

Adam Carlon, NEPC Executive Officer
National Environment Protection Council
Department of the Environment and Energy

Lodged online via: nepc@environment.gov.au

7 August 2019

Review of the National Environment Protection (Ambient Air Quality) Measure

The Australian Energy Council ('AEC') welcomes the opportunity to make a submission to the National Environment Protection Council ('NEPC') on the review of the National Environment Protection (Ambient Air Quality) Measure ('AAQ NEPM Review') as detailed in the *Draft Variation to the National Environment Protection (Ambient Air Quality) Measure for sulfur dioxide, nitrogen dioxide and ozone Impact Statement* ('Impact Statement').

The AEC is the industry body representing 23 electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. These businesses collectively generate the overwhelming majority of electricity in Australia and sell gas and electricity to over 10 million homes and businesses.

The AEC strongly supports the Ambient Air Quality National Environment Protection Measure (AAQ NEPM) standards, established under the *National Environment Protection Act 1994*. These standards have allowed governments to quantitatively assess and monitor levels of air pollution, thereby improving transparency over how certain pollutants can impact human health. Given the standards for sulphur dioxide (SO₂), nitrogen dioxide (NO₂) and Ozone (O₃) have not been updated since 1998, the current AAQ NEPM Review is timely and affords Australia the chance to ensure its air quality remains among the best in the world.

The AEC notes that consistency in monitoring methodology and implementation of the ambient air monitoring network, particularly with respect to the siting of "performance monitoring stations", is key to achieving the AAQ NEPM objective of minimising risk to the health of the Australian population. As such, we strongly encourage jurisdictions to agree to a set of national monitoring methods before the revised AAQ NEPM comes into force. In addition, the AEC would support a review of existing ambient air monitoring stations across jurisdictions and where applicable a reclassification of these stations should they no longer meet the criteria of a performance monitoring station as described in the proposed AAQ NEPM.

When considering the AAQ NEPM approaches against overseas equivalents, it is important to take into account Australia's uniquely fortunate situation of geographically dispersed emissions sources, which tend to be located away from major population centres. This consideration is important to avoid setting standards that result in high compliance costs for little health benefit. From an energy industry perspective, we must also be careful not to disrupt the orderly transition towards low-carbon electricity that is currently underway in our sector. The AEC is concerned that Australia's unique circumstances have not been duly considered in the decision to adopt and/or go beyond international standards for ambient SO₂ and NO₂ emissions. This concern is heightened by the proposed ban on allowable exceedances, which is inconsistent with the international standards set by the US and Europe.

Proposed Air Quality Standards

Section 4.4 of the Impact Statement explains that the standards were proposed following a review of international literature, regulations and standards of leading countries by the Air Thematic Oversight Group. A range of standards were proposed for SO₂, NO₂ and O₃ that covered the variation found across the international standards. Emission estimation, exposure modelling and health risk assessments were then undertaken for future projected BAU emissions and emissions abatement scenarios to determine likely compliance with the range of standards across Australia.

Overall, the proposed standards are values assessed as being achievable under the business-as-usual and abatement scenarios for the majority of the population, and where exceedances are predicted it is indicated that these could be addressed at a jurisdictional level. If the proposed AAQ NEPM was adopted then compared to the standards of other countries reviewed, Australia will have:

- the most stringent standards for 24 hour SO₂ and, by 2025, 1 hour SO₂ (with no allowable exceedances permitted, unlike the US, European, New Zealand and Canadian standards quoted in the Impact Statement); and
- the most stringent standards for 1 hour NO₂ and, by 2025, annual NO₂.

The AEC notes that the Impact Statement relied heavily on the World Health Organisation guidelines ('WHO Guidelines') to set some of these proposed standards. The WHO Guidelines make clear that their recommendations are not air quality standards and that when setting national standards, any government or regulating body should consider their own local circumstances.¹

With this in mind, the following sections detail the AEC's view on the proposed standards, whether local circumstances have been appropriately considered, and the challenges that electricity generators might face in meeting these standards, particularly if no exceedances are allowed.

