1999 to the Australian standard (of 4 g/kg) is around 2.4 g/kg (Figure 2.3). However there is no routine auditing of emission performance by jurisdictions or evidence that models entering the market perform as well as models tested at the time of certification. As such, the performance of models actually out on the sales floor may not match the certified standard. For example, the results of a 2003 audit showed that the average emissions from wood heaters on sale at retail outlets (based on the standard test method) was some 6.4 g/kg, despite all the models being certified as compliant with the 1999 standard [18].

Figure 2.3: Emissions 'leakage'



[17] Todd, J. (2008). Trends in Australia wood heater performance. *Clean Air and Environment Quality, Vol 42*(2), 13-14

[18] Department of Environment and Heritage. (2004). *National Wood Heater Audit Program Report*. Canberra, Australia: Author

Source: Todd 2008, DEH 2004 and CSIRO 2008

Retail wood heater performance may differ from design performance tested at certification because the wood heater sold at retail may differ from the model tested in a laboratory or the wood heater may have been modified. Non-compliance of retail wood heaters with the standards was identified in the Consultation RIS as one of the major areas of leakage that contributed to lower reduction in emissions than envisaged. The AHHA has expressed concern at the lack of regulatory enforcement of the current wood-heating certification scheme . Similarly, the Clean Air Society of Australia and New Zealand strongly supports measures to improve compliance with standards, noting that the national audit in 2003 had showed "widespread, serious, non-compliance", and that they considered this part of the reason that current policies had not achieved their objectives. They also noted that "unenforced standards provide an economic advantage to manufacturers that do not bother to comply" [19].

All states and territories that legislate and/or regulate wood heaters undertake some level of compliance activities of retail models. The Consultation RIS noted that these activities varied significantly in extent, frequency and nature and so far have provided little incentive to ensure only certified wood heaters are made available to the market The Consultation RIS also noted the positive impact the national audit programme had on compliance when undertaken in 2003.

In addition, in-service emissions are likely to be even higher again. A 2008 study by CSIRO of actual emissions from a sample of in-service heaters in Launceston indicated a wide range of emissions depending upon fuel use and operating practices, with 24 hour average emissions across the sample of 9.4 g/kg (Figure 2.3).

So, while virtually all heaters sold in Australia since 1999 have been subject to a regulated 4gm/kg PM10 limit, actual emissions may be twice as high due to leakage from a combination of poor compliance and sub-optimal in-service use by consumers.

2.6 Summary of issues and extent of the problem

In summary the evidence indicates that:

- ambient air pollution in Australia is a significant issue for human health and the environment and remains a concern even at low levels;

- wood heaters are – and will continue to be – important contributors to air pollution, particularly in cooler months and in urban areas;

- new standards have been published to control wood heater emissions, but significant leakage is likely due to poor compliance of retail wood heaters with the standards, and sub-optimal in-service use of heaters by consumers;

[19] Clean Air Society of Australia and New Zealand (CASANZ). (2013). Submission to Consultation regulation impact statement for reducing emissions from wood heaters: p. 2, accessed 15 July 2015

- jurisdictions are active in this area, but there is a significant variety of approaches to policy, programmes and compliance activity; and
- experience from the more successful programs suggests that scope exists for improvements to compliance and in-service use.

3 OBJECTIVES

The objectives in improving the management of wood heater emissions are to:

- Reduce the adverse impacts of wood heater emissions on human health;
- Increase the effectiveness of application of the new Standards, policies, programmes and practices across Australia, and
- Ensure that any approach provides a net benefit to the community and meets the objectives of the Australian Government's deregulation agenda by minimising the impact and costs on business to the extent possible while still meeting objectives 1 and 2.

4 OPTIONS

There are a range of potential policy measures that could be implemented to further reduce emissions from wood heaters. These measures fall into two major categories:

- wood heater design and performance standards, including measures to promote compliance against these standards; and
- measures influencing in-service operational performance of wood heaters.

The following sections describe the four options assessed in detail for this RIS:

Option 1: No Policy Change Adoption and implementation of the new Standards for wood heaters by all States and Territories. Governments and industry maintain existing policy, programmes and practices into the future

Option 2: Better Practice Adoption and implementation of the new Standards for wood heaters by all States and Territories, consistent with status quo. States and Territories adopt the better practices evident across jurisdictions of stronger compliance and improved in-service measures

Option 3: Better Practice and a National Star Rating Scheme Adoption and implementation of the new Standards for Wood Heaters by all States and Territories, consistent with status quo. States and Territories adopt the better practices evident across jurisdictions of stronger compliance and improved in-service measures. Implementation of a National Wood Heater Star Rating Scheme

Option 4: Better Practice and National Co-ordination Adoption and implementation of the new Standards for wood heaters by all States and Territories, consistent with status quo. States and Territories adopt the better practices evident across jurisdictions of stronger compliance and improved in-service measures. A nationally co-ordinated audit programme and education programme

4.1 Option 1: No Policy Change

The No Policy Change option is the scenario against which options for change are assessed. These are the current regulatory arrangements, and represent the future state where governments do not specifically address the issues identified in the statement of the problem.

For wood heaters, the No Policy Change option is similar to the Business As Usual case described in the Consultation RIS, but with the key difference being that the new Standards are assumed to have been adopted by states and territories.

Heaters available for sale in Australia must be shown to meet the new Standards where applicable under regulations made by the state or territory where the heater is purchased.

Additional measures, such as education programmes, wood heater replacement programmes and other measures such as fire wood controls and wood heater bans would be activities that continue to be managed and delivered by the relevant jurisdictional or local government agency as appropriate and in accordance with local circumstances.

4.2 Option 2: Better Practice

The Better Practice option covers all current policies under the No Policy Change option, including the implementation of the new Standards by all states and territories, combined with stronger compliance with the standards through state based audits and in-service measures, such as wood heater replacement incentive programmes and education programmes to ensure the appropriate use of wood heaters.

This approach recognises that the control of wood heater emissions and air quality is a state and territory government responsibility. States and territories would lead the effort to ensure compliance with the new Standards and deliver in-service measures drawing on the better practices from across all Australian jurisdictions. The approach will promote broader, more consistent policies, programmes and practices in the management of wood heater emissions and would seek to build on these experiences and work cooperatively with stakeholders. Programmes proven effective in one jurisdiction would be able to be replicated in other jurisdictions through the sharing of policy, practice and procedural documentation and experience in implementation.

Elements of this approach include:

Standards

- All states and territories will adopt and enforce the new Standards.

Compliance

- State/territory based retail audit programmes to identify non-compliant wood heaters and take enforcement action under current powers. The option assumes regular audits following the introduction of the new Standards over the analysis period. Co-operation between jurisdictions would reduce the audit activity required in relation to retailers operating in more than one jurisdiction.

In-service programmes

- State/territory based implementation, in conjunction with stakeholders, of better practice wood heater education and awareness programmes on the appropriate use of wood heaters.

- Adopting better practice state/territory based complementary measures, including wood heater replacement programmes, managed and delivered by relevant local and state authorities and applicable to wood heaters in priority areas.

- The development and adoption of a common definition for excessive smoke to be delivered by jurisdictions in a way that would best suit their enforcement and/or abatement requirements.

- States and territories would determine and control the acceptable methods for modification and installation of new and second hand wood heaters.

This option seeks to maximise the use of current regulatory settings, policies, programmes and practices in use across Australia with minimal change to the regulatory burden on industry or consumers.

4.3 Option 3: Better Practice and a National Star Rating Scheme

The Better Practice and a National Star Rating Scheme option shares the same basic elements of Option 2 with the significant addition of the introduction of a star rating labelling scheme.

As per Option 2, this approach recognises that the control of wood heater emissions and air quality is a state and territory government responsibility and seeks to promote broader, more consistent and co-operative policies, programmes and practices in the management of wood heater emissions.

In addition to this, a national programme for labelling wood heaters, similar to the energy star rating for electrical appliances or the water efficiency star rating for toilets, shower heads, etc, is proposed. This programme would compare a wood heater's heating efficiency and emissions output with other heaters on the market.

