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EPA Air Policy
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The Australian Sustainable Business Group (ASBG) is pleased to comment on the NSW Environment Protection Authority *Clean Air for NSW* (Clean Air Paper).

This submission was prepared with the assistance of ASBG's Policy Reference Group and ASBG's members.

Should you require further information, clarification or details on the submission please contact me on 02 9453 3348.

Yours Sincerely

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AUSTRALIAN SUSTAINABLE BUSINESS GROUP'S

Submission on

Review of Clean Air in NSW

January 2017

Sydney, Brisbane

1 SUMMARY

The Australian Sustainable Business Group (ASBG) is pleased to comment on the NSW Environment Protection Authority and Office of Environment and Heritage *Clean Air for NSW* (Clean Air Paper).

The Australian Sustainable Business Group (ASBG) is a leading environment and energy business representative body that specializes in providing the latest information, including changes to environmental legislation, regulations and policy that may impact industry, business and other organisations. We operate in NSW and Queensland and have over 120 members comprising of Australia's largest manufacturing companies. Members were fully involved in the development of this submission and ASBG thanks them for their contribution.

This response largely focuses on improving the efficiency of achieving better air quality, as well as considering air pollution's impacts in perspective with other issues. ASBG has identified a number of issues including:

- Erroneous use of the term *No safe level*, but should be put into a risk based perspective with contextual information. Use of no safe level implies that a zero emission is only acceptable, which carries considerable cost impacts. Overspending on one health issue can deplete other areas, which can lead to poorer heath and other outcomes.
- Focusing on the main sources of air pollution, which should include an evidence, scientific risk-based approach. Managing the most stressed air pollution locations and focusing controls on the major sources should be the adopted approach; however, this is not always the case.

ASBG considers that the regulatory approach on air pollution has elements that are improperly targeted. An example is the trend to focus on controlling air pollution where there is good air quality, such as the Hunter region. It would make more scientific sense and efficient use of public resources to primarily target western and south-western Sydney areas, which is the most stressed air shed and has the highest population levels. Attention, in part, has swung to coal fired power stations, mining and coal trains in the Hunter area, which has good air quality. There is also considerable scientific research undertaken 15 years ago demonstrating little contribution of air pollution between the Hunter and Sydney air sheds. Therefore, ASBG considers some of the Clean Air paper's actions will impose unnecessary costs and direct valuable resources away from the major air pollution in Sydney towards areas where air quality is below target limits. Much of the driver for such actions appears based on social and community issues rather than scientific issues.

Additionally, industry already has very heavy controls, however newer controls with massively increased load taxes are currently being proposed by the EPA. In contrast, hazard reduction burns have no controls. Wood heaters have just had their first grandfathered control regulation imposed. Despite this they make up over 50% of $PM_{2.5}$ emissions in the Sydney region. Motor vehicles have comparatively lighter controls, compared to those imposed on industry. Yet they are a major source of air pollution in the Sydney air shed, making up over 86% of ozone and diesel powered vehicles making around 7.5% $PM_{2.5}$, in contrast less than 7.9% of ozone and 15% $PM_{2.5}$ is emitted from industry in the area.

ASBG hence questions the Clean Air in NSW's attention to the Hunter region, which has good air quality. The use of an evidence, scientific and risk based approach appears to have been trumped by community concerns and local issues in dealing with Hunter air quality. While community issues should be addressed, ASBG considers the Government should lead by providing appropriate guidance and consultation and avoid increased costs and controls businesses that generate minor air emission improvements in areas that already have good air quality.

To make some real improvements to air pollution in the Sydney air shed, ASBG offers suggested methods to encourage less polluting motor vehicle use. This includes involving public participation on high pollution days and the use of additional VOC controls on vehicles.

2 NO SAFE LEVEL OR LOW RISK

Misinterpretation of health impacts of air pollutants is a common issue and even occurs in the Clean Air paper. There are two issues:

- The statement that there is *no safe level*, which is an erroneous statement
- No contextual material covering the risks associated at low risk level concentrations

There is an ongoing repeated error in interpretation of air pollution and health impacts. This is summarised by this typical erroneous statement:

> *...a summary of this work concluded that "there is no discernible human health threshold for ground-level ozone—in other words there is no safe level of ozone for human health[1].*

This erroneous statement can be applied to any 'pollutant' where science has not yet detected a threshold or a concentration / dose level where there are no observable adverse health effects. Also where the levels are not at a safe level does not mean that the risks are not low in comparison to other daily risks everyone is exposed to.

Most major air pollutants have been cited as having *no safe level*, yet when one goes to the source of this conclusion it is based on the conclusion that *no threshold level* has been found. The list below shows the source reference, with none saying there is no safe level, but saying there is no known level.

> **Particulate Matter:**
> *The risk for various outcomes has been shown to increase with exposure and there is little evidence to suggest a threshold below which no adverse health effects would be anticipated. In fact, the low end of the range of concentrations at which adverse health effects has been demonstrated is not greatly above the background concentration, which for particles smaller than 2.5 µm ($PM_{2.5}$) has been estimated to be 3–5 µg/m³ in both the United States and western Europe.[2]*
>
> **Ozone and NO_2:**
> *… if a safe level for ozone exists, it is only at very low or natural levels and far below current U.S. and international regulations.*
> *Firstly[2], the evidence for ozone (O3) and particulate matter (PM) indicates that there are risks to health at concentrations currently found in many cities in developed countries. Moreover, as research has not identified thresholds below which adverse effects do not occur, it must be stressed that the guideline values provided here cannot fully protect human health.*
>
> **Sulfur Dioxide:**
> *If there were a threshold for effects in either of these two studies, it would have to be very low[2].*
>
> **Benzene:**
> *No specific guideline value has been developed for air. Benzene is carcinogenic to humans, and no safe level of exposure can be recommended. For general guidance, the concentrations of airborne benzene associated with an excess lifetime risk of leukaemia of 10^{-4}, 10^{-5} and 10^{-6} are 17, 1.7 and 0.17 µg/m^3, respectively.[3]*

