Submission
No 65

INQUIRY INTO RURAL WIND FARMS

Name: Mr Paul Miskelly

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Submission to

The NSW Parliament, Legislative Council Inquiry into
The social, environmental and economic costs and benefits
of Industrial Wind Turbines

Paul Miskelly BE MEngSc
Personal Submission

The Director
General Purpose Standing Committee No 5
Parliament House
Macquarie Street
SYDNEY NSW 2000.

Dear Madam/Sir,
I respectfully request that I might:

1. Lodge this as a late submission (I had been working towards cob 21 August 2009 as the closing deadline.)
2. Add further material to this submission during the interim period leading to the committee's consideration of the submissions.
3. Speak to this submission at one of the Hearings of the Working Party.

Due to work commitments I have been unable to complete the preparation of graphical material which is pertinent to this submission. Preparation of this material is on a spare time, voluntary basis as I do have to earn a living. In addition I expect that new, pertinent information will be available shortly.

Yours sincerely
Paul Miskelly BE MEngSc (Electrical Engineering)

Terms of Reference for the Inquiry

The following statement regarding the Inquiry has been extracted from a recent Press Release attributed to Katrina Hodgkinson MP, Member for Burrinjuck. It can be found at:
http://nsw.nationals.org.au/news/wind-farm-inquiry-takes-off-hodgkinson.aspx

'That General Purpose Standing Committee No 5 inquire into and report on the social, environmental and economic costs and benefits of wind farms, and in particular;

1) The role of utility-scale wind generation in:
a - reducing greenhouse gas emissions generated by electricity production;
b - producing off peak and base load power.
2) Locating wind farms to optimise wind resource use and to minimise residential and environmental impacts.
3) The impact of wind farms on property values.
4) Mechanisms for encouraging local ownership and control of wind technology.
5) The potential for energy to be generated by rural wind farms under the Federal Government's renewable energy target.
6) Any other relevant matter.

"Unfortunately these Terms of Reference were the subject of quite a bit of negotiation and they have been watered down somewhat to remove references to planning," Katrina said.

"GSPC 5 intends to hold public hearings and site visits from 28 September to 24 October," Katrina said.

"Hearings will be held in Broken Hill, the Southern Tablelands and Sydney, which will allow members of the community to put their concerns and recommendations directly to Committee members.

"I have provided the Committee members with information that will assist them in contacting stakeholders so they can invite them to put forward submissions," Katrina said.

"Many people believe that there is a significant amount of inaccurate information being circulated about the effects of Industrial Wind Turbines on local communities and I believe that this inquiry, which I have asked for, will be the first to bring together all the information to be examined in a critical manner."

Katrina Hodgkinson said that written submissions can be made to the inquiry and they should arrive before 21 August 2009. Submissions can be faxed to (02) 9230 3416 or emailed to gpscno5@parliament.nsw.gov.au or posted to:

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"This is an excellent opportunity for the local community to contribute towards clearing the air and holding a worthwhile debate about the usefulness of Industrial Wind Turbines and I encourage everyone with an interest to contribute to the inquiry," Katrina Hodgkinson said.'

Electricity Grid Operational Characteristics

It may be helpful to summarise some of the salient features of the workings of the grid. There are many sources for such material. The Northwest Power and Conservation Council (2003) report is one example. From Parkinson in Einhorn & Saddiqi (1990):
"Generation must precisely equal load, literally on a second-by-second basis, despite unpredictable variations in load and generation"
The grid controller continuously calls in or shuts back generators from the mix available as required to precisely match the load or consumer demand.
During the course of each (24-hour) day, the consumer demand follows a very predictable pattern, a pattern that can be predicted with considerable accuracy. This accuracy is based on many years of operation, which experience is "written-into", the control strategies of any particular grid region.
In a market-operated grid, the grid controller operates from a list or "stack" of day-ahead-bidded generators, calling them in as demand increases on a least-cost-first basis, and shutting them back on a most-cost-first basis.