Elements of this approach include:

Standards

- All states and territories will adopt and enforce the new Standards.

Compliance

- State/territory based retail audit programmes to identify non-compliant wood heaters and take enforcement action under current powers. The option assumes regular audits following the introduction of the new Standards over the analysis period. Co-operation between jurisdictions would reduce the audit activity required in relation to retailers operating in more than one jurisdiction.

In-service programmes

- State/territory based implementation, in conjunction with stakeholders, of better practice wood heater education and awareness programmes on the appropriate use of wood heaters.

- Adopting better practice state/territory based complementary measures, including wood heater replacement programmes, managed and delivered by relevant local and state authorities and applicable to wood heaters in priority areas.

- The development and adoption of a common definition for excessive smoke to be delivered by jurisdictions in a way that would best suit their enforcement and/or abatement requirements.

- States and territories would determine and control the acceptable methods for modification and installation of new and second hand wood heaters.

National Star Rating Scheme

- Commonwealth regulation requiring an emission and efficiency star rating, similar to the current water and energy star rating schemes (as distinct from the mandatory minimum efficiency performance standards for a subset of these products).

- The scheme would draw on the certified emission and efficiency performance to be included on heater compliance plates as set out in the new standards and provide this to consumers in an obvious and simple fashion.

This option seeks to maximise the use of current regulatory settings, policies, programmes and practices in use by jurisdictions across Australia with the addition of regulation for a national star rating scheme.

4.4 Option 4: Better Practice and National Co-ordination

The Better Practice and National Co-ordination option shares the same basic elements of Option 2 with the addition of national co-ordination of some activities.

As per Option 2, this approach recognises that the control of wood heater emissions and air quality is a state and territory government responsibility and seeks to promote broader, more consistent and co-operative policies, programmes and practices in the management of wood heater emissions.

In addition to this, there would be national co-ordination of two audits of the existing industry-based certification procedures and national co-ordination of an education programme.

Elements of this approach include:

Standards

- All states and territories will adopt and enforce the new Standards.

Compliance

- State/territory based retail audit programmes to identify non-compliant wood heaters and take enforcement action under current powers. The option assumes regular audits following the introduction of the new Standards over the analysis period. Co-operation between jurisdictions would reduce the audit activity required in relation to retailers operating in more than one jurisdiction.

- The Commonwealth will facilitate two audits of the existing industry-based certification procedures – once after the first application of the Australian Standards (after 2015) and the second time after the further tightening of the Australian Standards (after 2019).

In-service programmes

- State/territory based implementation, in conjunction with stakeholders, of a nationally

co-ordinated better practice wood heater education and awareness programme on the appropriate use of wood heaters.

- Adopting better practice state/territory based complementary measures, including wood heater replacement programmes, managed and delivered by relevant local and state authorities and applicable to wood heaters in priority areas.

- The development and adoption of a common definition for excessive smoke to be delivered by jurisdictions in a way that would best suit their enforcement and/or abatement requirements.

- States and territories would determine and control the acceptable methods for modification and installation of new and second hand wood heaters.

This option seeks to maximise the use of current regulatory settings, policies, programmes and practices in use by jurisdictions across Australia with the addition of national coordination of certification audits and an education programme.

5 ASSESSMENT OF OPTIONS

This Section sets out the assessment of options and quantifies, where possible, the costs and benefits of the four options outlined in Section 4. It should be noted that the

quantified costs included in this section are indicative, and would depend on how the relevant programs are implemented [20].

5.1 Option 1: No Policy Change

In any cost-benefit analysis, it is the incremental impact of the options that is of interest. This is the difference between what will happen as a result of the option, compared to what would have happened in the absence of the option. Analysis of this difference requires a 'base case' that defines how the future will unfold without intervention over a period long enough to capture all potential costs and benefits of the proposal.

It should be noted that the additional costs to industry associated with the introduction of the new Standards for new wood heaters sold after August 2015 - which include the cost of heater redesign and plant retooling for the manufacture and sale of the new models - are assumed to be incurred under the base case.

Consistent with the Consultation RIS, it is assumed that 40 per cent of models would comply with the new Standards in the absence of additional government initiatives [21].

Continuation of current policy and trends would see emissions from wood heaters reduce by approximately 9,700 tonnes (or 25 per cent) as a result of the replacement of old heaters with new lower emitting heaters, despite increased wood heater numbers due to higher sales (see Figure 2.2). Such a reduction would see a reduction in health costs associated with PM emissions over 20 year of around $1.4 billion (compared with no reduction in emissions) [22].

5.2 Option 2: Better Practice

As set out in Section 4.2, the Better Practice option includes:

- current policy settings, including implementation of the new Standards by all states and territories;
- stronger compliance with the standards through increased state based auditing;
- implementation of better practice in-service measures, such as wood heater replacement incentive programmes, and
- implementation of better practice education programmes to ensure the appropriate use of wood heaters.

As described in the Problem section (and illustrated by Figure 2.3), policies that target the emissions ‘leakage’ caused by poor compliance with standards and sub-optimal in-

[20] For details on the cost assumptions, see BDA Group. (2014). *Cost benefit analysis of national measures to control wood heater emissions* Prepared for the Australian Government Department of the Environment, December.

[21] Ibid.

[22] ibid. Page 35. All present value figures quoted in the RIS are calculated over a 20 year period, using a 7% discount rate.

service use of heaters will be key to further reducing emissions from wood heaters. Initiatives aimed at in-service performance in particular will be important, as even with new standards approximately 80 per cent of PM emissions from wood heaters over the period 2015-2035 are likely to be from existing wood heaters unaffected by the new standards.

The components of Option 2:

- are based on existing state, territory and local government initiatives;
- target compliance and in-service performance; and
- can be tailored to particular geographic areas that experience high ambient air pollution from wood heaters.

5.2.1 Costs to Industry

The costs to manufacturers would be to ensure that they comply with the standards applicable to new wood heaters. Compliance levels are assumed to increase with the increase in auditing.

This option could increase the compliance burden on industry where they are not currently implementing the new Standards in a consistent or systemic basis. This compliance burden could increase such costs as:

- Potential wood heater redesign and production in order to bring otherwise non-compliant models into compliance;
- record keeping activities to demonstrate compliance with the Standards
- enforcement costs such as the resources required to facilitate audits undertaken by states and territories, and
- procedural costs such as those required by compliance activities.

All compliance costs are anticipated to occur in the first 3 years of the program as heater models are made compliant with the new standards – this is estimated to involve costs of around $3.5 million in each of the three years, some of which will be recovered from consumers in the form of higher wood heater prices [23].

5.2.2 Costs to Government

The costs to government of implementing Option 2 include a range of one-off and ongoing costs, including:

- strengthening audits to ensure compliance
- adoption, tailoring and delivery of better practice wood heater education and awareness programmes on the appropriate use of wood heaters, and

[23] *ibid*. Page 44.

- adopting better practice state/territory based complementary measures, including wood heater replacement programmes, managed and delivered by relevant local and state authorities and applicable to wood heaters in priority areas.

- One off costs would cover the development of a common definition of excessive smoke, and developing controls on modifications or installation of new and second hand heaters.

The estimated present value cost to government of implementing Option 2 over the twenty years is $40.2 million, with the majority incurred by state and territory governments from education and wood heater replacement programs [24].

5.2.3 Costs to Consumers

Consumers are unlikely to incur direct costs under the options, unless they participate in specific programmes, such as the wood heater replacement programmes. Consumers may face small wood heater price increases as manufacturers seek to recoup some of their higher costs through higher wood heater prices. The extent to which these costs are passed-on will depend upon a number of factors, including the price sensitivity of consumers to the relative cost of alternative forms of heating, the level of rationalisation of businesses and wood heater models, and sales distribution across these businesses and wood heater models. However based on the identified industry costs, price increases are likely to be less than 5 per cent of the average wood heater purchase price under all options [25].

