General Purpose Standing Committee No. 5

Rural wind farms

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Terms of reference

That General Purpose Standing Committee No 5 inquire into and report on the social, environmental and economic costs and benefits of rural 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 rural wind farms to optimise wind resource use and minimise residential and environmental impacts.
3. The impact of rural wind farms on property values.
4. Mechanisms for encouraging local ownership and control of wind technology.
5. The potential role of energy generated by rural wind farms in relation to the Australian Government's proposed Renewable Energy Target.
1. Any other relevant matter.[1]

These terms of reference were self-referred by the Committee on 24 June 2009.

[1] LC *Minutes* No. 110, 1 September 2009, Item 34, p 1303

Committee membership

Mr Ian Cohen MLC	The Greens	*Chair*
The Hon Rick Colless MLC	The Nationals	*Deputy Chair*
The Hon Robert Brown MLC	The Shooters Party	
The Hon Tony Catanzariti MLC	Australian Labor Party	
The Hon Charlie Lynn MLC	Liberal Party	
The Hon Lynda Voltz MLC	Australian Labor Party	
The Hon Helen Westwood MLC	Australian Labor Party	

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Chair's foreword

The Inquiry into rural wind farms has provided an opportunity for the Committee, as well as communities, industry and government agencies, to consider the development of rural wind farms across NSW. It has been challenging and rewarding to investigate the many issues surrounding the development of wind farms in NSW.

As a readily available and commercially deployable energy generation technology wind farms have an important role in Australia's 2020 Renewable Energy Target. Wind farms are a central component in Australia's developing clean energy infrastructure and portfolio, essential to addressing the challenges of anthropogenic climate change and energy security. However, during the investigation of the Committee, significant community angst and concern about the establishment, project design and monitoring of rural wind farms became apparent.

NSW has recently witnessed many instances where local communities have opposed large scale residential, commercial or industrial developments. The basis of opposition varies significantly, but the one constant justification appears to be a concern that particular developments alter the very character of the community. Rural wind farms, like all other developments requiring approval under the *Environmental Planning and Assessment Act 1979* (NSW) are not immune from public opposition. Not all people marvel at the graceful but imposing symbols of alternative energy. To some, rural wind farms are 'environmental statues of liberty', a step away from carbon intensive coal fired power electricity generation. To others rural wind farms are a noisy and unsightly blot on a sculptured natural landscape.

Beyond the personal, subjective views on the relative merits of rural wind farms, the Inquiry had to wrestle with the problem of systemic deficiencies inherent in the NSW planning framework aggravating community concerns about rural wind farms. The legislative requirements currently in place have the potential to leave local communities disenfranchised and effectively erodes community support for the environmental imperatives central to renewable energy targets.

The recommendations of the Committee reflect a partial way forward to address a more general community discontent with the environmental planning and assessment framework in NSW and in particular, processes under Part 3A of the *Environmental Planning and Assessment Act*. Considering the fundamental role of wind farms to clean energy development in NSW there is pressing need to ensure community consultation and project design are not prejudiced or compromised by broader planning law deficiencies. The recommendations are geared to ensure local communities can participate in designing NSW's renewable energy future and to encourage clean energy developments of which communities can be a part. Adoption of the recommendations will put planning processes for rural wind farms well ahead of deficiencies plaguing other major developments evaluated and approved under Part 3A of the *Environmental Planning and Assessment Act*.

I hope that the recommendations play a part in developing best practice for wind farm project assessment and community engagement. It is imperative that government and developers listen to real lifestyle concerns and move forward with respect for both the physical and social environment.

The Committee appreciates all those that participated in and provided information to the Inquiry. The Committee was confronted with contradictory and polarised views and reconciliation has been difficult. I hope that all participants feel that they have been able to make representations to the report allowing adequate ventilation of a diversity of views.

In conclusion I would like to thank Committee members for their efforts and goodwill in reaching unanimity in by far the majority of issues. Given the truly monumental task in what was a savagely short time frame I give particular thanks to Rachel Callinan, Beverley Duffy, Emily Nagle, Kate Mihaljek and Rhia Victorino for their assistance and hard work in bringing this report to fruition before the end of the year.

Ian Cohen MLC
Committee Chair

Executive summary

Wind power is promoted as a clean source of electricity that can help reduce the State's dependence on non-renewable sources such as coal power. The number of wind farms in rural NSW is increasing, which is due in part to the NSW Government's 'clean energy revolution' and recent changes to policy and legislation that fast-track their development. Wind power is a market ready technology that can be integrated into the current electricity network. It also contributes to the Commonwealth Renewable Energy Target through reducing greenhouse gas emissions.

However, proposed and existing wind farms in rural NSW have caused anxiety for many local communities. This may be as a result of wind farms being fast-tracked *prior* to the development of a robust policy framework that ensures all stakeholders are adequately provided for. Some local residents expressed concern to the Inquiry about potential impacts that may occur as a result of living near a wind farm, while others expressed frustration at the impacts they currently experience from existing wind farms, particularly noise. While many of the feared impacts were not supported in evidence, some impacts are real and require further action, as recommended in this report.

Wind power and the electricity market (Chapter 4)

The Committee received many and varied views regarding the capacity of wind power to be integrated into the current electricity system. Issues such as the intermittent nature of wind were identified, which led to concerns including the use of wind as a base load power, the reliability of wind power and the possibility that wind power may depend on back-up electricity. However, evidence presented to the Committee demonstrated that wind power is currently integrated successfully into the electricity network. In addition, Australian research has concluded that wind power can provide a reliable source of electricity and can be successfully managed in the National Energy Market.

The Committee believes that wind power should be viewed as part of a broader mix of resources, as it contributes to a broader network of electricity generation. All electricity resources have strengths and weaknesses, however, the potential weaknesses of wind power do not undermine the overall system.

The Committee formed the view that additional payment options that support the construction of transmission lines for wind farms are required. This is because wind farms are currently constructed near existing powerlines of appropriate voltage, as the cost of constructing new powerlines rests with the developer and may be seen as prohibitive. This is one of the reasons why wind farms are located near communities whose interests may not be compatible with the wind farm. The Committee recommends that the 'Network Extension for Remote Generation Proposal' be supported by the NSW Government, in addition to the development of other options that would support the construction of new transmission lines for the wind power industry in more remote locations.

Planning, policy and legislation (Chapter 5)

The Committee believes that the expeditious development of wind farms prior to having adequate policy and processes in place to address impacts on local communities is a flawed approach. Community interests and views need to be better balanced with the interests of the State in supporting renewable energy goals and the interests of wind farms corporations.

The Committee has noted that guidelines for wind farm developments are currently being prepared at the Federal and State level. The Draft National Wind Farm Development Guidelines intend to provide

a nationally consistent set of methods for addressing wind farm concerns, however, the Committee notes that they will only be effective if states such as NSW choose to require wind farm developers and operators to comply with them. The guidelines also state that 'other government policy' should be followed as required. This presents as an issue for NSW as there is currently lack of 'other government policy'. The Committee believes that the development of NSW Planning and Assessment Guidelines for Wind Farms presents an opportunity to vastly improve current policy, however, if the guidelines do not address issues such as DCPs being ignored in assessment of Part 3A development applications, the perception that the Department of Planning disregards local concerns may remain.

The Committee has therefore recommended that the Minister for Planning ensure that Local Government Development Control Plans for wind power generation, where they exist, are considered by wind farm developers. Developers should demonstrate their consideration of the relevant DCP in the development application submitted to the Department of Planning, through the inclusion of information that outlines how the relevant DCP has been complied with. If certain aspects of the DCP are not complied with the reasons for non-compliance should be set out. These requirements should be incorporated into the NSW Planning and Assessment Guidelines for Wind Farms.

The Committee also recommends that development of the NSW Planning and Assessment Guidelines for Wind Farms should also be expedited to ensure that wind farms are planned, assessed and managed appropriately. The Committee understands that the guidelines will be delivered mid-2010 and encourages the Government to meet this time frame. In the meantime it would benefit those who are affected by wind farms and wind farm proposals if detailed information about the nature of the guidelines, including the aspects of wind farm development that they will cover could be provided to the public.

The Committee found that there is an absence of noise guidelines for the development and management of wind farms in NSW and there are gaps in existing policies in relation to noise. The gaps include a process by which local residents can report noise issues and have them addressed in a transparent and timely manner. To improve the management of wind farm noise, NSW requires a wind farm noise policy in a similar vein as the South Australian Guidelines.

The Committee is concerned that wind power is excluded from being a scheduled activity under the Protection of the Environment Operations Act 1997, when all other types of electricity generation (other than solar power) are included. Reasons for this are not clear and it has resulted in the blurring of what was initially a very clear process for addressing wind farm noise pollution in NSW. Currently, wind farm noise management rests with local council. Since some local councils advised the Committee that they are not able to adequately fulfil this role, it seems that wind farm noise is not being managed effectively, if at all. This issue could have been avoided if an adequate policy was developed to ensure that another authority managed wind farm noise in place of the Department of Environment, Climate Change and Water (DECCW).

Delegating noise monitoring responsibility with local council without proper consultation is unreasonable and without appropriate planning has resulted in wind farm noise complaints not being adequately addressed. Furthermore, the Committee does not feel that the conditions of consent currently applied to wind farm development approvals by the Department of Planning give developers the guidance they require to adequately address wind farm noise complaints. The Committee believes that DECCW is the most appropriate agency to monitor and address wind farm noise complaints. This is in line with the agency's portfolio, expertise and experience. The Committee recommends therefore that wind power generation should be included on the list of scheduled activities under Schedule 1, Part 1 the Protection of the Environment Operations Act 1997, so that the NSW Department of

Environment, Climate Change and Water has more responsibility for monitoring and addressing wind farm noise complaints.

Many Inquiry participants suggested that a setback distance between wind turbines and houses is required. The Committee acknowledges that a prescriptive setback distance will not address all the issues faced by residents who live next door to a wind farm. However, communities that may host wind farms are entitled to clear guidance on how close turbines may be to neighbouring residences. The Committee recommends a two kilometre minimum setback between wind turbines and neighbouring houses (which can be waived by the affected neighbour) as a precautionary approach, in addition to the development and implementation of the NSW Planning and Assessment Guidelines for Wind Farms, to ensure that wind farms are located appropriately.

The Committee found that there is a lack of policy regarding decommissioning of wind farms in NSW. The importance of managing the 'whole of life' of utility scale wind farm developments should not be underestimated. Without adequate foresight during the planning process, wind farms may present a public health and safety risk once they cease operating. They may also adversely affect the environment and have socioeconomic ramifications such as burdening NSW taxpayers to fund their removal. Under current lease agreements host landowners may have responsibility to remove wind turbines from their property once the wind turbines stop operating. Due to the enormous size of wind turbines, the Committee is not confident that current decommissioning arrangements will in fact result in wind turbines being adequately removed. There is a risk that rapid planning and construction of wind farms is being prioritised over adequate whole of life planning. This could present problems in future years.

The establishment of a system that guarantees funding for wind farm decommissioning is supported by the Committee. The Committee has therefore recommended that the Minister for Planning address decommissioning of wind turbines in the NSW Planning and Assessment Guide for Wind Farms, including responsibility for decommissioning, the time period in which turbines should be dismantled and removed and how decommissioning will be funded, including the option of requiring developers to pay a bond.

The current 30 day exhibition period that is provided for communities to read, research and respond to Environmental Assessments of wind farms is the minimum time period recommended by legislation. The Committee believes that attempting to provide a considered response in 30 days, while attending to other responsibilities, is an unnecessary pressure. The Committee has recommended that period in which Environmental Assessments can be responded to should be extended to 90 days to give communities additional time to adequately respond to the diversity of issues assessed in wind farm Environmental Assessments.

The Committee recognises the potential conflict that can occur within communities as a result of the inequitable distribution of financial benefit from wind farms. The Committee notes the precedents that have been set and agrees that there are some circumstances in which it would be appropriate for some form of compensation to be provided to residents who are adversely impacted by wind farms. However, the Committee has not received enough evidence to be able to conclude exactly what type of compensation is appropriate and to whom it should be provided. Research should be conducted into compensation options that are appropriate for residents who are adversely impacted by wind turbines. The research should investigate options such as the purchasing of affected properties and the provision of monetary compensation. The report should include recommendations to be implemented by the NSW Government.

Environmental impact (Chapter 6)

Differing views were presented to the Committee regarding the ability for wind power to reduce greenhouse gas emissions. The Committee notes the concerns presented by some wind farm opponents in relation to the level of greenhouse gases generated during construction. However, as these emissions are offset within three to seven months of operation the Committee does not believe that this issue warrants further action.

Australia is among the countries producing the largest amount of greenhouse gas emissions per GDP in the world. The contribution of the electricity industry to these emissions is of concern to the Committee, in particular, coal-fired power stations are the largest single source of greenhouse gas emissions. Since wind power displaces carbon dioxide emissions from non-renewable sources of electricity such as coal, wind power has the potential to reduce dependency on non-renewable sources of electricity and reduce greenhouse gas emissions. The Committee also notes that wind farms do not generate any greenhouse gas emissions during electricity production.

Unfortunately there appears to be a significant degree of confusion and misinformation about the ability of wind farms to reduce greenhouse gas emissions. For such a potentially valuable contributor to reducing greenhouse gases this is an anomaly and one that is, somewhat understandably, giving rise to unnecessary suspicion. As this Inquiry has discovered in relation to a number of issues, misinformation can have a detrimental effect on people's perception and understanding of a particular issue. As wind farm developments are causing a great deal of stress for some local residents, it is important to clarify this issue. The Committee therefore recommends that wind farm developers be required, as part of the Environmental Assessment process, to provide information about the projected impact of their proposal in reducing greenhouse gas emissions and the carbon costs of the production of the infrastructure used.

The Committee believes that the conditions of consent, for example to monitor impact bird and bats, that are applied to development approvals are thorough. However, there is an absence of evidence to demonstrate that these conditions are adequately adhered to. For example, the claim by a wind farm developer and local residents that there is a 'lack of rigor' in monitoring bird deaths at wind farms is of concern to the Committee.

The importance of state critical infrastructure is acknowledged and appreciated by the Committee, however, the impact of these developments on native fauna, including birds, should be managed appropriately. As a minimum, the impact of wind turbines on wildlife requires adequate monitoring and reporting. The Committee also believes that conditions of consent need to be monitored more closely so that the Department of Planning can objectively conclude the level of impact specific wind farms have on local bird populations. The Committee has therefore recommended improved monitoring and reporting by the Department of Planning in relation to bird deaths and that appropriate penalties apply.

Health and social impact (Chapter 7)

The Committee notes the concerns of many Inquiry participants regarding wind farm noise. Although concerns about noise may not translate into as many actual complaints once the wind farm is constructed, the Committee acknowledges that adverse impacts remain for some residents. It is also noted that a reduction in the number of complaints may be as a result of residents becoming resigned to the presence of a wind farm, rather than the impact being abated.

The Committee believes that it is important to address noise concerns felt by local residents early in the development of a wind farm, regardless of whether the impacts eventuate to the level anticipated by residents. Wind farms in NSW currently cause a high degree of anxiety and stress in local communities, which in itself is an adverse impact that needs to be addressed as far as possible. The Committee also notes the importance of taking low frequency sound into consideration during wind farm planning, as this type of sound may impact local residents differently to high frequency sound.

The Committee acknowledges the evidence which demonstrates that atmospheric conditions impact on noise levels. As current NSW noise modeling for wind turbine noise is not required to take into account varying atmospheric conditions, the Committee notes it is possible that an increase in noise could be experienced by some residents. The Committee also notes that atmospheric conditions can vary between day and night and as a result wind farm noise can be louder at night.

Local residents would undoubtedly feel more confident that noise issues would be addressed if there were NSW noise guidelines for wind farms in place, which enabled them to understand what levels of noise were deemed acceptable and when and how they could report noise concerns. The Committee therefore recommends that that the Minister for Planning requires both day and night time noise modelling and noise modelling in relation to temperature inversions and the van den Berg effect to be taken into consideration as part of the Environmental Assessment process for of wind farm development applications to ensure that the most comprehensive assessment of potential noise impacts is completed.

The Committee acknowledges the concern expressed by some Inquiry participants regarding Vibroacoustic Disease, however, there does not appear to be any evidence to support the proposition that vibrations from wind turbines can cause this disease. Similarly, there does not seem to be sufficient evidence to support the existence of Wind Turbine Syndrome, despite there being a degree of fear within some local communities about this syndrome. The existence of this syndrome is debateable and certainly insufficient evidence was presented to the Committee to justify further examination of this issue.

The Committee notes the unique sound characteristics of wind farm noise and the different influences on the perception of this noise. The Committee further notes that reputable research has shown that noise annoyance is an adverse health effect that can result from wind farms, as it can result in effects such as negative emotions and sleep disturbance. The Committee also acknowledges the research which has found that there is an increased chance of being annoyed by wind farms in rural areas and if there is a pre-existing negative attitude to wind farm noise or the visual aspects of wind farms.

The Committee notes the adverse impact that wind farm development can have on the well-being of residents and communities. It is important to acknowledge and address the emotional impacts that these developments may cause, since they are an adverse health effect that can have serious consequences such as depression. The impact of wind farms on the well-being of communities in NSW may be compounded by other issues raised through this Inquiry, such as concerns associated with the planning process and the perception that community consultation is a tokenistic exercise that does not genuinely incorporate community concern.

The Committee notes that wind farms can cause shadow flicker and that this is a cause of concern for some Inquiry participants. The Committee further notes that there appears to be a great deal of fear in some communities regarding the potential for shadow flicker to occur and the effect this may have on peoples' health. However, the Committee also observes that no demonstrated experience of unreasonable or dangerous shadow flicker occurring in NSW was presented to the Inquiry. The

Committee notes that shadow flicker can be easily managed through turning the relevant wind turbine off for the few minutes that the sun is at the particular angle that causes flicker. The Committee does not believe that the level of concern associated with shadow flicker is supported by demonstrable evidence.

The Committee notes the concerns expressed in submissions and evidence about the safety of wind turbines. The Committee is of the view that, to the extent possible, most of these concerns appear to be adequately addressed by wind farm developers and operators. As with any major structure, it would be impossible to entirely insulate wind turbines against safety risks posed by natural events such as tornadoes.

Economic considerations (Chapter 8)

Wind farm developments provide some employment opportunities at the construction stage. Employment opportunities also exist when a wind farm is in operation although to a lesser extent. The Committee believes that the wind power industry can make a positive contribution to employment levels at a local and state level, particularly in rural areas. Although the number of jobs decreases after construction, the Committee notes that many of the skills acquired during this time may flow into other areas of the local community.

The Committee notes the concern expressed by some Inquiry participants about the potential impact that wind farms may have on property values. The Committee acknowledges the recent findings of the report, *Preliminary assessment of the impact of wind farms surrounding land values in Australia*, commissioned by the NSW Valuer General. However, the limitations of this study must be considered alongside its conclusions. The Committee is not convinced that the conclusions drawn from this study represent NSW or the whole of Australia.

While the study concluded that the majority of properties assessed did not experience a decrease in property value, the Committee is interested to note that five properties did experience a decrease in value and there were six inconclusive results. Relevant to many of the concerns raised in this Inquiry, the report stated that no conclusions can be drawn in relation to the impact of wind farms on lifestyle properties. In the Committee's view, therefore, no firm conclusions can be drawn about the impact of wind farms on property values in NSW based on this report. The Committee does note, however, that the report suggested that an appropriate setback distance may reduce the impact of wind farms on property values.

The Committee is of the view that further research is required to better inform those involved in the development and approval of wind farms. The Committee notes that the NSW Valuer General's report was a 'preliminary assessment' and the report itself refers to the 'inconclusive nature of the results' and concludes by stating that '[f]urther analysis (with additional data and expansion of the study area) may yield more comprehensive results.' The Committee therefore recommends that the NSW Valuer General commission a further, more comprehensive and on-going, study on the impact of wind farms on property values in NSW.

Community funds provide an opportunity to spread the financial benefit of wind farms more broadly than would otherwise take place. The Committee acknowledges that questions remain regarding how much money is appropriate and who, in particular, should be entitled to the money in community funds. To ensure a consistent and equitable approach to the development of community funds, the Committee recommends that guidelines are developed. This will help to ensure that community funds are established, donated to and managed consistently and equitably.

The Committee notes the many economic advantages and disadvantages identified by Inquiry participants regarding wind farm developments. Based on the evidence received, the Committee believes that in general, there are strong economic advantages of wind power in NSW, including the provision of income and employment to local communities.

Community consultation (Chapter 9)

A considerable level of concern exists regarding current community consultation practices for wind farms. The Committee notes that anxiety caused by this process is the antithesis of what community consultation seeks to achieve. That is, to provide an opportunity for local residents who may be impacted by a development to voice their concerns and have them adequately addressed. The Committee observed that many Inquiry participants feel disempowered by the current wind farm consultation that takes place and many reported bad experiences. The Committee notes that some of the behaviour demonstrated by wind farm developers has caused undue stress in local communities.

The Committee believes that the current consultation requirements for wind farms, as set out in Director General's Requirements and non-binding guidelines documents such as the Auswind guidelines, are not specific enough to ensure that the views of local communities are heard and addressed effectively. Evidence presented to the Committee indicates that an 'appropriate and justified level of consultation' has not taken place for some wind farms in NSW and has resulted in adverse impacts on local communities.

The Committee has recommended that the Minister for Planning require, as a condition of consent, that wind farm developers publish within the local community detailed information about all aspects of the wind farm and provide appropriate options for members of the community to discuss their concerns with the developer, such as establishing a phone line, email account or local office to hear and address local concerns. In addition, development of the *NSW Planning and Assessment Guidelines for Wind Farms* should ideally provide clarity for wind farm developers regarding what appropriate consultation involves.

The Committee has observed that goodwill toward wind farms generated by virtue of their being developed by 'clean energy companies' is quickly eroded when effective consultation does not take place. It is in the best interests of all concerned – local residents and developers alike – to conduct the best possible community consultation process. The Committee further notes that undoubtedly some people will ultimately be unhappy with a wind farm development in their local area. However, the depth of feeling can be minimised if people are provided with sufficient information, listened to and their views incorporated where reasonable.

Summary of recommendations

Acronyms

AAAA	Aerial Agricultural Association of Australia
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AusWind	Australian Wind Energy Association
BCSE	Australian Business Council for Sustainable Energy
CASA	Civil Aviation Safety Authority
CEC	Clean Energy Council
COAG	Council of Australian Governments
dB	Decibel
DECCW	NSW Department of Environment, Climate Change and Water (formerly NSW Department of Environment and Climate Change)
DGR	Director-General's Requirements
EPHC	Environment Protection and Heritage Council
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GW	Gigawatt
GWh	Gigawatt hour
GWEC	Global Wind Energy Council
HREA	Hepburn Renewable Energy Association
Hz	Hertz
INP	Industrial Noise Policy
KW	Kilowatt
LEP	Local Environmental Plans
LGA	Local Government Areas
MW	Megawatt
MWh	Megawatt hour
MRET	Mandatory Renewable Energy Target
NEM	National Electricity Market
PACs	Precinct Advisory Committees
REP	Regional Environmental Plans
RET	Renewable Energy Target

SEDA	Sustainable Energy Development Authority
SEPP	State Environmental Planning Policies
WHO	World Health Organisation

Chapter 1 Introduction

This chapter provides an overview of the Inquiry process and a brief outline of the report structure.

Terms of reference

1.1 The Inquiry terms of reference were adopted on 24 June 2009 under the Committee's power to make a self-reference. The terms of reference are reproduced on page iv.

Conduct of the Inquiry

Submissions

1.2 The Committee placed a call for submissions in *The Sydney Morning Herald* and *The Daily Telegraph* on 8 July 2009, as well as in the *Barrier Daily Truth*, *Southern Highlands News, The Land* and *The Herald* in Newcastle. A media release announcing the Inquiry was also sent to all NSW media outlets. The Committee also wrote to a large number of stakeholders inviting them participate in the inquiry. The closing date for submissions was 21 August 2009.

1.3 The Committee received 121 submissions to the Inquiry and 27 supplementary submissions. Submissions were received from a range of stakeholders, including energy companies, government agencies, non-government organisations, community groups and individuals.

1.4 A list of submissions is available in Appendix 1. The submissions are also available on the Committee's website: www.parliament.nsw.gov.au/gpsc5.

Public hearings

1.5 The Committee held five public hearings during the Inquiry. The first, fourth and fifth hearings were held at Parliament House on 11 September, 2 November and 9 November respectively, the second was held at Trapper's Conference Centre, Goulburn and the third at the Quality Hotel Powerhouse, Tamworth.

1.6 The Committee received evidence from a variety of stakeholders including the NSW Department of Planning, the NSW Department of Environment, Climate Change and Water, the Upper Lachlan Shire Council, the Upper Hunter Shire Council, the Glen Innes Severn Council, the Clean Energy Council, Eco Energy Solutions, Friends of Crookwell, assorted Landscape Guardians groups, the Hunter Thoroughbred Breeding Association, various energy companies, academics and local residents.

1.7 A list of hearing participants is available in Appendix 2 and transcripts of proceedings are published on the Committee's website. A list of documents tabled during the hearings is available in Appendix 3.

1.8 The Committee is grateful to the organisations and individuals that participated in the Inquiry.

Site visits

1.9 On 30 September 2009 the Committee conducted site visits to the Cullerin Range Wind Farm and private properties in Crookwell, Pejar and Tarago. Details of these visits can be found in Appendix 4. The Committee would like to thank the organisations and individuals that facilitated these visits.

Report structure

1.10 Chapter 2 explains what wind energy is and how it is harnessed to produce electricity. It also outlines the global wind power industry and the use of wind energy in Australia. The operation and regulation of Australia's electricity supply industry is discussed, as well as the recently expanded national Renewable Energy Target. This chapter also provides an overview of the recently released *Draft National Wind Farm Development Guidelines*. Finally, common arguments for and against wind farms are identified as background to more extensive discussion in the following chapters.

1.11 Chapter 3 examines the wind power industry in NSW and outlines recent steps taken by the NSW Government to promote wind energy generation. An overview of the current policy and planning framework guiding wind farm development in NSW is also presented as a preface to more detailed consideration of these issues in Chapter 5. This chapter also identifies the range of existing, approved and proposed wind farms in NSW.

1.12 Chapter 4 examines the integration of wind power into the electricity market. The capacity for wind power to act as a base load source of electricity is addressed as are concerns raised during the Inquiry about the intermittent nature and reliability of wind power. The potential dependence of wind power on back-up electricity sources is also discussed. The use of electricity generated by wind in existing electricity networks and issues such as incorporating variable sources of electricity within the market and network connections are also addressed.

1.13 Chapter 5 presents concerns identified by Inquiry participants regarding the planning of wind farms. It includes discussion of relevant state and local government policy, including the use of Development Control Plans. Noise regulations, guidelines and monitoring are also addressed from the perspective of the planning policy and legislation that is required to ensure wind farm noise managed effectively. Issues such as setback distance are examined, as well as the role that renewable energy precincts may have in improving the management of locations that host wind farms. The chapter concludes by considering wind farm decommissioning, impact assessment, compensation and local ownership.

1.14 Chapter 6 explores the issue of whether wind power is a clean source of electricity that reduces greenhouse gas emissions, or whether this notion is a misrepresentation. The impact of wind farms on the natural environment, including birds is also examined, as it was a key issue of concern for many Inquiry participants. This chapter also examines other environmental and cultural concerns raised, including whether wind farms pose a bushfire risk, the impact of wind farms on the landscape and cultural heritage of rural areas.

1.15 Chapter 7 examines the various health and social impacts of wind farms that have been identified as a concern by Inquiry participants. The health impact of wind farm noise was raised as a significant issue for many contributors and is addressed in detail in this chapter.

Factors that may influence noise levels are also addressed, including terrain and meteorology. The impact of low frequency noise is examined, including the potential for such noise to lead to Vibroacoustic Disease. 'Wind Turbine Syndrome' is also discussed. Current research regarding noise perception and annoyance is examined, including how this manifests as a health concern. Individual and community well-being, shadow flicker and wind turbine safety are also discussed in this chapter.

1.16 Chapter 8 considers economic issues relating to wind farm development including the creation of employment and the potential impact on property values and on local industries. The option of requiring wind farm developments to contribute to a community fund is also explored. Economic subsidies and incentives form an important part of developing the wind industry in NSW and are also examined in this chapter. Finally, issues regarding lease arrangements with landowners that host wind turbines are discussed.

1.17 In Chapter 9 issues regarding community consultation conducted by wind farm developers are examined. The significant number of concerns raised by Inquiry participants about consultation practices are explored and an analysis of current consultation requirements is undertaken. Options to address the issues identified are also examined in this chapter.

Chapter 2 Background

This chapter explains what wind energy is and how it is harnessed to produce electricity. It also outlines the global wind power industry and the use of wind energy in Australia. The operation and regulation of Australia's electricity supply industry is discussed, as well as the recently expanded national Renewable Energy Target. This chapter also provides an overview of the recently released *Draft National Wind Farm Development Guidelines*. Finally, common arguments for and against wind farms are identified as background to more extensive discussion in the following chapters.

What is wind energy?

2.1 Wind energy comes from changes to atmospheric temperature and pressure causing the air to move.[2] Wind can vary significantly in intensity depending on climatic conditions and surface topography. It therefore renders energy that cannot be stored or fully predicted.[3]

2.2 Research and development into harnessing wind energy over the past few decades means that wind is now used to generate significant amounts of electricity.

2.3 The electrical power generated by wind energy is generally proportional to the speed of the wind cubed. This means that if the wind speed doubles, the power generated is increased eightfold.[4]

2.4 To capture this energy, the modern wind industry uses wind turbines. Wind turbines are comprised of a tower, topped by an enclosure called a nacelle (which houses a gearbox and generator) and a rotor with three specially shaped blades. **Figure 2.1** illustrates the general structure of a wind turbine.[5]

2.5 Wind turbines vary in size and in their capacity to produce electricity. Mr Ken McAlpine, Government Relations Manager, Vestas Wind Systems, informed the Committee that towers can range in height from 80 metres to 110 metres.[6] Mr McAlpine confirmed that, together with a rotor blade of approximately 45 metres in length, some wind turbines can reach up to 150 metres in height.

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2 House of Representatives Standing Committee on Industry and Resources, *Renewable power*, Background information – interim report, September 2007, p *xix*

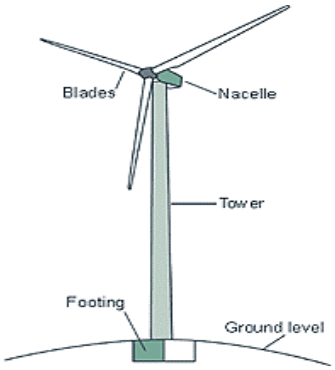
3 Submission 119, Professor Hugh Outhred, p 1

4 Department of Industry and Investment, *Wind power*, accessed 29 October 2009, <www.industry.nsw.gov.au/energy/sustainable/renewable/wind>

5 Department of Industry and Investment, *Wind power*, accessed 29 October 2009, <www.industry.nsw.gov.au/energy/sustainable/renewable/wind>

6 Mr Ken McAlpine, Government Relations Manager, Vestas Wind Systems, Evidence, 11 September 2009, p 19

Figure 2.1 General structure of a wind turbine



2.6 Mr McAlpine also advised that most turbines currently being installed in Australia are between 2 to 3 megawatts (MW) in generator size.[7] Turbines of this size are generally used in wind farms established for utility-scale wind generation.

2.7 Mid-range turbines refer to turbines of 15 kilowatt (KW) to 1MW generating capacity.[8] These are typically purchased by farmers and businesses for use on their land and are described by Mr Gary Yost, Eco Energy Solutions, as "particularly good in remote locations and in island locations because of [their] size and the flexibility".[9]

2.8 Small wind energy systems are turbines of less than ten KW and are designed as stand-alone power systems.[10] The Clean Energy Council (CEC), the national peak body representing the clean energy and energy efficiency industries, provides guidelines on design and installation for these small wind energy systems.

2.9 For the purposes of this report, a group of one or more wind turbines linked at a particular location and connected to the electricity grid will be referred to as a wind farm.

2.10 Wind farms are often classed according to their total generating capacity. The NSW Government defines wind farms with a capacity of up to a maximum of 60KW as 'micro wind' and wind farms over the threshold of 30MW as 'large-scale' or utility-scale.[11]

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7 Mr McAlpine, Evidence, 11 September 2009, p 19

8 Submission 87, Eco Energy Solutions, p 2

9 Mr Gary Yost, Managing Director, Eco Energy Solutions, Evidence, 11 September 2009, p 58

10 CEC, *System Design Guidelines, Stand-alone Power System (Small Wind Systems)*, p 1, accessed 19 November 2009, <www.cleanenergycouncil.org.au/cec/accreditation/quickfindforms/mainColumnParagraphs/0/text_files/file12/Small%20Wind%20Design%20Guidelines%20CEC.pdf>

11 Answers to questions on notice taken during evidence, 11 September 2009, NSW Department of Planning, Question, 2, p 1

Renewable energy

2.11 Renewable energy is energy that is drawn from sources that cannot be depleted or can be replaced.[12] Wind energy is considered a renewable energy.

2.12 Other forms of renewable energy include: solar energy, including solar thermal energy; hydro energy; ocean energy, including tidal; wave energy; geothermal energy; and bioenergy.

2.13 When generating electricity, renewable energy sources generally produce less greenhouse gas emissions than fossil fuel or non-renewable energy sources. Indeed, in its *State of the Energy Market 2008* report, the Australian Energy Regulator (AER) found that renewable energy sources, such as hydroelectric, wind and solar, produced some of the lowest greenhouse gas emissions.[13]

2.14 Renewable energy technologies have therefore been sought and developed not only to increase the diversity of energy supplies but to potentially displace fossil fuels and consequently reduce greenhouse gas emissions generated by electricity production.[14]

2.15 The specific role of wind energy in reducing greenhouse gas emissions is considered in Chapter 6.

The global wind energy industry

2.16 Wind power is one of the fastest growing energy technologies in the world.[15] According to the Global Wind Energy Council (GWEC), the global wind energy trade association, over 120GW of wind energy capacity is currently installed around the world.[16]

2.17 The United States is the number one market in wind energy and has the greatest installed capacity of all nations at over 25 GW.[17] Denmark, however, continues to have the highest level of penetration in the electricity sector, with 21% of its total electricity being generated by wind power.[18]

2.18 While the wind energy industry has grown by over 30% over the past decade, wind energy currently supplies less than one per cent of global electricity generation.[19] The GWEC,

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12 House of Representatives Standing Committee on Industry and Resources, September 2007, p *xviii*

13 AER, *State of the Energy Market*, 2008, p 56

14 International Energy Agency, *Renewable Energy*, accessed 10 November 2009, <www.iea.org/subjectqueries/keyresult.asp?KEYWORD_ID=4116>

15 Diesendorf M, *Bluff and Bluster: The campaign against wind power,* 23 February 2005, p 1, accessed 7 July 2009, <www.onlineopinion.com.au/view.asp?article=3057>

16 GWEC, *Wind is a global power source*, accessed 14 July 2009, <www.gwec.net/index.php?id=13>

17 GWEC, *Global Wind 2008 Report*, 2008, p 8

18 GWEC, *Wind Energy – The Facts 2009*, 2009, p 3

19 Institute for Sustainable Futures, *The Role of Wind Power in NSW*, July 2007, p 2, citing International Energy Agency, 2007

however, maintain that wind energy is on track to supply 10 to 12% of global electricity demand by 2020, reducing greenhouse gas emissions by 1.5 billion tonnes per year.[20]

2.19 The global wind energy industry employs more than 400,000 workers around the world and installed nearly US$50 billion worth of new power generation equipment in 2008.[21]

Wind energy in Australia

2.20 Of the renewable energy sources currently available in Australia, wind energy has been identified as an increasingly important part of the nation's energy mix. Beyond the environmental benefits, its growing profile has been attributed in large part to its status as market ready technology, at an increasingly affordable price. Ms Yolande Stone, Director of Policy, Planning and Systems Reform, Department of Planning, explained in evidence:

> Wind energy is seen to be a very valuable and proven way of reducing carbon intensity of electricity production … wind is market ready technology … [and] is currently cost efficient, relative to other types of renewable energy such as solar or geothermal.[22]

2.21 Moreover, Australia is described by the GWEC as having "some of the world's best wind resources", making it a prime location for wind farm development.[23] These resources are generally located in the southern latitudes of Australia – in Tasmania, Victoria, South Australia and the south of Western Australia.

2.22 Consequently, interest and investment in wind energy technology has increased over the years. In 2005, it was reported that Australia had a total installed wind energy capacity of just over 250MW.[24] As at 30 October 2009, total installed capacity had increased significantly to 1,727MW.[25]

2.23 Australia is currently home to 46 wind farms.[26] **Table 2.1** below provides a jurisdictional breakdown of wind farms across the country.[27]

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20 GWEC, 2008, p 4

21 GWEC, 2008, p 3

22 Ms Yolande Stone, Director, Policy, Planning and Systems Reform, Department of Planning, Evidence, 11 September 2009, p 2

23 GWEC, 2008, p 18

24 Diesendorf M, *Bluff and Bluster: The campaign against wind power,* 23 February 2005, p 1, accessed 7 July 2009, <www.onlineopinion.com.au/view.asp?article=3057>

25 Submission 117, Office of the Renewable Energy Regulator, p 2. Please note this figure is based on the number of wind farms accredited by the Office of the Renewable Energy Regulator for participation in the Renewable Energy Target scheme.

26 Submission 117, p 2. Please note this figure is based on the number of wind farms accredited by the Office of the Renewable Energy Regulator for participation in the Renewable Energy Target scheme, as at 30 October 2009. This figure differs slightly to that provided by GWEC, who state that there are 50 wind farms currently in Australia. GWEC, *Australia*, accessed 26 November 2009, < http://www.gwec.net/index.php?id=116>.

Table 2.1 Jurisdictional breakdown of wind farms in Australia (October 2009)

Jurisdiction	Number of wind farms
New South Wales	6
Queensland	3
South Australia	11
Tasmania	5
Victoria	10
Western Australia	11
Northern Territory	Nil
Australian Capital Territory	Nil
Australia	**46**

2.24 While South Australia and Western Australia each house the most number of wind farms within a state, South Australia is reported to have the highest level of penetration in the National Electricity Market, with 17% of its total electricity coming from wind power.[28]

2.25 According to the GWEC, additional wind energy projects providing a combined output of 5.8GW have been proposed for development across Australia.[29]

2.26 Despite the rapid growth of the Australian wind industry, wind power currently only provides for one per cent of Australia's electricity requirements.[30] It has been suggested by some Inquiry participants, however, that wind energy could contribute up to 20% of Australia's electricity generation.[31] The extent to which wind can effectively and significantly contribute to the Australian electricity mix will be discussed further in Chapter 4.

