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Environment Protection

Department of Environment, Land, Water and Planning

1 Nicholson St,

East Melbourne, Victoria 3000

Submission – Regulatory Impact Statement: ‘Noise and wind energy facilities’

Introduction:

The “Regulatory impact statement – Noise and wind energy facilities” (RIS), as prepared by Deloitte Access Economics, has been influenced by the wind industry lobbyists and not by independent acoustic engineers. This is clearly indicated on p62 of the RIS (Appendix A – Stakeholder consultation) where the list of “stakeholders consulted” includes 7 Victorian WEF operators etc, but no Acoustic Engineers. The regulatory changes appear to be solely directed at protecting the wind industry from litigation at the expense of the “health and well being” of residents that live in close proximity to an existing or proposed wind farm.

Summary of the existing problems:

- 1.** The application of NZS 6808:2010 to wind farm noise monitoring is not appropriate for modern large scale wind turbines. The application of this Standard to other forms of “nuisance noise” would not be tolerated by the Victorian public.
- 2.** The predictive noise modelling employed by Acoustic consultants in Victoria results in substantively lower levels of predicted sound levels at receptors, compared to the more conservative modelling employed by SA (and adopted by WA and NSW).
- 3.** The location and timing of “pre” and “post-construction” noise monitoring is at the discretion of the wind farm operator, and the data collected is currently treated as “commercial in confidence” and not released for public scrutiny.
- 4.** The 40dB noise limit outside a dwelling does not provide the 30dB inside “sleep requirements” recommended by the WHO, due to the lower acoustic absorption of dwellings built in Victoria (compared to Northern Europe).
- 5.** The mandatory setback distance of 1km for current evolution turbines to “non-involved” dwelling owners is manifestly insufficient for protecting dwelling occupants from sleep disturbance...Victoria lags behind the rest of Australia and chooses to ignore the NWFC's setback recommendations.

Explanatory details:

1. Use of NZS 6808:2010

A major shortcoming of NZS 6808:2010 is its use of the metric LA90(10min) rather than LAeq for assessing the actual turbine noise. The former metric LA90(10min) is suited to the measurement of background noise as it effectively excludes intermittent noises such as birdsong, a slamming door etc. The distinctive and “annoying” component of turbine noise

is the regular thump produced by each turbine blade during its downstroke, but as sound pulses occupy less than the requisite 90% of the measurement period, only the background noise of the turbine is measured. If all nuisance noise was assessed using NZS 6808:2010, then I could beat my bass drum outside of the Minister for the Environment's bedroom window all night with impunity! The standard ETSU-R-97, from which NZS 6808:2010 was derived, uses the LAeq metric. This metric “averages in” the blade “thumps” which produces a marginally better indicator of the turbine sound levels. For a typical turbine, LAeq measurements are 1.5 – 3.0 dbA higher than the LA90(10min) measurements for the same turbine noise levels. LAeq is the metric used by turbine manufacturers for stating their rated noise output levels, and by organisations such as WHO when assessing sleep disturbance. (It is also used by EPA South Australia for turbine noise). NZS 6808:2010 also falls short in defining “High Amenity Areas”, “Tonality” and “Special Audible Characteristics” such that it is near impossible to apply the requisite penalties in Victoria. An Australian version of this Standard needs to be written to reflect both the incremental increase in size of turbines, and the Australian laws under which they are applied.

NZS 6808:2010 is not a suitable standard for the assessment of turbine noise by the EPA

2. Predictive Noise Modelling:

The Acoustic engineers employed by Victorian Wind farm proponents to model predictive sound levels at nearby dwellings are able to employ input parameters that produce significantly lower sound level predictions than their counterparts in SA (and NSW & WA, since the SA guidelines are also used in these states). The major difference is that the other states take a more conservative standpoint. The predictive modelling under both ISO 9613-2 and CONCAWE has a high level of uncertainty as neither model (although permitted to be used under NZS 6808:2010), was written for wind turbines, but rather road noise and petrochemical refineries respectively. In table 5 of ISO 9613-2, the estimated calculation accuracy is +/- 3dBA for a mean height of the source and receiver less than 30m, and a distance between source and receiver less than 1km. Wind farms operate well outside these parameters and hence the real calculation inaccuracy is even higher.

When providing a chart of “WTG manufacturer specifications”, Marshall Day (MD) use the terminology “Guaranteed sound power level” to which they add a 1 dB margin to account for uncertainties. This is the only allowance for uncertainties that MD make, even though it is generally less than the manufacturer's stated uncertainty (Siemens typically 1.5 dB, Vestas typically 2 dB), and less than the 2 dB recommended in section 4.3.6 of “*A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise*” by the UK Institute of Acoustics. MD make no assessment of uncertainties even though it is recommended in NZS 6808:2010.

