



**SENATE INQUIRY INTO THE SOCIAL & ECONOMIC  
IMPACT OF RURAL WIND FARMS**

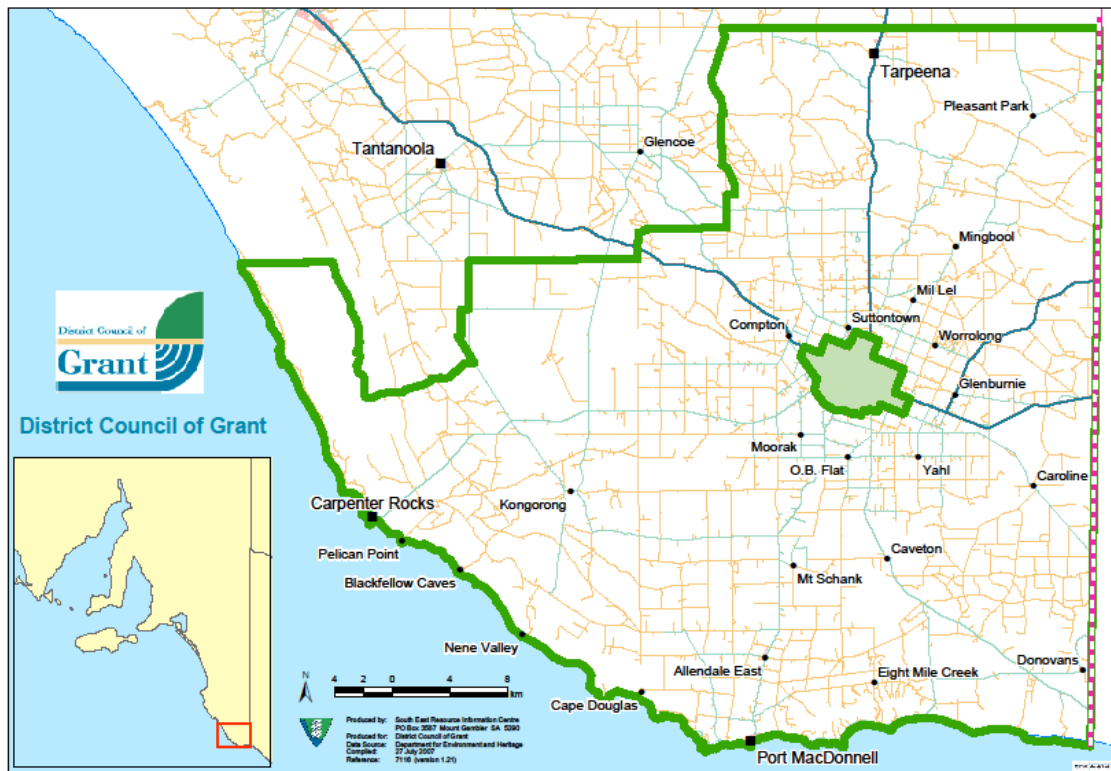
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# SENATE INQUIRY INTO THE SOCIAL AND ECONOMIC IMPACT OF RURAL WIND FARMS

## Introduction

The District Council of Grant is the most southern Local Government area in South Australia. The Council is predominantly rural with a number of small townships serving a population of approximately 8,500 covering an area of 188,493 hectares. It is bounded to the south and west by the Southern Ocean, the Victorian Border to the east and the Wattle Range Council to the north. The Council encircles the local government area of the City of Mount Gambier. Dairying, beef and sheep production, wool, seed, and grain production and horticulture are the predominant agricultural activities. The Port MacDonnell fishing industry, in particular the rock lobster industry is a significant factor in the economy of the area, as is forestry production and the related industries of logging and milling.



The District Council of Grant approved a number of wind turbines as part of the Lake Bonney Development. In addition, Council's Independent Development Assessment Panel recently approved a Development Application for 46 Wind Turbines near the township of Allendale East. The estimated value of the development is \$175 million. This approval was appealed by Representatives (ie: A Family) the family that objected to the development proposal and this Appeal is currently before the Environment Resources and Development Court of South Australia.

