



# The Answer is blowing in the Wind?

## Introduction

Most people living in the Mid North of South Australia are well-aware that the region is targeted with the rapid roll out of Premier Rann's renewable energy programme.

In recent years, massive industrial wind turbines have appeared along ridgelines from Waterloo in the south to near Jamestown in the north, and from Snowtown in the west to Hallett in the east.

Many more projects are in the pipeline: Carmody's Hill, Willogoleche, Collaby Hill, Hallett Stages 3, 4, and 5, Barnhill, Snowtown 2, Stony Gap and Robertstown; some of which are approved and all of which are planned.

The Mid North is not the only region of the state with wind farms but, at this stage, they are more concentrated there. Why is this so? In part, it is because of the close proximity of the wind farm sites to a number of electrical power sub-stations and to an extensive grid system.

<b>80 metres</b>	the height of the towers
<b>48 metres</b>	the length of the blades
<b>90 tonnes</b>	the weight of the nacelle and hub which sits on top of the turbine
<b>680 tonnes</b>	the weight of the crane required to lift all of the above into position

Also, experience from around the world shows that low-income areas are frequently targeted because people in such areas are less likely to criticise the problems caused by new industries. Some time ago, a bureaucrat, working in the state's energy department, when asked why the Mid North was considered a good area to locate industrial wind farms answered that the population there was low and people would put up with them.

By way of contrast, it is interesting to note that, thus far, there is only one wind farm on the Fleurieu Peninsular and none on the Willunga Escarpment – areas noted for their strong and reliable winds – due to the pressure on local councils from residents.

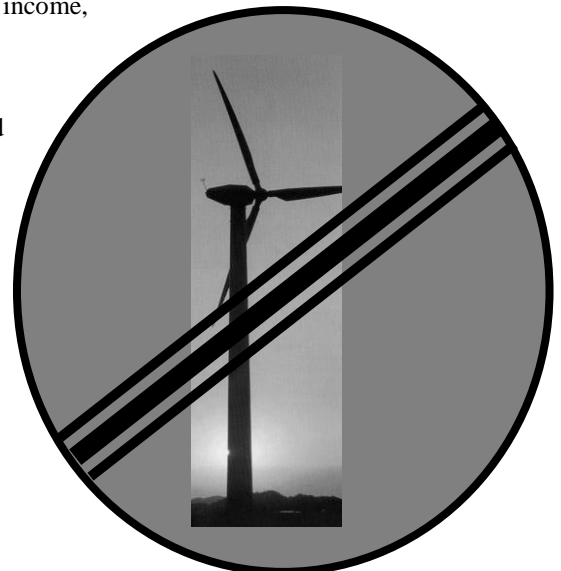
Victoria also has a very large wind energy programme underway and NSW is hoping to catch up too. These two states, together with SA and Tasmania, are interconnected via the national electricity grid.

Due to SA's renewable energy target of 30% and the federal government's target of 20%, both by the year 2020, wind energy earns large financial returns for investors. The targets mean that energy providers such as ElectraNet in SA must purchase their electricity from renewable energy sources first.

Renewable energy also attracts a subsidy in the form of renewable energy certificates (RECs) whereby each Mwh (1 million watts of energy produced in an hour) of renewable energy receives an additional source of income, depending on the market price of the certificates.

Late in 2009, the market price for RECs plunged from \$50 down to \$30. Over a year later, it had still not fully recovered. In late 2010, the price was around \$40/Mwh and not considered high enough to attract some potential investors into the market. This lower price partly explains why some planned and/or approved projects have not proceeded as quickly as developers would have hoped e.g. Stony Gap, Robertstown or Carmody's Hill.

**There are many claims and counter-claims about wind energy. This pamphlet puts the case against the building of further wind farms in the Mid North of South Australia. Enough is enough!**



# 21 important points you should know about a wind farm which could appear on a ridge top near you

Wind energy results in an addition to energy output not a replacement. This sounds like a paradox, but is it?