27 Office the Renewable Energy Regulator, *Register of accredited power stations*, accessed 16 November 2009, <www.rec-registry.gov.au/searchAccreditedPowerStations.shtml>

28 AER, 2008, p 59

29 GWER, *Australia*, accessed 14 July 2009, <www.gwec.net/index.php?id=116>

30 Australian Bureau of Agricultural and Resource, Energy in Australia, 2009, p 21. Economics Please note this figure is based on the generation capacity of wind in the National Electricity Market (NEM), which excludes Western Australia and Northern Territory (see paragraphs 1.35-1.38). A single figure for wind penetration in the electricity market across all of Australia is currently unavailable.

31 For example, Dr Mark Diesendorf, Institute of Environmental Studies, University of NSW, Evidence, 2 November 2009, p 2 and Mr Christian Downie, PhD scholar, Centre for Climate and Environmental Governance in the Regulatory Institutions Network at ANU, Evidence, 11 September 2009, p 43

The Australian electricity supply industry

2.27 In order to examine the potential for wind energy to be integrated into Australia's electricity market, it is important to understand elements of the electricity supply chain and the industry within which it operates.

2.28 The Australian electricity supply industry is comprised of a number of sectors, each signifying a stage in the supply chain – generation, transmission, distribution and retail sale.[32]

2.29 The supply chain begins when electricity is generated at a power plant. It then passes through a transformer to convert the low voltage electricity to high voltage electricity for transport on the transmission system. Transmission lines carry the electricity long distances until it arrives at a location where it is required. There the electricity is passed through a transformer to convert it back into low voltage electricity for distribution. Retailers complete the supply chain by purchasing wholesale electricity and packaging it with transmission and distribution services for sale to consumers who access the electricity through power outlets in homes and work places.

2.30 While this supply chain has operated successfully with the use of certain generator types, the integration of variable energy sources, such as wind, has presented a number of challenges to the electricity supply industry.

2.31 One challenge involves determining the ability of wind energy technology to produce base load power. Whereas some argue that it cannot, others maintain that renewable energy sources can indeed generate reliable continuous power, as expressed in a parliamentary research paper investigating the potential for renewable energy to provide base load power in Australia:

> The role of renewable energy in present and future energy scenarios is commonly portrayed as marginal owing to the perception that it is often generated in remote areas distant from major centres; and that it is mostly intermittent in nature and cannot deliver a reliable and continuous level of power to match continuous demand, or 'base load'. However, not everyone agrees with these perceptions about renewable sources. The conception that renewables are unsuitable for providing base load power is termed by some "The Baseload Fallacy". Those who hold this view claim that some renewables are indeed able to produce reliable continuous power.[33]

2.32 While this issue will be examined in further detail and with particular reference to wind energy in Chapter 4, the following provides some background by way of defining key terms used in the debate.

Defining the power mix

2.33 In order to meet the variations in demand for electricity, a mix of base load, peak load and intermediate load power is required.

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32 House of Representatives Standing Committee on Industry and Resources, September 2007, p 8

33 Needham S, *The potential for renewable energy to provide baseload power in Australia*, 23 September 2008, Research Paper No. 9, 2008-09, Parliament of Australia, p 1

2.34 *Base load power* is defined as the minimum continuous level of power needed to meet demand. Accordingly, it requires reliable supply sources to provide a steady flow of power without the risk of output dropping below the base load level.[34]

2.35 These supply sources have relatively high start up costs but low operating costs, making it economical to run continuously to meet the bulk of demand.[35] Base load generators are therefore available, in theory, all day, every day, but are limited in their capacity to vary output to meet changes in demand.[36]

2.36 Dr Mark Diesendorf, from the Institute of Environmental Studies at the University of NSW, believes that base load is an artificial concept that was created to describe the inflexibility of coal power.[37] Coal is an example of a base load power, even though coal-fired power stations do not run 100% of the time as they require maintenance and break down.[38]

2.37 The base load concept is often used to dispute the viability of new electricity sources, such as wind power, as discussed in detail in Chapter 4. However, the usefulness in doing so has been questioned because of the potential for all energy sources to play an important part in the power mix (see paragraph 2.41).

2.38 *Peak load power* refers to the power required to meet peaks in demand at different times of the day and seasons of the year and during unpredictable fluctuations.[39] For example, peak load power is required in summer to meet a single broad peak in demand in the early to mid-afternoon, while in winter it is required at two peaks occurring at breakfast and dinner time.[40]

2.39 In order to meet these variations, peak load power stations must be capable of starting up quickly from cold and their output can be changed rapidly. As a result, these generators have high operating costs but low capital costs. A gas-fired power station is an example of a peak load power station.

2.40 To fill the gap in supply between base load and peak load power is *intermediate load power* generated by power stations run during the day.[41] These operate more frequently than peak load generators but not continuously like base load generators. Likewise, the output of these power stations is more readily changed than base load power stations but less than peak load. Operating costs for intermediate load power therefore lie between the two.

2.41 The power mix described above highlights the importance of considering the electricity industry as a culmination of various energy sources, rather than judging each source in

34 Needham S, September 2008, p 1

35 Australian Energy Regulator, 2008, p 57

36 Diesendorf M, *The Baseload Fallacy, Fact Sheet 16*, March 2007, p 2; Submission 91, Epuron Pty Ltd, p 8

37 Dr Diesendorf, Evidence, 2 November 2009, p 9

38 Dr Diesendorf, Evidence, 2 November 2009, p 9

39 Diesendorf M, 2007, p 3

40 Diesendorf M, 2007, p 3

41 Diesendorf M, 2007, p 3

isolation. As expressed by Professor Hugh Outhred, Professorial Visiting Fellow from the School of Electrical Engineering and Telecommunications at the University of NSW wind energy should be seen "as part of a broader mix of resources".[42] It is suggested that in doing so, concerns over whether wind can and should provide base load power can be addressed with appropriate perspective. Further discussion on this is provided in Chapter 4.

Australian electricity markets

2.42 The variability of supply and demand is managed within the Australian electricity market. Market operators and regulators work to ensure that sufficient power generation is available to meet demand at all times and at the lowest cost available.

2.43 The Australian electricity market is comprised of the National Energy Market (NEM) and the separate electricity markets of Western Australia and the Northern Territory.

2.44 The NEM is a wholesale market through which generators and retailers trade electricity in eastern and southern Australia and the Commonwealth adjacent areas. There are six participating jurisdictions — Queensland, NSW, the Australian Capital Territory, Victoria, South Australia and Tasmania — that are physically linked by an interconnected transmission network.[43]

2.45 The Western Australian and Northern Territory electricity markets are not physically interconnected with the NEM.[44]

2.46 For the purposes of this report, reference will only be made to the NEM.

Operation and regulation of the NEM

2.47 The NEM is managed by the Australian Energy Market Operator (AEMO). Established on 1 July 2009, the AEMO operates according to the National Electricity Law and Rules. The AEMO is primarily responsible for balancing the demand and supply of electricity by dispatching the generation necessary to meet demand.[45]

2.48 The dispatch process involves instantaneously matching supply and demand in real time. Generators offer to supply the market with specific amounts of electricity at particular prices. From these offers, the AEMO determines the generators required to produce electricity based on meeting the demand in the most cost efficient way. The AEMO then dispatches these generators into production.

2.49 In its submission, Epuron, a company working in the field of renewable energy including wind farms, explains what this process means for wind energy and its potential to displace

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42 Professor Hugh Outhred, Professorial Visiting Fellow, School of Electrical Engineering and Telecommunications, University of NSW, Evidence, 2 November 2009, p 13

43 AER, 2008, p 76

44 AER, 2008, p 202

45 AEMO, *An Introduction to Australia's National Electricity Market,* July 2009, p 5

greenhouse gas emissions from other energy sources because of the low bids offered by wind farm generators:

> The market works by generators bidding in to have their output accepted. As wind energy is often sold under contract to retailers in 'off-market trades' the price is agreed and the wind operator bids into the market at zero dollars for the relevant dispatch periods. AEMO stacks bids from generators in ascending order which means that wind farm bids (at zero dollars) are generally assured of being dispatched. The net effect of this is to reduce the amount of electricity required to be dispatched from other sources. That is, wind energy displaces generation from the top of the dispatch stack i.e. the most expensive bids. When this happens the generators that are displaced reduce their output meaning one MWh of wind output leads to one MWh less output from another source. If the displaced generators rely on fossil fuels this will reduce emissions.[46]

Renewable energy targets

2.50 In 2001 the Mandatory Renewable Energy Target (MRET) scheme was introduced by the Commonwealth Government to encourage the generation of electricity from renewable energy sources and to reduce greenhouse gas emissions.[47] The scheme included a target requiring 9,500GWh of electricity to be produced by renewable energy sources by 2010.

2.51 On 20 August 2009, the *Renewable Energy (Electricity) Amendment Bill 2009* was passed in the Commonwealth Parliament expanding the MRET scheme to a national Renewable Energy Target (RET) scheme. Designed in cooperation with the States and Territories through the Council of Australian Governments (COAG), the RET scheme brings the MRET and existing and proposed state schemes into a single national scheme.[48]

2.52 The RET scheme includes a new target requiring 45,000 gigawatt per hour (GWh) of electricity to be produced by renewable energy sources by 2020,[49] thereby delivering the Government's commitment that the equivalent of at least 20% of Australia's electricity comes from renewable sources by 2020.

2.53 In a report commissioned by the Commonwealth Department of Climate Change, wind energy is projected to contribute over 17,000GWh per year to the RET.[50] Similarly, the Clean Energy Council forecasts that nearly 19,000GWh per year could be supplied by the power generated from proposed wind farms across Australia.[51]

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46 Submission 91, p 5

47 Mandatory Renewable Energy Target Review, Renewable Opportunities, A Review of the Operation of the Renewable Energy (Electricity) Act 2000, Executive summary, accessed 18 August 2009, <www.mretreview.gov.au/report/index.html#summary>

48 Commonwealth Department of Climate Change, *Renewable Energy (Electricity) Amendment Bill 2008 Exposure Draft –Commentary*, December 2008, p 1

49 Commencing this year, the target will increase each year so that by 2020, 45,000GWh of renewable energy will be produced in that year, and thereafter until 2030.

50 McLennan Magasanik Associates, *Benefits and Costs of the Expanded Renewable Energy Target*, January 2009, p 5

51 Clean Energy Council, *Clean Energy Fact Sheets – All about Wind Energy*, 2007

2.54 Dr Diesendorf believes that not only will utility scale wind generation reduce greenhouse gas emissions from the electricity sector by 20%, but that wind power alone could contribute at least 20% of Australia's electricity.[52]

2.55 The potential role of wind energy in meeting the RET is discussed in further detail in Chapter 4.

Wind farm guidelines

2.56 There a number of guideline documents relevant to the development and operation of wind farms in Australia. Some of these documents are still in the development stage, which reflects the relative youth of the wind farm industry.

2.57 At the national level, industry best practice guidelines - *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia* - were released by AusWind in 2002 and updated in 2006. The Environment Protection and Heritage Council released *Draft National Wind Farm Development Guidelines* for public consultation in October 2009.

2.58 At the state level, the NSW Government is in the process of developing the *NSW Planning and Assessment Guidelines for Wind Farms*. Victoria published its *Policy and planning guidelines for development of wind energy facilities in Victoria* in 2003 and South Australia released guidelines for the specific issue of wind farm noise, the *Wind Farms Environment Noise Guidelines* in July 2009.[53]

Best Practice Guidelines for Implementation of Wind Energy Projects in Australia

2.59 Wind farm guidelines have also been produced by the wind energy industry. The Australian Wind Energy Association (Auswind) was established in January 2000 as a representative body for the Australian wind energy industry. Auswind has since amalgamated with the Australian Business Council for Sustainable Energy to form the Clean Energy Council (see paragraph 2.8).

2.60 In response to the need for a national wind industry best practice document, Auswind, with the assistance of the Australian Greenhouse Office, produced its first edition of the *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia*, with a second edition released in 2006.[54]

2.61 The guidelines were designed for practical use by wind farm developers and operators, covering issues that are the responsibility of and can be controlled by, the developer or operator. As a result, the guidelines emphasise the environmental, amenity and stakeholder consultation aspects of the planning and operation of wind farms. In addition, they cover technical/commercial, contractual and public health considerations.

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52 Dr Diesendorf, Evidence, 2 November 2009, p 2

53 Environment Protection Authority, South Australia, *Wind Farms Environment Noise Guidelines*, July 2009

54 AusWind, *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia*, December 2006, p 7

National Wind Farm Development Guidelines

2.62 The Environment Protection and Heritage Council (EPHC), a body established by COAG in 2001 to address broad national policy issues relating to environmental protection, released the public consultation draft of its *National Wind Farm Development Guidelines* on 27 October 2009.

2.63 The guidelines were developed in direct response to recommendations made by the EPHC Standing Committee in its 2008 report, *Impediments to Environmentally and Socially Responsible Wind Farm Development*.[55] A key recommendation of the report was to create a consistent set of agreed best-practice guidelines for wind farm developers and operators across all jurisdictions.

2.64 The guidelines address a range of issues that are unique and significant to wind farm development and operation, providing detailed methodologies, including:

- community and stakeholder consultation
- noise
- landscape
- birds and bats
- shadow flicker
- electromagnetic interference.

2.65 In addition, the guidelines comment on aircraft safety, blade glint, risk of fire and indigenous heritage. However, in relation to these issues, the guidelines "do not provide detailed methodologies because the solution is relatively simple or covered well in other documents".[56]

2.66 The guidelines also do not address aspects of wind farm development and operation that are generally localised and/or are covered by existing policies and regulations. For example, issues of vegetation clearance and general fauna impacts addressed in the planning application for a wind farm are not included because consideration of these issues depend on state legislation and regulation.

2.67 As all issues are not addressed in these guidelines, it is necessary that the gaps are filled by State and Territory legislation and policy, which in relation to some issues, do not exist. For example, the guidelines refer wind farm developers and operators to State requirements for specific noise limits, however, NSW does not have wind farm noise guidelines. Wind farm developers and operators in NSW are advised to adopt standards from other jurisdictions, such as South Australia or New Zealand. The adequacy of legislation and policy with regard to wind farm development will be considered further in Chapter 5.

2.68 It should be noted that while the national guidelines will not be binding, they could become planning requirements if NSW chooses to adopt them through its planning system. Chapter 5 considers the planning framework within which wind farms are currently developed and will consider the contribution of these guidelines to that framework.

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55 EPHC, *Report on Impediments to Environmentally and Socially Responsible Wind Farm Development*, November 2008, pp 6-7

56 EPHC, *National Wind Farm Development Guidelines – Public Consultation Draft*, October 2009, p 8

NSW Planning and Assessment Guidelines for Wind Farms

2.69 The Committee was informed that the Department of Planning and other agencies would be developing *NSW Planning and Assessment Guidelines for Wind Farms*.[57] The guidelines are expected to provide a consistent framework within which standardised assessment criteria would apply and conditions of consent would be modelled.[58] Ms Stone advised the Committee that the guidelines "will reduce the level of uncertainty in the assessment process both for communities and for proponents".[59]

2.70 The guidelines will update the *Environmental Impact Assessment Guidelines for Wind Farms*, released by the Department of Planning in 2004[60] and are expected to incorporate various existing publications, including the draft EPHC national guidelines and AusWind's best practice guidelines, both described above. The NSW guidelines will also take into account guidelines prepared by other jurisdictions such as the Victorian Government's *Policy and planning guidelines for development of wind energy facilities in Victoria,* published in 2003.[61]

2.71 Following the completion of the EPHC national guidelines in early 2010, the NSW guidelines are expected to be finalised by mid-2010.[62]

Common arguments for and against wind farms

2.72 A number of common arguments for and against wind farms have been presented throughout the history of wind farm development in NSW. These arguments were raised during the course of this Inquiry and will be examined in further detail throughout the report.

2.73 On the one hand, it is argued that wind farms are a source of clean, effective and reliable energy. Supporters maintain that greenhouse gas emissions are significantly reduced both at the construction of a wind farm and during its operation. As a result, it has the potential to make a meaningful contribution to the RET. Other arguments in favour of wind farms include the ability to provide diversity to host farm income and the benefit to local community, such as employment and economic stimulation.

2.74 Conversely, wind farm critics suggest that wind energy is not only ineffective and unreliable, but that it comes at a cost to the local environment and community far greater than any value it has as an energy source alternative. Critics question the contribution wind energy may have in reducing greenhouse gas emissions and contend that wind farms impose negative impacts on biodiversity, landscape and the health and well being of local residents.

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57 Ms Stone, Evidence, 11 September 2009, p 3

58 Submission 104, NSW Government, p 5

59 Ms Stone, Evidence, 11 September 2009, p 3

60 The Committee was not provided with any further information about these 2004 guidelines and is unaware of what issues they address.

61 Submission 104, p 4

62 Answers to additional written questions on notice, 6 November 2009, NSW Department of Planning, Question 1(a), p 2

2.75 While many of these criticisms have been challenged as negligible or even false in their premise by academics and experts in the field of wind power and renewable energy, vocal opposition has persisted, particularly by communities located near proposed wind farm sites.

2.76 **Table 2.2** outlines the common arguments presented for and against wind farms. Where these issues are specifically addressed in this report, the relevant Chapter number is identified.

Table 2.2 Common arguments for and against wind farms

For wind farms	Against wind farms
Wind energy is efficient and reliable (Chapter 4)	Wind energy is intermittent and is therefore ineffective and unreliable (Chapter 4)
Wind energy can significantly reduce or offset greenhouse gas emissions (Chapter 6)	Wind energy does not significantly reduce or offset greenhouse gas emissions (Chapter 6)
Wind energy is a competitive source of electricity (Chapter 4)	Wind farms have a negative impact on the health and well being of nearby residents (Chapter 7)
Wind farms create employment (Chapter 8)	Wind farms have a negative impact on the landscape and biodiversity (Chapter 6)
Wind farms stimulate local economy (Chapter 8)	Wind farms are a source of noise pollution and shadow flicker (Chapter 5 and 7)
Wind farms drought-proof land by providing land owners with income	Wind farms have a negative impact on visual amenity and property values (Chapters 6 & 7)
Wind farms benefit the local community	Wind farms are currently developed within an inadequate and poorly supported planning and assessment system (Chapter 5)
Wind farms are a source of tourism	Wind farms do not significantly increase long-term employment opportunities (Chapter 8)
Wind farms provide diversity of farm income streams in a changing economic environment.	Wind energy is expensive and is not a competitive source of electricity (Chapter 4)
	Wind farms diminish heritage values (Chapter 6)

Chapter 3 Wind energy in NSW

This chapter examines the harnessing of wind energy in NSW and outlines the reasons for the industry's growth, the merits of which will be further examined in the following chapters. This chapter also outlines recent steps taken by the NSW Government to promote wind energy generation. An overview of the current policy and planning framework guiding wind farm development in NSW is also presented as a preface to more detailed consideration of these issues in Chapter 5. This chapter also identifies the range of existing, approved and proposed wind farms in NSW.

Why wind farms?

3.1 Interest and investment in wind energy technology has increased significantly in Australia, as noted in Chapter 2. This is particularly evident in South Australia where there are 11 wind farms producing 17 per cent of the state's total electricity. The development of wind energy in NSW, however, is a more recent endeavour. As a result, the sector is currently experiencing rapid growth.

3.2 There are a number of reasons for the emergence and growth of the wind energy industry in NSW. These include the status of wind energy technology as market ready, the potential contribution of wind energy to the State's electricity mix, its role in reducing greenhouse gas emissions, the potential for considerable investment and economic activity driven by the Commonwealth Renewable Energy Target (RET), the significant wind resources available in NSW and the price competitiveness of electricity generated by wind energy.

Market ready technology

3.3 The Committee was informed by a number of Inquiry participants that, of the renewable energy technologies currently available, wind was the most ready for widespread use.

3.4 For example, in response to a question about why the Government had promoted wind energy technology over other renewable technologies, Ms Yolande Stone, Director of Policy, Planning and Systems Reform, Department of Planning, stated that it was not the case that wind was being supported at the expense of other technologies, it was a matter of wind energy technology being more ready to use.[63]

3.5 Dr Mark Diesendorf, from the Institute of Environmental Studies at the University of NSW, also expressed the view that wind was market ready, making it a more preferable energy source to pursue:

> I believe that we should be moving to a much greater use of renewable sources of energy such as wind, sun, and geothermal. Of those technologies, the one that is most ready and that is the cheapest is wind.[64]

63 Ms Stone, Evidence, 11 September 2009, p 8

64 Dr Diesendorf, Evidence, 2 November 2009, pp 7-8

3.6 Dr Diesendorf also suggested that relatively, wind energy could be developed more quickly:

> … solar thermal is not ready to make the kind of contribution that wind power can make now … Wind farms can be developed very quickly—far more quickly than any conventional source.[65]

3.7 Associate Professor Richard Hindmarsh from the Griffith School of Environment and Centre for Governance and Public Policy at Griffith University, also provided comment on the status of wind energy technology. He stated that dependence on wind energy has resulted from the underdevelopment of other renewable energy sources:

> The technical problem for Australia is that insufficient development of geothermal and solar power, and limited opportunities for more hydropower requires a significant reliance on wind energy as a viable and proven technology.[66]

Contribution to the electricity mix

3.8 NSW currently has approximately 18,000 megawatts (MW) of installed electricity generation.[67] The Committee heard evidence that, of the electricity currently being consumed in NSW, only 6.3 per cent is generated by renewable energy.[68] Hydro energy is the principal source of renewable electricity produced in NSW.[69]

3.9 Ms Stone advised the Committee that if all the proposed wind farm projects were implemented, in addition to those already approved, NSW would have nearly 3,000MW of renewable energy delivered by wind. She argued that "this addition of wind energy will make a significant contribution".[70]

3.10 Dr Diesendorf agrees that wind energy has a significant role to play in the State's renewable energy mix and projects that wind power alone has the capacity to produce up to 20 per cent of Australia's electricity needs.[71]

3.11 The contribution that wind energy makes to the Australian electricity market is examined further in Chapter 4.

Reduce greenhouse gas emissions

3.12 According to the NSW Government, the use of renewable energy such as wind power is a proven way of reducing greenhouse gas emissions because of its ability to displace other forms of energy:

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65 Dr Diesendorf, Evidence, 2 November 2009, p 9

66 Submission 118, Professor Richard Hindmarsh, p 3

67 Ms Stone, Evidence, 11 September 2009, p 2

68 Ms Stone, Evidence, 11 September 2009, p 2

69 Ms Stone, Evidence, 11 September 2009, p 2

70 Ms Stone, Evidence, 11 September 2009, p 2

71 Dr Diesendorf, Evidence, 2 November 2009, p 2

> Each megawatt-hour of energy produced by a wind farm is one megawatt-hour of energy that does not have to be produced by emissive sources such as coal-fired or gas-fired power stations.[72]

3.13 Ms Stone supported the view of the importance of wind power and stated that "wind farms are likely to play a key role in NSW changing to a low-carbon economy".[73]

3.14 Mr Michael Vawser, Director of Wind Prospect CWP, cited evidence regarding the greenhouse gas reductions attributed to wind energy in South Australia:

> I refer to a report in South Australia by ElectraNet, one of its annual reports, which shows that given that wind power now provides about 17 per cent of the State electricity demand, that the emission levels of the electricity industry now in South Australia is back down to 1990 levels. They attribute that almost entirely to wind farms being built in South Australia. It has gone down. It has dropped roughly by about 20 per cent since its peak in 2004-05.[74]

3.15 The role of wind energy in reducing greenhouse gas emissions is considered in greater detail in Chapter 6.

Investment opportunities

3.16 As outlined in Chapter 2, the Commonwealth Government recently expanded its national RET. The target requires 45,000GW hours of electricity to be produced by renewable energy sources by 2020.

3.17 Ms Stone stated that approximately $25 billion to $30 billion of investment is expected to occur as a result of the expanded target and advised that "NSW wants to attract a large share of that".[75]

3.18 She explained that the Government is positioning the State to take advantage of this economic activity and investment by implementing a suite of measures to build the clean energy industry and promote green jobs.[76] These measures will be discussed in further detail later in the chapter.

Abundant wind resources

3.19 While NSW is not identified by the Global Wind Energy Council (GWEC) as having some of the best wind resources in Australia, the Committee heard evidence that there are a lot more wind opportunities in the state than originally anticipated.

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72 Answers to additional written questions on notice, 6 November 2009, NSW Government, Question 3, p 4

73 Ms Stone, Evidence, 11 September 2009, p 3

74 Mr Michael Vawser, Director, Wind Prospect CWP, Evidence, 2 November 2009, p 19

75 Ms Stone, Evidence, 11 September 2009, p 2

76 Ms Stone, Evidence, 11 September 2009, p 2

3.20 Ms Stone explained that initial mapping of wind resources in NSW in the early 2000s did not pick up all of the resources that have been identified by more refined mapping:

> …the Sustainable Energy Development Authority [SEDA] back in 2002 did initial mapping to identify winds based on the knowledge in about 2000. That information has been upgraded by the Commonwealth now and we have a slightly more refined mapping, which shows that there is a lot more wind than SEDA had anticipated. However, industry now is out there doing much more detailed mapping and it appears that there are a lot more wind opportunities in NSW than originally anticipated.[77]

3.21 It is also suggested that, while the best winds in NSW are along the Great Dividing Range and not along the coastline as in other Australian states, there are a number of significant sites in NSW with better wind resources than some European countries with extensive and well-established wind power generation.[78]

3.22 The NSW Department of Industry and Investment states that NSW has an estimated potential for over 3000MW of wind energy.[79]

Price competitiveness

3.23 According to Mr Christian Downie, PhD scholar in the Centre for Climate and Environmental Governance in the Regulatory Institutions Network at the Australian National University, "wind energy is probably the most competitive of all the renewable energy sources".[80] He explained in evidence that while wind energy is still more expensive than fossil fuel per megawatt-hour, wind energy would be competitive with coal and gas fired power stations if they had to "internalise the costs of pollution".[81]

3.24 Mr Downie also suggested that economies of scale and continuing advancements in technology are likely to improve the efficiency of wind power. He advised that wind power is therefore projected to be competitive with all forms of electricity by 2020.[82]

3.25 Professor Hugh Outhred, Professorial Visiting Fellow from the School of Electrical Engineering and Telecommunications at the University of NSW shares the view that wind energy is a commercially proven technology. In evidence, he provided the following example to demonstrate the commercial viability of wind energy technology when compared with solar thermal energy:

> The point about wind is that it is fully commercial. For example, suppose I am just an investment company wanting to invest in a wind farm ... I will get a number of proposals from commercial wind turbine manufacturers who can point to all of their

77 Ms Stone, Evidence, 11 September 2009, p 3

78 Ms Stone, Evidence, 11 September 2009, p 2

79 NSW Department Industry and Investment, *Wind power*, accessed 19 November 2009, <www.industry.nsw.gov.au/energy/sustainable/renewable/wind>

80 Mr Downie, Evidence, 11 September 2009, p 41

81 Mr Downie, Evidence, 11 September 2009, p 41

82 Mr Downie, Evidence, 11 September 2009, p 41

> previous project experience in the commercial fields and give me and my bankers, my financiers, confidence that this is a proven technology and the technological risks are known and understood and, moreover, those companies can carry those technical risks. In other words, if there is a problem with a particular wind turbine they will fix it and they can be relied upon to do that. If I want to buy a large solar thermal power station at the present time, I do not have a choice of providers. Therefore, the technological risks cannot be fully managed in the commercial sense … Therefore, it is not what we call … commercially cost-effective.[83]

The 'clean energy revolution'

3.26 According to the 2009 *State Plan*, the NSW Government recognises climate change as "the greatest environmental and economic challenge facing the planet".[84] Accordingly, the Government asserts that it is actively seeking to "ensure our future power supply is cleaner, affordable and reliable" by implementing a range of measures to increase renewable energy generation.[85]

3.27 On 17 August 2009, the former Premier, the Hon Nathan Rees MP, announced the establishment of renewable energy precincts, the reclassification of certain renewable energy projects as 'critical infrastructure' under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) and state-wide reforms to attract new investment in renewable energy, including a strategic approach to grid-connection. [86]

3.28 These measures are anticipated by the Government to facilitate and expedite the introduction of wind energy as a commercially viable renewable energy technology in NSW. They have been presented by the former Premier in preparation for the 'clean energy revolution' – the predicted surge of investment and growth in the renewable energy sector following the expanded RET.[87]

3.29 Further detail on two of the key measures announced by former Premier Rees is provided below.

Renewable energy precincts

3.30 Six renewable energy precincts are being established across NSW. These are in the New England Tablelands, Upper Hunter, Central Tablelands, NSW/ACT border areas, South

83 Professor Outhred, Evidence, 2 November 2009, p 16

84 NSW Government, *NSW State Plan*, 2009, p 38

85 NSW Government, 2009, p 38

86 Submission 104, p 1

87 Hon Nathan Rees MP, former NSW Premier, 'NSW prepares for clean energy revolution', *Media Release*, 17 August 2009

Coast and Cooma/Monaro.[88] Diagram 3.1 outlines where these precincts are placed within the State.[89]

3.31 According to the Department of Environment, Climate Change and Water, the precincts are based on Local Government Areas (LGAs) known to have high wind resources in order to streamline the planning and approval process for wind developers.[90] The NSW Government submission further explains that LGA boundaries were used to ensure that all viable wind sites were captured:

> Using LGAs as the boundaries was intended to reduce the risk of omitting or excluding potentially viable sites which may currently be under investigation by industry, particularly given increasing technological improvements which will make lower quality wind areas more attractive.[91]

3.32 In addition, Ms Stone advised that the precincts were identified to facilitate a more strategic role in the Government's renewable energy agenda:

> We see the precincts more at the strategic level rather than getting involved in the detail … we are more interested in having them provide the strategic planning, the policy context, and have a feed into that.[92]

88 Submission 104, p 1

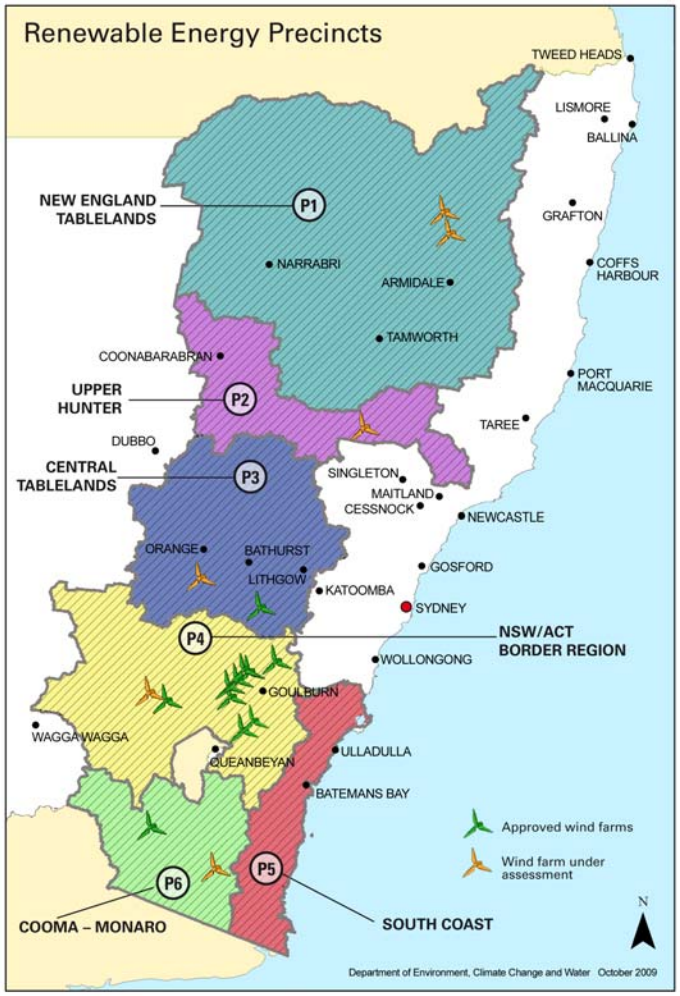
89 NSW Department of Environment, Climate Change and Water, *Renewable Energy Precincts*, October 2009, accessed 26 November 2009, <www.environment.nsw.gov.au/images/climatechange/WindPrecinctsMap.jpg>

90 NSW Department of Environment, Climate Change and Water, *Renewable Energy Precincts*, accessed 26 November 2009, <www.environment.nsw.gov.au/climatechange/windprecincts.htm>

91 Submission 104, p 4

92 Ms Stone, Evidence, 11 September 2009, p 4

Figure 3.1 Renewable Energy Precincts in NSW



3.33 According to the NSW Government submission, the precincts were also created to allow for better, more coordinated engagement with local communities through the establishment of Precinct Advisory Committees (PACs).[93]

3.34 Ms Stone informed the Committee that PACs would improve the community's understanding of wind farm issues and address the relevant needs and concerns of individual precincts:

> One of the important things with working with the precincts is that these communities are made aware of the importance of these areas for renewable energy generation from wind and they are given that information on sort of a precinct basis so that the issues that are important, say, down in the Snowy, are appropriately considered compared with those in the Goulburn Mulwarri area, which is a different set of issues compared with, say, around Glen Innes. So we felt that because there were local differences it would be important to look at those community issues on a

93 Submission 104, p 2

> precinct basis and to have those put in the guidelines that will be considered by the proponents doing their assessment.[94]

3.35 Furthermore, PACs will not only provide advice to local councils on regional issues that may be considered in the assessment of wind farms, but they will also support community programs on renewable energy in general.[95]

3.36 These community partnerships were highlighted in evidence by Ms Jennifer Stace, Manager, Emissions Reduction at the NSW Department of Environment, Climate Change and Water, who advised that the decision to establish PACs was drawn in part from experiences in South Australia:

> In terms of experiences from other jurisdictions, such as South Australia, which already has probably a larger renewable supply than we have in NSW at this time, the key thing is that early engagement with the community is something we have learned from their processes. That has been a contributor into the design in wanting to set up precinct committees in NSW.[96]

3.37 Further discussion of the Renewable Energy Precincts will be provided in Chapter 5.

Reclassification as critical infrastructure

3.38 One of the more significant measures adopted by the NSW Government to promote wind energy generation is the reclassification of all renewable energy projects with the capacity to produce at least 30MW of electricity as 'critical infrastructure' under Part 3A of the *Environmental Planning and Assessment Act* (NSW).[97] Prior to the former Premier's announcement 'critical infrastructure' status was only given to projects with a capacity to produce over 250MW of power. More information on 'critical infrastructure' projects and assessment under Part 3A will be provided later in the chapter.

3.39 Further to this measure, the former Premier announced that critical infrastructure fees for projects of 30MW or more would be waived from August 2009 to 30 June 2011.[98] Clean energy projects qualifying as critical infrastructure would also have their planning processes managed within four months.[99] The implications of these changes will be considered in further detail in Chapter 5.

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94 Ms Stone, Evidence, 11 September 2009, pp 3-4

95 Submission 104, p 2; Ms Stone, Evidence, 11 September 2009, p 3

96 Ms Jennifer Stace, Manager, Emissions Reduction, NSW Department of Environment, Climate Change and Water, Evidence, 11 September 2009, p 10

97 Submission 104, p 1

98 Submission 104, p 1

99 Submission 104, p 1

Overview of the policy and planning framework

3.40 NSW does not have specific wind farm development legislation. Depending on the size, value and status of a project, proposals for wind farms are assessed under a number of planning instruments and are subject to various environmental laws and regulations spanning the breadth of government.

3.41 According to Associate Professor Hindmarsh, this policy collective has resulted in a "history of highly contested planning and policy processes."[100] This has manifested as a key concern raised by Inquiry participants – that of the current lack of a clear, consistent and transparent planning and assessment framework for wind farm developments.

3.42 This concern was reflected in comments made by Mr David Brooks, Deputy Chair of the Parkesbourne Mummel Landscape Guardian, who called for a complete overhaul of the planning approach to wind farm projects:

> The planning framework needs to be drastically reformed, part 3A and the critical infrastructure provisions should be abolished and the whole procedure should be tightened up.[101]

3.43 While planning issues will be examined in detail in Chapter 5, the following sections provide background to the planning instruments and the assessment and approval process currently relevant to wind farm developments in NSW.

Environmental planning instruments

3.44 Wind farm developments in NSW may be assessed under a number of environmental planning instruments. These include the *Environmental Planning and Assessment Act* and associated regulations as well as State Environmental Planning Policies (SEPP), Regional Environmental Plans (REPs) and Local Environmental Plans (LEPs).

3.45 The *Environmental Planning and Assessment Act* is the principal legislation used to guide planning and development in NSW and is the primary means by which our environment and the use of its resources is managed. In particular, Part 3 of the *Environmental Planning and Assessment Act* sets out the plan-making system, including the mechanisms in place to assess and approve certain developments.[102]

3.46 SEPPs, REPs and LEPs are legal documents that regulate land use and development according to the area being impacted. SEPPs and REPs are generally prepared by the Department of Planning, while LEPs are prepared by councils to guide planning decisions for local government areas.

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100 Submission 118, p 8

101 Mr David Brooks, Deputy Chair, Parkesbourne Mummel Landscape Guardians, Evidence, 1 October 2009, p 47

102 NSW Department of Planning, *Legislation and planning instruments*, accessed 26 November 2009, <www.planning.nsw.gov.au/PlanningSystem/Legislationandplanninginstruments/tabid/67/Default.aspx>

3.47 Development Control Plans (DCPs) are prepared in accordance with the *Environmental Planning and Assessment Act* to help achieve the objectives of a LEP by setting out specific requirements for certain types of development of locations.[103] The Committee received evidence from numerous local councils that they have prepared DCPs for wind generation facilities. Issues relating to DCPs that were raised by Inquiry participants are discussed in Chapter 5.

3.48 In addition to these planning instruments, the Department of Planning has advised that *NSW Planning and Assessment Guidelines for Wind Farms* will be developed to guide wind farm planning and provide standardised assessment criteria.[104] Further information on the proposed guidelines is provided in Chapter 2.

Which assessment and approval process applies?