The District Council of Grant recognises that the State and Federal Governments have encouraged renewable energy, particularly through the Mandatory Renewable Energy Targets which represents Australia's national target for additional renewable energy production. MRET (the Mandatory Renewable Energy Target) creates a market for an additional 9,500GWh of renewable electricity generation per year by 2010, in accordance with the Renewable Energy (Electricity) Act 2000 and the renewable Energy (Electricity) Regulations 2001.

The South Australian Government has also particularly supported renewable energy through the Premier of South Australia as Australia's first Minister for Sustainability and Climate Change. South Australia has remained a national and in some areas an international leader in the generation of wind power. In addition, in the 2009/10 State Budget, a \$20million renewable Energy Fund was established to accelerate innovation and investment in the renewable sector.

Council is mindful that there are numerous issues to be considered when assessing Applications for proposed new Wind Farm development, which includes:-

- Character, landscape quality, visual significance, and/or amenity issues;
- Geotechnical considerations (i.e. topography, geology, volcanicity, hydrogeology, etc);
- Heritage issues (i.e. indigenous, cultural, natural, built, etc);
- Traffic movements and road infrastructure;
- Electromagnetic interference (i.e. television and radio signals, etc);
- Flora and fauna (i.e. native vegetation, bird and bat strike, habitats, etc);
- Noise issues;
- Shadowing, flickering, reflection, and blade glint;
- Air transport and/or airfields;
- Ancillary development such as substations, monitoring masts, overhead and underground power lines/cabling, temporary and/or permanent construction/maintenance compounds, depots, temporary concrete batching plants, and similar; and,
- Other matters.

In South Australia, Councils are only required to formally refer a Development Application for a proposed new Wind Farm development to the Environment Protection Authority (EPA), which primarily only considers and provides advice to Council in relation to noise issues. Council is aware that some Wind Farm developments in South Australia have been processed as major projects and have been assessed and determined by the State Government.

### **Potential Adverse Health Effects**

It is understood that "The health and well-being effects of noise on people can be classified into three broad categories:

1. subjective effects including annoyance, nuisance and dissatisfaction;
2. interference with activities such as speech, sleep and learning; and
3. physiological effects such as anxiety tinnitus or hearing loss (Rogers, Manwell & Wright, 2006)

Several commentators argue that noise from wind turbines only produces effects in the first two categories (Rogers, 2006; Pedersen & b Persson Waye, 2007).”  
(National Health and Medical Research Council - Wind Turbines and Health - A Rapid Review of the Evidence - July 2010, p 3)

Council is aware that the range of health symptoms and discernible health effects being associated with Wind Farms are being termed by some people as “Wind Turbine Syndrome”.

Whilst there is a plethora of evidence, “Numerous reports have concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines (DTI, 2006; CanWEA, 2009; Chatham-Kent Public Health Unit, 2008; WHO, 2004, EPHC, 2009; HGC Engineering, 2007)”  
(Ibid p 5)

From evidence and research undertaken, it is understood that

- Findings clearly show that there is no peer-reviewed scientific evidence indicating that wind turbines have an adverse impact on human health (CanWEA, 2009).
- Sound from wind turbines does not pose a risk of hearing loss or any other adverse health effects in humans. Subaudible, low frequency sounds and infrasound from wind turbines do not present a risk to human health (Colby, et al 2009).
- The Chatham-Kent Public Health Unit (Ontario, Canada) reviewed the current literature regarding the known health impacts of wind turbines in order to make an evidence-based decision. Their report concluded that current evidence failed to demonstrate a health concern associated with wind turbines. ‘In summary, as long as the Ministry of Environment Guidelines for location criteria of wind farms are followed ... there will be negligible adverse health impacts on Chatham-Kent citizens. Although opposition to wind farms on aesthetic grounds is a legitimate point of view, opposition to wind farms on the basis of potential adverse health consequences is not justified by the evidence’ (Chatham-Kent Public Health Unit, 2008).
- Wind energy is associated with fewer health effects than other forms of traditional energy generation and in fact will have positive health benefits (WHO, 2004).”

