NSW GOVERNMENT SUBMISSION

TO

SENATE COMMUNITY AFFAIRS COMMITTEE

INQUIRY INTO THE SOCIAL AND ECONOMIC IMPACT OF RURAL WIND FARMS

FEBRUARY 2011

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Introduction

The NSW Government is implementing a range of measures to maximise the State's share of renewable energy generation to 2020 and beyond, and is ensuring that renewable energy is a key part of our energy mix into the future.

NSW has a target of 20 per cent renewable energy consumption by 2020 in the *NSW State Plan*, consistent with the Federal Government's expanded Renewable Energy Target (RET).

As the RET will be the primary driver of new investment in renewable energy to 2020, the first component of the NSW Government's strategy is to implement measures to facilitate renewable energy projects that are commercially viable under the RET. Wind energy is projected to make a significant contribution to meeting the RET as wind is a market-ready technology which is currently highly cost-effective, relative to other types of renewable energy.

The 2009 NSW Legislative Council's Committee No. 5 Inquiry into Rural Wind Farms found that there are strong economic advantages for wind power in NSW and the industry can make a strong contribution to regional employment and development. NSW is continuing to implement recommendations from this inquiry, including development of NSW Wind Farm Planning Guidelines to provide more information to wind farm proponents and the community about the assessment of wind farm proposals in NSW. NSW Government initiatives relating to planning requirements for rural wind farms will be developed in consultation with stakeholders including local government.

The NSW Government acknowledges that some landowners and community members have concerns about wind farms. In NSW, these concerns are considered in relation to wind farm proposals as part of the comprehensive planning framework to ensure that economic and social impacts from wind farms are within acceptable limits.

The NSW Government has established six Wind Renewable Energy Precincts. These Precincts, cover 47 local government areas, and have been established across NSW in areas with the best known wind resources (the New England Tablelands, Upper Hunter, Central Tablelands, the NSW/ACT border region, South Coast and Snowy Monaro).

The Renewable Energy Precincts program is a community partnership initiative designed to facilitate well-sited renewable energy projects, in particular wind farms, to build community knowledge and understanding and to give local communities a voice and a stake in renewable energy development.

Since February 2010, a local coordinator has been employed full-time in each precinct to undertake community engagement. Information resources for community and industry have been developed and community forums have been undertaken within the Renewable Energy Precincts.

The NSW Government has also implemented State-wide regulatory and policy reforms to encourage investment in wind farms in NSW. These include:

- reducing the threshold for renewable energy projects across the State to be classified as 'critical infrastructure' under Part 3A of the *Environmental Planning and Assessment Act 1979* from 250 MW to 30 MW specifically for renewable energy generation facilities;
- providing more consistency by defining wind energy projects as development permitted with consent in rural land use zones across NSW;
- appointment of a Specialist Renewable Energy Projects Manager in the Department of Planning;
- four-month turnaround period for assessing renewable energy projects qualifying as critical infrastructure once the environmental assessment has been submitted;
- financial incentives – critical infrastructure fees are being waived (for projects of 30 MW or more) from August 2009 to 30 June 2011.

Community and small-scale wind energy generation can improve community understanding and interest in wind energy. The NSW Government supports the development of community wind energy initiatives and is assisting with feasibility studies for community-owned wind farms in the New England Tablelands and South Coast regions of NSW.

The NSW Government has also recently introduced state-wide planning provisions to make it easier to install small wind turbines while protecting neighbourhood amenity. These provisions were developed in consultation with the broader community. A growing number of NSW councils and landowners are investigating small wind opportunities.

NSW Merit Assessment Process

With appropriate planning controls, wind farm development can have minimal impacts on surrounding properties. In NSW, the impacts of a proposed wind farm – including on nearby landholders – are rigorously and transparently assessed under the *Environmental Planning and Assessment Act 1979* (EP&A Act) according to a merit-based process using performance-based standards. This includes, for example, specifying a maximum acceptable noise level at a receptor (eg a neighbour's house).

NSW has not adopted a mandatory set back distance for wind farms. This is because the merit-based process allows greater consideration of the particular proposal, including the local environmental, social and economic concerns. The average setback distance from the merit assessment process for approved wind farm projects in NSW is around 1.2 km, but typically varies between 800 metres and 2 kilometres depending on the project and site specific conditions.