3.49 Under certain circumstances, the Commonwealth Government may be required to assess and approve a wind farm development if it is deemed to impact on a matter of national environmental significance. Matters of national environmental significance protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) include listed threatened species and ecological communities and migratory species protected under international agreements. If a proposed wind farm were likely to affect threatened species for example, the assessment and approval processes under this Commonwealth legislation would apply.[105]

3.50 Local councils may assess smaller wind farm proposals in their jurisdiction using their own planning regulations and DCPs. As explained in paragraph 3.48, DCPs contain comprehensive requirements for certain developments. The current application of these DCPs and how they fit within the streamlined planning processes proposed by the former NSW Premier will be considered further in Chapter 5.

3.51 The majority of wind farms, however, will now be assessed by the Department of Planning under Part 3A of the *Environmental Planning and Assessment Act*, subsequent to the announced reclassification of renewable energy projects with a generating capacity of over 30MW as 'critical infrastructure' (see paragraph 3.38).

3.52 'Critical infrastructure' developments are a type of 'major project' deemed by the Minister of Planning to be essential for the State for economic, environmental or social reasons.[106]

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103 NSW Department of Planning, Legislation and planning instruments, accessed 26 November 2009, <www.planning.nsw.gov.au/PlanningSystem/Legislationandplanninginstruments/tabid/67/Default.aspx>

104 Ms Stone, Evidence, 11 September 2009, p 3

105 Commonwealth Department of Environment, Water, Heritage and Arts, *What is protected under the EPBC Act?*, accessed 26 November 2009, <www.environment.gov.au/epbc/protect/index.html>

106 NSW Department of Planning, *Which development proposals are assessed under Part 3A of the Act – Fact Sheet 1*, October 2009a, p 2

Accordingly, under Part 3A, the Minister for Planning determines the approval of these applications as the consent authority.[107]

3.53 Other wind farm developments may also be approved by the Minister for Planning under Part 3A even if they do not meet the 30MW threshold for consideration as 'critical infrastructure'. For these wind farms, the State Environmental Planning Policy (Major Projects) 2005 may apply.

3.54 Under the SEPP (Major Projects) 2005 wind farm proposals with a capital investment value of more than $30 million, or a capital investment value of more than $5 million and located in an environmentally sensitive area of State significance may be considered 'major projects' and therefore assessed under Part 3A of the *Environmental Planning and Assessment Act*.[108]

The Part 3A environmental assessment and approval process

3.55 Given the 30MW threshold and the application of SEPP (Major Projects) 2005, most wind farms will be assessed under Part 3A of the *Environmental Planning and Assessment Act*. The same assessment process applies to critical infrastructure projects as for other major projects. **Diagram 3.2** outlines the typical steps in this assessment process.[109]

3.56 Under the Part 3A assessment and approval process, it is the responsibility of the Department of Planning to identify and prepare environmental assessment requirements which outline the key issues that developers must address in their environmental assessment of a project.[110] These requirements are specifically tailored to a project and are referred to as Director General's Requirements.[111]

3.57 Environmental assessment requirements for a wind farm development typically include assessments of visual and noise impacts, identification of flora and fauna likely to be disturbed and assessment of the potential impact on indigenous heritage values. Consultation requirements are also outlined and they may specify that the developer undertakes an appropriate and justified level of consultation with the local community when preparing its environmental assessment.[112]

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107 NSW Department of Planning, accessed 1 September 2009, <www.planning.nsw.gov.au/PlanningSystem/DevelopmentAssessmentSystems/Howtofindoutwhichdevelopmentassessmentproce/tabid/92/Default.aspx>

108 *State Environmental Planning Policy (Major Development) 2005*, Schedule 1, 24

109 NSW Department of Planning, October 2009b, p 4

110 NSW Department of Planning, *Steps in the Part 3A assessment process – Fact Sheet 2*, October 2009b, p 1

111 NSW Department of Planning, October 2009b, p 1

112 NSW Department of Planning, October 2009b, p 1; Answers to additional written questions on notice, NSW Department of Planning, 6 November 2009, Question 2, p 3

Figure 3.2 Assessment process for projects under Part 3A of the *Environmental Planning and Assessment Act 1979*

3.58 While the Government has promoted the processes under Part 3A as a more streamlined approach to wind farm approvals, a number of criticisms have been raised by Inquiry participants. For example, there is the view that Part 3A limits community engagement and consultation and allows for the contradiction of local DCPs.

3.59 These criticisms were captured by Mr Ben van der Wijngaart, Deputy Mayor of Kiama Council, who suggested that Part 3A discredits the overall planning process:

> I believe the real problem is the part 3A process, which most communities now realise is the antithesis of community consultation. As soon as a part 3A process starts on a project—I know from my own experience—there is enormous community resistance

> and usually local government resistance as well. The part 3A process does not take into account DCPs, and that is the fundamental problem with it. The DCPs are created certainly by good councils, and I would regard mine as one of the good councils, based on a lot of community consultation and reflection on a very structured process and whatever else to determine what the community desires. When the part 3A process overrides that, as it often does, faith is lost in the overall planning process.[113]

3.60 Community engagement and consultation under the current planning framework will be examined in Chapter 9, while the potential inconsistency between local and state policy will be considered in Chapter 5.

Existing and proposed wind farms in NSW

3.61 Currently, over 170MW of wind energy generation has been installed or is under construction in NSW. At present, there are six[114] wind farms in operation within NSW:

- *Blayney Wind Farm* is located between Orange and Cowra in the central tablelands of NSW. It is comprised of 15 wind turbines, each with a capacity of 660KW. It was commissioned in 2000 and, according to the Department of Industry and Investment, produces enough electricity per year to power 3,500 homes.
- *Crookwell Wind Farm* is located near Goulburn and was installed in 1998. It was the first wind farm in Australia to provide electricity for general use and consists of eight 660KW turbines.
- *Hampton Wind Park* is located past the Blue Mountains, near Lithgow. It has two 600KW wind turbines and was established in 2002.
- *Kooragang Island* is located near Newcastle and has one wind turbine producing 660KW of power. It was installed in 1997 and was the first wind turbine in NSW.
- *Capital Wind Farm*[115] is located near Canberra and is the largest wind farm in NSW. It was completed in 2008 and is currently in the process of being commissioned. It is comprised of 67 wind turbines each with a capacity of 2.1MW.
- *Cullerin Range Wind Farm*[116] consists of 15 2MW wind turbines with, according to Origin Energy, the capacity to power over 14,000 homes. It is located near Goulburn.

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113 Mr Ben van der Wijngaart, Evidence, 2 November 2009, p 30. Mr van der Wijngaart is the Deputy Mayor of the Kiama Council although he appeared in his private capacity

114 Four of the six wind farms - Blayney, Crookwell, Hampton and Kooragang Island – are currently listed on the NSW Department of Industry and Investment website, from which the information on these individual farms has been taken, accessed 19 November 2009, <www.industry.nsw.gov.au/energy/sustainable/renewable/wind>. The Department confirmed the commissioning of two other wind farms – Cullerin Range and Capital Wind Farms. Information on these two wind farms has been referenced accordingly.

115 Infigen Energy, *Capital Wind Farm, NSW, Australia*, accessed 19 November 2009, <www.bbwindpartners.com/assets/australia/capital-wind-farm.aspx>

3.62 The Committee visited the Crookwell, Capital and Cullerin Range Wind Farms as part of this Inquiry (see Appendix 3).

3.63 Additional wind farms that have been approved or proposed for development in NSW are identified by the NSW Government in their submission and are listed on Department of Planning's Major Projects Register.[117] **Table 3.1** outlines these projects and their status as at November 2009.

Table 3.1 Approved and proposed wind farm developments in NSW

Wind Farm	Locality	Status	Description
Crookwell II	Crookwell	Application approved in June 2005	46 wind turbines; 110MW generating capacity
Woodlawn	Tarago	Application approved in October 2005	25 wind turbines; 50MW generating capacity
Taralga	Taralga	Application approved by the Land and Environment Court in February 2007. Modifications to increase turbine height approved by the Court in 2008. Further conditions are currently being considered by the Court.	61 wind turbines; 124-186MW generating capacity
Conroy's Gap	Yass	Application approved in May 2007	15 wind turbines; 30MW generating capacity
Black Springs	Oberon	Application approved in July 2008	Nine wind turbines; 18.9MW generating capacity
Silverton	Broken Hill	Application approved in July 2008	598 wind turbines; 1000MW generating capacity
Gullen Range	Crookwell	Application approved in June 2009	84 wind turbines over four sites (Kialla, Bannister, Pomeroy and Gurrundah); 278MW generating capacity
Glen Innes	Glen Innes	Application approved in October 2009	27 wind turbines; 44-81MW generating capacity
Ben Lomond	Glen Innes	DGRs issued[118]	100 wind turbines; 165MW generating capacity

116 Origin, *Cullerin Range Wind Farm*, accessed 19 November 2009, <www.originenergy.com.au/593/Cullerin-Range-wind-farm>

117 Submission 104, pp 7-8; NSW Department of Planning, *Major Project Assessments*, accessed 16 November 2009, <http://majorprojects.planning.nsw.gov.au/index.pl?action=search&page_id=&search=wind&authority_id=>

118 DGRs issued refers to the Department having issued Director-General's requirements (DGRs) for the project outlining the key issues which need to be addressed by the proponent in an environmental assessment. No such environmental assessment has been lodged as yet.

Wind Farm	Locality	Status	Description
Flyers Creek	Blayney/Orange	DGRs issued	30-40 wind turbines; 80-100MW generating capacity
Sapphire	Glen Innes/Inverell	DGRs issued	147-178 wind turbines over three sites (Kings Plains, Wellingrove and Sapphire); 356-485MW generating capacity
Boco Rock	Bombala/south of Cooma	DGRs issued	127 wind turbines; 270MW generating capacity
Yass	Yass	Project is currently on public exhibition and opportunity for public submissions is available	200 wind turbines over three sites (Coppabella Hills, Marilba Hills and Carrolls Ridge); 450MW generating capacity
Kyoto Energy Park	Scone	Project is currently being assessed by the Department of Planning	Renewable energy facility comprising of 42 wind turbines with a 126MW generating capacity, solar photovoltaic array and hydro-plant

Chapter 4 Wind power and the electricity market

In this chapter issues associated with the integration of wind power into the electricity market are examined. The capacity for wind power to act as a base load source of electricity is addressed as are concerns raised during the Inquiry about the intermittent nature and reliability of wind power. The potential dependence of wind power on back-up electricity sources is also discussed. The use of electricity generated by wind in existing electricity networks and issues such as incorporating variable sources of electricity within the market and network connections are also addressed.

Inquiry participants who raised these issues argued that they reduce or negate greenhouse gas emission savings and hence call into question the validity of promoting wind power as a viable alternative energy source. However, the voracity of these arguments is questioned and refuted by wind farm developers and academics.

Base load power

4.1 One of the Committee's terms of reference is to examine the role of utility scale wind generation in producing base load power. 'Base load power' is the minimum continuous level of power needed to meet demand. The concept of base load power is described in Chapter 2.

4.2 Many Inquiry participants asserted that wind power cannot provide base load power due to the variable nature of wind. The argument followed that since wind cannot act as a base load source of power, it may never replace the dependence on coal-fired power stations or have the reliability and efficiency needed to service a large portion of our energy needs. As such, wind power should not be promoted as it currently is by the NSW Government.[119]

4.3 For example, Mr Paul Miskelly, a resident from Mittagong, stated that "[b]ecause wind farms are an intermittent source of generation, they can never address base load demand."[120] In the submission he prepared on behalf of the Taralga Landscape Guardian, he stated:

> At present there is no form of local electricity storage therefore a grid-connected wind farm simply cannot supply either of these requirements for baseload or off-peak demands.[121]

4.4 Mr Gordon Halliday, a resident from Scone, stated that "[i]t is my understanding that wind farms are inefficient and generate energy only about 30% of the time, in lumps and that wind cannot provide power in isolation of base load power from coal."[122] Mr Julle Bierling, a resident from Scone, also stated:

> It is now widely reported that windfarms are less than 30% effective. Due to the variability in wind speeds, windfarms can never be relied on to supply anything but

119 See for example, Submissions 18, 34, 53, 84,110

120 Submission 65, Mr Paul Miskelly, p 6

121 Submission 84, p 10

122 Submission 18, Mr Gordon Halliday, p 1

> occasional power. Base load power can never be turned off, the wind may suddenly vanish.[123]

4.5 Other Inquiry participants, including several eminent academics, rejected these concerns. These participants agreed that base load is not a term that is necessarily relevant to wind power and that, in any case, whether or not wind power can produce base load power does not undermine the relevance of wind power in the national electricity mix. Wind power still has an important role to play in the mix of electricity sources that combine to service NSW.

4.6 For example, Mr Ben van der Wijngaart stated that the inability of wind power to produce base load power is a myth and that 'base load' is a misunderstood term:

> The myth that wind power, or for that matter other renewable energy resources, being unable to produce base-load power or that it is intermittent, is often propagated by the coal and nuclear industries to foster their own interests. Also, while the term base-load power is often quoted, it is commonly misunderstood.[124]

4.7 Mr Robert Holmes, Managing Director of Senergy Econnect Australia also believes that the base load argument against wind power is common but not substantiated:

> There is often an argument amongst different groups that wind energy cannot supply base load power as a substitution to traditional fossil fuel generators due to the 'intermittent' nature of wind. However, with appropriate use of wind forecasting techniques, generation planning and coordination, along with energy storage technologies, it can be shown that wind energy can contribute to base load energy requirements with existing and proven technologies.[125]

4.8 Epuron asserted that wind power is *already* used as a base load and off-peak source of electricity: "[u]tility scale wind generation in NSW currently supplies off-peak and base load power …".[126]

4.9 Mr Adrian Nelson, Executive Director of Future Energy believes that arguments against wind power that focus on its ability to provide base load power have a focus that is too narrow, as transition to a low carbon system will take a long time:

> The issue of dispatchability and base load power are often raised as reasons why wind farms should not be encouraged. In our view, a bigger picture view need to be taken. The transition of Australia's energy infrastructure to a low or zero carbon system must be seen as a 50 year journey in which coal generation will only phase out as dispatchable base load alternatives become viable and are constructed at scale.[127]

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123 Submission 20, Mr Julle Bierling, p 2

124 Submission 42, Mr Ben van der Wijngaart, p 8. Mr van der Wijngaart is the Deputy Mayor of Kiama and was head of a working group appointed by the Southern Councils Group earlier this year to conduct a high-level preliminary investigation of a community-based wind power generation on the South Coast of NSW Council, although he made his submission in his private capacity

125 Submission 95, Senergy Econnect Australia, p 4

126 Submission 91, Epuron, p 10

127 Submission 57, Future Energy, p 3

4.10 Dr Mark Diesendorf, Deputy Director of the Institute of Environmental Studies at the University of NSW, stated that the concept of 'base load' power is an artificial concept:

> You can also consider the concept of base load to be something that is rather an artificial concept that has been created in order to bless coal, because it is such an inflexible form of generation.[128]

4.11 In relation to the usefulness of using the concept of base load power to describe wind power, Professor Hugh Outhred, Professorial Visiting Fellow from the School of Electrical Engineering and Telecommunications at the University of NSW, stated that the concept can be applied to wind power, however, it is not appropriate:

> If you want to, you can apply the concepts of base load and peak load to a system that is predominately renewable, but really it is not that appropriate—you just have a different mix. The key thing is, can you make that system as reliable as the conventional plant? I would say, yes. That is on the basis of modelling that my colleagues and I did when I was in CSIRO and teams in Britain and Holland and elsewhere have done more recent modelling.[129]

Intermittency and back-up

4.12 Many Inquiry participants who reside in areas where wind farms operate or are proposed to operate highlighted the variable nature of wind and the impact that this may have on the reliability of wind power.[130] This argument was used to dispute the promotion of wind power. Such participants also stated that the need to 'back-up' wind power from non-renewable sources such as coal-fired power stations is uneconomical and may reduce or negate the greenhouse gas emission savings of wind farms.

4.13 For example, Mrs Janine Hannan, a resident of Roslyn, commented that "[w]hen the wind don't blow, the power don't flow."[131] This concern was also identified by Mr Peter Sherwin and Mrs Rosemary Noakes-Sherwin, residents from Taralga, who stated:

> When there is no wind there is no electricity and wind farms only operate for less than 1/3 of the time that they are standing, so conventional generation is still required as backup.[132]

4.14 Mr Miskelly, also expressed concern that wind power requires back-up from other energy sources and as a result "… wind generation causes the backing plant to operate potentially very inefficiently."[133]

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128 Dr Diesendorf, Evidence, 2 November 2009, p 9

129 Professor Outhred, Evidence, 2 November 2009, p 9

130 See for example, Submissions 36, 53, 81, 69 1

131 Submission 25, Mrs Janine Hannan, p 1

132 Submission 69, Mr Peter Sherwin and Mrs Rosemary Noakes-Sherwin, p 1

133 Submission 84a, Taralga Landscape Guardian, p 6

4.15 Dr Alan Shaw, a retired chartered engineer from Norfolk in the United Kingdom, agreed with the view that wind farms require non-environmentally friendly back-up:

> Wind power cannot be used in utility-scale generation unless backed up with a matching Megawatt capacity of "responsive" generation which is almost certainly NOT GHG [greenhouse gas] free. The output of the backup plant has to give way to wind power whenever the turbines have wind enough to generate.[134]

4.16 Technical difficulties associated with incorporating a "… highly variable and intermittent generation source into the national grid" were identified as a concern by Ms Wendy Bell from the Molonglo Landscape Guardian.[135]

4.17 Mr Dennis Workman, a contributor to the inquiry, believes that wind power makes other electricity sources less efficient:

> Wind power cannot work without other generating plant in the system capable of accommodating its fluctuations in output. It is not a symbiotic relationship where each type of generating plant needs the other in order to succeed. It is a parasitic relationship and wind is the parasite literally sucking the efficiency out of coal fired thermal plant and will force the coal fired thermal plant to be operated in a way it in which it was never designed to be operated.[136]

4.18 The use of alternative sources of electricity to back-up wind power was reported to contradict the greenhouse gas savings achieved by wind power. For example, Dr Shaw stated:

> Therefore the backup plant runs at uneconomic generation levels which adds greatly to the already high cost of wind power and largely negates the GHG benefit of the turbines themselves.[137]

4.19 Dr Burraston and Ms Last informed the Committee that a journal article was developed in 2008 titled *Will British weather provide reliable electricity,* that concluded the amount of back-up conventional fossil fuel power station CO_2 emissions need to be factored into wind industry carbon saving calculations.[138]

4.20 The amount of back-up required to support wind power was also identified as an issue by Mr Peter Smith, a resident of Wellingrove. He stated that back-up generators would need to be constructed with at least 90 per cent capacity of the wind farm to ensure a constant supply of electricity.[139] Alternatively, he suggested that coal-fired power stations would be required to continue at the same output levels as existed prior to the wind farm being constructed.

4.21 Other Inquiry participants, however, believe that having a number of wind farms spread across large geographical areas effectively reduces the variability of wind power. For example,

134 Submission 110, p 2

135 Submission 53, p 15

136 Submission 68, Mr Dennis Workman, p 3

137 Submission 110, Dr Alan Shaw, p 2

138 Submission 81, Dr David Burraston and Ms Sarah Last, Attachment H, p 5

139 Submission 8a, Mr Peter Smith, p 1

Mr Mark Dixon, Senior Project Manager, Pamada, reported that having a number of wind farms spread across different locations and wind regimes reduces variability, stating that a "… net contribution which is considerably less variable than each of the wind farms alone" is provided.[140]

4.22 This is supported by Professor Outhred who reported that "… diversity between different wind farms smooths the summated outputs of multiple wind farms compared to that of an individual wind farm."[141]

4.23 Dr Diesendorf acknowledged that wind is less constant than coal, but argued that wind power can be made as reliable as coal through "… dealing with the short lulls, which are usually from hours to several days, reflecting the passing of weather fronts."[142] Dr Diesendorf disputed that wind power itself was intermittent, advising that "[l]arge-scale wind power is not intermittent, because it does not start up or switch off instantaneously at irregular intervals." [143]

4.24 He also stated "[t]here is no such thing as a totally reliable source of electricity."[144] In this regard he stated that "… conventional power station[s] breaks down unexpectedly from time to time, causing an immediate loss of all its power. That is true intermittency, a particular type of variability that switches between full power and no power."[145]

4.25 Professor Outhred said the arguments that wind power cannot be included in the 'day ahead bid-stack' and that wind power requires very expensive back-up "… is not correct."[146] Professor Outhred also referred to his extensive experience in the design of the electricity market noting that at the time of the development of the National Electricity Market (NEM) incorporating non-storable renewable energy fluxes was taken into account:

> … in terms of what we call the National Electricity Market in Australia, my research into the question of implementing competition in the electricity industry now goes back 40 years. The principles on which the National Electricity Market is based are written up in papers that myself and my colleagues published in 1980 for work done in 1979. So I do have a deep understanding of the market design we have. Because at that time I and my colleagues were engaged in working out design principles for such markets, we were already taking into account the question of how you would incorporate non-stored renewable energy fluxes. The design that we have is appropriate and able to accommodate these resources.[147]

140 Submission 89, Pamada, p 7

141 Outhred H, 'National wind power study, an estimate of readily accepted wind energy in the National Electricity Market', November 2003 p 4

142 Dr Diesendorf, Evidence, 2 November 2009, p 9

143 Submission 116, Dr Mark Diesendorf, p 10

144 Submission 116, p 9

145 Submission 116, p 9

146 Professor Outhred, Evidence, 2 November 2009, p 10

147 Professor Outhred, Evidence, 2 November 2009, p 10

Current electricity network

4.26 Some Inquiry participants expressed the view that the integration of wind power into the existing electricity network faces technical problems and limitations. It is argued that wind power cannot be stored, so traditional means of managing electricity do not apply to this 'variable' source of power. Background to the Australian electricity supply system is provided in Chapter 2.

4.27 For example, Mr Peter Mitchell, the Chairman of the Economics and Scientific Committee of the Australian Landscape Guardian, stated that there are problems with the power grid which prevent wind power from effectively integrating into the existing network:

> Compounding this, power grids cannot store power; there is no economically practical way to store large amounts of power. Thus grid managers must control the power input to the grid, otherwise there will be power failures. The introduction of large amounts of highly variable and unpredictable wind power provides a significant challenge to safe and reliable management of power grids.[148]

4.28 Mr Mitchell also believes that the electricity grid requires gas generators to operate at levels equal to the maximum electricity output of wind farms to balance wind power production. If this doesn't occur, he believes that the "… chronic variability of wind power …" will be unmanageable.[149]

4.29 Ms Wendy Bell, President of the Molonglo Landscape Guardian also expressed concern regarding incorporation of wind power into the current electricity grid, stating: "[o]ne of the technical problems facing wind energy is the problem of incorporating this highly variable and intermittent generation source into the national grid."[150] Mr Paul Miskelly, a resident from Mittagong, stated:

> 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.[151]

4.30 However, others disputed the notion that the current electricity grid cannot support wind power, as it already does support it as well as other variable sources of power.

4.31 For example, Dr Diesendorf believes that the electricity network can incorporate wind power and that it already does. He stated that "… electricity grids are already designed to balance intermittent conventional supply against variable demand." [152] He also stated that "because it is very expensive to store electricity on a large scale, electricity grids are perpetually balancing intermittent supply against variable demand." [153]

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148 Submission 4, Australian Landscape Guardians, p 2

149 Submission 4, p 3

150 Submission 53, p 15

151 Submission 65, p 5

152 Submission 116, p 9

153 Submission 116, p 9

4.32 A paper prepared this year by Professor Outhred and Mr Stuart Thorcraft for a conference on System Sciences, described why the integration of wind energy into the current network faces challenges:

> … solar and wind energy resources are also rapidly varying, stochastic, distributed energy fluxes that introduce new issues for electricity industry design and operation, which have traditionally assumed that primary energy resources are storable. Thus the new environmental objectives may conflict with traditional objectives such as reliability of supply.[154]

4.33 However, the paper also noted that the systematic approach in Australia to the problem of integrating "… high levels of renewable energy penetration …" has "… achieved notable success to date."[155] This may be as a result of the Australian NEM being designed from the outset to accommodate renewable energy sources.[156]

4.34 The NSW Government submission stated that a number of changes have been made to the NEM to facilitate greater integration of wind generation, including:

> … the creation of a new category of generation (semi-scheduled) to better manage wind energy connected to the NEM, investment in sophisticated wind forecasting technology, and increased control for the market operator over the permitted output of wind generators.[157]

4.35 Mr Andrew Macintosh, Associate Director, Centre for Climate Law and Policy at the Australian National University and Mr Christian Downie, PhD scholar, Centre for Climate and Environmental Governance in the Regulatory Institutions Network at the Australian National University, identified that up to 20 per cent wind energy penetration into a large electricity network can generally be managed before problems occur and that since only 0.5 per cent of energy is supplied by wind power in Australia, it is too little to cause a problem.[158]

4.36 Professor Outhred stated that wind farms can cause disturbances to power systems, however, he also reported that these disturbances can be managed.[159] In the report prepared for the Australian Greenhouse Office, Professor Outhred concluded that the NEM could readily accept 8000 MW of wind power, provided that the wind farms:

- are installed in a progressive manner
- are widely dispersed
- use advanced wind turbine technology

154 Submission 119, Appendix 1, p 1

155 Submission 119, Appendix 1, p 1

156 Submission 119, Appendix 1, p 3

157 Submission 104, p 3

158 Submission 48, Mr Andrew Macintosh, and Mr Christian, Appendix 1, p 12

159 Outhred, H, November 2003 pp 6-7

- use advanced wind forecasting techniques to predict the future behaviour of wind farms and groups of wind farms.[160]

4.37 Professor Outhred acknowledged that all energy resources have problems and limitations and that a focus on the mix of electricity sources is beneficial:

> It turns out that all of these resources have their problems and their limitations. What we have to do is balance the strengths and weaknesses of each and try to find an appropriate mix of resources by which we as a society get the most benefits at the lowest costs. Of course, those costs are not just the direct costs that are incurred by organisations in terms of accounting costs; they are the so-called full economic costs, many of which are going to be incurred by future generations rather than us today.[161]

4.38 Epuron stated that the current electricity system is designed to cope with electricity sources such as wind power:

> Modern integrated networks are designed to cope with 'shocks' such as the sudden loss of large thermal power stations and with uncertainties in consumer demand. No special backup provisions need to be made for wind energy. All generating plants make use of a common pool of backup plant that is typically around 20% - 25% of the peak demand on the electricity network.[162]

4.39 Mr Geoff Dutaillis, Chief Operations Officer for Infigen Energy, also stated that the current electricity market can and does handle wind 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 lamest 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.[163]

4.40 Ms Megan Wheatley, Business Development Manager from Suzlon Energy Australia, believes that "… there are a range of measures to manage an increased penetration of wind energy in the network."[164] This is supported by Pacific Hydro which stated "Australia is uniquely positioned to support world-leading levels of naturally variable energy sources into the NEM."[165]

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160 Outhred, H, November 2003 p 17

161 Professor Outhred, Evidence, 2 November 2009, p 10

162 Submission 91, p 10

163 Submission 101, Infigen Energy, p 1

164 Submission 78, Suzlon Energy Australia p 1

165 Submission 106, Pacific Hydro, p 3

4.41 Mr Lane Crockett from Pacific Hydo believes that world class forecasting assists Australia in managing the variability of wind power, stating:

> This world class forecasting system has allowed Australia to learn from the mistakes of some European countries where rapid wind energy build rates were not supported by precautionary forecasting and information control systems that are required to manage large volumes of naturally variable generation.[166]

Network connection

4.42 Some Inquiry participants expressed concern that current wind farms need to be constructed close to existing transmission networks due to the expense of constructing new transmission lines and this results in wind farms being constructed close to houses. Wind farm developers also highlighted the high upfront costs associated with connecting wind power to transmission networks as a deterrent to developing sites for wind power generation that are far away from houses.

4.43 Proximity to the electricity grid is a key factor in site selection for potential wind farms,[167] due to the expense associated with building new transmission lines. Current electricity transmission networks are generally located close to populations which result in conflict between the residents who live near the electricity network and the wind farm.

4.44 Evolution of the current electricity grid is driven by coal-fired power stations.[168] For example, there are a small number of coal-fired power stations that support a very large area, so the current grid system feeds into the main urban centres.

4.45 Dr Diesendorf suggested that "[w]e need an electricity grid that is more distributed and that can handle the principal power transmission sources of the future, which are wind, solar and geothermal."[169]

4.46 The efficiency of current grid technology was questioned by Mr William Gill, Commercial Manager of Pamada. He feels that there are significant improvements required to reduce the amount of line loss:

> We are working with nineteenth century technology with the grid in Australia at the moment. There is an 8 per cent loss throughout the whole grid throughout the country. If you take the amount of electricity produced and the electricity actually used, there is about an 8 per cent difference. The grid has got to be made more nimble.[170]

4.47 Ms Bell expressed concern regarding the cost associated with connecting wind farms to the electricity grid and compatibility issues:

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166 Submission 106, p 4

167 Mr Mark Dixon, Project Manager, Pamada, Evidence, 11 September 2009, p 24

168 Dr Diesendorf, Evidence, 2 November 2009, p 7

169 Dr Diesendorf, Evidence, 2 November 2009, p 7

170 Mr William Gill, Commercial Manager, Pamada, Evidence, 11 September 2009, p 23

> The other area of major concern is with the large inter-connectors on transmission lines. These have defined limits as to how much power can be put across the lines - too much power going too fast will trip the lines. Regulators are incorporated to stop the lines tripping. Generators close to connection points along the transmission lines are the controllers of the flow of power. If wind generation is one of those generation sources, the ability to control the speed lessens because it is not possible to control the speed of the wind. Therefore, it is necessary to have some other form of power generation close to the connection point as the moderator of the flows of electricity.[171]

4.48 The Bathurst Community Climate Action Network, however, believes that the issues regarding transmission lines relate to the lack of lines of appropriate capacity that can support wind power in appropriate areas:

> … many suitable sites are constrained by a lack of suitable power transmission infrastructure. For example, a single utility scale wind turbine produces too much power to connect to the typical rural 11,000-volt powerlines. Potential wind farm sites in NSW located close to powerlines rated at 66,000 volts or higher are rare. Connecting a new wind farm to distant powerlines involves considerable additional expense and is often uneconomic unless the wind farm is very large … New powerlines would drive development in the NSW Government's Renewable Energy Precincts for wind energy.[172]

4.49 The view that the cost of new transmission lines prevents wind farms from being constructed in remote areas is supported by Mr Dutaillis, who stated:

> 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 330kVline could cost about 3 times 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.[173]

4.50 Mr Tim O'Grady, the Head of Public Policy at Origin Energy stated that the cost of transmission infrastructure could deter the development of wind farms in remote areas:

> The long distances inherent in the development of renewable energy in Australia will make the cost of transmission connection going forward a key factor in determining the viability of projects. The high upfront costs of transmission infrastructure could therefore act as an impediment to remote wind generation connecting. [174]

171 Submission 53, p 16

172 Submission 66, Bathurst Community Climate Action Network, p 4

173 Submission 101, p 2

174 Submission 54, p 6

4.51 Mr O'Grady noted that the Australian Energy Market Commission (AEMC) has recently proposed a solution that might address this issue – the Network Extension for Remote Generation Proposal:

> The AEMC is currently conducting a review into the impact of climate change policies on energy markets, and has proposed a solution to help address this issue. The so called "Network Extension for Remote Generation Proposal" would facilitate the efficient building of transmission connection assets through the regulatory process with generators repaying their portion for the use of the asset as they connect. Origin is supportive of this model and considers that it will be instrumental in ensuring the connection of remote generation such as wind to the electricity network.[175]

4.52 An Inquiry conducted by the Victorian Government into the approvals process for renewable energy projects heard from Mr N Watt, Manager, Network Assets Strategy and Performance, CitiPower and Powercor Australia, in July 2009. Mr Watt also provided comment on the Network Extension for Remote Generation Proposal:

> We do see some issues with that AEMC approach. It is a very complex approach and may not provide the most efficient process for a lot of wind farm connections. It gives a role to AEMO, the Australian Energy Market Operator, which deals with the transmission issues in the grid, and gives it a role within distribution network planning, which is currently outside its role and its obligations. There is some work yet to be done on getting an efficient process for that.[176]

4.53 Wind farm developers are currently required to pay for the construction of extra transmission lines that may be required to service their wind farm.[177] However, Dr Diesendorf does not believe this is consistent with other forms of electricity generation and stated:

> The transmission lines of coal-fired power stations were paid for from electricity rates, where effectively urban electricity consumers subsidised rural consumers as a cross-subsidy in paying for those transmission lines. I would argue that it is now unfair, as well as economically inefficient, to go back to a situation where wind farm developers have to pay for their transmission lines to connect.[178]

4.54 Bathurst Community Climate Action Network also believe that the upfront costs of network connection is an issue in wind farm development and stated that improvement could be made to the current transmission connection process:

> The network connection cost for embedded generators is an upfront cost. It would be encouraging to embedded generators to have the cost of connection amortised over a suitable period or the cost of connection to be carried by the network owner and the costs recouped through transmission charges.[179]

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175 Submission 54, p 6

176 Mr Neil Watt, Manager, Network Assets Strategy and Performance, CitiPower and Powercor Australia, Evidence, Victorian Government, Environment and Natural Resources Committee, Inquiry into the approvals process for renewable energy projects, 6 July 2009, p 22

177 Dr Diesendorf, Evidence, 2 November 2009, p 8

178 Dr Diesendorf, Evidence, 2 November 2009, p 8

179 Submission 66, p 4

4.55 Another issue that relates to the connection of wind farms to the existing network is the planning of the connection. Mr Dixon believes that not enough consideration is given to this issue early in the planning process:

> At the outset no consideration is given to how these parks fit into the network. It is an end of thought process. You look at where the wind is, you look at the topography, you establish whether any outstanding social issues are apparent, and you look at the planning constraints. You then say, "Okay, now I need to get connection." It just seems to be an afterthought. It is a major issue.[180]

4.56 Professor Outhred agrees that large wind farms may "… require substantial network augmentation or extension to connect them to the existing network …"[181]

Committee comment

4.57 The Committee notes the differing views regarding whether wind power can provide base load power. We question the usefulness of attempting to describe wind power according to a concept that was designed for coal. The arguments against wind power being used as a base load source of electricity revolved around the reliability of wind power. However, the Committee notes that wind power is being successfully used in the current electricity market at present and there is research that concludes that wind power can provide a reliable source of electricity.

4.58 The Committee notes the potential difficulties identified by some Inquiry participants regarding the integration of wind power into the current electricity grid. However, it is evident that planning to prevent these issues commenced during the 1980s and as a result, wind power is currently integrated successfully.

4.59 The Committee acknowledges the concerns regarding the intermittent nature of wind. However, we did not receive credible evidence to demonstrate that these concerns have eventuated, such as the National Electricity Market encountering problems due to the intermittent nature of wind. On the contrary, evidence indicates that wind is not the only variable source of electricity that is successfully managed in the NEM. The Committee also notes that no electricity source is 100% reliable and that the NEM appears to handle wind power effectively.

4.60 The differing opinions on whether wind power requires uneconomical and greenhouse emitting back-up are noted by the Committee. The Committee further notes that the NEM appears to have been developed in such a way that 'non-storable renewable energy fluxes' such as wind power do not undermine the system. As such, the Committee does not believe that arguments against the use of wind power that are based on the back-up requirements are justified.

4.61 The Committee notes the advice of Professor Outhred who stated that wind power should be viewed as part of a broader mix of resources. The Committee believes that this is important

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180 Mr Dixon, Evidence, 11 September 2009, p 22

181 Outhred H, 'Wind energy and the national electricity market with particular reference to South Australia' Version 8, A report for the Australian Greenhouse Office, March 2003 p 23

when considering the potential weaknesses of wind power. The Committee also notes that all electricity resources have strengths and weaknesses and that wind power should be considered as part of the broader mix. However, even having considered wind power largely in isolation, as this Inquiry has been tasked to do, the Committee believes that wind power has been planned for, effectively integrated into the electricity network and continues to be managed appropriately.

4.62 The issues regarding the connection of wind farms to transmission networks are acknowledged by the Committee. The Committee understands that wind farms are currently constructed near existing powerlines of appropriate voltage, as the cost of constructing new powerlines rests with the developer and may be seen as prohibitive. The Committee also notes that this contributes to wind farms being located near communities whose interests may not be compatible with the wind farm.

4.63 The Committee notes the inconsistency in how new transmission lines are required to be paid for, when the coal industry is compared with the wind industry. The Committee believes that additional payment options that support the construction of transmission lines for wind farms are required. Alternative payment options may provide incentives for wind farms to be constructed away from existing communities and ensure that the development of renewable electricity sources such as wind power are supported appropriately.

4.64 The Committee notes the 'Network Extension for Remote Generation Proposal' developed by the Australian Energy Market Commission, which presents an alternative payment option for the construction of transmission networks. The Committee has concluded that this proposal should be supported by the NSW Government in addition to the development of other options that would support the construction of new transmission lines for the wind power industry in more remote locations.

Recommendation 1

That the NSW Government develop and introduce alternative payment options for the construction of new transmission lines for the wind power industry in more remote locations in New South Wales, including supporting the Network Extension for Remote Generation Proposal put forward by the Australian Energy Market Commission.

Chapter 5 Planning, policy and legislation

This chapter examines the concerns identified by Inquiry participants regarding the planning of wind farms. It includes discussion of relevant state and local government policy, including the use of Development Control Plans. Noise regulations, guidelines and monitoring are also addressed from the perspective of the planning policy and legislation that is required to ensure wind farm noise is managed effectively. The issue of setback distance is examined, as is the role that the recently created Renewable Energy Precincts may have in improving the management of locations that host wind farms. The chapter concludes by considering wind farm decommissioning, environmental assessment, compensation and local ownership.

Wind farm policy and legislation

5.1 There is a variety of policy and legislation that applies to wind farm development and operation in NSW, as described in Chapter 3. Some inquiry participants expressed concerns regarding the lack of clear and consistent wind farm policy at a state and local level. Other concerns were expressed regarding assessment of wind farm proposals and insufficient consideration of the community impact.

5.2 There is contention regarding the relevant policy and legislation to manage the development of wind farms in NSW. In addition, legislative changes have occurred that may further reduce the effective management of wind farm development and operation in NSW. Evidence to this Inquiry demonstrated that this has resulted in confusion for stakeholders involved in the development of wind farms.

5.3 The *Draft National Wind Farm Development Guidelines* were developed to identify nationally consistent best practice methods for addressing issues relating to wind farms.[182] As there are no comprehensive national guidelines currently, these guidelines may provide improved guidance for wind farm planning for issues such as impacts of noise and impacts on landscape, birds and bats.

