

## The Social and Economic Impact of Rural Wind Farms

Dear Senators,

My name is Robyn Brew, and I live 1.5 – 2 km, on the Northern end of the Waubra wind power station turbines.

Because of our love of animals, the natural environment, a belief in a sustainable future through organic farming, my husband and I chose to relocate to Country Victoria, where we believed we could create a lifestyle and business where we could share these values with others. We searched a long time to find a property with enough trees to make us carbon neutral and enough land for the number of animals we wanted, so as not to overgraze. This was the perfect peaceful environment to raise our animals stress free. I thought we moved to the country for serenity, a quiet and healthy lifestyle, and here we are in the middle of a noisy Industrial Park. It should be safe to assume that the meaning of a “Rural Environment” is “peaceful”, with a lack of noisy Industry and night-time noise, and a sanctuary for people, farm animals, birds and wildlife.

### HEALTH

Since the operation of the Waubra Wind Turbines my health has deteriorated. I no longer sleep through the night, waking at approx 2am/3am/4am, with lips vibrating and pins and needles in my legs and arms. Over the last year my eyesight at night when I wake and look at the clock has become blurred and can take a while before I can see the numbers.

Some mornings I wake with a sense of lethargy, the inability to think clearly and a vibrating sensation through my chest and body. Other mornings I wake with a tight chest and vibrations. Headaches can be a feeling of wearing a tight bathing cap that you take off and your head needs to recover, but it never does. On nights when the wind farm is particularly loud the pulsating swoosh swoosh of the blades keeps me awake. I can wake suddenly with heart palpitations and a sense of “what happened”. It is the sudden onset of palpitations and body vibrations I find most frightening and distressing.

While sitting watching TV my pulse rate can jump without warning to a quick rate of 98 to 100 beats per minute accompanied by a feeling of panic. In conversation I can have trouble recalling words and find it hard to make decisions.

The lack of sleep and almost constant body vibrations has affected my physical and mental health. I can be reduced to tears over minor incidents, or for no apparent reason and I feel no joy or purpose to living this life that has been forced upon me. I have cried on my way to work and thought I can't cope with this life any more and have asked for it to end.

I am sad, and have lost any sense of excitement about our future on what began as our “perfect farm”.

I have been keeping a diary and will share some extracts:

On Monday 10<sup>th</sup> Jan 2011 I felt so bad I went to lie down at 2.30pm. I had a headache, felt nausea and an overwhelming feeling of hopelessness and lethargy, my heart was skipping beats and my body experiencing some vibrations.

My recent visit to a Doctor in December 2010, was for a rash over my body, particularly my arms and legs. The rash was diagnosed as Psoriasis. *“Psoriasis is linked to toxins produced during periods of emotional stress”*

During this consultation my Doctor made a comment that *“Wind Turbine Syndrome will become a recognised disease”*. I ask you the question: Why do we need a new disease that has no cure?.

Visits earlier in 2010 for vibrations and palpitations prompted my Doctor to take

precautionary blood tests for diabetes and thyroid, and I have had 2 overnight heart monitors. My blood tests were clear, but I was referred to a heart specialist who has diagnosed Tachycardia, and I was given a prescription for Sotalol.

When Sleep deprivation prompted another visit I completed an assessment at the surgery and I was referred to a psychologist noting on this referral "The Waubra community is experiencing increased stress and disquiet with their turbines", he has also prescribed Cipramil for mood/depression and sleep.

Why, NOW, do I need all this medication. During my life I have taken great care not to smoke, nor drink excessively, to eat healthy organic foods, and maintain exercise through my daily routine. I never had any of these symptoms before the turbines started operating.

Wind facilities are polluting the environment with audible and inaudible noise, visual destruction of the landscape and causing HEALTH problems.

Sleep deprivation is very common among residents living with turbines, how much sleep disruption can we tolerate before it causes clear physiological symptoms such as increased stress hormones in our bloodstream, or psychological impacts such as lack of concentration, increasing the chances of farming accidents.

