AUSTRALIAN HOME HEATING ASSOCIATION INC.

A Second Supplementary Submission to the Community Affairs References Committee

Impact on Health of Air Quality in Australia Inquiry

July 5, 2013

Contents

Dr Ian Holland
Committee Secretary
Senate Standing Committees on Community Affairs
PO Box 6100
PARLIAMENT HOUSE
CANBERRA ACT 2600

Dear Dr Holland,

On behalf of the 200 members of the Australian Home Heating Association, and the 10,000 Australians who depend on our industry for their livelihood, we are pleased to supply supplementary information to the Senate Community Affairs Reference Committee.

This supplementary information relates largely to the line of questioning taken by Senator Di Natale regarding AHHA activities in the five years since Standards Australia ceased investigating reducing the emissions threshold and increasing the efficiency rating for emissions from wood heating appliances.

We have provided an excerpt from the transcript to outline the matter raised by the Senator.

> **Senator DI NATALE:** In 2007, the standards committee expressed concern that the testing does not actually reflect how these units operate and you have said that you think that is a legitimate cause for concern. If you are so concerned, why have you not done any work on this in the past five years? Why has the industry not sought to develop that sort of test? That is five years ago and we still do not have a test. It does not sound like the industry has even done any work to get us closer to that. Why has that happened?
>
> **Mrs Brown:** Because that is a process that needs to go through the standards committee. I agree, that the industry—
>
> **Senator DI NATALE:** You are working on improving standards, independently—you have used the words self-regulation on a number of occasions—so why is this not an area for self-regulation?
>
> **Mrs Brown:** I think it is.
>
> **Senator DI NATALE:** Why have you not done any work on it over the past five years?
>
> **Mrs Brown:** The cost is so significant for the industry to go down that path, not knowing where the Commonwealth or state jurisdictions are coming from. We have not been able to gain any solid discussion on their requirements. For the industry—at a significant cost for testing and doing research and development—to think, 'Okay, let's start working on all these test methods', and to put money towards it and to complete what we believe would be a good result, only to have the Commonwealth and state jurisdictions come back to us and say, 'Well, no, that's not good enough, we want something else', the cost to the industry would be quite significant. It is detrimental to the industry to do that.

We appreciate the opportunity to correct the record and ensure the Committee is aware of the AHHA's activities during this period.

Demi Brown
General Manager
Australian Home Heating Association

Matters requiring clarification/correction

1. In the time between 2007 and 2012, the AHHA has been involved in a series of initiatives designed to reduce emissions and place the industry on a path towards delivering wood heating appliances that produce lower emissions.

In no specific order, these activities include:

- Leading a two and a half year process to develop a Nationally Accredited Training Course for installers of wood heating appliances. This course is now being delivered by RMIT in Melbourne.

- The AHHA had lodged a proposal to Standards Australia to change the emission requirement of the current Standard AS/NZS4013:1999 from the current 4g/kg to 2.5g/kg and introduce an efficiency of 55%. This proposal has been accepted and the CS-062 Standards Committee is working towards changing this standard.

  AHHA was a joint partner in the Australian Government Rural Industries Research and Development Corporation, Research Project with the University of New England. This project was conducted over a 3 and a half year period and focused on reducing emission levels in the Armidale (NSW) area.

- More information on this can be obtained from Professor Don Hine PhD, School of Behavioural, Cognitive and Social Sciences, University of New England can confirm our involvement on 02 6773 2731.

- The AHHA was a joint partner with the South Australian EPA for the two SmokeWatch Programs held in the Adelaide Hills and Mount Gambier, South Australia. http://www.epa.sa.gov.au/xstd_files/Air/Brochure/woodheating_brochure.pdf

- The AHHA presented a White Paper to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities with no response received on the suggestions included in the paper. Industry has requested responses to the development of the RIS yet the department was not forthcoming, only to advise it is being worked on and explained the change in the Environment Protection Heritage Council Committee and this will take time.

- To date we have not had any acknowledgement from the department on the two documents presented. These were also provided to NSW EPA offices with no response.

  Both documents are attached in Appendix 1

- The AHHA has provided Free inspection services to councils to combat wood smoke complaints – 99% of these complaints have been corrected through inspection, education and understanding of requirements to use wood heating appliances. Warming notices have been issued by some (NSW) councils and our understanding is that only one court notice was issued after failing to reduce emissions.

- The AHHA has offered its services to EPA Tasmania to work together with them on their “Burn Brightly this Winter” campaign. The department requested copies of the “Clear Skies” DVD which is an educational DVD showing consumers how to operate their wood heater correctly. The AHHA was happy to provide these to the department for distribution.

2. Further to the discussion related to lowering emission requirements of wood heating appliances which was raised at the Standards meeting of 2007, we offer the following minutes of the meeting which clearly state the industry representative was provided with two weeks with which we could consult with industry and return to the Standards Committee with a response.

These minutes were tabled at the Senate Inquiry.

5.1 Item No. 1: Resolution of comments of Doc No CS-062-R0026 and R0028:

DR 06661 CP - Project No: 4215 - Domestic Solid Fuel Burning Appliances - Method for Determination of flue gas emission.

The committee discussed and resolved the comments of the above DR06661CP as follows:
https://committees.standards.org.au/COMMITTEES/CS-062/PRIVATE/R0031/CS-062-R0031.DOC

5.1.1 Clause 7.1

The Committee extensively discussed the need to reduce the emission limit further from current specified 4g/kg. Discussion centred on the lack of change to the standard since 1999 in light of multiple submissions from members and the general public calling for a reduction in the particle emission factor.

The committee agreed that this was overdue given the that any change as a result of work being progressed by the sub-committee on real life emissions would realistically require another five years before adoption. The committee agreed to a reduction to 3.0 g/kg with the majority further in agreement that 2.0 g/kg was more
appropriate.

ACTION: Industry representative to consult the manufacturers to consider reducing the emission limits to 2 g/kg. PM to circulate the notification non-attending member about this decisions and requesting to seek the view of the industry to reduce the emission limit to 2g/kg.

{PM Note: The resolutions of Comments and the Committee decision to reduce the emission limit to 3g/kg were circulated. The industry representatives were informed to report back by 5th April (within 2 weeks of circulation of e-mail) regarding the view of the industry on this further reduction of emission limits to 2 g/kg}.

In addition to this, the committee further proposed to introduce a minimum efficiency of 50%. This is simply a ‘backstop’ provision to ensure that emissions reductions are not achieved at the expense of operating efficiency (in some instances it may be possible to significantly increase air flow to reduce emissions).

We would therefore submit that it is inappropriate for any witness or committee member to suggest that the industry vetoed discussions about tighter regulations for wood heating appliances.