Short-term SO₂ standards

Recommendations 4 and 5 of the Impact Statement ask for the 1-hour standard for SO₂ of 200 ppb to be reduced to 100 ppb, and then 75 ppb starting from 2025. The Impact Statement reasons this new standard will ensure the protection of health because it puts Australia more in line with international benchmarks. The AEC believes this reason alone does not provide sufficient cause for such a reduction in concentration standards, and might have unintended consequences.

More specifically, state jurisdictions in Australia usually adopt AAQ NEPM standards as impact assessment standards for individual facilities during the development approval process as well as applying them at hot spots near major point sources or at the boundary of an industrial facility. The application of the AAQ NEPM in this manner is inconsistent with how the AAQ NEPM standards should be applied, as described in Part 4 of the draft AAQ NEPM, but nonetheless it is current practice.

If this practice were to continue with the proposed new standards then a number of areas within close proximity to large industrial sources could exceed these standards, potentially triggering a cost prohibitive abatement program. Given the Impact Statement acknowledges that using abatement measures to ensure compliance with a 75 ppb 1 hour SO₂ standard is 'very uneconomic' and has a

¹ World Health Organisation, Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide, Global Update 2005, Summary of Risk Assessment, 2006, page 7.

‘relatively low’ health benefit, this surely cannot be a desired outcome.² It is probably for this reason that the practice internationally, as set by the UK and Europe, is to allow some exceedances of their 1-hour SO₂ standards to accommodate for the atypical exceedance that does not impact on the desired health and environmental outcomes.

Moreover, as most Australian coal-fired power stations are halfway through their economic lives and their role in the National Electricity Market (‘NEM’) is declining, retrospectively installing de-SO₂ technologies, such as flue gas desulphurisation, is not a realistic or economic proposition. Aggressive sulphur standards without any allowable exceedances could have the unintended effect of forcing the early closure of some coal generation units and therefore disrupting the orderly transition away from coal. This would have a very significant and undesirable impact on the NEM, as well as the Australian economy more broadly.

Allowable exceedances

The Impact Statement proposes to prohibit any allowable exceedances for SO₂, NO₂ and O₃ emissions. In presenting this proposal, the Impact Statement does not discuss the application of allowable exceedances or the use of percentiles, a key element of other international short-term (1 hour, 24 hour) standards. It also appears to ignore the World Health Organisation’s *Air Quality Guidelines for Europe*, which state that when developing standards ‘the numerical value of a standard may also include the permitted number of exceedings’.³ Instead of allowing exceedances, the Impact Statement refers to a concept of “exceptional events”:

*The setting of air quality standards recognises that certain events can lead to high concentrations, but these are unpredictable and uncontrollable. Examples include extreme meteorological conditions and bushfires. Control programs that are designed to meet the standards during extreme conditions can be prohibitively expensive or technically unfeasible.*⁴

The exceptional events rule is proposed for O₃ but not SO₂ or NO₂. The Impact Statement reasons that an “exceptional event” clause for SO₂ and NO₂ emissions is unnecessary since it cannot foresee any exceptional events in the future.⁵ From the AEC’s perspective, an “exceptional event” clause is in place for this very reason: to allow for an unforeseeable event.

This position is supported by past reviews of SO₂ ambient air quality monitoring data in areas where there are large point sources. These areas have shown rare outlier SO₂ concentrations above typical current maximum levels and that these result from ‘exceptional’ meteorological conditions. In this regard, such events would arguably constitute the definition of an “exceptional event”.

The table in Attachment 1 serves as a practical example of this. It provides:

- a) a summary of the proposed changes to the AAQ NEPM standards for SO₂, NO₂ and O₃ compared with international standards, including allowable exceedances; and

² National Environment Protection Council, *Draft Variation to the AAQ NEPM for sulfur dioxide, nitrogen dioxide and ozone: Impact Statement* (‘Impact Statement’), May 2019, p57.

