

Interim report

1.1 The Senate Select Committee on Wind Turbines was established in December 2014. To date, it has received 464 submissions from a wide range of stakeholders. It has conducted public hearings in Portland in south-west Victoria on 30 March, in Cairns on 18 May, in Canberra on 19 May, in Melbourne on 9 June and in Adelaide on 10 June 2015. Further public hearings are planned in Canberra on 19 June and 23 June and in Sydney on 29 June 2015.

1.2 This represents a considerable volume of evidence relating directly to the committee's terms of reference. The committee has received written and verbal evidence from State Governments, local councils, various federal government agencies, wind farm operators and manufacturers, country fire authorities, acousticians, medical experts and representatives from various associations and institutes. In addition, many private citizens have had the opportunity to voice their concerns with the planning, consultation, approval, development and operation of wind farms in Australia.

1.3 Access to all public submissions and public hearing transcripts can be found on the committee's website.¹

The committee's headline recommendations

1.4 This report presents seven headline recommendations. The committee believes that these recommendations are important and urgent given that legislation on the renewable energy target is due to be debated in the Senate shortly. The final report in August this year will provide supporting evidence and supporting recommendations. It will also address other terms of reference, including the merit of subsidies for wind farm operators and the effect of wind power on household power prices.

Recommendation 1

1.5 The committee recommends the Commonwealth Government create an *Independent Expert Scientific Committee on Industrial Sound* responsible for providing research and advice to the Minister for the Environment on the impact on human health of audible noise (including low frequency) and infrasound from wind turbines. The IESC should be established under the *Renewable Energy (Electricity) Act 2000*.

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http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Wind_Turbines/Wind_Turbines/Terms_of_Reference

Recommendation 2

1.6 The committee recommends that the National Environment Protection Council establish a *National Environment Protection (Wind Turbine Infrasound and Low Frequency Noise) Measure* (NEPM). This NEPM must be developed through the findings of the *Independent Expert Scientific Committee on Industrial Sound*. The Commonwealth Government should insist that the ongoing accreditation of wind turbine facilities under the *Renewable Energy (Electricity) Act 2000* in a State or Territory is dependent on the NEPM becoming valid law in that State or Territory.

Recommendation 3

1.7 The committee recommends that the Commonwealth Government introduce *National Wind Farm Guidelines* which each Australian State and Territory Government should reflect in their relevant planning and environmental statutes. The committee proposes these guidelines be finalized within 12 months and that the Commonwealth Government periodically assess the Guidelines with a view to codifying at least some of them.

Recommendation 4

1.8 The committee recommends that eligibility to receive Renewable Energy Certificates should be made subject to general compliance with the *National Wind Farm Guidelines* and specific compliance with the NEPM. This should apply immediately to new developments, while existing and approved wind farms should be given a period of no more than five years in which to comply.

Recommendation 5

1.9 The committee recommends that the Commonwealth Government establish a *National Wind Farm Ombudsman* to handle complaints from concerned community residents about the operations of wind turbine facilities accredited to receive renewable energy certificates. The Ombudsman will be a one-stop-shop to refer complaints to relevant state authorities and help ensure that complaints are satisfactorily addressed.

Recommendation 6

1.10 The committee recommends that the Commonwealth Government impose a levy on wind turbine operators accredited to receive renewable energy certificates to fund the costs of the *Independent Expert Scientific Committee on Industrial Sound*—including the funding of additional research—and the costs of a National Wind Farm Ombudsman.

Recommendation 7

1.11 The committee recommends that the data collected by wind turbine operators relating to wind speed, basic operation statistics including operating hours and noise monitoring should be made freely and publicly available on a

regular basis. The proposed *Independent Expert Scientific Committee* should consult with scientific researchers and the wind industry to establish what data can be reasonably made freely and publicly available from all wind turbine operations accredited to receive renewable energy certificates.