3. The spokesperson for the Australian Air Quality Group, Dorothy Robinson, made several statements to the Senate Committee regarding the effectiveness and outcomes of the Libby Montana change-out program.

The AHHA is unsure which submission she is referring to but we obtain all our information direct from the source.

Attached in Appendix 2 are the results of the Change Out program released May 2013.

4. With respect to placing "Health Warnings" on units or manufacturers operating instructions.

The AHHA has made enquires and has been informed it is the responsibility of the ACCC and not the position of the CS-062 Technical Committee to advise or request such warnings on appliances.

There are no requirements for health warnings to be placed on gas or electrical heating appliances. We would therefore respectfully ask why are wood heating appliances being targeted for such an initiative?

Appendix 1

Woodheater Consultation
Regulation Impact Statement

Prepared By

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Submission date: May 18, 2009

Introduction & Purpose

The purpose of this submission is to inform the preparation of the Woodheating Consultation RIS by offering woodheating industry insights which may not be available elsewhere.

We understand that the drive to a national framework for the management of wood smoke is in part due to the frustration of all stakeholders from the delay in achieving regulatory headway. Our objective is to assist resolve these delays and move forward.

Specifically, the purpose of this submission is:

- fundamentally to support the move to a national wood smoke management scheme;
- to offer advice as to the most productive opportunities for improved management within the current management structures; and
- to provide considerations to assist the design of new management schemes which we believe are manageable and sustainable for all stakeholders

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Executive Summary

The woodheating industry fundamentally supports the introduction of a national scheme of wood smoke management. A major proviso is that if the management scheme extends to the setting of performance requirements, either emissions or efficiency, then industry must be represented at all stages of consideration.

We point out a number of avenues for the reduction of wood smoke which are available within current management structures:

- We believe that relying on development of Australian Standards will not bring about needed change in any reasonable timeframe.
- The current certification scheme is ripe for enhancement using the domestic gas appliance industry as a model. Most importantly, the industry would seek to acquire JAS-ANZ certification to provide independent oversight and accountability to the scheme.
- Current laws in place are frequently not enforced due to lack of resource on the part of the relevant jurisdictions. Reports by AHHA of non compliant woodheaters being sold have not been followed up. It is clear that any new scheme is destined to disappoint unless the means to enforce are properly established.
- Extending the woodheater changeout programmes, with owners of uncertified heaters offered incentives to upgrade to cleaner forms of heating, including certified woodheaters. This has convincingly been shown to produce the most favorable outcome.
- Extending community education targeted to specific individuals that are causing wood smoke at nuisance levels has also been shown to produce quick decisive reductions.

Moving to a national management scheme of course requires careful consideration at the detail level. The most significant consideration outside the issue of legal enforcement is whether the management body would set mandatory performance standards, and if so, what would be the mechanism by which those standards were set. In particular, the woodheating industry submits

- It would be possible to move quickly and with minimal disruption to emission levels of 3g particulates/kg fuel burnt, down from 4g/kg as currently required. At present, around 2/3 of available heater models already achieve this.
- Any further reduction would require substantial investment in both R&D (2-3 years) and testing (at least 2 years), since we believe a new technical approach would be needed to achieve widespread reductions in emissions.
- Due to the radical (80%) contraction of the industry since 1990, few companies would have the margins to support any significant R&D effort. A national R&D effort funded jointly by the industry and the public would be the most equitable and lowest risk means of achieving the necessary R&D outcomes.

Finally, we point out that any significant reduction in the supply side of the woodheating industry will impact regional centres more heavily than major cities, and will almost certainly result in higher uptake of electric heating, with emissions from coal fired power plants attributable to the extra heating load likely to rival those of the woodheaters it has displaced.

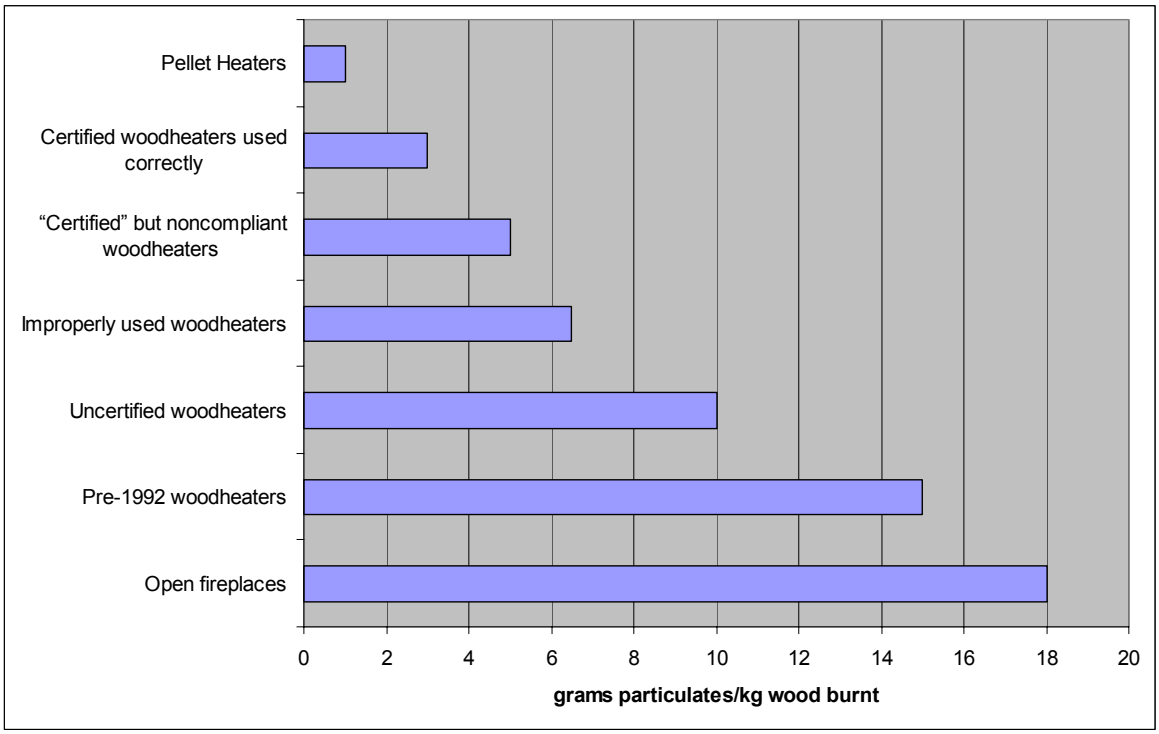
Sources of Wood Smoke

A useful starting point is a view of the most significant causes of wood smoke

- Open brick fireplaces
- Pre-1992 woodheaters
- Uncertified woodheaters
- Improperly used woodheaters
- "Certified" but noncompliant woodheaters

In assessing the impact, positive or negative, of any proposed management options, it is worth quantifying each of these:

- Emissions per unit
- No of units
- Susceptibility to management control



Average wood smoke emissions per unit for the major species of woodheating appliances.

