Australian Government

2020 ANNUAL REPORT

INDEPENDENT SCIENTIFIC COMMITTEE ON WIND TURBINES

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18 June 2021

The Hon Angus Taylor MP
Minister for Energy and Emissions Reduction
Parliament House
CANBERRA ACT 2600

Dear Minister

2020 Annual Report of the Independent Scientific Committee on Wind Turbines

Pursuant to the Committee's Terms of Reference, I am pleased to provide the fifth Annual Report to the Australian Parliament on the activities of the Independent Scientific Committee on Wind Turbines.

The Report on the activities of the Committee has been prepared by the Secretariat with input from the Committee members.

The Report covers activities in the period from 1 January 2020 through to 31 December 2020.

Reappointed at the end of 2018, the Committee values the opportunity to continue monitoring research, both here and overseas, in relation to understanding the impact of sound from wind turbines on sleep and health, in particular.

During 2020, the Committee published its third journal paper, describing technical deliberations undertaken by the Committee examining existing wind turbine sound limits.

The Committee values the opportunity to continue delivering on its Terms of Reference by supporting the National Wind Farm Commissioner to consider the harmonisation of wind farm noise standards across states and territories, and providing advice to the Government on the needs to consider changes to existing standards, based on a review of the World Health Organization's Environment Noise Guidelines, and the two ongoing National Health and Medical Research Council projects.

Yours sincerely

John Davy
Chair
Independent Scientific Committee on Wind Turbines
iscwt-secretariat@industry.gov.au

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Background

On 9 October 2015, the then Minister for the Environment, the Hon Greg Hunt MP, announced that the Independent Scientific Committee on Wind Turbines ('the Committee') had been established to build on the work of the National Health and Medical Research Council (NHMRC) and provide advice on the science and monitoring of potential impacts of wind turbine sound on health and the environment. The Committee provides an Annual Report to the Australian Parliament. The establishment of this Committee was part of the Government's commitment to respond to community concerns about wind farms.

In November 2018, following an internal review, the Committee was extended for a further three-year term with a slightly revised Terms of Reference.

Members

The Committee is chaired by:

Adjunct Professor John Davy
RMIT University and CSIRO.

The Chair of the Committee is Adjunct Professor John Davy. Professor Davy has been an Adjunct Professor of RMIT University since 2009 and a part time Principal Research Scientist with CSIRO since 2005. Research interests include the prediction of diffuse field sound insulation, the directivity of sound insulation, the directivity of the radiation of sound from openings, reverberant and anechoic sound fields, microphone turbulence screens, urban noise and building acoustics measurements.

Professor Davy has been a fellow of the Australian Acoustical Society since 2008 and is currently a member of the Physical Performance Testing Accreditation Advisory Committee of the National Association of Testing Authorities, Australia.

Other members of the Committee are:

Professor Simon Carlile
Head of the Auditory Neuroscience Laboratory, School of Medical Science, University of Sydney and Senior Technical Lead, [X] The Moonshot Factory, Mountain View, CA, USA.

Professor Simon Carlile is the Head of the Auditory Neuroscience Laboratory in the School of Medical Sciences at the University of Sydney and also leads an interdisciplinary group of researchers and developers at Alphabet's R&D company, [X] in the USA. Professor Carlile's expertise covers hearing science including hearing impairment and the development and applications of virtual auditory space technologies.

Clinical Professor David Hillman AM
Department of Pulmonary Physiology and Sleep Medicine, Sir Charles Gairdner Hospital Perth, WA.
Centre for Sleep Science, University of Western Australia.

Professor Hillman is an emeritus sleep physician at the Department of Pulmonary Physiology and Sleep Medicine at Sir Charles Gairdner Hospital in Perth, Western Australia and a former director of the West Australian Sleep Disorders Research Institute, and a senior principal research fellow at the Centre for Sleep Science, University of Western Australia. He is a respiratory physiologist, anaesthetist and sleep physician. His clinical and research interests focus on the physiology of the respiratory system and upper airway and their relationship to respiratory disease, sleep disorders and anaesthesia. He has published extensively in these and related areas.