Often cited by many Government agencies is the erroneous statement "*there is no safe level for (pollutants name) pollutant*". Page 10 of the Clean Air in NSW states:

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[1] Environmental Policy in North America, By Robert G. Healy, Debora Van Nijnatten, Marcela López-Vallejo (p 113)
[2] WHO, Air Quality Guidelines http://apps.who.int/iris/bitstream/10665/69477/1/WHO_SDE_PHE_OEH_06.02_eng.pdf
[3] World Health Organization (WHO) benzene guidelines, 2010, http://www.who.int/ipcs/features/benzene.pdf

As there is no safe threshold for exposure to fine particles, continued reductions in exposure can reduce adverse symptoms, need for medication, visits to doctors and emergency departments, hospital admissions and premature deaths across cities and communities.

Therefore, the NSW consultation paper also jumps to the conclusion there is no safe level, rather than stating no known safe level. This appears to justify that any reduction is beneficial. It also erroneously justifies ignoring the costs of such reductions focusing only on the benefits. ASBG considers this is a major justificational driver for proposed increased controls on Hunter air shed emitters.

Using the *no safe level* approach results in misinterpretation. If there is no safe level then it is easy to conclude that *only zero* is acceptable. This ignores background levels, where, for example Newcastle, natural sources of $PM_{2.5}$ make up the majority. It also ignores the reality that most substances, both natural and manmade have no known safe level. Therefore, the statement that *there is no safe level* is relatively meaningless. A value is required, if available, to attach to a substance where a comparison with other substances. For example, LD_{50} is one method to assign a value for toxicity. If no value is available, contextual information should be provided.

Focusing on what is safe causes considerable misinterpretational issues, which can skew policy and expenditure. Most human activity is not 'safe'. It is not a question of being safe or not, but one costs and benefits and of properly balancing the risks. Stating there is no safe level also signals that any level of a pollutant is dangerous. It would be more responsible to place such substances into a risk-based perspective with appropriate contextual information. Such an approach is used for more sociably acceptable carcinogens. For example, alcohol is a known human carcinogen[4], but is commonly and wilfuly consumed. To place this issue into a risk-based perspective the UK's Chief Medical officer Prof Dame Sally Davis said[5]:

> *Drinking any level of alcohol regularly carries a health risk for anyone, but if men and women limit their intake to no more than 14 units a week it keeps the risk of illness like cancer and liver disease low."*

However, for air pollutants such a risk-based approach is lacking and seems to ignore the reality of background levels of air pollution, which humans have been exposed to during their entire history. ASBG considers it is reasonable to state that air contaminants at common background levels or the recommended AAQ NEPM levels be regarded as a low risk.

Recommendation R1

The NSW Government indicate:

- ***The level of risk in a contextual form that various levels of air pollution represents.***
- ***That where ground level concentrations of air pollutants meet current standards that such exposure represents a low level of risk.***

[4] IARC, Consumption of Alcoholic Beverages http://monographs.iarc.fr/ENG/Monographs/vol100E/mono100E-11.pdf
[5] UK Department of Health: Updated alcohol consumption guidelines give new advice on limits for men and pregnant women, https://www.gov.uk/government/news/new-alcohol-guidelines-show-increased-risk-of-cancer

3 FOCUSING ON THE MAIN SOURCES

It is desirable to reduce air contaminant concentrations, but this should be undertaken in manner that balances costs and benefits. Hence, the issues and actions should focus on:

- Where are the main pollution impacts
- Who is contributing to them, or what are the sources
- How such emissions can be reduced in a cost effective manner

3.1 Where to Focus On Air Pollution?

Sydney's air shed is by far the most stressed area in NSW. The following figures[6] show particulate and ozone pollution concentrations in western Sydney area.

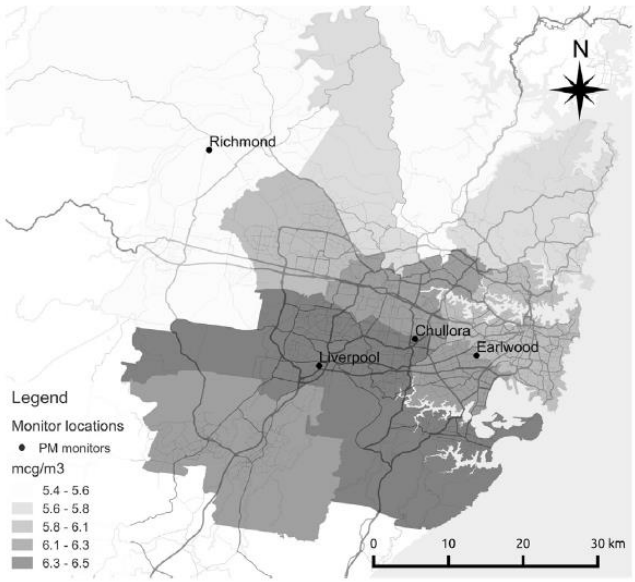


Fig. 2. Interpolated baseline annual average $PM_{2.5}$ concentrations ($\mu g/m^3$) in 2007 by LGA.