In assessing the impact, positive or negative, of any proposed management initiatives, we need to be guided by the opportunities for greatest reduction potential. All initiatives in this submission refer to these distinct species of wood smoke origination.

Scope Within Current Management Options

Existing management structures have not led to sustained improvement. This leaves scope for 2 complementary courses of action:

- Improve implementation and effectiveness of current management structures
- Introduce expanded national wood smoke management measures

This section details our insights into the potential for current management structures to deliver sustained air quality improvement. In general, these suggestions can coexist with any new management structure.

Current Australian Standards

The major standards, published by Standards Australia ("SA") are:

- AS/NZS 4013:1999 - Domestic solid fuel burning appliances - Method for determination of flue gas emission
- AS/NZS 4012:1999 - Domestic solid fuel burning appliance - Method for determination of power output and efficiency
- AS/NZS 2918:2001 - Domestic solid fuel burning appliances – Installation
- AS/NZS 4014.1:1999 - Domestic solid fuel burning appliances - Test fuels - Hardwood

As can be seen from the publication date of these standards, they are overdue for revision. However, there are significant hurdles to overcome for this situation to be redressed.

- ***Committee has disbanded:*** The committee largely responsible for the development of these standards, the CS-62 committee, effectively disbanded some years ago and may no longer be constituted as a Standards Australia committee. A replacement committee would need to be reformed with the required balance of interest from all stakeholders for the ongoing refinement and maintenance of these standards.
- ***Net Benefit Issues:*** It is unclear whether the maintenance of these standards would meet SA's net benefit criteria for the organisation to resume management of the standards.
- ***Standards Development Backlog:*** There is currently a significant backlog of standards development within many industry sectors, which is related to SA's new business model.
- ***Standards Development Organisations ("SDO's"):*** SA as an organisation is moving away from its active role in assisting the development of standards, preferring instead to accredit Standards Development Organisations which will take over the development workload and management of standards. SA will continue to publish and sell the standards under their recognised brand. Setting up such an entity is clearly the fastest route to developing the required standards, but will need to be independently funded.
- For such an organisation to be accredited, it will need active support of other stakeholders. The most readily available body is the AHHA, but it is highly unlikely that the state EPA's will support this.

Recommendation

For these reasons, we regrettably conclude that the current method of developing standards is an unreliable vehicle for effecting useful change.

Scope Within Current Management Options

Enhancing The Current Certification Scheme

The current certification scheme administered by AHHA has been in place since 2001, when the previous administrator of 7 years, Energy Information Centre South Australia, advised they were no longer able to continue the service.

The scheme provides for certification of woodheaters once they pass AS4013 testing at one of two NATA certified laboratories, one of which is owned by the Association.

The scheme also provides for Design Specification Tests every 3 years, where an audit is carried out on a certified heater to ensure that units produced are equivalent to the design which was certified. Manufacturers or importers of heaters which fail the audit are advised and given an opportunity to bring their heaters back to a compliant state.

Opportunities

JAS-ANZ Certification: The current scheme lacks independent oversight which we believe is necessary to keep any certification scheme robust and transparent. The AHHA is investigating having its certification and auditing function being accredited by JAS-ANZ (Joint Accreditation System of Australia and New Zealand). This will bring the scheme into line with other successful industry led certification schemes such as is found in the domestic gas appliance industry.

Production Sample Verification: The AHHA will require an applicant to present a randomly selected production sample to an AHHA auditor to confirm that the model produced is identical to the model tested.

Annual Audits: The AHHA propose that we move to a scheme of random annual audits:

- An independent body nominate from the certified model database those models which will be subject to DST.
- A subcontracted auditor will choose an individual unit preferably from a warehouse or from a retail outlet if required.
- The auditor will conduct the audit to verify that the unit as stocked conforms to the specification which was tested and certified.
- Non-conformances will be divided into 3 categories based on their likelihood to affect either safety or emissions:
    - administrative/cosmetic,
    - moderate, involving changes that may affect safety or emissions, such as unclear warning labels or changed external paneling
    - serious changes that are almost certain to affect safety or emissions. These cover most internal firebox, baffling or air system alterations.

We recommend at least 20% of all models be audited in any year, to maximize the disincentive for any manufacturer to play the probabilities.

These measures will greatly mitigate the problem of woodheaters that are "certified" but which do not comply with current emissions standards because of post-testing design changes.

Recommendation

The domestic gas appliance industry provides a readily available model that can be readily adapted to drastically reduce an entire species of wood smoke origination.

Scope Within Current Management Options

Enhancing Levels of Legal Enforcement

Any certification scheme is effective only to the extent that it is legally enforced. This is clearly a major opportunity for improvement.

The AHHA has been concerned for some time at the lack of regulatory enforcement of the current woodheating certification scheme. There are several documented cases where we have notified the state EPA of woodheaters for sale that have either not been certified or which substantially differ from their certified design. In each case we either do not receive a reply, or are told there simply isn't the resource to investigate and follow up.

By comparison, the domestic gas appliance industry relies heavily on the state technical regulators such as Energysafe Victoria to provide retail level surveillance, incident investigation and most importantly legal enforcement of relevant standards compliance. The activity of these bodies provides a substantial disincentive to the supply of nonconforming product.

Introducing any new framework, no matter how desirable on paper, is pointless until enforcement issues are overcome. For obvious reasons relating to separation of responsibilities, this is an area where an industry body such as ours (which is owned by its member manufacturers and which administers the certification scheme) should be specifically excluded.

We believe this has been insufficiently addressed in the cost benefit analyses that have been presented so far.

Recommendation

The simplest option of enforcing current legislation offers the fastest payback, the lowest political risk, the simplest implementation and when combined with other initiatives, has the highest beneficial leverage.

Scope Within Current Management Options

Extending Woodheater Changeout Programmes

Although expensive and labour intensive in the short term, there is evidence they can provide the most effective solution to localised air quality problems because they target the most significant cause – pre-1992 heaters..

Our experience has been that changeout programmes differ in their effectiveness for several reasons:

- Usually incentives are limited to gas and electric alternatives, which will specifically exclude the majority of active users who will prefer to stay with wood. In addition to a high degree of satisfaction with wood heating among existing users (implying a reluctance to change), larger families and low income earners are vulnerable to the higher costs of heating their home with alternative fuel sources
- Many of those that elect to take up the alternative are not using their woodheater as the primary means of heating. They are using an underutilized woodheater to effectively purchase a new form of heating at public expense. This results in negligible wood smoke reduction.
- Anecdotal evidence suggests that many of these programmes suffered from insufficient follow through, where some of the heaters removed were reconditioned and resold by unscrupulous tradespeople, which further compromised the net air quality benefit.

