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27 August 2010

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Dear Ms Scott

Submission from the National Generators Forum (NGF) on the consultation draft 'An Australian approach to setting air quality standards' and the discussion paper on the 'Review of the National Environment Protection (Ambient Air Quality) Measure' dealing specifically with air quality standards.

The National Generators Forum (NGF) welcomes the opportunity to comment on the consultation draft on 'An Australian approach to setting air quality standards' (the Consultation Draft) and the discussion paper on the 'Review of the National Environment Protection (Ambient Air Quality) measure dealing specifically with air quality standards (the Discussion Paper).

The NGF represents electricity market facing generators in the National Electricity Market and the WA Electricity Market. These include generators with large thermal power plant that provide the bulk of electricity in Australia.

NGF members have a long-term interest in ambient air quality (AAQ) standards and standards' setting because AAQ standards reflect directly on the operating regime of power stations through the association with point-source air emissions and related environmental licensing processes. Electricity generators have a long history in undertaking and sponsoring air quality research that has been of broad benefit in these processes.

These issues are very significant because power stations can sometimes be mistakenly associated with unrelated emissions impacts, particularly in more distant metropolitan airsheds but also locally. In framing standards, regulators should ensure that regulations are based on a sound understanding of source – receptor relationships. The tall stacks of power stations, together with the discharge plume buoyancy, ensure that emissions are dispersed in the upper airshed.

Therefore, the approach taken to setting AAQ standards and the actual AAQ NEPM standards have profound jurisdictional and industry implications.

The NGF congratulates the NEPC Secretariat for its structured and considered approach to reviewing the AAQ NEPM. The Consultation Draft and the Discussion Paper, as well as the associated presentation sets and summary paper, provide considered and systematic information on both the approach to standard setting and the international and national evidence for reviewing Australia's AAQ standards.

Both documents do lack an executive summary that would have been helpful, given the length and complexity of the documents. However, the presentation sets make up much of this short-coming. A more significant issue is the real lack of time to respond to two complex documents, although it is acknowledged that versions of the approach to standard setting consultation draft have been in the public domain in some form or another for some time.

The time constraint has made it challenging for the NGF to properly respond to the Discussion Paper in particular, and the current version of the Consultation Draft in general. Accordingly this submission confines itself to a number of key issues from the NGF members' perspective, recognising that this is one of the steps in the review process and that there will be further, but possibly more limited, opportunity to comment on future developments of the AAQ NEPM.

A somewhat added concern is the simplistic nature of the 'tick-a-box' feedback form on the Discussion Paper. Although the use of the feedback form is purely voluntary, its mass circulation to briefing sessions' participants and the ease of completion and dispatch may well provide a very unbalanced and unconsidered view of the many complex issues at hand. The NGF would expect the NEPC Secretariat to consider the responses on the pro forma feedback form as somewhat of a 'straw poll', based on the weight of such feedback, rather than being insightful responses to complex issues.

The Australian approach to setting air quality standards

The NGF recognises the pioneering Australian approach to the setting of air quality standards and welcomes the thoroughness of the draft standard setting framework with its three key areas of risk assessment, potential risk-based guidance values, and risk management, including the stakeholder and public consultation phases. This process acknowledges that in setting standards there is inevitably an acceptance of some risk. This important point is generally not well understood and may require further public engagement.

Of direct interest, and of possible concern to NGF members, is the risk assessment stage based on hazard assessment, exposure assessment and risk characterisation.

Review of the Consultation Draft by NGF members did not highlight any specific area that would determine what methodology was used, or is to be used, in the risk assessment or how to tabulate the outcomes of the risk assessment. There were some high level generic-type statements but nothing to provide any support as to the way risk assessments were, or are to be, undertaken, or the setting out of results, such as in risk tables or risk matrices.

It is understood that there is no one way to do risk management and each organisation will develop a framework and process that works for its needs. In situations where risk is being used as a factor to support a point, especially in the sciences or human health impact areas, there needs to be demonstrated integrity in the methodology used. This may well be the case in the draft standard setting framework, but there appears to be no evidence as to what risk methodology was developed and/or utilised to provide integrity in the decision making for all participants.

There is no clear evidence of the actual basis of the risk assessment approach that is in alignment with either the Australian (AS/NZS4360:2005) or the International (ISO:31000:2009) Risk Management Standards.

Review of the AAQ NEPM

The review of the AAQ NEPM is indeed most challenging. The significant amount of new evidence about the health effects of the criteria pollutants needs to be treated with respect but also with caution as there are anomalies and inconsistencies, such as the higher association between concentration and health impacts for PM₁₀ and NO₂ in Australia and Canada, compared to Europe and the USA, yet in light of arguably better ambient air quality in the two Commonwealth countries. Caution is also required when acknowledged limited ambient data and even more limited exposure data is used in dealing with the vexed and complex issue of threshold limits for health effects and the observations that there are generally no threshold limits for health effects for most criteria pollutants.