Where a residual impact such as a visual or noise impact on neighbours cannot otherwise be mitigated or offset, and is considered to be unacceptable, the Minister for Planning may include an acquisition clause within the conditions of approval if requested by the affected landowners. Acquisition is to be based on:

- the current market value as if the property was unaffected by the project;
- reasonable costs associated with obtaining expert advice including legal advice; and
- reasonable compensation for any disturbance caused by the land acquisition process.

In addition, the NSW Department of Planning encourages wind farm proponents to provide voluntary community enhancement programs as a good will gesture and to offset residual impacts in the local area in which the wind farm is proposed. Commitment to these programs is formalised through the conditions of approval. Activities carried out under these programs have included:

- a ‘clean energy package’ for all homes within 10 kilometres of the Silverton Wind Farm, near Broken Hill. The package comprises solar hot water heaters, photovoltaic systems and an energy efficiency package including energy efficient lights, AAA-rated showerheads, tap aerators and flow restrictors;
- establishment of a community enhancement fund (Cullerin Wind Farm, near Goulburn) administered in consultation with the local council and local community representatives. Allocations from the fund have been used for equipment for local community use, historical projects and other community revitalisation projects; and
- funding for upgrades to a local road and purchase of a new fire truck (Capital Wind Farm, Bungendore).

Comments in relation to the Inquiry's Terms of Reference

(a) Any adverse health effects for people living in close proximity to wind farms

The NSW Government relies on the advice of recognised health authorities in dealing with this issue.

The World Health Organisation (WHO) has concluded "*there is no reliable evidence that sounds beneath the hearing threshold produce physiological or psychological effects*.[1]"

The National Health Medical Research Centre (NHMRC) is the peak national body on health medical research in Australia. Following a review of the evidence, the NHMRC issued a public statement in July 2010 stating "*there is no published scientific evidence to positively link wind turbines with adverse health effects*.[2]"

(b) Concerns over the excessive noise and vibrations emitted by wind farms, which are in close proximity to people's homes

Noise

Improvements in the design of wind turbines have significantly reduced the noise from turbines. Turbine designers are continuing to improve the design of turbines to minimise noise, as this reflects lost energy and output.

In NSW, noise levels at nearby residences are managed through appropriate siting of turbines, the merit assessment process under the *Environmental Planning and Assessment Act 1979* (EP&A Act) and operational management of wind farms including compliance monitoring and reporting.

The assessment process typically requires proposals for wind farms to meet the following key requirements:

- comply with *South Australian Environment Protection Authority (SA-EPA), Wind Farms: Environmental Noise Guidelines, 2003;*
- predict 'worst case' noise impact at all relevant receivers (including homes);
- collect background noise data correlated to wind speed;
- measure background noise levels over 10-minute intervals;
- use a minimum of 2,000 measurement intervals (approximately 2 weeks);
- monitor within 20 metres of any houses;
- consider any significant difference between daytime and night time background noise levels;
- identify any risks with respect to tonal, low frequency or infra-noise; and
- determine any noise impacts under operating meteorological conditions including impacts under meteorological conditions that may exacerbate

[1] World Health Organization (2004): *Energy, sustainable development and health.* Background document for the Fourth Ministerial Conference on Environment and Health, 23-25 June 2004, Geneva.

[2] National Health and Medical Research Council Public Statement (2010) *Wind Turbines and Health*, http://www.nhmrc.gov.au/_files_nhmrc/file/publications/synopses/public_statement_wind_turbines_and_health.pdf.

impacts (including varying atmospheric stability classes and van den Berg effect) and quantify the probability of such occurrences.

A prescriptive approach to assessment of wind farms (whereby a minimum prescriptive standard is specified, such as height or setback distance) has not been adopted in NSW because:

