Submission
No 101

INQUIRY INTO RURAL WIND FARMS

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Date received:	25/08/2009

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Confidential Submission

21st August 2009

The Director
General Purpose Standing Committee No. 5
Parliament House Legislative Council
Macquarie St
Sydney NSW 2000

Fax: (02) 9230 3416

Dear Director:

RE: Submission for the Inquiry into rural wind farms

Please find attached our submission to the Legislative Council Inquiry into rural wind farms.

As the largest owner of wind energy facilities in Australia, we look forward to your consideration of the comments raised in our submission. Infigen Energy fully supports the Australian Government's, Expanded RET scheme as well as the Premier's recent announcement with regards to improvements in the planning assessment process for wind energy facilities. While other states may have benefited more than NSW from the original MRET scheme, Infigen Energy looks forward to working with the NSW Government to help NSW obtain an appropriate share of renewable energy investment and rural job creation.

Infigen Energy is the owner of NSW's largest wind farm the 67 wind turbine140.7MW Capital Wind Farm near Bungendore, and we look forward to future investment opportunities in renewable energy generation in New South Wales.

We would also welcome the opportunity to appear before the Committee to communicate our views in person. With this in mind, we propose that Mr. Jonathan Upson attend the Inquiry on behalf of Infigen Energy Ltd and he will contact you in the next several days to discuss.

If you have any questions concerning our submission, please do not hesitate to contact myself or Mr Jonathan Upson

I would appreciate that you treat our submission as confidential.

Yours Sincerely

Geoff Dutaillis
Chief Operating Officer
Infigen Energy

cc. Miles George, Managing Director
Jonathan Upson

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Submission for the NSW Legislative Council Inquiry into rural wind farms

21st August 2009

1 The role of utility-scale wind generation

1.1 Reducing greenhouse gas emissions

Approximately 90% of electricity in Australia is generated from burning gas or coal resulting in substantial greenhouse gas emissions. Therefore it is inevitable that an increase in wind energy generation will result in a substantial reduction in greenhouse gas emissions as an increase in wind energy generation must result in a reduction in electricity generation by other technologies (as the supply of electricity must very closely mirror electricity demand in the National Electricity Grid).

Forecasting of the exact amount of greenhouse gas emissions displaced by wind energy generation requires very sophisticated modeling of the wholesale electricity market. A number of these detailed studies have been performed documenting the significant greenhouse gas emissions resulting from increased wind energy generation in Australia. Perhaps, the most focused of these studies was performed for the Victorian Government by McLennan Magasanik Associates Pty Ltd (MMA) in 2006. This study, *Assessment of Greenhouse Gas Abatement from Wind Farms in Victoria*[1], found that 1000MW of wind energy facilities in Victoria would result in a reduction of between 2.4 and 2.9 Million tones of CO_{2e} per annum. The table below, from this study, shows that 1000MW of wind energy is forecast to result in a reduction of slightly more than 1000 tonnes CO_{2e} for each GWh of electricity generated by wind energy.

Table 1: Average abatement intensity from wind generation, kt CO_2e/GWh

Wind Capacity	2007	2008	2009	2010	2011	2012	2013	2014	2015
100 MW	0.95	0.92	0.94	0.93	0.95	0.95	0.93	0.91	0.88
1000 MW	1.12	1.10	1.08	1.09	1.09	1.10	1.05	1.03	1.06

Source: MMA analysis

A study forecasting the greenhouse gas abatement of 1000 MW of wind farm capacity in NSW might prove to be a worthwhile report. However, it would be very surprising if such a modeling exercise resulted in dramatically different results from the MMA study.

1.2 Producing off peak and base load power

When considering the issue of baseload versus intermittent generation sources such as solar and wind, it is important to recognize that the National Electricity Market (NEM) exists in a continual state of 'over-supply' in order to manage the instantaneous loss of the largest generator or the largest transmission line. Therefore, equipment and processes are in place to accommodate the instantaneous loss of a 660 MW generator from one of NSW's larger coal fired generation stations without disruption of electricity supply. It is clear, that an instantaneous, unexpected loss of such a large amount of electricity generation is much more difficult for the electricity market to handle than, for example, a 140MW wind farm reducing its output 30-40MW over a minute or so because of decreasing wind speeds.

[1] Available to download at:
http://www.sustainability.vic.gov.au/resources/documents/Greenhouse_abatement_from_wind_report.pdf

In addition, CSIRO has developed a wind energy forecasting system which is currently being utilized by the Australian Electricity Market Operator (AEMO) to accurately forecast wind energy production in the NEM. As changes in wind speed are easily forecast, this system significantly reduces unexpected variation of wind energy production in the NEM.