Professor Hillman is a fellow of the Australian and New Zealand College of Anaesthetists, the Royal College of Physicians of Edinburgh and an honorary fellow of the Royal Australasian College of Physicians. He is a Clinical Professor at the University of Western Australia and a past president of the Australasian Sleep Association and of the Society of Anesthesia and Sleep Medicine. He is founding chair of Australia's Sleep Health Foundation, a national charity devoted to improving sleep health.

Dr Kym Burgemeister
Principal, Arup.

Dr Burgemeister is a Principal at Arup with over 20 years' experience as an acoustic engineer. He specialises in measuring, predicting and assessing noise and vibration from industry and transport infrastructure. He has worked on major highway and railway projects in Australia, the UK and the US and wrote the draft Victorian guidelines for the assessment of wind turbine noise. Dr Burgemeister's role at Arup is to describe and help clients and their stakeholders understand how acoustics and vibration affects their projects in a comfortable and an easy to understand way.

Dr Burgemeister is the Noise and Vibration Technical Expert for the Infrastructure Sustainability Council of Australia (ISCA), providing technical advice regarding noise and vibration aspects of their rating credits.

Terms of Reference

The former Department of the Environment and Energy conducted an internal policy review of the role of the Committee in 2018. The review acknowledged that investment in wind farms remains strong and the concerns have not been fully resolved in either the community or the scientific literature. Accordingly, the Government agreed to extend the term of the Committee, as well as update its Terms of Reference to provide particular focus on supporting the National Wind Farm Commissioner's efforts to harmonise noise standards and monitoring associated with wind turbines and the ongoing provision of advice to Government regarding ongoing investigations.

The Committee's revised Terms of Reference communicated in December 2018 are stated below.

Terms of Reference

The Committee is convened as an independent, multidisciplinary, expert group to improve science and monitoring of the potential impacts of sound from wind turbines (including low frequency and infrasound) on health and the environment.

The Committee will provide advice on:

- the development of Australian methodologies and frameworks in sound measurement and standards for wind farms, including in the field of infrasound and low frequency sound
- innovation in cost-effective, continuous sound monitoring of wind farms
- options for wind farm operators to maximise transparency such as by providing information on wind speed, operational statistics, operating hours and sound monitoring.

The Committee will monitor and periodically review progress in understanding the potential health impacts of wind farms and comment on further possible research developments to support standards and measurement protocols. An important part of the Committee's role is bringing together partners to inform their work, including linking to the work being undertaken through the National Health and Medical Research Council (NHMRC).

The Committee complements the work of the National Wind Farm Commissioner to identify needs and priorities for monitoring efforts to deliver transparency of information.

The Committee will:

- support the National Wind Farm Commissioner to consider the harmonisation of wind farm noise standards across states and territories
- provide advice to Government on the need to consider changes to existing standards, based on a review of the World Health Organization's Environment Noise Guidelines, and the two ongoing NHMRC projects.

The Committee will provide an Annual Report to the Australian Parliament reporting on delivery against these Terms of Reference and other achievements. The Committee will operate for a further 3 year period until December 2021.

The work of the Committee

The Committee's work has concentrated on examining the sources of disturbance associated with living in proximity to wind turbines, existing sound limits across Australia, the basis for these limits and how disturbance might be best defined with a view to future harmonisation of state-by-state sound limits.

Our considerations have led to the publication of three open access peer reviewed learned journal papers available at https://doi.org/10.1016/j.apacoust.2018.06.009, https://doi.org/10.1177/2331216518789551 and https://link.springer.com/article/10.1007/s40857-020-00192-4.

The Committee meets regularly with the chief investigators of the two NHMRC funded research projects on the effects of wind turbine noise on humans and with the National Wind Farm Commissioner and some of his staff.

The Committee is paid on a daily rate as determined by the Remuneration Tribunal. Committee members are only paid for the hours of attendance at meetings. The Committee utilises video conferencing facilities for meetings and is provided with support from a part time secretariat in the Department of Industry, Science, Energy and Resources.

Total costs for the Committee for 2020 were $16,691.47.

Meetings

The Committee met on 3 occasions between January 2020 and December 2020.