- NSW wind farm noise criteria are among the most stringent in the world;
- noise impacts from wind farms are rigorously and transparently assessed through the existing merit-based process;
- prescriptive setbacks do not allow for site-specific and project-specific factors to be taken into account in the development assessment process that may amplify or attenuate noise levels at different receptors;
- a merit-based approach is more focused and allows for project and site specific factors to be considered, including:
    - turbine type – some turbines are quieter than others. If quieter turbines are used the resultant separation distance may be less;
    - turbine layout – turbines are typically arranged in a line along a ridge. The noise level at a house facing the line of turbines will typically be higher than the noise level at a house located at the end of the ridge line;
    - topography – if a wind farm is screened from a house by a hill, the noise level at that house may be lower compared to a house with no topographical barrier;
    - ground conditions – different ground conditions (such as grass and trees) may amplify or attenuate noise levels at a receptor. In NSW, ground conditions typically attenuate noise levels;
    - atmospheric conditions;
    - prevailing wind conditions – the noise impact at a receptor located adjacent to the prevailing wind direction will typically be lower than a receptor located downwind of the prevailing wind direction;
    - background noise – receptors that have higher background noise (such as wind in trees) may be able to accommodate higher noise levels with no greater impact than compared to a receptor that has lower levels of background noise; and
    - mitigation measures – wind farms typically include mitigation measures such as bunds,earth mounds, acoustic screens, acoustic insulation of buildings, and ‘sector management’ (whereby particular turbines are switched off when the wind is blowing from a particular direction at a particular speed) to mitigate noise levels at receptors.
- A prescriptive setback distance of 2 km would have a negative impact on the wind industry and increase the cost of meeting the RET.

The *South Australian Environment Protection Authority (SA-EPA), Wind Farms: Environmental Noise Guidelines, 2003* recommend that the noise level from a wind farm should not exceed an equivalent continuous noise level (LAeq,10 minutes) of 35dB(A), or the background noise level by more than 5dB(A), whichever is the greater, for each integer wind speed at which the turbine operates. This standard has

been found to be among the most stringent in the world, as shown in the table below.[3]

Wind farm noise criteria

Jurisdiction	Criteria
NSW	35 dB
South Australia (2009 guidelines) Victoria New Zealand	40 dB
UK Denmark	44 dB
US (some States) Holland	50 dB

The noise is to be free from tonality, which is an annoying characteristic of some noise sources generally characterised by a distinct pitch or tone. NSW environmental noise requirements are designed to protect 90 per cent of the population from being highly annoyed at least 90 per cent of the time. This is normally determined by dose-response relationship studies. Limited studies have been undertaken regarding the dose-response relationship for wind farm noise, however those that have been undertaken suggest that the base noise limit of 35dB (A) currently applied in NSW is conservative. These studies (Pederson and Persson Way, 2004[4]; Pederson and Persson Way, 2007[5]; and Pederson *et. al.*, 2009[6]) are summarised in a review prepared by the American and Canadian Wind Energy Association, *Wind Turbine Sound and Health Effects*, 2009[7].

The National Health and Medical Research Council (NHMRC) public statement on '*Wind Turbines & Health*' compared the level of noise from a ten turbine wind farm at 350 metres, with the level of other noise environments and concluded that: *"Based on these figures noise levels from wind turbines have been assessed as 'negligible', that is, they appear to be no different to that found in other everyday situations"*.[8] The average setback distance for approved wind farm projects in NSW resulting from the merit assessment process is around 1.2 km, but typically varies between 800 metres and 2 kilometres depending on the project and site specific conditions.

Conditions of planning approvals require that noise monitoring is routinely carried out at wind farms and the results provided to planning authorities. A comprehensive framework is in place in NSW to ensure that approved projects – including wind farms – comply with conditions of approval. The NSW major development compliance framework is outlined in the NSW Department of Planning's *Compliance Policy* (2010). The Policy is available on the Department's website.

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[3] Sonus Pty Ltd for the Clean Energy Council, *Wind Farms Technical Paper*, November, 2010

[4] Pedersen, E. and K. Persson Waye. 2004. Perception and annoyance due to wind turbine noise: A dose–response relationship, *Journal of the Acoustical Society of America* 116: 3460–3470.

[5] Pedersen, E. and K. Persson Waye. 2007. Wind turbine noise, annoyance and self-reported health and wellbeing in different living environments, *Occupational and Environmental Medicine* 64: 480–486.

[6] Pedersen, E., R. Bakker, J. Bouma, and F. van den Berg. 2009. Response to noise from modern wind farms in The Netherlands. *Journal of the Acoustical Society of America* August 126: 634-643.

[7] Colby, W. D., Dobie, R, Leventhall, G., Lipscomb, D., McCunney, R., Seilo, M. and Sondergaard, B., (2009). *Wind Turbine Sound and Health Affects An Expert Panel Review*. American Wind Energy Association, Canadian Wind Energy Association.