This moves the AAQ NEPM review into some new territory as it would be quite difficult to apply the standard setting framework when there are no threshold limits. Some leads could be taken from the standard setting of carcinogenic substances, such as limits per 100,000 persons contracting a cancer linked to the substance, but in the case of setting air quality standards, this approach is likely to prove to be problematic given the diversity of air quality health effects, the 'reversibility' of health impact in many instances, and the overall impact of modern lifestyles. The NGF believes that more analysis is needed for dealing with the absence of threshold limits for health effects in setting AAQ standards and we recommend that the NEPC Secretariat produces separate documentation for dealing with this issue.

In the absence of threshold levels, there is some inevitability to lower AAQ standards as has been the case for SO₂ in the USA and in WHO guidelines (where the limit was reduced by an order of magnitude). Sound risk assessment is thus even more important in the absence of threshold levels for health effects.

As acknowledged in the Discussion Paper, another key issue is that of 'allowable number of exceedances' and whether the approach used is still appropriate. A number of alternatives are put forward such as no exceedances, simply reporting exceedances but without an allowance, excluding 'exceptional' or 'natural' events, or using an USA EPA approach of measuring compliance in percentile form.

Whilst all methods for dealing with exceedances have challenges and issues, the NGF believes that the current approach to dealing with exceedances has generally served Australia well as it is both simple and transparent and little additional value seems to be gained from the alternatives. A possible exception could be for SO₂ as the only 'tall stack' pollutant and one that is highly skewed in distribution. The USA EPA percentile approach could potentially be used more effectively for this essentially non-urban air pollutant.

Allowable exceedances are particularly important when dealing with particulate matter, even if separately dealing with 'exceptional' or 'natural' events, because of the wide-ranging composition of particulate matter comprising both naturally-occurring background levels and anthropogenic pollutants. This issue is important for dealing with PM₁₀ but even more important if the advisory reporting standard for PM_{2.5} is translated into a compliance standard; a move not supported by NGF members due to the lack of robust Australian data, particularly for rural environments. There is little evidence that much PM_{2.5} data has been collected in the past few years as proposed when setting the reporting standard and if this is correct, the NEPC Secretariat and the State regulators should embark on further work in this area.

The Discussion Paper poses two overarching questions, namely:

- Is there sufficient evidence to support a recommendation to NEPC to revise the current standards in a variation to the AAQ NEPM? If so, for what pollutants?
- Does the current approach meet the requirement for 'adequate protection' or are there alternative methods that could provide more consistency in the level of health protection associated with complying with the NEPM standards?

With respect to the first question, NGF members believe that the growing pool of data over the last 10 years does warrant a recommendation to NEPC to revise the current standards in a variation to the AAQ NEPM but with a number of caveats, namely:

- NEPC should be advised that the current standards have served Australia well with improving air quality in at times polluted big and growing cities:
 - Ambient air quality in much of Australia is extremely good. Apart from some of the larger cities, poor air quality episodes elsewhere are nearly always associated with 'exceptional' or 'natural' events, such as wild fires and dust storms and relate almost exclusively to particulate matter, although occasional SO₂ impacts still occurs. Such issues should be treated by exception and not become enshrined in standards.
 - Much of ambient air pollution is dominated by vehicle emissions, particularly in large urban areas and any revision to standards for NO₂, CO, O₃ in particular should take account of what is achievable with current tail-pipe catalytic technology and the current Australian vehicle suite.
- NEPC should be advised that in the general absence of thresholds for health effects for most of the criteria pollutants, setting objective standards by applying the draft standard setting framework is likely to be quite challenging and may well require further risk assessment development.

With respect to the second question, the NGF believes that the current approach to standards setting and the implementation of the standards have served Australia well in providing appropriate health protection from ambient air pollutants. NGF members would like to encourage NEPC to continue with this sensible, careful and pragmatic approach, together with timely reviews of the standards as is the current case.

With respect to exceedances, NGF members would welcome a more detailed analysis of the options, particularly with respect to particulate matter and SO₂. NEPC should provide additional guidance to the jurisdictions on how to apply uniform national approaches to addressing the cause of exceedances and to implementing control measures, if necessary, in a consistent manner.

Some specific comments on individual pollutants

Sulfur dioxide

By limiting or eliminating sulfur compounds from transport fuels, a key issue in congested cities like Hong Kong, emissions of sulfur dioxide are largely limited to emissions from tall stacks as point sources.

Given the small number of relevant point sources and locations in Australia, a valid argument could be made for an amended approach to SO₂ standards setting, particularly with respect to exceedances and the potential for significantly lower emission limits. NGF members recognise standards were designed to be applied at locations generally representative of exposure of the population and that they do not apply at peak sites or 'hot-spots'. However, NEPC should be cognisant of the fact that the jurisdictions do use standards for setting point-source emission limits and therefore greater care is needed in considering SO₂ standard setting issues, and in particular a standard using a very short averaging period.

