

## INQUIRY INTO RURAL WIND FARMS

**Organisation:** Taralga Landscape Guardians  
**Name:** Mr Paul Miskelly  
**Date received:** 21/08/2009

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Partially Confidential

**Submission to**

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

**The Taralga Landscape Guardians**

Paul Miskelly  
Taralga Landscape Guardians

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 consideration period as new information comes to hand.
3. Speak to this submission at one of the Hearings of the Working Party.

Yours sincerely  
Paul Miskelly BE MEngSc (Electrical Engineering)  
For,  
Taralga Landscape Guardians

## **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](mailto:gpscno5@parliament.nsw.gov.au) or posted to:

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

"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.'

## **Preface**

The Taralga Landscape Guardians Inc. (TLG) is a community group formed in late 2004 by members of the community of the Taralga village and environs in response to the announcement of a proposal, by RES Southern Cross Pty Ltd, to build a 62-turbine windfarm to the immediate east of the village of Taralga, NSW.

As a result of the approval given for the construction of the windfarm by the then Minister for Planning, Mr Frank Sartor, the Guardians commenced a Class 1 Appeal in the Land & Environment Court of NSW (L&EC Proc 10196 of 2006). The outcome of the Proceedings was that the Appeal was upheld, but the windfarm development was approved, with an increased number of Conditions of Consent. Importantly, two adjoining, non-associated rural properties were placed on a schedule of acquisitions in the decision.

In the meantime, the proponent, RES Southern Cross Pty Ltd decided, for reasons unknown, that it wished to utilise taller wind turbines, with larger diameter rotors. This change in dimensions fell outside the maximum dimensions permitted in the original Consent. Accordingly, the developer lodged a Modification Application with the NSW Department of Planning. The decision of the Minister for Planning was to advise the proponent to lodge the matter with the Land & Environment Court. The TLG applied to the Court to be permitted to be a Respondent in the matter. As a result, the TLG found itself in the L&E Court (L&EC Proc 11216 of 2007) for a second time. The outcome of this matter, and following a subsequent Appeal by the proponent regarding certain aspects of the Commissioners' decision in the matter, was that the Modification was approved, albeit again with additional Conditions of Consent being applied. Importantly, two further adjoining properties were placed on the schedule of acquisition.

More recently, after somewhat prolonged deliberations by Country Energy, and after what the TLG believes is a somewhat rudimentary and cursory Environmental Impact Assessment, a transmission line route has been approved for a transmission line that is to take the generated electricity to the NSW electricity grid. This transmission line commences near the southern end of the windfarm and terminates at a substation at Canyonleigh near Marulan, a distance of 32 km through rugged and often pristine country. This country, comprising as it does portions of Tablelands Basalt Forest Endangered Ecological Community, and part of the Sydney Catchment Authority's jurisdiction forming part of the Lake Burraborang catchment, is ecologically very sensitive.

The Taralga Landscape Guardians believe that, with this Court experience behind them, they are particularly well informed in the issues surrounding the use and impacts of industrial wind turbines. In this submission we will comment on pertinent aspects of the entire assessment process where applicable against the Terms of Reference of the Inquiry. We would wish to address the Panel personally in regard to these matters. Matters of which we have five years of accumulated knowledge, due to our intense experience in Planning and Legal Appeals.

We wish to thank the NSW Legislative Council for the opportunity to contribute to this Inquiry.

Paul Miskelly  
President,  
Taralga Landscape Guardians

## **Preamble**

The Terms of Reference for this Inquiry make it potentially wide-ranging. We will attempt to present our case against these Terms of Reference. Headings will broadly follow the Terms of Reference. The document concludes with a set of recommendations.

## **Introduction**

Because electrical energy can be efficiently extracted from the wind using a simple propeller coupled to a generator, then to seek to extract more energy, a larger propeller is used. Having solved the problem of constructing large propellers, and finding that megawatt quantities of electrical energy are available, it would seem plausible that it would be a relatively straightforward matter to inject that quantity directly into the national electricity grid. While the amount generated can be expected to vary with the windspeed, nevertheless many people readily accept the proposition as plausible that:

- (a) the wind varies relatively smoothly and predictably and,
- (b) while the wind may vary at any one location, any such variation is compensated for by by placing windfarms at dispersed locations, and that the result will be that such variations are smoothed out.