5.2.4 Benefits to the Community

Under this Option, urban residents would receive the majority of the health benefits of reducing particle emissions due to higher population exposures and assumed avoidance of health impacts. This is not to discount the significant benefits that would accrue to those regional centres currently experiencing high wood heater emissions, such as Launceston.

This means that, compared with no policy change scenario, the incidence of adverse health outcomes such as respiratory disease, bronchitis, asthma, cardiovascular disease and chronic obstructive pulmonary disease is likely to be lower

It is difficult to predict the impacts of the above described measures on the level of emissions from wood heaters over the next 20 years, and as a result the health impacts of Option 2 compared with the no policy change case could not be confidently quantified

5.2.5 Net impact of compliance and in-service measures

The estimated present value of the economic cost of Option 2 is $41.1 million [26].

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[24] *ibid*. Page 43
[25] *ibid*. Page 45.
[26] *ibid*. Page 37.

As discussed, the health benefits of Option 2 over and above the status quo are difficult to predict, and therefore it is difficult to derive a quantified net present value for Option 2. However, given that the present value of the costs of this option are estimated to be in the order of $41 million, total emissions from wood heaters would need to be reduced by approximately 0.1 per cent (compared with no policy change) for Option 2 to deliver a positive net present value [27]. Given the current rates of non-compliance with wood heater standards, and the potential for better practice complementary programs to reduce emissions, a reduction of at least 0.1 per cent (and thus an overall net benefit) appears likely.

5.3 Option 3: Better Practice and a National Star Rating Scheme

As set out in Section 4.3, the Better Practice and a National Star Rating Scheme option shares the same basic elements of Option 2 with the significant addition of the introduction of a star rating scheme.

A national star rating scheme would seek to rate and label, possibly using a five star system, all wood heaters manufactured and/or sold in Australia based on their relative emissions and efficiency performance.

The elements of Option 3 that are shared with Option 2:

- are based on existing state, territory and local government initiatives;
- target compliance and in-service performance; and
- can be tailored to particular geographic areas that experience high ambient air pollution from wood heaters.

A National Star Rating Scheme, on the other hand, would be geographically broad-based, and would be targeted at guiding consumers towards wood heater models with lower certified emissions levels. Compliance and in-service performance would not be directly affected.

5.3.1 Costs to Industry

The costs to manufacturers would be in response to new compliance requirements applicable to new wood heaters. The costs are similar to Option 2, but with the additional costs of complying with the National Star Rating Scheme.

Option 3 would impose a one-off cost to industry in the form of staff time for businesses to educate themselves about the new regulatory arrangements, and ongoing costs for the labelling of new wood heaters.

The estimated present value cost to industry over a twenty year period is $8.7 million (PV) for Option 3; it is assumed that the costs of complying with the National Star Rating Scheme would be in the order of $13,500 per year across the industry [28].

[27] Derived from *ibid*.
[28] *ibid*. Page 45.

5.3.2 Costs to Government

The costs to government of implementing the various measures to reduce emissions from wood heaters are the same as outlined for option 2 with the significant additional cost of the development of the policy and legislation for the National Star Rating Scheme, and for its subsequent programme implementation. The cost of the National Star Rating Scheme has been estimated at $10 million over the twenty year period.

One off costs would cover the development of a common definition of excessive smoke, and developing controls on modifications or installation of new and second hand heaters.

Other ongoing costs would continue to be the delivery of the education programmes and the wood heater replacement incentives. These would include advertising costs and the development of promotional materials.

The estimated present value cost to government of implementing all components of Option 3 over the twenty years is $51.1 million, $42.4 million of which will be incurred by state and territory governments.

5.3.3 Costs to Consumers

As indicated earlier, consumers are unlikely to incur direct costs under the options, unless they participate in specific programmes, such as the wood heater replacement programmes. Consumers may face small wood heater price increases as manufacturers seek to recoup some of their higher costs through higher wood heater prices. Based on the identified industry costs, price increases are likely to be less than 5 per cent of the average wood heater purchase price under all options.

5.3.4 Benefits to the Community

As for all options, urban residents would receive the majority of the health benefits of reducing particle emissions under all options, due to higher population exposures and assumed damage cost estimates. However regional centres currently experiencing high wood heater emissions, such as Launceston, would continue to receive significant benefits.

This means that, compared with no policy change scenario, the incidence of adverse health outcomes such as respiratory disease, bronchitis, asthma, cardiovascular disease and chronic obstructive pulmonary disease is likely to be lower

As with Option 2, it is difficult to predict the impacts of the above described measures on the level of emissions from wood heaters over the next 20 years, and as a result the health impacts of Option 3 compared with the no policy change case cannot be confidently quantified

5.3.5 Net impact of compliance and in-service measures

The estimated present value of the economic cost of Option 3 is $51.1 million [29].

As discussed, the health benefits of Option 3 over and above the status quo are difficult to predict, and therefore it is difficult to derive a quantified net present value for Option 3. However, given that the present value of the costs of this option are estimated to be in the order of $51 million, total emissions from wood heaters would need to be reduced by approximately 0.1 per cent (compared with no policy change) for Option 3 to deliver a positive net present value [30]. Given the current rates of non-compliance with wood heater standards, and the potential for better practice complementary programs and a star rating system to reduce emissions, a reduction of at least 0.1 per cent (and thus an overall net benefit) appears likely.

5.4 Option 4: Better Practice and National Co-ordination

As set out in Section 4.5, the Better Practice and National Co-ordination option shares the same basic elements of Option 2 with the addition of national co-ordination activity.

A nationally coordinated education programme to ensure the appropriate use of wood heaters and two national audits of the industry based certification procedures would be implemented.

The elements of Option 3 that are shared with Option 2:

- are based on existing state, territory and local government initiatives;
- target compliance and in-service performance; and
- can be tailored to particular geographic areas that experience high ambient air pollution from wood heaters.

National oversight of state-based compliance audits would be broad-based, and would be targeted at improving compliance with the new standards. A similar national audit undertaken in 2003 was successful in highlighting “widespread, serious, non-compliance” with existing standards, and served as a prompt for industry to pay more attention to the problem of non-compliance.

5.4.1 Costs to Industry

As with Options 2 and 3, the costs to manufacturers would be in response to new compliance requirements applicable to new wood heaters, including:

- potential wood heater redesign and production in order to bring otherwise non-compliant models into compliance;
- record keeping activities to demonstrate compliance with the Standards

[29] *ibid*. Page 37.
[30] Derived from *ibid*.

- enforcement costs such as the resources required to facilitate audits undertaken by states and territories, and
- procedural costs such as those required by compliance activities.

There would also be additional costs related to cooperating with the national auditing programmes.

The estimated present value cost to industry over a twenty year period is $9.9 million for Option 4 [31].

5.4.2 Costs to Government

The estimated present value of cost to government of implementing Option 4 over twenty years is $40.6 million [32]. Education and replacement programmes would include advertising costs and the development of promotional materials.

One off costs would cover the development of a common definition of excessive smoke, and developing controls on modifications or installation of new and second hand heaters.

Under Option 4, two nationally co-ordinated certification audits are proposed, the first in 2016-18 following the new standards introduced in 2015; and again in 2020-2022 following the new 2019 standards. Certification audits would be contracted to an independent party at a cost of around $30,000 for each audit.

Other ongoing costs would continue to be the delivery of the education programmes and the wood heater replacement incentives. These would include advertising costs and the development of promotional materials.

5.4.3 Costs to Consumers

As discussed above, Consumers are unlikely to incur direct costs under the options, unless they participate in specific programmes, such as the wood heater replacement programmes. Consumers may face small wood heater price increases as manufacturers seek to recoup some of their higher costs through higher wood heater prices. Based on the identified industry costs, price increases are likely to be less than 5 per cent of the average wood heater purchase price under all options.

5.4.4 Benefits to the Community

As for all options, urban residents would receive the majority of the health benefits of reducing particle emissions due to higher population exposures and assumed damage cost estimates. However regional centres currently experiencing high wood heater emissions, such as Launceston, would continue to receive significant benefits.

