

7 August 2019

The Executive Officer
National Environment Protection Council
Department of the Environment
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Dear Sir

The Australian Sustainable Business Group (ASBG) has prepared this submission on the [Draft varied National Environment Protection \(Ambient Air Quality\) Measures for O₃, NO₂ and SO₂](#) and the supporting documents including:

- [Impact Statement - Draft variations to the National Environment Protection \(Ambient Air Quality\) Measures for O₃, NO₂ and SO₂ \(PDF - 1.27 MB\)](#)
- [AAQ NEPM Impact Statement Appendix A Air Quality Study Review of the Ambient Air Quality NEPM standards for O₃, NO₂ and SO₂ \(PDF - 13.48 MB\)](#)
- [AAQ NEPM Impact Statement Appendix B Health Risk Assessment Review of the Ambient Air Quality NEPM standards for O₃, NO₂ and SO₂ \(PDF - 2.67 MB\)](#)
- [AAQ NEPM Impact Statement Appendix C Cost Benefit Analysis Review of the Ambient Air Quality NEPM standards for O₃, NO₂ and SO₂ \(PDF - 1.05 MB\).](#)

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 110 members comprising of Australia's largest manufacturing companies and other related businesses.

ASBG supports the overarching principles of the proposed changes to the National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM), but identifies a number of issues with the approach and future directions especially how the AAQ NEPM will be used.

A key issue is that AAQ NEPM standards are routinely incorporated in jurisdictional planning and operational conditional policies. When inserted they are often applied as *impact criteria* on industrial sites, not as ambient standards as the NEPM requires. Application is not limited to new sites, but is increasingly being applied to existing sites, ignoring grandfathering, which has been a cornerstone of air pollution control in the past. ASBG considers this practice, which considerably tightens the standards, needs to be recognised and considered in the AAQ NEPM variation.

There are a number of issues discussed including:

- Adoption of World's tightest air standards
- The enforcement of AAQ Standards
- Issues with the SO₂ and PM_{2.5} changes
- Use of zero exceedances and differences with overseas air standards
- Including prescribed burns as exceptional events

1 World's Tightest Air Limits

The proposed draft standards concentration on NO₂, SO₂ and Ozone, on a concentration basis, is similar to that of Europe and North America. For PM_{2.5} Australia has already adopted the world's tightest air standard, which is to be further tightened in 2025 as a goal. While some countries have lower concentration in their standards none require *no maximum allowable exceedances*, except Australia. This no tolerance limit means that Australia will have, in effect, tighter limits than all other countries. The hard line of no exceedances means again Australia is adopting world's tightest limits on NO₂, SO₂, Ozone and Particulates.

Much of the current WHO standards are close to or often exceed background concentrations of the pollutants. Likewise much of the health publications concerning air pollution make similar concerns with natural occurring pollution events such as caused by bush fires or high wind laded dusts.

ASBG notes the Impact Statement states, *"The Abatement Package scenario modelled as part of this review has been shown to not be cost-effective in achieving reductions in pollutant levels."* If the new standards are not cost effective then it is questionable as why are they proposed. Also what effectiveness to exposure reduction can the proposals provide, especially if major sources of air pollution, like wood heaters are poorly controlled or worse exempt.

However, missing in the cost benefit study is consideration of how the AAQ NEPM standards would actually be applied. Adoption of these standards will add further costs on industry, in some cases to the point of closure, because the AAQ NEPM standards have for some time been enforced as impact criteria, rather than an ambient standard, on industrial sites in most jurisdictions. This difference in enforcement, covered in section 2, appears to be ignored in the NEPM process.

Adoption of the tighter standards may generate some political accolades it will also deliver higher direct costs for industry and the general community, despite the findings in the cost-benefit study. Need for the '*no maximum allowable exceedances*' is questioned later in this submission as its use misaligns Australia with its OECD trading partners.

R1 ASBG recommends the AAQ NEPM require provisions of contextual data clearly identifying natural background levels as well as non-anthropogenic exceedances of the standards.