1. Electricity in the grid must be balanced **at all times** i.e. the energy going into the system – the supply – must match the energy going out – the demand
2. No electricity can be stored in the grid or at the power station
3. The wind is not predictable (though wind forecasting is improving) because it is intermittent i.e. it stops and starts, and it is variable i.e. it rises and falls in strength without warning
4. When the output from renewable energy sources reaches more than about 10%-20% of the total demand, it puts strains on a system which needs to be highly managed all the time
5. In 2010, S.A.'s contribution from wind energy, measured by its rated capacity, reached about 18% of the total demand and this is said to be a similar percentage to Denmark's penetration. At this level, wind energy creates a serious challenge to the organisations which manage national grids. In Australia, the national energy market operator is known as AEMO (Australian Electrical Market Operator)
6. To ensure continuity of supply when wind fails, there must be back up power ready to come on stream instantly. This is why base load power stations, which must be fuelled by a reliable fuel source e.g. coal, gas, uranium or hydro, cannot be decommissioned even though there may be a large number of wind farms
7. Base load is the minimum load of electrical energy required all of the time to meet demand. In S.A. this requirement is about 1,100MW (MW= 1 million watts)
8. Output from wind farms, because of its unreliability, is used only to meet demand above this base load or what is known as peak load and represents the daily fluctuation in demand. Although the rated capacity of S.A.'s wind energy is around 18% of demand it contributes only 1% of its capacity at times of the ten highest summer peak demand periods. At the time of the top ten winter peaks the contribution is 1%, and 15% for fifty percent of the time at other peak demand periods; so, just when demand is greatest wind power is least useful
9. A significant percentage of the energy produced by wind farms in S.A. is exported via the inter-connector to Victoria. For example in 2007-8 sixty-six percent was sent to Victoria and in 2008-9 forty-eight percent. This is because when wind energy is available, it is not

always at a time when it is required in SA

**3** the number of wind turbine fires in South Australia

- 2006 at Lake Bonney
- 2009 at Cathedral Rocks
- 2010 at Starfish Hill

## Wind power is “clean and green”?

10. The whole rationale for renewable energy systems – in this instance wind – is that they do not produce CO2 and, therefore, do not contribute to the greenhouse effect. **However, by exactly how much wind energy is reducing CO2 levels is not at all clear**
11. According to the Australian national greenhouse accounts, S.A.'s CO2 emissions from electricity generation for the years 2006, 2007 and 2008 are **increasing**. In other words, wind power had no noticeable effect during that period. This contradicts Rann's claim that emissions are declining. Rann's figures would appear to be based on the electricity industry's figures
12. It remains, therefore, an open question as to whether CO2 emissions are being reduced and how much fuel is being replaced in base load power stations. **Without clear and demonstrable evidence of a significant reduction in CO2, the entire argument for wind farms collapses**
13. As mentioned above, due to the intermittent nature of wind energy, output from wind farms must be backed up with reliable sources of electricity. ESPIC's (Electricity Supply Industry Planning Council) Annual Planning Report 2009 said, “In order to provide voltage support” (to allow for the variability of wind energy) “a number of conventional operators will need to be kept operating at all times”
14. Base load power stations which run on coal or gas in SA are not suited to rapid start up, but when providing back up for wind energy they are required to ramp up output quickly. Base load stations must be kept in a “spinning” mode all the time and this, together with the need to keep altering output, is an inefficient way to use fuel and the potential to reduce CO2 emissions
15. Open-cycle gas fired power stations can be turned up and down very quickly, unlike other fossil fuel power stations which have to be kept running if they are to provide rapidly available back up for renewable energy sources. Not surprisingly, there are now many proposed open-cycle power stations, especially from companies such as AGL and ORIGIN who can then match their new gas generators to their wind farms and continue to sell energy whether the wind is blowing or not

**27%**

the *capacity factor* (the actual capacity) of South Australia's wind farms and not to be confused with the *rated capacity* which is a theoretical maximum output. Figures taken from 2008-9 data

**1 acre**

the area of flattened and cleared land required for each 80

**46 km**

of side-tracks to be built to service the proposed Carmody Hill project

**5016 hectares**

the total site required for construction of the proposed Carmody Hill project

**18 km**

the distance the 37 turbines spread over the Waterloo wind farm (further expansion planned)