[31] *ibid*. Page 37.
[32] *ibid*. Page 43

This means that, compared with no policy change scenario, the incidence of adverse health outcomes such as respiratory disease, bronchitis, asthma, cardiovascular disease and chronic obstructive pulmonary disease is likely to be lower

As with Options 2 and 3, it is difficult to predict the impacts of the above described measures on the level of emissions from wood heaters over the next 20 years, and as a result the health impacts of Option 4 compared with the no policy change case cannot be confidently quantified

5.4.5 Net impact of compliance and in-service measures

The estimated present value of the economic cost of Option 3 is $42.9 million [33].

As discussed, the health benefits of Option 3 over and above the status quo are difficult to predict, and therefore it is difficult to derive a quantified net present value for Option 3. However, given that the present value of the costs of this option are estimated to be in the order of $43 million, total emissions from wood heaters would need to be reduced by approximately 0.1 per cent (compared with no policy change) for Option 3 to deliver a positive net present value [34]. Given the current rates of non-compliance with wood heater standards, and the potential for better practice complementary programs and national education and audit programs to reduce emissions, a reduction of at least 0.1 per cent (and thus an overall net benefit) appears likely.

5.5 Competition Impacts

It is likely that the introduction of standards (considered under all four options including the base case) and the complementary programs considered in the various options in this RIS would have an impact on competition in the market for wood heaters. It should also be noted that a 28 per cent reduction in the number of models that would be available under the base case and options is likely to lead to changes in market shares held by different manufacturers. For example, the new Standards would have a disproportionate impact on small producers of wood heaters (which sell around 500 wood heaters each) as model redesign and retooling costs would need to be spread over smaller sales volumes. These producers represented around 10 per cent of sales in 2007-08. Despite the increase in sales since then, the reduction in the number of models in response to the new Standards would most likely see this market share picked up by other manufacturers with compliant models.

The economic analysis has identified the costs to government of implementing the options. The final incidence of these costs would depend on the government financing arrangements, whether offsets would be required and/or may be passed on to taxpayers and ratepayers accordingly.

[33] *ibid*. Page 37.
[34] Derived from *ibid*.

6 CONSULTATION

Extensive stakeholder consultation was undertaken in 2013 as a part of the Consultation RIS process and all feedback and data received has been given due consideration. There was a high level of engagement across a range of stakeholders including:

- Commonwealth, state and territory agencies
- Local government
- Industry
- Academic, research and professional organisations
- Community organisations, and
- Individuals.

Consultation included a series of public meetings, one-on-one engagement with key stakeholders and facilitation of a formal response to the Consultation RIS process [35].

Key points and feedback are outlined below.

6.1 Nature and extent of the problem

A significant proportion of the submissions to the Consultation RIS reported on the difficulty they are experiencing in addressing emissions from wood heaters on neighbouring properties. Thirty nine per cent of these report adverse health effects on their families, requiring increased medical attention, including for the treatment of asthma in children.

The toxicity of emissions from wood heaters was noted in many submissions, with many citing overseas and Australian studies of poor health outcomes associated with emissions. The submissions noted the cost-benefit analysis presented in the Consultation RIS as evidence for prompt government action to curb wood heater emissions.

The wood heating industry also acknowledged the evidence and recognised its role in reducing emission standards for new wood heaters.

A number of respondents indicated that wood heater usage was understated and, in addition, that the emission figure of 40,000 tonnes of PM referenced in the Consultation RIS was overstated.

[The figure of 40 000 tonnes of emissions nominated in the Consultation RIS was based on an NPI estimate of aggregate emissions Australia wide from domestic solid fuel burning for 2008-09 being around 20 000 tonnes. This was only half the amount of emissions the authors of the Consultation RIS estimated is generated by wood heaters, and which for the purposes of the Consultation RIS used in establishing

[35] An outline of the process of the consultation and the summary report of submissions received from consultation: Retrieved June 3, 2015

'base-line' emissions. The authors considered that the difference arose for two key reasons: Firstly, while the NPI requires industries that meet specified emissions thresholds to submit annual reports, pollutant releases from domestic and commercial sources and from diffuse industry sources that are not required to report, are estimated by jurisdictions. These assessments are only undertaken periodically. (The NPI notes that "diffuse data may be from a study completed in 1998-99; however it is the most up-to-date information available at that time." This imposes limitations on the accuracy of the data, especially for example, in airsheds such as Launceston where there has been a concerted effort to reduce wood heater emissions.) Secondly, the NPI estimates are based on compliance with emission standards without making any adjustments for 'real life' operating conditions, where heaters sold may not comply with emission design standards and due to variations in operating practices. Accordingly, the NPI wood heater estimates significantly underestimate actual emissions. Nevertheless, the levels of wood heater emissions reported by the NPI are still sizeable, such that wood heaters are clearly a significant contributor to ambient levels of particulates in at least some airsheds.]

In response, the base case assumptions and data were revisited, based on more recent ABS data on wood heater use, industry data on the sale of new wood heaters in recent years, and estimates of firewood consumption provided by the Bureau of Resources and Energy Economics (BREE).

6.2 Response to Consultation RIS options

Thirty-seven per cent of submission responses indicated a preference for at least one of the options presented in the Consultation RIS, with the majority of these (over 40 per cent) indicating a preference for a regulatory option.

Almost a third of the submissions commented on the application of regulations at a local level, noting that a consistent application of regulations should apply across jurisdictions or that specific restrictions be allowed in airsheds subject to regular effects of wood heater emissions. Many submissions reported on the failure of local government regulation to resolve the problem, including statutes in some jurisdictions requiring measurement of smoke plumes over time and distance variables during periods when these are difficult or impossible to obtain (such as at night-time).

Local governments also acknowledged that they do not have the resources to attend to issues between neighbours, and when they do, are unwilling to impose penalties available to them under by-laws. The local governments also expressed a preference to focus on educating wood heater users to the proper use of their appliances. However, other reports indicate that these efforts are often not successful, with the users continuing to improperly use their wood heater [36]. In areas prone to temperature inversions, such as Armidale or Launceston, which are more exposed to increased PM during the winter months, arguments were put forward that the local councils in these communities should have the opportunity to impose restrictions over and above those that may be applied on state or territory level.

[36] For example, see Armidale Dumaresq Council. (2013). *Regulation impact statement for reducing emissions from wood heaters* (Submission 48).

A number of submissions highlighted significant compliance and enforcement issues and noted their support for measures to improve in these areas.

There was some call for standards governing wood heater emissions to be health based, allowing for the sale and use of wood heaters providing it could be shown that there were no or minimal effects on human health. That said, a significant proportion of submissions received (over 40 per cent) called for a ban on wood heaters, either outright or at the very least, in urban areas with higher population densities. Some of these submissions called for an immediate moratorium on wood heater installations until such time as more complete legislation can be enacted.

The Consultation RIS discussed banning wood heaters [37], pointing out that a ban on wood heater installation was not considered feasible as part of a nationally consistent programme. It was considered that such measures would be a blunt instrument in terms of imposing unnecessary restrictions on households in areas not experiencing air quality impacts related to wood heaters. A ban on new wood heaters in established communities would also see a perverse incentive in that users would hold onto older (more polluting) heaters and therefore not result in significant emissions reductions in the short to medium term.

The Consultation RIS also noted other issues jurisdictions have previously considered in the context of wood heater bans, including that in some circumstances bans would place economic pressure on disadvantaged groups in the community which could result in health impacts during the cooler months. A further consideration has been that wood smoke impacts are primarily a neighbourhood issue best addressed at a local level by restrictions introduced and enforced by councils. In addition, wood heating in regional areas is both popular and very cost-competitive. Therefore, as wood smoke is a problem in a few regional centres, the impact of a ban would be broader than for the disadvantaged and could lead to significantly higher heating costs across regional Australia.

Local governments may still choose to introduce bans in situations where wood heaters are demonstrated to be a major contributor to poor air quality. For example, if a ban is applied to new housing areas, the measure could be inexpensive but instrumental in preventing new air quality problems from arising. Such outcomes have already occurred, such as in the Molonglo Valley of the ACT and Camden in NSW.