(Ibid p 5)

Further, “there is no reliable evidence that sounds below the hearing threshold produce physiological or psychological effects. A recent expert panel review in North America found no evidence that audible or subaudible sounds emitted by wind turbines have any direct adverse physiological effect.”  
(NHMRC Public Statement - July 2010)

The District Council of Grant has been subject to claims from some residents that the proposed wind turbines at Allendale East will create and cause adverse health consequences. It is understood that in some other wind farm areas, affidavits have been produced bearing testament to those purported health impacts. Notwithstanding this, it is understood that peer based empirical evidence and research has not been produced to scientifically substantiate these claims.

Indeed “In response to those concerns, the American and Canadian Wind Energy Associations (AWEA and Can WEA) established a scientific advisory panel in early 2009 to conduct a review of current literature available on the issue of perceived health effects of wind turbines, This multidisciplinary panel is compromised of medical doctors, audiologists, and acoustical professionals from the United States, Canada, Denmark, and the United Kingdom. The objective of the panel was to provide an authoritative reference document for legislators, regulators, and anyone who wants to make sense of the conflicting information about wind turbine sound.

The panel undertook extensive review, analysis, and discussion of the large body of peer-reviewed literature on sound and health effects in general, and on sound produced by wind turbines. Each panel member contributed a unique expertise in audiology, acoustics, otolaryngology, occupational / environmental medicine, or public health. With a diversity of perspectives represented, the panel assessed the plausible biological effects of exposure to wind turbine sound.

Following review, analysis, and discussion of current knowledge, the panel reached consensus on the following conclusions:

- There is no evidence that the audible or sub-audible sounds emitted by wind turbines have any direct adverse physiological effects.
- The ground-borne vibrations from wind turbines are too weak to be detected by, or to affect, humans.
- The sounds emitted by wind turbines are not unique. There is no reason to believe, based on the levels of frequencies of the sounds and the panel’s experience with sound exposures in occupational settings, that the sounds from wind turbines could plausibly have direct adverse health consequences.”  
(Wind Turbine Sound and Health Effects - An Expert Panel Review - December 2009)

### **Concerns over Excessive Noise and Vibrations Emitted by Wind Farms**

It is understood that “Wind turbines produce noise that can be classified into the following categories:

1. Mechanical noise which is produced from the motor or gearbox; if functioning correctly, mechanical noise from modern wind turbines should not be an issue.
2. Aerodynamic noise which is produced by wind passing over the blade of the wind turbine (Minnesota Department of Health, 2009).

As well as the general audible range of sound emissions, wind turbines also produce noise that includes a range of Special Audible Characteristics (SACs) such as amplitude modulation, impulsivity, low frequency noise and tonality (EPHC, 2009). Table 1 compares the noise produced by a ten turbine wind farm compared to noise levels from some selected activities.

<b>Activity</b>	<b>Sound pressure level (dBA)<sup>1</sup></b>
Jet aircraft at 250m	105
Noise in a busy office	60
Car travelling at 64kph at 100m	55
<b>Wind farm (10 turbines) at 350m</b>	<b>35-45</b>
Quiet bedroom	35
Background noise in rural area at night	20-40

Table 1: Noise levels compared to ten turbine wind farm (SDC, 2005).

Macintosh and Downie (2006) conclude that based on these figures “noise pollution generated by wind turbines is negligible”.

(National Health and Medical Research Council - Wind Turbines and Health - A Rapid Review of the Evidence - July 2010, p 3)

In addition “A survey of all known published results of infrasound from wind turbines found that wind turbines of contemporary design, where rotor blades are in front of the tower, produce very low levels of infrasound (Jakobsen, 2005). Another recent report concludes that wind farm noise does not have significant low-frequency or infrasound components (Ministry of the Environment, 2007).”

(Ibid, p 3)

It is important to note that, “In 2007, as part of research into wind farms noise commissioned by the government, the University of Salford surveyed all local authorities in the UK where wind farms were in operation. Out of all UK wind farms (133 at the time of the report operating for up to 16 years), only one wind farm has ever been found guilty of causing a nuisance to the nearest residents - and the issue has since been resolved through management of the turbine control system. In comparison, the report highlights that on one year alone (and for only 69% of local authorities in England and Wales, not the entirety of the UK), there were 39,508 cases of noise nuisance not related to wind farm noise” (BWEA)

Council has also noted the findings contained in the ‘Wind Farms Technical Paper - Environmental Noise’ (November 2010) which was prepared for the Clean Energy Council by Sonus Pty Ltd, which made the following key conclusions:-