Wind farms and human health

1.12 Why are there so many people who live in close proximity to wind turbines complaining of similar physiological and psychological symptoms? As with previous Senate inquiries, this committee has gathered evidence from many submitters attributing symptoms of dizziness, nausea, migraines, high blood pressure, tinnitus, chronic sleep deprivation and depression to the operation of nearby wind turbines. The committee invites the public to read and consider the evidence of people who have experienced these symptoms and who attribute their anxiety and ill health to the operation of turbines.²

1.13 These health affects should not be trivialised or ignored. The committee was particularly distressed by renewable energy advocates, wind farm developers and operators, public officials and academics who publicly derided and sometimes lampooned local residents who were genuinely attempting to make known the adverse health effects they were suffering.

1.14 The committee is aware of people complaining of these impacts who have since left their family home. Some now live a nomadic and uncertain existence. In one case, the now deserted home had been in the family for five generations—since the 1840s. These are not decisions taken lightly. Having left the turbine vicinity, several witnesses noted that the symptoms had faded if not disappeared.³

1.15 Some submitters attribute these illnesses to a 'nocebo effect'—a result of expectations of harm rather than exposure to turbine activity. This claim has been made by Professor Simon Chapman, a sociologist by training and a professor of Public Health at Sydney University. He has labelled wind turbine syndrome 'a communicated disease', claiming that it 'spreads by...being talked about and is therefore a strong candidate for being defined as a psychogenic condition'.⁴

1.16 However, most people recognise that noise including low frequency noise could cause these impacts and emphasise that noise standards, properly enforced, are

2 See submissions 17, 18, 34, 35, 42, 56, 60, 122, 204, 206, 208, 209, 210, 211, 219 and 337 and the evidence of affected residents from the public hearing transcripts of 30 March, 18 May and 9 and 10 June 2015.

3 See the evidence of Mr Peter Jelbart, *Proof Committee Hansard*, 30 March 2015, p. 72.

4 Professor Simon Chapman, 'Wind turbine syndrome: a classic communicated disease', *Australasian Science*, October 2012, vol. 33, no. 8, p. 36. See also *The Australia Institute*, submission 67, p. 20.

crucial to ensuring public safety.⁵ This view acknowledges that the noise from wind turbines creates annoyances which can manifest in sleep disruption. The clear remedy is to set noise standards (such as the New Zealand Standard) and enforce these standards. This is essentially the public position of the relevant authorities in Australia.

The need to investigate infrasound and low frequency noise from turbines and its effect on human health

1.17 The committee highlights the need for more research into the impact of low frequency noise and infrasound (0–20 hertz) from wind turbines on human health.⁶ A 2014 pilot study conducted by acoustician Mr Steven Cooper found a correlation between infrasound emitting from turbines at Cape Bridgewater in Victoria and 'sensations' felt, and diarised, by six residents of three nearby homes. By identifying a unique infrasound 'wind turbine signature', recording it as present in the homes, and linking it to 'sensations' felt by the residents, Mr Cooper's research has received international attention.⁷

1.18 It is clear that the extent and nature of wind turbines' impact on human health is a contested issue. The nocebo effect, the existing standards for measuring audible noise⁸ and the NHMRC's 2011 literature review⁹ have all been criticised by submitters and witnesses to this inquiry. The criticisms relate both to flaws in methodology and to inaccurate and incomplete findings.

1.19 Fundamentally, the lack of detailed, reliable data does not allow for a proper scientific conclusion to be drawn. The committee is struck by the considerable gaps in understanding about the impact of wind turbines on human health. These gaps have widely acknowledged key issues, both explicitly and implicitly:

- the NHMRC found in February 2014 that 'there is currently no consistent evidence that wind farms cause adverse health effects in humans'. While maintaining this stance, in February 2015, the NHMRC recognised that the body of direct evidence on wind farms and human health is '*small and of poor*

5 This is the view of the various wind farm operators. See submissions by AGL Energy (83), Ergon Energy (84), RATCH Australia (116), Wind Prospect (167) and Trustpower (173) and Infigen (425).