The SA *Wind farm environmental noises guidelines* as used by SA, WA & NSW recommends on page 10, the use of “a conservative approach” by using the following input parameters:

- atmospheric conditions at 10°C and 80% humidity,
- weather category 6 (if CONCAWE method is utilised)
- hard ground (zero ground factor)

It further requires:

- an estimate of the model accuracy in dB(A)

These precautionary parameters are not mandated and consequently not used in Victoria.

Victoria does not take a conservative approach to the prediction of turbine noise which is why “turbine noise nuisance” regularly occurs.

3. Post-construction noise monitoring:

Each wind farm needs at least one permanent noise monitoring station which feeds sound levels, wind speed and turbine power levels into an internet portal that can be remotely accessed by the wind farm operator, the EPA, and the public. This has been done at several European wind farms, and enables real time compliance checking by all affected parties. The idea of 5 yearly compliance checking is unworkable and encourages a “dieselgate” scenario where any wind farm operator is able to place the wind farm into “reduced noise” mode whenever he believes “noise monitoring” is imminent or taking place. The current practice of not releasing “noise test results” by declaring them to be “commercial in confidence” is also unsatisfactory. All monitoring must be open to public scrutiny.

Victoria must legislate for honest and open wind farm post construction noise monitoring.

4. Achieving a 30 dBA Indoor noise level to meet the WHO sleep limits.

The “theory” that 40dBA outside a dwelling will automatically provide a 30dBA or less “inside” sound level is based on dubious assumptions. The sound attenuation achieved in European dwellings is typically much greater due to their higher thermal insulation standards, which result in the use of smaller, double and triple glazed windows and doors, a greater use of stone and double brick and other high mass wall materials, and a greater usage of slab or other “on ground” flooring systems. The 10 -15 dBA attenuation to “normal sound” is rarely achieved in Victoria with its typical rural light weight construction of weatherboard and raised floor on stumps, and large open windows. Furthermore, ETSU-R-97 on page 32 states: *It should be noted that an assumption of 15dB(A) level reduction between external and internal noise levels has been assumed. This is quite a high level of attenuation through a building envelope if large glazed areas exist within the building facade of a neighbouring residence. The actual level difference between external and internal noise levels (free field to internal) is typically 10 – 5 dB(A) for a face with 25 – 40% glazed facade area, respectively.* It should be noted that Victorian building regulations require a minimum window area equivalent to 25% of the floor area. The fact is, that at 1km+ from a turbine, the legal 40dB noise received at a dwelling comprises almost all low frequency components (the higher frequencies are absorbed by the atmosphere). The lower the frequency, the more readily it penetrates buildings with minimal attenuation. The WHO recommends a sound level LAeq of 30dB for “falling asleep” which equates to a LA90(10 min) of 28dB inside a dwelling (or less than 35dB outside) which is generally unachievable with turbine to dwelling separation distances of less than 2km.

Under the current Victorian legislation, the WHO noise levels to prevent sleep disturbance cannot be met.

5. Dwelling to turbine setback distances.

The mandatory setback distance of 1km for current evolution turbines to “non-involved” dwelling owners is manifestly insufficient for protecting dwelling occupants from sleep disturbance....Victoria lags behind the rest of Australia and chooses to ignore the NWFC's setback recommendations. (The National Wind Farm Commissioner recommends setback distances of 1.5km for turbines up to 200m high, and 2km for turbines greater than 200m. He also recommends a 200m boundary setback on the basis that *“The setback distance between a turbine and a boundary fence is more about courtesy, protection from animals*

that might be spooked by the turbine such as horses, and distractions for road safety purposes for roads.”) Qld has long mandated a 1.5km setback, WA adopted 1.5km in March 2020 (replacing WA planning bulletin #67) SA has adopted 1.5km in its latest EPA revision. This puts Tas, NSW and Victoria behind in sensible legislation which affords their residents some form of certainty in acceptable noise levels. The balance of protection has shifted much too far in favour of the wind industry to the detriment of rural Victorian residents.

Victoria must urgently implement a 1.5km (or greater) dwelling/turbine setback and 200m boundary/turbine setback policy.

Conclusion:

The Victorian Government's invitation for feedback on the proposed changes to the *regulation of wind farm noise* has been deliberately limited in scope to avoid discussion of the major wind farm problems of “noise nuisance”, noise modelling, and setback distances. None of the 3 options offered in the survey adequately address these problems. Of the bad lot, “Direct regulation” offers the greatest potential to rectify the current problems if (and only if) the standards under which the EPA is to operate are revised to better reflect the problems outlined in Items 1 – 5 above.

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