5.4 The NSW division of the Planning Institute of Australia believes that the absence of state guidelines for the development of wind farms in NSW is a concern:

> The main concern associated with wind farms in rural NSW is the lack of suitable planning guidelines … PIA would like to see a State wide code or guidelines for the design, development and assessment of wind farms and including procedures for community consultation. The development of guidelines will provide certainty for proponents, the assessor and the community; and consistency in assessment of development proposals for wind farms.[183]

5.5 Ms Yolande Stone, Director of Policy, Planning and Systems Reform, Department of Planning, stated that

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182 EPHC, October 2009, p 7. As discussed in Chapter 2, this Council was established by COAG in 2001.

183 Submission 100, State Manager, Planning Institute of Australia, NSW division, p 2

> The Department of Planning and the other agencies will be developing the NSW planning and assessment guidelines for wind farms to provide a consistent framework for assessment of wind farms in NSW consistent with the national guidelines.[184]

5.6 Although this will be an improvement on the current policy position, there are some issues that are not addressed in the *Draft National Wind Farm Development Guidelines*, which if not addressed by the development of the *NSW Planning and Assessment Guidelines for Wind Farms*, will result in guidelines that do not adequately address the issues identified through this Inquiry.

5.7 In addition to developing consistent policy and legislation, there is also a need for the policy framework to give greater consideration to the community impacts of wind farms.

5.8 Recent policy changes have reduced the amount of time that wind farm developments take to obtain development approval. It has been suggested by some Inquiry participants that a corresponding policy change is required that addresses the impact of wind farms on the communities in which they are located.

5.9 Legislation has recently been amended to expedite the planning process for wind farms in NSW. In addition, policy has been changed to enable faster processing of critical infrastructure planning applications, critical infrastructure fees have been waived and renewable energy precincts have been announced. For example approval is no longer required to erect wind monitoring towers:

> To facilitate investment in wind energy, in early 2008 the Department of Planning introduced new planning legislation which exempted developers from the need to obtain any form of planning approval to erect wind monitoring towers subject to meeting certain requirements.[185]

5.10 Unfortunately, planning legislation and policy changes to provide clear guidance to address issues such as community consultation and engagement, noise, communication and complaint handling processes have not been implemented as swiftly. As a result, there is a perception that the needs of politicians and developers are being prioritised over those of the local communities that may host wind farm developments.[186] In this regard, one contributor to the Inquiry, nghenvironmental, suggested that:

> The Part 3A Major Project legislation in NSW reinforces the perception that the broader population will be served by the decision at the expense of the local community, by taking the decision away from local councils and placing it with state government."[187]

5.11 Mrs Jennifer Price-Jones, local resident of Crookwell, believes that the public is not adequately involved in wind farm development application processes:

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184 Ms Stone, Director, Evidence, 11 September 2009, p 3

185 Submission 104, pp 3-4

186 See for example, Submissions 20, 49, 27, 69

187 Submission 93, nghenvironmental, p 6

> The most negative aspect of wind turbine development is the manner in which the public is, in effect, disenfranchised by the current processes of approval. On paper it appears that the public is consulted in a number of ways. Firstly, the developer must undertake a community consultation process as part of its development application. This is nothing short of a charade, simply a tick-the-box exercise to say that it has been done and to satisfy the Department of Planning.[188]

Development Control Plans

5.12 Some Inquiry participants expressed concern and frustration that policies or guidelines developed at the local council level are not required to be taken into consideration in utility-scale wind farm development applications. The perception that local policies are overlooked for the greater good of the state have increased feelings of disenfranchisement in local communities.

5.13 Development Control Plans (DCP) are documents "… prepared by a local council under the *Environmental Planning and Assessment Act 1979* that contains detailed guidelines that must be considered when carrying out new development."[189] DCPs are described in Chapter 3.

5.14 DCPs specifically for wind power generation have been produced by some local councils who have, or may have, wind farm developments in their area. Development of these plans involves consultation with the local community and, as a result, they can vary between council areas.

5.15 However, wind farms in NSW are not required to follow local DCPs if they are assessed by the Department of Planning under Part 3A of the *Environmental Planning and Assessment Act*. Some Inquiry participants have identified the ability for wind farm developers to bypass local DCPs as a concern, because local communities have an expectation that the requirements set out in a DCP will be adhered to in the event that relevant developments are constructed.

5.16 The Glen Innes Severn Council advised that a DCP was created in their local area in 2008 due to a lack of State government direction and guidelines.[190] However, Glen Innes Wind Farm was assessed by the Department of Planning under Part 3A and was approved in October 2009, without being required to adhere to the Council's DCP for wind generation.[191]

5.17 The Environmental Assessment for Glen Innes Wind Farm acknowledged the local DCP and provided the following reason for not complying with the two kilometre setback that is required by the DCP:

> The setback distance appears to follow that proposed by the Upper Lachlan Shire Council in the Southern Tablelands of NSW. However, the two kilometre setback is greater than that applied for many other wind farm sites and in planning instruments

188 Mrs Jennifer Price-Jones, Resident, Crookwell, Evidence, 1 October 2009, p 51

189 Department of Environment, Climate Change and Water, *Glossary*, accessed 24 November 2009, <www.environment.nsw.gov.au/salinity/glossary.htm>

190 Submission 19, Glen Innes Severn Council, p 1

191 NSW Department of Planning, *Major Project Assessment: Glen Innes Wind Farm,* August 2009 p 7, *Environmental Planning and Assessment Act 1979* (NSW), s 75F

> for other Australian States and overseas locations. Other planning instruments do not always specify a particular setback distance and instead base acceptability of the wind farm proposal on the impacts at neighbouring locations.[192]

5.18 Ms Judith Wheeler, Secretary of the Upper Hunter Landscape Guardian, expressed dismay that the Department of Planning "… just ignores absolutely everything at the local level."[193] She also stated that "… the community itself feels totally disenfranchised about the whole process", partly as a result of local DCP not being acknowledged by the Department of Planning.[194]

5.19 The Upper Hunter Shire Council supports the view that ignoring DCPs can create adverse perceptions in the local community:

> I have heard of that happening at Oberon as well. Oberon had a development control plan and had an approval for turbines being placed at a distance less than that specified. I think that reinforces the need for a common State accepted guideline. What is the point of us going through and getting something that the community has an expectation will be applied and then the department simply takes no notice of it? It is sending out the wrong message in my view.[195]

5.20 Politicians have also made statements that emphasise the importance of taking local planning into consideration. Such statements may exacerbate the frustration of local residents, who feel that local concerns are being ignored. For example, in March 2009 the Glen Innes Examiner quoted the former Premier Nathan Rees as saying "[w]ind farm developments should comply with local council and community standards."[196] The local Member, Hon Richard Torbay MP has expressed that he supports renewable energy development and also believes that wind farms should comply with local council and community standards.[197]

5.21 Despite the community consultation that informs the development of a DCP and the local knowledge held by local council, the developer Epuron believes that:

> Some DCP's provide unreasonable and unachievable requirements that are inconsistent with State and Federal policy. Many of the requirements are prescriptive and have no sound basis.[198]

5.22 The Department of Planning advised the Committee that standard assessment criteria would be provided for wind farm development through the *NSW Planning and Assessment Guidelines for Wind Farms*.[199] The Committee was informed that these NSW guidelines are proposed to be

192 Connell Wagner, *Glen Innes Wind Farm Environmental Assessment*, October 2008, p 4-10

193 Ms Judith Wheeler, Secretary, Upper Hunter Landscape Guardian, Evidence, 16 October 2009, p 16

194 Ms Wheeler, Evidence, 16 October 2009, p 16

195 Mr David Casson, Director, Environmental Services, Upper Hunter Shire Council, Evidence, 16 October 2009, p 36

196 'Wind farms should comply with local standards: Rees', *Glen Innes Examiner*, 19 March 2009

197 Hon R Torbay MP, 'Noise a key factor in wind farm developments', *Media Release*, 2 March 2009

198 Submission 91, p 14

199 Submission 104, p 5

consistent with the *Draft National Wind Farm Development Guidelines* and should be completed by mid 2010. Background to the NSW guidelines is provided in Chapter 2.

Committee comment

5.23 The Committee notes that recent amendments to policy and legislation have expedited the development of wind farms in NSW. The Committee also notes that there has been an absence of corresponding changes to policy and legislation that addresses the impact of wind farms on the communities in which they are housed. The expeditious development of wind farms prior to having policy and processes in place to adequately address impacts on local communities is a flawed approach.

5.24 In relation to the *Draft National Wind Farm Development Guidelines*, which intend to provide a nationally consistent set of methods for addressing wind farm concerns, the Committee notes that they will only be effective if states such as NSW choose to require wind farm developers and operators to comply with them. The guidelines also state that 'other government policy' should be followed as required. This presents as an issue for NSW as there is an absence of 'other government policy' relevant to the development of wind farms for issues such as noise, setback distances and community consultation.

5.25 The Committee notes with concern the perception that current wind farm planning processes do not take local matters into account sufficiently. This includes there being no requirement that consideration be given to relevant Development Control Plans by wind farm developments assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. The Committee believes that community interests and views need to be better balanced with the interests of the State in supporting renewable energy goals and the interests of wind farms corporations.

5.26 A transparent process is required that effectively balances the community views reflected in local policy with the needs of the State. The Committee notes that the development of the *NSW Planning and Assessment Guidelines for Wind Farms* presents an opportunity to vastly improve current policy. Currently the only NSW guidelines are those developed by various local councils as DCPs and local stakeholders have raised significant concerns that they are ignored when wind farms are assessed under Part 3A development applications.

5.27 As DCPs are developed through consultation with the local community, the Committee recommends that these must be considered by developers and the Department of Planning as far as practicable in developing planning proposals for wind farms. In the event that certain aspects of a DCP are not complied with, the Committee recommends that developers outline their reasons for non-compliance in their planning application. This may go some way to requiring wind farm developers and the Department of Planning to take local policy into account more sufficiently than at present. This process should be reflected in the *NSW Planning and Assessment Guidelines for Wind Farms*.

5.28 The Committee further concludes that the *NSW Planning and Assessment Guidelines for Wind Farms* should also be expedited to ensure that wind farms are planned, assessed and managed appropriately. The Committee understands that the guidelines will be delivered mid-2010 and encourages the Government to meet this time frame. In the meantime it would benefit those who are affected by wind farms and wind farm proposals if detailed information about the

nature of the guidelines, including the aspects of wind farm development that they will cover could be provided to the public.

Recommendation 2

That the Minister for Planning make detailed information available to the public as soon as possible regarding the matters that will be included in the *NSW Planning and Assessment Guidelines for Wind Farms*, including how the guidelines will fit in with the current planning framework relevant to wind farms.

Recommendation 3

That the Minister for Planning ensure that Local Government Development Control Plans for wind power generation, where they exist, are considered by wind farm developers. Developers should demonstrate their consideration of the relevant DCP in the development application submitted to the Department of Planning, through the inclusion of information that outlines how the relevant DCP has been complied with. If certain aspects of the DCP are not complied with the reasons for non-compliance should be set out. These requirements should be incorporated into the *NSW Planning and Assessment Guidelines for Wind Farms*.

5.29 As discussed in paragraph 5.9, planning approval is no longer required by developers to erect wind monitoring towers to determine whether a particular area is suitable for a wind farm. The Committee is particularly concerned about this change to planning requirements and believes that the erection of wind monitoring towers should still need to be subject to local government approval processes and that this process needs to take into account local aviation issues. The impact of wind farms on local aviation industries is examined in Chapter 8.

Recommendation 4

That the Minister for Planning pursue appropriate policy or legislative changes to require that the erection of wind monitoring towers be subject to local government approval processes and that this process takes into account local aviation issues.

Noise

5.30 The impact of noise from wind turbines was identified by many Inquiry participants as a significant concern. The concerns include uncertainty about what noise levels local residents may experience in the event that a proposed wind farm is constructed in addition to complaints about existing noise levels from wind farms. This section examines regulations and guidelines that are applicable to wind farm noise management in NSW. The responsibilities of various authorities to manage wind farm noise are also addressed. The health and social impact of wind farm noise is examined in detail in Chapter 7.

5.31 The following provides a sample of the noise concerns of local residents. For example, Mr Geoff Gorrie, Chairperson of the Mt Spring Association, commented that "[t]urbine noise is

at the heart of most resident concerns."[200] For example, Mr Jim and Mrs Noreen Marshall live near the proposed site for Kyoto Energy Park in Scone. They stated:

> At the open day [for Kyoto Energy Park] back in 2008, when we asked the noise consultant about the noise impact and showed him where we were situated on the map he said, 'will be noisy - you'll get used to it.' We DON'T want to have noise pollution.[201]

5.32 Mr John Mendl, a resident from Crookwell, questioned the validity of the noise modelling that is conducted and hence the accuracy of the predicted noise levels:

> We have been advised from reliable sources that there are no guarantees in regard to the accuracy of the models used for calculating the noise levels at certain distances. The statistical data has been prepared and funded by the developer.

5.33 Mr George McLaughlin, a resident near Capital Wind Farm, has wind turbines within two kilometres from his house and reports that "since the closest turbines were activated, we have had many sleepless nights due to the incessant noise generated from these." [202]

How is noise measured

5.34 Noise levels are a measurement of sound pressure in the air.[203] As noise levels are usually monitored to determine the levels that specific groups of people may experience "… normalisation schemes or filters have been applied to absolute measurements."[204] This has resulted in the dB(A) scaling of sound pressure measurements, which is the measurement most commonly referred to when discussing wind farm noise.

5.35 Since sound is generally a combination of frequencies within the audible range, the dB(A) scale is used to standardise these reported noise levels at 'low loudness'.[205] In comparison dB(B) is used for 'medium loudness' while dB(C) is used for 'loud' environments.

5.36 The World Health Organisation[206] advises that the dB(A) measurement is not a reliable assessment of noise that has a large low frequency component, such as wind farm noise. As Environmental Assessments for proposed wind farms in NSW generally use dB(A) readings to model noise impact, it has been suggested that noise modeling may be providing an incorrect picture of expected noise levels.[207]

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200 Submission 6, p 5

201 Submission 15, Mr Jim and Mrs Noreen Marshall, p 2

202 Submission 108, Mr George McLaughlin, p 1

203 Submission 81, Appendix O, p 10

204 Submission 81, p 10

205 Submission 81, p 10

206 World Health Organisation, *Guidelines for Community Noise*, 1999, p 10

207 Minnesota Department of Health, 2009

Regulations and guidelines

5.37 A key issue identified by Inquiry participants related to the absence of specific NSW Guidelines for wind farm development. As a result of the lack of specific guidelines, NSW depends on a variety of legislation and policies to regulate the development and construction of wind farms. Confusion has been observed regarding identifying which policies apply to different aspects of wind farm development, such as noise levels. The use of national and international wind farm guidelines are also examined in this section, in relation to their potential to meet the policy needs of NSW wind farm development.

5.38 This section examines legislation and policy that relates to wind farm noise, however, the health impacts of noise are addressed further in Chapter 7.

5.39 The Department of Planning, local residents and developers provided inconsistent information to the Inquiry regarding which policies are required to be adhered to for wind farm planning and operation in NSW. Uncertainty about wind farm policy in NSW has resulted in local communities feeling confused about what to expect from wind farm developments in their local area.

5.40 For example, some Inquiry participants expressed concern regarding the potential noise levels they may experience after a wind farm is constructed. For example, Mr Keith Thompson, a resident from Scone, told the Committee of uncertainty about potential noise levels: "The Department of Environment and Climate change tell me it is 35 plus 5; Pamada tell me it is 30 plus 5, dBAs. I do know who is correct …"[208]

5.41 This confusion may be exacerbated by the lack of NSW guidelines for wind farm noise and the inadequate communication and provision of information by some wind farm developers. Issues regarding consultation are examined in more detail in Chapter 9.

5.42 In Australia, there are two main approaches to managing wind farm noise, as outlined by Mr Scott Jeffries, Director of Major Infrastructure Assessments, Department of Planning, who stated "… there are essentially two camps: there are the States that adopt the approach taken by the South Australian authorities and the states that look at the New Zealand standard and follow that approach."[209]

5.43 NSW wind farm developments are required to use certain aspects of the South Australian *Environment Protection Authority Wind Farm Environmental Noise Guidelines*.[210]

South Australian noise guidelines

5.44 The South Australian *Environment Protection Authority Wind Farm Environmental Noise Guidelines* recommend a maximum noise level of 35dB(A) in rural living areas, 40dB(A) in other zones or

208 Mr Keith Thompson, Resident, Scone, Evidence, 16 October 2009, p 42

209 Mr Scott Jeffries, Director, Major Infrastructure Assessments, NSW Department of Planning, Evidence, 11 September 2009, p 4

210 Mr Jonathan Upson, Senior Development Manager, Infigen Energy, Evidence, 11 September 2009, p 40

5dB(A) greater than background noise (whichever is greater).[211] Concern regarding the use of a 35dB(A) for all rural areas was expressed by Upper Hunter Shire Council, due to the low level of background noise in rural areas.[212]

5.45 Mr Jonathan Upson, Senior Development Manager, Infigen Energy, expressed the view that current South Australian limits on noise levels are adequate:

> The kind of headline noise level is 35 decibels from outside the house. That is quite a low decibel level. I feel that any wind farm that complies with that standard should not provide any disruption or annoyance.[213]

5.46 The wind farm developer Epuron also believes that the current guidelines are adequate, stating that "[t]hese guidelines are comprehensive and strict, requiring tighter controls than other noise guidelines including Victoria and New Zealand, which use 40dB(A) or background plus 5dB(A)."[214]

5.47 Mr Phillip and Mrs Mary Anne Evans, residents from Furracabad and members of the Glenn Innes Landscape Guardian, may soon live 800 metres away from the recently approved Glen Innes Wind Farm.[215] Although the Committee heard evidence that NSW uses the South Australian Guidelines, Mrs Evans expressed concern that developers may be free to choose whether or not they comply with the South Australian guidelines:

> The acknowledgement from Infigen, the 80 per cent profit margin company, that our home noise levels from the wind turbines will exceed the noise regulations using South Australian guidelines, yet they are not required to do anything to change the turbines or to reconfigure the amount of turbines and their proximity to my home. Infigen simply will not compromise or budge from its position, and it would seem it is not required to by the Department of Planning.[216]

5.48 Dr Mark Diesendorf, Deputy Director of the Institute of Environmental Studies, University of NSW, believes that objective noise standards should be set and that action should be taken to address noise concerns if they arise:

> … people have the right to have objective standards set and if they believe they are suffering ill effects they have a right to have measurements taken by independent bodies like universities and the issue to be discussed and then on those rare occasions when there is a problem, then it has to be addressed either by fixing the offending wind turbine or shutting it down.[217]

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211 Environment Protection Authority, South Australia, July 2009, p 3

212 Submission 56, Upper Hunter Shire Council, p 4

213 Mr Upson, Evidence, 11 September 2009, p 32

214 Submission 91, p 14

215 Submission 82, Mr Phillip and Mrs Mary Anne Evans, p 1

216 Mrs Mary Anne Evans, Secretary, Glen Innes Landscape Guardian, Evidence, 16 October 2009, p 27

217 Dr Diesendorf, Evidence, 2 November 2009, p 3

5.49 An aspect of wind farm noise that is not addressed by the South Australian Guidelines includes the management of excessive noise. 'Excessive noise' is experienced when noise levels exceed the maximum permitted noise limit as identified by relevant policy.

5.50 In relation to addressing excessive noise, the South Australian Guidelines state:

> The EPA can require the developer to repeat the compliance checking procedure if it receives any complaint that may be valid about an unreasonable interference on those premises from noise impacts. An Environment Protection Order as provided under Section 93 of the EP Act [*Environment Protection Act 1993]* may be issued by the EPA to secure compliance with the criteria in these guidelines.[218]

5.51 NSW does not have a process to monitor and address excessive noise produced by wind farms in NSW, because the South Australian Guidelines refer to legislation that does not apply to NSW.[219] The lack of clarity regarding how excessive noise should be managed has evolved as a key issue during the Inquiry for residents of NSW who live in close proximity to wind farms.

NSW Industrial Noise Policy

5.52 The *NSW Industrial Noise Policy* produced by the (then) NSW Environment Protection Authority, also establishes noise criteria for sources that are scheduled under the *Protection of the Environment Operations Act 1997*.[220] Although wind farms are excluded as a scheduled activity under this Act, it appears that some wind farm developers and local councils still use some aspects of this policy in Environmental Assessment of wind farm noise.[221]

5.53 For example, Pamada identify the lack of noise policy for wind farms in NSW and suggest that such issues are managed by the NSW Industrial Noise Policy:

> There are no specific guidelines relating to the noise assessment of wind farms prepared by the NSW Government. However, the guidelines for the assessment of noise from industrial facilities are managed within the NSW Department of Environment and Climate Change (DECC) Industrial Noise Policy (INP). [222]

5.54 As a result, Pamada used the Industrial Noise Policy in their Environmental Assessment for the proposed Kyoto Energy Park.[223] On the other hand, the NSW Industrial Noise Guidelines were not used in the development of the Environmental Assessment prepared by Renewable Power Ventures for the Capital Wind Farm.[224]

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218 Environment Protection Authority, South Australia, July 2009, p 15

219 Environment Protection Authority, South Australia, July 2009, p 15

220 Environment Protection Authority, NSW, *NSW Industrial Noise Policy*, January 2000, p 1

221 Submission 19, Appendix A, p 4; Pamada, *Environmental Assessment, Kyoto Energy Park*, November 2008, p 251

222 Pamada, November 2008, p 251

223 Pamada, November 2008, p 251

224 NSW Department of Planning, *Capital Wind Farm, Director-General's Environmental Assessment Report*, October 2006, p 15

5.55 It would be undesirable to apply all aspects of the Industrial Noise Policy to rural wind farms, due to the large difference in accepted noise levels when compared to the South Australian Guidelines. Recommended noise levels from industrial sources are identified in the NSW Industrial Noise Policy for a range of premises. Acceptable noise levels at rural residences are reported to be acceptable at 50 dB(A) during the day time, which is 15 dB(A) greater than is permitted by the South Australian Guidelines. The maximum day time noise level is 55 dB(A).

5.56 However, aspects of the NSW Industrial Noise Policy provide direction relevant to wind farms in regard to areas that are not covered by other policies or guidelines. For example, meteorological conditions are addressed in this policy including temperature inversions and methods to address the impact of increased wind speeds at increased heights.[225]

5.57 The Department of Planning stated that developers are not required to comply with the Industrial Noise Guidelines as "… wind farms are different in their noise impacts compared to a normal industrial facility."[226] However as demonstrated, there may be confusion regarding whether the Industrial Noise Guidelines are required to be followed by wind farm developers. There is also confusion among residents, which adds to the difficulties some experience in knowing whether they have a legitimate complaint.

Draft National Wind Farm Development Guidelines

5.58 The *Draft National Wind Farm Development Guidelines* identify best practice methods for addressing issues such as wind farm noise.[227] However, specific noise limits are not provided by the guidelines as:

> … they are the responsibility of State and Territory authorities. The proponent should refer to the various State and Territory requirements for set limits, but should use these Guidelines as best practice to model and measure noise from wind farms."[228]

Draft Australian Standard

5.59 The draft *Australian Standard DR 07153 CP Acoustics – Measurement, prediction and assessment of noise from wind turbine generators* was developed in 2009 and proposed a methodology for assessing the impact of wind turbine noise at local residences.[229]

5.60 Specific maximum noise levels are not identified in the draft Standard, rather they are stated as being set by the relevant regulatory authority. It is unclear whether the 'relevant regulatory authority' in NSW is local council or the Department of Planning as the consent authority.

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225 Environment Protection Authority, NSW, January 2000, p 31

226 Mr Jeffries, Evidence, 11 September 2009, p 9

227 EPHC, October 2009, pp 7-8

228 EPHC, October 2009, p 19

229 *Australian Standard DR 07153 CP Acoustics – Measurement, prediction and assessment of noise from wind turbine generators*

World Health Organisation Guidelines for Community Noise

5.61 The World Health Organisation (WHO) Guidelines for Community Noise were referred to by some Inquiry participants who noted that they set a lower acceptable level than the South Australian Guidelines. For example, Mr Gorrie, stated:

> Current World Health Organisation standards specify that detrimental noise pollution health effects (disturbed sleep etc) occur where noise levels exceed 30 dB over an eight hour per day period. Current wind turbine installation standards permit noise levels at 35 dB and more. Noise pollution is an integral part of our environment and a legitimate concern of government. Standards need to be brought in line with WHO recommendations.[230]

Noise monitoring

5.62 Responsibility for monitoring noise levels emitted by wind farms is currently unclear. The Committee was advised that conditions of consent placed on development applications require the wind farm operator to monitor noise levels. However, evidence has suggested that this does not take place. A contributing factor to this confusion may relate to the exclusion of wind power under the *Protection of the Environment Operations Act 1997*. As a result, local councils may be the authority responsible for monitoring and addressing noise concerns. However, as some local councils have advised the Committee that they do not have the resources to complete this role, noise monitoring responsibilities remains unclear.

5.63 Some Inquiry participants stated that current noise monitoring at homes affected by wind farm noise is inadequate.[231] In addition, it appears that the course of action residents should take to report and address noise concerns is not clear. This issue is compounded by the confusion regarding which organisation has responsibility for monitoring and addressing noise concerns.

5.64 Mr Andrew Durran, the Executive Director of Epuron believes that consent conditions imposed upon wind farm development approvals by the NSW Department of Planning ensure that noise is adequately managed by the developer.[232] This is supported by the Department of Planning Director-General's Environmental Assessment Report for Capital Wind farm which stated that:

> In the event the monitoring and assessment indicates that noise from the wind turbines exceeds the specified noise limits, the Applicant's Noise Compliance Assessment Report must investigate and propose mitigation and management measures that are available to achieve compliance with the noise limits.[233]

5.65 The Department of Planning Director-General's Major Project Assessment of Capital Wind Farm stated that "[t]he Proponent will have to ensure that the noise levels as adopted for wind

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230 Submission 6, p 5

231 See for example, Submission 108, p 1

232 Mr Andrew Durran, Executive Director, Epuron, Evidence, 11 September 2009, p 48

233 NSW Department of Planning, October 2006, p 16, *Environmental Planning and Assessment Act 1979* (NSW) October 2006, s 75I

farms by the EPA and the Department are met at all residences who are not participants in the wind farm Project…"[234]

5.66 However, the Committee heard evidence from local residents who suggest that this is not taking place. For example, Mr George McLaughlin lives within 2 kilometres of the turbines at Capital Wind Farm and has reportedly moved house due to the noise.[235] Mr McLaughlin states that he has made a number of complaints to the developer Renewable Wind Ventures and the NSW Department of Planning, however, he has had no response.[236] There are a number of other residents who live in the vicinity of Capital Wind Farm who also report noise concerns and feel that they are not adequately addressed. [237]

5.67 A reason for such outstanding noise concerns may be that although the South Australian Guidelines set a maximum permitted noise level and methods for measuring noise, the guidance it provides for the handling of noise complaints is not directly relevant to NSW.

5.68 For example, the South Australian Guidelines advise that "an Environment Protection Order under the *Environment Protection Act 1993* (SA)" is required to address noise concerns when levels exceed the maximum permitted. As wind power generation is excluded as a scheduled activity under the *Protection of the Environment Operations Act 1997* (NSW), NSW appears to be currently be without legislation and policy regarding how excessive wind farm noise should be addressed.

5.69 The NSW Department of Environment, Climate Change and Water (DECCW) states that noise pollution in NSW is regulated through the *Protection of the Environment Operations Act 1997* (NSW).[238] Any activities scheduled under this Act are regulated by DECCW. Scheduled activities require an Environment Protection Licence through which DECCW can apply noise control conditions and manage issues regarding noise pollution.

5.70 As wind power generation is not a scheduled activity, the normal processes by which excessive noise in NSW is addressed is not applicable to wind farm noise. Since DECCW has clear processes in place to address noise pollution issues, reasons why wind farm noise is excluded from their supervision are unknown. It should be noted that all forms of 'electricity generation' remain as a scheduled activity under the Act, except wind power and solar power.[239]

5.71 The exclusion of wind farms as a scheduled activity under the Act also means that wind farms are not required to follow the *NSW Industrial Noise Policy*, which identifies processes to address many issues of relevance to wind farms including meteorological conditions such as temperature inversions.[240]

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234 NSW Department of Planning, October 2006, p 15

235 'George in a spin over noisy wind power…', *Sydney Morning Herald*, 21 September 2009

236 Submission 108, p 1

237 See for example, Submissions 34, 72,

238 NSW DECCW, *Noise*, accessed 7 December 2009, <www.environment.nsw.gov.au/noise/index.htm>

239 *Protection of the Environment Operations Act 1997* (NSW), Sch 1, Part 1(17)

240 Environment Protection Authority, NSW, January 2000

5.72 Dr Diesendorf believes that the DECCW is the most appropriate authority to monitor noise pollution caused by wind farms. He stated:

> Noise pollution is like any other form of pollution. Under the State Government the Department of Environment, Climate Change and Water has the mandate and the requirement to do pollution monitoring, so that would be the obvious situation.[241]

5.73 Local council is the regulatory authority for activities that are not listed as a scheduled activity under the *Protection of the Environment Operations Act.*[242] Although the Department of Planning is the approval authority for wind farms over 30MW, as wind power is excluded as a scheduled activity under this Act, the Department of Planning advised that local council is the 'appropriate regulatory authority' for wind farms.[243] This means that local council is responsible for addressing issues regarding wind farm noise.

5.74 Reasons why wind power has been excluded as a scheduled activity under this Act are unclear. As stated in paragraph 5.69, DECCW has clear processes in place to address noise pollution issues and is the obvious authority to monitor wind farm noise.

5.75 When asked about the concerns expressed by local councils that they are now responsible for addressing wind farm noise complaints, the Department of Planning stated that as the appropriate regulatory authority, local councils "… could regulate construction and operation noise … could investigate complaints and potentially respond using the provisions of the *Protection of the Environment Operations Act.*"[244]

5.76 However, local councils said that they were concerned about addressing noise complaints for wind farms that they have not approved and that do not comply with their Development Control Plan.[245]

5.77 The concern about local council being the appropriate regulatory authority is exacerbated due to the lack of consultation prior to the responsibility being transferred and the lack of technical, staffing and financial resources available to adequately address wind farm noise complaints. For example, Glenn Innes Severn Council stated:

> These changes were made without any consultation with Local Government. The fact that Council, in the majority of instances, is not the consent authority however will be the ARA for noise complaints from wind farms puts many smaller regional Council's in a difficult situation. Investigations of complex noise complaints from wind turbines will place pressure on both Council resources and staff expertise.[246]

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241 Dr Diesendorf, Evidence, 2 November 2009

242 *Protection of the Environment Operations Act 1997* (NSW), s 6(2)

243 Answers to additional written questions on notice, 6 November 2009, NSW Department of Planning response, Question 1(a) p 6

244 Answers to additional written questions on notice, 6 November 2009, NSW Department of Planning, Question 1(a), p 6

245 See for example, Submission 19, p 2; Mr Casson, Evidence, 16 October 2009, pp 34-35; Email from Mr Simon Holloway, Environmental Services Coordinator, Planning and Environmental Services, Palerang Council, 6 October 2009, p 1

246 Submission 19, p 2

5.78 Palerang Council also expressed the view that council is not the appropriate authority to monitor noise, stating "[w]e normally only deal with domestic noise issues such as barking dogs and pool pumps and don't even have a noise meter that meets the current standards for collecting evidence."[247]

Committee comment

5.79 The Committee acknowledges the negative impact of noise on a number of residents who live in the vicinity of wind farms in NSW. The Committee also recognises the effort these residents have invested in trying to address the issues and the difficulty they have faced in finding an appropriate resolution.

5.80 The Committee notes the absence of noise guidelines for the development and management of wind farms in NSW and the gaps in existing policies in relation to noise. The gaps include a process by which local residents can report noise issues and have them addressed in a transparent and timely manner. To improve the management of wind farm noise NSW requires a wind farm noise policy in a similar vein as the South Australian Guidelines.

5.81 The Committee also notes the following in relation to responsibilities for addressing wind farm noise complaints:

- DECCW does not have responsibility to monitor and address wind farm noise as a result of wind power being excluded as a scheduled activity under the *Protection of the Environment Operations Act*.
- The *Protection of the Environment Operations Act* places the responsibility for wind farm noise monitoring with the relevant local council despite local council not being the consent authority or having the resources to fulfil this role.
- The Department of Planning has little role to play in monitoring and addressing wind farm noise for developments approved under Part 3A of the *Environmental Planning and Assessment Act*, other than imposing development consent that often places responsibility on the developer to monitor and report on their own wind farm noise. This, in effect, requires operators to 'self-monitor' and has not proven successful for wind farms in NSW.

5.82 The Committee is concerned about the reasons why wind power is excluded from being a scheduled activity when all other types of electricity generation (other than solar power) are included. Reasons for this are ambiguous and have resulted in the blurring of what was initially a very clear process for addressing noise pollution in NSW.

5.83 The fact that wind farm noise management rests with local council and that some local councils at least are not able to fulfil this role suggests that wind farm noise is not being managed effectively, if at all. This issue could have been avoided if an adequate policy was developed to ensure that another authority managed wind farm noise in place of DECCW. The Committee notes the increased number of wind farms that may be developed in NSW in the near future and hence the important role that clear guidance on noise management will play.

247 Email from Mr Holloway, 6 October 2009, p 1

5.84 The Committee appreciates that some local councils have acknowledged that they do not have the technical expertise, equipment, staff or financial resources to be able to monitor and address wind farm noise complaints. Delegation of such a responsibility to local council without proper consultation is unreasonable and without appropriate planning has resulted in wind farm noise complaints not being adequately addressed.

5.85 The responsibility of local councils for wind farm noise management raises an important question. That is, in the event that local council could adequately monitor wind farm noise, what power does local council have to ensure that wind farm operators actively reduce the noise emitted from their turbines, as the Department of Planning is the consent authority? Such questions demonstrate that wind farm noise monitoring policy in NSW requires serious consideration and improvement.

5.86 The Committee does not feel that the conditions of consent currently applied to wind farm development approvals by the Department of Planning give developers the guidance they require to adequately address wind farm noise complaints and, as such, many noise complaints are outstanding. This is shown by the number of submissions received from Inquiry participants who are currently adversely impacted by wind farm noise and the frustration they express about the lack of a clear complaints process.

5.87 The Committee believes that the NSW Department of Environment, Climate Change and Water is the most appropriate agency to monitor and address wind farm noise complaints. This is in line with the agency's portfolio, expertise and experience. The Committee recommends therefore that wind power generation should be included on the list of scheduled activities under Schedule 1, Part 1 the *Protection of the Environment Operations Act 1997*, so that the NSW Department of Environment, Climate Change and Water has more responsibility for monitoring and addressing wind farm noise complaints.

Recommendation 5

That the Minister for Climate Change and the Environment:

- pursue appropriate policy or legislative changes to include wind power generation in the list the list of scheduled activities under Schedule 1, Part 1 the *Protection of the Environment Operations Act 1997* to establish the Department of Environment, Climate Change and Water as the authority responsible for monitoring and addressing wind farm noise complaints, and
- require the Department to report annually to Parliament on wind farm noise complaints.

Recommendation 6

That the Minister for Planning include in the *NSW Planning and Assessment Guidelines for Wind Farms* a clear process for handling complaints about wind farm noise, including identifying the authority that is responsible for managing complaints and how noise is to be measured for the purpose of making complaints.

Wind farm setback

5.88 There is no legislative or policy requirement in NSW that defines the minimum permitted distance, or 'setback', between wind turbines and houses. This was identified by many Inquiry participants as a significant concern as wind turbines have been approved at distances that many residents feel are too close to their homes.

5.89 There are currently no minimum setback requirements in NSW legislation or policy for wind turbines. Furthermore, neither the *Draft National Wind Farm Development Guidelines* or the South Australian *Wind Farms Environment Noise Guidelines* recommend a setback distance.

5.90 The Committee was informed that some Local Environment Plans and Development Control Plans do include setback limits (see Chapter 3 for further information about these plans). For example, the Snowy River Rural Local Environment Plan requires a minimum setback distance, stipulating that a minimum of 1.5 km between wind energy facilities and a dwelling is acceptable.[248] A 2 kilometre setback is recommended in some DCP's, including the Glen Innes Severn Council Development Control Plan for wind power generation, which states:

> Where visible from a non related dwelling or immediate surrounds, the development shall not be located within 15 times the blade tip height or 2 km's (which ever is the greater) of any dwelling not associated with the development …[249]

5.91 Lack of regulation or guidance on this issue has resulted in wind turbines being planned to be constructed as close as 800 metres to a home in the case of the Evans family house near Glen Innes.[250] The Evans' house is on a property that is not part of the recently approved Glen Innes wind farm and does not receive income from the wind farm. The Evans family will be impacted more than the host property owner who does not live at the property on which the wind farm is being constructed.

5.92 Like many other inquiry participants, Mr Philip and Mrs Mary Anne Evans suggested a mandated setback limit as a simple solution:

> There is a simple solution to the entire problem. A 2 km buffer zone from any houses. This means that developments will go ahead without destroying the lives of the people living near them.[251]

5.93 Various opinions were presented to the Committee about the appropriate setback limit ranging from 750 metres to 12 kilometres.