³ World Health Organisation, *Air Quality Guidelines for Europe*, 2nd Edition, WHO Regional Publications, European Series (no. 91), 2000, page 42.

⁴ Impact Statement at xiv.

⁵ Ibid at 58.

- b) the number of exceedances of the current and proposed AAQ NEPM standards at five ambient air stations on the NSW Central Coast from 2016 to 2018.

The table shows that ambient air quality in the NSW Central Coast region was exceptionally good, meeting the proposed 2025 SO₂ 1hour 75 ppb standard on all but three occasions in the three year period. The three exceedances that did occur were only 4 ppb or less than the 75 ppb standard.

If these unpredicted exceedances were to continue under the proposed AAQ NEPM standards, it would be prohibitively expensive and/or technically unfeasible to mitigate, factors that constitute the Impact Statement's definition of an "exceptional event". Moreover, there is the possibility of pollution control programs being mandated at a state level, which would pose further technical challenges as well as significant expense for no material health benefit.

Notwithstanding the above, the Impact Statement does not provide sufficient evidence that the provision of a small number of allowable exceedances or exceptional events within the proposed standards would prevent the AAQ NEPM from achieving its goal to minimise any material health risk to the Australian population. In fact, it appears to contradict what the Impact Statement says earlier in the report about how adopting tight standards will not provide a material health benefit:

... exceedances (of the proposed 1-hour SO₂ standard of 75 ppb) have been infrequent. The health outcomes associated with 1-hour SO₂ concentrations are therefore low, and for the majority of the Australian population meeting the proposed standards would not lead to a material health benefit.⁶

Given the absence of a material health benefit, the continued use of allowable exceedances by other leading countries and the relative infrequency of exceedances in Australia, it is the AEC's view that the proposed variations should provide for some allowable exceedances. This is consistent with world's best practice as evidenced by the various international standards cited in the Impact Statement, and consistent with the latest World Health Organisation air quality guidelines, which acknowledge that standards can be developed with an allowable number of exceedances that 'for example, in terms of percentage of days per year that should be allowed or, rather, not be regarded as a failure to meet the standard'.⁷ Without such a provision, the proposed standards may disrupt the stability of the NEM and an orderly transition to a lower carbon energy market.

Having allowable exceedances will ensure uniform standards remain pragmatic

One of the benefits of using national standards is it achieves uniformity and consistency across Australia. It also means though that it does not differentiate between areas based on the proximity of population centres to industry sources, and the relative health impact that goes with it. This differentiation is nonetheless recognised in the Impact Statement, which frequently divides data into two categories: 'major cities' and 'regional centres'. This division is used for measuring emission levels of pollutants as well as health information, such as mortality rates.⁸

While the AEC is not proposing for the AAQ NEPM to adopt a differentiated approach, it should have mechanisms in place to ensure that infrequent pollutant activity above the permitted standards, but of

⁶ Ibid at 53.

⁷ World Health Organisation, *Evolution of WHO Air Quality Guidelines: Past, Present and Future*, 2017, page 20.

⁸ Impact Statement at 38, 47.

little health risk due to geographical factors, is not subject to prohibitively expensive abatement measures. The most pragmatic way to achieve this while maintaining a uniform national approach is through providing some allowable exceedances. As repeated above, this is consistent with international standards and does not pose an unacceptable health risk to the community given how small and exceptional these exceedances are.

Impact on gas-fired power stations

As the Impact Statement notes, a number of coal-fired power stations will be phased out over the next two decades.⁹ While ongoing investment in renewables (solar and wind energy) as well as storage options will replace much of the energy, these sources are intermittent and, at this stage, cannot act as a consistent source of baseload power. For this reason, gas is viewed as a viable option to support the variability of solar and wind energy as well as being a considerably lower carbon emitting fuel in itself.