6.3 Impacts on stakeholders

The AHHA highlighted that it has undertaken a series of initiatives designed to reduce emissions and place the industry on a path towards delivering wood heating appliances that produce lower emissions, including initiating the updating of the Australian Standards.

[37] BDA Group. (2013). *Consultation regulation impact statement for reducing emissions from wood heaters*. Commissioned by the National Environment Protection Council. Canberra, Australia: Author. p. 137-138.

The Firewood Association of Australia (FAA) questioned the balance, accuracy and use of statistics and analysis of the Consultation RIS. It considered that the simpler and more effective way to reduce smoke emissions is through identification of high wood smoke emitters and carry out direct intervention procedures to change their behaviour. This could be through a mix of education, encouragement and enforcement. These intervention procedures should be guided and managed to allow for flexible, local implementation through the application of a nationally consistent regulatory framework.

Many submissions noted that poor operation of wood heaters was a significant factor that would determine the level of emissions. It was suggested that information programmes are only effective for the period when the issue is being pursued with the community, and the effect of the focus (efficient wood heater use) does not necessarily endure after the education programme ceases.

6.4 Other issues

Other issues raised in submissions included:

- that open fireplaces and/or wood heaters should be phased out;
- that the Federal government should set standards that state if an area's air quality is bad enough, or smoke-related health costs high enough, on an evidence-based scale, then wood heaters should be banned in that area;
- the need for controls and regulation on the sale and use of wood as fuel, the use of other toxic materials for fuel, compliance and enforcement for use of fuel for wood heaters and not permitting wood heaters tested on softwoods (as the softwood/hardwood tests are different);
- the need for strengthened testing procedures, covering agreed real-life test methods, and standards for softwoods; and
- the introduction of incentives to encourage homeowners to insulate their homes, to reduce the need for overnight burns.

6.5 Summary of Consultations

The main themes emerging from the consultations were:

1. that wood heater emissions are harmful to human health;
2. the continuing need for action to reduce emissions from wood heaters, particularly to address areas of greatest concern (locality, frequency and concentration);
3. the need for consistency across states and territories in the application of the standards, policies, programmes and practice; and
4. the need to continue to educate users about the standards and the correct use of wood heaters.

Further details on consultations undertaken are at Appendix D.

7 SUMMARY AND RECOMMENDATION

7.1 Summary of Options

The adoption of the new Standards and continuation of current polices of the states and territories (Option 1, No Policy Change) is likely to result in ongoing reductions in the level of emissions from wood heaters over the forecast period. This reduction is estimated to be 25 per cent or some 9,700 tonnes over 2015 to 2035.

The alternative options 2-4 share key measures - auditing, education, wood heater replacement incentives and in-service programmes. They all provide for the sharing of better practices across jurisdictions on a more consistent and systematic basis. Programmes effective in one jurisdiction would be able to be replicated in other jurisdictions through the sharing of policy, practice and procedural documentation and experience in implementation. This would provide for cost effective transfer of successful programmes while maintaining the ability to tailor for local conditions and priorities.

Relative to Option 2, Option 3 also includes a National Star Rating Scheme, while Option 4 incorporates elements of national co-ordination but excludes the National Star Rating Scheme. Therefore, costs (to industry and government) vary across the alternative options ranging from $41 million for Option 2 to $51 million for Option 3 (Table 7.1).

It should be noted that the quantified costs included in this section are indicative, and would depend on how the relevant programs are implemented.

Table 7.1: Present value of costs 2015 – 2035 ($m 2013)

Costs included in this table are indicative, and would depend on how the relevant programs are implemented. For details on the cost assumptions, see BDA Group. (2014). *Cost benefit analysis of national measures to control wood heater emissions* Prepared for the Australian Government Department of the Environment, December.

	Option 2 Better Practice	**Option 3 Better Practice and a National Star Rating Scheme**	**Option 4 Better Practice and National Co-ordination**
Costs to Industry*	8.6	8.7	9.9
Costs to Government	32.5	42.4	33.0
Total Cost	**41.1**	**51.1**	**42.9**

* Total maximum additional cost imposed by the option on industry, some or all of which industry may pass on to consumers

It is difficult to confidently predict the impact of each of the alternative options on further emission reductions (that is, on emissions over and above the no policy change scenario). However, given that further emissions reductions of around 0.1 per cent would deliver sufficient health benefits outweigh the costs outlined above, it is likely that each of the Options 2-4 would deliver a net benefit to the community.

7.2 Recommendation

The Problem Section identified the importance of addressing the 'leakage' in emissions that are likely to occur despite the introduction of stricter wood heater performance standards. In particular, poor compliance with performance standards and sub-optimal in-service use by consumers were considered likely to reduce the potential gains from the newly published performance standards.

Measures targeting in-service use were considered particularly important, given the fact that even with the introduction of new standards approximately 80 per cent of emissions over the next 20 years are likely to come from wood heaters certified to earlier standards.

All three options contain measures targeting poor compliance and in-service use that can be targeted to areas (urban or regional) where emissions from wood heaters have the highest health impacts. As such, all three options are likely to address in part the 'leakage' described in the problem section.

In addition to these measures, Option 3 includes a National Star Rating system for wood heaters that would guide consumers towards purchasing models with a higher certified performance. While arguably this would further reduce emissions, it does not directly impact the compliance and in-service performance issues identified in the problem section, and as a national program cannot be targeted to the geographic areas of highest concern.

Option 4, in addition to the measures described under Option 2, includes an agreement to develop nationally-consistent education programs, and a national audit of the industry based certification procedures. Again, these initiatives would arguably further reduce emissions, but the national elements of this option would not specifically be targeted at local emissions issues, which are covered by state-based initiatives.

The adoption of better practice across jurisdictions (Option 2) provides a set of clear benefits with modest cost and regulatory implications. It targets the problem of emission 'leakage' identified in this RIS, and can be tailored to take account of local conditions. Given the uncertainties around any additional benefits offered by Options 3 and 4 – and the fact that the implementation of the new wood heater performance standards are ongoing - It is recommended that States and Territories adopt the better practices evident across jurisdictions of stronger compliance and improved in-service measures (Option 2).

8 IMPLEMENTATION AND REVIEW

8.1 Implementation

The key measure affecting future air quality from wood heaters is the introduction of the new Standards from 2015. Irrespective of the accompanying measures, such as education programmes, the introduction of the Standard provides the basis for significant improvements in wood heater efficiency and lowering emissions.

More consistent and better co-ordinated activity across the states and territories, even where based on current better practices, will see substantial reductions on emissions from wood heaters. Significantly, this approach provides the greatest opportunity to gain national consistency through compliance and enforcement of the new Standards while retaining the flexibility for each State and Territory, where they consider it relevant and necessary to do so, to tailor solutions to meet local needs, such as has been evidenced in the programmes in Launceston and Canberra.

This approach includes continuing work under the proposed National Clean Air Agreement, within the context of the meetings of the Environment Ministers, to gain agreement on the definition of excessive smoke, and any further nationally consistent controls on modifications and installation of new wood heaters, and on second hand heaters. The Commonwealth, states and territories would work collaboratively to achieve these aims without the bureaucratic overlay of further Commonwealth regulation.

8.2 Review

Once the new standards have been fully implemented (after 2019), and the initiatives described under Option 2 in this RIS have been put in place, the effectiveness of these measures to improve compliance and in-service performance – and reduce emissions from wood heaters – will be reviewed. This is consistent with the COAG principle that to ensure regulation remains relevant and effective over time it is important that all regulation be reviewed periodically.