Currently only about 1% of electricity in NSW is generated by intermittent renewable sources such as wind and solar. International and domestic studies have shown that until these variable energy sources approach around 20% market penetration, issues of grid stability are easily managed by the electricity market operator. If NSW were to share in the RET investment "equally" with other states, one might expect variable energy generation in NSW to rise to about 10% by 2020. Therefore, it is clear that grid stability issues in NSW due to variable generation sources is very unlikely to be a significant issue for many years to come.

2 Locating rural wind farms to optimize wind resource use and minimize residential and environmental impacts

While it might be desirable to try to locate wind farms in windy locations 'in the middle of nowhere' where few, if any, residences exist, this is not normally very practical. Wind energy facilities require more than just high wind speeds. They also require a practical and economical option to connect to the electricity grid and a supportive local community. One could find a very windy potential wind farm site, but if it's too far from a suitable connection point to the electricity grid able to accommodate the project's generation, the wind project will not be viable.

Electricity transmission and/or distribution lines, with the exception of the highest voltage transmission lines, are not usually built in the middle of nowhere, as electricity lines are built to service nearby homes and businesses. While high voltage transmission lines are sometimes located in remote areas, it is important to note that connection costs to these high voltage lines are much more expensive than for lower voltage lines. For example, connection of a wind farm to a 330kV line could cost about 3X more than connection to a 132kV line. Therefore, even if a remote section of a high voltage 330kV line is found in a windy location, the connection costs will be relatively high—negatively impacting on the viability of the wind energy generation project. In addition, connecting large generation projects in remote areas, without significant nearby electricity loads, results in the generator's revenue being reduced by the electricity losses caused by the transmission of large amounts of electricity over long distances.

There is little doubt that in an ideal world locating wind farms in areas with lower population densities is desirable. However, it is not realistic to expect many wind farm projects to be viable remote for the reasons discussed above. Infigen Energy considers that the current NSW planning assessment process with regards to potential amenity impacts to nearby residences is both balanced and fair.

With regards to environmental impacts, wind farms, by their very nature, minimize potential environmental impacts by typically being located on cleared, or mostly cleared, farm paddocks. As these areas have little, or no, native vegetation, the impact on native vegetation is minimal. In addition, most native animals tend to live in, or travel between, areas of native vegetation. Therefore, locating wind energy facilities on mostly cleared farm land minimizes potential impacts on native fauna. Extensive native flora and fauna surveys are required to be performed as part of the Environmental Impact Assessment process for potential wind farm in NSW in order to confirm the proposed location is unlikely to have any significant detrimental impacts on native flora & fauna.

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3 The impact of rural wind farms on property values

It is very difficult, many would argue impossible, to accurately determine the impact an infrastructure project, such as a wind farm, might have on neighbouring property values. This is because it is not possible to accumulate property sales data for two different parallel scenarios. When a property next to a proposed, or existing, wind farm, is sold no one can accurately determine what the property would have sold for if the wind farm was not present. While we recognise some real estate agents have claimed various property value declines on account of nearby proposed wind farm projects, we are also aware of rural property advertisements where views of a wind farm were promoted as a selling point.

Despite the inherent difficulties, there have been several studies that have been attempted to determine the impact of a wind farm on neighbouring property values. Two of these which we are aware of, are as follows:

- *Land Value Impact of Wind Farm Development – Crookwell New South Wales*, Henderson & Horning Property Consultants, February, 2006
  Available to download at: www.epuron.com.au/ResourceImage.aspx?raid=2101

- *The Effect of Wind Development on Local Property Values* – Renewable Energy Policy Project, May 2003
  Available to download at: www.repp.org/articles/static/1/binaries/**wind**_online_final.pdf

4 Mechanisms for encouraging local ownership and control of wind technology

While we are aware of several proposed "community" wind farm developments in Australia, this is not a market segment that our company currently seeks to address. Therefore, we will not offer any comment on this topic, except to state that the economics of a 1 or 2 wind turbine community project in Australia would be very challenging due to the relatively large overhead such a project entails during the development and construction phases.