5.94 Mr Vawser, Director of Wind Prospect CWP, stated that his company has a preferred minimum setback from neighbouring residents of 750 meters, however, that as conditions vary it is more effective for experts to assess and model noise levels:

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248 Snowy River Rural Local Environmental Plan 2007, Regulation 36(b)

249 Submission 19, Appendix A, p 8

250 Submission 82, p 1

251 Submission 82, p 1

> It is 750 metres, but effectively until you get the expert noise acoustic engineers to go out there and assess the noise, and model what the wind turbine is going to do on that site or a range of wind turbines, in fact, because each wind turbine has its different noise characteristics. You have some that are very, very quiet and you have some that are not as quiet, so you have got to have the flexibility in the system where if you end up using the turbine that is not as quiet, then the separation between houses needs to be higher and the only thing that can tell you that would be your acoustic studies that need to be carried out.[252]

5.95 The Glen Innes Landscape Guardian proposed that two kilometres is a reasonable minimum setback distance "… because at this distance many of the ill effects are significantly reduced".[253] The Guardian also stated that "the 2 km setback has been a compromise position agreed upon despite many residents calling for greater setbacks." [254]

5.96 However, a number of Inquiry participants stated that they live over two kilometres from a wind farm and still experience adverse effects.[255] For these people, a two kilometre setback may not be sufficient. Mr Peter Smith, suggested that a five kilometre setback would prevent "… noise or shadow flicker problems …"[256], while Mrs Julianne Frost, a resident from Scone, believes that a 12 kilometer setback is required.[257]

5.97 The Parkesbourne Mummel Landscape Guardian present another setback option, based on the size of the wind turbine:

> The width of the buffer zone would have to depend on the capacity of the turbines to be used, and perhaps on other factors that influence the quantity of noise produced. Judging from the problems raised by the EA of the Gullen Range Wind Farm, one might say that a 2 km buffer zone would be adequate for a 2.0 MW turbine, but a 3.0 MW turbine would probably need a 3 km buffer zone.[258]

5.98 The Clean Energy Council and several wind farm developers stated that they do not support a specified wind turbine setback distance.[259] Reasons for this include the lack of research into the issue, that it may impede the development of wind farms and that issues should be addressed on a site-by-site basis since no specific setback distance will resolve all issues. For example, Epuron stated:

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252 Mr Vawser, Evidence, 2 November 2009, p 22

253 Submission 74, p 2

254 Submission 74, p 2

255 See for example, Ms Julie Gray, Resident, Bungendore, Evidence, 1 October 2009, p 4; Submissions 27, 108, 72

256 Submission 8, Mr Peter Smith, p 2

257 Submission 16, Mrs Julianne Frost, Sp 1

258 Submission 99, Parkesbourne Mummel Landscape Guardian, p 23

259 See for example, Submissions 91, 60 and Mr Robert Jackson, General Manager, Policy, Clean Energy Council, Evidence, 11 September 2009, p 18

> An example would be the imposition of a setback distance between wind turbines and residences which in one DCP is 2 km. This distance has no sound technical or planning basis and creates an impediment to the development of wind farms.[260]

5.99 Acciona Energy Oceania do not support a minimum setback distance either, stating:

> We believe potential amenity impacts … associated with a wind farm are not efficiently addressed by merely setting an arbitrary setback. Amenity impacts vary from site to site - such that residential and environmental impacts may be negligible at distances much closer than 2 km (or any other set distance). Equally, in some circumstances, site conditions may dictate a greater buffer …[261]

5.100 The Committee did not receive information regarding the noise impact of Cullerin Wind Farm on neighboring residents perhaps because the closest houses are those of the host property owners. There are few non-host houses that neighbor the wind farm.[262]

5.101 Perhaps as a result of the lack of regulation or policy guidance on this issue, it appears that the Department of Planning does not have a consistent approach to the appropriate distance between houses and turbines when it comes to approving new wind farms.

5.102 For example, Mr Keith Thompson, a resident of Scone, informed the Committee that the developers of Kyoto Energy Park moved the location of proposed turbines from within one kilometer of his house to 1.1 kilometers, due to the perception that the Department of Planning would not approve a wind turbine within one kilometer of a house.[263]

5.103 In response to a question from the Committee about whether people were less opposed to wind turbines once they were erected, Dr Eja Pedersen, an academic from Halmstad University in Sweden who appeared before the Committee via videoconference, referred to the research work of Professor Wolsink, stating:

> That is from his research: that is quite correct. Not so much when it comes to big wind farms but when it comes to small wind farms and one or two turbines. ... What happens when there are no people who know about this planning and have an attitude like this, then they get to hear that there is going to be a wind farm in their area, people are very negative from the go set and then after they are raised they are more positive.[264]

Committee comment

5.104 The Committee notes the stress placed on residents as a result of having wind turbines planned for construction within 600-800 meters from their houses. The Committee believes

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260 Submission 91, p 14

261 Submission 60, Acciona Energy Oceania, p 3

262 nghenvironmental, *Proposed Development of a 30MW Wind Farm on the Cullerin Range, Southern Tablelands, New South Wales*, May 2006, p 118

263 Mr Thompson, Evidence, 16 October 2009, p 41

264 Dr Eja Pedersen, Academic, Halmstad University, Sweden, Evidence, 9 November 2009, p 4

that locating a wind turbine within such distances of houses in a rural areas, with limited community consultation and compensation is unreasonable.

5.105 The Committee notes with concern that it is likely that the adverse impacts experienced by some local residents as a result of the stress and anxiety associated with the planning process and the prospect of living in such close proximity to wind turbines, will eventually be replaced by impacts related to the actual construction and operation of the wind farm.

5.106 The Committee believes that the decision to approve wind farms with turbines so close to houses does not demonstrate a well considered approach by the Department of Planning. The absence of NSW guidelines that address many of the issues identified through this Inquiry, including the issue of setback distances, means that such outcomes may continue to occur.

5.107 The Committee accepts that wind farms will impact upon local communities. However, NSW communities should have a clear understanding of what level of impact can be expected. The current lack of guidelines and consistency of wind farm development in NSW results in undue stress on local communities.

5.108 The Committee acknowledges that a prescriptive setback distance will not address all the issues faced by residents who live next door to a wind farm. However, communities that may host wind farms are entitled to clear guidance on how close turbines may be from neighbouring residences. The Committee recommends a two kilometre minimum setback between wind turbines and neighbouring houses as a precautionary approach, in addition to the development and implementation of the *NSW Planning and Assessment Guidelines for Wind Farms*, to ensure that wind farms are located appropriately. The minimum setback of two kilometres should be able to be waived with the consent of the affected neighbouring property owner.

5.109 The Committee further notes that if it is essential for a wind turbine to be placed in a location that will adversely impact neighbouring residents, the issue of compensation should be considered. The issue of compensation is examined in the last section in this Chapter.

5.110 With the creation of NSW Guidelines for wind farm developments, the decision regarding where to place wind turbines may better balance the needs of all stakeholders. It seems that the current planning process does not balance the need to develop areas of good wind resources with the needs of the local residents. It is hoped that guidelines will improve the representation of stakeholders such as neighbouring residents.

Recommendation 7

That the Minister for Planning include a minimum setback distance of two kilometres between wind turbines and residences on neighbouring properties in the *NSW Planning and Assessment Guidelines for Wind Farms*. The guidelines should also identify that the minimum setback of two kilometres can be waived with the consent of the affected neighbouring property owner.

Renewable energy precincts

5.111 As outlined in Chapter 3, the establishment of renewable energy precincts across NSW was among the measures announced by the former Premier in August 2009 to facilitate renewable energy generation. Precinct Advisory Committees (PACs) will also be formed to help drive the Government's clean energy agenda.

5.112 While the measures have been promoted as a way to engage the local community and address concerns specific to a local area, the Committee received evidence from a number of Inquiry participants who are critical of the proposed precincts and PACs.

5.113 Key concerns relate to the uncertainty of what a renewable energy precinct is, what purpose it will service and how communities may be involved. For example, Ms Wheeler with the Upper Hunter Landscape Guardian, told the Committee in October 2009 that she had approached the Department of Planning to gain further information about the precincts but was advised that no further information could be provided as guidelines were still being drafted:

> I have personally been in contact with the Department of Planning policy section in relation to the renewable energy precincts that has been announced by the Premier looking for guidelines. The Premier has made several announcements about things that are going to happen but there are no guidelines about how it is going to happen. The information I have as late as yesterday from talking to somebody from the department is that whilst those guidelines have been drafted they are currently under review and there are also currently some areas that they need to seek further information on. It is also a case that the Department of Planning will not be managing those guidelines; they will be producing them but they will more likely be managed by the Department of the Environment. So we still do not have anything there. That will also explain how the community is to be involved with the renewable energy precincts, all of which is very unclear from the Premier's announcement.[265]

5.114 The Committee was advised that the role of PACs and the benefit to the local community is just as unclear. Ms Rosalind Bush, Secretary, Molonglo Landscape Guardian, suggested that PACs represented yet "another layer of bureaucracy" for community groups to get through:

> Public servants will be sent out in these precinct committees. I read the transcript of the last hearing where you asked the officials from the planning department about this. I could not make head nor tail of what a planning precinct committee would be, except it is just another layer of bureaucracy to stop you getting to the decision-makers. That is from our perspective. If we go to the planning Minister to plead our case, we will be fobbed off to this precinct committee. What are the precinct committees? I doubt very much that Wendy or I are going to be invited to be on them. So what is the purpose of them? They have made this announcement and we still do not know what it is.[266]

5.115 After the Committee received this evidence, DECCW released the Terms of Reference for Wind Renewable Energy Precinct Advisory Committees.[267] The Terms of Reference outline

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265 Ms Wheeler, Evidence, 16 October 2009, p 16

266 Ms Rosalind Bush, Secretary, Molonglo Landscape Guardians, Evidence, 1 October 2009, p 19

267 NSW DECCW, *Terms of Reference for Wind Renewable Energy Precinct Advisory Committees*, October 2009

the purpose, role and committee membership of PACs and provides detail on the responsibilities and selection a PAC member.

5.116 The Terms of Reference appear to address some of the community's concerns over the lack of clear and decisive information regarding renewable energy precincts and PACs in particular. For example, the Terms of Reference specify that up to four representatives covering a cross-section of community interests may participate in a PAC, thereby giving community members the direct opportunity to work with local government on wind farm issues.

5.117 Others aspects of the PAC are not so explicit. For example, while the Terms of Reference outline the propose of PACs in so far as the assistance and advice they will provide to local councils, it does not outline to what extent and how input will be discussed and provided to the State Government.

5.118 Another concern expressed to the Committee was the lack of consultation with the community prior to the establishment of the renewable energy precincts. According to Mr Humphrey Price-Jones, Spokesperson for Friends of Crookwell, community groups were not involved in the planning of the precincts:

> I am totally opposed to the concept of precincts as it exists at the moment. They were imposed upon unsuspecting populations. Community groups were not involved in this process; local councils were not involved in the process. It was a decision handed down from above. It is a great infringement upon our democratic rights.[268]

5.119 Dr John Formby, Chairman, Friends of Crookwell, concurred, stating that "we were made a wind farm ghetto or precinct without any consultation whatsoever and without any study of the impact".[269]

5.120 Ms Bush stated that she had approached the Minister for Planning about community consultation but was advised that consultation would take place after the precincts were established. Ms Bush expressed dissatisfaction with this process and deemed it "consultation without consequence":

> The NSW Cabinet had a meeting at Queanbeyan earlier this year. We went along and we did speak to the planning Minister. We asked her specifically, "When are we going to be consulted? You have declared these precincts. Where was the consultation?" She said to us, "You will be consulted afterwards. We will declare these precincts and then you will be consulted." That is most unsatisfactory—consultation without consequence, really. That is the only opportunity we have had to talk to anybody in government about it. As far as we are concerned, there has been no consultation.[270]

5.121 Likewise, local government expressed concern that limited consultation had taken place regarding the establishment of the renewable energy precincts. For example, Mr Casson, informed the Committee that his council was invited to a workshop to talk about the concept of precincts and where they would be but that he had "heard little since that".[271]

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268 Mr Humphrey Price-Jones, Spokesperson, Friends of Crookwell, Evidence, 1 October 2009, p 55

269 Dr John Formby, Chairman, Friends of Crookwell, Evidence, 1 October 2009, p 41

270 Ms Bush, Evidence, 1 October 2009, p 19

271 Mr Casson, Evidence, 16 October 2009, p 37

5.122 The role of PACs in fostering open and accessible communication within the local community on wind farm issues is also a point of contention for some Inquiry participants.

5.123 The Government announced that community consultation and engagement through PACs will "address community concerns and improve the community's understanding of wind farm issues".[272] Moreover, they will "help communities adjust their perceptions and valuations around wind farms".[273]

5.124 However, the need to "improve the community's understanding" and "adjust their perceptions" has been perceived unfavourably by some members of the community. For example, Mrs Price-Jones believes that communities are being told how they should be feeling about wind farms in their area rather than being given the opportunity to express their concerns:

> [Ms Yolande Stone, Department of Planning] also stated that precinct committees would serve to educate the community in regard to the importance of the area for renewable energy production. By that I take it we are to be told how lucky we are that we can have turbines on our boundaries. It is of great concern to residents such as myself that these committees will simply present communities with spin and take as little notice of heartfelt community concerns as the current Department of Planning officers.[274]

5.125 Mr Ben van der Wijngaart suggests that community knowledge should not be underestimated and that a need exists for the community to be heard, rather than be told, about their local area:

> I do not think you should underestimate the expertise that exists, particularly in rural communities with farmers, environmental protection groups and the catchment development people. People certainly in regional areas—and I can speak directly for mine—are very knowledgeable about their environment, biodiversity, what works, what does not, what the issues are. They just feel that they are not listened to.[275]

5.126 Ms Bush believes that community disengagement could ensue now the precincts have been established, particularly as community members see their local plans and regulations, to which they contributed, being overridden:

> Local environment plans and DCPs are developed in close consultation with the affected community. Naturally we think these are primary planning instruments that should be taken into consideration. But, unfortunately, now that we are living in a wind farm precinct all bets are off. You have heard today that shire councils' DCPs are just ignored. That makes us feel powerless and that is not a good way to feel. It has not improved the planning process.[276]

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272 Ms Stone, Evidence, 11 September 2009, p 3

273 Submission 104, p 4

274 Ms Price-Jones, Evidence, 1 October 2009, p 51

275 Mr van den Wijngaart, Evidence, 2 November 2009, p 3

276 Ms Bush, Evidence, 1 October 2009, p 19

Committee comment

5.127 The Committee believes that Renewable Energy Precincts have the potential to improve the management of wind farm development in NSW. However, without detail on how precincts will function and when they will commence operation, renewable energy precincts are creating more questions than answers. It is therefore recommended that the provision of detail regarding renewable energy precincts to the public is expedited and communicated appropriately.

Recommendation 8

That the Minister for Climate Change and the Environment make detailed information available to the public as soon as possible about how Renewable Energy Precincts will function and when they will commence operation.

Decommissioning

5.128 Many Inquiry participants identified the decommissioning of wind turbines as an issue for wind farm planning and development.[277] Concern was expressed regarding who has responsibility to remove the turbines at the end of their functional life, to ensure that communities are not left to view old wind turbines in the landscape. Inquiry participants also identified issues regarding securing the finances to dismantle wind turbines at the planning stage of the wind farm, to ensure their removal was guaranteed.

5.129 For example, Ms Helen White, a resident of Scone, asked:

> What happens when the life of the turbine is finished, is the original investor returning to deconstruct these great monstrosities or is the small community left with rusting infrastructure as has been seen so often in the past.[278]

5.130 Some Inquiry participants referred to wind farms in America that have been abandoned and left to deteriorate. There is concern that without adequate management at the planning stage that this may happen in NSW.[279]

5.131 As wind farms are relatively new in NSW, there are no wind farms that were brought to the attention of the Committee that have reached the end of their contractual or operational life. As such, local experience of the decommissioning stage of a wind farm has not been observed.

5.132 Dr David Burraston and Ms Sarah Last, rural residents from Cootamundra, expressed concern regarding an absence of decommission funding for wind farms in NSW and current misinformation, stating:

277 See for example, Submissions 15, 56, 107, 118

278 Submission 5, Ms Helen White, p 1

279 Answers to questions taken on notice during evidence, 1 October 2009, Dr David Burraston and Ms Sarah Last, p 1

> Something that was particularly alarming to us as potential hosts of wind turbines is the complete lack of funding for decommissioning the turbines and the misinformation the wind industry is providing in planning applications about decommissioning.[280]

5.133 Mr Charlie Prell is a rural landowner who may host Crookwell II Wind Farm. He stated that as the landowner he would be responsible for the "… cleaning up of that land at the decommissioning stage of the turbines … I am responsible for removing the turbines from my land in 30 years time, or maybe even after five years if they become unviable "[281] Mr Prell does not agree that decommissioning will be an issue for wind farms in NSW. He stated:

> I will not be paying someone to come and pull those turbines down if I ever get to that situation, but a scrap metal dealer or somebody will pay me to come and pull those turbines down.[282]

5.134 Dr Burraston believes that selling the turbines as scrap metal is not a certainty partly due to the expense associated with decommissioning. He stated:

> Most of the landholders we have spoken to are under the impression, "Well, that doesn't matter. We will just get the scrap value for the turbine." I went to get this document from Energy Ventures Analysis for the Beech Ridge facility in the USA. That report is basically showing that not only is decommissioning not covered by scrap value, which has been explicitly rubberstamped by all these developments in this country and quite often abroad, it is a very expensive process to decommission it.[283]

5.135 When asked about decommissioning during a Committee hearing, Mr Ken McAlpine, Government Relations Manager at Vestas Wind Systems, expressed uncertainty regarding wind farm decommissioning responsibility.[284]

5.136 The Committee was informed, however, that decommissioning is included in the conditions of consent that form part of the planning approval for wind farms. For example, Mr Mark Dixon, Project Manager from Pamada stated "we have conditions of consent to remove the structure, all structures, from the site if we decommission."[285] Similarly, Mr Upson, stated:

> In our agreements with the landowners, and typically, of course, the State Government, the development approval conditions will specify the same thing. Basically all the hardware above ground is removed, so all the turbines are taken away and the substation switchyard.[286]

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280 Dr David Burraston, Resident, Cootamundra, Evidence, 1 October 2009, p 23

281 Mr Charlie Prell, Evidence, Resident, Crookwell, 1October 2009, p 66

282 Mr Prell, Evidence, 1 October 2009, p 66

283 Dr Burraston, Evidence, 1 October 2009, p 28

284 Mr McAlpine, Evidence, 11 September 2009, p 16

285 Mr Dixon, Evidence, 11 September 2009, p 27

286 Mr Upson, Evidence, 11 September 2009, p 39

5.137 Dr Diesendorf believes that decommissioning is an important issue for wind farms and that it can be addressed through conditions of consent on development application approval. He stated:

> It is probably not as bad as, say, the situation in Queensland where open-cut coalmines that are supposed to be remediated have not been remediated, but it is an issue and I think the permission should have requirements either to take down the turbines at the end of their operating lives, which could be 20 or 25 years or to repower the turbines, so putting new blades on old towers to keep them going because the tower lifetime, as your question indicates, can be quite long, longer than the blades.[287]

5.138 An example of conditions of consent applied to a wind farm development include the following conditions that are applied to the Capital Wind Farm:

> 78. Within one year of decommissioning, the Development Site must be returned, as far as practicable, to its condition prior to the commencement of Construction. All wind turbines and associated above ground structures (i.e. not including turbine foundations) including but not limited to, the substation, the control and facilities building and electrical infrastructure must be removed from the Development Site …
>
> 79. If any wind turbine is not used for the generation of electricity for a continuous period of 12 months, it must be decommissioned unless otherwise agreed to by the Director General …
>
> 80. Prior to the commencement of Construction, the Proponent must provide written evidence to the satisfaction of the Director General, that the lease agreements with the Site landowners have adequate provisions to require that decommissioning occurs in accordance with this Approval. [288]

5.139 Mr Upson believes that a benefit of wind farms is that they can be decommissioned to a point that takes the site back close to its original aesthetic condition "… it ends up probably a year later, once the deconstruction activity had settled and the pastures had been resown, that you probably would not even know that the wind farm had even been there."[289]

5.140 The Auswind *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia* (see Chapter 2 for details) recommend that wind farm sites be decommissioned at the end of their operational life.[290] The steps that are identified include being aware of original conditions of development, giving notice to stakeholders, obtaining relevant approvals and completing an environmental assessment. These guidelines provide a useful foundation on which to base NSW decommissioning policy, however, additional information that is required includes identifying who is responsible, the time period after operation in which turbines should be dismantled and how dismantling will be funded.

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287 Dr Diesendorf, Evidence, 2 November 2009, p 3

288 NSW Department of Planning, October 2006, p 72

289 Mr Upson, Evidence, 11 September 2009, p 39

290 AusWind, *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia*, October 2006, p 46

Financial security of decommissioning

5.141 Some Inquiry participants expressed concern regarding the ability of the relevant authority to pay for decommissioning at the end of the operational life of a wind farm.[291] Consequently, it has been suggested that an environmental infrastructure levy or a trust fund be established prior to construction to secure the removal of wind farms.

5.142 Mr McAlpine confirmed that the wind energy industry is "… not required to pay a bond in the manner that a lot of coalmine developments are."[292] This might be because land owners accept decommissioning responsibility upon signing a lease contract with a wind farm developer.

5.143 Evidence received from Mr Prell and Dr Burraston stated that lease contracts between wind farm developers and landowners place responsibility for removing wind turbines with the landowner.[293] However, Dr Burraston cautioned that the option of landowners selling turbines for scrap metal does not appear to be a guaranteed solution and provides little assurance that appropriate planning for the whole life of a wind farm has been undertaken. [294]

5.144 In the event that wind farms are not appropriately decommissioned, there is a risk that infrastructure such as turbines may be left to corrode in the landscape. Experience of this occurring in America has caused a great deal of concern among Inquiry participants that the same may occur in NSW.[295]

Committee comment

5.145 The Committee notes with concern the apparent lack of policy regarding decommissioning of wind farms in NSW. The importance of managing the 'whole of life' of utility scale wind farm developments should not be underestimated. Without adequate foresight during the planning process, wind farms may present a public health and safety risk once they cease operating. They may also adversely affect the environment and have socioeconomic ramifications such as burdening NSW taxpayers to fund their removal.

5.146 The Committee further notes that under their lease agreement host landowners may have responsibility to remove wind turbines from their property once the wind turbines stop operating. Due to the enormous size of wind turbines, the Committee is not confident that current decommissioning arrangements will in fact result in wind turbines being adequately removed from the landscape.

5.147 The Committee believes that effective wind farm planning should take responsibility for the whole life of a wind farm, including decommissioning and it is unclear whether this is

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291 See for example, Submissions 63, 64

292 Mr McAlpine, Evidence, 11 September 2009, p 16

293 Mr Prell, Evidence, 1 October 2009, p 66; Dr Burraston, Evidence, 1 October 2009, p 23

294 Dr Burraston, Evidence, 1 October 2009, p 28

295 See for example, Dr Burraston, Evidence, 1 October 2009, p 28; Mrs Noreen Marshall, Evidence, 16 October 2009, p 23

currently occurring. There is a risk that rapid planning and construction of wind farms is being prioritised over adequate whole of life planning. This could present problems in future years.

5.148 The Committee notes that decommissioning requirements are identified as conditions of consent in development approvals. The Committee further notes that these responsibilities *may* be passed on to host land owners in their lease contracts with wind farm developers. As host land owners may not be able to afford to remove wind infrastructure, there is a level of uncertainty regarding wind farm decommissioning.

5.149 The Committee believes that improved clarity and assurance is required for wind farm decommissioning to ensure that the requirements identified as conditions of consent are adhered to. The establishment of a system that guarantees funding for wind farm decommissioning is also supported by the Committee.

5.150 The Committee notes that the decommissioning information provided in the Auswind *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia* should be applied to wind farms in NSW. The Committee further notes the need for NSW policy to make this information obligatory in wind farm planning. The Committee believes that additional information is required to be included in the development of the *NSW Planning and Assessment Guidelines for Wind Farms* to identify responsibility, the time period after operation in which turbines must be dismantled and how dismantling will be funded, including the option of applying a bond.

Recommendation 9

That the Minister for Planning address decommissioning of wind turbines in the *NSW Planning and Assessment Guide for Wind Farms*, including responsibility for decommissioning, the time period in which turbines should be dismantled and removed and how decommissioning will be funded. And that the Government consider requiring the developer to pay a bond.

Environmental assessment

5.151 Environmental assessment forms a central part of wind farm development in NSW. However, many Inquiry participants believe that the process is not robust enough to adequately assess impacts of wind farms. Some believe that the Department of Planning is not the most appropriate body to assess wind farms because it is biased towards wind farm development. The limited time that Environmental Assessments are on public display was also a concern to many Inquiry participants, because it does not allow adequate time for residents to adequately respond to the issues identified.

5.152 Certain aspects of Environmental Assessment are also discussed in Chapter 6, such as Environmental Assessment of wind farms in relation to birds.

5.153 Environmental Assessment is required to be conducted under the *Environmental Planning and Assessment Act 1979* (NSW).[296] Environmental Assessment currently takes place as part of the development application process for all wind farm development proposals. Environmental Assessment is generally undertaken by consultants at the request of developers.

5.154 Inquiry participants expressed concern that this process is not impartial and that the Department of Planning do not have the expertise or independence to examine wind farm Environmental Assessments. For example, Dr Formby, stated:

> … environmental planning legislation is heavily biased towards development with provisions such as Part 3A and the critical infrastructure provision. The Department of Planning has become highly politicised in favour of wind turbine development, and that is apparent from the transcript of the first hearing. The Department does not have the technical expertise to assess complex developments, even if it wanted to. The current environmental approval process is a disgrace ...[297]

5.155 Ms Carmelle Lymbery, President of the Upper Hunter Landscape Guardian expressed concern that developers are able to self-assess in relation to the predicted environmental impacts of wind farms. She stated:

> The current process for wind farm developers requires them to 'self assess' impact in relation to the Federal act for flora and fauna and National Heritage and lodge a referral' with the Federal Government if they believe there is an impact. The same has to be done at the State level because the flora, fauna and heritage listings differ. At both Federal and State levels the knocking down of a small area of endangered species of flora or killing a number of endangered species of birds and bats does not appear to receive other than cursory consideration if it appears small in the overall scheme of the development.[298]

5.156 Mr and Mrs Price-Jones, also do not believe that current Environmental Assessment of wind farm developments in NSW is robust. They believe that economic considerations override adequate consideration of environmental impacts:

> The Environmental Impact Statements which accompany wind farm development applications are disingenuous and indicate a lack of rigor in preparation. Because of the economic imperative on the part of the developers, the reports they commission show little serious regard for the protection of ecologically sensitive areas, the preservation of native species and their habitat.[299]

5.157 Mr Geoffrey Putland a member of the Glen Innes Landscape Guardian also feels that the current wind farm development process is inadequate, including the process developers follow to complete an Environmental Assessment. He described the process as follows:

> The process is that developers have found an area that they want to put wind turbines on. They find farmers to agree to that process, sign those farmers with contracts that contain secrecy clauses and all that, but no consultation or advice to the community

296 *Environmental Planning and Assessment Act 1979* (NSW), Part 3A, s 75F(2)

297 Dr Formby, Evidence, 1 October 2009, p 40

298 Submission 32, Upper Hunter Landscape Guardian, p 5

299 Submission 49, p 7

> about what they plan to do. Eventually we have an environmental assessment prepared with no consultation, with very little limited time to respond and then we are given an approval. To me that process is all wrong. It is not the way we should operate in the world today.[300]

5.158 Under Part 3A of the *Environmental Planning and Assessment Act,* Environmental Assessments are required to be on display for *at least* 30 days.[301] The Committee heard evidence from local residents and local council that Environmental Assessment of wind farms currently use this minimum exhibition period. Many Inquiry participants stated that 30 days is not long enough to provide a comprehensive response to issues identified.

5.159 The Parkesbourne Mummel Landscape Guardian believe that 30 days is not adequate to be able to provide a comprehensive response. They stated:

> When a development proposal goes on public exhibition, the general public has only 30 days to examine the proposal, understand it and its ramifications, and to write a submission on it. This period of time is very much too short. A development application may be 1000 pages long, and contain specialist studies based on science and engineering. People who are working or bringing up a family cannot possibly make a full examination and criticism of such a document in 30 days.[302]

5.160 The Upper Hunter Shire Council requested an increase to the 30 day response period for the Kyoto Energy Park from the Department of Planning. The Council stated:

> the advice we had back from the department was it was not prepared to extend that period. It indicated that a similar length of exhibition period had applied to the Gullen Range, which had been most recently approved, and it thought that 30 days was appropriate—end of story[303].

5.161 Mrs Price-Jones suggested that people who wish to respond to the Environmental Assessment within the current 30 day period are required to give up work to meet the deadline:

> People like ourselves often have to give up working in order to adequately respond to the environmental assessment within the given time. Even when we do this, our refutations are ignored by the Department of Planning.[304]

5.162 The Upper Hunter Shire Council suggested that increasing the response period for wind farm Environmental Assessment would provide local communities with more time to make informed decisions about potential impacts:

> I make the point in the submission that at least 60 days would be a small extension, given the project preparation time. I would have thought that two to three months would be reasonable time and the more information or access the community has to

300 Mr Geoffrey Putland, Member, Glen Innes Landscape Guardian, Evidence, 16 October 2009, p 28

301 *Environmental Planning and Assessment Act 1979* (NSW), Part 3A, s 7H

302 Submission 99, p 16

303 Mr Casson, Evidence, 16 October 2009, p 35

304 Mrs Price-Jones, Evidence, 1 October 2009, p 51

> people with appropriate levels of expertise so they can make more informed decisions about the potential impacts.[305]

Committee comment

5.163 The Committee notes the concerns expressed by Inquiry participants regarding the current Environmental Assessment process, including the time that Environmental Assessments are on public display.

5.164 The Committee notes that the 30 day exhibition period for communities to read, research and respond to Environmental Assessments of wind farms is the *minimum* time period recommended by the Act and that many Inquiry participants do not feel that it is adequate. The Committee appreciates the length of Environmental Assessments and the amount of technical information that is included. Attempting to provide a considered response in 30 days, while attending to other responsibilities, is an unnecessary pressure.

5.165 The Committee believes that the period in which Environmental Assessments can be responded to should be extended within existing legislation and that Environmental Assessments should be on display for 90 days. This would give communities additional time to adequately respond to the diversity of issues assessed in wind farm Environmental Assessments.

Recommendation 10

That the Minister for Planning increase the public exhibition period for Environmental Assessments of wind farms from 30 days to 90 days and clarify the notification process for public exhibitions.

Compensation

5.166 The provision of compensation to residents who are adversely affected by wind farms was identified by many Inquiry participants as a means for these impacts to be acknowledged and addressed. Examples of appropriate compensation suggested include the provision of monetary compensation to affected residents and the purchasing of affected property.

5.167 Mr Alan Gillespie-Jones, a resident of Bombala, believes that compensation should be provided to properties that neighbour wind farm developments:

> … an adjoining landowner can be subject to most of the disadvantages caused by wind turbines, but will receive no compensation. The fact that nearby farmers receive no compensation for the loss of value or amenity of their farms is a national disgrace.[306]

305 Mr Casson, Evidence, 16 October 2009, p 38

306 Submission 43, p 4

5.168 Monetary compensation has been identified as a way to help offset the loss of amenity or property value and appease affected residents who do not want the turbines in their vicinity but have to live with them nonetheless. Mr Prell suggested that compensation may resolve some of the conflict within the community over inequitable financial outcomes stemming from a wind farm development:

> It may be difficult, but I actually think that the solution to this issue about jealousy between people getting money or not is to have a compensation arrangement that takes into account specific issues of individual wind farms.[307]

5.169 The Committee was advised that some residents have approached wind farm developers regarding compensation for impacts experienced as a result of wind farms. For example, Mr Warwick and Mrs Sandy Marshall told the Committee that they had enquired about compensation from a wind farm developer but their queries were dismissed:

> The very sensitive reply when my wife asked Pamada re compensation for monies we had already spent and the fact that our whole life has been upturned by this development was that it is "difficult to pay emotional compensation".[308]

5.170 A number of Inquiry participants cited examples in Europe where monetary compensation has been effective. For example, Mr McLaughlin informed the Committee that in Europe compensation to residents neighbouring wind turbines appears to "help mitigate some of the concerns".[309] Similarly, the Upper Hunter Landscape Guardians stated:

> In Europe adjoining, non-hosting landholders have received some part of the income from the wind farm to help compensate for the loss of amenity and potential loss of property value etc.[310]

5.171 Mr McLaughlin described the European system in further detail stating that a staggered percentage of the lease payment is paid according to distance from the wind farm:

> In Europe there is a much more equitable payment system where people next door will receive 50% of the lease payment and residents further away receive a 25% payment as compensation.[311]

5.172 The view that monetary compensation should be guided by proximity to wind turbines was also expressed by some Inquiry participants. For example, Dr Formby, considers that an appropriate distance for compensation is within three kilometers of a wind farm.[312]

5.173 However, Mr John Mendl, a local resident from Crookwell, raised the point that while a resident may be outside the boundary to receiving compensation, they may well still be disadvantaged by the wind turbines:

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307 Mr Prell, Evidence, 1 October 2009, p 67

308 Submission 14, p 2

309 Mr George McLaughlin, Resident, Tarago, Evidence, 1 October 2009, p 3

310 Submission 32, p 3

311 Mr McLaughlin, Evidence, 1 October 2009, p 3

312 Submission 45, Dr John Formby, p 5

> Recent letters in the local paper talk about compensation for those within two kilometres of the turbines. We will be disadvantaged but live outside that perimeter. Why should we miss out. There is also mention of about $240,000 per year given by the developer to Council for local community projects. That sounds great but again we might not get any advantage from these funds.[313]

5.174 Mr McLaughlin asserted that requiring wind farm developers to pay compensation would force a financial incentive to reconsider their proposal:

> Perhaps the more appropriate approach would impact on the hip pocket nerve. If the wind turbine constructors were required to pay compensation on the basis of proximity to the turbine with much higher compensation paid the closer one is to the turbines, that would lead to a financial incentive to re-examine their business case in a much more careful way and would hopefully lead to a better outcome for everybody.[314]

5.175 Parkesbourne Mummel Landscape Guardian noted that there is currently no legal requirement for compensation to be paid to residents affected by wind farm development:

> At present the law does not recognise the need for any compensation to affected landholders. The only exception to this is the precedent set by the Taralga wind farm case, and that only applies if the noise guidelines are breached, or if the LEC judge considers that the visual impact is unacceptable. (N.B. the unacceptability of a visual impact is a matter in the judge's discretion, since there are no recognised criteria to determine what is an acceptable visual impact, and what is an unacceptable impact.) There is as yet no general principle in law for compensation to be paid for loss of property value, loss of subdivision potential, or deterioration in quality of life. This is unjust.[315]

5.176 Parkesbourne Mummel Landscape Guardians maintain, however, there is an "inequality in the distribution of costs and benefits from wind farm developments"[316] and to deny compensation to the local community would be "a simple and straightforward injustice".[317]

5.177 An alternative to providing monetary compensation is the purchase of affected properties by wind farm developers. This was the case for landowners residing near the proposed Taralga Wind Farm, who won compensation in the Land and Environment Court. As expressed by Ms Martha Grahame, Member of the Taralga Landscape Guardian:

> …won compensation for 4 neighbouring landowners and some protection for the environment. One of the landowners who now must be bought out, is a man whose family has owned the property for more than 150 years. It was an official sanctuary for the wedge tailed eagle since the 1930s."[318]

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313 Submission 33, Mr John Mendl, pp 1-2

314 Mr McLaughlin, Evidence, 1 October 2009, p 5

315 Submission 99, p 14

316 Submission 99, p 15

317 Submission 99, p 16

318 Submission 80, Ms Martha Graham, pp 1-2

5.178 The Director-General's Environmental Assessment Report for the Gullen Range Wind Farm also recognised the purchase of property as an appropriate measure for that development. The report considered the noise impact on neighbouring residents to be unacceptable and recommended that the developer "be required to acquire the affected properties at the request of the landowner. This will ensure that the landowner's interests are protected should the turbines along the boundary of the site proceed". [319]

5.179 Although developers have been directed to purchase affected properties for the development of specific wind farms, it is not an explicit requirement in any policy or guideline for wind farm development in NSW. As such, it is not a standard compensation measure that must be considered by wind farm developers.

5.180 It is also noted that while examples of compensation have been suggested, a number of Inquiry participants indicated that compensation – and the compromise it represents – was not an option. For example, Mr Colin Dooley, a resident of Crookwell, expressed fervent opposition to compensation despite proposals for his property to be surrounded by wind turbines on three sides.[320] He attributed his refusal to relocate, be bought out or be paid compensation to preserving the heritage of his property. Mr Dooley remained steadfast at any suggestion that a compromise could be reached, including that a turbine be placed on his own land so he could make some profit:

> There is no way a turbine will be on that property. It would be over my dead body—and a few others.[321]

5.181 Dr Ashley Peake, Member of the Glen Innes Landscape Guardian, described the difficulty in quantifying the family history and commitment to his local area in a form of compensation:

> In my situation, my wife's family has been in this district for decades, since the turn of last century they have had land in that area, so it is a hard thing to just up and move. Also, we have actually moved there, we have settled there, our kids go to school locally and we have made those kinds of commitments so it is hard to imagine what kind of compensation would make up the dislocation associated with moving away from there.[322]

5.182 Dr Formby reflected this concern for uprooting family history, saying that [y]ou may not want to move because your whole life is bound up with that property and your whole ancestral memories are bound up with it.[323]

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319 NSW Department of Planning, *Director-General's Environmental Assessment Report, Major Project Assessment of Gullen Range Wind Farm*, March 2009, p i

320 Mr Colin Dooley, Resident, Crookwell, Evidence, 1 October 2009, p 62

321 Mr Dooley, Evidence, 1 October 2009, pp 62-63

322 Dr Ashley Peake, Member, Glen Innes Landscape Guardian, Evidence, 16 October 2009, p 31

323 Dr Formby, Evidence, 1 October 2009, p 44

Committee comment

5.183 The Committee notes that some Inquiry participants believe that residents who are adversely impacted by wind farms should receive some form of compensation. The Committee further notes that there are currently no legal requirements for compensation to be provided to residents affected by wind farm development.

5.184 Landowners who host wind turbines receive financial benefit from the development while neighbors who may be subject to the adverse impacts of the turbines do not. The Committee recognises the potential conflict that can occur within communities as a result of the inequitable distribution of financial benefit from wind farms.

5.185 Although there is no legal requirement for wind farm compensation, the Committee notes the precedents that have been set in the Land and Environment Court and also by the Department of Planning in assessment of the Gullen Range Wind Farm. Both of these examples required that specific properties that would be impacted by the wind farms to be purchased.

5.186 The Committee agrees that some form of compensation could be appropriate to be provided to residents who are adversely impacted by wind farms. However, the Committee has not received enough evidence to be able to conclude exactly what *type* of compensation is appropriate and to *whom* it should be provided.

5.187 As such, the Committee recommends that research should be conducted into compensation options that are appropriate for residents who are adversely impacted by wind turbines. The research should investigate options such as the purchasing of affected properties and the provision of monetary compensation. The report should include recommendations to be implemented by the NSW Government.

Recommendation 11

That the Minister for Planning commission research into compensation options for residents who are adversely impacted by wind turbines and wind farms in general. The research should investigate options including the purchasing of affected properties and/or the provision of monetary compensation by the developer.

