

Submission  
No 97

## INQUIRY INTO RURAL WIND FARMS

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Friends of Renewable Energy

*Clean Energy for Future Generations*

## **Submission to the NSW Rural Wind Farm Inquiry**

We wonder why there is yet another inquiry about renewable energy and climate change related issues. How many times do we need to discuss what has been proven, regurgitate what has been resolved and argue over what has been working successfully overseas for decades?

Wind farms are not new. They have been operating around the world with great success for well over 20 years.

Wind energy continues to grow at a staggering rate globally. In Europe last year, more wind power was installed than any other electricity generating technology. China doubled its wind energy capacity for the fourth year in a row and the US now leads the world in the number of installed wind turbines. Wind power is part of the energy mix in over 70 countries around the world. Even countries such as Spain, India and Egypt with their enormous natural solar resource have many times more wind power installations than they do any other new renewable technology.

The fact that Europe sees wind energy as profitable, despite having a much weaker resource than we do, is testimony to the viability of wind power and indicates the enormous potential we have here. On average a single 2MW wind turbine produces enough electricity to power 850 homes and save 6000 tonnes of GHG emissions.

Denmark is living proof that tackling climate change can be pro-growth. Their "green tech" sector comprises nearly 500 companies, employs 32,000 people and accounts for 10% of total Danish exports. In 2008 the Danish wind industry exported 5.7 billion Euros of wind technology. Wind energy supplies over 20% of Denmark's total consumption per annum. At times the penetration of wind into the grid exceeds 100% allowing export of wind-generated electricity from one region into others.

Wind power alone is expected to save 10 billion tons of CO<sub>2</sub> globally by 2020. It is currently one of the main power generating technologies capable of making a substantial difference in reducing CO<sub>2</sub> emissions by the large amounts necessary leading up to 2020. This is because it is proven clean technology that is available now, is cost effective, quick to install and can be operational within a matter of months.

One third of Australia's greenhouse gas emissions come solely from the production of electricity, 84% of which is generated by the burning of coal, a major contributor to the reason why Australia has one of the highest per capita emissions of greenhouse gas in the world. Meanwhile our rich wind resource remains largely unharnessed.

## **Rural wind farms**

There are two main types of wind turbines; the small “domestic” style turbine that has a capacity of up to several kW and the “grid scale” rural (or offshore) farms of multi megawatt size machines that provide substantial amounts of energy to the electricity grid. Rural communities are very reliant on the weather and hosting wind farms enables us to play our part in helping to reduce the effects of climate change. Wind farms also offer rural communities great employment opportunities and bring much needed finance into regional areas; welcome benefits at a time when rural Australia is struggling. Wind farms offer farmers additional income whilst maintaining essentially full use of the land around the turbines. Their construction and maintenance also brings jobs and investment into rural communities.

There is a belief held by some that wind farms depreciate land values, so we decided to investigate. We spoke with the Real Estate Institute Of Australia in April this year, as well as several real estate agents in locations where wind farms exist, including three in the area of Gippsland where wind farms have been built. They all said that there is no indication of any depreciation in the value of properties hosting wind farms, or those adjacent to, or in sight of the turbines. Patrick Barry from Wonthaggi Real Estate in Gippsland said, “There is absolutely no decline in property value in the immediate vicinity of the wind farm, nor anywhere across the Shire”. This was the same sort of response received from the seven other real estate agents asked to comment. In fact in Albany, the real estate agents advertise “view to a wind farm” as an asset to a property and Phil, from First National Ararat, said “Ararat has gone ahead in leaps and bounds since the wind farm”.

## **Market for green energy**

The greatest impediment to renewables remains a lack of an active national market mechanism. Another impediment to its potential lies in cost of transmission. As we move to a renewable energy future we should look at decentralising the energy sources on our grid system. Much of the current grid is now due for upgrade, so we should take this opportunity to undergo an upgrade with distributed energy in mind. The grid we are using was built around the concept of centralised generation supplying centralised load 100's of km away - and was paid for by the government. For example, the transmission line that runs from Latrobe Valley to Portland, Victoria almost exclusively for its aluminium smelter was built using taxpayer's money. This infrastructure privilege is not extended to the renewables sector where developer pays.