16. ESIPC's 2009 document identified 15,500 MW of new gas plant to meet the state's constantly growing peak demand (i.e. required in times of extreme weather) and to provide backup for intermittent, renewable sources
17. With the currently available technology, it is, therefore, unlikely that there will be any phase out of conventional fossil fuelled power stations soon. The best that could be hoped for is that some fuel use in those stations can be reduced.
18. The energy payback time for wind turbines is another issue that needs research, but who's doing it? And, who would fund it? The industry claims that a wind farm returns the energy used during its manufacture and construction in 6-18 months, but when challenged to provide the data to show how this time-frame is arrived at there is no response
19. With many more wind farms in the pipeline, S.A. is already facing technical limitations in its transmission system. The federal government in early 2010 committed billions of dollars to upgrade the grid; \$5 billion of which would be to meet the requirements of the renewable energy target and \$15 billion to meet growth in demand
20. **Remember, the whole purpose of wind energy is to reduce CO2 emissions; not to win green votes for politicians, not to provide more economic growth and not to provide some cash to farmers or a few crumbs to local communities**
21. Until such time as there is a transparent and full evaluation of the real contribution that wind energy is making to the reduction of CO2, it is futile to go further down this road just so that people in cities can feel secure in the belief that there is an easy fix to the climate crisis. We must look at wind energy in an overall context of energy policy and, in particular, what is driving the spiralling demand for electricity



## The Wind is Renewable but the Hills are not

One of the first statements of opposition to wind turbines was written in Germany in 1998 and signed by 60 academics. Known as the Darmstadt Manifesto, it said, in part, *A type of technology is being promoted before its effectiveness and consequences have been properly assessed. Ecologically and economically useless wind generators... are not only destroying the characteristic landscape of our most valuable countryside and holiday areas, but are also having an equally radical and alienating effect on the historical appearance of our towns and villages ... More and more people are subjected to living unbearably close to machines of oppressive dimensions. Young people are growing up into a world in which natural landscapes are breaking up into tragic remnants.*

The Australian landscape is very different to the German one, but the distortion and visual sense of dislocation is the same no matter in which landscape or community these vast machines are built.

People living in areas of the Mid North near wind farms have made comments such as, *They take the landscape out of the land - I no longer feel at home here in my own place - My favourite place to go and just sit and look at the view on a warm evening is ruined. I won't go there anymore.*

There are proposals to build wind farms in the Clare Valley wine region; along 11km of the Mt Bryan Razorback Range – Mt Bryan being the highest point in the Mt Lofty Ranges-to surround on three sides the bio-diverse rich Tothill Belt and in the Beetaloo Valley in the southern Flinders Ranges.

The sheer height – up to 125 metres – and dominance of the wind turbines distorts and shrinks all natural and man-made features in the landscape: trees, buildings etc become like toys in a miniature world.

## 15 important points about wind turbines and the natural environment

1. The construction of wind farms requires large-scale earthworks spread over thousands of acres, usually, high up along prominent north-south running ridgelines which often have very steep gradients and may be covered in remnant woodland vegetation or native grasslands
2. Bulldozers and other earth-moving equipment are required to clear and flatten the turbine sites, roadways, other ancillary building sites and to dig trenches for cables. Explosives may be required to blast through rocky ridges or sub-structure. Soil, rocks and vegetation are pushed into gullies and used to alter gradients on tracks. Erosion is enhanced and water runoff altered
3. Each tower must be secured in a base (pad) requiring at least 450 cubic metres of concrete and hundreds of tonnes of reinforcing steel rods. In addition, each pad requires anchoring and 3 very deep holes must be drilled for this purpose and have the potential to interfere with aquifers. Nine thousand truckloads were required to cart the materials for construction of 37 turbines for the Waterloo wind farm

**4000**

the number of bats killed by 44 turbines in one year at a West Virginian wind farm

**20% - 60%**

of 108 bird species in S-E Australia are in decline. Both common species such as Grey Shrike Thrush and Kookaburras as well as uncommon species are in major decline due to fragmentation and isolation of habitat and reduced rainfall.

Professor Bennett, Deakin University, Vic (2009).