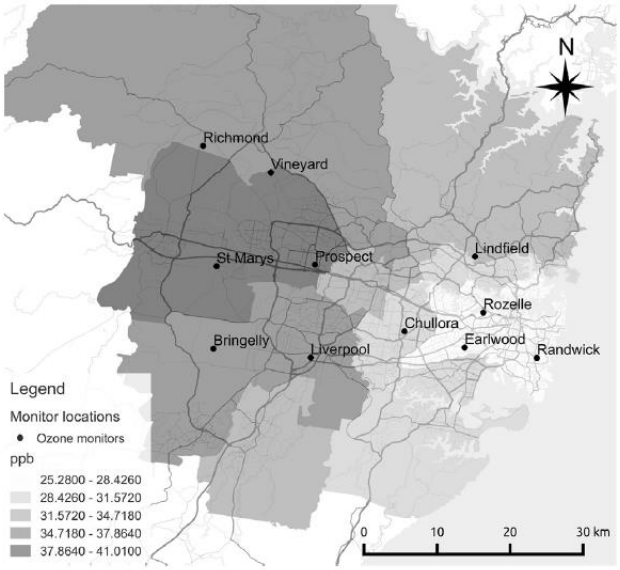


Fig. 4. Interpolated baseline seasonal average of maximum daily one hour average ozone concentrations (ppb) in 2007 by LGA.

Focusing further, the area around Liverpool and St Marys generally suffers the poorest air pollution in NSW. As a consequence, the Sydney air shed should be the main focus of air pollution reduction policy. However, the main actions of Clean Air in NSW is on industrial sources in the Hunter region.

The missing issue is how much contribution of pollution is there with this area from other air sheds and what impact does this inter-mixing make? Cross contamination between air sheds must have regard properly scientific assessment. Fortunately, such work has been undertaken. Past reports[7] on transfer of NO_x from the Hunter to the Sydney Basin air-shed showed minimal contribution. Chart 4[8] shows the Percentage of time that power stations contribute to ozone concentrations in the Sydney Basin air shed.

[6] The Health Benefits of Reducing Air Pollution Sydney, Australia, R. Broome, Neal Fann et al, 2015, https://www.researchgate.net/publication/286263491_The_health_benefits_of_reducing_air_pollution_in_Sydney_Australia

[7] Inter-Regional Transport of Air Pollutants Study, Hugh Malfroy paper presented to AEBN's POEO Conference 15 August 2002

[8] NOx Inter-Regional Transport (IRT) Study, CSIRO TAPM modelling 1999

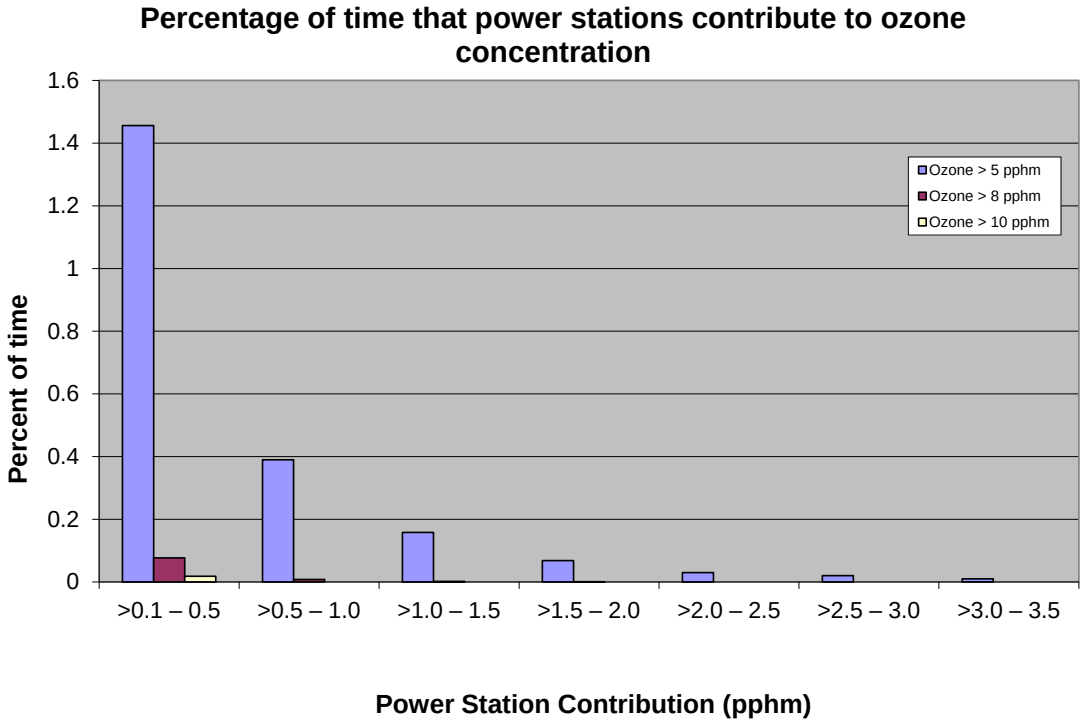


Chart 1 Percentage of time that power stations contribute to ozone concentrations in the Sydney Basin air shed

The above chart shows that the Hunter regional power stations contributed to Sydney's air shed ozone levels approximately 1% for less than 1.4% of the time. Such research clearly demonstrates little inter-regional transport between the Hunter basin and Sydney Basin air sheds. It also strongly suggests that there are at least two air sheds in the Greater Metropolitan Region (GMR).

ASBG considers the use of the GMR as a basis for air pollution policy can lead to misleading conclusions that the area is one air shed and not multiple. Added to this there are very rare references to the Hunter air shed, in contrast to use of the GMR and to a lesser extent the Sydney Basin air shed are considered and reviewed widely. Use of the GMR by the EPA to set air policy is strongly reflected in the Clean Air for NSW Figure 5. ASBG considers it would make better scientific understanding to identify all the air sheds in the GMR, rather than as commonly done, collate them together under the broad erroneous assumption that the GMR is one air shed.