## ANIMAL HEALTH

I have noticed the native bats have moved away from our area, this must be a sign they cannot tolerate the noise, whether it be infra sound or audible sound from the turbines. This upsets the natural balance of nature. It is a proven fact that bats lungs explode due to pressure change when they get too close to turbines.

After the turbines started operating I noticed our chickens were laying lighter coloured eggs, the eggs from our chickens were a dark brown and are now mostly pale brown and some almost cream. We have introduced new chickens since the turbines started and they lay dark brown eggs to start then they get lighter and lighter. After a particularly noisy night there will be some shell-less eggs and possibly miss formed eggs and egg production can be less. (I have pictures if needed). After noticing these changes in the eggs I started Internet research. Veterinary sites state the lighter colour of eggs is due to stress, something not at all normal for a free range chicken. The laying of shell less eggs is called premature laying, where the shell and egg are out of sync. In a letter written during World War Two by a poultry farmer to the Government, he protests regarding the noise from low flying bombers passing over the farm. "*hens lay premature eggs, which is a serious loss to me and the country*". This is anecdotal evidence, but, from my observations I believe the turbines could be causing these problems.

What effect may this be having on eggs of the native bird life?

What else is happening that we have not noticed.? Even our dog on some mornings has to be coaxed into the house.

I believe there is a real need for independent research into the effect on wildlife, and on our pets and livestock

From dead bird collection performed by Acciona under their terms of approval, juvenile Little Eagles have been killed by turbines. When young birds are killed there are no birds to replace the Adults, again upsetting nature's balance, causing a reduction in bird numbers and at worst possible extinction of a species in this area. The post bird strike monitoring methods need to be reviewed and the initial bird study was inaccurate as the Brolga population was not properly recorded and their decline has been noticed in Waubra.

## EXCESSIVE NOISE

**Both the NHMRC and the Australian Wind Industries reviews, use quotes and misquotes from outdated research. They did not conduct independent studies**

The NHMRC review uses a report by Macintosh and Downie (2006) which used a table to compare noise levels of **ten** turbines at 350 metres. The noise output is 35-45 decibels and concludes based on these figures “*noise pollution generated by wind turbines is negligible*”.

There are several problems with this statement:  
Macintosh and Downie miss-interpreted the original report.

The original table used is for the **one** turbine installed at Fenland Cambridgeshire. Fenland was seen to be a good use of non-sensitive, semi-industrial land to place **one** turbine not ten as stated by NHMRC. Misreading of the original report makes all subsequent reports based on this information inaccurate. It is this report and table that is widely used by the Wind Industry to dismiss concerns about noise.

Noise limits at Waubra are calculated as the greater of 40db or background noise + 5db which means they should not exceed 40 db, the measured output above is already 5 db over the limit.

Accessible at [http://www.sd-commission.org.uk/publications/downloads/Wind\\_Energy-NovRev2005.pdf](http://www.sd-commission.org.uk/publications/downloads/Wind_Energy-NovRev2005.pdf) is the original report.

A diagram provided by American and Canadian Wind Industry shows turbines are louder the further away you are, and **that low frequency noise can penetrate walls and windows and is sensed as vibrations and pressure change.**

Karl Bergey for the American Wind Energy Association measured the output of wind turbines and reported readings of 54 to 55 dB(A), at 300 feet.  
<http://www.awea.org/smallwind/toolbox/windzone/noise.htm>

Neither the previous Victorian State Government or wind developers disclose correct information on noise levels.

Waubra residents are subjected to the noise of 128 turbines, the largest wind farm in the Southern Hemisphere.

Without having completed any studies or noise measurements The NHMRC also states by way of an outdated quote “*Wind farm noise does not have significant low-frequency or infra sound components (quoted from Ministry of the Environment 2007)*”  
What the Ministry in 2007 considered insignificant is now relevant as noted on the Ministry of the Environment website (2010) “*as a condition of approval for wind turbine projects, proponents would be required to monitor and address any perceptible infra sound (vibration) or low frequency noise as a condition of the Renewable Energy Approval.....It is anticipated that in appropriate circumstances **shut-down conditions** may also be addressed through conditions of approval.*”

Wind farms in Australia are **not required to monitor low frequency noise**, and so

far I have not been able to find any shut-down conditions. Why?  
There are many peer-reviewed studies showing that infra and low frequency sound can cause adverse health effects, especially when dynamically modulated.