It is in the addressing of the second-by-second control requirement outlined above that unpredictable, intermittent sources, such as wind generation, have the potential to fail. Because the wind is intermittent and unpredictable, wind generation is not able to be included in the day-ahead bid stack. Because it is so unpredictable, it must be regarded as an unscheduled negative load by the grid controller. This is the case as I understand it at present in the operational control of the eastern Australian grid. To deal with wind's relatively rapid, unpredictable swings, the controller has to call upon fast-acting, and hence very expensive to operate, generation plant.
Furthermore, this plant has to be in so-called "hot standby" mode, ready to go into operation at a moment's notice.

This fast-acting plant is available to be called at present as it has been installed for peak-load-following duty and the windfarm installed capacity is presently modest. If the windfarm fleet were to be expanded, this type of plant will have to be expanded very significantly.
The windfarm operational data reproduced both below and in Miskelly and Quirk (2009) show, conclusively, that fast-acting plant, to the same installed capacity as the total windfarm capacity, will be required to be installed.

It is often stated by wind's proponents that the unpredictability and intermittency of the wind may be fully addressed by adopting a strategy to spread wind generation widely over a region. Their argument is that "while the wind might not be blowing in a given location, it will be blowing somewhere else". This, they argue, smooths the intermittency.
Recent work by myself and a colleague, (Miskelly and Clark, 2008, refused publication), and also by other colleagues (Miskelly and Quirk, 2009), show conclusively that in the eastern Australian situation, this geographic dispersion hypothesis fails, and fails spectacularly.

Another myth advanced by wind proponents is apparent in the cry that "the problem will be solved with improved methods of wind forecasting". The continued statement of this mantra has been very successful in the Australian context: the Commonwealth government has

allocated very significant amounts of money to research into wind forecasting. A little thought shows the futility of such an exercise. It may indeed be possible to forecast the windspeed across a region in a general way up to a day ahead.
Such information is undoubtably useful in a broader weather forecasting context. However the combination of the locally stochastic (chaotic) wind variations, coupled with the second-by-second control requirements of the grid, make such predictions futile. These control requirements demand that a second-by-second windspeed forecast be prepared. I suggest that this is a herculean, if not impossible, task. Added to these uncertainties, the cubic nature of the wind generator output characteristic curve simply amplifies the effects of the inevitable errors in the predictions.
Sharman (2005b) shows that a forecast error of just 1.5 metres/sec in either direction (plus or minus16%) at a windspeed corresponding to the the middle of the winfarm operating range (9 metres/sec) results in an output error of either 25% below or 69% above the calculated power output. This level of uncertainty is simply intolerable to the grid operator as a day-ahead forecast of wind power availability.
Unlike other forms of generation, there are no penalties on windfarm operators for failure to supply a promised level of power. There are also no penalties at present for oversupply. The full responsibility for management of these unexpected excursions is placed on the grid operator.

There are a number of important issues arising out of wind's intermittency and the failure to properly address it. Among these are:

- As shown by Oswald et al (2008), because unpredictable and intermittent wind generation must be constantly shadowed by fast-acting, controllable gas-turbine plant, the claimed greenhouse-gas (GHG) offsets presently claimed in the Australian context by wind's proponents are grossly exaggerated.

- The introduction of any significant level of wind power capacity raises the very serious issue of its likely impact on grid operation stability. Grid destabilisation, if uncorrected, leads to widespread, unscheduled, ongoing, blackouts. The necessary mitigation carries with it very significant, very large, costs, costs which are at present not borne by wind developers.

- Grid-connected windfarms, without provision for at-site storage of electricity, can never be used to supply any baseload power requirement.

Grid stability

See Section 19 of Shaw (2005) for a UK perspective.
As Shaw states, there is argument among engineers about what percentage of total installed capacity might be permitted to be supplied by intermittent, unpredictable sources - such as wind - beyond which level system stability is unnecessarily compromised. As Shaw (*ibid.*) says:
" Just how much wind power can be installed on the national grid without risking destabilisation and blackouts is still open to question. A debate in the House of Lords

(Ref 14) concluded that expert opinions agreed that up to 10 per cent of wind generated MWh could be accommodated, but that there is some lack of agreement about the range 10 to 20 per cent and above."