Further, perhaps because the resulting large propeller seems from a distance to be rotating slowly, it would seem plausible that its operation would be 1. quiet, 2. that it does not generate any damaging turbulence, and 3. that it would not constitute a threat to avian wildlife.

To the uninformed observer at a distance, it would also seem plausible - if that observer has not been present during the construction process and has not even a rudimentary understanding of the requirements of civil engineering works - that there is minimal environmental impact in the placement and construction of each wind turbine.

In this submission, the veracity or otherwise of each of these, at first glance, seemingly plausible assumptions is critically assessed, using hard data. This assessment is conducted in the discussion against each Term of Reference in turn.

## **GHG emissions reduction, contribution to off-peak and baseload demand**

The first term of reference is:

The role of utility-scale wind generation in:

- a - reducing greenhouse gas emissions (GHG) generated by electricity production;
- b - producing off peak and base load power.

### **a- GHG emission reduction potential**

To more fully understand the potential for integration of utility-scale wind generation into the national grid, it is useful to summarise the way the national grid must operate.

The important point to recognise is that to remain in operation, the grid must be controlled on a second-by-second basis. This aspect of grid operation is covered in many electrical engineering texts, eg in Parkinson T (1990) and quite usefully in Shaw (2005).



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 must be regarded as an unscheduled negative load by the grid controller. To deal with it, the controller has to call upon fast-acting, and hence very expensive to operate, peak-load-following or shadowing? generation plant. Furthermore, this plant has to be in so-called "hot standby" mode, ready to go into operation at a moment's notice. Such requirements are met, almost invariably, by the provision of fast-acting gas turbine plant, operating necessarily in a very inefficient mode.

The continuous operation of such plant, as described by Oswald et al (2008), unnecessarily consumes fuel, generating GHG emissions. These emissions are presently completely unaccounted for in the exaggerated claims made by windfarm developers.

### **b-Production of off-peak and base load power**

The author of the Terms of Reference (ToF) has correctly identified that these power requirements, although often occurring at the same time during a 24-hour period (usually at night), are indeed quite separate.

The baseload power demand is that resulting from the requirements of processes that operate continuously. The demand from a given requirement may or may not be constant. Examples of such requirements are:

Street and other security lighting (constant demand during night time hours),  
Hospital and other 24-hour emergency centre power,  
Bulk refrigeration stores,  
Industrial processes such as Alumina electrolytic processing, desalination plants.

As an in-depth example, consideration is given here to the principle of operation, and the resulting type of electricity requirement, of a desalination plant.

### **Baseload example: Kurnell Desalination Plant**

A desalination plant consists of thousands of elements, each of which is called a reverse osmosis unit. Each element contains a semi-permeable membrane, one side of which is subject to the inlet flow of salt water maintained at very high pressure. The very high pressure is provided continuously by high-pressure pumps driven by electricity from the grid. Pure water emerges from the other side of this semi-permeable membrane unit. The electricity powering the high-pressure pumps is the main energy consumption requirement of the desalination plant.

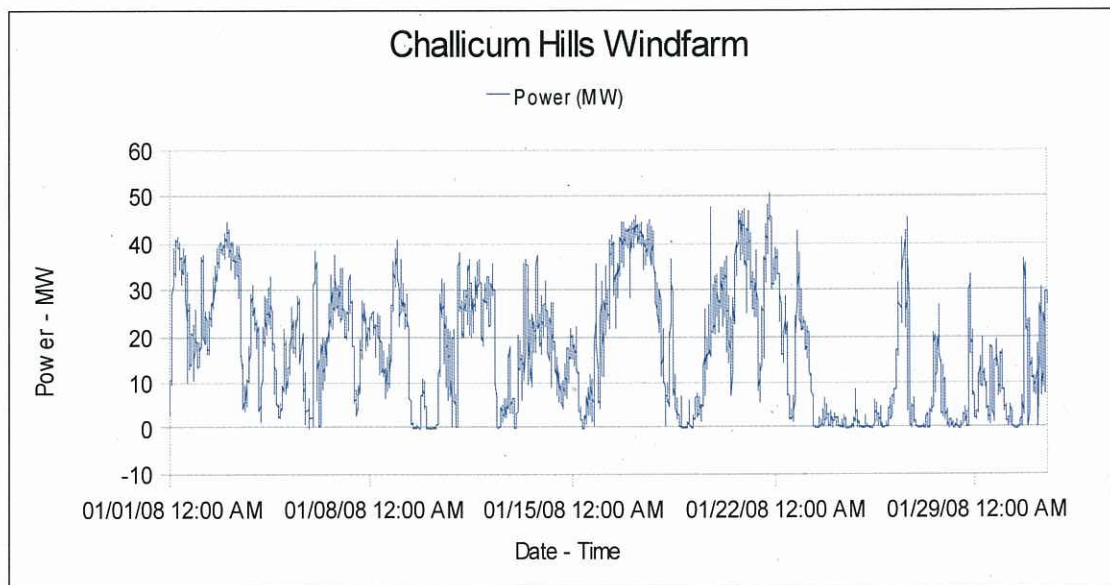
It is absolutely vital to both the continued operation of the desalination plant, and to the obtaining of a reasonable service life from the very expensive and absolutely critical reverse osmosis units, that the inlet pressure is held as near to absolutely constant as possible.