2 Enforcement of AAQ NEM Standards

Enforcement of the AAQ Standards is being undertaken in at least four decreasing levels:

1. Industrial sites, especially those with environmental licences, have the AAQ standards enforced well beyond the requirements of the NEPM. Commonly the ambient standards are applied as impact assessment criteria by the jurisdictions on industrial sites¹.
2. Product controls such as Australian Design rules for motor vehicles, and other controls on packaged equipment such as gas fired boilers. In these cases the air emission standards are [grandfathered](#). For example, if you bought a 1972 car now it still requires no air pollution control system at all. Similar grandfathering for industrial sites are often over-ruled or ignored for existing sites and the latest criteria applied.
3. Community behavioural methodologies. Trying to control emissions from [wood fired heaters](#) is a classic approach. Jurisdictions use awareness and education programs and even replacement wood heaters with more efficient ones, but this replacement programs and even cash for old heaters are poorly taken. Only

¹ To put this in context Sydney's built urban area density of population is 1,237 persons per km². So an ambient standard would require an area of 20.2 km² in Sydney to reach the exposed population of 25,000. So for an ambient standard to be exceeded, using SO₂, the average 1 hour concentration would need to exceed 200 part per billion (ppb) for 1 hour over this area. However, an impact standard, as applied to industrial sites, is based on any point at ground level outside the property boundaries to exceed this concentration for 1 hour, derived from an air pollution mathematical model.

recently were regulations passed to set emissions requirements for new wood fired heaters in some jurisdictions.

4. Having no standard or controls on *exceptional events* on [prescribed burns](#). These manmade emissions are simply exempt from the standard.

Industrial sites have long been the main target for application of AAQ NEPM standards. The AAQ NEPM's Impact Statement identifies how the AAQ NEPM is enforced, which is summarised in table 1. Virtually all the references made relate to enforcement on industrial sites.

Table 1 Enforcement of AAQ NEPM Standards Across Jurisdictions		
State	Enforcement	Comment
NSW	<i>Approved Methods for the Modelling and Assessment of Air Pollutants in NSW</i> . Applies generally to industrial sites, especially those with Environmental Licences. Note AAQ NEPM criteria have been routinely incorporated into this regulatory document and applied as impact criteria. <i>Protection of the Environment Operations (Clean Air) Regulation 2010</i> . NSW EPA can and does set tighter limits than the usually grandfathered criteria in this regulation.	Applies generally to scheduled sites. It is largely triggered by Development applications, but has been applied to existing sites subject to the discretion of the NSW EPA. There are many examples where Approved Methods criteria including AAQ NEPM standards are applied as impact criteria with no exceptions. Sets controls on motor vehicles, purchased equipment, wood heaters, ships at ports and industrial activities and plant. A grandfathered process with some by-pass arrangements.
Vic	<i>State Environment Protection Policy (SEPP) for Ambient Air Quality</i> . Key requirements include meeting ground-level concentration criteria for many air quality indicators. This document is routinely updated to include the latest AAQ NEPM criteria which is available to be applied as impact criteria.	Ground level concentrations apply to scheduled premises and enforced through licence conditions. This usually occurs at the planning stage but can impact at the discretion of the Vic EPA on existing sites.
QLD	<i>Environmental Protection (Air) Policy 2008 State Planning Policy 5/10 Air, Noise and Hazardous Materials (2010)</i> Applies to industrial land uses.	Largely applied to sites requiring environmental authorities and other industrial land uses only.
SA	<i>Applied within licences under the Environment Protection Act 1993 and/or within development approvals under the Development Act 1993.</i>	Primarily applied to industrial sites requiring environmental licences
WA	Works Approvals and Licences under Part V, of the <i>Environmental Protection Act 1986</i> .	Primarily applied to industrial sites requiring environmental licences

The issue is that historically industrial sites were a significant source of air pollution, though motor vehicles always dominated as the urban source of VOCs, NO_x and, via photo chemical smog, ozone. With the shrinking of large industrial sites across Australia over the last 25 years, industrial sites have also shrunk in their contributions to air pollution. For example in the Sydney area industrial source of NO_x are estimated to contribute less than 5% of the total with motor vehicles dominating. With the demise of large old industrial sites the major sources of NO₂, Ozone and particulate matter has shifted to other sources, such as wood heaters for particulates.

However, the enforcement of air quality standards has been slow to change and deal with these other dominant sources. If Australia wishes to improve its air quality then these other sources require increasing enforcement and control.