APPENDICES

Appendix A: Wood Heater Industry

Appendix B: Summary of Wood Heater Emissions Management across Australian Jurisdictions

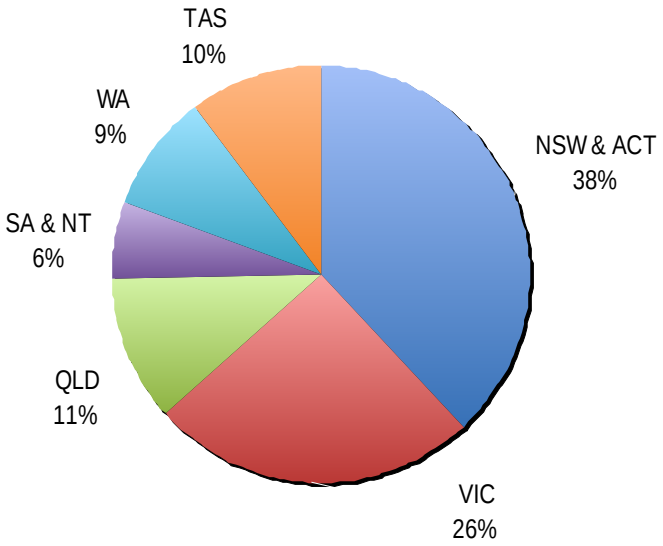
Appendix C: Examples of Jurisdictional Wood Heater Programmes

Appendix D: Consultation

APPENDIX A: WOOD HEATER INDUSTRY

Eighteen respondents to a manufacturer survey conducted in 2009 reported retail sales of 24,180 units in 2007-08 (up from 21,896 units in 2006-07). These sales figures include sales of imported units, estimated at around 6,000 units in 2007-08 (or around 25 per cent compared with around 15 per cent reported by the AHHA in 2005/06). Over 90 per cent of these are assembled units, with a small proportion requiring local assembly. Almost 50 per cent of imported units are estimated to come from New Zealand and around 20 per cent from China. More details can be seen at Figure 2.2 of the Consultation RIS.

Figure A.1: Retail Sales of Wood Heaters by State - 2007/08



Source: WalterTurnbull 2009

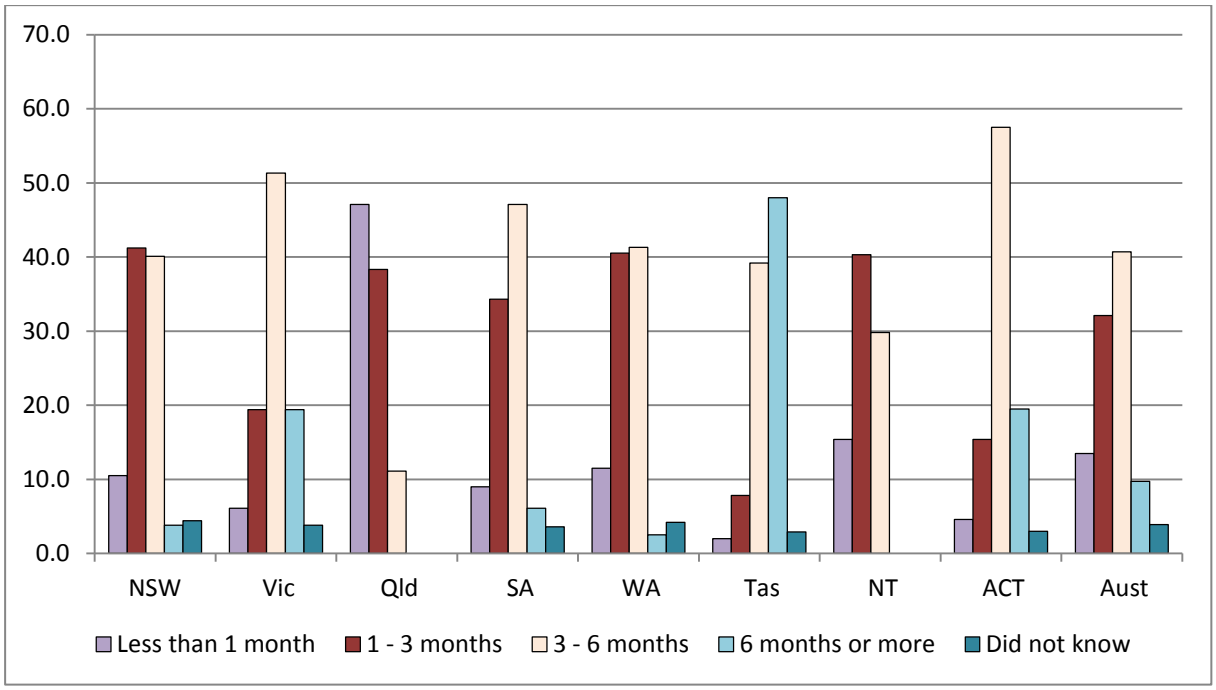
The following table summarises the characteristics of wood heater manufacturers reported by AHHA.

Table A.1: Characteristics of wood heater manufacturers

Characteristic	Annual turnover ($m)	Number of employees
Lowest	$0.1	2
Average	$11	60
Highest	$100	600

Figure A.2 shows how the months of heater use differs by state/territory.

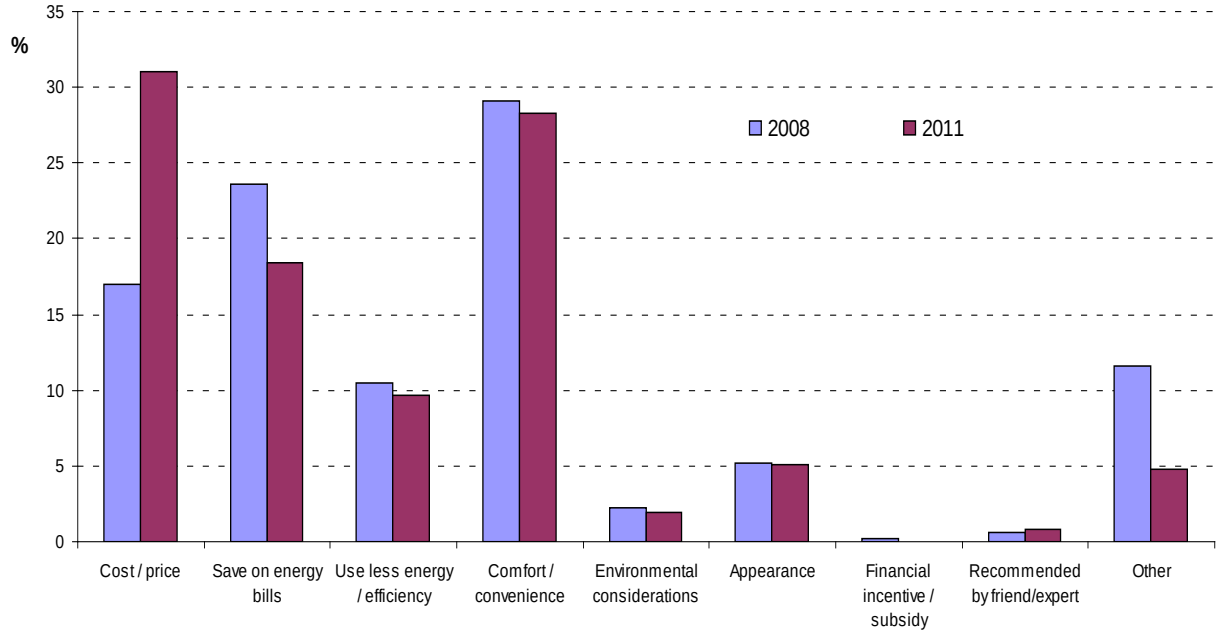
Figure A.2: Months of Heater Use (all Heater Types) by State - 2011



Source: ABS 2011

Figure A.3 shows the main reason for the selection of a heater by those households purchasing a wood heater in 2011 compared to 2008.

Figure A.3: Main Reason for Choice of Heater - 2008 - 2011



Source: ABS 2011 (Catalogue 4602.0.55.001)

In 2008, over 40 per cent of people reported the cost of heating as the primary reason for choosing a wood heater (24 per cent for ongoing savings and 17 per cent for a lower upfront price). As seen in the above graph, the key reasons expressed by households for their choice of heater in 2011 was cost, savings on energy bills or

energy efficiency, markedly up from 2008. There is anecdotal evidence gathered during the consultation process that indicated people were returning to wood heaters because of the increasing cost of electricity and gas prices [38].