The only way to maintain that constant pressure is to ensure that the desalination plant has a steady, secure, rock-solid source of electricity supply.

This then is a classic example of a baseload generation requirement.

It does seem difficult to reconcile this requirement with the fact that wind farms produce a highly erratic, intermittent, and totally unpredictable electricity output. To illustrate examine the graph below. It shows a typical output from a typical large windfarm in Australia. This graph shows the output for the month of January 2008 from the Challicum Hills windfarm, located near Ararat in Victoria.

Two things are immediately obvious. The intermittency of the electrical output and the long periods where there is little or no electrical output..



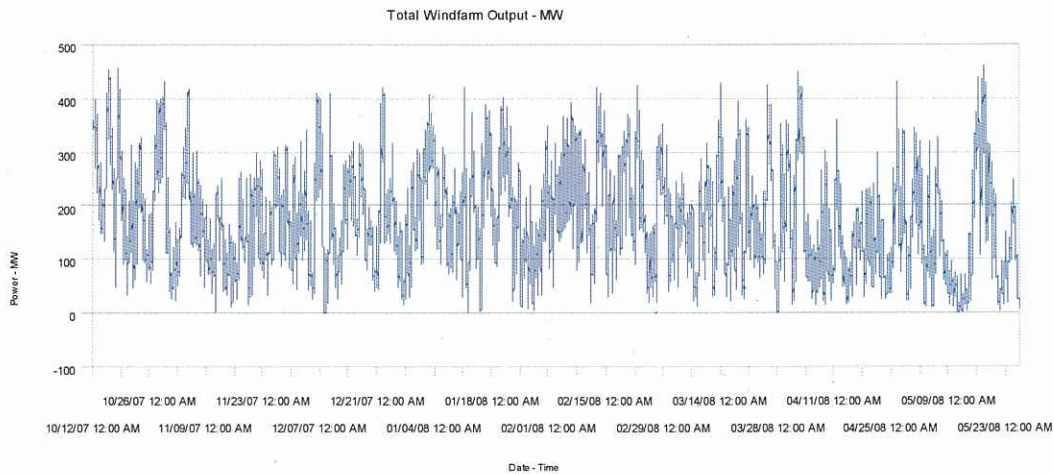
All days and all months exhibit much the same pattern. Incidentally, the Challicum Hills windfarm achieved an average output of 28% of its installed capacity for the period October 2007 - May 2008. This is rather less than the Victorian government's guidelines claim of a generic 35% for windfarms in that State.

It is claimed repeatedly by the supporters of wind power that geographic dispersion, (that is the use of several different windfarms over a wider area to supply requirements) smoothes the output, thereby providing a steady supply. We understand that the NSW government supports the construction of a windfarm near Broken Hill in the hope that it will balance the output of the windfarms sited in the Southern Tablelands, such as the Capital, Crookwell II and Taralga windfarms.

To provide some understanding of the futility of such an approach, the following chart is revealing. This shows the aggregate output of the larger windfarms across SE Australia.

The windfarms summed for this graph are: Woolnorth, Yambuk, Challicum Hills, Lake Bonney, Canundra, Starfish Hill, Wattle Point, Mount Millar and Cathedral Rocks. These windfarms are situated up to a distance of 1000km from each other.