Town Planners in the U.S.A have acknowledged low frequency noise, and more importantly human body vibrations.

According to Calumet and Ellis County regulations, “*Low Frequency Noise: A Wind Energy Facility or Wind Turbine operation that emits sound or **human body vibration** with strong low-frequency content .... shall be **deemed unsafe and shall be shut down immediately.**”*

The body vibration symptoms were reported by myself and Evansford residents to the Department of Health and the Environment Protection Authority (EPA).

### **Why is Waubra still operating?**

Australia follows the NZ noise standards NZS 6808, and the findings presented to a NZ court by NZ Dr Robyn Phipps are therefore relevant to Waubra.

Dr Phipps states “*The evidence from my research and the evidence of Dr Mosley at Ashhurst clearly indicates severe and significant adverse noise and vibration effects on residents that is **not anticipated** by either the approving authorities or the owner of the wind farm. Such effects are not anticipated in NZS 6808 (wind farm noise standard) and **this standard is not adequate** to protect the health and amenity of residents. The turbines will create significant adverse health and amenity effects on residents*

*The **limits recommended** by the International Standards Organisation are set out below and it is important to note that health based noise limits set much lower levels of noise for rural environments in recognition of the lower ambient noise levels. In particular this standard seeks to protect the night time quiet period. This noise level should be enforced under section 4.4.4 of NZS6808.*

### **Table 3 ISO 1996-1971 Recommendations for Community Noise Limits – limits to protect health and well-being**

District type:	Daytime upper limit:	Evening time upper limit (7-11pm)	Night time upper limit (11pm-7am)
Rural	35 dBA	30 dBA	25 dBA
Suburban	40 dBA	35 dBA	30 dBA
Urban residential	45 dBA	40 dBA	35 dBA

Noise standards at Waubra are the greater of background noise + 5db or 40db whichever is the greater..... is it any wonder Rural residents cannot sleep when the recommended limit at night is 25db.

If the NZ6808 are not adequate for NZ, why are we using them here?

Acoustic consultant Richard Horonjeff reports that the unique noise from turbines can have significant health effects.

*“The wind turbine produces a distinctive broadband “swoosh-boom” sound with each passing blade of the turbine. The repetitive sound character is unique and as such it is easily identifiable. It does not blend in to other background sources that are continuous in nature.”*

*Wind turbine noise is most prevalent in rural areas. By their very nature, large-scale wind turbine installations require vast areas of open land. Hence, any potential sound masking effect from urban and suburban sources is unlikely to be present. This means*

*that their sound will be audible at lower levels in the rural environment. It further means that rural noise standards should be applied to these installations as opposed to suburban or urban ones where night time sound levels, for example, can be 15 to 20 decibels lower in rural areas.*

*At the present time there is fairly consistent anecdotal evidence that at sound levels consistent with existing standards of acceptability for the other sources residents express higher degrees of annoyance than expected, and also report new physiological symptoms (in addition to sleep interference) when living near wind turbine installations. Stated another way, residents appear to become sensitive to wind turbine noise at lower sound levels than they would to other sources.”*

Mr Horonjeff stated that *physiological symptoms include (but are certainly not limited to)*

- Feelings of uneasiness,*
- *Dizziness,*
  - *Nausea,*
  - *Headache,*
  - *Inability to concentrate, and*
  - *Sleep disruption”*

Extracted and summarised from the DEFRA Ref. NANR 5 which is a review and analysis of published research into the adverse effects of industrial noise (including wind farms)

#### ***“Noise induced stress related effects***

*As the Dutch Health Council recognized individual reactions to a stressor can be of a psychological, behavioural or somatic nature. ....**excessive stress** is by definition ‘excessive’ and there are a number of possible stress-related adverse effects of excessive environmental noise reported in the literature. **Psychological effects concern feelings of fear, depression, frustration, irritation, anger, helplessness, sorrow and disappointment. Examples of behavioural reactions to a stressor are social isolation, aggression, and resort to excessive use of alcohol, tobacco, drugs or food”***

I can see myself now in many of the above effects.