2005-2007 Libby Montana Changeout Programme

The well publicised changeout in Libby Montana 2005-2007resulted in

- 1130 pre 1992 woodheaters being replaced by EPA certified models.
- 28% reduction in outdoor particulates (source: EPA and Montana Dept of Environmental Quality)
- 72% reduction in indoor particulates (Source: University of Montana, Center for Environmental Health Sciences)

This programme, like similar other successful initiatives, involved a partnership between industry, local councils, the EPA and local residents.

1998 Armidale Changeout Programme

Armidale Dumaresq council managed two separate changeout programmes with significantly different takeups:

- 1998 - Administered by the Australian Home Heating Association, and funded with $30,000 for promotion from the AHHA and $200,000 in loan funds from Armidale council. The event was run over a single weekend, February 28 - March 1, 1998. Consumers were given interest free loans to replace a pre-1992 heater with a modern, low emissions heater. As a result of that single weekend event, approximately 80 heaters were replaced, and all funds were taken up.

2002 Armidale Changeout Programme

Administered by the Environment Protection Authority along with the local councils of Armidale, plus other participating councils with funding from The Environmental Trust through the EPA's Clean Air Program. It was run between February and September 2002.

The following replacement heater technologies attracted a cash incentive of $500 ($700 for pensioners or low-income earners):

- Fixed electric heaters with thermostatic controls
- Night storage heaters
- Fixed flued gas heaters
- Fixed flued oil heaters
- Electric heat pumps
- Reverse-cycle air conditioners
- Ducted gas central heating
- Solar (passive and active)
- Pellet fires

According to their report, during the 7 months, 106 applications were received by Armidale council, of which 81 proceeded to being submitted claims.

The reasons given for the low opt-in rate were instructive:

- The cost of removing old heaters and patching up walls and ceilings consumed far too much of the incentive.
- The alternative forms of heating offered were either too expensive to run or were otherwise inappropriate to many applicants:

Recommendation

Changeout programmes result in substantial removal of pre-1992 woodheaters when users are given a wide choice of modern woodheaters as an upgrade path, and follow up is used to ensure proper disposal of old units.

As a policy tool within existing management structures, changeout programmes specifically target the worst offending contributors to wood smoke generation and accumulation.

Scope Within Current Management Options

Extending Community Education

Any wood smoke management initiative by necessity will rely on user awareness and education to achieve its objectives.

In general, the main issues with incorrect use of woodheaters include:

- Using wet or unseasoned timber
- Overloading heaters with fuel
- Shutting down the primary air supply before the firebox reaches efficient burning temperature, as a means to extend burn times through the night.
- Burning household refuse
- Poor maintenance practices

It has been found that general, broad based education programmes are not a cost effective means of changing user behaviour.

However, pamphlets and advice targeted towards known offenders has been shown to be cost effective. This is the only feasible means of controlling a major species of wood smoke generation: incorrect use of certified heaters. The practice mirrors a similar program where owners of noisy dogs receive educational material to help the individual take steps to resolve the problem.

We acknowledge that nuisance smoke is outside the scope of the current RIS; however it is worth acknowledging that there is still scope for air quality improvements within current management structures which will help achieve the overall goals of the enquiry.

Recommendation

The current practice of councils sending pamphlets to individuals with an identified wood smoke issue should be extended, and pursued more actively.

Restriction of Sale of Spare Parts For Pre-1992 Heaters

Most manufacturers support the cessation of spare parts sales to all uncertified models prior to 1992 to encourage their removal from circulation. The industry would also consider the cessation of spare parts supply for pre-1999 heaters after 15 years.

We accept that this may in some cases have the adverse effect of encouraging do-it-yourself repairs in cases where the owner is determined not to upgrade, though we believe that the net effect will be positive.

National Management - Considerations

The AHHA supports the introduction of a national, legally enforced scheme for the management of wood smoke. In view of the issues already described, it must be consistent across all states and territories, and be consistently enforced.

The *potential* benefits to the public in general and to our industry in particular, are tangible and easy to identify.

However, the *realised* benefit to stakeholders of any introduced management depends very much on the form which it would take. It is not possible to separate considerations of benefit from considerations of structure.

In this section we outline suggestions and concerns that hopefully will assist policy writers draft the final proposal.

Industry Participation in Setting Performance Standards

The current mechanism for effecting improvements to required performance via the traditional standards development process has failed to deliver any change in over 5 years. Due to fundamental philosophical changes at Standards Australia, this situation is set to continue indefinitely.

However, the prospect of government agencies unilaterally setting performance standards is unacceptable at every level.

We understand that any proposed changes to performance standards must go through the usual RIS process; however, this is clearly too late in the process to be useful. Industry must be consulted in the earliest stages of determining changes to performance levels to ensure time is not wasted on initiatives already known to be infeasible, or unattainable within the expected timeframe.

This is particularly true where test methods are concerned. The development of robust test methods requires input from several sectors:

- Most importantly, testing professionals who have a native understanding of testing variables and uncertainty, as well as available technologies
- Certification representatives, who see the results of conformance failures, and are in constant contact with all manufacturers, in particular those who struggle to achieve certification.
- Manufacturer representatives, who can provide some commercial insight into the process.
- Academic input, where available, to provide insight into emerging or best practice technologies.

Recommendation

In order to ensure industry consultation at the formative stages of expected performance level policy change, we recommend a formal structure allowing industry input and participation.

Bearing The Cost of Performance Improvement

Cost/Benefit Separation of Improving Performance

Cost benefit analyses presented thus far have, as is understandable, netted out all costs and benefits to a single figure of overall community benefit, which ignores the necessary structural issue that the costs accrue entirely to manufacturers and the benefits to users (in lower wood use) and to the community at large in improved air quality.

In addition, since the major cost will be around 18 months of Research & Development, followed by up to 2 years of product testing, there is a significant lag between the occurrence of costs and benefits. This time lapse negates any argument about the ability of manufacturers to simply pass these costs on to the consumer. Rather, these costs will be borne by each manufacturer for an average of 2-3 years before being recouped. A number of manufacturers will not survive this process.

Industry Economics

In brief, within the AHHA alone, there are 21 manufacturers

With the exception of Barbeques Galore which owns around 30% of the Australian market, all companies are small, privately owned or family operated businesses.

15 companies produce less than 2000 units per year.

The industry has dropped from a peak of 120,000 units pa in 1988 to around 25,000 units pa average over the last 3 years. In other words, the woodheating industry has contracted almost 80% from the time when the initial burst of R&D was undertaken to implement the then radical changes of AS4013:1992..