Applying the AAQ NEPM standards as if they are impact targets, as is currently practiced generally is not in line the AAQ NEPM requirements for ambient air quality which is based on an average population of 25,000². There are strict rules on the location and use of monitoring stations, such as avoiding hot spot areas such as along major roads etc as required under the referenced Australian Standard AS/NZS 3580.1.1:20. In contrast, many industrial sites are measured according to their ground level (not average ambient) concentrations at their

² See section 14 AAQ NEPM
ASBG's Submission on the AAQ NEPM August 2019

nearest receptor³, including other industrial and even agricultural land has been used. In addition, this impact criteria are commonly assessed using air modelling methods assuming worst case scenario circumstances. This common heavy application of the AAQ NEPM criteria on industrial sites, as identified in the Impact Statement should be recognised as going much further than required under the AAQ NEPM.

In addition, a number of ASBG members report the application of the latest AAQ NEPM criteria. They report there are three scenarios in which the NEPM has and can be used on existing sites:

- Licence renewal/variation – an EPA may propose tighter emission standards or modelling to demonstrate emissions meet impact levels linked to the new NEPM standards
- EPAs may run a program and request existing industry to demonstrate through modelling to demonstrate emissions meet impact levels linked to the new NEPM standards
- New plant or extension to a plant – potentially may require modelling to demonstrate emissions meet impact levels linked to the new NEPM standards

Normally such impact assessment criteria are applied at the planning level where the site is either a new development or is undergoing an expansion. However, application of impact assessment on existing sites which are not subject to any planning criteria is occurring more frequently. Triggers for environmental regulators to undertake such a review usually includes where there has been a string of complaints from neighbours and or where an activist group has taken particular interest in a site and perhaps identified a few issues, unrelated to NEPM standards. The issue here is that now multiple precedents have been set⁴ to apply the latest air emission criteria in most jurisdictions there is considerable uncertainty for many sites. The local environmental inspectors may at anytime in the future, by-pass all grandfathering provisions and statements in policy documents and apply the latest tightest standard.

R2 ASBG Recommends the AAQ NEPM recognise and consider the:

- ***The cost impact of the much tighter use of ambient air standards are used as impact criteria for industrial and other sites requiring and or holding environmental licenses.***
- ***Poor application of AAQ NEPM criteria to other sources – (not industrial sites and motor vehicles).***
- ***Exclusion of hazard reduction burns.***

ASBG considers the reassessment of how AAQ NEPM standards are applied should trigger a reconsideration of the recommendations in the Impact Statement consider the likely costs these changes would impose and the low cost-effectiveness of their enforcement, especially on existing sites.

3 Issues with the SO₂, NO₂ changes and PM_{2.5} Consequences

ASBG has considered the issues with the draft standards and comments on two main ones likely to impact on our members: SO₂, NO₂ and PM_{2.5}.

3.1 SO₂ and NO₂ Tightening

Of the increased tightening SO₂ appears as the most threatening to industry if it is imposed on existing facilities as impact limits. NO₂ tightening is also considered important, though the impingement on new facilities will be where it is most felt, given the need for natural gas use as a transitional fuel in the energy sector.

To repeat the AAQ NEPM standards will be enforced on new and many existing industrial sites as impact standards, not ambient as per the NEPM. If so enforced as impact limits these standards certainly will stop

³ Nearest sensitive receptor is the point where ground level air concentrations are estimated to be at the worst case scenario. They include the closest residential dwelling, but can include neighbouring industrial commercial sites and even agricultural land

⁴ ASBG can provide a list of affected sites where the tightest impact criteria has been applied to existing sites

development of many industries into the future, which needs to burn coal or coke or other fuels, which contain sulfur. Some bio-gas systems also generate SO₂ will require scrubbing either before or after combustion, hence its effect will also include renewable energy sources. Enforcement of SO₂ scrubbing on cement, steel, aluminium, ceramics sectors and coal fired power stations will most likely close that site than encourage installation of scrubbers. Age and existing life of industrial plant is old and limited due to Australia being a poor choice for such investment over the last 25 years in such industries. Consequently, the choice to either install scrubbing, which in many cases exceeds 25% the cost of a new plant is simply uneconomic.