This link <http://www.timesonline.co.uk/tol/news/environment/article6954565.ece> to an article in the UK Sunday times states

*“Civil servants have suppressed warnings that wind turbines can generate noise damaging people’s health for several square miles around.”*

France enacted regulations in 2006 that stipulated a level of 25 decibels should not be exceeded in the home.

World Health Organization recommends no industry should increase ambient daytime noise by five decibels and night time noise by three decibels.

Why are Industrial Wind Power Stations allowed to exceed all these recommendations.

#### **Interface between Commonwealth, State and Local planning.**

The Commonwealth Government are setting guidelines for wind development. Within these guidelines the Commonwealth have already pre-determined approval of Industrial Wind Installations .....

In section 4.1.2 of the draft guidelines.

The flowchart does not have an exit box for community refusal. There has to be a box stating majority of the community opposed the development and the wind farm proposal should then be stopped. Without this, the community is having its basic human rights overridden.

In Section 3.3 of the guidelines talks about visual impact.

There is nothing in the guidelines that models the visual impact.

At Waubra the wind facility owner Acciona states:

*“Visual impact can be reduced **somewhat** by turbines being off white in colour and with carefully chosen plantings to screen local views. Site measures have been undertaken to reduce the visual impact, such as **sensitive** siting of turbines and landscaping of related infrastructure.*

These developments are effectively creating industrial landscapes through the installation of 40 story skyscraper size structures, with spinning blades the size of the Melbourne Cricket Ground. The visual impact of these structures, topped by blinking red lights at night is not reduced, (as stated by Acciona) by being painted white. It is impossible to disguise one 40 story turbine, far less 128 of them, when they are on the crown or along the ridge of a once beautiful natural horizon. Turbines are dotted haphazardly across the ridges and it looks like a huge graveyard of White Crosses. This is not a sensitive siting as stated above and no amount of planting will cover the turbines. Why also do communities want their views mitigated? Unacceptable.

This large sprawling industry known as the Waubra wind farm covers 173 square kilometres. Driving from Ballarat to my home the visual corridor is over 40 kilometres. It is seen from the three main arterial roads leading from Ballarat. The flashing red lights can also be seen as far away as Buninyong south of Ballarat, Dunolly north west of Maryborough, Carisbrook and Red Lion north east, and as close as Talbot 20km to the North of Waubra.

There is nothing in the consultation process to show you what changes you can expect to your view.

Section 3.1 of the Draft guidelines states: *“Best practice development requires the proponent to understand the community's concerns and to ensure that concerns are duly considered in the design and development of the wind farm project.*

At present this is not happening, communities and Government don't fully understand the visual, noise and environmental impact until after the turbines are in place.

There is poor consultation by Wind developers, they do not fully disclose the impact on the landscape. There is no landscape modelling. I find the wording they use is deceitful. They have divided long standing relationships in rural communities through Financial bribes. Community concerns are ignored, Bird studies are not completed correctly or independently. Health is a major concern at Waubra and has been ignored. Local planning process was over-ridden by the previous Minister for Planning, who has not listened to community concerns or problems.

Acciona answers the question *Will the turbines be noisy? A detailed assessment of the potential impacts of noise from the Waubra Wind Farm has been undertaken by specialist noise consultants, as required by the planning permit conditions. The Waubra*

*Wind Farm must meet this standard.*

Nowhere do they tell you turbines run at 40 decibels day and night and you will have no choice but to listen to it.

During the Waubra Panel review Several houses were identified that would receive more noise than was allowable – yet those turbines were still built. “*House 49 Will have unacceptable noise*”. How does the proponent expect to comply when already homes have been identified to receive unacceptable noise.

