Suzlon Energy Australia Pty Ltd

SUZLON
POWERING A GREENER TOMORROW

9th February 2011

Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600

By email: community.affairs.sen@aph.gov.au

Dear Sir / Madam,

Subject: Inquiry into the Social and Economic Impact of Rural Wind Farms

Suzlon Energy Australia Pty Ltd appreciates the opportunity to put forward this submission to the Senate Community Affairs Committee and agrees that this document can be available to the public as part of the Inquiry.

Suzlon Energy Australia is a wholly owned subsidiary of Suzlon Energy Ltd, headquartered in Pune, India. Suzlon, together with its majority owned subsidiary REpower, is the world's third largest manufacturer of wind turbines by installed capacity.

Suzlon Energy Australia is a leading constructor of grid connected wind farms and an Operations & Maintenance service provider for wind projects in Australia.

Suzlon has been contracted to deliver over 750 megawatts of wind generation for a range of utility and investor clients, across nine sites in rural regions of South Australia, Victoria and New South Wales. Six of these wind farms are currently operating with the remaining three approaching construction completion and will be fully operational in the second half of 2011.

Suzlon directly employs over 250 permanent staff across Australia, who are located in our Melbourne head office, on project site offices and at a warehousing facility in Jamestown, South Australia.

Suzlon is proud of its on-going involvement with the Australian stationary energy sector and to be working towards achievement of the government mandated Renewable Energy Target (RET), which will see 20% of electricity generated from renewable sources around the nation by 2020. Suzlon is committed to the provision of low carbon energy through the sustainable use of wind technology and to reducing carbon intensity in all its operations.

This submission has been structured to provide specific responses to the Inquiry's terms of reference.

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

The commentary that follows in this section seeks to address claims of adverse health effects from wind turbines. Discussion of noise and vibrational issues can be found in section b) of this submission.

It is generally claimed that health effects may arise from a variety of physical phenomena relating to turbine operations. Health impacts may result from the occurrence of shadow flicker, blade glint and exposure to Electro Magnetic Fields (EMF) in the vicinity of wind generation plant and associated transmission infrastructure.

Approaches to mitigate the effects of each of these potential impacts are addressed below:

Shadow flicker

Comprehensive shadow flicker assessments are conducted during the statutory approval phase of all Australian wind farms. These assessments are based on an internationally accepted methodology that calculates the position of the sun relative to proposed turbine positions and tracks the shadow paths cast by each turbine.

Studies broadly recognise that, if proper siting guidelines are not observed, shadow flicker from wind turbines has the potential to cause annoyance and in extreme cases may trigger epileptic seizure in susceptible individuals. The *Policy and planning guidelines for the development of wind energy facilities in Victoria* [1] are commonly used in Australia as a de-facto framework to estimate shadowing effects.

Shadow flicker assessments generally employ a conservative set of input assumptions to predict the greatest possible effect on existing and approved dwellings near proposed turbine locations. If the framework for assessment of shadow flicker is correctly applied, the Environment Protection and Heritage Council (EPHC) estimate the chances of an individual experiencing a seizure as a result of exposure to shadow flicker to be less than one in ten million[2]. Annoyance resulting from occasional exposure to levels of shadow flicker within the standards of the Victorian guidelines are generally not considered to pose a threat to human health.

Suzlon is not aware of any complaints of shadow flicker causing either adverse health effects or annoyance at any of the wind farms we have constructed and are currently operating. We consider the Victorian guidelines adequate to ensure that potential health impacts resulting from shadow flicker are avoided in the areas around wind farms.

Blade glint

Assessment of the potential of turbines to reflect light onto roads and residences in the vicinity of proposed wind farm projects is a standard component of the statutory approval process for Australian wind farms. All modern wind turbine blades are painted with a matt coating that is very effective in reducing blade glint and other exposed areas of turbine towers and nacelles use off-white, low gloss paints to reduce reflection of light.

Suzlon is not aware of any issues relating to blade glint on Australian wind farms that we have constructed and/or operate.

The EPHC regards the risk of occurrence of blade glint when low reflectivity coatings are used as "very low"[1]. Taking these factors into consideration, Suzlon is of the opinion that no significant levels of annoyance or adverse health effects are likely to result from turbine blade glint.