Per unit wholesale margins on woodheaters are generally fairly robust when compared to the general domestic appliance industry. However, the low volumes achieved by most companies leaves inadequate capital to fund a sustained R&D effort.

Lessons from the 1999 Change to Emissions Standards

In 1999 the maximum allowed particulate emissions was reduced from 5.5g/kg (where it had been since 1992) down to 4g/kg. A phase-in period of approximately 2 years was allowed.

There was some industry restructuring as smaller, marginally profitable players either went out of business or were bought by larger participants. Saxon in particular was a major employer in the Tasmanian town of Campbelltown. Unable to survive independently, it was purchased by Barbeques Galore in 2001, and the operation was moved to Sydney. Two senior employees were relocated, the remaining workforce of 60 employees was made redundant.

After the initial restructure, total sales by industry recovered quickly, and a reasonable continuity of supply was maintained.

Although retrospective assessments differ, the general consensus *among the remaining participants* was that the change was beneficial to the industry. This should not surprise for three vital reasons:

- Industry participants were actively involved in the development of the 1999 Standard.
- The change was significant but not beyond the known technical capacity of industry at the time
- Sufficient adjustment time was allowed

A New Technical Approach Is Required

The main avenues that have up to now been utilised for securing improvements in woodheater performance are near exhaustion. Essentially, wood smoke is reduced by maintaining high temperatures in the firebox and introducing preheated air to maximise combustion of particulates in combustion gases prior to escape as flue effluent. These higher temperatures come at a cost of efficiency – the hotter the gas escaping the flue, the more heat is wasted, effectively as thermal effluent.

Improvements over the last 5 years have largely borne out this tradeoff. With few exceptions, low emissions heaters tend to be lower efficiency heaters within any given market segment. Improvements in one variable for any firebox design tend to come at the expense of the other. The implication is that a move to lower emissions will often result in higher fuel usage for the same heat output.

It is clear that new R&D approaches are needed to break through this barrier, which will substantially increase the cost of future R&D due to

- higher levels of technical uncertainty and risk, resulting in more prototype production and increased testing
- the requirement of more sophisticated engineering and scientific input.
- Longer timeframes to achieve commercially reproducible outcomes

Recommendation - Jointly Funded R&D

The foregoing suggests a strong case for industry wide R&D supported at least in part by public research funds and facilities, as a better alternative to individual proprietary efforts being duplicated to varying degrees of effectiveness by each manufacturer.

This effort is ideally carried out by universities where the availability of graduate research students provides a pool of dedicated low cost expertise. The research would be carried out with participation from industry participants, through secondment of technical expertise, contribution of workshop time or the provision of test models.

We can again look to the domestic gas appliance industry for a useful model of industry wide action:

- Levies would be imposed on manufacturers for the life of the research through the heater certification scheme, which unlike Association membership, would be compulsory and enforced under national management.
- To prevent the perennial problem of free riding and underreporting of heater sales, each manufacturer would be required to report a serial number range to the certification body.
- Audits would be carried out at retail level to detect unreported serial numbers or potentially duplicated serial numbers.
- Consideration for credit could be given to companies which contribute materials or expertise

There is still some potential for under reporting by determined free riders, as there is with any contribution scheme, but we see this as the most effective means to enforce and administer industry contribution.

National Management - Considerations

Timing Considerations

The woodheating industry considers regulatory change as necessary for the best interest of all stakeholders. We turn now to considerations of the pace of change.

Upgrades to performance standards that require R&D as well as new tooling will involve inevitable industry cost and dislocation. We believe there will be further industry rationalisation and closures of marginally profitable players whose volumes are too small to absorb further product development costs.

However, we are still confident that positive development can happen at a rate which will minimise negative impacts to industry, employment, and the supply of suitable product to the Australian market.

R&D Time

The general consensus is that 2-3 years is a reasonable timeframe to achieve the next level of improvement in woodheater performance.

Testing Time

There are only two laboratories in Australia which are certified to carry out woodheater performance testing. With over 240 models currently supplied to the market, and a capacity in each of the labs to test 2-3 heaters per month, the total time to effect any performance improvement will be at least 2 years, allowing for similarities between available models.

Staged Introduction Of Higher Performance Standards

We note that a majority of woodheaters are already rated with emissions at or below 3g/kg. Thus performance standards at this level could be introduced with minimal delay. If more stringent standards were to be agreed upon, then these would need to be implemented with allowance for the timing considerations described above.

The disadvantage of this approach of course is that for some manufacturers, this will involve double testing for units which are currently above 3 g/kg. The most likely outcome will be that these units will simply be taken off the market until a final performance target is established.

Wood Supply Considerations

The woodheating industry is concerned over the future course of performance standards that are based too closely on overseas models, in particular New Zealand.

The fuel most commonly available, and most commonly used in Australia, is hardwood, which by virtue of its higher density, burns more slowly but for a longer duration on average when compared to softwood. The New Zealand market, on the other hand, is dominated by softwood, which burns with a higher intensity.

This difference in fuel is the major reason for the difference in average emissions achieved by heaters in these two countries.

Consequences of an Industry Reduction

This section considers the impact of an industry contraction either due to commercially or technically unattainable targets or due to the imposition of overambitious timeframes.

Various cost benefit analyses have outlined the impact of industry contraction in a broad brush approximation. But these analyses finesse over uneven localised impacts.

Regional Impacts

All of the cost benefit analyses we have seen concentrate exclusively on major metropolitan air sheds, plus the exceptional cases of Armidale and Launceston. However, most woodheaters are sold in regional areas. The largest supplier to the Australian Market, Barbeques Galore, with a network of 30 metropolitan stores plus 50 franchisees in regional centres, reports a breakdown of close to 30% metropolitan and 70% regional sales consistently for the last 4 years.

Most regional centres have poor natural gas penetration. With LPG units widely considered uneconomic, the only alternative for most homes is electric heating, either direct resistive or heat pump. However, in the colder regional centres, this leaves two problems:

- Heat pumps are much less effective at colder temperatures
- Conventional resistive heaters are generally limited to 2.4 KW per unit.

The result for lower income families can be under heated homes. Apart from unnecessary discomfort, the health implications of this problem have not been factored into any cost benefit analysis.

Higher Uptake of Electric Heating

For most regional families, the only viable alternative will be electric heating, with two separate environmental consequences

- Carbon release from the burning of nonrenewable fossil fuels is significantly higher.
- It has been estimated that particulate release from many coal fired power stations is equivalent to that of certified woodheaters. Many of these power stations are close to urban centres. A recent example, a new power station proposed in the Macarthur region near Sydney, has generated a wave of negative community reaction (www.stopagl.com).

We understand that the terms of reference of this consultation RIS are focussed more on air quality than on the broader questions of carbon emissions and renewable energy. However, in terms of total cost and benefit to the community, these issues must be considered.