Estimates of the annual cost of wood heating in selected locations are shown in Table A.2, along with recent estimates of the cost of firewood and wood use in each place.

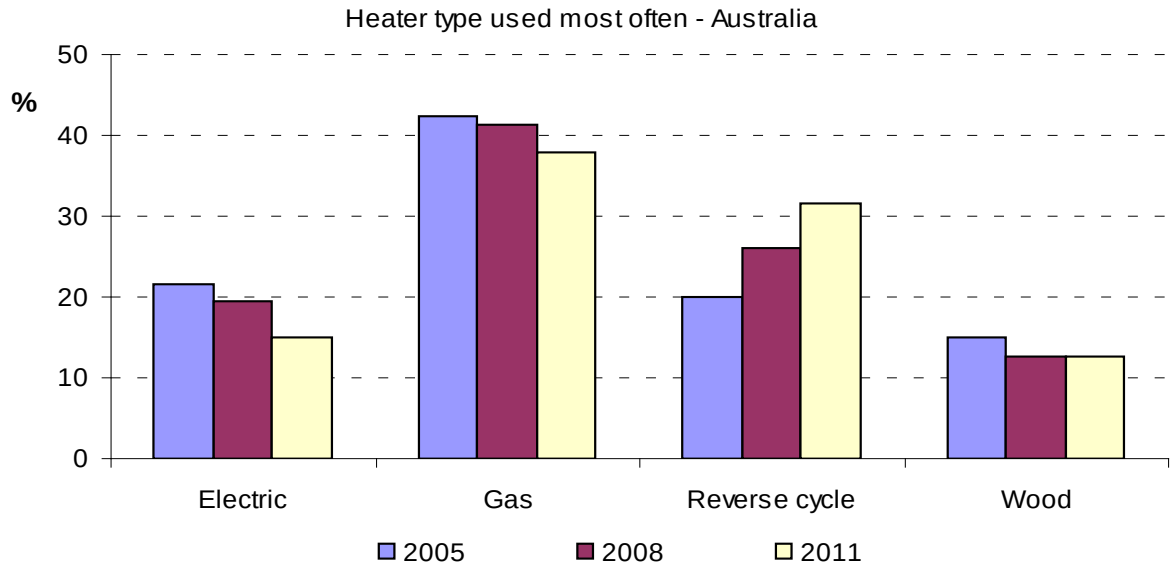
Table A.2: Estimated Annual Cost of Wood Heating per household, selected locations

	Price ($/tonne)	Wood use tonnes	Annual heating cost $
Tasmania	$145	5.6	$831
Sydney	$325	2.0	$636
Wagga Wagga	$230	4.2	$980
Melbourne	$333	4.0	$1,317
Perth	$254	2.0	$454

Source: Phone survey by the Australian Government Department of the Environment of firewood retailers in each location (Jan 2014)

The annual heating cost varies in different locations due to both differences in wood purchase costs and levels of wood use.

Figure A.4: Heater Type Use - Australia



Source: ABS 2011 (Catalogue 4602.0.55.001)

[38] (2013). *Consultation regulation impact statement for reducing emissions from wood heaters, Summary report of submissions*. Canberra, Australia: Author, p.5.

APPENDIX B: SUMMARY OF WOOD HEATER EMISSIONS MANAGEMENT ACROSS AUSTRALIAN JURISDICTIONS

	NSW	VIC	QLD	WA	TAS	ACT	SA	NT
Policy framework	Protection of the Environment Operations (Clean Air) Regulation 2010	Waste Management Policy (Solid Fuel Heating) 2004	Environmental Protection Act 1994 and Environmental Protection Regulation 2008	Environmental Protection (Domestic Solid Fuel Appliances & Firewood Supply) Regulations 1998	Environment Protection Policy (Air Quality) 2004 Environmental Management & Pollution Control (Distributed Atmospheric Emissions) Regulations 2007	*Environment Protection Act 1997*	No regulatory framework. Draft Code of Practice for Environmentally Responsible Wood heater Use 2005 recommends AS/NZS4013	No regulatory framework
Emission limit (current)	AS/NZS4013 (4 g/kg)	AS/NZS4013 (2.5 g/kg)*	AS/NZS4013 (4 g/kg)	AS/NZS4013 (2.5 g/kg)*	AS/NZS4013 (4 g/kg)	AS/NZS4013 (2.5 g/kg)*	Will adopt new standards	Will adopt new standards
Certification	Yes accepts national certificates of compliance	Yes accepts national certificates of compliance	Yes accepts national certificates of compliance	Only requires laboratory certificate	Yes accepts national certificates of compliance	Yes accepts national certificates of compliance	-	-
Standards for new sales	Yes	Yes	Yes	Yes	Yes	Yes	-	-
Regulation of used heaters	No	No	No	Yes	Yes	Yes	-	-

	NSW	VIC	QLD	WA	TAS	ACT	SA	NT
Regulation of installation	BCA requires AS2918 Also local council approval under LG Act 1993	BCA requires AS2918	BCA requires AS2918	BCA requires AS2918	BCA requires AS2918 Also Tasmanian appendix to BCA requires AS4013 Notify local Council under the Building Regulations 2004	BCA requires AS2918	BCA requires AS2918	BCA requires AS2918
Regulation of modifications	Yes	No	Yes	No	Yes	Yes	-	-
Regulation of firewood	No	No	No	Yes	No	Yes	-	-

	NSW	VIC	QLD	WA	TAS	ACT	SA	NT
Enforcement	Councils issue smoke abatement notices. EPA periodic audits of compliance plates.	Local government manages nuisance smoke	Local governments manage nuisance smoke. Councils issue smoke abatement notices and on the spot fines.	DER officer auditing of wood heater retailer labelling and sale of green firewood in wood yards. Councils resolve nuisance complaints	Local council manages excessive wood smoke EPA regulates manufacture, importation and retail sale	Firewood audits every 1-2 yrs. Reactive follow up of smoke complaints	Nuisance provisions, general env duty under AP Act 1993.	-
Recent education programs	Wood smoke reduction program 2013-2014.Council resource kits.		Council resource kits. Raising Community Awareness about the health effects of Burning wood in Residential Areas (CABRA).	BurnWise program resource guide and workshops to assist local government environmental health officers.	Burn Brighter this Winter (2012, 2013)	Don't Burn Tonight	The Woodside SmokeWatch Challenge Smoke is no Joke community awareness program	-

	NSW	VIC	QLD	WA	TAS	ACT	SA	NT
Recent buyback programs	RTA M5 East solid fuel heater buyback program 2006-2007. Wood smoke reduction program 2013-2014.	-	-	Wood heater replacement programs 2004-2006 Wood heater rebates 2008	Launceston City Council Wood Heater Replacement Program ended in 2013	Wood heater replacement program 2010	-	-

* existing regulations incorporate the most recent emission standard.

Source: Department of the Environment survey of jurisdictions - 2014

APPENDIX C: EXAMPLES OF JURISDICTIONAL WOOD HEATER PROGRAMMES

A number of jurisdictions offer rebates for replacing old wood heaters with less polluting heaters. Examples of programmes are described below.

ACT Wood Heater Replacement Program

The ACT Wood Heater Replacement Program [39] aims to reduce winter air pollution from wood smoke by offering a financial incentive for replacing an old wood heater with a new mains supplied natural gas heater.

The programme has been running since 2004. The ACT Government administers the program in association with ActewAGL who provide the funding for rebates paid. The programme offers a subsidy to eligible householders for replacing an old wood heater with a new mains supplied gas heater.

The subsidy is available only for replacing solid fuel wood heaters that are used as the main source of heating and are in the main living or occupational area of the home. The household must replace either an open fireplace or a controlled combustion wood heater.