ASBG considers the current and proposed regulatory controls, under the Clean Air paper and LBL Review, heavily target industrial sources and lightly deal with other sources in the Sydney Basin air shed, NSW's most stressed and repeatedly failing air quality standards. Clean Air paper focuses controls on the coal-fired power stations located in the Hunter region. However, the evidence of disconnect between the Sydney and Hunter air sheds appears strong. In addition, as there are no significant air pollution issues in the Hunter air shed, the heavy focus on coal-fired power stations appears miss-focused.

If the NSW Government is serious in addressing the main health issues by better managing the Sydney Basin air shed, tightening controls on the major sources should be its priority rather than disproportionately increasing controls on Sydney based industrial contributors, which are minor contributors to poor air quality. It would seem that a focus on air sheds is required to ensure that pollution reduction is properly targeted for reducing the levels in the most stressed areas rather than focus on which sources are easiest to regulate.

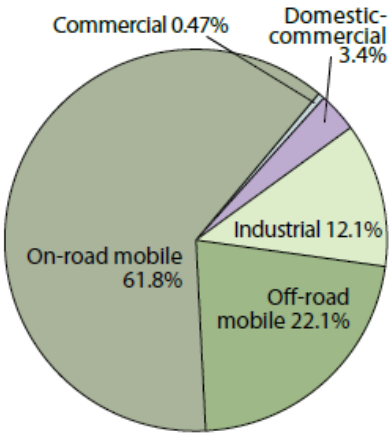
3.2 What Are the Main Sources?

Industrial sources of air pollution are already tightly controlled and in many cases pay a load tax under the Load-Based Licensing (LBL) scheme, with further tightened with significant tax increases proposed. In contrast, the main sources of NO_x and PM are motor vehicles and wood heaters, both of which have far lighter to minimal emission controls, with wood heaters receiving it inaugural regulatory control only a few months ago.

While industry and business are contributors to air pollution, this is diminishing, especially in the Sydney air shed due to the shrinking industrial sector. The NSW EPA often says industry should do its share of emissions reduction; the facts are that it does most of the heavy lifting and much of the older polluting sites have closed.

Tight air pollution controls make it rather unattractive to install new industrial facilities that generate significant air emissions in the Sydney air shed. Since 1999 NSW has seen the closure of two oil refineries, flat glass manufacturing site, carbon black manufacturing, a coke production plant, a coal fired power plant, aluminum smelters, cement kilns and the list goes on. This does not include reductions in the capacities of most of the major industrial sites in NSW. As a consequence, in the Sydney area there are far fewer emitting sites and those which are left are emit less pollutants than even a few years ago. As industrial output declines, its contribution to air pollution in the Sydney basin will be very small contributor.

These charts show the reduction in the emissions of NO_x in the Sydney Basin air shed from 2008 to 2014. As shown industry NO_x emissions has shrunk from 12.1% to 7.9% of the total sources of NO_x. Motor vehicles make up the vast majority of NO_x emissions, which is the main limiting precursor to ground level ozone, formed from photochemical smog.



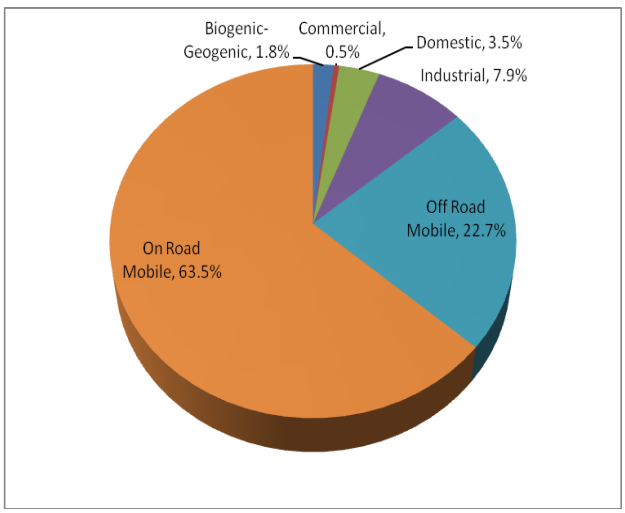


Chart 1 - NOx Emissions In the Sydney Basin air-shed 2008 Chart 2 - NO_x Emissions In the Sydney Basin air-shed 2014 – Source EPA Air Emissions Inventory

NO_x the main revenue earner under LBL, only manages to capture less than 7%[9] of NO_x in the Sydney Basin air shed. It was much higher, but with the closure of many high emitting industrial sites, the main pollution sources continue to be motor vehicles. While EPA is somewhat hamstrung in that it has only influence over motor vehicles as they are governed at the National level, it can control licensed sites. However, tightening controls on less than 8% of the problem has diminishing returns. Consequently, additional controls on industrial and business emissions will have little effect on improving air quality in the Sydney air shed.

[9] The total Sydney Industrial NOx emissions were estimated at 7.9%, those subjected to LBL fees would be portion of this percentage. Considering these figures are based on 2014 data and industry has further reduced, this is an over estimate.

However, there are many diffuse sources with are major sources of air pollution including:

- Wood fired heaters
- Motor vehicles
- Other transport
- Hazard reduction burns
- Traffic on dirt roads

Even with shrinking industrial activity and their emissions in the Sydney area, ozone levels are expected to continue to slightly rise as shown in Figure 2[10].. It rise is due to a complex set of sources including increased motor vehicle kilometers travelled and spikes from bushfires. Whatever the reasons for these upward trends industrial emissions are not to blame as they have been declining for many decades and are a minor and decreasing contributor to this issue, yet are the only source subject to both load fees and concentration restrictions.

Figure 2: Maximum annual average pollutant concentrations recorded at the monitoring stations in Sydney during 1994–2012.