Other Initiatives

Controls On Sale Of Second Hand Heaters

The woodheating industry would welcome any effort to curb the sale of uncertified heaters on the second hand market. Although we acknowledge the difficulty in assessing the number of heaters sold in this way, anecdotal evidence suggests a large proportion of these are old and/or uncertified.

Controls on Installation

It has also been suggested that a certification scheme for installers may be worth pursuing. It has been the experience of most manufacturers that a large proportion of nuisance wood smoke cases have been due to improper installation, typically relating to flues too short, or insufficient allowance for neighbouring structures. A national register of certified installers would help to curb this problem.

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Woodheater Consultation

Regulation Impact Statement - Update October 2011

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Table Of Contents

Introduction And Purpose

This paper provides an update to the original submission to the RIS consultation process in May 2009. Since that time, the wood heating industry has moved forward to pro-actively and voluntarily introduce a new performance standard for all wood heaters.

Executive Summary

The industry has voluntarily proposed to introduce the following new performance standards for all wood heaters

- Emissions will be reduced from the current 4.0g/kg of wood burnt down to 2.5 g/kg
- A minimum efficiency of 55% will be introduced.
- Target implementation date of December 2013, significantly faster than the expected evolution of government-initiated requirements.

These initiatives fortunately coincide with a general growth in wood heater sales, following growing community concern over renewable energy, and the rising cost of gas and electricity.

While the expected cost to the wood heating industry is expected to top $5 million, a considerable sum for an industry largely composed of small, family run businesses, we have asked only for support in the following ways:

- Expanding changeout programmes to include new lower emission wood heaters, a proven way to ensure that these programmes are more effective at achieving their goal of removing older pre 1992 heaters from use.
- More vigorous enforcement of current and new standards
- The preservation of the current AS4013 endorsed single test to cover both inbuilt and freestanding heaters.
- A commitment from legislators that our industry will be consulted prior to the release of the first draft of any new legislation, to allow us to modify the initiatives proposed should additional burdens be placed on our manufacturers.

Our belief is that these new performance targets together with stronger government enforcement provides the most effective, equitable, and fastest way forward toward reducing wood smoke in the community while still providing consumers with a form of heating preferred by a large and growing percentage of Australians.

Proposed New Performance Standards

Our original RIS submission (May 2009) reported that the current method of developing standards was unreliable, due mainly to internal difficulties within Standards Australia, including an unworkable backlog, and the then stated move by Standards Australia away from actively developing standards in favour of promoting external Standards Development Organisations. In addition, the CS-62 committee which has traditionally had responsibility for maintaining the standard has been disbanded.

Positive Developments At Standards Australia Since 2009

Since our original submission, and largely as a result of new management, activity within Standards Australia has picked up markedly, with other similar committees (eg AG001 which deals with domestic gas appliances) reporting an acceptable rate of standards development within the traditional development framework.

The Australian Home Heating Association has thus approached Standards Australia to request that they

- re-establish the CS-62 committee, and
- assist with the following modifications of the relevant Standards, which are called up in legislation in most states.

Proposal 1: Voluntary Reduction of Emissions from 4.0g to 2.5g

The industry proposes to voluntarily introduce a reduction in the maximum particulate emissions from 4.0g/kg of wood burnt required by the current standard (AS/NZS 4013:1999), down to 2.5 g/kg of wood burnt. This represents a 60% reduction in emissions, a radical reduction in both relative and absolute terms.

The last reduction in emissions came with the development of the 1999 standard, when emissions went from 5.5g/kg down to 4.0g/kg, a 37.5% reduction. It will be appreciated that the effort and cost required to lower emissions increase dramatically as we approach the zero limit.

Proposal 2: Voluntary Introduction of 55% Minimum Efficiency

Although there is a standard to measure efficiency (AS/NZS 4012:1999), and efficiency is required to be reported on a heater's compliance plate, up to now there has been no minimum efficiency requirement for a heater to be certified.

The industry proposes that an efficiency level of 55% be introduced as a minimum requirement for certification. This, together with the emission level of 2.5g/kg quoted above, will form the performance baseline for all newly manufactured models.

Implementation Timing and Costs

Proposed Target Date: December 2013

The industry is prepared to commit to an implementation date of December 2013, after which time all heaters manufactured must comply with the new performance levels. Enforcement is greatly simplified by the requirement that all heaters bear a date of manufacture on the compliance plate.

Although there is always some stockholding carried between seasons, we envisage over 95% of this stock will be cleared the following season, leaving only the slowest moving models still in the system at a retail level.

We believe that this initiative will bring results faster than any government legislation, given the timeframe required for development of the legal framework, as well as the likely timing of its implementation in each jurisdiction.

Estimated Cost To The Industry Over $5 Million

More than 55% of the 263 currently certified wood heater models do not meet these new performance standards. As such, significant R&D will need to be invested to bring new compliant models to market. In terms of costing:

- Testing costs average over $13,500 per unit
- Cost of development and prototyping varies widely between companies, but averages around $20,000 per unit.
- New certification cost per unit is $200:
- Cost of artwork changes to brochures, instructions and other collateral can be applied at around $500 per unit (allowing for an average of 3 models covered in each brochure or instruction booklet, and that some collateral may already be due for reprinting, so the extra printing cost in these cases is zero)

This equates to over $34,000 per unit, or more than $5 million industry wide.

As stated in our original submission (May 2009), with the exception of Barbeques Galore which owns around 30% of the Australian market, all companies are small, privately owned or family operated businesses. In fact, 15 companies produce less than 2000 units per year.

As is well known, cash flow for many such businesses is chronically tight, and therefore this voluntary change will impact these businesses significantly. Indeed, this initiative is by far the single biggest issue facing these businesses,

Consumers Accumulate Most Of The Benefit

These expected outlays will be seen as a cost to stay in business; in other words, the high investment is unlikely to result in any net sales increase for the industry. Tight competition will prevent any but a small percentage of these investment costs being passed on to consumers in the form of higher prices, and even these small increases this materialise only 2-3 years after the initial outlays, given the time lag between the initiation of development and bringing a product to market.

It is clear that the greatest part of the benefit of this investment will flow directly to the consumer in lower wood usage, and to the community as a whole in providing cleaner air space.