6 A distinction is made between noise (which is audible) and sound (which is both audible and sub-audible).

7 See *Submission 254*. For praise of Mr Cooper's work, see Mr Peter Mitchell, *submission 387*.

8 See Atkinson & Rapley Consulting, *Submission 409*

9 See Parkesbourne/Mummel Landscape Guardians Inc., *Submission 119*, pp 84–87.

quality'. It concluded that 'high quality research into possible health effects of windfarms, particularly within 1,500 metres, is warranted';¹⁰

- In June 2015, the German Medical Assembly forwarded a motion to the board of the German Medical Association for further research into the possible side effects of wind turbines. The committee has received advice from the German Medical Association that this motion proposes that the German Government provide the necessary funding to research potential adverse effects to health. The motion also argues that wind turbines should not be erected in the vicinity of residential areas until this research has yielded results. The Board of the German Medical Association has advised the committee that it will revisit the motion in July 2015;¹¹
- the position of several well-informed submitters that more research is needed, including;
 - criticism of the composition of the NHMRC Reference Group, and in particular the lack of acoustical expertise. One witness, who was a formal observer of the Reference Group process, noted that only one member of the panel was an acoustician, adding: 'No-one else on the panel had any idea of acoustics. They could not tell when they were being misled or information was being withheld';¹²
 - criticism of the 2010 and 2015 NHMRC reviews which ignored studies *in situ* of people reporting serious adverse effects and the nature of the exposures to which they are subject. A submitter noted: 'The NHMRC did examine some of these types of study but it was done as a secondary activity rather than the main focus and allowed it to base its conclusions predominantly on research settings that inevitably have weak power to detect material effects';¹³
 - the importance of research that has a rigorous methodology, a level of independence and the outcomes of which are peer reviewed;¹⁴
 - the claim of one eminent acoustician that wind farm entities have stifled some genuine research into the possible effects of wind farms. A prominent international organisation well equipped to evaluate

10 National Health and Medical Research Council, 'NHMRC Statement: Evidence on Wind Farms and Human Health', February 2015, https://www.nhmrc.gov.au/files_nhmrc/publications/attachments/eh57_nhmrc_statement_wind_farms_human_health_0.pdf (accessed 10 June 2015). Emphasis added.

11 Correspondence from Dr Ramin Parsa-Parsi, Head of International Affairs, German Medical Association, received 15 June 2015.

12 Mr Peter Mitchell, *Proof Committee Hansard*, Melbourne, 9 June 2015, p. 16.

13 Dr Michael Crawford, *Submission 316*, p. 8.

14 Mr Kane Thornton, Clean Energy Council, *Proof Committee Hansard*, Melbourne, 9 June 2015, p. 3.

infrasound data and analysis declined his invitation to examine his own research into wind farm infrasound;¹⁵ and

- a submitter's proposal for a thorough noise audit of all existing wind farms, using the methodology of Mr Steven Cooper, and incorporating the objective measurement of health effects (sleep quality, blood pressure, heart rate, stress hormones, etc) on neighbours, out to 10 kilometres from turbines.¹⁶

1.20 Independent scientific research is needed into acoustic matters—such as whether each wind turbine has unique 'signature' and the effect of that signature on neighbouring turbines—and into health matters.

An Independent Expert Scientific Committee (IESC) on Industrial Sound

1.21 The committee believes that there is an urgent need to establish an *Independent Expert Scientific Committee on Industrial Sound* (see recommendation 1). The IESC should work in a similar way to the IESC on Coal Seam Gas and Large Mining Development.¹⁷ It should have both a broad research and advisory role.

1.22 In terms of research, the IESC on Industrial Sound should be directed to:

- conduct independent, collaborative, multi-disciplinary research into the adverse impacts and risks to individual and community health and wellbeing associated with wind turbine projects and any other industrial projects;
- develop a national acoustic standard on infrasound and low frequency noise from wind turbines; and
- identify priorities for research projects to improve scientific understanding of the impacts of wind turbines on the health and quality of life of affected individuals and communities.

1.23 In terms of providing scientific advice based on this research, the IESC will have responsibility to:

- provide scientific and technical advice to the relevant state of territory environment minister to assess whether a proposed wind farm project poses risks to individual and community health; and
- provide advice to the environment minister on whether an existing wind farm project poses health risks to nearby residents.