- *The standards and guidelines used for the assessment of environmental noise from wind farms in Australia and New Zealand are amongst the most stringent and contemporary in the World;*
- *The rate of complaints relating to environmental noise emissions from residents living in the vicinity of operating wind farms is very low;*

- *There are complaints relating to environmental noise emissions from residents living in the vicinity of operating wind farms. These complaints generally relate to concerns regarding low frequency noise and health related impacts; and,*
- *There is detailed and extensive research and evidence that indicates that the noise from wind farms developed and operated in accordance with the current Standards and Guidelines will not have any direct adverse health effects.*

## **Interface Between Commonwealth, State and Local Planning Laws**

The Federal Government has developed the “National Wind Farm- Development Guidelines Draft – July 2010. These Guidelines, “are intended to be referred to within the planning process of the relevant state or territory. They are intended to inform the considerations of the relevant authority when assessing a proposal for a wind farm. They are also intended to make those considerations more consistent and transparent to those outside of that planning process.

Once a planning application is submitted, relevant authorities will assess the application based on a balanced consideration of the individual merits of the specific wind farm development. Such an assessment will weigh the benefits provided by the project (particularly in relation to government climate change policies) against the potential impacts on the environment, neighbouring landowners and local communities and what measures can be put in place to mitigate any such impacts.

When conducting their assessment, relevant authorities are expected to have regard to the principles of wind farm development outlined in the next section. They may also have regard to the attached technical methodologies.

Wind farm proponents can use these Guidelines to ensure they structure their application to anticipate the requirements of the relevant authority and facilitate the assessment process.

They are also intended to provide a suitable level of information to the community about the process and scope of wind farm developments.

The guidelines are not intended to be mandatory; every jurisdiction has a different statutory process for assessing wind farm proposals and it is not the intention of the Guidelines to change these. Opting for the release draft Guidelines allows each jurisdiction to assess how the Guidelines could best be adopted within their processes” (p 5, Draft Guidelines)

However, it is contended that this could translate to Federal Legislation so that relevant State Legislation and Council Development Plans have the necessary, interface and applicability for new wind farm developments. Practically, in South Australia, the relevant Council receives a Development Application which is then processed and advertised in accordance with the State Development Act and Regulations. The Application is then assessed and determined by the Council’s Independent Development Assessment Panel based on the provisions of the State Development Act and Council’s Development Plan. At present, in South Australia, it is understood that there are few if any Councils that have provisions in the Development Plan relating to potential noise and vibrations emitted by wind farms and potential adverse health effects.

Indeed, it may well be considered at present to be an irrelevant consideration by the statutory Independent Development Assessment Panel in considering the Development Application, if there is no legislative basis for such assessment.

It is noted that the Commonwealth enacted the Environment Protection and Biodiversity Conservation Act. The Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as matters of national environmental significance. Indeed, the applicant must satisfy the provisions of this Act prior to being able to proceed with the development.

It is contended that similar legislative framework could apply in relation to rural wind farms if the Federal Government considers there is sufficient empirical evidence supporting adverse health affects and excessive noise.

With respect to the current planning appeal for a wind farm involving this Council, the Court did allow medical / health evidence to be presented. It is fair to say that the medical / health evidence presented for the appellants in opposition to the development was largely "anecdotal" and "heresay", where they believed there was reason for concern and as such the need for urgent independent research in the issue.

In contrast, the medical / health evidence presented during the appeal in support of the wind farm development, concluded the following:

- 1. Although genuine health effects, typical of stress and anxiety reactions, do manifest in some people as a result of some stimulus or stimuli associated with wind farms, it seems extremely unlikely that these are due to infrasound, or audible sound with intensity below 40 dB(A).*
- 2. The health effects described in anecdotal reports appear to be confined to a small group of the population and there is likely to be the same response wherever you put a wind farm.*
- 3. These health effects are similar to what has been reported in association with other developments with some potential for a real or perceived environmental impact.*
- 4. There is no credible evidence of a causal link between the physical outputs of a turbine (or sets of turbines) at the levels that are described in the statement of Mr C Turnbull relating to the proposed development at Allendale, or that occur in Waubra, and adverse effects on health.*

*(Statement of Gary Allen Wittert, Head of the Discipline and Medicine, University of Adelaide, December 2010)*

In relation to the Renewable Energy provisions contained in Council's Development Plan, they were placed in the Plan by way of a State Government Ministerial amendment in 2003 (Wind Farm Plan Amendment Report), and are planning policies which also apply to other Council areas in South Australia. The Council's Development Plan makes no other reference to Wind Farm developments in any of the specific Zone provisions or General provisions contained in the Development Plan.