A new ducted gas installation attracts a subsidy of $800 and a new flued gas installation a subsidy of $600. There are no additional subsidies for low income earners or pensioners. The existing solid fuel heater must be removed and taken to the Mugga Lane waste facility for recycling. For an open fireplace, the replacement heater must be inserted into the fireplace or the fireplace permanently disabled.

Environment ACT indicated that the rebate levels reflect the break-even cost to ActewAGL, who make available $100,000 each year for rebates (that have never been fully drawn on). The cost of programme administration, advertising and inspections to Environment ACT is around $40,000 per year [40].

Since the initial programme was launched in 2004, some 953 wood heaters have been replaced by the end of 2012 [41], while another 44 were replaced in 2013 [42] compared to some 250 in 2004, the first year of the programme. The declining uptake under the programme is perhaps not surprising, as based on ABS estimates of households in the ACT using wood as their main heating source, the reduction in wood heaters since 2004 is around 25 per cent [43].

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[39] ACT Wood Heater Replacement Program - Retrieved March 16, 2015
[40] Environment ACT. (2009). *Title of submission* [personal communication]
[41] Corbell, S. (2012, March 8). *Wood heater replacement program* [Press release]
[42] ACT Environment and Sustainability Directorate (March, 2014). Title of submission (personal communication).
[43] Note the ABS caution that their estimate of households using wood heaters has a relative standard error of 25% to 50%

NSW Wood Smoke Reduction Program

Councils throughout NSW can submit expressions of interest for funding from the NSW Government via the Environment Protection Authority (EPA) to participate in the Wood Smoke Reduction Program. Up to $60,000 is available for councils, with up to $100,000 for Regional Organisations of Councils for each successful application and for use in:

- community education programs about the health impacts of wood smoke pollution and how best to operate wood heaters;
- smoky chimney surveys by councils and appropriate educational/enforcement action; and
- targeted cash incentives to replace old, polluting wood heaters and fireplaces with cleaner alternatives.

This wood heater replacement component is similar to the ACT scheme. The NSW EPA, in collaboration with selected councils, provide incentives for the replacement of solid fuel heaters used as the main source of heating and in the main living area of homes. Any replacement heating system must be new and must adequately heat the same area as the existing solid fuel heater.

A $500 cash incentive is available to replace a solid fuel heater with an approved form of heating (electric or gas). In the case of pensioners and low-income earners, the rate is increased to $700. Where reticulated gas does not pass a property, pensioners and low-income earners can also access an incentive of $350 where the heater replacement is a slow combustion wood heater. All replacement heaters must meet AS/NZS 4013:1999 and council installation requirements.

To be eligible, the property must be located within the town limits in areas zoned for residential use. At the time of the new heater's installation, the existing solid fuel heater must be removed and deposited at a council disposal depot for metal recycling. For an open fireplace, the replacement heater must be inserted into the fireplace or the fireplace permanently disabled. The wood heater replacement incentives have been made available in a number of council areas including Dubbo, Campbelltown, Lithgow, Singleton, Blacktown City and Camden.

Launceston Wood Heater Replacement Program

The initial Launceston wood heater replacement program ran from 2001 to 2004, and was administered jointly by the Australian Government and the Launceston City Council. Since 2006/07, the Launceston City Council has run the program. Unlike the earlier programme, low emission wood heaters were excluded from the scheme because of uncertainty over their operation and maintenance in the long term. By 2010, some 500 wood heaters had been replaced under the programme with gas or electric heating systems [44]. The current programme run by the Launceston City

[44] Launceston City Council (2010).*Submission to the Australian government to fund the air quality improvement plan (including wood heater buyback program*

Council provides a one-off wood heater replacement incentive of $500. The following replacement heaters systems are eligible for the grant:

- fixed electric heaters with thermostatic controls
- night storage heaters
- natural gas heaters
- electric heat pumps, and
- bottle gas heaters with fixed flue.

Households must be within the urban area of Launceston. Grants are only available for the replacement of wood heaters (not including fireplaces) that are currently being used as the main source of home heating and are in the main living area of the household. Replacement heating equipment must be new and have sufficient output to be able to adequately heat the same living area as the existing wood heater. At the time of installation of the new heater, the existing wood heater must be presented for recycling at Launceston waste transfer station.

APPENDIX D: CONSULTATION

In March 2008, the EPHC agreed on the need for a nationally consistent approach to wood heater emissions management. An EPHC Wood Heater Reference Group was established to provide input to the assessment of options. The EPHC Wood heater Reference Group was chaired by the Commonwealth Department of the Environment and included representatives from environment agencies from all jurisdictions except the Northern Territory. The New Zealand Ministry for Environment was also invited.

The National Environment Protection Council engaged a consultant to prepare the consultation Regulation Impact Statement. The project team consulted with a range of stakeholders during the preparation of the Consultation RIS, seeking information and perspectives on a range of options for reducing emissions from wood heaters.

The Consultation RIS was released on 11 April 2013 to facilitate formal public consultation and enable all stakeholders, including the broader community, to respond to the options presented and the analysis of their costs and benefits. Public input on the Consultation RIS closed on 15 July 2013 and 59 submissions were received. During the consultation period, eight public meetings were held to explain the contents of the Consultation RIS and encourage submissions from interested parties. The public meetings were held in four metropolitan centres and four regional centres and eighty people in total attended:

- Metropolitan meetings: Sydney, Melbourne, Adelaide, Perth
- Regional meetings: Tuggeranong (ACT), Launceston, Armidale, Wagga Wagga

The 59 individual submissions received plus a report summarising these documents was made available on the Standing Council on Environment and Water website.

A list of stakeholders consulted, both in the early stages and during the formal consultation period is at Table F.1.

Table F.1: Stakeholders Consulted

Stakeholder Group	Stakeholder
Jurisdictions	ACT Environment and Sustainable Development Directorate NSW Environment Protection Authority Victorian Environment Protection Authority QLD Department of Environment and Heritage Protection SA Environment Protection Authority TAS Environment Protection Authority

Stakeholder Group	Stakeholder
	WA Department of Environment and Conservation NZ Ministry for the Environment
Industry	Australian Home Heating Association Barbeques Galore AF Gason Shamic Sheetmetal Pecan Engineering Firewood Association of Australia ACTEW Master Builders Australia Housing Industry Association Building Designers Australia Association of Building Sustainability Assessors Energy Supply Association of Australia Energy Networks Association
Local Government	Australian Local Government Association Local Government NSW Municipal Association of Victoria Local Government Association of Tasmania Local Government Association of NT Local Government Association of Queensland West Australian Local Government Association Armidale Dumaresq Council Launceston City Council Wagga City Council Tuggeranong Community Council

Stakeholder Group	Stakeholder
	Belconnen Community Council North Canberra Community Council Woden Valley Community Council Weston Creek Community Council Queanbeyan City Council
Federal Agencies	Environment Health Committee, Office of Health Protection, Department of Health and Ageing Department of Resources, Energy and Tourism Department of Climate Change Prime Minister and Cabinet Customs Department of Infrastructure and Transport Department of Foreign Affairs and Trade Treasury Australian Competition and Consumer Commission Department of Agriculture, Forestry and Fisheries Department of Innovation, Industry , Science and Research Department of Families, Housing, Community Services and Indigenous Affairs
Other stakeholders	ECO Energy Options Pty Ltd Standards Australia CS-062 Committee members Clean Air Society of Australia and New Zealand (CASANZ) Australian Air Quality Group (Dorothy Robinson) Individual representations

Also taken into account in this RIS are the recommendations and findings from the Impacts of health of air quality in Australia report [45] of the Standing Committee on

[45] Impacts of health of air quality in Australia report - Retrieved March 16, 2015

Community Affairs (the Committee) handed down on 16 August 2013.Two recommendations specifically address wood heater emissions:

Recommendation 12 - that Australian Governments immediately adopt minimum efficiency and maximum emission standards for all newly installed wood heaters in Australia.

Recommendation 13 - that local councils continue to manage the use of wood heaters in their own jurisdictions through the use of bans, buy-backs, minimum efficiency standards, and other mechanisms as appropriate to protect the health of their local communities.