## **Benefits of wind farms**

Wind is not there to supply dispatchable power, peak power or base load power although wind farms are able to contribute in all these areas. Wind's forte is the ability to provide energy at very low greenhouse gas emissions levels (around 1% or less of that attributed to coal fired generation). Wind is a free, natural, renewable resource and the power produced creates no harmful by products, waste or dangerous emissions (eg. nitrous and sulphur oxides).

Many generation systems require large quantities of water to produce their power. With dwindling water supplies, wind energy also provides a water free option.

Wind farms are quick to install and recoup the energy required for manufacture and construction within three to twelve months depending upon the wind resource of the particular site. Once a turbine reaches the end of its design life (usually 25 years) it can be totally dismantled and recycled as is the current practice, leaving very little trace of its previous existence and importantly no dangerous waste.

Australia has a very good wind resource by international standards. This translates into good capacity factors (eg. 25 to 40%) when compared to solar and hydro (for example, Snowy Hydro and solar PV both at around 17%).

## **Wind farms and the electricity network**

Wind energy is one form of distributed generation; there are several others and they are becoming more prevalent in electricity networks the world over. Advantages of distributed versus centralised generation include less risk to overall energy security if a fault occurs, or if there was an attack on the facility. In the case of centralised power generation, this can create extensive wide spread blackouts.

With grid connected wind farms deployed over wide areas, base load generation from wind becomes possible. As weather patterns over dispersed areas of the country are varied, when the wind is slight in one region, it may be blowing strongly in another. Wind is a variable resource but predictable outputs can be gained by using modern weather prediction methods. Advanced weather forecasting computer systems can predict wind speeds 40 hours or more ahead with accuracy. This information can then be used to balance energy outputs from the different available sources.

Wind is a particularly good source when used in combination with gas or hydro. Hydro and Gas can be used to compliment wind energy because they are both dispatchable and fast on/fast off power sources. So when the wind wains, the shortfall can be easily replaced, then switched off when the wind picks up. By using wind in conjunction with hydropower storage dams, we can achieve even cleaner power. For many years Brazil has been a good example of how these two systems can be successfully combined. However, to use coal to do pumped storage (as we do presently) results in an even dirtier source of power since there are efficiency losses during pumping the water back up into dams and again when generating. Thus the equivalent overall process is made worse – if we consider that 1kWhr from burning coal results in approximately 1kg of greenhouse gas emissions, then by using coal to power pumped storage will equate to approximately an additional 0.25 to 0.4 kg or 25 to 40% increase in emissions. Conversely, in the situation where another type of renewable energy is used to pump water, the efficiency loss becomes unimportant in terms of environmental impact and reduces to an essentially economic consideration.

Modern wind farms can also support to the grid during fault conditions thus strengthening reliability of the grid.

## **Planning considerations**

Wind farms cannot be constructed anywhere. They must go where the resource is with due regard to environmental and community aspects. They require a steady wind resource (typically an average wind speed of around 25km/h or more) to make them viable. Other considerations include proximity to existing transmission lines, accessibility to land and stringent planning guidelines.

## **Community involvement**

There are several models for community involvement with wind farms. Wind farm developers/operators, through consultation with the community and local council could create various partnerships - such as a portion of the wind farm profits being put into a community fund, or by financing specific community projects, or by donating a turbine to the community, etc. Alternatively the community may wish to develop and run their own wind farm, as is often the case in Denmark and Germany. The options are numerous and it is really up to the particular community as to the amount of involvement they desire. Community involvement and consultation should be encouraged and this needs to be recognised in the processes required to get a wind farm up and running.

## **The Renewable Energy Target (RET)**

During the mid 1970's, Australia had ~23% renewable energy in the mix of electricity sources, presently this is less than 10%. The aim of the RET is to increase the proportion of electricity from clean sources thus reducing the overall emission rates from electricity production. It will also help negate the need for new fossil plants that create much higher emission levels. In conjunction with the RET, efforts to improve energy efficiency of the end use is very important so that not only is electricity generation made cleaner per unit but the overall consumption level is minimised. Australia has one of the best wind resources in the world. This, coupled with the pace with which a wind farm can be operational, ensures that it will be one of the major players in helping to meet the governments Renewable Energy Target.

## **Conclusion**

Wind energy brings emissions cuts to our nation as well as much needed employment and finance to the rural sector, so what are we waiting for? Action is needed now. Lets stop getting bogged down in bureaucracy and politics, cut the red tape and get turbines up and running as a matter of urgency.

Friends Of Renewable Energy

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21<sup>st</sup> August 2009