Local ownership

5.188 The terms of reference for this inquiry include this issue of local ownership and control of wind technology. Much of the discussion and opposition to wind farms raised during the Inquiry related to utility-scale wind power generation. Community owned cooperatives using micro wind and mid-range wind generation may also have an important role to play in providing for the State's electricity needs. Locally owned wind farms are smaller than utility-scale farms and as such are less intrusive in landscapes and communities. Another benefit of locally owned wind farms is that the financial benefits are distributed more widely and there is generally a greater level of community involvement and acceptance. These issues are explored further in this section.

5.189 According to the NSW Government, local ownership of wind farms could take place through cooperatives comprised of community members. Through these cooperatives, members are given the collective responsibility of purchasing and operating a wind farm and each member benefits from the revenue generated when the electricity is sold:

> One mechanism for encouraging local ownership is through the establishment of community wind farms. Community wind farms are cooperatives of local community members that enlist investors to purchase and operate wind farms. The revenues from selling the electricity are then divided amongst members.[324]

5.190 A number of international examples of cooperative models were provided to the Committee to demonstrate their prevalence and benefit. For example, the NSW Government advised that community cooperatives are common in Europe:

> Community wind farm cooperatives are the leading form of wind turbine ownership in Denmark and cooperatives or other forms of community ownership have also developed in other countries, including Germany, The Netherlands, the United Kingdom, and the United States.[325]

5.191 Germany is cited as a prime example of how local ownership can be successfully implemented, with social acceptance of wind energy attributing in large part to the number of community wind farms established across the country.[326] 300,000 people are reported to be shareholders in community wind farm projects in Germany and in as early as 2001, approximately 80% of Germany's wind farms were own by the community.

5.192 Similarly, Denmark is reported to derive 85% of its wind generation capacity from small clusters of three wind turbines rather than large wind farms.[327]

5.193 The Committee received evidence from Ms Stone, that there is a growing interest in NSW in pursuing community-owned wind farms. As a result, the Department is preparing a handbook to help guide community cooperatives:

> … there are a number of places in NSW where communities have said they would be quite interested in the cooperative model. We are doing a handbook about cooperatives and how you can approach them. Maybe that is a model that will be attractive within some precincts and not in others.[328]

5.194 Mr Ben van den Wijngaart suggested that these cooperatives not only empower communities but also help foster acceptance of a technology that has often provoked resistance. He stated that "… a cooperative structure is the most likely to achieve the greatest community benefit and acceptance on the way." [329]

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324 Submission 104, p 5

325 Submission 104, p 5

326 Submission 42, p 21

327 Submission 42, p 21

328 Ms Stone, Evidence, 11 September 2009, p 10

329 Submission 42, p 24

5.195 Other benefits of a cooperative model include establishing more resilient and self-sustaining local communities, ownership of a renewable energy resource by local residents, revenue from selling the electricity is more equally distributed, greater community involvement and decision making and less visual and noise impact than utility scale wind farms. As expressed by Pacific Hydro in their submission:

> Pacific Hydro supports community project development as they increase public acceptance and understanding of wind energy technology and thereby remove barriers to wind energy developments in the vicinity.[330]

5.196 The NSW Government announced in November 2009 that subsidies will be provided for electricity generated by turbines of up to 10 kilowatt (KW) installed in homes in NSW.[331] 60 cents per KW will be paid, which brings micro wind turbines in-line with subsidies for solar energy generated at homes.

5.197 It is noted that planning issues surrounding micro turbines for homes are also unclear. Mr van der Wijngaart, for example, recognised the success of cooperative wind farms but was careful to point out the importance of the legislation required to facilitate this:

> Cooperative models have been very successful overseas, but it must be conceded that in many of these countries and states there has existed enabling legislation for cooperatives. Denmark has its 'Cooperative Act', as do California and Canada - all very similar to the Danish legislation.[332]

5.198 Professor Outhred, professorial visiting fellow at the University of NSW, commented on the important role that locally owned wind farms may have in the future as a result of issues such as climate change:

> With respect to the role of community wind farms, that certainly is an important issue. Looking forward into the future, we do now have to imagine a future that is quite significantly different or may be very significantly different from what we have been used to for the last 50 to 100 years. That really is because of the implications of climate change and other issues of that type. In the future it is almost certainly the case that communities are going to have to take more responsibility for both their energy supply and use, and community wind farms sit within this sphere of activity.[333]

Committee comment

5.199 The Committee notes that locally owned wind farms play an important role in the generation of electricity internationally and that they appear to have the potential to play an important role in the range of electricity options available in NSW.

5.200 The Committee notes that locally owned wind farms may go some way to reducing the negative impact of utility scale wind farms on local communities, while still enabling the

330 Submission 106, p 6

331 'Subsidies planned for home turbines', *Sydney Morning Herald*, 11 November 2009

332 Submission 42, p 21

333 Professor Outhred, Evidence, 2 November 2009, p 11

benefits of wind power to be reaped. For example, smaller scale wind farms may not be as intrusive in landscapes, benefits may be distributed more equitably and community involvement and acceptance may improve.

5.201 The recently announced subsidy of wind power installed at homes is acknowledged by the Committee, in addition to the handbook on cooperatives that is being developed by DECCW. Although it remains to be seen how practical and desirable it will be for home owners to have a micro wind turbine on their property, the introduction of subsidies such as this indicates the Governments support of wind power and may increase the uptake of local ownership of wind power.

5.202 The Committee believes that local ownership should be encouraged and that successful examples and experience from overseas should be further explored and used to identify how NSW could best support local ownership in the future.

Recommendation 12

That the NSW Government commission a study on encouraging local ownership of wind farms. The report should examine international examples and include recommendations on how local ownership can be better supported in NSW, including consideration of legislation, local ownership models and incentives.

Chapter 6 Environmental impact

This chapter explores the issue of whether wind power is a clean source of electricity that reduces greenhouse gas emissions, or whether this notion is a misrepresentation. The impact of wind farms on the natural environment, including birds is also examined, as it was a key issue of concern for many Inquiry participants. This chapter also examines other environmental and cultural concerns raised, including whether wind farms pose a bushfire risk, the impact of wind farms on the landscape and cultural heritage of rural areas.

Greenhouse gas emissions

6.1 The Inquiry terms of reference include an examination of the role of utility-scale wind generation in reducing greenhouse gas emissions generated by electricity production. Inquiry participants identified various issues regarding the relationship between greenhouse gas emissions and wind power. Some participants believe that wind power will reduce the amount of greenhouse gases emitted in NSW, while others consider that wind power will not be able to offset an appropriate level of emissions to justify the development of wind power.

6.2 Wind power is promoted as a clean and 'green' source of electricity, due to the low level of greenhouse gas emissions generated. However, opponents of wind power generally disagree with this view and believe that wind power is not as green as people are led to believe.

Wind farm construction

6.3 Utility-scale wind turbines are big structures that require a large quantity of resources for their construction. This includes materials to manufacture the turbines, transportation of the turbines and resources to assemble the turbines at the wind farm. Some Inquiry participants argued that the greenhouse gases emitted during this stage of wind farm development reduce or negate any anticipated emission savings.

6.4 For example, the Upper Hunter Landscape Guardian believes that the materials and transport required for the construction of a wind farm negates the greenhouse gas emission reductions achieved through wind farm operation:

> Taking into account the amount of CO_2 used for the concrete (300m^3 cubic metres per tower, plus slabs for maintenance sheds and sub-stations), steel that is required to make the wind farm components, the manufacture and installation of new HV power lines and transformers together with emissions from the ocean freight for imported components, the volume of truck traffic for roads and cartage and the cost of erection it is questionable whether or not a wind farm could generate sufficient 'green power' in typically 15 years of operation to offset greenhouse gas emissions created during its construction.[334]

6.5 Mr Julle Bierling, an engineer and resident of the Scone area, highlighted the potentially large amount of greenhouse gases created during wind farm construction stating:

[334] Submission 32, p 1

> … nor do they publish the fact that the actual construction of these enormous wind farms—200 tonnes of steel, concrete and roads—will cost an enormous amount of greenhouse gas and so-called carbon footprint; all this episode is not mentioned at all.[335]

6.6 However, other Inquiry participants suggested that the greenhouse gas emissions produced in the construction stage of wind farms are small.

6.7 For example, Dr Mark Diesendorf, the Deputy Director of the Institute of Environmental Studies at the University of NSW reported that greenhouse gas emissions produced during wind farm construction "… are tiny and are declining with increasing size and efficiency of its wind turbines."[336] Dr Diesendorf also reported that wind farms generate the energy used in their construction within three to seven months of operation.[337]

6.8 Ms Cate Faehrmann, Executive Director of the Nature Conservation Council of NSW also stated that "[w]ind farms pay back energy used in their construction in 3-7 months "… and added that wind farms "… then operate emission free for another 20-30 years."[338]

6.9 The low greenhouse emissions generated through wind farm manufacturing and construction is also identified by Mr Robert Holmes, Managing Director of Senergy Econnect Australia:

> Comparative studies from all over the world have found that even after wind turbine manufacturing processes and wind farm construction the greenhouse emissions from wind farms is quite small - in the order of 1% of those from coal and approximately 2% of those from natural gas, per unit of electricity generated.[339]

6.10 Epuron Energy agrees that the greenhouse gas emissions generated during manufacturing and construction are paid back within months of operation and that wind farm construction emissions are low when compared with other types of electricity generators:

> An additional factor to be considered is the assertion that wind energy has significant emissions arising from manufacture, transport and erection. This assertion is sometimes used to diminish the GHG savings derived from wind energy. This argument is a distraction as Life Cycle Analysis (LCA) studies show that a wind turbine's life cycle energy use is paid back within 6 to 7 months of operation. Given the size of wind turbines and the technologies used in their construction and operation these emissions are small compared to those associated with the construction and operation of other types of generators particularly large fossil fuel and nuclear generators.[340]

335 Mr Julle Bierling, Resident, Scone, Evidence, 16 October 2009, p 3

336 Submission 116, p 3

337 Submission 116, p 3

338 Submission 107, Nature Conservation Council of NSW, p 3

339 Submission 95, pp 4-5

340 Submission 91, p 7

Wind farm operation

6.11 Similarly, divergent views were presented to the Committee in relation to the ability of wind farms to reduce greenhouse gas emissions. Many of the Inquiry participants who where opposed to wind farms queried whether wind power is capable of offsetting an appropriate level of emissions to justify the development of wind power, while other inquiry participants contended that they could.

6.12 Some Inquiry participants suggested that as wind farm developers do not tend to clearly demonstrate the amount of emissions saved, there may not be a significant saving. Mr Bierling highlighted the lack of information from the wind farm developers in his area:

> One thing they [Pamada] do not mention is how much greenhouse gas any of this is going to save, but in my opinion the only reason we are even looking at wind farms at all is to reduce greenhouse gases and yet these proposals do not refer to greenhouse gases nor how much they are going to save.[341]

6.13 It was also suggested that as wind farms depend on non-renewable sources of electricity as back-up, the argument that wind farms are a clean source of electricity is compromised. For example, the need for wind farms to depend on greenhouse gas emitting back-up sources was identified by Dr Alan Shaw, a retired chartered engineer and resident of the United Kingdom. He stated that wind farms depend on back-up sources, which "… negates the GHG [greenhouse gas] benefit of the turbines themselves."[342] This issue is examined in detail in Chapter 4.

6.14 Lack of Australian research into the potential for wind farms to reduce greenhouse gas emissions was also presented as a reason why wind power is not necessarily as clean as is commonly believed. Mr David White authored a paper in 2004 titled *Reduction in carbon dioxide emissions: estimating the potential contribution from wind-power* which reported that further examination of the ability for renewable sources of power to reduce carbon dioxide emissions is required:

> … the relationship between renewables and CO_2 reduction in the power generation sector does not appear to have been examined in detail, and the likelihood, scale, and cost of emissions abatement from renewables is very poorly understood.[343]

6.15 Dr David Burraston and Ms Sarah Last, residents from Cootamundra, believe that research *has* been undertaken and it does not demonstrate that wind power significantly reduces greenhouse gas emissions.[344]

6.16 Mr Gordon Halliday, a resident of Scone, believes that wind farm developers and operators should be required to demonstrate the level of greenhouse gases that will be abated through the development of their wind farm:

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341 Mr Bierling, Evidence, 16 October 2009

342 Submission 110, p 2

343 White, D, *Reduction in carbon dioxide emissions: estimating the potential contribution from wind-power*, December 2004, p 4

344 Submission 81, p 22

> Proponents of wind farms should be required to provide a calculation of the greenhouse gas emissions in establishing the farm and set that against any greenhouse gas emission savings from the wind energy generated compared with coal.[345]

6.17 Dr John Formby, a resident of Binda, argued that greenhouse gas savings should be impartially assessed against other technical factors such as "… their inefficiency, high capital cost per kilowatt, fluctuating output, inability to significantly replace base load power and multiple adverse impacts …"[346]

6.18 Mr Humphrey and Mrs Jennifer Price-Jones, owners of property near Crookwell, stated that research conducted in Germany into the operation of wind turbines, suggested that there is "… no demonstrable effect on the reduction of that country's greenhouse gas emissions."[347]

6.19 Ms Anne Davis, a local resident of Scone, agrees with the notion that wind farms may not reduce greenhouse gas emissions, as they generate electricity "… 30% of the time".[348]

6.20 Mr Peter Mitchell from the Australian Landscape Guardian expressed concern regarding the *amount* of greenhouse gases that are saved through wind farm development. He stated that "… detailed analysis shows net [greenhouse gas] savings are miniscule, no more than about 5% of that claimed by promoters (and supported by government)."[349]

6.21 In response to these views, other Inquiry participants stated that Australia has among the highest level of greenhouse gas emissions per Gross Domestic Product (GDP) in the world and that the electricity industry in particular needs to take action to address this.[350] It was also argued that as wind turbines do not produce any greenhouse gases during operation as such, they displace non-renewable electricity generation for every kilowatt generated.

6.22 Epuron asserted that arguments against the potential for wind power to offset greenhouse gas emissions are incorrect:

> There is an allegation from opponents that electricity generated from wind energy does not displace electricity from other sources and therefore does not meaningfully reduce GHG emissions. This is a fallacy. Wind generation is an efficient and reliable energy player within the National Electricity Market (NEM) and displaces generation on a MWh by MWh basis.[351]

6.23 Mr Richard Tanner, from the Coolah area, also believes that wind power can decrease greenhouse gas emissions. He reported that "… wind power is the one technology most likely to succeed in reducing man-made greenhouse gas emissions."[352]

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345 Submission 18, Mr Gordon Halliday, p 1

346 Submission 45, Dr John Formby, p 1

347 Submission 49, Mr Humphrey and Mrs Jennifer Price-Jones, p 10

348 Submission 62, Ms Anne Davis, p 1

349 Submission 4, p 1

350 For example, Submission, 95, p 4

351 Submission 91, p 5

352 Submission 115, Mr Richard Tanner, p 3

6.24 The importance of taking action to reduce greenhouse gas emissions is supported by the Bathurst Community Climate Action Network, who highlighted the importance of wind power from the perspective of the impact of climate change. The Network believes that wind power can play an important role in reducing greenhouse gas emissions:

> The effects of human-induced climate change are having a catastrophic effect upon the environment and this is going to impact upon how we feed, clothe and shelter ourselves on a world scale. Wind power can make a significant contribution to the community by reducing greenhouse emissions.[353]

6.25 In its submission Marubeni Australia described wind power as an important part of the solution to the problem of global warming, highlighting that wind turbines do not produce CO_2 themselves:

> It is well understood that we must take action to reduce greenhouse gas emissions in order to stop global warming. Global warming is leading the world into uncertainty in regard to the stability of all ecosystems which in turn leads to difficulty in forecasting future economic stability … Wind power is an important part of the solution to this problem. Wind turbines do not produce any C02 …[354]

6.26 Dr Mark Diesendorf stated that coal-fired power stations are the largest single source of greenhouse gas emissions and that through substituting coal for wind power, carbon dioxide emissions will be reduced.[355]

6.27 The stationary energy sector was identified by Senergy Econnect Australia as the sector that produces the largest amount of emissions in Australia. Senergy's submission observed that the electricity generation industry requires significant action to reduce greenhouse gas emissions:

> Australia's greenhouse emissions per unit of GDP are amongst the highest in the world. Although Australia's greenhouse gas emissions arise from various sources the stationary energy sector is known to be the largest emission sector and, in 2008, it contributed to 51% of Australia's total greenhouse gas emissions … Given the contribution to global warming from traditional fossil fuel generators, Australia's electricity generation industry requires a major step forward in the form of significant and responsible actions to reduce greenhouse gas emissions.[356]

6.28 The Department of Planning informed the Committee that electricity produced by wind farms may displace emissive sources of electricity:

> Depending on market conditions, energy from wind farms may displace existing generation from emissive sources, or may provide a supply to meet the growth in energy demands in the future, avoiding the need to develop emissive generators.[357]

353 Submission 66, pp 1-2

354 Submission 70, Marubeni Australia, p 1

355 Submission 116, p 3

356 Submission 95, p 4, quoting 'CANA Emission Reduction Targets Position Paper', August 2008; 'Capital Wind Farm Environmental Assessment', February 2006; 'Tracking Kyoto and 2020', August 2009

357 Answers to additional written questions on notice, NSW Department of Planning, 6 November 2009, Question 3, p 4

6.29 In a paper authored by Macintosh and Downie from the Australian National University entitled, *Wind farms, the facts and the fallacies,* it was stated that wind power directly displaces power produced by greenhouse gas emitting sources:

> For every megawatt hour (MWh) of wind energy, one less MWh of output is needed from another source. As around 90% of Australia's electricity comes from fossil fuel-based generation, this means that the energy production that is displaced by wind farms is likely to be from coal- or gas-fired power stations. By displacing coal- and gas fired generation, wind farms reduce greenhouse emissions. The evidence indicates that a modem 50 megawatt (MW) wind farm operating at 30% capacity will reduce emissions by approximately 120,231 tonnes of CO_2 each year, which is equivalent to the annual emissions from 27,767 cars.[358]

6.30 Infigen Energy also highlighted studies which demonstrate the significant greenhouse gas emission savings that can be achieved from wind power, including a study of Victorian wind farms in 2006:

> 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 and Associates Pty Ltd (MMA) in 2006. This study, *Assessment of Greenhouse Gas Abatement from Wind Farms in Victoria* found that 1000MW of wind energy facilities in Victoria would result in a reduction of between 2.4 and 2.9 million tonnes of CO_2 per annum … 1000MW of wind energy is forecast to result in a reduction of slightly more than 1000 tonnes CO_2 for each GWh of electricity generated by wind energy.[359]

6.31 Infigen Energy also suggested that a NSW study to forecast the greenhouse gas abatement of 1000 MW of wind energy could be worthwhile, however, would probably result in similar results to the study noted above.[360]

6.32 Mr Lane Crockett, the General Manager, Australia/Pacific of Pacific Hydro suggested that the amount of greenhouse gas emissions saved could equate to approximately two million tonnes of greenhouse gas abatement over a 20 to 25 year life of a wind farm.[361]

6.33 Dr Diesendorf believes that wind power "… could contribute at least 20 per cent of [Australia's] electricity and reduce greenhouse gas emissions from the electricity sector by about 20 per cent"[362]

6.34 Pacific Hydro reported that the amount of greenhouse gas emissions that have been abated through the development of this company's wind farm in Victoria is one million tonnes over six years:

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358 Submission 48, Appendix A, p ix

359 Submission 101, p 1

360 Submission 101, p 2

361 Submission 106, p 3

362 Dr Diesendorf, Evidence, 2 November, p 3

> Pacific Hydro's 52.5MW Challicum Hills Wind Farm, located near Ararat in rural Victoria, was commissioned in 2003. In the six years of its operation, it has abated one million tonnes of greenhouse gas emissions. Pacific Hydro's current operating wind farms in Australia abate up to 670,000 tonnes of greenhouse emissions every year. Projects in our development pipeline would increase this figure by up to two million tonnes per annum.[363]

6.35 Epuron stated that the benefits of wind power extend beyond greenhouse gas emission savings to savings in water use:

> An amount equivalent to 15% of Sydney's potable water supply is used in cooling for fossil fuel generation. In operation wind energy uses no water. There is therefore not only savings in GHG emissions but also significant savings in potable water associated with wind farm generation.[364]

Committee comment

6.36 The Committee acknowledges the differing views regarding the ability for wind power to reduce greenhouse gas emissions. The Committee notes the concerns presented by some wind farm opponents in relation to the level of greenhouse gases generated during construction. However, as these emissions are offset within three to seven months of operation the Committee does not believe that this issue warrants further action.

6.37 The Committee notes that Australia produces amongst the largest amount of greenhouse gas emissions per GDP in the world. The contribution of the electricity industry to these emissions is also of concern to the Committee, in particular, that coal-fired power stations are the largest single source of greenhouse gas emissions.

6.38 The Committee notes information provided to the Committee about the amount of greenhouse gases that are abated through wind power in Australia. As wind farms displace carbon dioxide emissions from non-renewable sources of electricity, the Committee believes that wind power has the potential to reduce dependency on non-renewable sources of electricity and reduce greenhouse gas emissions. For example, greenhouse gas emissions could be reduced by approximately 120,231 tonnes of CO_2 each year with the operation of a 50 MW wind farm operating at 30% capacity.

6.39 The Committee acknowledges that wind power is not a panacea in addressing the issue of greenhouse gas emissions generated in NSW. However, developing cleaner sources of electricity is a responsible direction for NSW to follow.

6.40 The Committee notes that wind farms do not produce any greenhouse gas emissions during electricity production and at the same time, they displace electricity that may otherwise have been generated through non-renewable sources. The Committee concludes that wind farms have the potential to reduce greenhouse gas emissions in NSW.

6.41 The Committee does note, however, that there appears to be a significant degree of confusion and misinformation about the ability of wind farms to reduce greenhouse gas emissions. For

363 Submission 106, p 3

364 Submission 91, p 7

such a potentially valuable contributor to reducing greenhouse gases this is an anomaly and one that is, somewhat understandably, giving rise to unnecessary suspicion. As this inquiry has discovered in relation to a number of issues, misinformation can have a detrimental effect on people's perception and understanding of a particular issue. As wind farm developments are causing a great deal of stress among local residents (as discussed in Chapter 8), it is important to clarify this issue.

6.42 The Committee therefore recommends that wind farm developers be required, as part of the Environmental Impact Assessment process, to provide information about the projected impact of their proposal in reducing greenhouse gas emissions.

Recommendation 13

That the Minister for Planning require wind farm developers, as part of the Environmental Assessment process, to provide information about the projected level of greenhouse gas emission reduction that would result from the proposal and the carbon costs of the production of the infrastruture used.

Biodiversity

6.43 Many Inquiry participants expressed concern regarding the impact that wind farms may have on the natural environment, including plants, animals and the general biodiversity of the area.[365] The effect of wind turbines on birds and bats was identified as a particular concern and is examined in detail in this section.

6.44 Biodiversity is defined as "the variety of life forms: the different plants, animals and microorganisms, the genes they contain and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecosystem diversity." [366]

6.45 Dr David Burraston and Ms Sarah Last, local residents of Cootamundra, provided the Committee with information from the book *Environmental Impacts of Wind-Energy Projects,* which outlines benefits and impacts of wind energy.[367] In relation to the potential impact of the construction of wind farms on vegetation, the book stated:

> The construction and maintenance of wind-energy facilities also alter ecosystem structure through vegetation clearing, soil disruption and potential for erosion, and noise. Alteration of vegetation, including forest clearing, represents perhaps the most significant potential change through fragmentation and loss of habitat for some species.[368]

365 See for example, Submissions 32, 88, 3

366 Department of Environment, Heritage, Water and the Arts, *Biodiversity*, accessed 23 November 2009, <www.environment.gov.au/biodiversity/>

367 Submission 81a, Dr David Burraston and Ms Sarah Last, Appendix U

368 Submission 81a, Appendix U, p 49

6.46 Ms Rosalind Bush, Secretary of the Molonglo Landscape Guardian, also expressed concern regarding the need for vegetation to be removed so that wind farms can be constructed. She stated:

> The proposal they put forward was for 60 turbines. They said some of these would be micro-sited in wooded areas, which meant chopping down trees and putting a turbine in the middle of a wooded ridge.[369]

6.47 Macintosh and Downie acknowledged that wind farms have the potential to impact on biodiversity, through the clearing of vegetation, bird and bat collisions with turbines and disturbances to animal behaviour.[370] However, it was also noted that "the available evidence indicates that provided wind farms are located in appropriate areas the risks to biodiversity are likely to be small."[371]

6.48 Mr Nick Graham-Higgs, a consultant from nghenvironmental has been involved in the environmental planning, impact assessment and environmental management of nine wind farms in rural NSW.[372] He reported that all of the sites investigated by his business for wind farm developments have been in a poor environmental condition due to long term agriculture:

> All of the sites investigated by nghenvironmental for wind farm proposals have had long histories of agricultural use. On the majority of sites of proposed turbines, land degradation can be observed in forms such as overclearing, salination, erosion hills and gullies, infestation by noxious weeds and feral animals and depauperate native biodiversity, in comparison to unworked remnants ... Ongoing land degradation associated with drought is the context of most of the proposal's nghenvironmental have been involved with.[373]

6.49 Mr Howard Charles, a local resident from Nimmitabel, believes that landowners involved with wind farm developments, especially in the Monaro area, will be protecting biodiversity rather than reducing it.[374] The role that wind farms may play in supporting biodiversity is also supported by Dr Diesendorf, who stated "in substituting for coal power in mainland Australia, wind power produces a net decrease in greenhouse gas emissions and air pollution and therefore a net increase in biodiversity." [375]

6.50 Dr Diesendorf also stated "… wind power is currently the cheapest of the non-hydro sources of renewable energy in the world. It is also the electricity generating technology with one of the lowest environmental impacts."[376]

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369 Ms Bush, Secretary, 1 October 2009, p 18

370 Submission 48, Appendix A, p 21, quoting Langston and Pullan, 2004; SDC, 2005

371 Submission 48, Appendix A, p x

372 Submission, 93, p 1

373 Submission, 93, p 3

374 Submission 58, p 2

375 Submission 116, p 3

376 Dr Diesendorf, Evidence, 2 November 2009, p 2

Birds and bats

6.51 Various Inquiry participants raised concern regarding bird and bat strike from wind turbines, as they can potentially collide with the tower, nacelle or moving rotor blades of wind turbines.[377] For example, Mr Andrew Macintosh and Mr Christian Downie, from the Australian National University noted that:

> … collisions with the essentially stationary elements are relatively rare … The main problem relates to the risk of birds and bats colliding with moving rotor blades. The tips of the blades generally rotate at speeds between 200 and 300km/h, meaning that there is a high risk of mortality if animals do come in contact with them.[378]

6.52 Macintosh and Downie also stated that relatively little research on bird and bat strike has been conducted in Australia, making it difficult to estimate the likely number of collision-related deaths at domestic wind farms.[379] However, he referred to overseas research to conclude that the problem may be small:

> … overseas research indicates that the mortality rate for birds and bats from wind turbine collisions is low - typically less than five birds and five bats per turbine per year. If this rate is used as a rough guide, it would suggest that less than 2,550 birds and 2,550 bats currently die each year in Australia as a result of collision with wind turbines. By comparison, an estimated 8.5 million birds died each year in Queensland alone in the late 1990s as a result of land clearing.[380]

6.53 In contrast to this research, monitoring studies in the United States have concluded that "some utility-scale wind facilities have killed a large number of bats."[381] Furthermore, the American Bird Conservancy noted that "… the actual number of birds killed by wind turbines is unknown, estimates have been made in the range of 30,000 to 60,000 per year at the current level of wind development."[382] Whether the results of these studies are applicable to NSW is unclear.

6.54 Dr David Burraston and Ms Sarah Last, residents of Cootamundra, expressed concern that the construction of wind turbines near their property could negatively impact on Box-Gum Grassy Woodland.[383] They argue that as Box-Gum Grassy Woodland is host to vulnerable species of bats and birds, disturbing the area could undermine its biodiversity.[384] Dr Burraston also argued that bird and bat strike could increase the insect population to the detriment of croplands.[385]

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377 See for example, Submissions 34, 69 81, 88, 96

378 Submission 48, Appendix A, p 21, quoting Smalls 2006

379 Submission 48, Appendix A, p 22

380 Submission 48, Appendix A, p x

381 Submission 81a, Attachment G, p 316, quoting Kerns and Kerlinger 2004; Arnett 2005; Johnson 2005

382 Submission 81a, Attachment J, p 4

383 Submission 81, p 10

384 Submission 81, p 10

385 Dr Burraston, Evidence, 1 October 2009, p 28

6.55 Ms Last expressed the view that having good biodiversity assisted in drought proofing properties and that potentially losing such an important biological system could hinder her ability to farm conventionally.[386]

6.56 Various Inquiry participants expressed concern regarding the impact of wind turbines on specific bird species. Mr Humphrey and Mrs Jennifer Price-Jones, residents of Crookwell, stated that bird species that are at risk of striking wind turbines at the proposed area for the Crookwell II Wind Farm site include Gang Gang, Powerful Owl, waterfowl and raptors.[387]

6.57 Mr Price-Jones, also the Spokesperson for Friends of Crookwell, told the Committee that "whenever detailed studies have been done on bird deaths due to wind turbines, eagles, hawks and falcons are over represented".[388] This may be significant for wind farms in the Upper Hunter, as the region was also stated as being an important habitat for wedge-tailed eagles.[389]

6.58 The life cycle and breeding patterns of the wedge-tailed eagle may make the species vulnerable to bird strike, as Mr Price-Jones explained:

> … when one [eagle] is dispatched [killed], another comes in and that eagle is dispatched. It is not that eagles never learn; they do not have time to learn because when they move into the area they are frequently being killed.[390]

6.59 Ms Carmelle Lymberry, a local resident from Scone, advised that the wedge-tailed eagle also holds cultural significance for the Wonnarah People, the Indigenous owners of the Glen Range and Castle Rock.[391]

6.60 In terms of how the regulatory regime relates to the issue of bird and bat strike both Commonwealth and State law is relevant. Wind farms that may have a significant impact on 'matters of national environmental significance', including threatened species and listed migratory species, must be referred to the Commonwealth Minister for Environment, Water, Heritage and the Arts for approval, under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).[392]

6.61 Under this legislation the wind farm developer, as the 'person proposing to take the action', must refer the wind farm development to the Minister, who then assesses the likely impact. The Minister assesses whether the wind farm is likely to have a significant impact on one or more matters protected under the Act. If a significant impact is likely to occur, the action is assessed and approved under the Act before it can continue.[393]

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386 Ms Sarah Last, Resident, Cootamundra, Evidence, 1 October 2009, p 28

387 Submission 49, Appendix 1, p 4

388 Mr Price-Jones, Evidence, 1 October 2009, p 56

389 Submission 62, p 2

390 Mr Price-Jones, Evidence, 1 October 2009, p 56

391 Submission 10, Ms Carmelle Lymberry, p 1

392 *Environment Protection and Biodiversity Conservation Act 1999* (Cth), Part 3

393 Commonwealth Department of the Environment and Water Resources, *Fact Sheet, EPBC Act – Environment Assessment Process*, p 3

6.62 The NSW Department of Planning requires wind farm developers to address impacts on birds and bats through Environmental Assessment and conditions of consent that are applied to development approvals. For example, the Project Approval for the Gullen Range Wind Farm in June 2009 required the developer to prepare a bird and bat adaptive management program. Requirements of the program include:

> a) Incorporate an ongoing role for the suitably qualified expert;
>
> b) Set out monitoring requirements in order to assess the impact of the project on bird and bat populations, including detail on survey locations, parameters to be measured, frequency of surveys, analyses and reporting … data may be required to be collected prior to construction …;
>
> c) Incorporate a decision making framework that sets out specific actions and when they may be required to be implemented to reduce any impacts on bird and bat populations that have been identified as a result of the monitoring;
>
> d) Identify 'at risk' bird and bat groups such as the Powerful Owl, the Common Bentwing bat, the Large – footed Myotis and the Eastern False Pipistrelle and include monthly mortality assessments and periodic local population censuses and bird utilisation surveys;
>
> e) Identify potential mitigation measures and implementation strategies in order to reduce impacts on birds and bats such as minimising the available raptor perches, swift carcass removal, pest control including rabbits, use of deterrents, and sector management including switching off turbines that are predicted to or have had an unacceptable impact on bird/ bat mortality at certain time; and
>
> f) Identify matters to be addressed in periodic reports in relation to the outcomes of monitoring, the application of the decision making framework, the need for mitigation measures, progress with the implementation of such measures, and their successes.[394]

6.63 The Department of Planning Director General's Environmental Assessment Report for Gullen Range Wind Farm also considered the impact of the wind farm specifically on the threatened Powerful Owl.[395] The Assessment recommended:

> … that the Proponent be required to undertake further investigations into the dispersion of juvenile Powerful Owls before it is permitted to operate turbines in the Pomeroy section of the project during dispersion periods. This approach will ensure that the project does not operate in a manner that can potentially affect this threatened species unless and until the Proponent conclusively demonstrates that there will not be a conflict between the project's operation and the dispersion of juveniles in the area.[396]

6.64 There is currently no legislation or government policy that outlines a penalty to be administrated in the case of bird and bat deaths that result from collisions with wind turbines

394 NSW Department of Planning, March 2009, p 76

395 NSW Department of Planning, March 2009, p i

396 NSW Department of Planning, March 2009, p i

approved under Part 3A. However, in the case of *Taralga Landscape Guardians Inc v. Minister for Planning and RES Southern Cross Pty Ltd* (2007) the NSW Land and Environment Court resolved that:

> The Proponent [RES Southern Cross Pty Ltd] must make a financial contribution of $1500.00 to the NSW Wildlife Information and Rescue Service (WIRES) for each death of a wedge-tailed eagle that has reasonably been attributed to the carrying out of the development. The financial contribution must be paid by the Proponent within one month of the Proponent becoming aware of the death. The contribution must be adjusted to take account of any increase in the Consumer Price Index over time, commencing at the March 2007 quarter.[397]

6.65 Some Inquiry participants expressed frustration in relation to a donation system to compensate for bird strike. For example, Mr Jim and Mrs Noreen Marshall, residents of Scone, noted, "the most abhorrent thing I have researched in regards to these industries is the fact that a "dollar" amount is mentioned to be paid to RSPCA [sic] for example, for every wedge tailed eagle slaughtered."[398]

6.66 Mrs Jennifer Price-Jones, resident of Crookwell, observed, "… if I killed a wedge-tail I would be prosecuted. If a wind turbine company kills a wedge-tail it pays a fine, which is less than if an individual deliberately killed a wedge-tail."[399] The Upper Hunter Landscape Guardians also believe "the decision to charge $1500 for every eagle kill is sending the wrong message …"[400]

6.67 Although the penalty for the death of wedge-tailed eagles is inconsistent, Macintosh and Downie noted that the number of deaths is likely to be small. They stated that of the estimated 173 Tasmanian wedge-tailed eagles killed each year as a result of human activities, only one is likely due to wind farms.[401]

6.68 All native birds, reptiles, amphibians and mammals, except the dingo, are protected in NSW by the *National Parks and Wildlife Act 1974* (NSW).[402] The death of any species protected under this Act may result in a maximum penalty of six months imprisonment and/or $11,000 (100 penalty units plus 10 penalty units per animal).[403] However, this penalty does not apply to deaths of protected species that result from developments approved under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW). This includes most wind farms in NSW.

6.69 Evidence has not been presented to the Inquiry in relation to other legislation or policy that requires wind farm proponents to pay for the death of protected species that are caused by wind farms. As such, the ruling in *Taralga Landscape Guardians Inc v. Minister for Planning and*

397 *Taralga Landscape Guardians Inc. v. Minister for Planning and RES Southern Cross Pty Ltd [2007] NSWLEC 59*

398 Submission 15, p 3

399 Mrs Price-Jones, Evidence, 1 October 2009, p 54

400 Submission 32, p 5

401 Submission 48, Attachment A, p 22, quoting Bevilacqua, 2006

402 NSW Department of Environment, Climate Change and Water, *Protected species*, accessed 23 November 2009, <www.environment.nsw.gov.au/animals/ProtectedSpecies.htm>

403 *National Parks and Wildlife Act 1974* (NSW), Part 7, s 98, 2b(a)

RES Southern Cross Pty Ltd (2007) NSWLEC 59 that the proponents of Taralga Wind Farm must pay $1,500 for each death of a wedge-tailed eagle that was caused by the wind farm, may have set a precedent.

6.70 The current penalty for individuals and corporations convicted under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) for taking an action that will have a significant impact or is likely to have a significant impact on a listed threatened or endangered species, such as the Tasmanian subspecies of wedge-tailed eagle, is up to $500,000 for the former and up to $5,500,000 for latter.[404] Threatened species are often identified in Environmental Assessments of proposed wind farms.

6.71 For example, three federally listed threatened bird species were identified through the Cullerin Wind Farm Environmental Assessment, which had 'greater than low potential' to be present on site, including the Swift Parrot, Superb Parrot and Regent Honeyeater. The Assessment concluded that the expected level of collisions would not impact these species at a population level, however, the proposal should "… incorporate rigorous and properly timed monitoring of collision impacts and protocols so that action can be taken if unacceptable levels of mortalities occur onsite."[405]

6.72 Information presented in the Environmental Assessment for Cullerin Wind Farm regarding the impact of the wind farm on birds is not clear. It initially stated "… population level impacts exist through ongoing collisions with turbines" then in the same paragraph "… expected levels of collisions would not generate a population level impact." The latter conclusion may be as a result of considering "… surrounding habitat and local records as well as consideration of mortalities at existing wind farms."[406]

6.73 However, as the Environmental Assessment identifies the "… paucity of long-term data available and the lack of rigor in monitoring at many existing wind farms" it is unclear why such information would be used to reach the conclusion that a population level impact was not anticipated, given the initial assessment proved otherwise. [407]

6.74 The developer of Cullerin Wind Farm identified that "if mortalities exceed a pre-determined threshold, additional mitigation measures should be considered, such as diversion structures, blade painting (refer Hodos *et al* 2001), turning off blades at critical times, further turbine ridge habitat modification and enhancement of off-site habitats and prey populations."[408]

6.75 The Committee received evidence that suggested there are many other threats to birds which exceed the threat presented by wind turbines. For example, Dr Diesendorf stated that "…the main threats to birds are habitat destruction, pet cats, buildings, motor vehicles and

404 Environmental Defenders Office (SA), *Litigation under the Environment and Biodiversity Conservation Act (Cth) 1999, at March 2008*, p 10

405 nghenvironmental, May 2006, p 152

406 nghenvironmental, May 2006, p 152

407 nghenvironmental, May 2006, p 152

408 nghenvironmental, May 2006, p 154

powerlines."[409] This was supported by Mr Ben van der Wijngaart's assertion that "wind turbines account for between 1/5000th to 1/10,000th of annual bird deaths."[410]

6.76 It was further argued that the risks to biodiversity from bird and bat strike are "insignificant compared to the threats associated with other processes and activities."[411] Macintosh and Downie cautioned that:

> … while care should be taken in the siting and operation of wind farms, the risks to biodiversity should not be exaggerated and must be weighed against the potential for wind farms to contribute to reducing the severity of the impacts of climate change.[412]

6.77 A similar comment was made by Mr Christopher Croker, a farmer from Golspie, who stated:

> I believe if something is not done to reduce our greenhouse gases then eventually we will not have to worry about eagles flying into them—they could just be falling out of the sky anyway.[413]

6.78 In order to manage the potential impacts of wind farms on birds, Mr Downie suggested that each wind farm proposal be considered on a case-by-case basis, factoring in such issues as the site's proximity to forested land.[414] Mr Downie further elaborated that bird deaths could be minimised if the siting of wind farms take into account the migratory routes of birds.[415]

6.79 Mr van der Wijngaart agrees that the siting of wind energy facilities is critical to minimising the number of deaths of birds and bats, as earlier reports of bird kills by turbines were often related to poor siting.[416] Dr Diesendorf explained that "the most suitable sites are exposed to wind, naturally; that is ridges and hills. The least suitable sites, which I think should be avoided, are, of course, national parks, wetlands where birds congregate and forests."[417]

Committee comment

6.80 The Committee notes the potential impact that developments such as wind farms can have on natural environments, especially in the event that planning and operational stages are not managed appropriately.