**37**

birds killed per turbine per year. Estimate by the US Fish and Wildlife Service

4. Engineering on this scale permanently alters the form of ridges. When a wind farm reaches the end of its life, the hills **cannot** be returned conveniently to their original contours. Old trees, which provide vital nesting sites or shelter for birds, bats, insects and reptiles, **cannot** be replaced, except over a very long time

5. State and federal governments spend large sums of money “protecting” remnant native vegetation and encouraging landholders to adopt conservation methods for farming and land care. (For example,

the many programmes initiated by the state’s Natural Resource Management Boards.) At the same time, wind farms are being built right through the heart of the Mid North’s remaining woodlands and native grasslands. In particular, the critically endangered Peppermint Box Grassy Woodland and Iron-grass Natural Temperate Grasslands areas are being impacted by some of the developments

6. Members of government departments whose duty it is to care for the natural environment are gagged from speaking out about damage being caused by the roll out of wind factories
7. Due to climate change and continued habitat destruction, species decline and extinctions are escalating in many parts of the world. Australia’s record for species’ extinctions is very poor
- 8. Wind farms destroy and fragment remaining habitat and, thereby, threaten many native plants and animals**
9. To reverse these disastrous trends, degraded remnant native vegetation needs to be maintained and restored, and corridors linking habitat created to allow birds and other native fauna: kangaroos, lizards, echidnas etc. to survive and, hopefully, to

flourish

10. In addition to the losses caused by the fragmentation of habitat, the tips of rotating turbine blades move at speeds of 240km/hour – 320km/hour and kill any bird or bat that collides with them. Raptors (Wedge tail eagles, Kites, Falcons etc.) are especially vulnerable as they favour ridgelines, rising on up-drafting air and soar at similar heights to the turning blades

11. Bats – some so small that they can fit inside a hand – are killed directly by the blades and also by the percussion caused by the up-draft and turbulence. It is likely that turbines attract bats as they like to fly between structures. The migratory routes of bats in the Mid North are not well studied

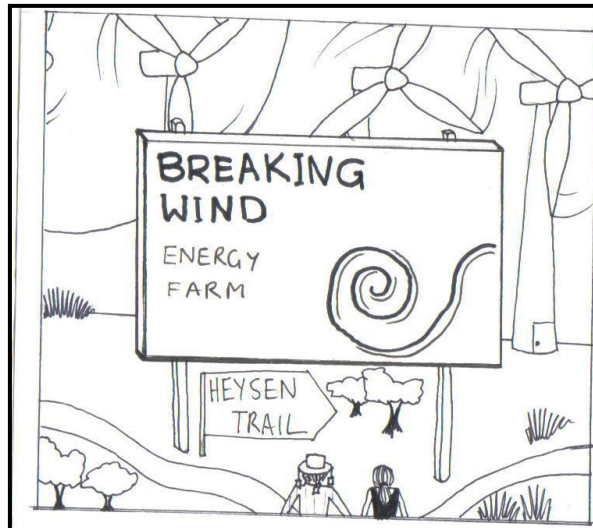
12. Migratory birds move through areas of remnant vegetation and waterbirds flying between sites do so at night making collisions more likely

13. Kills of birds and bats are not properly recorded by wind farm operators or by landholders. Carcasses may be scavenged or decompose before they’re noticed, and that is if anyone is looking. It is, therefore, easy for deaths to be

denied, but that they occur is beyond doubt

14. The US Fish and Wildlife Service Guidelines for placement of wind turbines states that they should not be near wetlands or other known bird and bat concentration areas or in areas of low- cloud ceiling, especially during times of bird migration - anyone who lives or frequents the MN will regularly see low cloud or fog obscuring the ranges, especially during the winter and spring periods
15. The visual amenity of a landscape is destroyed wherever gigantic turbines as high as Adelaide’s tallest buildings are built

**The ecological crisis of climate change cannot be used to justify the environmental vandalism being inflicted by the rollout of industrial-scale wind turbines**



**3.2**

the number of protected species of eagle being killed each year by Roaring 40s Woolnorth Tasmanian wind farms.