Particulates

The NGF believes that significantly more background work is needed on the sources and size-ranges of particulate matter, and in particular PM_{2.5} fine particulates and ultrafine particulates. NGF also notes concerns expressed at the briefing sessions about coarse particulate matter and its dust nuisance value in local areas. NGF members do not support the setting of compliance standards for PM_{2.5} because of insufficient knowledge about sources. Maintaining the current PM_{2.5} one-day advisory standard makes sense given the dearth of Australian data. However, NGF members believe that the one-year advisory standard of 8 $\mu\text{g}/\text{m}^3$ is very stringent compared to measures adopted elsewhere and given the absence of analytical data and data analysis. It is generally a fact that stakeholders have little understanding of background levels of these particles and the influence of natural events on background levels of fine and ultrafine particulates.

NEPC should differentiate between rural/regional areas and cities to account for background fine particles. Particulates could be higher and of a different nature in rural areas compared to cities where they tend to be by-products of other processes and the resultant pollutants are potentially more toxic.

Also, NEPC should note the implications of fine particulate standard setting, particularly when guidelines are based on studies in large cities. This issue could have significant implications from point source emissions, such as from power stations, in rural areas, when jurisdictional regulators determine point source emission limits.

As mentioned previously, when it comes to particulate emissions from 'exceptional' or 'natural' events, such as wild fires, control or fuel reduction burns or (perhaps not natural) forestry operations fires, the standards setting process should analyse these events more fully before considering amending the PM_{2.5} advisory standards or dealing with the issue of discarding the standards on 'event days' altogether.

Carbon monoxide

Ambient carbon monoxide levels are mostly due to vehicle emissions and the very minor emissions from power station (particularly coal-fired power station) stacks are irrelevant with respect to ambient air levels.

NGF members recognise the linear relationship between CO levels and carboxyhaemoglobin levels in blood, the absence of a threshold level for health impacts and the increase in health-related effects at increasing concentrations.

An approach to standard setting for CO should be based on an appropriate standard for COHb blood level and further work may be needed to determine such a maximum blood level and then, by inference, determine any potential changes to the AAQ CO standard level. The NEPC Secretariat should more fully explain the potential use of the standard setting framework when influenced by uncertain COHb standard level.

Lead

The Australian standard for lead is determined on the basis of the 10 ug/dL lead in blood level with current evidence suggesting cognitive effects in children at levels as low as 2 ug/dL. With the removal of lead from transport fuels, the remaining sources of lead are well understood with some more easily controlled than others.

NGF members are of the view that with the significantly increased knowledge of the effects of lead, particularly in children, the lead standard should be reviewed, but with the recognition that ambient air lead levels may make only a minor contribution to blood lead levels, apart for areas near lead smelting or processing facilities.

Ozone and nitrogen dioxide

Photochemical oxidants, measured as O₃, and nitrogen dioxide are problem pollutants in large urban areas mostly resulting from vehicle emissions, some industrial emissions, and in the case of NO₂, also from fuel reduction burns. NO_x emissions from power stations are also significant but because they are dispersed via tall stacks generally and are located away from major pollution centres, they do mostly not contribute to urban air pollutions (as has been shown by studies in the Hunter and Latrobe Valleys).

NGF members acknowledge the NEPC work with respect to an eight-hour ozone standard, noting that current one-hour and four-hour levels are close to or already exceeded in key Australian cities. An eight-hour ozone standard has significant implications for cities like Sydney with increasing summer temperatures. However, NGF members urge the need for great care in setting an eight-hour O₃ standard or amending the one-hour and four-hour standards as these standards have regulatory implications for industry that is generally not the main cause of the problem, particularly industry located well away from large cities.

Setting lower NO₂ standards has similar implications for industry but is an issue of particular significance when the standards are used by jurisdictional regulators in setting emission licence limits for thermal power stations that generally operate in decoupled airsheds with no or few NO₂ problems.

Benzene and polycyclic aromatic hydrocarbons

Both benzene and PAHs are listed as air toxics in the Air Toxics NEPM.

Benzene as a pollutant is almost exclusively a by-product of vehicle emissions and PAHs are produced by vehicles, wood heaters, some industrial emissions, agricultural burning and natural sources.

Under the Air Toxics NEPM, both are assigned an annual averaging period and an investigation level with the current goal of gaining sufficient data nationally to facilitate the development of standards. NGF members believe firmly that there is currently insufficiency monitoring data in Australia to set ambient air quality standards for these pollutants under the AAQ NEPM. Hence, the priority goal of gathering sufficient information and data remains and this can best be achieved via the requirements of the Air Toxics NEPM.

Summary

NGF members welcome the Consultation Draft on the standard setting framework and the Discussion Paper on the review of AAQ NEPM standards. The NGF acknowledges the excellent work undertaken by NEPC in putting together some very complex information and in conducting some quality workshops on the issues.

The NGF cautiously supports the need for NEPC to set amended AAQ NEPM standards based on the growing body of evidence. This submission has outlined a number of additional challenges and issues that should be considered in the standards setting process. The NGF would welcome further engagement with NEPC and with the jurisdictions in advancing the amended standards setting process.

Should you require further information or clarification, please contact the NGF Policy Advisor, Dr Harry Schaap (Harry.Schaap@tpg.com.au or by phone on 03 9499 4249 or 0413 623 043).

Yours sincerely



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