The Renewable Energy provisions generally allow for Wind Farm developments in appropriate locations, and requires that such developments be located, sited, designed and operated to avoid or minimise adverse impacts and maximise positive impacts on the environment, local community and the State.

It is interesting to note that with respect to Council's recent Wind Farm planning Appeal, the Environment, Resources and Development Court heard/received expert evidence from Planners, Acoustic/Noise Consultants, Landscape Architects, Spatial Mapping Consultants, and medical/health practitioners/experts. The Court received, over some 10 days, very extensive, detailed and technical information/evidence/material, which was certainly much more than Council's Independent Development Assessment Panel had before it in reaching its decision.

In relation to Wind Farm developments, a key issue which is regularly raised is what should the separation distance be between a wind turbine and a residence/dwelling. Although Council realises that there are numerous issues to consider with such developments, and in particular this separation distance, Council also believes that perhaps there is a need for a more precise separation distance to be specifically identified, with lesser separation distances being allowed for under certain circumstances (i.e. topography of land, visual and acoustic barriers, agreement from the current landowner/s, expert information about impacts, height of wind turbine, type/quality of wind turbine etc). Another consideration could be that where lesser separation distances are applied for perhaps the approval process becomes more stringent (i.e. non-complying/prohibited development requiring State Government concurrence if recommended for approval, greater involvement by Government Agencies in providing broader advice to Councils, State Government becomes the planning authority, etc).

Further, Council believes that there is a need for better uniformity and consistency right across Australia in relation to how State Governments, and/or Local Government, process and determine Applications for Wind Farm developments. In doing so, there would be a need for it to be appropriately legislated so that it can be legally used when considering such Applications - particularly if these Applications are the subject of Appeals/Court actions.

### **Impact on Property Values, Employment Opportunities and Farm Income**

It is recognised that some residents in reasonable proximity (eg 2kms) of a wind farm do claim that there will be a detrimental effect on their property values. This is particularly relevant where a wind turbine is able to be seen from their farm/property. Notwithstanding this, the effect of any development on property values is not an existing relevant consideration under the Council's Development Plan. There is no statutory basis to take into account the potential affect on property values of a wind farm. The assessment of the application must be based solely on the provisions of the relevant Council Development Plan.

Further, it is understood that wind farm developments do provide employment opportunities for construction and maintenance. For example a 47 wind turbine development will employ up to 12 maintenance staff as well as a construction workforce.

Further, for those properties upon which a wind turbine is located, a farm will derive income based on the contract as agreed between the parties. The income will supplement the farm property and is viewed by some farmers as a benefit for their business.

## **Conclusion**

It is understood that “the recently released Draft National Wind Farm Development Guidelines (EPHC, 2009) include detailed methodologies at different stages of the planning and development process to assess such issues as noise and shadow flicker to mitigate any potential impact. Such processes include a range of measures such as high-level risk assessment, data collection, impact assessment, detailed technical studies and public consultation.

Therefore, if planning guidelines are followed and communities are consulted within a meaningful way, resistance to wind farms is likely to be reduced and annoyance and related health effects avoided”

(National Health and Medical Research Council - Wind Turbines and Health - A Rapid Review of the Evidence - July 2010, p 7,8)

Notwithstanding this, despite significant community and statutory consultation in relation to the Allendale East Wind Farm proposal, some residents have claimed that they were unaware of such a proposal. It is contended that consideration could be given to Federal Legislation being considered should there be demonstrated empirical evidence regarding purported adverse health impact and noise. However, it is considered that independent research is needed to be undertaken regarding any such potential impacts association with wind farms prior to consideration of such legislation. At present, from evidence and research undertaken there is no evidence that wind turbines have an adverse impact on human health.