ASBG has provided a number of case studies from our members in consideration of application of the SO₂ and NO₂ standards as impact criteria:

- Company A in the ceramics sector assessed the SO₂ scrubbing costs to achieve impact level limits estimated its costs in excess of \$60 million, if bag houses can achieve the result or double this cost if they cannot.
- Company B estimates the cost of SO₂/NO₂ scrubbing would be around 50% of capital replacement costs of the facility. Given its existing service life this site would close.
- Company C in the non-ferrous sector was forced to purchase neighbouring land as it was deemed a sensitive receptor by the environmental regulator. Apparently air modelling estimated this receptor may exceed ground level SO₂ levels during specific meteorological conditions perhaps once or twice a year. With a once only exceedance policy this was unacceptable to the regulator. If the SO₂ impact criteria are lowered again the issue will likely re-emerge over properties (receptors) in that wind direction. This time with no exceedances permitted. Land purchase and scrubbing is considered too costly and if applied the site would likely close.

ASBG members consider their likely breaches of the SO₂ limit would be only on the draft 1 hour standard and then only under certain meteorological conditions at a few specific spot ground level locations around their site, then only a limited number of times a year. In other words the SO₂ standard is applied as an impact limit and not an ambient standard. Environmental regulators already use worst case scenarios to derive these likely exceedances using air modelling tools. They will use the no exceedances approach, which is not used elsewhere in the world, so the limit becomes one which can never be exceeded. So a safety factor is often used by regulators to ensure this is the case.

There is another issue with use of impact limits at the nearest receptor, in that it sets a double standard with other SO₂ limits. Many foods are permitted to use SO₂ as a preservative. Under Australia and New Zealand's Food Standards up to 300 ppm SO₂ is permitted in wine. It is common for the gas space in a wine bottle to quote:

...in a wine bottle, free SO₂ may range from 20 to 30 mg.L⁻¹, and total SO₂ may be ~100 mg.L⁻¹⁵.

So here a food standard permits short term exposure to SO₂ directly near people, when for example opening wine. Opening the wine releases a small mass of SO₂, and is diluted, but it may be at 45 ppm or even higher and the Standard is 100 ppb; 500 times lower. Yet when SO₂ or other AAQ NEPM standards are applied using impact limits similar extrapolated exposures one thousand times lower is not. There seems to be somewhat of a double standard between food and air quality in such a case. Of course this argument only applies if the SO₂ standard is applied as an impact limit and not at the ambient level. However, the impact on a person of opening a wine bottle to impact criteria has similarities.

AAQ NEPM's cost benefit study shows enforcement of the proposed SO₂ standards is not worth the cost as every dollar spent results in a 1 cent benefit and 7 cents for NO₂. This is reflected in AAQ NEPM's the [Cost Benefit study](#) which shows SO₂ abatement costs to be \$24,409m with a benefit of \$196m. ASBG notes these

⁵ [Cosorption of Sulfur Dioxide and Water on Cork](#), Sonia Lequin, David Chassagne, Thomas Karbowski, Jean-Pierre Bellat, Am J Enol Vitic. March 2012 63: 127-131

costs only cover power stations, petroleum refining, iron and steel sectors, but do not consider the costs on aluminium, ceramic, coke making and other industrial sources of SO₂. There are similar gaps with NO₂. Nevertheless, the trend is clear, enforcement of the additional SO₂ and NO₂ standards are simply not worth it. Given that enforcement of impact limits on existing sites, will most likely close the activity, the loss of jobs and the health impact of resulting unemployment⁶ would result in significantly more health impacts which are not considered in the cost-benefit study.

AAQ NEPM cannot not ignore the enforcement processes, which will likely result in SO₂ scrubbing requirements for new and many existing industrial sites. Given the Impact Statement has cited multiple jurisdictions applying ambient standards as impact standards, the NEPM process cannot pass this issue off as application of the AAQ Standards at jurisdictional levels. As an alternative ASBG considers that if the SO₂ draft was kept, but appropriate exceedances permitted, then our members can generally meet such criteria.

3.2 PM_{2.5} Issues

The PM_{2.5} goal is to be to 7µg/m³ 1 year in 2025 as identified in the 2016 NEPM change. In part the SO₂ emissions are linked to particulates so the standards are somewhat intertwined. The problem with this is large parts of Sydney and areas of Melbourne now exceed the 8 µg/m³ 1 year PM_{2.5} current NEPM standard. As PM_{2.5} is generated from all motor vehicles, any new development increasing vehicle flows should be captured at the development application stage. This assumes planning will apply AAQ standards in a uniform manner, which is questionable. To apply the criteria correctly any new development is sited in an affected area, Planning controls should impose a zero emission level on the proposed development. This process is supported by the [NSW Approved Methods](#), which considers cumulative emissions. However, as even a new block of units will increase traffic, hence particulate levels. They too could be subject to a zero emission. As zero emissions cannot be achieved does this mean affected areas may become development sterile?