*Post construction, Acciona Energy will undertake a noise monitoring program to ensure that noise levels comply with the planning permit conditions.*

In a very recent newspaper article on the 30<sup>th</sup> January 2011, reporter Peter Rolfe wrote the following about Waubra: [www.news.com.au](http://www.news.com.au)

*“Since the wind farm started operating in July 2009, about 11 houses in the area have been vacated by people complaining of noise problems.*

*Acciona has bought at least another seven houses, the purchase of two of which appear to have been prompted by the new State Government’s threat to shut down the farm unless noise and permit conditions were met.*

*Acciona generation director Brett Wickham said “the most recent two houses bought by Acciona were purchased in September and October last year, when noise levels detected on the property were in breach of the company’s planning permit”.*

In this article Acciona have admitted that turbines are NOT meeting permit conditions and their solution is to buy the properties rather than address the real issue, correcting the noise. Buying the properties dose not lesson the fact they are in Breach.

Why does Acciona think they above the Law. How many untested properties would prove to be in breach.

Waubra panel report states: *What are the legitimate expectations of residents living within the Rural Zone. Can residents expect the same level of amenity as that offered in other zones, e.g. the Rural Living or Residential Zones? In short, the Panel’s answer to this question is no, they cannot.*

Did the previous State Government take away our rights of equality and our right to visual amenity if we live in a Rural zone: **YES**

The Waubra panel report states;

*The local community is strongly divided between those who supported the project and would benefit from it financially, and those who would not.*

*- It was suggested that there was intimidation of those opposed to the project and that this resulted in objectors not coming forward to express their views.*

*- There was some criticism of the planning process including lack of information and secrecy.*

*The Panel concludes that the social impacts are not likely to be long term and that the long term impact will be lessened by a generally well conducted public consultation process.*

*On a project of the size proposed it is inevitable that there will be different community views and that these views will be strongly held. It is also inevitable that there will be some degree of social division and disruption to the fabric of small communities as a result of these differing views. The process of consultation and notification should ensure that opportunity is provided for local input into the project design and that persons not satisfied with the outcome have opportunity to have their concerns considered fairly and independently.*

*The Panel notes that there were some written submissions expressing dissatisfaction with the process. However, no details were provided and no person making such claims appeared before the Panel*

Did the previous State Government value the Social networking of a rural community: **NO**, it allows bullying and intimidation.

During the planning process residents submitted written submissions to the Pyrenees Council, but they were unaware that they also needed to appear before the panel, as a consequence of this, their submissions were ignored. This is not a fair process, when you write to your council you expect your views to be considered.

Waubra is still a divided community and has a growing rift with the people in the adjacent area, leading to tension and stress. Social networking is an integral part of rural living and has now been undermined.

The Panel review is conflicting, stating below .....

*“a wind farm development should not entail the unwarranted or unfair exposure of individuals to unpleasant, unsafe or disorderly visual circumstances, where reasonable attention to siting and design considerations could control such impacts....the planning system does provide an underpinning of basic visual amenity standards”*

The previous Victorian State government has already allowed inappropriate development at Waubra, health has become a severe problem which has been ignored.

The panel required “Technical information” to be included in the residents objections to offset information supplied by the proponent. The lack of Technical information was used by the planning Panel to disregard the Residents objections to the Waubra Wind Farm Development. Why was the submission approved, when the Panel disregarded the community concerns? Because the wind industry has too much power, **Waubra was not protected in the final outcome.**

Why also did the panel and the previous Minister for Planning ignore the residents basic human rights and the Planning and Environment Act.

*“Section 4 (c) to secure a **pleasant, efficient and safe** working, living and recreational environment for **all** Victorians and visitors to Victoria;”*

Where are the rights of Rural Victorians?

OTHER INTERESTING FACTS;

Wind farms **can** change the weather.