Electro Magnetic Fields

Wind farms consist of turbine generation plant connected by low voltage (22kV-33kV) reticulation cabling to step-up transformers (66kV-500kV in Australia) which in turn are connected to a local transmission network. EMFs are produced by the generator housed in each turbine's nacelle and surround all current carrying wires. It is recognised that exposure to powerful EMFs can be detrimental to human health. - As a result all Australian planning codes applied to the generation, transmission and distribution of electricity have strict guidelines to ensure the safety of those living or working in areas proximate to sources of EMF.

Standards for the safe levels of exposure to EMF are set out in guidelines produced by the Australian Radio Protection and Nuclear Safety Agency (ARPANSA)[3]. The ARPANSA standard recommends the same thresholds for safe EMF exposure as are put forth in the National Health and Medical Research Council's (NHMRC) Radiation Protection Standard[4]. All Australian wind farm projects are subject to these standards.

Research conducted on operational wind turbines in Canada indicates that EMF levels measured near generation plant were at levels of less than one thousandth of the ARPANSA recommended safe EMF threshold[5]. Modern wind turbines employ extensive conductive shielding to reduce EMF levels in the vicinity of wind generation plant. All internal reticulation and transmission cabling connected to turbines/substations also use conductive shielding to virtually eliminate EMF levels near infrastructure.

The ARPANSA EMF standard used across the electricity transmission and distribution sectors is adequately robust to protect personnel and residents in the vicinity of wind farms. With consistent and clear adherence to EMF standards, it is highly unlikely that any detrimental health impacts will result from EMFs in the vicinity of wind farms.

Suzlon is not aware of any EMF based complaints of adverse health effects that have resulted from operating wind farms in Australia.

The statements made here on the likelihood of adverse health impacts caused by shadow flicker, blade glint and exposure to EMFs are consistent with the findings of the NHMRC's 2010 review of wind turbine impacts on human health[6]. This report examined the adequacy of existing standards and summarised evidence on health impacts with the following conclusion:

> "*There are no direct pathological effects from wind farms and (that) any potential impact on humans can be minimised by following existing planning guidelines*."

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

Submissions to this Inquiry raise serious concerns that adverse health impacts are likely to result from exposure to audible sound and/or low frequency sound/infrasound generated by wind turbines.

Suzlon considers the assessment of acoustic impacts as an essential component in the design and operation of all wind farms.

Two distinct issues are relevant to addressing this particular point as put before the Committee;

i) the emission of audible sound from the blades and mechanical components of operational turbines

Analysis of the acoustic impact of proposed wind farm is a central component of the statutory planning process. Statutory authorities typically require assessment of acoustic impact using a wind farm specific acoustic assessment standard. Australian wind farms have generally been required to conform to noise standards established in either South Australia[7] or New Zealand[8]. These standards are some of the world's most stringent in terms of the levels of audible sound that may be allowed to affect nearby residences. France is the only country that may, depending on site specific measurements of background noise, be considered to mandate lower acoustic thresholds[9].

Recent amendments to these standards released in 2009(SA) and 2010(NZ) have not seen changes to the level of audible sound permitted at dwellings located near wind farms[9]. The SA and NZ standards referred to above make use of acoustic levels at or below the threshold recommended by the World Health Organisation (WHO) to avoid night time sleep disturbance of outside occupied dwellings[10]. Suzlon has operational experience in more than 25 countries around the globe , none of which have more rigorous acoustic guidelines than those used in Australia.

Based on our experience operating wind farms and extensive Australian and overseas studies on the health effects of industrial/wind turbine noise, Suzlon does not consider emission of audible sound from wind farms to be a likely cause of any adverse health effects, provided that acoustic standards are applied.

This view is consistent with the findings of the NHMRC[6] and the results of an expert review of evidence on turbine acoustic impact undertaken on behalf of the American and Canadian Wind Energy Associations[11].

ii) the emission of low frequency sound and infrasound from wind generation plant

It is a broadly accepted fact that acoustic emissions in the infrasound frequency range are observed in virtually all urban, industrial and many natural environments. Infrasound and low frequency sound are considered by acoustic experts to be inaudible at levels below 88dB(A) at 16Hz (the infrasound frequency threshold) [11].

A recent study commissioned by Pacific Hydro and undertaken by acoustics specialist Sonus, measured levels of infrasound and low frequency noise at the operating Clements Gap Wind Farm in South Australia, which comprises 27 Suzlon turbines. This study [12] found that at a distance of 360m from an operating turbine, the measured levels of infrasound were well below the audible threshold. It must be emphasised that these measurements were taken at a distance much closer to an operating turbine than would be permitted under acoustic guidelines used in Australia. As levels of infrasound attenuate with distance, it is expected that infrasound levels at distances of beyond1 kilometre would fall to natural background levels.