6.81 From evidence presented to the Committee, the primary impact on vegetation seems to occur during wind farm construction, as land clearing is normally required. Since many wind farms in NSW are constructed on land that is already suffering from effects of land clearing, erosion

409 Submission 116, p 3

410 Submission 42, p 19

411 Submission 48, Attachment A, p 23

412 Submission 48, Attachment A, p v

413 Mr Christopher Croker, Resident, Golspie, Evidence, 1 October 2009, p 74

414 Mr Downie, Evidence, 11 September 2009, p 45

415 Mr Downie, Evidence, 11 September 2009, p 44

416 Submission 42, p 18

417 Dr Diesendorf, Evidence, 2 November 2009, p 2

and weed growth, the Committee agrees that the impact of land clearing for wind farms is viewed as having a minor impact. The Committee further notes that when in operation, wind farms have no additional impact on vegetation.

6.82 The Committee notes that the Environmental Assessment required by the Department of Planning as part of the development application acts to ensure that more sensitive vegetation is not negatively impacted by wind farm development.

6.83 Conversely, the impact on animals appears to be more prominent during operation rather than the construction stage of a wind farm. The Committee acknowledges the concern expressed by many Inquiry participants regarding the potential impact of wind farms on birds and bats. In particular, the perception that wind farm proponents are not currently required to effectively monitor, report or be penalised for animal deaths caused by wind turbines.

6.84 The Committee recognises that a significant number of bird deaths have been experienced overseas as a result of wind turbines, which is a cause for concern for many Inquiry participants. However, there is no record of wind turbines having a similar effect on birds in NSW, although this is not to say that it has not occurred.

6.85 The Committee notes that wind farm developers are required to assess the potential impact of wind farms on animals, such as birds, as part of the development application process. In addition, development conditions of consent identify ongoing monitoring responsibilities for wind farms.

6.86 The Committee believes that the conditions of consent applied to development approvals are thorough. However, there is an absence of evidence to demonstrate that these conditions are adequately adhered to. For example, the claim by a wind farm developer and local residents that there is a 'lack of rigor' in monitoring bird deaths at wind farms is of concern to the Committee.

6.87 The Committee also notes that the Inquiry received no data identifying the *actual* number of bird deaths that result from wind farms in NSW. Without this data, the Committee is not able to conclude that the impact of wind farms on birds is managed effectively.

6.88 The Committee believes that conditions of consent need to be monitored more closely so that the Department of Planning can objectively conclude the level of impact specific wind farms have on local bird populations. It appears that local communities become aware of the anticipated impact of wind farms on birds through the Environmental Assessment process, however, the *actual* impact is not communicated. Improved monitoring and reporting by the Department of Planning may go some way to resolving this concern.

6.89 The Committee acknowledges the frustration expressed by Inquiry participants regarding the inequitable penalties that are applied as a result of bird deaths from wind turbines, including the wedge-tailed eagle. The absence of a penalty means that there is little incentive for wind farm proponents to actively avoid such impacts. The lack of legislation regarding the death of protected species as a result of developments such as wind farms is of concern to the Committee.

6.90 While the Committee acknowledges and appreciates the importance of state critical infrastructure, impacts of these developments should be managed appropriately. As the

number of wind turbines in NSW is increasing, the Committee reasons that the potential impact on animals and birds in particular may increase. As a minimum, the impact of wind turbines on wildlife requires adequate monitoring and reporting. Action to address any impact caused by wind farms should be identified as required and appropriate.

6.91 The Committee is also of the view that research work should be undertaken into the impact of wind farm developments on native fauna. Therefore the Committee recommends that the Minister for Climate Change and the Environment, commission a research project, in partnership with a relevant NSW tertiary institution, into the effects of wind farm operations on native fauna including an on-going monitoring project involving academics and students.

Recommendation 14

That the Minister for Planning ensure that wind farm developers comply with bird and bat management conditions of consent. A summary of results of bird and bat monitoring, including the number of deaths, should be published annually on the Department of Planning website. Where the results demonstrate non-compliance with the conditions of consent the Minister should apply appropriate penalties or action.

Recommendation 15

That the Minister for Climate Change and the Environment commission an appropriate research project, in partnership with a relevant NSW tertiary institution, into the effects of wind farm operations on native fauna including a monitoring project involving academics and students.

Other concerns

6.92 In this section other environmental and cultural concerns that were raised by Inquiry participants about wind farms are examined. This includes whether wind farms pose a bushfire risk, the impact of wind farms on local cultural heritage and the impact of wind farms on the landscape and local climate.

Bushfire risk

6.93 Some Inquiry participants expressed concern that wind turbines may increase the risk of bushfires.[418] For example, Mrs Janine Hannan, a resident near the proposed Crookwell II Wind Farm, stated "there is a real threat of bushfires from the wind turbines catching fire. This has already happened twice in South Australia …"[419]

418 See for example, Submissions 107, 111, 61

419 Submission 25, Mrs Janine Hannan, p 2

6.94 Ms Shirely Watson, a local resident from Scone, expressed concern that wind turbine fires may be started through lighting strikes:

> … if a wind turbine that is filled with hundreds of litres of fuel was ignited by a lightning strike there would be a major fire, that would just have to keep on burning out of control because these turbines are 150 metres tall and it is absolutely impossible for rural fire fighters to put out these huge fires.[420]

6.95 Wind farm developers acknowledge a 'small risk' of fire. For example the Environmental Assessment prepared by Pamada for Kyoto Energy Park stated that "wind turbines manufactured today incorporate the highest quality safety standards. Nevertheless, there is always still a small risk of fire ignition from malfunctioning electrical or moving parts within the generator enclosure."[421]

6.96 The Environmental Assessment for Cullerin Wind Farm identified fire risks including "… the potential for containment lines, potential for the substation to start a fire and activities such as hot welding in fire danger periods."[422] The Assessment concluded that risks are considered to be manageable with the implementation of mitigation measures.

6.97 For example, during the Committee's visit to Cullerin Range Wind Farm, Mr Stuart Atkinson, Wind Farm Operations Leader, Origin Energy, informed the Committee that transformers are positioned on the ground near the wind turbine, rather than within the nacelle. Mr Atkinson advised that this reduces the fire risk.[423]

6.98 The Environmental Assessment for Kyoto Energy Park identified the following measures to reduce the risk of fire from wind turbines:

- Temperature increases in the turbines can be detected through monitoring systems in each wind turbine and are automatically shutdown as required.
- Because of their hub height (hub height up to 150m), wind turbines can be susceptible to lightening strikes and therefore if not designed properly can cause electrical damage and possible fire risk. Lightening protection devices will be fitted to each turbine, additionally turbines will be earthed to prevent arching or surging resulting from lightening strikes which may potentially ignite fires.
- Wind turbines must comply with the Building Code of Australia and the Australian Standards.
- High voltage power cables would be buried underground.
- Vegetation around transformers would be kept below 100 mm.[424]

420 Submission 73 Ms Shirley Watson, Attachment B, p 7

421 Pamada, November 2008, p 339

422 nghenvironmental, May 2006, p 10

423 Appendix 3, site visit report Cullerin Range Wind Farm

424 Pamada, November 2008, p 340

6.99 Dr Diesendorf disputed the suggestion that wind farms increase the risk of bushfires stating that "[i]ndeed, the opposite is true. Fossil fuels cause global warming and, in some regions, drought and so increase the prevalence and severity of bushfires. In so far as wind power substitutes for fossil fuels, it reduces the risk and intensity of bushfires."[425] Dr Diesendorf also noted that wind farms have never caused bushfires in NSW.

Committee comment

6.100 The Committee notes the concerns expressed by some Inquiry participants regarding the potential for wind farms to increase the risk of bushfires. However, it appears that wind farm developers are aware of the potential risks and implement appropriate management measures to prevent bushfires from occurring. The Committee further notes that as far as it is aware no bushfires have been started through wind farm activity in NSW. As such, the Committee concludes that wind farms do not significantly increase the risk of bushfires in rural areas.

Landscape and cultural heritage

6.101 Wind farms are large structures that can dominate large areas of land and can be located within kilometres and sometimes hundreds of meters of houses. Through changing local environments, there is the potential for wind farms to change landscapes and have an impact on local cultural and family heritage. Some Inquiry participants expressed concern regarding the potential impact of wind farms on the amenity and cultural heritage of areas, including the impact on Indigenous heritage. Inquiry participants also expressed concern that these impacts are not adequately assessed during the planning stage of wind farms.

6.102 For example, Dr Burraston and Ms Last expressed concern regarding the impact of wind farms on their family and its cultural heritage.[426] This sentiment was also expressed by Mr Colin Dooley, who owns property beside Crookwell I Wind Farm and is concerned about the impact of the wind farm on his family, stating "[w]e just want to preserve the heritage of this property, which has been there for generations, for future generations."[427]

6.103 Mr John and Mrs Nicki Zubrzycki, residents near Crookwell, observed that wind farms have the potential to "… change this landscape and its heritage forever."[428]

6.104 Inquiry participants also expressed concern regarding the possibility that heritage considerations are not adequately taken into account during wind farm planning. In this regard Upper Hunter Landscape Guardian stated:

> The affects [sic] on heritage, particularly local aboriginal heritage, the environment, wildlife corridors, and birds kills … is not seriously taken into account by the self-appraisal system required under the *EPBC Act* both Federal and State.[429]

425 Submission 116, p 8

426 Submission 81, p 41

427 Mr Dooley, 1 October 2009, p 63

428 Submission 36, Mr John and Mrs Niki Zubrzycki, p 7

429 Submission 32, p 2

6.105 The impact on the Indigenous heritage of the Scone area was identified by Mr Jim and Mrs Noreen Marshall who stated:

> The Wonnarua tribe have concerns re this particular site as they may well have in regard to Mountain Station because of the bird life and the landscape ... It is the home of the Wedge Tailed Eagle - their totem bird.[430]

6.106 The Inquiry did not receive evidence from the Wonnarua people or their representatives regarding potential impact of wind farms. However, Ms Katrina Hodgkinson MP stated that the Buru Ngunawal Aboriginal Corporation is concerned that cultural heritage may have been affected by a wind farm development. She stated that representatives of the Corporation:

> … have been involved in the assessment of some of the turbine locations for the presence of burial sites and camping and ceremonial areas of importance to the traditional owners. Their concerns centre on not being fully informed of the location of all work sites, temporary and permanent … In one case they believe that they may have lost one of the graves at Cullerin, which is distressing for them. [431]

6.107 Mr and Mrs Price-Jones live near the potential site for the Gullen Range Wind Farm, which they argue threatens the amenity of their rural area:

> The very reason that many people choose to live in rural areas is the amenity it provides. It is the ability to feel close to the natural world and appreciate the rural landscape that induces farmers to remain on the farm even when agricultural/pastoral incomes dwindle. The establishment of huge industrial structures which dominate the landscape and produce noise which is impossible to ignore totally destroys the amenity of many rural residents.[432]

6.108 Ms Margaret Lynn from Glen Innes expressed that "[i]t is an industrial imposition on a peaceful rural valley and my view will never be the same…"[433]

6.109 Mr Jamie Buck, who lives between Goulburn and Taralga, stated that wind farms "… are a blight on the landscape and cost the consumer both in the environment and the hip pocket."[434]

6.110 Mrs Julianne Frost, a resident from Scone, also believes that wind farms change rural landscapes. She highlighted the "… stresses of changing a rural landscape into an industrial zone."[435]

6.111 The Environmental Assessment for Kyoto Energy Park acknowledges the visual impact that wind turbines have on the landscape:

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430 Submission 15, p 3

431 Ms Katrina Hodgkinson MP, Member for Burrinjuck, Evidence 11 September 2009, p 69

432 Submission 49, p 7

433 Submission 63, Ms Margaret Lynn, p 1

434 Submission 17, Mr Jamie Buck, p 1

435 Submission 16, Mrs Julianne Frost, p 1

> These elements [turbines] will contrast strongly with the landscape surrounding them. Those turbines located on the ridge line are the major visual element as the strong line created by them. This will be added to by the movement of the blades.[436]

6.112 The visual impacts of wind farms are also acknowledged by Dr Diesendorf, who stated that "[b]y its very nature wind power has a visual impact, which most people accept and a small minority dislikes."[437]

6.113 The Committee was advised that as a means to reduce the visual impact of wind turbines of Kyoto Energy Park, the worst affected residents are offered landscape planting at their houses.[438] In addition, turbines can be coloured to best suit the background on which they will most often be viewed. The Committee was not advised of any turbines being painted in this way.

6.114 However, some residents feel that planting vegetation to screen wind turbines is ineffective due to the size of the turbines, the fact that favourable views are also then obstructed and that vegetation can create a fire hazard.

6.115 The turbine layout can also be changed to reduce the visual impact of a wind farm. For example, Pamada reported that some wind turbines were removed from the original design of Kyoto Energy Park due to 'visual recommendations'.[439]

6.116 Dr Eja Pedersen, an academic from Halmstad University in Sweden who appeared before the Committee via videoconference, has conducted research which showed a connection between negative perception of wind turbines in the landscape and noise annoyance.[440] She reported that "[n]egatively appraising the impact of the wind turbines on the landscape scenery was highly associated with noise annoyance."[441] This relationship is explored further in Chapter 9.

6.117 Mr Stuart and Mrs Heather Carter, residents of Scone, do not believe that the impact of wind farms on the landscape is as severe as some people believe. They stated "… the risks and loss of amenity highlighted by some rural communities is exaggerated. Wind farms have been established all around the world and sometimes quite close to people's homes."[442]

6.118 Mr Howard Charles, a resident from Nimmitabel, stated that "[t]he windmill has been an iconic symbol of rural Australia for many years and I believe that these new turbines also have a grace and beauty of their own.[443]

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436 Pamada, November 2008, p 263

437 Submission 116, p 7

438 Pamada, November 2008, p 268

439 Pamada, November 2008, p 272

440 Submission 81a, Attachment V, p 480

441 Submission 81a, Attachment Z, p 79

442 Submission 13, Mr Stuart and Mrs Heather Carter, p 1

443 Submission 58, p 1

6.119 The Department of Planning Director General's Environmental Assessment Report for Gullen Range Wind Farm considered 'public perception' and concluded that it need to be balanced with other factors:

> The Department recognises that public perception is an important component but only one element in the visual assessment methodology, as discussed further below. In terms of broad landscape consideration, the site provides a suitable setting for a wind farm development. There is already significant disturbance in the area which is a cleared agricultural landscape including existing built elements such as, industrial agriculture, aerodrome, telecommunication towers, and high voltage transmission lines.[444]

6.120 The Australian Wind Energy Association developed *Wind Farms and Landscape Values: National Assessment Framework* (2007) for wind farms to help minimise potential landscape impacts from wind farms.[445] However, Parkesbourne Mummel Landscape Guardians do not believe that the National Framework is adequate in addressing visual impacts, stating:

> No definite method for assessing visual impact is imposed on proponents. Booklets such as *Wind Farms and Landscape Values* do not describe a method. They only offer general advice on topics to be considered, and tasks to be performed. The construction of the methodology is left to the consultant employed by the developer. This results in significant differences in methods used by different consultants, with sometimes preposterous results.[446]

6.121 The Environmental Assessment for some wind farms does not provide clear information regarding the potential impacts of wind turbines on landscapes. For example, the Visual Assessment for Kyoto Energy Park stated:

> Visual quality of a landscape unit has little influence on visual effect, nor does it of itself define the visual qualities of visual settings that include more than one landscape unit but it does give an indication of the distinctive landscapes in the locality and the relative values of the visual quality of the various landscape units.[447]

6.122 The Department of Planning Director General's Environmental Assessment Report for Gullen Range Wind Farm stated that landscape value should be considered from a regional or state-wide perspective, as placing too much emphasis on a local perspective may reduce the number of sites that could be suitable for wind farm development:

> In assessing any wind farm proposal, the Department deems it necessary that the landscape value be seen from a regional, if not State-wide perspective. For example, if a wind farm proposal such as this project is refused solely upon a local perspective of scenic quality, it would probably eliminate opportunities to construct wind farms possibly anywhere in the region, and possibly in the State. The Department's assessment is consistent with the general approach taken for previous wind farm proposals in that a wind farm would have to impact a landscape of regional, if not

444 NSW Department of Planning, March 2009, p 20, *Environmental Planning and Assessment Act 1979* (NSW), s 75I

445 AusWind, *Wind Farms and Landscape Values - National Assessment Framework,* June 2007, p 1

446 Submission 99, p 10

447 Pamada, November 2008, p 261

State or national importance, for it to be refused on the basis of scenic quality alone.[448]

Committee comment

6.123 The Committee acknowledges the impact that wind farms have on the landscape and the concern that this causes many Inquiry participants. The Committee also notes concerns regarding the potential impact of wind farms on cultural and heritage values.

6.124 The Committee acknowledges that changes to local landscapes can be difficult for many residents to accept. The impacts experienced by residents may be compounded by poor community consultation methods and a perception that the government will approve such developments regardless of their impacts, as identified in Chapter 9.

6.125 The Committee notes that there are few changes that can be made to a wind farm to reduce the impact on the landscape. While turbines can be coloured to blend as far as practicable with the surrounding landscape and trees planted, they are still highly obvious in most settings.

6.126 The Committee further notes that wind farm developers are not able to change the design of the wind farms to suit all residents. However, the Committee believes that every effort should be made by the Department of Planning and wind farm developers to respectfully respond to and address these sensitive issues as far as practicable.

6.127 In the event that the design of the wind farm cannot be changed to avoid or reduce the impact to within a reasonable level, the Committee recommends that compensation as discussed in Chapter 5 should be considered.

Recommendation 16

That the Minister for Planning address landscape and cultural heritage values in the *NSW Planning and Assessment Guide for Wind Farms*.

448 NSW Department of Planning, March 2009, p 20, *Environmental Planning and Assessment Act 1979* (NSW), s 75I

Chapter 7 Health and social impact

This chapter examines the various health and social impacts of wind farms that have been identified as a concern by Inquiry participants. The health impacts of wind farm noise were identified as a primary concern for many contributors and as such it is addressed in detail in this chapter. Factors that may influence noise levels are also addressed, including terrain and meteorology. The impact of low frequency noise is examined, including the potential for such noise to lead to Vibroacoustic Disease. 'Wind Turbine Syndrome' is also discussed. Current research regarding noise perception and annoyance is examined, including how this manifests as a health concern. Well-being, shadow flicker and wind turbine safety are also discussed in this chapter.

Noise concerns

7.1 The noise produced by wind turbines and the associated impact on health and lifestyle was identified as a primary concern for many Inquiry participants who currently live, or who may soon live, near a wind farm.[449] These concerns are examined in this section. The planning aspects of wind farm noise are examined in Chapter 5.

7.2 The main source of noise from wind turbines is 'aerodynamic noise', which results from the movement of the turbine blade through the air.[450] The noise that is generally reported to be of concern to people in the vicinity of wind turbines is as a result of 'modulation of aerodynamic noise', for example the rhythmic 'whoosh … whoosh … whoosh' sound that occurs when the blade passes the turbine tower.[451]

7.3 Reasons offered by contributors to this Inquiry for why wind turbine noise is a significant concern include the potential impact on health, sleep interruption, the impact on rural amenity and property values and the creation of community division.[452]

7.4 Ms Wendy Bell from the Molonglo Landscape Guardian reported that noise is the most common complaint about wind farms:

> The effect most frequently complained of is noise from turbines and spinning blades. Reduction in property values are also a concern and result from the combined negative effects of noise, diminished landscape values and industrialisation of the landscape.[453]

7.5 Mrs Julie Gray, a resident from Bungendore near Capital Wind Farm, stated: "[w]e are 2.1 kilometres away and I definitely have an underlying vibration at night—not during the day. It

449 See for example, Submissions 6, 38, 28, Mr Gordon Halliday, Upper Hunter Landscape Guardians, Evidence, 16 October 2009, p 15

450 Submission 81, Appendix O, p 11

451 Submission 81, Appendix O, p 6

452 See for example, Submission 111, 49, 74, 88

453 Submission 53, Molonglo Landscape Guardian, p 19

is definitely there when I am trying to go to sleep."[454] Mrs Ruth Corrigan, a resident from Tarago, also reported that there are noise impacts from the Capital Wind Farm turbines near her house and that the noise is most intrusive at night.[455]

7.6 Mr Humphrey and Mrs Jennifer Price-Jones who live on a property near the site of the proposed Crookwell II Wind Farm explained that the constant exposure to the noise caused by wind turbines might be a health and safety risk because "… as farmers, our days are spent OUTSIDE in the paddocks, in ALL SEASONS".[456]

7.7 Mr Paul Miskelly from the Taralga Landscape Guardian expressed concern regarding the impact that wind turbine noise may have on property value, stating that "[i]t is the noise impact that effectively completely destroys any residential value that a property might have."[457] The impact of wind farms on property value is examined in detail in Chapter 8.

7.8 Mr Dennis Workman, a resident near Taralga, expressed the view that wind farm hosts do not receive appropriate noise information from wind farm developers:

> They [wind farm hosts] are almost certainly not told that the wind turbines make incessant low frequency noise and vibration. They are almost certainly not told that their farm houses will be made uninhabitable by noise. They are almost certainly not told that their farms will be dried out by the turbine wake.[458]

7.9 The NSW Department of Planning asserted that "[s]ome of these [noise] issues have been addressed as a result of advances in technology and positioning of the turbine blades …", while also acknowledging that new wind farms do introduce a new source of noise to an area and the impacts need to be assessed.[459]

7.10 The Committee was informed that the Victorian Government is currently investigating the impact of 'sub-audible' noise from Waubra Wind Farm in Victoria on the health of local residents.[460] Mr Peter Kavanagh MP raised the issue in the Victorian Parliament after some local residents claimed that they were suffering from adverse health impacts as a result of the wind farm.

7.11 The extent of the impact of wind turbine noise on health was questioned by other Inquiry participants. For example, Mr Ken McAlpine, the Government Relations Manager for Vestas Wind Systems, stated that "[o]nce these projects are actually completed a lot of the complaints

454 Mrs Gray, Evidence, 1 October 2009, p 4

455 Submission 72, p 1

456 Submission 49, p 6 (original emphasis)

457 Submission 84, Taralga Landscape Guardian, p 11

458 Submission 68, Mr Dennis Workman, p 14

459 NSW Department of Planning, August 2009, p 17, *Environmental Planning and Assessment Act 1979* (NSW) s 75I

460 'Health check for Waubra Wind Farm', *Stock & Land*, 19 October, 2009

go away. A lot of it is the fear of the unknown."[461] This view was supported by Mr Robert Jackson, General Manager Policy, Clean Energy Council.[462]

7.12 Mr Jackson provided some background information regarding how wind turbine design assists in minimising noise:

> First of all, any noise produced by the wind turbines, of course, is wasted energy. That is energy that they are not capturing, it is going out in noise rather than in electrical energy. It is in the best interests of the turbine manufacturers to keep noise to a minimum. Secondly, over the years there have been changes in the design of turbines. One of the prime reasons for that was noise reduction. That is why we have settled on the current design. All major turbines that I can think of at the moment are three-blade turbines with the blades up wind of the tower. Previously the blades were down wind.[463]

7.13 Some of the evidence presented to the Inquiry suggested that some sources of wind farm noise can be managed. For example, the mechanical noise heard from wind turbines should only be audible if there is a problem with the turbine. In this regard, information identified by Dr David Burraston and Ms Sarah Last, rural residents from residents from Cootamundra, that was published by the Minnesota Department of Health in the USA stated that: "[m]echanical noise from the turbine or gearbox should only be heard above aerodynamic noise when they are not functioning properly."[464]

Influence of terrain and meteorology on noise

7.14 Many submissions highlighted the impact of terrain and meteorology on wind turbine noise levels. It was argued that certain types of terrain and meteorology could increase the level of wind farm noise experienced.

7.15 For example, Dr Burraston and Ms Last highlighted research conducted by Mr GP van den Berg which "… shows that there are significantly higher levels of noise pollution at night than are experienced in the daytime and the effects of complex terrain such as hills are different to flat terrain.[465]

7.16 Research conducted by van den Berg concluded that atmospheric conditions have a significant influence on sound levels produced by wind turbines.[466] Specifically, when wind is stronger towards the top of a wind turbine and weaker at ground level, the noise emissions are higher. This has been labelled as the 'van den Berg effect'. This variance was also recognised by Mr Scott Jeffries, Director, Major Infrastructure Assessments at the NSW Department of Planning, who stated:

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461 Mr McAlpine, Evidence, 11 September 2009, p 17

462 Mr Jackson, Evidence, 11 September 2009, p 18

463 Mr Jackson, Evidence, 11 September 2009, p 19

464 Submission 81, Attachment O, p 11

465 Submission 81, p 30

466 Submission 81a, Attachment G1, p 32

> … under stable weather conditions at night, for example, we may experience much greater noise impacts than predicted, simply because there is that differential between wind speeds at the ground level and at hub height.[467]

7.17 In addition, van den Berg noted that those who visit wind farms areas may experience noise differently than residents:

> Those who visit a wind turbine in daytime will usually not hear this and probably not realise that the sound can be rather different in conditions that do not occur in daytime. This may add to the frustration of residents …[468]

7.18 Molonglo Landscape Guardian expressed concern regarding the impact that atmospheric conditions such as thermal inversions have on noise levels at night.[469] This submission also stated that noise assessment does not currently consider the impact of atmospheric conditions when modelling expected noise levels for wind farms.

7.19 This assertion appears to be correct for the majority of Environmental Assessments for wind farms in NSW. However, the Committee is aware that Pamada considered the potential impact of temperature inversions in relation to the Kyoto Energy Park, concluding in the Environmental Assessment that:

> … it will be necessary to review the likelihood of modulation during operations to understand whether controlling of wind turbines is required to eliminate high degrees of modulation under certain stable atmospheric conditions.[470]

7.20 Pamada also considered the van den Berg effect in the Environmental Assessment for Kyoto Energy Park, concluding that the effect is considered to be low:

> The data concludes that the wind shear at night time is steeper than during the day time and some months it is steeper than others. However, in all cases the speedups result in a relatively small change in noise emissions (Sound Power Levels) [sic] from the generator with change in wind speed. Therefore potential for aspects of the Van Den Burg [sic] effect at the site are considered low.[471]

7.21 Research conducted by van den Berg also concluded that it is possible for certain types of wind turbine noise to be heard at greater distances from the turbine.[472] This was acknowledged in the South Australian *Wind farms environment noise guidelines*.[473] However, topography is not currently taken into account when modeling noise levels at properties surrounding proposed NSW wind farms. This approach may result in increased noise levels being experienced than predicted.

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467 Mr Jeffries, Evidence, 11 September 2009, p 5

468 Submission 81a, Attachment G1, p 32

469 Submission 53, Attachment A, p 2

470 Pamada, November 2008, 257

471 Pamada, November 2008 p 256

472 Submission 81a, Attachment G1, p 21

473 Environmental Protection Authority, South Australia, July, 2009, p 6

7.22 Although the South Australian guidelines recognise that topography may 'substantially' *reduce* noise levels, the guidelines do not acknowledge circumstances in which topography may *increase* perception of noise.[474] Furthermore, the specific topographical conditions that may result in either an increase or decrease in noise levels are not identified. As such, the usefulness of including such information in the guidelines is unclear.

7.23 Glen Innes Severn Council's *Development Control Plan for Wind Power Generation* identifies the potential impact of the van den Berg effect and requires developers to include scenarios in the Environmental Assessment under which meteorological conditions may exacerbate noise impacts.[475] However, as discussed in Chapter 5, the Department of Planning does not require developers to adhere to local council Development Control Plans in preparation of Environmental Assessments for wind farms.[476]

7.24 Research was carried out by Dr Eja Pedersen, an academic from Halmstad University in Sweden, which measured the different levels of annoyance experienced by people in different environments.[477] She concluded that 'hilly or rocky' terrain increased the risk of perception of wind turbine noise in rural landscapes.

Frequency of sound

7.25 Concern regarding the impact of infrasound (0-20Hz) and low frequency sound (20-500Hz) produced by wind turbines was expressed in many submissions.[478] The reasons offered by Inquiry participants for being concerned about low frequency noise include the potential health impacts and also the possibility of vibration.[479]

7.26 For example, Ms Anne Davis, a resident from Scone, stated: "…the low frequency noise vibration emitted by these machines 24/7 will destroy a peaceful environment that has been such a valuable part of our rural existence."[480] Mr Dennis Workman, a resident near Taralga, also expressed concern that "… wind turbines make incessant low frequency noise and vibration."[481]

7.27 The NSW Department of Planning described infrasound sound as "… the frequencies below about 20 hertz that the human ear cannot hear".[482] The South Australian *Wind farms environment noise guidelines* states that low frequency noise "… manifests as a rattle in lightweight material such as glass."[483]

474 Environmental Protection Authority, South Australia, July 2009, p 2

475 Submission 19, Attachment A, p 4

476 Ms Wheeler, Evidence, 16 October 2009, p 17

477 Submission 81a, Attachment V, p 480

478 For example, Submissions 14, 18, 56, 62, 68

479 Submission 14, Mr Warwick and Ms Sandy Marshall, p 3

480 Submission 62, p 2

481 Submission 68, p 14

482 Mr Jeffries, Evidence, 11 September 2009, p 9

483 Environmental Protection Authority, South Australia, July 2009, p 15

7.28 A paper titled *Public health impacts of wind turbines,* developed by the Minnesota Department of Health and brought to the attention of the Committee by Dr Burraston and Ms Last identifies that low frequency sound becomes more pronounced at a greater distance from the turbine.[484] The sound can also be heard inside residences, as low frequency sound is not attenuated by walls and windows due to the very long wavelength. This can also result in the 'rate of decay', ie the rate that noise levels decreasing over a distance, being slower than high frequency sound. Minnesota Health also identified that low frequency sound can especially be a problem at night.

7.29 It has been reported that experience of low frequency sound varies significantly. For example, Minnesota Health reported: "In fact, it is possible that there are rooms within buildings exposed to low frequency sound or noise where some frequencies may be amplified by resonance … within the structure."[485]

7.30 Dr Mark Diesendorf, the Deputy Director of the Institute of Environmental Studies at the University of NSW, stated that infrasound was a problem with older wind turbine technology.[486] Dr Diesendorf also stated that infrasound was "… virtually undetectable at a range of 400 metres …".[487] Dr Pedersen agreed that infrasound was more of a problem with older technology.[488]

7.31 A number of local councils also raised the issue of low frequency noise. For example, Upper Hunter Shire Council stated that it had urged the Department of Planning "… to ensure that potential impacts of low-frequency noise levels, such as wind turbine syndrome and the like, be fully assessed. If there is inadequate data to correctly predict or fully assess such potential effects, a conservative empirical distance should be adopted as a safety measure."[489]

7.32 Mr Daryl Dutton, General Manager of Upper Hunter Shire Council also identified the potential health effects of low frequency noise as a concern:

> Council is also aware of concerns in the community in respect of potential health issues that may be related to a condition referred to as "wind turbine syndrome". It is understood that such conditions are attributable to low frequency noise vibration emanating from the turbines. Such issues should be thoroughly addressed and included in any assessment.[490]

7.33 The potential link between low frequency sound and adverse health impacts is addressed later in this Chapter in the sections titled *Vibroacoustic Disease* and *Wind Turbine Syndrome*.

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484 Submission 81, Attachment O, p 24

485 Submission 81, Attachment O, p 9

486 Submission 116, p 4

487 Submission 116, p 4

488 Dr Pedersen, Evidence, 9 November 2009, p 5

489 Mr Casson, Evidence, 16 October 2009, p 34

490 Submission 56, p 14

Committee comment

7.34 The Committee notes the concerns that many Inquiry participants have communicated regarding wind farm noise. Although concerns about noise may not translate into as many actual complaints once the wind farm is constructed, the Committee acknowledges that adverse impacts remain for some residents. It is also noted that a reduction in the number of complaints may be as a result of residents becoming resigned to the presence of a wind farm, rather than the impact being abated.

7.35 The Committee believes that it is important to address noise concerns felt by local residents early in the development of a wind farm, regardless of whether the impacts eventuate to the level anticipated by residents. Wind farms in NSW currently cause a high degree of anxiety and stress in local communities, which in itself is an adverse impact that needs to be addressed as far as practicable.

7.36 The Committee notes the importance of taking low frequency sound into consideration during wind farm planning, as this type of sound may impact local residents differently to high frequency sound.

7.37 The Committee acknowledges the evidence which demonstrates that atmospheric conditions impact on noise levels. As current NSW noise modeling for wind turbine noise is not required to take into account varying atmospheric conditions, the Committee notes it is possible that an increase in noise could be experienced by some residents. The Committee also notes that atmospheric conditions can vary between day and night and as a result wind farm noise can be louder at night.

7.38 Local residents would undoubtedly feel more confident that noise issues would be addressed if there were NSW noise guidelines for wind farms in place, which enabled them to understand what levels of noise were deemed acceptable and when and how they could report noise concerns.

7.39 The Committee therefore recommends that that the Minister for Planning requires both day and night time noise modelling and noise modelling in relation to temperature inversions and the van den Berg effect to be taken into consideration as part of the Environmental Assessment process for of wind farm development applications to ensure that the most comprehensive assessment of potential noise impacts is completed.

Recommendation 17

That the Minister for Planning ensure that the Environmental Assessment process for wind farm development applications requires comprehensive assessment of potential noise impacts. Both day and night time noise modelling and noise modelling in relation to temperature inversions and the van den Berg effect should be taken into account.

Vibroacoustic Disease

7.40 Several Inquiry participants expressed concern regarding the potential health impact of vibration cased by wind turbines.[491] In particular, Vibroacoustic Disease was considered by some as a health risk that could result from this vibration.[492] For example, Mr Paul and Mrs Sue Adams expressed concern that the proximity of their house to a proposed wind farm will have adverse impacts:

> My dwelling is 1.9 kilometers from the turbines and will, at certain times, be exposed to industrial noise and sub sonic vibration that will cause distress and anxiety, particularly at night.[493]

7.41 Vibroacoustic Disease can be described as changes to the structural component of tissue as a result of excessive exposure to low frequency noise.[494] Those exposed to levels of vibration that can lead to Vibroacoustic Disease include "… aircraft technicians, commercial and military pilots and cabin crewmembers, ship machinists, restaurant workers and disk-jockeys."[495]

7.42 The Committee was informed of the work of Castello Branco and Alves-Pereira by Mr and Mrs Price-Jones.[496] Castello Branco and Alves-Pereira conducted a study to evaluate whether low frequency noise levels in a home near a wind farm in Portugal were conducive to Vibroacoustic Disease. The home is located within 322 to 642 meters of four 2 MW wind turbines. Levels of low frequency noise that could potentially lead to Vibroacoustic Disease were identified at the house. However, despite testing the five residents for this disease, it was not diagnosed. The Committee is not aware of whether this study has been published in a peer-reviewed journal to date.

7.43 The link between wind turbines and this disease was disputed by other participants in this Inquiry. In this regard, Dr Eja Pedersen has conducted research into the impact of wind turbine noise and she disputes that Vibroacoustic Disease can be caused by wind farms:

> Vibroacoustic Disease is something that appears with very high vibrations for people who are working with special machinery, like really heavy industry machinery and the vibrations will be so heavy their cells will be disturbed. There is no way that this could be in the case of wind turbines so I do not know why that is brought up as an issue. It does not have anything to do with wind turbines.[497]

491 See for example, Submissions 14, 18, 26, 36

492 See for example, Submissions 14, 49, 81

493 Submission 88, p 1

494 Submission 81a, Appendix K, p 256-279

495 Submission 81, p 29, quoting Castelo Branco and Alves-Pereira, 2004

496 Submission 81, p 29, quoting Castelo Branco and Alves-Pereira, 2004

497 Dr Pedersen, Evidence, 9 November 2009, p 8

Committee comment

7.44 The Committee acknowledges the concern expressed by some Inquiry participants regarding Vibroacoustic Disease, however, there does not appear to be any evidence to support the proposition that vibrations from wind turbines can cause this disease. The Committee was not informed of any cases of Vibroacoustic Disease being diagnosed in local residents in NSW, or overseas, as a result of wind turbine noise.

Wind Turbine Syndrome

7.45 Some Inquiry participants identified 'Wind Turbine Syndrome' as a possible health risk that may result from living near a wind farm.[498] It was argued that this syndrome can describe the adverse health effects experienced by people who live near wind turbines.