15 Mr Les Huson, *Proof Committee Hansard*, Melbourne, 9 June 2015, p. 60. The organisation is the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO).

16 Parkesbourne/Mummel Landscape Guardians Inc., *Submission 119*, p. 52. See also Mr Les Huson, *Proof Committee Hansard*, Melbourne, 9 June 2015, p. 61; Mr John McMahon, Victorian Wind Reform Alliance, *Proof Committee Hansard*, Melbourne, 9 June 2015, p. 67.

17 See <http://www.iesc.environment.gov.au/>

1.24 The federal Minister for the Environment should be required to take the IESC's advice into account prior to any decision to grant accreditation for a new wind turbine facility. In this way, the federal government has an immediate mechanism to provide greater assurance that adverse impacts on health, sleep and quality of life are minimised from future wind farm developments.

Transparency of, and access to, data

1.25 The committee heard that some researchers have had difficulty obtaining basic wind speed and other data from wind turbine operators to help conduct research into the impact of wind turbines on health.¹⁸ In evidence to the committee, some confirmed that such data is recorded by wind turbine operators as a matter of course.¹⁹

1.26 This data could be used to help conduct independent research into the level of infrasound and low frequency noise being caused by wind turbine operators. In an environment where the state of the evidence of the impact of wind turbines is insufficient, any way of encouraging greater research should be seriously considered.

1.27 The committee believes that greater transparency of the data collected by wind turbine operators will assist further research on wind turbine impacts and help build greater community trust in wind turbine operations. The committee recommends that any non-commercial data (such as wind speed, basic turbine operation statistics including operating hours and noise monitoring) should be made freely and publicly available as a matter of course (recommendation 7). These transparency conditions should be consistent for all wind turbine operations. The proposed IESC should seek to establish what data should be made available and the format it should be presented in.

Membership of the IESC on Industrial Sound

1.28 The committee is acutely aware of the importance of ensuring that the research projects and outcomes of an IESC on Industrial Sound have integrity. In the committee's view, it is the way that past literature reviews have been framed and conducted that has led to a polarised debate and a general lack of engagement by many stakeholders. The NHMRC's 2011 literature review was focused on selective research. In the Cape Bridgewater study, Pacific Hydro commissioned only one study and set a very narrow research framework with a limited budget.²⁰

1.29 It is the committee's hope and expectation that an IESC will draw on the expertise of professionals with a range of views.²¹ The members should be drawn

18 Mr Les Huson, *Proof Committee Hansard*, 9 June 2015, p. 59.

19 See Mr Christophe Delaire, Marshall Day Acoustics, *Proof Committee Hansard*, 10 June 2015, p. 14.

20 See Pacific Hydro, *Submission 419*

21 See Dr Bob Thorne, *Proof Committee Hansard*, 18 May 2015, p. 47. See also Ms Natalie Webster, *Submission 237*, p. 2.

from both the acoustical and medical communities and the research proposal—complete with a detailed methodology—must be formally submitted to the COAG Council of Environment Ministers (also known as the National Environment Protection Council (NEPC)) for approval.²²

A levy to fund the IESC on Industrial Sound

1.30 The committee is aware that maintaining the research, assessment and compliance work of an IESC on Industrial Sound will cost money. The committee proposes that a levy be applied on wind turbine operators accredited to receive renewable energy certificates to cover the cost of the research (see recommendation 6).

A National Environment Protection Measure on Infrasound

1.31 It is important that the work of the IESC on Industrial Sound is reflected not only in Ministerial decisions on proposed and existing wind farms, but also in the States' and Territories' statutes. A good mechanism to achieve this is through the NEPC.

1.32 A primary function of the NEPC is to make National Environment Protection Measures (Protection Measures) in the form of standards, goals, guidelines or protocols. Once a Protection Measure is established, it applies as a valid law of each jurisdiction.²³ This includes Protection Measures for:

...the protection of amenity in relation to noise (but only if differences in environmental requirements relating to noise would have an adverse effect on national markets for goods and services).²⁴

1.33 As noted above, the IESC should be responsible for researching and developing a national acoustic standard on infrasound and low frequency noise from wind turbines. Once developed, the committee recommends that the NEPC should implement this standard as a Protection Measure, which becomes an enforceable standard in the relevant state and territory environment acts (recommendation 2). The NEPC will have an ongoing role to assess and report on the implementation and effectiveness of the Protection Measure in each jurisdiction.