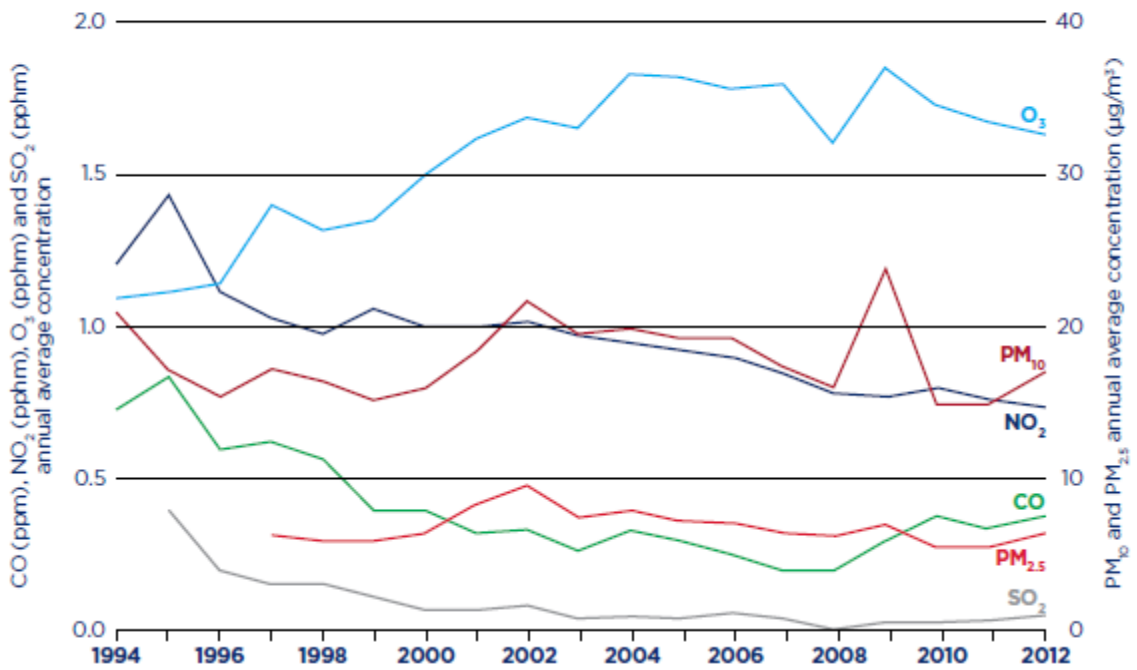


Figure 2 also shows that particulate matter pollution is in general improving. However, the LBL Review and the Clean Air in NSW papers stress increased attention to reducing particulate matter, especially $PM_{2.5}$. This focus on $PM_{2.5}$, is largely due to the recent World Health Organizations' reports[11] on the extrapolated increased death rates due to particulate pollution. WHO, estimates 3 million additional deaths are caused worldwide by particulate pollution. Though this focus on cities where air pollution is many times worse than experienced in NSW urban areas

[10] Figure 2 Air Quality Trends in Sydney, Chief Scientist: http://www.chiefscientist.nsw.gov.au/__data/assets/pdf_file/0003/52986/Road-Tunnels_TP02_Air_Quality_Trends_in_Sydney.pdf

[11] WHO Estimates on Air Pollution Exposure and Health Impact http://www.who.int/mediacentre/news/releases/2016/air-pollution-estimates/en/

ASBG welcomes the NSW Government's actions which include management options for hazard reduction burns (HRB). ASBG for many years has drawn the attention of HRB as a major source of particulate and other toxic air pollutants, especially dioxins. Currently, this large source of spikes in air pollution has no controls and little management consideration of the downwind impacts of such actions. However, these impacts are large. A recent medical report[12] found that HRB in May 2016 caused an estimated 14 premature deaths and 87 hospitalisations. This was from one HRB in which the wind changed direction and large urban areas where affected. While the EPA is quick to propose increased controls on industry the pace on HRB, like with wood heaters is very slow.

ASBG considers there is a double standard where industrial emissions are heavily regulated, but pollution from Government agencies, motorists and residents are handled very lightly. In the case of HRB, the health impacts from its pollution have, until recently been simply ignored, generally with the excuse 'it's a safety issue' or 'there is nothing else we can do'. It now appears the Clean Air paper has found that HRB air pollution harm reduction can be at least considered.

The case of double standards continues; looking at the sources of particulate matter in the most stressed air shed – Sydney, especially around the Liverpool area, finds industrial sources are again very much in the minority. Yet sites holding EPLs are subjected to tight control with further controls proposed. Figure 3 *Top* 10 Sources of PM_{10} in Sydney, from the NSW EPA shows, that industrial sources are a minor source around 7.9%. Figure 6, in Clean Air in NSW, also supports industry's minor contribution, which focuses on $PM_{2.5}$. Both data show the main source is by far (Domestic) Solid Fuel Burning—wood heaters. In terms of controls wood heaters have just had regulations introduced, which only require new heaters to meet emission standards. Consequently, installed wood heaters have no control requirements and no requirement to replacement them with new compliant heaters required. It would seem the EPA has been controlling air emissions on industrial sites since the Clean Air 1961 came into force 55 years ago. However, the Protection of the Environment Operations (Clean Air) Amendment (Solid Fuel Heaters) Regulation 2016 only commenced 16 November 2016.