**13.1%**

the area of remaining woodland and native grasslands in the Yorke and Mid North

**116**

the number of bird species observed in the Robertstown, Pt Pass and Tothill areas over the last few decades

# You Cannot Shut Your Ears

## 21 points you need to know about wind turbines and noise

Wind turbines are loud. The bigger the towers and blades, the higher the capacity of the turbine; the louder they get. Industry representatives say they are not very noisy, that their brand of generators and blades is quieter than others. They lie. All wind turbines are noisy and can be very distressing to some people living nearby.

1. In Australia wind factories are being built in quiet, rural areas; areas which are not subjected to urban hum, airports etc. The development of this industry into, usually, very quiet places is, therefore, particularly intrusive and distressing to some people living near them. Background night time sounds in rural areas can be as low as 25dcB (dcB=decibel which is a measure of amplitude or loudness).
2. Wind turbines create different types of noise from:
  - (i) the mechanical equipment inside the hub at the top of the tower
  - (ii) an aerodynamic source created by interaction of the turning blades with the wind. During periods of optimal wind this is a steady noise sometimes described as an aeroplane overhead that never leaves
  - (iii) changing weather conditions such as turbulence caused during a storm when the steady sound is augmented by fluctuating sounds. At such times a whooshing sound is audible and repeats about once every second. This sound can be particularly distressing. The audible part of this whooshing is around 300 Hz (Hz=Herz and is a measure of frequency) and can easily penetrate walls
  - (iv) the rotating blades also create energy at frequencies as low as 1-2 Hz with overtones of up to 20Hz. Most people do not hear these very low frequencies (infrasound) which are more likely to be sensed as vibrations by people who react negatively to it.
3. The South Australian EPA (Environment Protection Agency) sets noise guidelines (35dcB/A-40dcB/A at nearby residences) based on the New Zealand standard (DZ 6808:2009). There is no effective policing of wind turbine noise levels, and, significantly, **the EPA does not consider that very low-frequency noise (infrasound) is present at any modern wind farm site.**
4. The WHO's (World Health Organisation) recommendation to protect public health and minimize sleep disturbance is 30dcB for steady, continuous
5. There is no independent, professional noise measurements required prior to or post-development of wind farms. If wind farm neighbours wish to obtain testing independently of the wind farm developers, they must be prepared to pay tens of thousands of dollars for acousticians' reports. The financial burden of accessing this expertise is an important obstacle to objective judgement and to social justice

### Examples of recommendations for setbacks:

- The French Academy of Medicine 1.5km
- Sound experts Rick James and George Kamperman – 2-3km
- UK Noise Association – 1.5km
- Marjolaine Villey – Migraine, University of Paris -5km
- NSW Upper House Inquiry 2009 – 2 km
- Victorian Liberal Party - 2km
- Australian Medical Association – 1.5km
- Acoustician Robert Thorne – Between 2 and 3.5 km
- Waubra Foundation – 10km

It should be noted that some residents near MN wind factories are suffering adverse health impacts at distances greater than 3 km. Furthermore, wind turbines being built today are larger and have a higher capacity than those built in Europe over the past few decades.

The WHO recognises the seriousness of low frequency noise as an environmental problem. Its publication on Community Noise in 2000 says, *It should be noted that low frequency noise . . . can disturb rest and sleep even at low sound levels. For noise with a large proportion of low frequency sounds a still lower guideline (than 30dcB) is recommended. And, The evidence on low frequency noise is sufficiently strong to warrant immediate action.*

noise. The state EPA's guidelines do not ensure this level. For wind companies to hold turbine noise to 30dcB at night has serious economic consequences. Not surprisingly, the companies maintain 45-50dcB to be safe levels.

6. In spite of recommendations for setbacks from increasing numbers of noise and health workers and their professional associations, the SA EPA does not recommend a minimum setback
7. Germany possibly has the most comprehensive regulations and defines different zones, with 'quiet regions' having a setback of 1.5 km
8. After many wind farms had been approved, Scotland introduced a 2 km setback between the edges of cities, towns and villages (pity about individual dwellings)
9. The loudness of the turning blades can be very annoying to nearby residents (as numerous reports and witnesses in court cases in Australia and overseas have testified) and can disturb sleep which can then cause other health problems such as stress and depression. Landholders who receive around \$10,000 per turbine per year for leasing their land to wind companies are less often annoyed!
10. Publicly, the wind energy industry denies that turbines are annoying; not surprisingly, the industry also denies the validity of any noise complaints