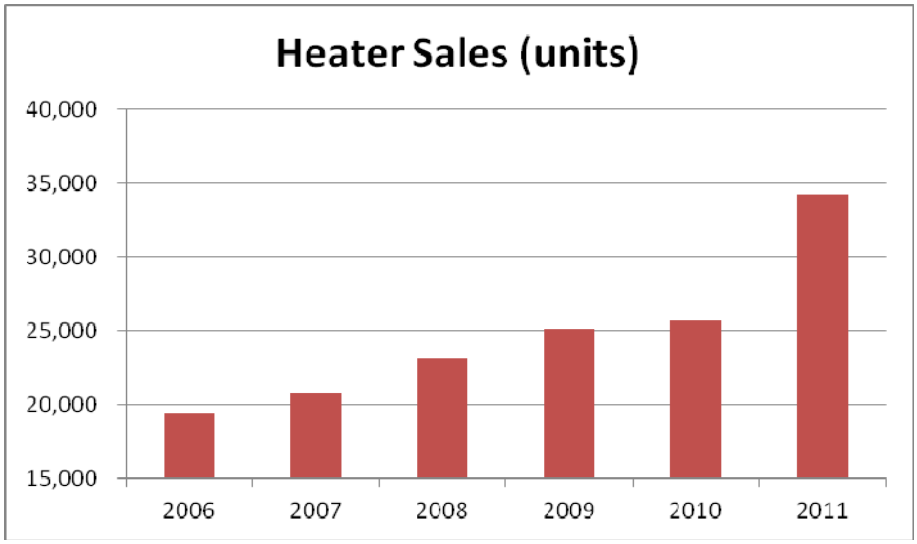
Average 11.5%pa Market Growth Since 2006

We have observed an average 11.5% increase in unit sales since 2006, including a 33% increase in the last 12 months. This most recent large increase is partly due to a colder winter this year, but as shown below, this is at best only a partial explanation.

Temperature Fluctuations Do Not Explain Trend Growth

Using Sydney and Melbourne as representative examples of recent temperature trends (see tables following page), we can see that temperatures were lower than in 2010 (which was an unusually warm winter) but not significantly lower than 2009. Importantly, temperatures remain above their long term average. Similar patterns exist for other centres.

Despite this, national wood heater sales in the last 6 years have proceeded as follows:



2005-2006	19,455
2006-2007	20,826
2007-2008	23,120
2008-2009	25,163
2009-2010	25,728
2010-2011	34,260

Note: These unit sales are as reported by members of the Australian Home Heating Association, and thus do not include sales by non-member manufacturers or importers. Although the absolute numbers are lower than the true total national sales, the trend remains clear.

Growth Is Accelerating Due To Concern Over Rising Energy Prices

Although temperature fluctuations can partially explain short term variations, the trend growth in wood heater sales is undeniable. Temperatures have not been trending downward during this entire period.

Our own market intelligence reveals clearly that

- Trend growth tracks rising community concern over the use of renewable energy, and
- Recent growth is largely due to the spike in concern over rising cost of gas and electricity.

Timing Of Growth Is Ideal

Despite the growth of the last 5 years, unit sales are drastically below their peak in the late 1980's. However, we believe that this growth is ideally timed to coincide with the active development of a national regulations for solid fuel heating appliances, and the proposed development of newer, cleaner burning appliances.

Sydney and Melbourne Temperature Tables 2009-2011

Sydney

2011	April	May	June	July
ave maximum temperature	22.7	19.5	18	17.4
ave minimum temperature	14.7	10.7	10.3	8.6

2010	April	May	June	July
ave maximum temperature	24.6	20.6	17.7	17.1
ave minimum temperature	15.9	12.1	9.6	9.2

2009	April	May	June	July
ave maximum temperature	22.8	20.7	17.9	18.3
ave minimum temperature	15.7	12.5	10.3	9.2

long term average	April	May	June	July
ave maximum temperature	22.4	19.4	16.9	16.3
ave minimum temperature	14.7	11.5	9.3	8

Sydney maximum and minimum temperatures for 2009- 2011 compared to long term average (as at Observatory Hill)

Melbourne

2011	April	May	June	July
ave maximum temperature	21.2	16.3	15.8	14.6
ave minimum temperature	11.7	9.6	7.8	7.7

2010	April	May	June	July
ave maximum temperature	22.9	18.2	14.6	14.6
ave minimum temperature	14.5	9.8	7.5	7.3

2009	April	May	June	July
ave maximum temperature	21	18	15.6	15.2
ave minimum temperature	11.6	9.6	7.7	8.2

long term average	April	May	June	July
ave maximum temperature	20.3	16.7	14	13.4
ave minimum temperature	10.8	8.6	6.9	6

Melbourne maximum and minimum temperatures for 2009- 2011 compared to long term average (as at Melbourne Regional Office)

Role Of Government Bodies

Notwithstanding the high investment required of the industry and its impact on small businesses, the Association is not asking for direct government assistance or incentive. This is an industry led and industry funded initiative.

However, to maximise its effect and the flow on benefits, government can actively support the effort in two key areas:

Changeout Programmes To Encourage Newer Low Emission Heaters

Our original submission gave evidence of the greater effectiveness of changeout programmes when they include newer wood heaters in the incentive scheme. The fundamental reason was the strong preference for wood heating among many current users, particularly in regional areas where these schemes are most often targeted.

The introduction of the new performance requirements outlined here (2.5g/kg emissions/55% efficiency) provides an ideal platform to launch changeout programmes with renewed vigour, where pre-1992 wood heaters would be swapped for a range of cleaner alternatives, including newly certified, cleaner burning wood heaters.

Government Enforcement Of Standards Still Required

A major finding of our original submission (May 2009) was the frustration of our industry over the inaction of government regulators to our reports of manufacturers and dealers making available heaters which do not comply with current standards.

This issue becomes even more important when the change to higher performance requirements comes into effect, as the temptation for some suppliers to avoid the high cost of compliance will be even greater.

Importantly, enforcement is made easy by the following:

- All heaters must have a compliance plate with the model number, certificate number, and the date of manufacture
- The AHHA as the certifier has a register of certified models to allow for crosschecking
- The AHHA also keeps original design details on record to provide evidence when there is a belief that a heater design is not certified, or a model has been altered since certification.

Most of the surveillance is carried out by members of the Association. The only effort required of regulators is to take action, and enforce rules that are currently in existence. Clearly, any new framework will be effective only insofar as it is enforced.

Requests To Government

To assist with the industry led initiatives outlined in this paper, we request some government co-operation in the development of any subsequent legislation.

Right To Review

Our commitment to significantly lower emissions coupled with minimum efficiency targets may need to be reviewed pending the outcome of legislative changes. If changes to other regulations impose too many additional burdens on manufacturers, their ability to meet the emissions and efficiency targets may well be compromised.

One Test To Cover Inbuilt And Freestanding Heaters

It has always been the practice to fully test freestanding units, and then request the testing laboratory to recommend certification of the equivalent inbuilt model, due to long standing experience that inbuilt models perform better than an equivalently designed freestanding units. This retesting exemption is ratified under s9.2 of AS/NZS4013:1999.

Currently, 20-25% of all units sold are inbuilt heaters. The cost of having to test all models represented by these sales would place a high and unnecessary cost burden on manufacturers, diverting funds away from R&D activities that would result in actual performance gains.