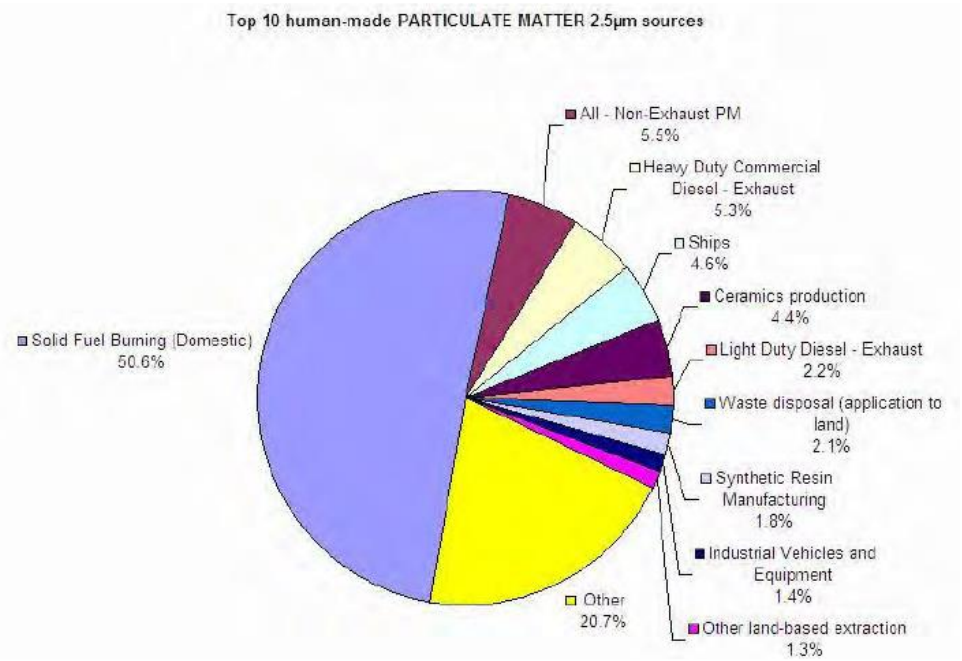


Figure 3 Top 10 Sources of PM_{10} in Sydney[13]

[12] MJA, A rapid assessment of the impact of hazard reduction burning around Sydney, May 2016, Richard A Broome1, Fay H Johnston et al
[13] Senate Standing Committee On Community Affairs Inquiry Into The Impacts On Health Of Air Quality In Australia – Report from NSW EPA 14/3/14

3.3 Reducing Emissions

Clean Air in NSW proposes a list of actions, which have commendable new inclusions, especially the consideration of wood smoke emissions from households and emission from hazardous reduction burns. Nevertheless, the bulk of emission tightening, especially considering cost implications are to be applied to businesses especially those with Environment Protection Licenses (EPL).

The proposed fee increases under the Load-Based Licensing Review (LBL Review) are extensive and considerable. Extensive in that LBL is proposed to be expanded to capture all EPL holding sites. Considerable in that proposed fee increases to cost of abatement and cost of damage levels would for example increase particulate load fees by a minimum of 600%. Also Clean Air in NSW specifically targets coal fired power stations and coal mining and transport, both of which are in the Hunter region.

In 2014 industrial NO_x emissions contributed to approximately 7.9% of the total emissions[14] in the Sydney Basin air shed and that motor vehicles contributed 86.2%. ASBG contends the focus of load fees on industry is miss-focused and will serve to reduce investment in NSW industry and fail to deal with the health impacts of air pollution especially in Sydney's stressed air shed. There is no argument that Sydney's south west area, centered around Liverpool, receives the worst air pollution in NSW if not Australia.

3.3.1 Alternative Approaches for Controlling the Main Sources

Motor vehicle emissions appear to be rather historically intractable by the NSW Government. The token approaches of promoting electric vehicles and the use of government contracts have merit, but will have little impact. Doing little else is based on the argument that vehicles are controlled using Australian Design Rules (ADR) is outside NSW's jurisdiction. This is a limited argument when considering load they impose on the stressed Sydney Basin air-shed.

Based on the above should not motor vehicles be subject to more control? Emission control on motor vehicles is under Australian Design Rules, of which the NSW Government has influence, but no direct control. However, ASBG considers there are a number of options to better manage motor vehicle emissions at a local level. A comparative look, in Table 1 at the emissions controls of motor vehicles vs Licensed sites shows the differences.

[14] See Chart 2

Table 1 – Air Pollution Control – Motor Vehicle v Licensed Sites					
Control method	**Concentration at end of pipe**	**Concentration on ground**	**Measurement**	**Consideration of locational issues**	**Load fees**
Motor Vehicles	☑ ADRs set emission concentrations and fuel efficiency. Vehicles follow the laboratory test cycle but perform at lower standards in real driving conditions.	☒ Not undertaken but calls for GLC controls for road tunnels are common	☑ Undertaken at registration checks.	☒ None	☒ Motor vehicles escape from load fees. Motor vehicles operating on an EPL site subjected to LBL fees may be also captured and could pay load fees in the future
Sites with EPLs	☑ Required under the POEO (Clean Air) Regulation with stringent testing and monitoring required.	☑ Sites to be developed and potentially in operation are subject to the ground level concentrations at the nearest receptor under the Approved Methods	☑ Measurement method vary from ensuring proper maintenance is being done so the equipment performs to within its design to comprehensive and continuous testing on sites paying load fees	☑ Stressed air sheds are covered by both Licence concentration limits and critical zones under LBL	☑ It is a proposed option to expand LBL to all sites holding EPLs

If the NSW EPA wishes to better control air pollutants it should focus on the main sources, rather than continue to penalize and restrict a shrinking source. The difficulty is in sending the right market signals to encourage overall emission reduction practices to motor vehicle users.