The Sonus report used measurements of infrasound in a variety of natural environments (including near the ocean) to conclude that:

> *"The levels of infrasound from natural sources are of the same order as those measured within 100m of a wind turbine"*[12]

Suzlon employs over permanent 140 technical support, installation and service technicians and maintenance staff, many of whom have worked in close proximity to wind turbines for many years. None of these have reported adverse health effects from exposure to either infrasound or audible sound.

All evidence reviewed by Suzlon suggests that the levels of infrasound/low frequency sound experienced in the vicinity of turbines are well below audible thresholds and do not pose a threat to hearing or health in humans.

As a company with extensive experience in the design and construction of wind farms, Suzlon takes application of noise assessment criteria extremely seriously. Adherence to robust noise standards is one of the fundamental structuring features in the design of Australian wind farms and is central to ensuring that turbines are located at distances sufficiently far from occupied dwellings to minimise acoustic impact.

Suzlon is confident that existing standards are adequate in fulfilling this purpose.

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

The potential for wind farm projects to impact on the value of rural properties has been raised as an issue of concern in submissions put before the Committee for this Inquiry.

Fluctuations in property values, particularly in rural agricultural areas, are subject to influence from a variety of factors that affect all property markets. Anecdotal accounts of changes in value of individual properties located near wind farms are not sufficient to demonstrate large scale patterns of behaviour in property markets.

In 2009, the NSW Valuer General commissioned a report investigating the effect of 6 wind farms in Victoria and 2 in NSW on the value of nearby houses and land. Using sale information from 45 properties, 40 of which showed no appreciable change in value, the report concluded that "*the wind farms do not appear to have negatively affected property values in most cases*."[13]. This study is supported by similar work undertaken in the United States and it would appear that no wholesale and long term trend of declining nearby land value has accompanied the development of wind farms studied to date.

On the issue of the impacts of wind farms on farm income, Suzlon is not aware of any anecdotal or documented evidence that wind developments decrease farm income for either landowners who have turbines sited on their land, or those of nearby or neighbouring properties.

Rather than reducing farm income at nearby properties, wind farms assist communities through upgrades to local roads and infrastructure, thereby improving access to the area for the benefit of both involved landowners and neighbouring farms.

Suzlon has extensive experience in preserving existing land use at sites where we operate. Wind farm infrastructure occupies a very small proportion of the land on which projects are constructed. Project infrastructure tends to cover less than 10% of leased land parcels, and the overwhelming majority of this footprint is made up of access roads. Agricultural practice remains essentially uninterrupted during the operational phase of wind energy projects. Additionally, farmers involved in projects have access to an alternative stream of income allowing them to provide an increased financial security for their families.

Wind farms provide substantial benefit to local and regional economies. In our experience, more than 50% of project value is delivered back into the Australian economy through the use of Australian goods and services and the engagement of civil and electrical contractors during the construction phase of projects.

In contrast to suggestions that wind farms discourage growth in regional economies made in other submissions presented to this Committee, a study undertaken by Sinclair Knight Mertz (SKM) has estimated that Suzlon's construction of the 4 existing AGL Hallett wind farms in South Australia added an equivalent of 1.15% to the Gross Regional Product of the Mid North Region[14].

An average of 90 full time annual employment positions have been required for construction of the Hallett winds continuously since 2006 . A further 36 full time service technicians are required to maintain the wind farms over their 25 year lifespan [14]. The SKM report estimates that between 100 and 150 employees from the local area have been continuously engaged on these projects since 2006 and that a further 2,000 jobs will result directly in other sectors from construction of the wind farms, throughout the construction phase.

The indirect stimulus that accompanies wind farm projects also supports growth for nearby local businesses. Some of these businesses include: engineering and electrical contractors, freight and logistic providers, machine operators, general labour firms, excavation and equipment hire services, and venues providing hospitality and accommodation.

For example, in a three year period to mid 2010, Suzlon alone had a direct spend of over $12million with businesses local to the South Australian wind farms that it had been contracted to construct and operate. This amount excludes salaries, travel and accommodation costs. Subcontractors working during the construction of wind farms bring large workforces into the regions adding to the economic stimulus of the local community.