Conclusion

All of the issues and suggestions raised in our original submission (May 2009) remain valid. The points raised here have all come to light since that time.

We await any development in legislation to introduce an effective framework for national regulation of solid fuel heaters, and will actively support its ongoing implementation. The new initiatives of 2.5g/kg emissions and minimum 55% efficiency targeted to December 2013 represent a serious pro-active move by the wood heating industry to achieve this.

Appendix 2

The Libby, Montana, Wood Stove Change-Out

By James E. Houck

Did the CHANGE-OUT WORK?

Five heating seasons have passed since the hearth industry replaced all the old, dirty-burning wood stoves in Libby; it's time to look at the results.

Five heating seasons have now passed since the wood stove change-out in Libby, Montana, was completed. For those of you who don't remember, the Hearth, Patio & Barbecue Association and its individual members teamed with the U.S. EPA, the Montana Department of Environmental Quality, and the Lincoln County Environmental Health Department to change-out *all* uncertified wood-burning devices in the small Montana community of Libby.

The majority of fine atmospheric particulate material – a.k.a. $PM_{2.5}$ – during the heating season in Libby has been identified to be from residential wood combustion. Additionally, historically Libby has been challenged by air pollution due to its deep valley setting with wintertime temperature inversions, and an unrelated asbestos exposure from a now-abandoned mine and associated mill. Many of the residents of Libby are low income.

The Hearth, Patio & Barbecue Association (HPBA) and its members stepped up to the plate and contributed heaters, accessories and funding to make the change-out happen. Along with its partners, the U.S. EPA, the Montana Department of Environmental Quality, and the Lincoln County Environmental Health Department, the HPBA started change-outs in 2005 and made the last of the stove change-outs by the end of the 2007-2008 heating season. (For more details about the change-out the reader is referred to www.hearthandhome.com, click on Libby Articles on bottom of page).

A clear, sunny day in Libby, Montana.

So, the million-dollar question is...

Did the change-out program improve air quality?

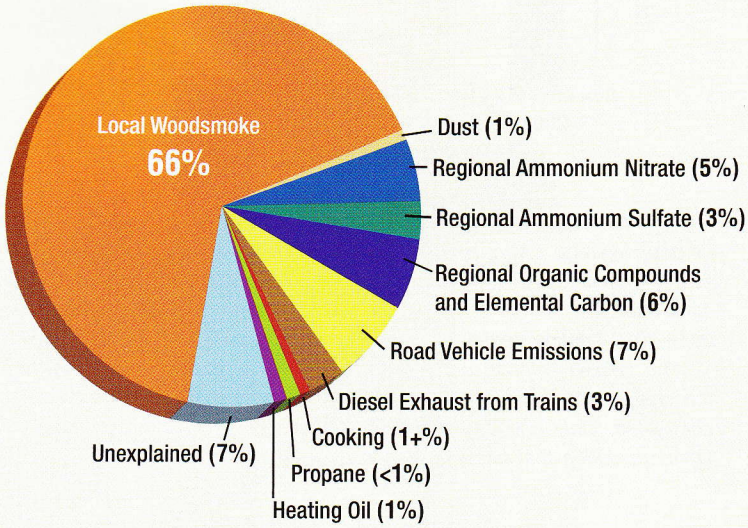
By all metrics, the answer is YES!

First, the number of episodic high 24-hour events above the 35 micrograms per cubic meter of air ($\mu g/m^3$) National Ambient Air Quality Standard dropped from six during the 2004-2005 heating season prior to the change-out program, to one, one, one and zero, respectively, during the four heating seasons after the change-out was completed. (The data for the most current 2012-2013 heating season is not yet available.)

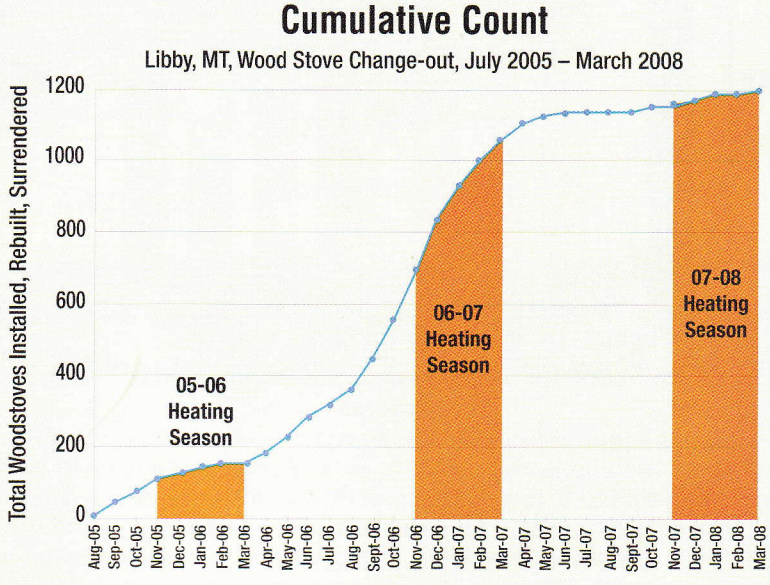
It's worth noting that these short-term high episodic events are often associated with triggering respiratory issues such as asthma attacks or cardiovascular incidents and are often the basis of the perception of poor air quality. A short-term high pollutant episode makes much more of an impression than the modest elevation of the long-term average.

Second, the average heating season concentration of $PM_{2.5}$ decreased by about 30 percent before and after the change-out was completed. This means that the chronic exposure to fine particles was decreased significantly – but it's more than that. Besides the irritative effect of particles, the fine particles from wood combustion are made up of organic compounds, many of which are toxic, carcinogenic or mutagenic – but it's even more than that. Along with particles, volatile organic compounds (VOC) and carbon monoxide (CO) are emitted from wood combustion. As with fine particles, VOC (gases) from wood combustion include toxic, carcinogenic and mutagenic compounds, and everyone knows the issue with CO.

The good news is that the same complete combustion conditions that characterize new certified wood heaters in contrast to old uncertified ones will reduce all three categories of pollutants – fine particles, VOC and CO. Chronic exposure of Libby's residents to fine particles, organic air toxics and carbon monoxide were all reduced by the change-out.



Pre-change-out, residential wood combustion was estimated to contribute about 66 percent to atmospheric fine particulate levels in Libby during the heating season (November 1 through February 28/29).



The wood stove change-out program took about two and one-half years to complete. Most of the change-out was completed by the end of the 2006-2007 heating season, with 1,054 new wood stoves installed, old wood stoves rebuilt, or old wood stoves surrendered. An additional 56 change-outs were accomplished by the end of the 2007-2008 heating season.

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