22 The Council is composed of the federal Minister for the Environment and each of the State and Territory Environment Ministers. The Council's key functions are to make NEPMs and to assess and report on the implementation of these measures in participating jurisdictions.

23 *Intergovernmental Agreement on the Environment, Schedule 4 section 16*

24 National Environment Council Act 1994, section 14(1)(c) and *Intergovernmental Agreement on the Environment, Schedule 4, s 5*.

National Wind Farm Guidelines

1.34 At the same time as establishing the Protection Measure, the NEPC would finalise National Guidelines to establish standards for other issues including visual, landscape, fauna and community impacts, shadow flicker, aircraft safety and wind turbine noise (with the inclusion of infrasound and low frequency noise, which will be enforced through a Protection Measure).

1.35 Draft National Wind Farm Guidelines (National Guidelines) were first proposed nearly a decade ago and reached draft form in 2010. These guidelines were not mandatory, but were intended to encourage improvements in state and territory processes for evaluating wind farm proposals by clearly outlining the key principles and issues for consideration during the assessment stage.

1.36 The draft National Guidelines were later abandoned by the former Australian Government in 2012. It is not a coincidence that progress to develop nationally consistent state and territory level wind farm development guidelines has faltered at the same time.

1.37 By the sheer weight of submissions to this inquiry alone, some from the regulatory decision-makers themselves, it is clear that the planning frameworks have failed to address community concerns, or to create nationally consistent wind farm development and monitoring standards to give certainty to the renewable energy generation market.

1.38 The committee argues that there is an ongoing role for the Australian Government to play in the development of a consistent, transparent and sustainable regulatory framework for the development, monitoring and compliance of wind farms. In the first instance, National Wind Farm Guidelines must be implemented (recommendation 3). These must set minimum standards (which all jurisdictions must observe) on the following issues:

- ongoing wind farm operator compliance with planning conditions and requirements for holding records;
- requirements that wind farm operators publicly disclose certain operating data;
- buffer distances between turbines and residences;
- specific requirements for community and stakeholder consultation at each stage of planning, development and operation;
- visual and landscape impacts;
- the impact on birds and bats;
- indigenous heritage issues;
- aircraft safety; and
- the property rights of neighbours.

1.39 In the context of neighbours' property rights, the committee notes the concerns of Grain Producers SA that the location of the wind turbines on adjacent farming lands will have a significant impact on the neighbouring farm businesses to carry out the practice of profitably growing crops. It also noted that farmers adjacent to wind turbines will experience 'significant financial loss due to a decrease in the value of their farmland due to changes in the way they are able to go about farming'.²⁵

1.40 The committee believes that the Australian Government should carefully consider the case for codifying certain guidelines to ensure that the States and Territories are compliant.

Stricter monitoring and compliance of wind farms

1.41 This inquiry has received considerable evidence that wind farm operators have often not been compliant with approval conditions and noise standards. The committee is dissatisfied with the current monitoring and compliance processes which it considers to be a patchwork and which have caused considerable community angst and frustration.

1.42 The problem of poor monitoring and compliance of wind farms partly reflects the lack of dedicated resources. Clearly, local councils lack resources and expertise to monitor compliance with approval conditions and noise standards. The committee has also received evidence from submitters that despite the repeated calls from residents to investigate alleged wind farm breaches, the council concerned has failed to even investigate.²⁶

1.43 Local councils have themselves acknowledged they lack the technical knowledge, expertise, workforce or financial resources to properly deal with development applications for wind farms and the on-going compliance and monitoring of same.²⁷ Furthermore, where legal challenges are mounted by either residents or wind turbine proponents, the astronomical costs incurred ultimately fall on their ratepayers. The financial burdens are particularly acute for smaller shire councils.