4 Use of zero exceedances and differences with overseas air standards

The [Impact Statement](#) provides a summary of international standards for SO₂ in table 6-3. While the AAQ chooses mid ranges of 100 ppb (75 ppb in 2025) per 1 hour and, 20 ppb 1 day, it also uses a zero exceedance level. The current AAQ NEPM permits one exceedance per year with is similar to the US 99 percentile criteria for exceedances. The EU and UK permits 24 exceedances per year with a caveat of any being over 160% not being permitted.

Most industry can live with 99 percentile exceedances per year, but when zero is applied as impact limits, this can become rather difficult. The issue here again is that application of AAQ NEPM standards as impact standards can result in non-compliance, whereas if applied as ambient standard exceedances would be rare as identified in the NEPM Impact Statement.

ASBG recommends the AAQ NEPM adopt allowable exceedances for SO₂, NO₂, Ozone and PM_{2.5} as consistent with the EU or North America.

Currently, one exceedance is permitted annually for SO₂ and NO₂, but considering the use as impact criteria ASBG considers increasing the exceedances permitted to that of the EU or North America would assist in meeting impact criteria by enforcement by environmental regulators.

⁶ See [Consequences of Unemployment](#) House of Representatives Committee on Employment, Education and Training

5 Including prescribed burns as exceptional events

Sydney was subjected to two prescribed burns that resulted in hazardous air pollution levels, primarily particulates, twice in 2019 for at least 3 days each from each prescribed burn. There is considerable public disquiet about this type of air pollution caused by Government agencies. Such action raises the question as to their risk balance. While prescribed burns may be necessary, having them exempt from the AAQ NEPM is considered a double standard. It is difficult for Government abatement programs, such as to avoid wood fired heater smoke, to gain community support, when an arm of Government is exempt from similar standards. While prescribed burns were made *exceptional events* in the last AAQ NEPM review, this new review is making this glaringly double standard look even more absurd.

Consider if prescribed burns were undertaken by private organisations. EPAs would likely require considerable and detailed research to justify the burns, providing a cost benefit studies and risk reduction controls to ensure minimum health exposures. Controls should consider picking up litter as it may contain PVC a precursor to dioxin. Burns done in winter months are also when fire temperatures are lower and more incomplete combustion occurs, hence more air toxics, including dioxins and many other carcinogenic substances.

Dr Broome et al, NSW Department of Health, undertook a study - [A rapid assessment of the impact of hazard reduction burning around Sydney](#) It states *In May 2016, hazard reduction burns around Sydney caused smoky conditions with high PM_{2.5} concentrations on several days...We estimated that 14 premature deaths (95% confidence interval [CI], 5e23), 29 cardiovascular hospitalisations(95% CI, 5e53) and 58 respiratory hospitalisations (95% CI, 0e124) were attributable to smoke from hazard reduction burning on the six smoky days.*

As the NSW Government's own Health agency warned of the impact of poorly conducted prescribed burns, the exemption of such burns from the AAQ NEPM standard remains and is still Government Policy. ASBG considers this a mistake as there is considerable disquieted within the community over the poor handling of prescribed burns and its air pollution. To achieve ambient air quality that allows for the adequate protection of human health and well-being is the objective of the AAQ NEPM, but if it is poorly applied, or ignores certain source of air pollution then it is failing in this outcome.

R3 ASBG recommends that:

- ***Prescribed burns be included under the AAQ NEPM and the European Union exceedances used to permit a limited set of exceedances for them and other sources.***
- ***All sources of anthropogenic air pollution be addressed in a similar manner and enforced using similar standards of measurement and appropriate controls suitable to the source type.***

Overall the scientific approach used in the draft NEPM is as a consequence of the above issues questionable. To progress the current worlds tightest limits with unknown direct costs and resulting job losses, required to meet the new limits is a poor way to progress this issue. Further assessment is required before the AAQ NEPM is finalised.

I look forward to having further discussions with the NEPC in relation to the issues in this submission.

Yours sincerely



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ASBG's Submission on the AAQ NEPM August 2019