The benefits to local and regional economies of wind farm projects are undeniable and capable of reviving growth in areas that have been plagued for years with drought and extreme weather.

Suzlon has a strong belief in the value of developing, training and upskilling its employees and has established and implemented training programs tailored specifically for the wind energy industry. Recognising the potential shortage of skilled wind turbine technicians, in 2009 Suzlon implemented Australia's first wind farm electrical apprenticeship program, in partnership with RMIT. 10 apprentices are currently being trained in this program. Suzlon plans to extend the current apprenticeship program subject to the Australian wind industry continuing to grow. Suzlon is also working with universities and educational institutes to develop specialist training for engineering graduates and accreditation for our wind turbine technician training program.

Suzlon has a proud history of providing support to regional communities within a 50km of our wind farm projects through sponsorships and in-kind benefits to local organisations. Virtually every Australian wind farm has had a voluntary community fund established by its owner to provide support to important community projects.

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

At present, the main interface between Commonwealth and State/Local planning frameworks is through implementation of the *Environment Protection and Biodiversity Conservation Act 1999*. Suzlon supports the on-going accreditation and assessment of EPBC matters as part of the relevant State/Local planning process and ecological assessment of wind farm projects.

Suzlon is in favour of clear, simple and efficient planning frameworks to support the responsible deployment of renewable energy technology around Australia, the shift to a less carbon intensive economy and achievement of the RET.

e) Any other relevant matters

Wind technology is currently the most mature and cost competitive source of utility scale renewable energy and is broadly supported by the Australian public. Evidence for high levels of public approval for wind farms has been presented in a survey commissioned by the NSW Department of Environment, Climate Change and Water (DECCW)[15], which found that 81% of the 2,022 residents and 300 businesses surveyed regarded wind farms as an acceptable form of power generation.

Australia currently has one of the highest per capita levels of carbon dioxide emissions of any country in the world. Applying additional barriers to wind energy projects would act to undermine the objective of the RET and run contrary to efforts to meet the Government's target of reducing Australian carbon emissions by between 5% and 15% on 2000 levels by 2020.

The use of wind energy, in conjunction with the implementation of energy efficiency measures and development of other large scale renewable energy technologies will be central to the realisation of Australia's long term emission reduction targets. The likely introduction of a price on carbon will see renewable energy technology play a central part in the Australian economy's ability to remain competitive in global markets. It is essential for the sake of future generations that the broad and long term social value of renewable energy is recognised.

The environmental value of wind turbines is easily demonstrated. Lifecycle analysis of the embodied energy in wind turbines and associated wind farm infrastructure provides compelling insight into their environmental value. It has been estimated that a 2MW turbine, operating at a much lower capacity factor than the average utility scale turbine in Australia, will recover the energy invested in its manufacture, delivery, erection and decommissioning in a typical 3 month period of operation. [16] Unlike many conventional thermal generators, wind farms do not require continuous supplies of potable water to operate.

Despite many claims to the contrary, the intermittent output from wind farms is easily and efficiently integrated with existing thermal generation in the National Electricity Market (NEM). Claims that constant backup from thermal generation is required to support wind farms are manifestly incorrect.

The Australian Wind Energy Forecasting System (AWEFAS) is capable of forecasting production from wind generation assets to an accuracy of between 1% and 3% on a five minute dispatch basis[17]. The ability to forecast output from semi- scheduled generators allows scalable thermal generators to adjust their level of generation to efficiently utilise fuel sources and network wide infrastructure.

Wind energy provides low cost carbon mitigation, successfully complimenting generation from existing coal and gas without requirements for installation of addition fast-response gas generation to provide supply security. Despite claims made in other submissions put before the Committee that wind energy requires constant back up, there has not been a single case of a gas turbine being installed in order to allow a wind farm to operate in Australia.

The introduction of arbitrary setback distances between dwellings and proposed wind turbines would render a large proportion of proposed wind farm projects unviable, potentially placing achievement of the RET in jeopardy. The application of such arbitrary setback distances is without specific scientific basis and is inconsistent with the assessment framework applied to approval of other infrastructure projects.

Suzlon thanks the Committee for accepting this submission to the Inquiry. We would be pleased for a company representative to appear before the Inquiry during the course of its deliberations, if so required.

Yours faithfully

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Suzlon Energy Australia Pty Ltd

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