1.44 State Governments have commissioned an acoustician to perform wind farm noise audits, with the State EPA and the relevant council involved as formal observers. The noise audits have been conducted in accordance with the standard covering environmental auditing. However, this work had been irregular and the findings have often been met with community cynicism.

25 Mr Darren Arney, *Proof Committee Hansard*, 10 June 2015, p. 50.

26 Tarwin Valley Coastal Guardians, *Submission 45*, p. 28.

27 See Moorabool Shire Council, *Submission 375*, p. 2; Moyne Shire Council, *Submission 460*, p. 6; Tablelands Regional Council, *Submission 158*, p. 2; Pyrenees Shire Council, *Submission 47*, p. 2.

1.45 The committee is interested in the progress of discussions between the Municipal Association of Victoria (MAV), its council members and the Victorian Government to consider shifting the wind farm compliance and monitoring burden to the State EPA. The MAV has told the committee that ideally, the State EPA would operate a licensing regime for wind farms with compliance occurring on a fee-for-service basis.²⁸ The annual compliance certificate must be the subject of an independent audit.

1.46 The proposal of State-based licensing system conducted by the EPA's to accredit acousticians has merit. It would certainly take the pressure off councils. A fee-for-service model—in addition to the fee for the proposed IESC on Industrial Sound—would ensure that State EPAs have adequate resources. It would also provide regulatory certainty for the wind farm industry.²⁹

1.47 The committee notes that similar to the method used to ensure compliance with the Building Code of Australia, wind farm developers could be required to receive certificates of compliance with National Wind Farm Development Standards from an independent inspector at key points of development: site selection; project feasibility; planning and approvals; construction; commissioning and operations and decommissioning.

1.48 In its final report, the committee will consider in more detail the idea of a fee-for-service licensing regime run by State EPAs. The final report will also consider the case for strengthening the CER's role and powers to approve or suspend accreditation in the event that a wind farm operator fails to comply with the requisite terms and conditions.

A National Wind Farm Ombudsman

1.49 This inquiry has gathered considerable evidence from citizens and community groups with real and genuine concerns about the way they have been treated by wind farm companies, local councils and State planning officials. While the committee has and will consider these complaints in making its recommendations, it has no power to properly investigate them or respond directly.

1.50 The committee recommends that the Commonwealth Government establish a National Wind Farm Ombudsman in Australia with responsibility for recording and categorising complaints about the operation of wind farms (see recommendation 5). An independent commonwealth authority would have the capacity to work across multiple jurisdictions, and investigate breaches of any relevant piece of legislation or framework. This would create a one-stop shop to refer complaints to relevant state authorities and help ensure that such complaints are satisfactorily dealt with.

28 See Mr Gareth Hatley, Municipal Council of Victoria, *Proof Committee Hansard*, 9 June 2015, p. 54.

29 See Mr Hatley, *Proof Committee Hansard*, 9 June 2015, p. 54.

1.51 The register of complaints to an Ombudsman should inform the work of the proposed IESC on Industrial Sound and the Commonwealth Government in future considerations to codify certain National Wind Farm Guidelines. A register will also greatly assist monitoring and compliance efforts, particularly if these tasks are coordinated through the State EPAs.

1.52 The committee proposes that the levy to fund the IESC also contribute to funding the work of the wind farm Ombudsman (recommendation 6).

Concluding comment

1.53 This report records the committee's concern with the issue of infrasound and low frequency noise emitted from wind turbines and the possible impact on human health. Independent, multi-disciplinary and high quality research into this field is an urgent priority.

1.54 The committee believes the recommendations in this report are crucial to putting in place regulatory structures and guidance that will set clear, consistent and robust parameters for future wind farm developments. These recommendations are intended for implementation federally, but they will direct and guide State and Territory Governments in their planning approval processes and in monitoring processes.

1.55 Further, the proposed recommendations are not dissimilar to regulations that apply in other energy producing sectors. It is the committee's view that industries that go out of their way to proactively comply with such regulations tend to have better community relations and hence a greater ability to proceed with investments with community acceptance. The committee encourages the wind industry to adopt such an approach to help ease community concerns and improve the investment climate for renewable energy projects.

Senator John Madigan

Chair