The output of any and each of these windfarms is readily available. We have obtained the daily output of each of these windfarms from 12 October 2007 to the present. All of this information is in the public domain.



The graph shows quite clearly that, for windfarms in SE Australia, separated by distances of up to 1000 km, there is no appreciable smoothing of the output resulting from geographic dispersion.

The reality then is, that in order to obtain the absolutely essential rock-solid electricity supply for the desalination plant, this windfarm output will have to be backed up for over 90% of its installed capacity by reliable rock-steady fossil fuel-fired plant.

Given this, it is unfortunate that Mr Rees, as the then Minister for Water and Energy, misinformed the public and the Parliament when using a set of words which included the phrases: "that the desalination plant would be powered 100% by renewable energy", and, "the output of approximately 75 wind turbines"?

The data tells us a different story..

Incidentally, there is more that has to be addressed here by the NSW Government than mere clarification of its release of misinformation. . Producing fresh water from wind in this way is a triple hit on the environment. This comes about from:

- (a) the local environmental impact of the desalination plant itself, and its concentrated brine effluent,
- (b) the wholesale destruction of the rural environment by the hundreds of windmills, and the many kilometres of required roads and tracks for the access of very large and heavy construction vehicles to build the wind turbines (the devastation to the property "Currandooley" adjacent to the iconic Lake George on which the Capital windfarm is constructed is instructive),

(c) the extra CO2 emissions from the necessary coal-fired power stations required for the real electricity supply.

### **Production of off-peak power**

That this requirement similarly cannot be addressed by wind power is clear from the presentation of the data above. Windfarm output is totally unpredictable, it is totally unreliable, and it shows huge swings in output levels.

Off-peak power requirements, hot-water heating, or electric-car battery charging, as examples, must be performed securely and reliably during the night time (off-peak) hours.

At present there is no form of local electricity storage therefore a grid-connected windfarm simply cannot supply either of these requirements for baseload or off-peak demands.

What is clear from this discussion of the real data is that, should any windfarm proponent wish to connect to the national grid, then that windfarm proponent should be required to provide, on site, on its own side of the connection terminals, the necessary generation infrastructure to compensate for the windfarm's intermittent, variable, and otherwise woeful performance. .

What is also clear is that any notion of "grand-fathering" should be discarded. ALL windfarms connecting or already connected to the national grid should be required forthwith to provide this compensating generation. It should be provided at source, that is, at the windfarm site and on the windfarm side of the connection terminals to the grid. At present, the only feasible type of compensatory generation is an open-cycle gas turbine (OCGT) plant. As the output of the windfarm is very often much less than its rated capacity, and often zero, the required installed capacity would be the same as that of the windfarm.

### **The Impact of Windfarms on Property Values**

The placement of huge turbines on neighbouring properties has a profound visual impact on adjacent properties, and hence on their assessable value compared to pre-windfarm values. This factor was agreed by the L&E Court (L&EC Proc 10196 of 2006). This is not the only factor however.

### **Wind Turbine Noise**

It is the noise impact that effectively completely destroys any residential value that a property might have. Evidence on noise production was lead by the TLG during these first Proceedings, but we were obstructed from bringing meteorological evidence at that time to alert the Court to the effect of temperature inversion sound enhancement resulting from the night time meteorology occurring in high-altitude, continental Australia such as frequently occurs at Taralga. During the Modification Application (Proc 11216 of 2007), we were able to present expert testimony from a meteorologist skilled in this branch of

meteorology, called "near-surface meteorology". This testimony was accepted unchallenged before the Court. Further, the expert testified that the measuring equipment and procedures used by the Applicant to conduct both wind monitoring and background noise testing are inadequate for the proper assessment of wind turbine noise generation, propagation and impact on residents on nearby unassociated properties.

In spite of this wealth of evidence on both key aspects of noise impact on residents, from the world's best experts in their respective fields, staff from both the Depts of Planning and Environment and Climate Change remain resolutely opposed to both changing their noise guidelines and enforcing proper noise testing by wind developers.