*Somnath Baidya Roy from Princeton University, and his colleagues modelled a hypothetical wind farm. Data from the model suggests at night the wind farm has a significant effect on the climate.*

*This data is backed by US researchers who discovered that wind farms produce a distinct effect on the temperatures of the land on which they are sited.*

*The discovery came as the result of an analysis on temperature data collected at a wind farm in San Geronio, California, by Neil Kelley a principal scientist at the National Wind Technology Centre part of the National Renewable Energy Laboratory.*

*Analysis of Kelley’s data, provided the first evidence of the effect of wind farms on local temperature. Roy and his team analysed Kelley’s data and found the area surrounding turbines was warmer at night than the rest of the region. This rise in temperature can*



*affect the growth of crops within the wind farm because warm temperature at night robs plants of moisture.*

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Denmark have placed their turbines off shore, noise and also more stable wind conditions on the ocean surface, being the major considerations. Katrine Heilmann one of Denmark's Power Engineers states *"people don't like a wind turbine in their backyard"* *"They are noisy"*. (Winds of Change reported by Australian reporter Mark Corcoran 3/11/09)

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Acciona the owners of the Waubra wind facility are a Spanish owned company. **In 2006 the Spanish government "ended—by emergency decree—its subsidies to wind."**

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Dr Pierpont is a leading New York paediatrician, and has written a book "Wind Turbine Syndrome" she studied the symptoms displayed by people living near turbines for more than five years, in five countries. In her findings she has identified a new health risk, wind turbine syndrome (WTS). WTS is the disruption or abnormal stimulation of the inner ear's vestibular system by turbine infra sound and low-frequency noise. She believes WTS, which does not effect all people living close to turbines, causes problems ranging from internal pulsation, quivering, nervousness, chest tightness and increased heart rate, heart disease, tinnitus, vertigo, headaches and sleep deprivation.

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Dr. Christopher Hanning (a UK sleep expert) in a report (July 09) titled "Sleep Disturbance and Wind Turbine Noise." states *"Of particular concern, were the observed effects on children, including toddlers and school and college aged children."* *The study found changes in sleep pattern, behaviour and academic performance. Seven out of ten children in the study had a decline in school performance while exposed to wind turbine noise. School performance recovered after exposure ceased."*

The school in Waubra is surrounded by turbines, what effect could the turbines be having on the children attending this school.?

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In Australia low frequency noise is not monitored or planned for. On Feb 1<sup>st</sup> 2011, the *"Danish Environment Minister Karen Ellenan wants to set binding limits for low-frequency noise generated by wind turbines."* Why does the Australian Wind Industry continually deny the existence of low frequency noise.

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*"Some years ago Walt Disney and his artists apparently felt the effects of infra sound released accidentally at 12Hz on one occasion. A cartoon sound effect was slowed from 60Hz via a tape-editing machine and amplified through the theatre sound system. The resulting tone, though brief in duration, **made the entire crowd nauseas and the effects lasted several days.**"*

### **The Concept of Wellness:**

The World Health Organisation defines health as *'a state of complete physical, mental and social well-being'*. Wellness according to the WHO is more than the absence of disease it is *'the optimal state of health of individuals and groups'*. The WHO recognizes that these key areas, *"psychological, social, spiritual and economic"* are needed to achieve optimal health and the fulfillment of these are achieved *'in the family, community, place of worship, workplace and other settings'*.

WHO health promotion glossary: new terms', *Health Promotion International*, vol 21 no 4

The rural landscape does not need to be destroyed further by any more Wind Power developments. Solar power installed on home roofs will not affect the landscape, nor will it create the health problems associated with Wind power stations. True Farming needs to be encouraged not discouraged, we need to ensure farmers are aware of the very real opportunities for reducing greenhouse gas emissions in the atmosphere through storing carbon in biological systems, we can keep the landscape intact and decrease greenhouse gases by the same amount. Remove the subsidies for Wind development and move it to Solar, on homes and larger industrial scale Solar Power Stations. Create soil carbon incentives.

The Government, has allowed our health to be compromised, they have a duty of care not to cause harm or permit harm to be caused.

I ask that independent studies on health and noise be conducted, and low frequency noise monitored at existing wind facilities. Once offending turbines have been identified, steps need to be taken to shut them down immediately.

I look forward to hearing from you  
Kind regards  
Robyn Brew