The oft-quoted "fact" that Denmark has a level of 20 per cent or more of its installed capacity supplied by windfarms has been comprehensively debunked. Sharman (2005a) showed that, unlike the island situation of the UK or Australia, Denmark has transmission interties of massive capacity into the wider European grid. These are used, and often, by the Danish grid controllers, to effectively dump the impacts of wind's intermittency into the much larger wider European grid.

At the levels of penetration that might be tolerable to ensure system stability, windfarm output makes no useful contribution to electricity generation as it must be continuously compensated for by other, controllable, generators. Such generation can be regarded as merely the injection of electrical noise into the grid, whose purpose is merely the supplying of a lucrative subsidy income to the owners of the wind generators.

Contribution of wind turbines to the maintenance of grid operation

As is demonstrated by an examination of the Cullerin data, where the output of a given windfarm is zero, it is drawing a significant amount of power from the grid to operate its internal control systems. This is power produced by GHG-emitting generators which could be more efficiently utilised in addressing legitimate consumer load requirements.
Wind turbines are also of little use in assisting in fault recovery - they disconnect very early during a fault sequence. In the event of a widespread blackout, (a blackout which may indeed result from the instability introduced by this form of generation), wind turbines cannot be used to assist in the required "black start" - the sequence of generator startup that must be followed to enable grid recovery.

Wind turbines are truly parasites on the national grid.

Consideration of these aspects against the Terms of Reference of the Inquiry

Returning to the Terms of Reference of the Inquiry, I trust that these considerations demonstrate clearly that:

- Because windfarms are an intermittent source of generation, they can never address baseload demand,
- Because of the unpredictability of their generation, they cannot address off-peak demand.
- Because of the need for constant shadowing by controllable, fast-acting, fossil-fired generation plant, and the lack of this consideration to date, the supposed greenhouse gas (GHG) abatement benefits attributed to wind generation has been grossly exaggerated by wind energy proponents.

Other relevant matters

The impact of wind farms on property values

My wife and I own a small holding (32 acres) on which we have developed a small vineyard. The vineyard has been in production since about 1996. The holding is sited immediately adjacent to two of the properties associated with the Taralga windfarm. When the project proceeds, there will be a number of wind turbines sited within relatively close proximity to the vineyard. We had intended to build a house on the property once the vineyard had been developed to better manage the vineyard operations. The announcement of the proposed windfarm development ended that business strategy, as we are well aware of the impact of the continual noise nuisance and wake turbulence that the windfarm will create. As more fully outlined in the Taralga Landscape Guardians submission, it took a long time, and considerable time in the Land & Environment Court, before the Court decided that our property be placed on the windfarm properties acquisition list.
In the interim, we have had the property up for sale. We are of an age where it is becoming increasingly difficult for us to manage the workload required in managing and running a vineyard and a small winery. We have had it in the hands of a reputable real estate agent, who specialises in rural properties. It has been on the market for nearly 3 years. There has been some interest, but we have found that this interest from potential buyers quickly evaporates once those parties learn of the proposed windfarm development.
It is very clear to us that windfarms impact on property values of neighbouring, unassociated properties. The impact is particularly severe on neighbouring smaller holdings such as ours.

While it is correct that the property is on the acquisition list, the Court ruling is that the property does not have to be acquired by the wind developer until after construction of the windfarm commences. In the meantime, with no sale of the asset, and no prospect of sale of the asset, we are at a very significant financial disadvantage.

In addition, having to go to Court, where we are up against both the NSW Minister for Planning and a very well resourced developer has been a considerable financial strain. It has also caused a great deal of personal stress to both ourselves and our family.

That ordinary people, whose "crime" is that their properties, in many cases their homes, are next door to a proposed windfarm development, should be subject to such a denial of basic rights by the NSW government, is absolutely outrageous. Whether windfarms deliver GHG emissions abatements or not, people should be properly entitled to compensation for loss of property asset and amenity. At present, the NSW government is in complete denial that such common law rights are to be properly addressed.

As this submission attempts to show, windfarms deliver no measurable GHG emissions abatement benefits at all. This outcome makes it even more important that citizens' common law rights be properly taken into account by the NSW government.

References

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