11. However, "... a comprehensive understanding of wind turbine noise and its effects was established by thorough NASA (United States National Aeronautic and Space Administration) research over 20 years ago. **Contrary to suggestions this is not new science.**" Dr Malcolm Swinbanks, UK scientist. Specialist in unsteady dynamics, vibration and acoustics
12. The NASA research showed that wind turbines emit significant quantities of infrasound. Current work by acousticians suggests that, depending on the surfaces over which the sound travels, infrasound could be measured more than 5 km away
13. Measurements of seismic noise generated by wind turbines show that it can travel over even larger distances such as 15 km and more
14. The most serious adverse health impacts are thought to result from exposure to the low-frequency noise and associated vibrations
15. These very low frequencies are often inaudible but may be experienced as vibration. Different people can experience wide variations from these low-frequency exposures and some may not notice any effect at all, whereas, others may feel quite ill and wish to get away from the area
16. Low-frequency noise enters the ear, the body and other objects where it can set up resonant vibrations in our dwellings and possessions as well as our chest cavities, sinuses and throat
17. Low-frequency sound transmitted through ducting in so-called sick buildings in the 1970s and 80s was identified as the source of symptoms identical to Wind Turbine Syndrome
18. Other related adverse health effects: cardiac arrhythmias, hypertension and headaches are being attributed to noise or vibration from wind turbines
19. The most vulnerable populations to these impacts are children, especially those under 6-yrs, the elderly and people with pre-existing medical conditions
20. Current research shows that noise from wind turbines is more noticeable at night when there is a change to higher atmospheric stability
21. Noise is also amplified in mountainous and hilly landscapes. Hilly landscapes characterise the Mid North of SA where turbines are built in the highest possible locations and residents, typically, live below them

Landholders with turbines on their land enter into confidential contracts which curtail their freedom of speech, so even if the noise is driving them nuts, they are gagged from saying so publicly. Some landholders do not live anywhere near their leased land. Many have second homes to escape to. Not so others living around them – this could be you!

There are clinical reports accumulating from around the world which provide sufficient evidence of adverse health effects. Residents living within 1km to several kilometres of Mid North wind factories are experiencing symptoms similar to those described as Wind Turbine Syndrome. If you are one of these people or you know someone who is, you may wish to contact the *Waubra Foundation* (Email [malpasarah@westnet.com.au](mailto:malpasarah@westnet.com.au) and phone no. 08 86362051) which is collecting evidence from around the country. For all other enquiries phone (08)85818255



Robertstown Hills, cemetery in foreground: Is this what you want for a view?

## What is to be done?



- Join a local group opposed to wind farms near you or start one - many voices are stronger than one.
- Keep informed on this issue.
- Be ready to make submissions on new wind farm developments or expansion to existing developments. Remember you only have 15 days in which to lodge an objection after a wind energy company makes an application, so keep a close watch on council notices in council minutes or in the back section of your local newspaper. Council websites are not always reliable.
- If you do not lodge an objection, you have no right to appeal to the courts later.
- Put a sign on your front gate or fence.
- Write your local paper and keep writing!
- Write/phone/email councillors, state and federal politicians.
- Phone talkback radio – most people in cities are not aware that there are any problems relating to wind energy.
- Inform your friends, relatives and colleagues about the issue and why you are opposed to the turbines.
- If you do not want wind turbines in your area or nearby **SPEAK UP**. Remaining silent will not worry anybody, least of all politicians and the companies. Remember, once the turbines are built it's too late. The cards are stacked against those who oppose wind farms so don't just leave it to others to do the work and to speak for you.
- If your health is being affected by living near turbines, report it to your health practitioner, keep a diary of your problems; let others know about it.
- If meeting with wind energy company representatives, ensure that there is a witness to your conversation and take notes.
- Invest in a noise monitoring meter (available from Dick Smith's for around \$120) and keep a record of your background night time sound levels or wind turbine noise, if you are already living near a wind farm.
- Write to wind energy companies and ask relevant questions regarding background noise levels, actual CO2 reductions, predicted noise levels, electromagnetic interference, fire hazard, property values etc.

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