There are international practices, which target motor vehicles, apart from their emission design requirements, including:

- The mayors of Paris, Madrid, Athens and Mexico City announced plans to take diesel cars and vans off their roads by 2025.
- 20 EU states tax motor vehicles on their CO_2 emissions and sometimes-other emissions.
- Promotion of public transport on high pollution days

Other arguments such as the impact on Australian made vehicles is mute as this industry will have virtually disappeared next year. Constitutional issues should be easy to overcome. While concentration and environmental performance cannot be directly targeted, application of a load fee can be from environmental grounds. ASBG suggests two additional approaches to better limiting air emissions from motor vehicles:

1. A registration fee component based on the emissions from a vehicle
2. A program to deal with high pollution days

An Emissions Registration Fee

A suggested means to control motor vehicles could simply be to modify a component of the registration fee based on:

- Location of the vehicle – e.g. rural to receive a low fee rate
- Kilometers travelled – obviously linked to fuel consumed and hence emissions
- Type of model and engine – electrical vehicles could be exempt, hybrids at low cost all the way up to large heavy diesels, which can attract a maximum levy.

Ideally, such an emissions tax are offset in a reduction in other registration fees and taxes on motor vehicles. While the approach suggested is focused on non-$CO_{2\text{-}e}$ emission — NO_x, PM and VOCs, a carbon price could be added using a variation to the formula. Application of load fees on motor vehicles would provide an incentive for motorists to:

- Use their vehicle less often as it is based on kilometers travelled.
- Replace their vehicle with one of lower emissions, especially favouring electrical vehicles and hybrids.

High Pollution Days

There are a number of innovative and more publically acceptable approaches in dealing with motor vehicle emissions. Health impacts of high pollution days can be reduced by encouraging the use of public transport over private vehicles. There are a number of such examples

- Paris recently introduced free public transport plus alternative vehicles days to reduce air pollution in the city centre.
- Warsaw also used free public transport to tackle air pollution.
- Arizona Department of Environmental Quality recommends catching public transport on high pollution advisory days. Note many state environmental agencies across USA recommend similar action.

This approach was recommended by ASBG in 2004; this is an extract of the submission on the Review of POEO (General) Regulation in October 2004.

> *For example, if there was a substantial reduction in the number of motor vehicles on the road during a potential high-ozone day, then the NSW government could take action to reduce the acute pollution on sensitive days. DEC publications have indicated that the number of high pollution days where the NEPM on Ambient Air Quality is exceeded has not exceeded 15 for ozone. Actions for up to 15 per year do not appear excessive to AEBN[15].*
>
> *AEBN proposes a method whereby acutely high-pollution days are targeted. Already the DEC publish trend forecasts[16] on which days will be high in pollutants, especially for particulates. The DEC can, and has, issued No Burn Notices or No light tonight requests for future days of high pollution. The Department of Health issues health warnings for persons with poor health or who suffer asthma. Forecasts for ozone are common in cities in the United States[17] and Canada. We know that for photochemical smog to form, it requires the function of three factors:*
>
> - *Meteorological conditions — usually a calm day with an inversion layer—high ozone days generally occur in summer, especially in February; they are predictable and occur less than 15 times each year.*

[15] ASBG traded under AEBN in 2004
[16] These are attached to the Regional Pollution Index notices which are published on the DEC's website and often used by the media in forecasting days of high pollution.
[17] A website www.ozoneactiondays.org is dedicated to reducing peak ozone on forecast high ozone days for Arkansas.

- *The level of NO_x in the air.*
- *The concentration of reactive organic compounds (ROCs).*

AEBN considers that these parameters are predictable and, in part, avoidable. A number of actions, which could be introduced, include:

- *"Leave the car at home today" government advertising or notification initiative through the Bureau of Meteorology and or DEC reports to the media for such high pollution days.*
- *Promote car pooling, riding a bicycles etc*
- *Half price or free public transport on such days—'catch the train and save lives'*
- *Avoid mowing the grass or use of other two-stroke small motors*
- *Other industry action*

There are many actions that could be undertaken to attack the high pollution days and reduce the peak concentration of air contaminants in NSW urban air sheds. AEBN also considers this approach worthy of implementation and further research to identify types of behavioral changes that would lead to a healthier air environment for NSW citizens.

Dealing with acute pollution days by changing the behaviour is innovative and should see positive results by dealing with the peaks of air contaminants.

Given the recent attention to particulate matter, the above approach will also provide benefits in that area as well. The program could be further extended to deal with $PM_{2.5}$ by:

- Recommending that wood heaters not be used on high pollution times
- Regulating the use of wood heaters on predicted high pollution times with enforcement
- Use of some of the revenue from motor vehicles, such as a buy back or replacement of wood heaters with ones that meet the new air quality limits in the Solid Fuels Heaters Regulation.

Reducing air pollution in other means will be the main spinoff from such a program. Fees collected are hypothecated to a range of programs and grants focusing on improving air quality especially in stressed air sheds. ASBG considers such an approach better balanced and tackling Sydney's and other stressed air sheds directly.

Recommendation R2:

- ***Reduction in air pollutants be based on an evidence, risk based and scientific approach***
- ***Reductions to focus prioritising actions on:***
  - ***The most stressed areas and air-sheds***
  - ***The sources of major contributors to air pollution in those areas***
  - ***Cost effective ways to reduce those emissions***
- ***Balance controls on air pollution emissions with proper cost benefit analysis including the impacts of increased unemployment and higher utility costs.***
- ***Consider innovative methods to control the two major sources of particulates and oxides of nitrogen emissions—motor vehicle and wood heater emissions—that will result in measureable emission reductions.***

3.4 Additional Vapour Recovery on Service Stations

The Petrol Vapour Recovery Requirements in Regional Centres appears as the most inefficient and misplaced policy under Clean Air in NSW for the following reasons:

- The US EPA has abandoned the use of vehicle filling vapour recovery at service stations[18] (VR2) as in vehicle activated carbon capture during filling and desorb during driving—called On Board Refuelling Vapour Recovery (ORVR)—are a far more effective and economical means to capture these fuel emissions.
- Extension to rural regions where air pollution is well below AAQ NEPM criteria is an example of emission reduction is beneficial regardless of cost.
- The high cost of VR2 is well above the abatement cost and cost of damage according to the ACIL Allen paper, which supports the LBL Review.
- Justification that VR2 will reduce exposure during filling ignores the lack of evidence of such health impacts and is based on an erroneous *no safe level* approach.