[8] National Health and Medical Research Council Public Statement (2010) *Wind Turbines and Health*, http://www.nhmrc.gov.au/_files_nhmrc/file/publications/synopses/public_statement_wind_turbines_and_health.pdf.

Vibration

The term “vibration” is typically assigned to energy that can travel through a solid medium, such as the ground, and be detected as tactile sensations at a receiver location. Wind farms do not produce significant levels of ground-borne vibration.

(c) The impact of rural wind farms on property values, employment opportunities and farm income

The impact of rural wind farms on property values, employment opportunities and farm income is rigorously and transparently assessed in NSW under the merit assessment process provided by the EP&A Act. This typically requires:

- justification of the project taking into consideration the environmental, social and economic impacts of the project;
- analysis of the suitability of the proposed wind farm development with respect to potential land use conflicts with existing and future uses taking into account local and strategic land use objectives and the potential for cumulative social and economic impacts on the local community (this includes bushfire risk and impacts on mineral resources); and
- a consultation program, including consultation with the local community and landowners.

In regard to bushfire risk, the NSW Legislative Council General Purpose Standing Committee noted that as far as it is aware no bushfires have been started through wind farm activity in NSW. The Committee concluded that wind farms do not significantly increase the risk of bushfires in rural areas.[9] Bush fire risk is considered and addressed as part of the merit assessment process for wind farms in NSW.

More detail on these aspects is to be included in the NSW Wind Farm Planning Guidelines.

Property values

Conclusive data on the impact of wind farms on property values does not presently exist. Wind farm development is relatively new and, in Australia, wind farms are typically built away from population centres.

However, the NSW Valuer General commissioned a study on this issue in 2009, which is the most comprehensive study that has been undertaken to date on the relationship between wind farms and property values in Australia. The *Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia*[10] examined 45 properties near eight wind farms (six in Victoria and two in NSW), across different types of land-use (rural, town/residential, rural lifestyle).

The key findings of the study were as follows:

- no negative impacts on property values were found for either rural or township properties;
- lower sale prices than expected were found for four of the 13 lifestyle properties. However, as they were located next to lifestyle properties with no

[9] New South Wales Legislative Council General Purpose Standing Committee No. 5 Report No. 31. Rural Wind Farms (2009).
[10] Available at http://www.lpma.nsw.gov.au/valuation/publication-reports

observed impacts on sale prices, it was unclear if the wind farm had an impact; and
- in total, five out of the 45 properties studied may have been negatively impacted (ie lower sales prices than expected). However, as other nearby property sales prices were not affected, further work is required to determine if this was due to the presence of a wind farm or other factors.

The study also noted these findings were consistent with the major studies completed internationally to date, which have found no statistical relationship between wind farms and surrounding property values. Wind farms bring investment, income, jobs and new residents to regional areas, which could have a positive impact on property values.

It is also relevant in this context to note that there is general high level of community support in NSW for wind farms in the areas with the best wind resources (the Renewable Energy Precincts). The NSW Government commissioned a consultant to conduct a survey of over 2,000 residents and 300 businesses in regional areas of NSW on attitudes to wind farms and renewable energy. The research shows 85 per cent of residents support wind farms in NSW, and 60 per cent supported wind farms at one to two km from their residence.[11]

Employment Opportunities

Wind farms provide new employment opportunities both directly and indirectly. Modelling commissioned by the Climate Institute estimated that new renewable energy projects under the Australian Government's RET scheme could lead to the creation of more than 6,000 jobs in NSW. A large proportion of these jobs will be in the construction and operation of wind farms in regional areas.[12]

Income from direct job creation, landowner revenue for hosting wind turbines (see below) and community enhancement programs also create indirect jobs. For example, during the construction of a wind farm, there will be significant flow-on effects to local businesses from construction workers spending their money in the local economy.

Voluntary community enhancement programs are another way that wind farms can generate employment. Wind farm developers often voluntarily contribute funds to pay for local infrastructure or programs, creating local employment opportunities.

The NSW Government has commissioned the Climate Institute to assess employment opportunities from renewable energy for each of the six Renewable Energy Precincts. The project will estimate the potential State-wide and regional employment opportunities, and regional roadmaps for each of the six Renewable Energy Precincts to assist regional stakeholders maximise the region's future employment opportunities from renewable energy, including wind farms.