An example of this is the Australian Energy Market Operator's *Gas Statement of Opportunities 2019*, which expects gas 'to continue to provide a reliability and security role to complement variable renewable energy' in both the medium and longer term.¹⁰ Gas-fired power stations also have the benefit of being locatable near load centres, which removes the need for expensive transmission and lowers transmission losses. However, it also means their emissions may be within a metropolitan airshed where ambient NO₂ background levels may already be elevated on occasion.

In the likely event jurisdictional authorities adopt the proposed NO₂ and O₃ standards as assessment criteria, the AEC is concerned that imposing such stringent standards, particularly in the absence of any allowable exceedances, will constrain an airshed's assessed capacity for NO₂ emissions and may deter investment in new gas-fired power plants. This is because any prospective investor will have to weigh up the increased regulatory burden during the approvals process and possibility of having to install cost prohibitive pollution controls if the plant records even one exceedance under the proposed standards. This again threatens the orderly transition of the electricity system into a lower carbon future.

The AEC looks forward to continuing working with NEPC to ensure Australia's air quality remains clean and healthy, and supports an orderly transition to a low carbon future that avoids causing major unintended consequences for the Australian economy.

Any questions about this submission should be addressed to Rhys Thomas, by email to Rhys.Thomas@energy.council.com.au or by telephone on (03) 9205 3111.

Yours sincerely,



Ben Skinner

General Manager, Policy & Research
Australian Energy Council

⁹ Ibid at 32.

¹⁰ Australian Energy Market Operator, *Gas Statement of Opportunities*, March 2019, p5.

Attachment 1

Pollutant Standard	Current NEPM Standard ppb (AE) ^(a)	Recommended NEPM Standards ^(b)		International Standards ppb (AE) ^(a)	Central Coast Air Quality 2016 to 2018		
		once NEPM varied likely from 2020	future standard from 2025		no. of exceedances of current standard	no. of exceedances of 2020 standard	no. of exceedances of 2025 standard
SO ₂ 1-hour	200 (1)	100 (0)	75 (0)	EU 124 (24) US 75 (1%) NZ 124 (9)	0	0	3 *
					* exceedances recorded were 79 ppb at Wallsend and 76 ppb & 78 ppb at Wyee, all in 2018. Next highest was 66 ppb at Dora Creek		
SO ₂ 24-hour	80 (1)	20 (0)	(no change)	EU 44 (3) WHO 7 (0)	0	0	0
					maximum recorded was 13 ppb at Wyee in 2018		
SO ₂ annual	20	no standard	no standard	EU, US & WHO - no standard	(not applicable as there will be no future standard)		
NO ₂ 1-hour	120 (1)	90 (0)	80 (0)	EU 97 (18) WHO 97 US 100 (1%) NZ 97 (9)	0	0	0
					Maximum recorded was 70 ppb at Wyee in 2017. The next highest was 51 ppb at Wyong in 2017		
NO ₂ annual	30 (0)	19 (0)	15 (0)	EU 19 (0) WHO 19 (0) US 53 (0)	0	0	0
					Maximum recorded was 10 ppb at Wyee in 2017. The next highest was 8 ppb at Wyee in 2016 and Wallsend in 2017		
O ₃ 1-hour	100	no standard		EU, US & WHO - no standard	no data - ozone pollution is not monitored as it is not a considered a problem pollutant on the Central Coast		
O ₃ 4-hour	80	no standard					
O ₃ 8-hour	no standard	65	(no change)				

Notes:

(a) AE = allowable exceedances per year (identified by the number in the brackets). The European Union (EU), US (United States EPA) and New Zealand permit some exceedances of their ambient air standards. The current Australian NEPM also permits 1 exceedance per year for SO₂ & NO₂ 1-hour.

(b) The new recommended NEPM standards do not permit any allowable exceedances of the SO₂, NO₂ and O₃ ambient air standards.