The Victorian EPA's RIS on the *Environment Protection (Vehicle Emissions) Regulations 2013*[19] states on page 12:

> *This RIS found that the costs associated with installing VR2 are very uncertain, and that costs at the higher end of current industry estimates would make this option not cost-effective. For example, if VR2 equipment and installation costs are $150,000 per petrol station, this would impose a net cost on the community of around $5.9 million over 10 years).*

In comparison the additional cost of ORVR in the US was $6-8 USD in 1992-3 dollars, which in 2016 dollars is about $10-14.50 USD when fitted as original equipment by the manufacturer (OEM). This makes ORVR extremely cost effective. Because ORVR is required across the US fleet, and since the vast majority of manufacturers who supply Australia also already supply the US, there should be marginal additional cost to vehicle manufacturers in requiring ORVR on imported vehicles. This compares to the costs associated with the installation of VR2 in service stations which at $150,000 per service station is considered an underestimate by ASBG's members who suggest $300,000 is a better estimate for a 3.5 ML.

Victoria after consideration has indicated it will not pursue VR2, despite it having similar air quality issues to NSW in urban areas. No other jurisdiction has considered VR2, so it appears NSW is enforcing VR2 unilaterally in Australia.

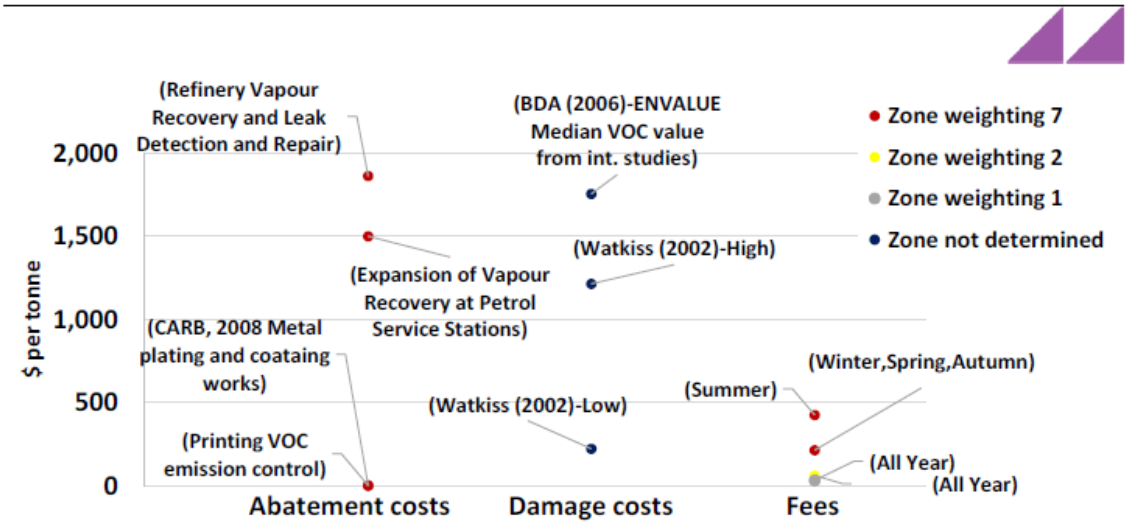
Application of Vapour Recovery at service stations appears well above most environmental damage costs according to the ACIL Allen report[20] .

[18] US EPA Ozone: Stage Two Vapor Recovery Rule and Guidance, https://www.epa.gov/ozone-pollution/ozone-stage-two-vapor-recovery-rule-and-guidance

[19] Victorian EPA's RIS on the Environment Protection (Vehicle Emissions) Regulations 2013, http://www.epa.vic.gov.au/~/media/Publications/1543.pdf

[20] ACIL Allen Comparison Of Load-Based Licence Fees With Marginal Abatement Costs (Mac) And Marginal External Costs (Mec) For Selected Pollutants, 2014, http://www.epa.nsw.gov.au/resources/licensing/lbl/load-based-licensing-acil-allen-fee-comparison.pdf

Figure 7 **MAC, MEC and LBL fees for VOCs (< 2,000 $/t)**



ASBG members indicated that cost of VR2 is around $56,000/t VOC removed based on a 3.5 ML petrol station site. Additionally, the performance of the proposed VR2 scheme is estimated to remove 1.6% of total VOC emission from the Sydney Basin air shed. As a consequence the $1,500/t VOC recovery in the above figure is not reflective of VR2 costs and appears to be based on VR1. Additionally, the $56,000/t cost of abatement is some 30 times higher than the maximum cost of environmental damage and 37 times higher than the cost of abatement.

ASBG is concerned that this part of the Clean Air in NSW is already a *fait accompli*, as the NSW EPA website, update on 23 December 2016 has spelled out the rollout details of vapour recovery for regional NSW. Despite consultation with the petroleum sector, the cost of VR2 has been ignored. ASBG considers this another example of an environmental policy where any reduction is perceived as good regardless of the cost.

As a consequence, ASBG finds the enforced uptake of VR2 in NSW is a very expensive way to capture a tiny amount of VOCs from the transport sector. It would appear obvious that adoption of ORVR in ADRs offers superior reduction in VOC emissions and at far lower cost than the enforcement of VR2 systems.

Recommendation R3

- ***NSW to abandon its expansion of Vapour Recovery Stage Two program***
- ***Promote the uptake of On Board Refuelling Vapour Recovery in the Australian Design Rules***

Should further details and explanation of the above points be required please contact ASBG.

Yours Sincerely

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