That the noise issue is a potential time bomb for the NSW government is graphically illustrated by the recent "A Current Affair" segment on the topic. The link below tells the noise story:

[http://video.ninemsn.com.au/video.aspx?mkt=en-au&brand=ninemsn&tab=m164&mediaid=224784&from=39&vid=06F65387-45FD-47C5-B17E-A99C5BDF3C4A&playlist=videoByTag:mk:en-AU:vs:0:tag:aunews\\_auaca:ns:MSNVideo\\_Top\\_Cat:ps:10:sd:-1:ind:1:ff:8A#:06f65387-45fd-47c5-b17e-a99c5bdf3c4a](http://video.ninemsn.com.au/video.aspx?mkt=en-au&brand=ninemsn&tab=m164&mediaid=224784&from=39&vid=06F65387-45FD-47C5-B17E-A99C5BDF3C4A&playlist=videoByTag:mk:en-AU:vs:0:tag:aunews_auaca:ns:MSNVideo_Top_Cat:ps:10:sd:-1:ind:1:ff:8A#:06f65387-45fd-47c5-b17e-a99c5bdf3c4a)

What is occurring at this particular windfarm - at Waubra near Ballarat in Victoria - is that the noise levels are vastly exceeding the developer's predicted noise levels. This comes as no surprise to the TLG as the proper assessment of the likely noise impacts, according to the methodology proposed by the TLG's expert witnesses, has been completely ignored in Victoria.

The fact that, in addition, the residents are experiencing totally unacceptable levels of subsonic infrasound is extremely distressing. The production and propagation of the latter noise is not well understood but its biological impacts are unequivocal. The fact that residents are being forced to leave their homes as a result comes as no surprise to members of the TLG.

It is certain that the same distressing outcome will occur at Taralga when that windfarm proceeds. Meanwhile, the respective Departments remain in complete denial that there is a noise problem.

As a matter of urgency, the DECC should be required to reinstate the NSW Industrial Noise Policy as the proper noise instrument for the assessment and control of noise from windfarms.

### **Mechanisms for encouraging local ownership and control of wind technology**

It is the view of the TLG that until the assessing authorities are thoroughly cognisant of the impacts of wind generation, and serious about the minimisation of those impacts, all encouragement of wind technology should cease forthwith.

## **The potential for energy to be generated by rural wind farms under the Federal Government's renewable energy target**

The studies by Miskelly and Clark (2008), Miskelly and Quirk (2009) show conclusively that the energy potential of rural, as indeed any other, grid-connected windfarms, is trivial if not non-existent. All renewable energy targets should be scrapped and all subsidies for this form of energy production should be abolished immediately. These subsidies are allowing for continued development of ineffectual and inefficient power generation that is masking the urgent need for real solutions.

### **Any other relevant matter**

There seems to have been a complete disappearance of the enforcing of proper environmental assessment by the NSW Dept of Planning in relation to windfarm promotion. Because it is "clean, green" wind energy, the regulatory body seemingly morphs into a proponent of the technology. Such matters as the proper assessment of likely impacts on individual threatened species, and worse, entire declared endangered ecological communities, seem somehow to be no longer of any concern to the DoP and the DECC.

The removal of the protections afforded by common law rights from those affected by windfarm developments. Even if windfarms have some environmental benefits, the denial of the inalienable right to compensation for affected non-associated residents, as has happened in NSW, is an outrage.

### **Turbine spacing violations by the developer of the Taralga windfarm**

Wind turbine manufacturers specify minimum spacings between wind turbines in a multi-turbine windfarm. It would seem that these spacings are specified to minimise the impact of the rotor-produced turbulent wake from a given wind turbine on other turbines likely to be embedded downwind in the wake. Where a turbine is in the wake of an upwind turbine, it is likely to both produce significantly less power output and generate more noise, than when sited in a "clean", that is, a non-turbulent incoming airstream. The TLG was recently made aware of the content of the Vestas specification document for one of the turbine models proposed in the Modification Application for the taralga windfarm. This specification document was obtained by a community group in the UK dealing with a matter in the UK courts involving RES UK P/L, the partner in the Taralga windfarm proposal.