However, it is important to note that local ownership of a wind energy facility is by no means the only way a community benefits from a wind energy facility in the district. A local wind energy facility provides:

- Substantial employment of local contractors and tradespeople
- Increased business opportunities for local service providers (construction, hospitality, and other industries)
- Increased income for landowners involved in the project which can be spent on local services and products to improve the productivity of their farms
- Potential increases in tourism benefiting the local hospitality industry
- Increase in Shire Rates payable by the Wind Farm owners

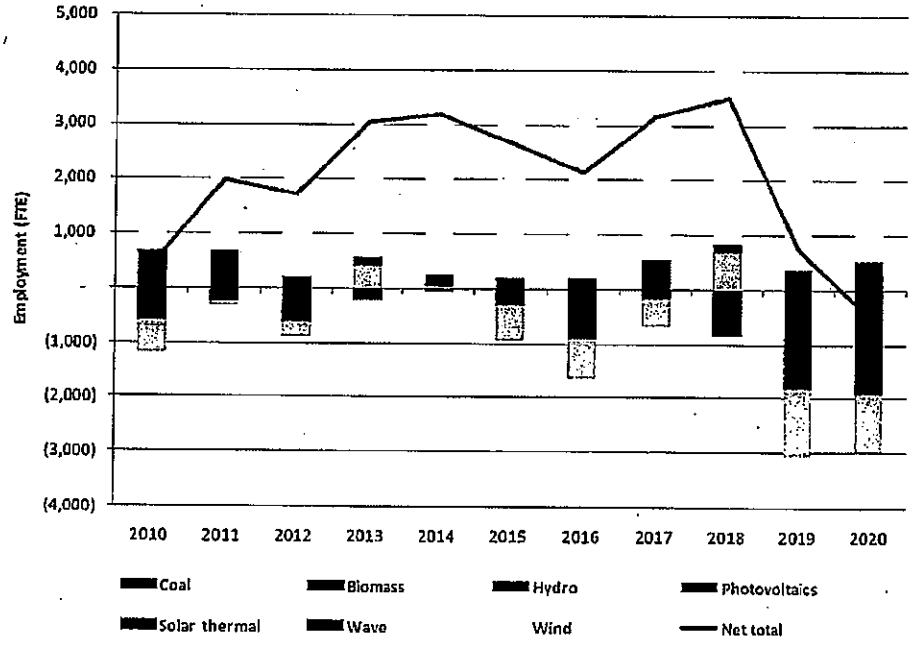
Two recent studies that have sought to quantify the significant employment benefits nationally of an increase in the Commonwealth Renewable Energy Target scheme (recently passed by Parliament). The first study was *Employment and Income Opportunities Provided by Renewable Energy Generation*, McLennan Magasanik Associates (MMA), May 2009[2]. The key points from this study were that the renewable energy industry would result in the following positive benefits to NSW through 2020:

[2] Available to download at : www.climateinstitute.org.au/index.php?option=com_content&view=article&id=436:mma-report-jobs&catid=83:rl&Itemid=26

- An increase of 4000 construction jobs at the peak of construction in NSW
- An increase of over 800 ongoing jobs in NSW supporting and managing the operating renewable energy projects
- A total of $1.5 Billion dollars of investment within NSW

The second study was by Access Economics for the Clean Energy Council entitled, *The net employment impacts of climate change policies*, June 2009[3]. This study primarily looked at the net jobs impact of the RET although several energy efficiency schemes were also studied. A graph from this report, shown below, summarizes the significant employment benefits of the RET scheme by technology. As one can see, wind energy construction jobs are the most significant predicted employment increase.

Chart 3.11 Direct construction employment associated with the RET, by technology



Source: Access Economics research

Therefore, it is clear that significant local, and statewide, economic benefits are realized by the increasing uptake of wind energy generation.

[3] Avaliable for download at: http://www.cleanenergycouncil.org.au/info/index.php

5 The potential role of energy generated by rural wind farms in relation to the Australian Government's proposed Renewable Energy Target

Historically, Renewable Energy Certificates (which reflect the total volume of renewable energy produced under the RET) surrendered to date have been fairly evenly split between wind energy, biomass, hydro, and solar hot water heaters. Wind energy had a slight lead over the other three technologies. Recent analysis has also indicated that PV installations are likely to have a short term increase in installations due to the PV multiplier provisions of the recently passed expanded RET legislation.

There have been quite a number of studies and forecasts attempting to estimate the installed capacity for each renewable technology to be built under the RET scheme going forward. Now that the details of the RET scheme have been finalized, there will undoubtedly be more forecast studies of this kind.

For the purposes of this Inquiry, we feel it is probably sufficient to simply state that the great majority of the existing studies and forecasts indicate that wind energy is likely to be the leading renewable technology for the short – medium term within the RET scheme. This is primarily because wind energy enjoys a substantial cost advantage over other existing RE technologies.

6 Conclusion

Infigen Energy welcomes the opportunity to contribute to this important Legislative Council Inquiry. Infigen Energy has built the largest wind farm in NSW, the 140MW Capital Wind Farm, and looks forward to constructin, and operating, additional wind farms in NSW, thus enabling:

- Further increases in business opportunities for NSW rural areas
- Substantial increases in rural jobs during construction, and operation, of the wind farms
- Significant reduction in greenhouse gas emissions by the NSW electricity generation sector