Farm Income

Due to the relatively small physical footprint of wind turbines, wind farms can co-exist with grazing and cropping. The rental income for hosting wind turbines provide a

[11] AMR Interactive (2010) *Community Attitudes to Wind farms in NSW*, http://www.environment.nsw .gov .au/resources/ climatechange/ 10947WindFarms_Final.pdf
[12] MMA (2009) *Regional Employment and Income Opportunities Provided by Renewable Energy Generation*, http: www.climateinstitute.org.au/images/MMAreport.pdf.

valuable stream of guaranteed annual revenue for landowners, which can aid drought-proofing farms.

Through the Renewable Energy Precincts program, the NSW Government has been assisting landholders who wish to host wind turbines. Workshops were held in five areas on the topic '*Landholders Working with the Wind Industry*' during 2010. The workshops assembled experts on all aspects of hosting wind turbines, such as legal contracts, construction, grid connection and planning issues. More than 500 people attended the workshops across the five Renewable Energy Precincts.

Participant evaluation surveys completed by workshop attendees indicated a strong level of interest amongst landholders in hosting wind turbines. More than 60 per cent of respondents were from working rural properties, and 50 per cent of all respondents had already been approached by a wind developer and over 90 per cent rated the forum as 'good' or 'very good'.

The NSW Government is planning to release a noise guide for landowners considering signing an agreement with a wind farm developer to host turbines on their property.

(d) The interface between Commonwealth, State and local planning laws as they pertain to wind farms

Commonwealth wind farm requirements

A proposed bilateral agreement between the NSW Government and the Commonwealth Government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) has been publicly exhibited. The proposed agreement will allow the Commonwealth to rely on NSW assessment of wind farm proposals, with the Commonwealth retaining its decision making power. This agreement is aimed at streamlining assessment processes, minimising duplication of environmental assessment processes, strengthening intergovernmental co-operation and promoting a partnership approach to environmental protection and biodiversity conservation. Currently, the Commonwealth accredits NSW major development assessments on an individual project-by-project basis, although this can only occur if the proposal has been declared a controlled action under Commonwealth legislation prior to the exhibition of the Environmental Assessment under NSW legislation.

National Wind Farm Development Guidelines

The NSW Government supports the concept of national guidelines to provide improved consistency and transparency to wind farm development. The NSW Government and other States and Territories are currently evaluating the Draft National Wind Farm Development Guidelines. The evaluation is due to be completed in July 2011.

Feedback on the guidelines at a NSW industry workshop convened in late 2010 focussed on the perceived complexity of the assessment process under the draft guidelines and deviation from accepted practices in existing assessment requirements, particularly regarding noise. Any national guidelines should be practicable and accessible to all stakeholders including community stakeholders.

NSW Wind Farm Planning Guidelines

The NSW Government will release NSW Wind Farm Planning Guidelines in 2011. These guidelines will provide information on NSW specific assessment processes

and requirements. The guidelines will also provide clarification for NSW stakeholders on the interface between local, state and Commonwealth requirements regarding wind farms.

(e) Any other relevant matters

As part of the NSW Renewable Energy Precincts program, a series of information resources have been developed for industry and community which may be of relevance to the Inquiry:

1. *Estimating Greenhouse Gas Abatement from NSW Wind Farms*: a detailed modelling study on the greenhouse gas abatement from NSW wind farms in each of the six Renewable Energy Precincts.
2. The *NSW Wind Farm Greenhouse Gas Savings Tool* - an on-line tool for communities to calculate the greenhouse savings and electricity generation of a local wind farm based on the *Estimating Greenhouse Gas Abatement from NSW Wind Farms* study.
3. The *Wind Energy Fact Sheet*: an information resource on wind farms prepared for regional communities. The technical information was peer-reviewed by the Centre for Energy and Environmental Markets, University of New South Wales.
4. *Community Attitudes to Wind Farms in NSW*: this is the most comprehensive community survey undertaken in NSW – a detailed survey of over 2000 residents and 300 businesses across the Renewable Energy Precincts and one other regional area as a 'control group'.

To access these information resources and for further information about the Renewable Energy Precincts program, please visit:

http://www.environment.nsw.gov.au/climatechange/renewableprecincts.htm