### **Vestas 2 MW Wind Turbine General Specification**

The DoP is aware of the document "NSW Wind Energy Handbook 2002" published by the then Sustainable Energy Development Authority (SEDA). In that document is mentioned the "5r-8r rule" relating to the desired minimum spacing of individual wind turbines one from the other. Briefly, this rule specifies that wind turbines shall be spaced 5 rotor diameters apart within rows and 8 rotor diameters apart between rows. The rows

would normally be sited to be normal, that is, at 90 degrees to the prevailing wind. The chosen spacing of the wind turbines in the Taralga proposal is much, much closer than the SEDA Guidelines recommend, the spacing between some being as close as one rotor diameter. During cross-examination for the recent Modification Application matter before the Land & Environment Court, a member of the Applicant, a **[Omitted by resolution of the Committee]** stated, when this apparent anomaly was brought to his attention, that the Guidelines "are, after all, merely Guidelines". It would appear that, what **[omitted by resolution of the Committee]** Members of the Department's legal branch, we have no doubt, will clearly remember this particular exchange.

Attached is a copy of the specifications for two of the proposed wind turbines from the Vestas Company, the manufacturer of these wind turbines. This particular model turbine is indeed one of those under consideration for the recently-modified proposal, so these specifications are indeed both relevant and pertinent. In particular we draw attention to Section 1.4 of that document. Here, Vestas specify a minimum spacing between turbines of at least four (4) rotor diameters. This spacing is given as a definitive, ie "must". The question that immediately arises is whether, in the case of any accident, any insurer would be prepared to indemnify any owner who erected turbines at a closer spacing than this minimum spacing so clearly specified by the manufacturer.

**[Omitted by resolution of the Committee]**

Furthermore, a redesign of the proposed Taralga windfarm which addresses the minimum spacing as required by the manufacturer has very serious implications for the layout as this latter is tightly governed by the Conditions of Consent.

Could we suggest that the occurrence of this matter is a sufficient "trigger" to require the Applicant to revisit the EIS process anew?

**[Omitted by resolution of the Committee]**

### **Discussion of Behaviours by the Windfarm Proponent**

We believe that it is important that the TLG report on specific matters that have occurred as a result of our members' dealings with the Taralga windfarm proponent. We are aware of the occurrence of similar instances of the same types at other proposed windfarm sites.  
**[Omitted by resolution of the Committee]**

The windfarm proponent was/is variously represented by the following companies:

Taralga Windfarm P/L  
RES Southern Cross P/L  
RES (UK) Ltd

### **Towards the owners of the property "Rosvale"**

This elderly couple are lifelong farmers in the Taralga district. The property "Rosvale" has been in the husband's family for several generations. An outcome of the Taralga Appeal - the first Court case - was that the Chief Judge determined that the "Rosvale" property is so badly impacted by the proposed windfarm that he ordered that it is to be purchased by the developer once construction has commenced, at pre-windfarm marked valuation, should the owners wish so to do.

That decision remains unchanged as a result of the Modification Application.

**[Omitted by resolution of the Committee]**



### **Behaviour of the noise expert called by RES Southern Cross P/L**

During the period that the Modification Application was being heard by the L&E Court, the developer requested a representative of Sonus P/L to conduct background testing at the "Rosvale" property. As a condition of entry to the property, the owners had the representative of Sonus P/L sign an agreement that he would, within 2 weeks of completion of the noise testing, provide a full set of results and a copy of his noise report. **[Omitted by resolution of the Committee]**

### **Recommendations**

We respectfully request that the Inquiry address the following issues as a matter of urgency.

1. The demonstrated complete absence of skilled technical expertise within the Dept of Planning and the complete unwillingness by DoP staff to call upon relevant, independent advice where necessary to deal with the undoubted complexity of the issues raised by such as windfarm projects.
2. The manifest and abject failure by both the NSW Dept of Planning and the NSW Dept of Environment and Climate Change to address their responsibilities to the community under their required Duty of Care in the conducting of wind energy project assessments.
3. The manifest failure of relevant staff of both Country Energy and TransGrid to conduct a full and thorough Review of Environmental Effects in determining the most environmentally acceptable grid connection solution for the Taralga windfarm.
4. The clear and blatant cronyism exhibited by Dept of Planning staff towards the wind industry. This was most evident during the Court Hearings for the matters mentioned above. This symbiotic relationship, is not only completely unprofessional, but was sickening to observe.
5. The totally unacceptable, aggressive behaviours by the wind industry towards rural communities and individuals.

## References

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