Wednesday 1 April 2020

Topics discussed included:

- comments the Committee had received on their research paper on the potential impacts of wind turbine noise in the Australian context that were provided to Acoustics Australia.
- feedback from the Chair of the Committee following his attendance at the roundtable for state and territory government's renewable planning project arranged and hosted by the National Wind Farm Commissioner. This attendance was in line with the Committee's Terms of Reference to support the National Wind Farm Commissioner to consider the harmonisation of wind farm noise standards across states and territories.
    - The Chair had explained different types of noise measurements, levels and studies and provided an overview of the WHO report which addressed wind turbine noise.
- discussion of a review paper on recent advances in wind turbine noise research.
- discussion on materials the Committee could develop to outline information on their findings targeted to specific audiences.

Thursday 6 August 2020

Topics discussed included:

- a briefing from the National Wind Farm Commissioner Mr Andrew Dyer. The Commissioner advised that his 2019 annual report should be available soon, and that the recent quarter had been the busiest ever for complaints.
    - The Committee discussed the possibilities of national standards for wind farm noise with the Commissioner.
    - The Committee discussed the difficulty in finding auditors who have experience with wind farms.
- a progress update on one of the two NHMRC funded investigations of the relationship between wind turbine noise and sleep ("Establishing the physiological and sleep disruption characteristics of wind farm versus traffic noise disturbances in sleep") with its chief investigator, Dr Peter Catcheside, who joined the meeting for this purpose and provided the Committee with an update.
    - The Committee asked questions about the study and any impacts of the COVID-19 pandemic, and provided their advice to Dr Catcheside.
- The Committee discussed a recent paper they had circulated and discussed sleep disturbance.

Thursday 21 November 2020

Topics discussed included:

- a briefing from the National Wind Farm Commissioner Mr Andrew Dyer. The Commissioner advised that his 2019 annual report had been tabled.
    - The Committee and Commissioner discussed other recent developments related to wind farms.
- a progress update on the second NHMRC funded project from Dr Brett Toelle and Associate Professor Nathaniel Marshall ('Multidimensional Assessment of the Health Impacts of Infrasound: Two Randomised Controlled Trials').
    - The Committee discussed and provided advice to the project leads relating to the project and discussed the impacts of the COVID-19 pandemic.
    - The researchers indicated they were developing a manuscript, and the Committee indicated they were interested in infrasound and were keen to see the manuscript from the researchers when it had been accepted.
- the Committee's draft 2020 annual report.
- communication strategies the Committee could utilise to provide details of their research and findings to the general public.

Other activities/initiatives

- The Committee used their meetings to receive briefings from project leads of the National Health and Medical Research Council (NHMRC) projects researching wind turbines:
    - On 22 March 2016, Associate Professor Peter Catcheside from Flinders University was awarded $1.36 million to establish the physiological and sleep disruption characteristics of wind farm versus traffic noise disturbances in sleep. The project was a five year project which has been extended to 31 August 2021.
    - On 22 March 2016, Professor Guy Marks from the University of New South Wales was awarded $1.94 million to investigate the multidimensional assessment of the health impacts of infrasound: two randomised controlled trials measuring sleep quality, balance, mode and cardiovascular health. The project was a five year project which has been extended to the end of 2021.
- The Committee used their meetings to discuss recent research and papers to keep abreast of current issues and findings.

During 2020, members of the Committee published a journal paper which examined a number of issues including:

- existing wind turbine sound limits
- possible perceptual and physiological effects of wind turbine noise
- aspects of the effects of wind turbine sound on sleep health and quality of life
- low-frequency noise limits
- the concept of annoyance including alternative causes of it and the potential for it to be affected by low-frequency noise
- the influence of amplitude modulation and tonality, sound measurement and analysis and management strategies.

The paper was based on Committee members undertaking a detailed review of the existing wind turbine sound limits in Australian states and several other countries with similar constraints.

The paper, available at https://link.springer.com/article/10.1007/s40857-020-00192-4, provides an opportunity for harmonisation across Australia of provisions for siting and monitoring of wind turbines, which currently vary from state to state, contributing to contention and potential inequities between Australians, depending on their place of residence.