7.46 For example, Mr Gordon Halliday, a resident from Scone and a member of the Upper Hunter Landscape Guardian, stated:

> Vibration is an insidious impact that is now being recognised in overseas studies as "wind turbine syndrome". Symptoms such as sleep problems and physical sensations of pulsation, headaches, dizziness, unsteadiness and nausea, exhaustion, anxiety, concentration problems and tinnitus have been recorded.[499]

7.47 Mr Warwick and Mrs Sandy Marshall, residents from Muswellbrook, agree that there may be a link between wind farm noise and adverse health effects:

> The Consultant acknowledged it [noise] is an issue so why do we have to live with it? Why should any of us have to get used to something that we currently haven't got and has the potential to cause and I quote: there is "a link between chronic exposure to low frequency sound abnormal growth of collagen and elastin in the blood vessels, cardiac structures, trachea, lungs and kidneys of humans and animals![500]

7.48 The Upper Hunter Shire Council referred to community concerns regarding 'Wind Turbine Syndrome':

> Council is also aware of concerns in the community in respect of potential health issues that may be related to a condition referred to as "wind turbine syndrome". It is understood that such conditions are attributable to low frequency noise I vibration emanating from the turbines. Such issues should be thoroughly addressed and included in any assessment.[501]

7.49 In relation to this syndrome the Committee was referred by several contributors to the Inquiry to the work of Dr Nina Pierpont, who is a medical doctor and an ecologist in the United States of America.[502] For example, Mr John Carter and Mr Colin Dooley, residents near

498 See for example, Submission 111, p 2

499 Submission 18, pp 2-3

500 Submission 14, pp 2-3

501 Submission 56, p 4

502 <www.windturbinesyndrome.com/> (accessed 8 December 2009)

Crookwell 1 Wind Farm, stated that they "… read about a US complaint called Wind Turbine Syndrome on the internet. Dr Nina Pierpont has become a world authority on the subject."[503]

7.50 Dr Burraston and Ms Last also highlighted the work of Dr Nina Pierpont, in relation to 'Wind Turbine Syndrome':

> Dr Nina Pierpont MD, PhD, who has recently published a book and several articles on the detrimental health effects. Dr Pierpont's research and observations are reiterated in the press release by the Medical Staff of Northern Maine Medical Center. These issues of are of considerable concern for landholders, neighbors, residents, the general public and particularly for young children and the elderly. According to Dr Pierpont the symptoms of Wind Turbine Syndrome include:
>
> 1) Sleep problems: noise or physical sensations of pulsation or pressure make it hard to go to sleep and cause frequent awakening.
> 2) Headaches which are increased in frequency or severity.
> 3) Dizziness, unsteadiness and nausea.
> 4) Exhaustion, anxiety, anger, irritability and depression.
> 5) Problems with concentration and learning.
> 6) Tinnitus (ringing in the ears).[504]

7.51 However, Dr Pierpont's findings in relation to 'Wind Turbine Syndrome' were disputed by other Inquiry participants. A key reason for this relates to the research into 'Wind Turbine Syndrome' not being published in a peer-reviewed journal.

7.52 For example, Dr Diesendorf noted that "[t]here have been studies by a medical doctor called Dr Nina Pierpont and she has made a number of claims, but I have read her article and it does not really qualify as a scientific paper. It is very emotional and does not set out data in a clear way."[505] In addition, Dr Diesendorf highlighted the negative impact that 'campaigns' against wind farms can have.

> It is an area that deserves investigation because there is a very big campaign in some parts of Australia against wind farms and that can create fears in people even if there is no substance to the concerns. [506]

7.53 Dr Pedersen also raised questions about the scientific integrity of 'Wind Turbine Syndrome':

> I have not found any wind turbine syndrome. For me it is nothing I have seen. I think you must think very carefully about how these results are presented to you. The common way within the research society is that you get funding from a solid economic research place and you do your research and then it is published in what we call peer review journals.[507]

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503 Submission 111, p 2

504 Submission 81, p 27

505 Dr Diesendorf, Evidence, 2 November 2009, p 3

506 Dr Diesendorf, Evidence, 2 November 2009, p 3

507 Dr Pedersen, Evidence, 9 November 2009, p 8

7.54 Mr Andrew Durran, Executive Director of Epuron tabled an article prepared by the United Kingdom National Health Service titled *Are wind farms a health risk?* The article reviews the work of Dr Nina Pierpont, surmising that "[n]o firm conclusions can be drawn from this study as the design was weak and included on 38 people." [508] The article also identified that many of the participants in Dr Pierpont's study had pre-existing medical conditions that may distort her findings. However, the article acknowledges that "… it is physiologically and biologically plausible that low frequency noise generated by wind turbines can affect people …"[509]

7.55 Pedersen and Waye completed research into the impact of wind turbine noise on self-reported health and well-being. The study concluded that annoyance was the only adverse health effect that could be identified as being connected to wind turbine noise. [510] This issue of annoyance addressed later in this chapter in Section titled *Noise perception and annoyance*.

Committee comment

7.56 The Committee notes the concerns expressed by Inquiry participants regarding 'Wind Turbine Syndrome'. The Committee further notes that research findings of 'Wind Turbine Syndrome' have not been published in a peer-reviewed journal.

7.57 The Committee is concerned that the significance of 'Wind Turbine Syndrome' is being unnecessarily exaggerated because Dr Pierpont is a medial doctor and has published a book on the issue, rather than any scientific merit of such a syndrome. As a result, a degree of fear is being instilled in communities that may host wind turbines. The Committee is concerned that, based on evidence received, this unwarranted fear may be causing greater health impacts than the presence of any actual 'Wind Turbine Syndrome'.

Noise perception and annoyance

7.58 This section analyses evidence and research that was presented to the Committee in relation to wind farm noise perception and annoyance. This research concluded that noise annoyance, such as that experienced by many Inquiry participants, is an adverse health impact caused by wind farms. The research also concluded that noise level alone does not determine levels of annoyance. Factors which influence this are identified in this section.

7.59 The physiological response to wind turbine noise was acknowledged by Dr Pedersen who described why the characteristics of wind farm noise are more troublesome that other sources of noise:

> The most troublesome in the wind turbine noise is the amplitude modulation. That means that the sound levels increase and decrease with the pace of the rotor blades and we get this swishing sound and this, of course, treats the ear, because we were all equated once in a while when we needed to be very careful when we walked in the woods back millions of years ago, whenever it was and we walked around there and if

508 Tabled document, National Health Service. *Are wind farms a health risk?,* 3 August 2009, p 1

509 Tabled document, *Are wind farms a health risk?,* p 2

510 Submission 81a, Attachment V, p 485

> there was a change in sound then we should certainly pick it up, not just with our ears but with our whole body, to get ready—should we run or should we fight. That is the basic physiological thing here. And if there was a change—it could, of course, be a tiger stepping on a stick—then we should pick it up like this. So this change that goes on all the time is troublesome for people and of course this change also changes with the distance because of physical reasons. That is why wind turbine noise is more troublesome than other types of more even noises. [511]

7.60 Dr Phipps also identified the physiological response humans have to noise in her paper *Visual and noise effects reported by residents living close to Manawatu wind farms: preliminary survey results:*

> Hearing has evolved from our survival instincts to respond to danger as well as to alert, warn and communicate; our hearing is operational even when people are asleep. As a result, both wanted and unwanted sound directly evokes reflexes, emotions and actions which are both stimulants and stressors. The auditory system has the fastest response rate in the human brain and processes information hundreds of times faster then other senses. [512]

7.61 The Department of Planning stated "… currently there is not sufficient information to draw a connection between health impacts and infrasound impacts, or emissions, from a wind turbine."[513] However, research conducted by Dr Pedersen concluded that annoyance is considered to be "…an adverse health effect" of wind turbine noise and visibility and was associated with "… lowered sleep quality and negative emotions."[514]

7.62 Whether the annoyance created by wind turbines manifests itself as a real health issue, in isolation of other worries an individual might be experiencing, is unclear and would depend on the circumstances of each individual.

7.63 Dr Pedersen has completed research that studied people's perceptions of wind turbine noise.[515] She found that character of the sound, such as swishing, throbbing or whistling and noise sensitivity, increase the perception of wind turbine noise.[516] Dr Pedersen's research suggests that there are more factors that contribute to noise perception and annoyance than simply the noise level.

7.64 Additional research completed by Dr Pedersen found that the "… subjective report of visibility of wind turbines increased the odds of being annoyed."[517] Other factors that were reported by Dr Pedersen to increase the chance of being annoyed by wind turbines include living in a rural area that has subjectively low background noise levels and having a negative attitude towards wind turbines in general or their visual impact on the landscape.

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511 Dr Pedersen, Evidence, 9 November 2009 pp 3-4

512 Submission 81a, Attachment Y, p 6, quoting Hudspeth, 2000

513 Mr Jeffries, Evidence, 11 September 2009, p 9

514 Submission 81a, Attachment V, pp 480 and 485

515 Submission 81a, Attachment W

516 Submission 81a, Attachment W, p 3

517 Submission 81a, Attachment V, p 484

7.65 Recommendations to minimise annoyance experienced by residents who live near wind farms were identified by Dr Pedersen. For example, "[t]o avoid annoyance, the characteristics of a geographical area should be taken into account when establishing new wind farms."[518]

7.66 Dr Pedersen also recommended that the most successful coping strategy for residents who live near wind farms was discussing and seeking information.[519] It is stated that this could decrease adverse health effects.

Committee comment

7.67 The Committee notes the unique sound characteristics of wind farm noise and the different influences on the perception of this noise. The Committee further notes that noise annoyance is an adverse health effect that can result from wind farms, as it can result in effects such as negative emotions and sleep disturbance.

7.68 The Committee acknowledges the research which has found that there is an increased chance of being annoyed by wind farms in rural areas and if there is a pre-existing negative attitude to wind farm noise or the visual aspects of wind farms.

7.69 The recommendations that resulted from this research are of interest to the Committee due to their potential to reduce the adverse health impacts of wind farms on individuals and communities. The Committee therefore recommends improved distribution of wind farm information during the planning stage and improved options for individuals to discuss concerns associated with wind farms.

Recommendation 18

That the Minister for Planning require, as a condition of consent, that wind farm developers publish within the local community detailed information about all aspects of the wind farm and provide appropriate options for members of the community to discuss their concerns with the developer, such as establishing a phone line, email account or local office to hear and address local concerns.

Well-being

7.70 The impact of wind farms on the overall well-being of local residents and on local communities was expressed as a concern by some Inquiry participants. Feelings of helplessness, powerlessness, stress and depression caused by the presence of wind farms in rural communities, or proposals to develop wind farms, were linked with depression and disruption to place-related identity.

518 Submission 81a, Attachment V, p 485

519 Submission 81a, Attachment V, p 485

7.71 For example, Mrs Jennifer Price-Jones, a resident of Crookwell, stated that local residents can suffer feelings of helplessness as a result of the amount of time and resources devoted to being engaged in the wind farm development process with little outcome:

> It is my experience that what in fact causes the clinical depression is the overwhelming feeling over a very long period of utter helplessness. You spend hours and much-needed personal financial resources doing a job that as individual we should not have to do. We take hugely supposedly technical, voluminous documents and spend every waking hour for the month we get analysing it, researching it, contacting experts and getting them to send us documents. We do all of that. The Department of Planning should be doing that; I should not be doing that. Even when we do that, it is all for nought.[520]

7.72 Mr Warwick and Mrs Sandy Marshall also identified the emotional impact of having a wind farm proposed to be located near their house:

> The emotional loss to our family has been one that has been extremely difficult to come to terms with. We had planned for our children to go to the local school and to be available for my aging parents who have the block next door.[521]

7.73 Dr Ashley Peake is a General Practitioner and a member of the Glen Innes Landscape Guardian. He stated that wind farms remove people's personal power, which may relate to incidences of depression:

> … wind turbines that are big things that come into people's lives and take away their personal power. As we have already heard, people in the country have incidences of depression. Often depression is related to powerlessness, whether it is the effects of the drought or all those other effects.[522]

7.74 The role that wind farms play in disrupting the emotional attachment of local residents to areas was identified by Devine-Wright in his published paper *Rethinking NIMBYism: The Role of Place Attachment and Place Identity in Explaining Place-protective Action:*

> Local opposition is conceived as a form of place-protective action, which arises when new developments disrupt pre-existing emotional attachments and threaten place-related identity processes.[523]

7.75 Mr Phillip and Mrs Mary Anne Evans reported that they stand to loose their "… lifestyle, health and well-being and the chronic devaluation of our property" as a result of the Glen Innes Wind Farm, which will include turbines located only 800 metres from their house.[524] The stress experienced by this family was observed by the Committee during a public hearing, when Mrs Evans was overcome with emotion when discussing this issue.

7.76 Mr Jeffries, acknowledged that the Department does not take 'emotional' issues into account:

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520 Mrs Price-Jones, Evidence, 16 October 2009, p 54

521 Submission 14, p 2

522 Dr Peake, Evidence, 16 October 2009, p 32

523 Submission 118, p 35, qoting Devine-Wright, 2009

524 Submission 82, p 1

> … we have distanced ourselves from the emotive arguments about 'This is where I live. This is my special place' and look at it very dryly and rationally, based on the availability of similar landscape values across the State.[525]

7.77 The Committee also heard that disputes over wind farms and proposed new developments can have a significant impact on the well-being of local communities. For example, Mr and Mrs Evans stated:

> The split of the community has been enormous. The secretive nature of these companies is an attempt to "divide and conquer" the community. Setting one neighbour against each other and for what?[526]

7.78 Ms Katrina Hodgkinson MP, the Member for Burrinjuck also identified that community division is occurring in Taralga as a result of the proposed wind turbines:

> Turbines can be extremely divisive for communities. The small town of Taralga was a close-knit community. By the time that it was redistributed out of the Burrinjuck electorate at the last election, Taralga had become a community where lifelong friends and even family members were not talking to each other because of the industrial wind turbine development.[527]

Committee comment

7.79 The Committee notes the adverse impact that wind farm development can have on the well-being of residents and communities. It is important to acknowledging and address the emotional impacts that these developments may cause, since they are an adverse health impact that can have serious consequences such as depression.

7.80 The impact of wind farms on the well-being of communities in NSW may be compounded by other issues raised through this Inquiry, such as concerns associated with the planning process and the perception that community consultation is a tokenistic exercise that does not genuinely incorporate community concern. This strengthens the importance of the Committee's recommendations concerning the development of a complaints process (Recommendation 6) and increasing the amount of time for consultation on wind farm Environmental Assessments (Recommendation 10).

Shadow flicker

7.81 Some Inquiry participants expressed concern regarding the impact of 'shadow flicker' on their health and wellbeing. Shadow flicker refers to the strobing effect caused by wind turbine blades blocking the sun as the blades rotate.[528]

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525 Mr Jeffries, Evidence, 11 September 2009, p 8

526 Submission 82, p 1

527 Ms Hodgkinson MP, Evidence, 11 September 2009, p 68

528 EPHC, October 2009, p 20

7.82 According to the Environment Protection and Heritage Council's (EPHC) *Draft National Wind Farm Development Guidelines*, the likelihood of shadow flicker affecting people is dependent on the alignment of the wind turbine and the sun and their distance from the wind turbine.[529] The *Draft National Guidelines* suggest that the main risk associated with shadow flicker is the potential to disturb residents in the immediate surrounds.[530]

7.83 Ms Katrina Hodgkinson MP, the Member for Burrinjuk, stated that shadow flicker was one of the common concerns raised by local residents at proposed wind farm sites in her constituency. She expressed that shadow flicker is a disturbance to the local community and may have adverse health consequences:

> It has been my experience that as soon as turbines are suggested for a regional area, a proportion of the local population will automatically become extremely vocal and strongly opposed to its development. The reasons for this are many and varied, but there are a few that keep coming back time and time again: loss of land value; loss of visual aesthetics; concerns for adverse health consequences, including noise and shadow flicker; and concern for bird life.[531]

7.84 Some Inquiry participants identified shadow flicker as an annoyance, with the potential to impact physical health.[532] For example, Mr John and Mrs Niki Zubrzycki commented that shadow flicker makes wind turbines more conspicuous than other structures:

> The consequences of shadow and reflective flicker are also apparent at greater distances, making wind turbines much more obtrusive than static structures of similar height. For this reason the industry's repeated attempts to compare them with transmission towers ('pylons') are deceitful - pylons do not move and are of a half or even a third of the height of big turbines.[533]

7.85 Dr Burraston and Ms Last presented research suggesting that shadow flicker is "known to precipitate seizures in people with photosensitive epilepsy".[534]

7.86 The Committee also heard evidence from Mrs Noreen Marshall, a resident of Scone, regarding shadow flicker and her husband's health concerns. She suggested that the shadow flicker issue had not been sufficiently addressed:

> My husband's biggest concern is the flicker issue. He gets very nauseous if you are driving through heavily forested areas. That flicker issue really concerns him. I do not think that has been dealt with enough with any of the information I have read in relation to this.[535]

529 EPHC, October 2009, p 21

530 EPHC, October 2009, p 21

531 Ms Hodgkinson, Evidence, 11 September 2009, p 68

532 See for example, 109, 8a, 14

533 Submission 36, p 5

534 Submission 81, p 28

535 Ms Marshall, Evidence, 16 October 2009, p 21

7.87 Other Inquiry participants expressed the view that shadow flicker did not pose a significant health risk. For example, Dr Diesendorf stated that shadow flicker occurs only occasionally and not enough to warrant concern:

> The studies just do not support the concern [for loss in property value] and similarly with these other things that people talk about like flicker. Flicker occurs only some places for a few days of the year. You have to imagine that the sun moves around seasonally ... So if there is a problem, it occurs usually at sunrise or sunset for a few days of the year when the sun is in that position. It is rare; it is hard to notice. Again, it is hard to see anything of substance there.[536]

7.88 The EPHC *Draft National Wind Farm Development Guidelines* maintain that risks such as epileptic seizures and the distraction of drivers as a result of shadow flicker are negligible.[537] For example, following its investigations, the EPHC determined that the chance of wind turbines causing an epileptic seizure for an individual experiencing shadow flicker is less than one in ten million.[538]

7.89 Dr Pederson believes that there is a practical solution to concerns regarding shadow flicker. She suggested that because shadow flicker could be predicted, wind turbines could simply be switched off for the period it was expected to occur:

> We can, of course, take care of flickers—the light that appears when you have the sun behind the rotor blades, so it will be like a blinking light. We can take care very easily of that because we just turn it out a few minutes: we will stop the turbine. I think it could be predicted quite well how the noise and light will affect you.[539]

7.90 Planning regulations across Australia generally require that shadow flicker be addressed in any wind farm development. For example, shadow flicker is often addressed in the Environmental Assessment of wind farms in NSW.

7.91 International regulation of shadow flicker varies widely. For example, the *US Wind Energy Handbook* recommends a minimum setback of one kilometer to minimise flicker, based on modelling completed by the Minnesota Department of Health.[540] Ireland, on the other hand, recommends a setback distance of 300m from a road to decrease driver distraction.[541]

7.92 The most comprehensive regulations, however, are implemented in Germany. Their detailed limits include 30 hours per year and 30 minutes per day of *modelled* shadow flicker and eight hours per year of *actual* shadow flicker. These limits apply within a distance of 2 km or where there is a 20% blockage of sunlight.[542]

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536 Dr Diesendorf, Evidence, 2 November 2009, p 4

537 EPHC October 2009, p 21

538 EPHC, October 2009, p 185

539 Dr Pedersen, Evidence, 9 November 2009, p 4

540 Submission 81, Attachment O, p 14

541 Submission 81, Attachment O, p 14

542 EPHC, October 2009, p 186

Committee comment

7.93 The Committee notes that wind farms can cause shadow flicker and that this is a cause of concern for some Inquiry participants. The Committee further notes that there appears to be a great deal of fear in some communities regarding the potential for shadow flicker to occur and the effect this may have on peoples' health. However, the Committee also observes that no demonstrated experience of unreasonable shadow flicker occurring in NSW was presented to the Inquiry.

7.94 The Committee notes that shadow flicker can be easily managed through turning the relevant wind turbine off for the few minutes that the sun is at the particular angle that causes flicker. The Committee does not believe that the level of concern associated with shadow flicker is supported by demonstrable evidence.

Safety of wind farms

7.95 A number of Inquiry participants expressed concern in relation to the safety of wind farms.[543] Concerns included the effect of severe weather conditions on wind turbines, distance between wind turbines, potential fire hazards, occupational health and safety issues and the possible dangers of wind farm lighting.

7.96 For example, the proximity of Cullerin Range Wind Farm to earthquake fault lines and disused mine shafts caused concern that the area's under ground water supplies may be "permanently interrupted or contaminated should the weight/operational vibrations from the wind turbines collapse …"[544] Mr John Mendl, a resident of Crookwell, expressed similar concern about the risk of water supply contamination at Conroy's Gap Wind Farm.[545]

7.97 Some Inquiry participants whether the structural integrity of wind turbines could withstand extreme weather conditions. It was brought to the Committee's attention that some wind farm locations, such as the site at Cullerin, are subject to tornadoes, extreme weather conditions and intense weather systems.[546] Examples of extreme winds removing rotor blades and causing damage to surrounding areas were identified at European wind farms.[547]

7.98 The Committee also received evidence suggesting that public safety may be undermined if the distance between wind turbines does not meet the required specifications.[548]

7.99 The possibility of fires being caused from faulty wind turbine design, lightening strikes and wind farm layout were also raised as a potential safety issue, which is examined further in Chapter 6.

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543 See for example, Submissions 46, 15d, 69

544 Submission 46, p 2

545 Submission 51, Mr John McGrath, p 1

546 Submission 46, p 2

547 Submission 15d, Mr Jim and Mrs Noreen Marshall, Appendix C, p 2

548 Submission 46, p 1

7.100 The potential impact of Cullerin Wind Farm lighting on passing drivers was identified as a concern by Ms Katrina Hodgkinson MP:

> "The Cullerin turbines… are located close to the Hume Highway and are an excellent example of this. They are very distracting to drivers travelling at night in particular. The lights do not flash all at once. They are very close to the highway. They are quite high in the air. There is nowhere to pull over if you are a driver if you want to investigate what is going on. It is quite unsafe and I can say that from experience".[549]

7.101 Dr John Formby also discussed the potential danger of lighting. He described the lights at Cullerin Wind Farm as having a "distracting and mesmeric effect".[550]

7.102 Wind Prospects Group CWP provided information regarding the site selection process, outlining the methods undertaken to management any potential impacts associated with wind farm projects.[551]

7.103 Wind energy companies defended the structural integrity of wind turbines. For example, Mr Durran, explained to the Committee that certified engineers implement a number of safety margines, including the capacity to withstand extreme winds, into wind turbine designs.[552] The designs are then checked by international standards organisations, such as Germanischer Lloyd, to ensure they are suitable.[553]

7.104 When questioned by the Committee on this topic, Mr Jonathan Upson, Senior Development Manager at Infigen Energy, gave evidence that:

> "… when the wind speed exceeds a certain level—it is roughly 100 kilometres an hour for a sustained period, depending on the model of turbine—then the blades are actually turned to face the wind. Then there is no reason for them to go around and eventually the turbine comes to a stop. There is a braking system that grabs the rotor at that point and holds it still. If you had a class five hurricane or something come through you might actually knock it over. But short of a catastrophic storm such as that you would never cause a turbine to fall over."[554]

7.105 Mr Upson elaborated: "if a tornado actually struck a turbine or had a direct hit on a turbine it would probably break it, yes. But it would be turned off so you would not have the issue of the blades flying any more than they would have just because of the tornado."[555]

7.106 A number of wind energy companies suggested that safety concerns in relation to the distance between wind turbines are negligible. Wind Prospects Group CWP suggested that as a rule of thumb "[d]istances should be equivalent to at least three times the diameter of the turbine

549 Ms Hodgkinson MP, 11 September 2009, p 69

550 Submission 45, p 5

551 Submission 67, Wind Prospect Group CWP, pp 4-5

552 Mr Durran, Evidence, 11 September 2009, p 49

553 Mr Durran, Evidence, 11 September 2009, p 49

554 Mr Upson, Evidence, 11 September 2009, pp 39-40

555 Mr Upson, Evidence, 11 September 2009, p 40

rotor proposed for use, in order to ensure that each turbine operates in a relatively undisturbed wind".[556]

7.107 Mr Duran also asserted that:

> "[t]he turbines are spaced far enough apart in any case to maximise the energy production of them. There is never going to be an issue where blades are hitting each other from different turbines, or that any structural issues will come into effect because of the proximity of turbines to each other."[557]

7.108 The threat of fire caused by wind turbines may not be a significant concern. Mr Christian Downie stated that "… in almost 20 years of wind farm operation in Australia, there appear to have been two fires, neither of which resulted in a wildfire and the only property damage caused by the fires was to relevant wind turbines".[558]

Committee comment

7.109 The Committee notes the concerns expressed in submissions and evidence about the safety of wind turbines. The Committee is of the view that, to the extent possible, most of these concerns appear to be adequately addressed by wind farm developers and operators. As with any major structure, it would be impossible to entirely insulate wind turbines against safety risks posed by natural events such as tornadoes.

Committee conclusions

7.110 The Committee notes the concerns expressed by Inquiry participants regarding the health impacts of wind farms. The Committee further notes that the health effects associated with wind farm noise appear to be the most common concern. From the evidence presented during the Inquiry it was clear that some people are significantly affected by their experience of wind farms, both existing and proposed.

7.111 The Committee acknowledges that some health impacts are supported by scientific research, such as the impact of noise annoyance. However, the Committee also notes that many purported impacts have created little more than unfounded fear in local communities, for example, Vibroacoustic Disease, wind turbine safety, shadow flicker and 'Wind Turbine Syndrome'.

7.112 As the level of concern for many impacts is not supported by evidence, the Committee believes that such impacts are being promoted to support arguments against wind power in general, rather than being used to highlight fundamental problems with wind farms.

7.113 The adverse impact that some wind farms have on the well-being of local communities is acknowledged by the Committee. The Committee feels that it is unfortunate that the well-being of some residents and communities is adversely impacted and not being adequately

556 Submission 67, p 4

557 Mr Durran, Evidence, 11 September 2009, p 49

558 Submission 48, Attachment A, p 19

addressed. It is hoped that with the implementation of the recommendations identified in this report, that the impact of wind farms on well-being will reduce.

Chapter 8 Economic considerations

This chapter considers economic issues relating to wind farm development including the creation of employment and the potential impact on property values and on local industries. The option of requiring wind farm developments to contribute to a community fund is also explored. Economic subsidies and incentives form an important part of developing the wind industry in NSW and are also examined in this chapter. Finally, issues regarding lease arrangements with landowners that host wind turbines are discussed.

Employment

8.1 Some Inquiry participants who presented arguments to support wind farms emphasised that they create employment opportunities during the construction and operation phase.[559] Others, however, argued that job creation is limited to a small number of jobs during construction as operation can largely be managed remotely.[560]

8.2 The Nature Conservation Council of NSW expressed the view that "[w]ind farms provide employment (often in rural areas) and can bring other economic benefits through local investment, manufacturing and construction".[561]

8.3 Origin Energy stated that wind farm construction and operation creates many direct and indirect jobs at a local and regional level and that training and upskilling of local employees may also flow into other local industries that require skilled labour.[562]

8.4 Origin Energy also highlighted how employment in the international wind industry has significantly increased since 2005, stating "… the wind sector worldwide has become a major job creator: within only three years it has almost doubled the number of jobs from 235,000 in 2005 to 440,000 in the year 2008."[563]

8.5 Epuron stated in its submission that wind power presents an opportunity for NSW to create hundreds of long term jobs:

> … NSW is presented with a once in a generation opportunity to create hundreds of long term, high quality jobs in rural areas and to obtain wider community benefit through viable wind farm developments. NSW must seize this opportunity to attract sustainable energy projects and the employment and investment they bring.[564]

559 See for example, Submissions 58, 60, 66

560 See for example, Submissions 36, 49

561 Submission 107, p 3

562 Submission 54, Origin Energy, pp 6-7

563 Submission 54, p 7

564 Submission 91, p 3

8.6 Epuron also suggested that previously declining rural communities could be supported by the jobs created by the wind energy industry, such as occurred in Jamestown, South Australia.[565]

8.7 Recent studies that researched the employment benefits of the Renewable Energy Target scheme were identified by Mr Geoff Dutailis, the Chief Operations Officer of Infigen Energy:

> 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 by Renewable Energy Generation* McLennan Magasanik Associates (MMA), May 2009. The key points from this study were that the renewable energy industry would result in the following positive benefits to NSW through 2020:
>
> - 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.[566]

8.8 Mr Keith Hungerford, Vice President of the Bathurst Community Climate Action Network also referred to economic benefits including employment:

> This natural resource could be the foundation of a sustainable industry for NSW, linking a supportive planning and regulatory policy setting with clear energy market signals, a strong manufacturing base, skilled technical training and support and engaged local communities including local investment and employment opportunities.[567]

8.9 Dr Mark Diesendorf, the Deputy Director of the Institute of Environmental Studies at the University of NSW, also expressed the view that the wind industry has the potential to create many jobs in Australia, however, he suggested that changes to government policy are required to enable this to occur:

> To enable the growth in a job-creating technology to occur, effective policies are needed from both federal and state governments. Because the present design of the RET limits the amount of wind power that can be assisted, the NSW government should include large-scale wind power in its feed-in tariffs. It should also contribute, along with the federal, Victorian and South Australian governments, to upgrading and expanding the transmission system for the NEM. With these policies, wind power could create many new jobs in Australia and achieve large reductions in greenhouse gas emissions from electricity generation even before 2020.[568]

8.10 Employment potential of the wind industry was compared with the coal power industry and summarised in a journal article published by Dr Mark Diesendorf, which concluded that:

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565 Submission 91, p 18

566 Submission 101, pp 3 - 4

567 Submission 66, p 1

568 Submission 116, p 13

> By serving as a substitute for coal power, the wind power industry, with 50% local content in dollar terms, already creates two to three times the number of direct, local job-years per kWh generated than coal power. If an expansion of the Australian content of a wind power were to be facilitated by appropriate government policies, this ratio could be expected to double, thereby indicating that a shift towards 'cleaner' energy sources need not come at the expense of employment. [569]

8.11 Mr Ben van der Wijngaart stated that the potential for growth in the amount of electricity generated by wind power in Australia has the potential to create large employment benefits:

> There are currently over 6,000 megawatts of large-scale wind farms being investigated in Australia, or nearly 19,000 gigawatt hours per year. In 2004 Iain MacGill and Hugh Outhred from UNSW suggested that 8,000 megawatts could be installed in the National Electricity Market, and with further development in turbine technology this could be exceeded. This presents huge employment potential.[570]

8.12 The NSW Government submission to the inquiry reported that Renewable Energy Precincts will also provide employment opportunities, stating that "[t]he creation of precincts will allow for better, more coordinated engagement with local communities and will include the employment of 'go to' people within each precinct to drive a clean energy action agenda."[571]

8.13 These assertions about the ability of wind farms to create employment opportunities were refuted by other inquiry participants.

8.14 For example, Mr John and Mrs Niki Zubrzycki, residents near Crookwell, who argued in their submission that many of the benefits of wind farms were highly debateable, suggested that any employment benefits from wind farms are only short-term.[572]

8.15 Mr Daryl Dutton, the General Manager of the Upper Hunter Shire Council noted that most employment in the construction phase would occur outside the local area and the longer terms employment opportunities were not significant:

> The total expenditure of such developments will be considerable. They have the potential to generate significant employment during the construction phase, however much of the work will be undertaken outside the region or require specialists. There is potential for local employment in some aspects and in particular, local contractors may benefit providing raw materials for roads, concrete etc. In the longer term however, there is not any significant employment generated from such proposals. The number of maintenance staff required appear to be quite minimal. Wind farms bring very short term benefits for employment for local communities.[573]

8.16 Mr Humphrey and Mrs Jennifer Price-Jones, residents from Crookwell, do not believe that rural areas will gain many new jobs through the wind power industry:

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569 Diesendorf, M, 'Comparison of employment potential of the coal and wind power industries', *International Journal of Environment, Workplace and Employment*, Vol 1, No 1, 2004, p 82

570 Submission 42, p 33

571 Submission 104, p 2

572 Submission 36, p 6

573 Submission 56, Upper Hunter Shire Council, p 2

> Proponents will state that jobs are created by wind farm establishment - but in reality rural areas gain precious little as the majority of jobs involved in wind farm establishment are specialised and therefore not given to locals and as the running of wind turbines is computerised and co-ordinated from a distant source, NO local jobs are created in this phase either. The only economic gain to rural economies is a minimal and extremely short term one which comes from the construction workers accommodation and meal purchase.[574]

8.17 Dr John Formby, a resident from Binda, believes that the negative effects of wind turbines, such as noise and change to the landscape, may cause people to leave locations where wind farms are constructed and hence negatively impact local employment:

> … physical aspects such as noise, blade flicker, aircraft safety lighting, and landscape intrusion have a wide range of social impacts on lifestyle, community cohesion and mental health. These in turn lead to decisions to leave the area, or not to move into it, which in turn affect land values, employment and the regional economy. There is a danger that such a decline can become self reinforcing, as declining employment forces more people to leave the area with consequent flow-on effects.[575]

8.18 Mr David Boundy, the Manager of Superair Australia Lonoaks, which is the largest aerial topdressing company in Australia, expressed concern about the impact of wind farms on his industry and hence employment:

> We have a hard time coming to grips with the fact that these towers will decrease our safety margins, which may ultimately lead to a negative effect on our turnover. This could contribute to a loss in local jobs.[576]

Committee comment

8.19 The Committee notes that wind farm developments do provide employment opportunities at the construction stage, although the precise location of such opportunities is unclear. Employment opportunities also exist when a wind farm is in operation, however, the number of jobs maintained at this stage is significantly reduced. The Committee also acknowledges the studies that have been undertaken which demonstrate the employment potential of the renewable energy sector in general.

8.20 The Committee believes that the wind power industry can make a positive contribution to employment levels at a local and state level. Although the number of jobs decreases after construction, the Committee notes that many of the skills acquired during this time may flow into other areas of the local community.

8.21 The Committee believes that wind farms have a positive impact on employment in NSW, particularly for rural communities.

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574 Submission 49, p 4

575 Submission 45, p 4

576 Submission 76, Superair Australia Lonoaks, p 1

Impact on property values

8.22 One of the terms of reference for this inquiry is to examine the impact of rural wind farms on property values. The Committee heard conflicting views about this issue and the views again reflected the general divide between those who supported wind farms and those who were critical of wind farms.

8.23 A number of residents in areas with wind farms or where wind farms are proposed expressed the view that wind farms reduce property values. For example, Mr Paul Miskelly, a resident from Mittagong stated:

> In the interim, we have had the property up for sale ... 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 wind farm development.[577]

8.24 Mr John Carter, a resident near the Gullerin Range Wind farms, whose property the Committee visited, discussed the issue of property values noting that a nearby wind farm can prevent a property owner from sub-dividing:

> … it has been pointed out to them quite rightly by the planning officer at the Upper Lachlan shire that people cannot put in for a subdivision if they are within two kilometres of a wind tower.[578]

8.25 Inquiry participants identified a potential decrease in property value of 20 to 30 per cent.[579] Mr Julle Bierling, a retired engineer and a resident and property owner in the Scone area, stated:

> The impact [of property devaluation] will increase with a) the size of the wind turbines, b) the number of turbines c) the proximity to the property d) the visual impact of the turbines e) the noise generated in the otherwise quiet rural environment. A direct example is the reduction in value of our property, which was confirmed by two local real estate agents to be some 20% of value prior to the proposed Kyoto project.[580]

8.26 Other inquiry participants disputed the argument that wind farms will reduce property values, with some even suggesting that wind farms may have the opposite effect.

8.27 Acciona Energy Oceania, in its submission expressed the view that employment benefits that result from wind farms may also result in increased property values:

> Employment creation, through the construction and operational phases of the development will create demand in nearby supporting towns. In turn, this is likely to

577 Submission 65, p 8

578 Mr John Carter, Crookwell, Evidence, 1 October 2009, p 59

579 See for example, Submissions 20, 14

580 Submission 20, p 3

> result in elevated values for residential and (through increased trade) commercial properties.[581]

8.28 The New England Strategic Alliance of Councils spoke of anecdotal reports from local real estate agents that wind farms can even increase property values because they may attract buyers to an area where additional incomes can be generated from having turbines:

> Reports from local real estate agents and anecdotal evidence from property owners, where the wind turbines are to be installed, have indicated that rather than reducing property value of properties wind farms and even properties with the potential for such development have an increased value. It is generally considered that a wind farm is an asset and potential purchasers are attracted to the site due to the additional income from the development which purchasers consider will have little effect on the operations of the property itself.[582]

8.29 The point was made that 'property value' is a notion that is not entirely tangible and that there are factors that can lead to a perception about property values that can then become realised. In this regard Dr Diesendorf, Deputy Director of the Institute of Environmental Studies, at the University of New South Wales, stated:

> The most likely way of reducing property values is for people to assert that wind farms are going to reduce property values and then it becomes a self-fulfilling prophecy.[583]

8.30 In relation to the impact of wind farms on property values, the Government submission stated that:

> There does not appear to be any conclusive data as wind farms are relatively new and, in Australia, have usually been built away from population centres, but the major studies to date have found no impact or only temporary impacts on property values.[584]

8.31 The Government submission speculates that the Renewable Energy Precincts program may contribute to altering people's perceptions of windfarms, which in turn may have an impact on their views of property values:

> The Government precinct program aims to help communities adjust their perceptions and valuations around wind farms. While some people view wind farms as a visual intrusion, others value them as evidence of a new approach to tackling climate change and transforming our energy systems towards sustainability.[585]

8.32 The Government also advised that "[i]n order to provide a NSW-based source of information to add contextual objectivity to this debate, the NSW Valuer General has engaged a consultant

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581 Submission 60, p 3-4

582 Submission 59, New England Strategic Alliance of Councils, p 2

583 Dr Diesendorf, Evidence, 2 November 2009, p 3

584 Submission 104, pp 4-5

585 Submission 104, p 5

to undertake a preliminary study on the impacts of wind farms on surrounding land values in Australia."[586]

8.33 This study was commissioned in June 2009 and the report titled *Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia* was completed in August 2009 (hereafter referred to as 'NSW Valuer General's report on property values').[587] The report's main finding was that "… wind farms do not appear to have negatively affected property values in most cases."[588]

8.34 This main finding must be understood in context. The study assessed the impact of two wind farms in NSW and six in Victoria on property values. However, no relevant data was available for three of these wind farms so the actual number assessed was five wind farms.

8.35 In relation to the wind farm assessed in NSW, the study concluded that there is no reduction in property value surrounding Blayney Wind Farm and that three new homes have been constructed in the area which orient towards the wind farm:

> No reductions in value associated with the wind farm were identified based on the 'matched pairs' analysis. This included both rural and lifestyle properties. No reductions in value were found for eight (8) rural properties with various view of the wind farm. Similarly, no reduction was found for four (4) lifestyle properties with various views of the wind farm. The wind farm does not appear to have deterred the construction of new homes in the area. This is evident by the fact that three (3) relatively newly constructed properties have been oriented with views towards the turbines despite views being available in alternative directions.[589]

8.36 Capital Wind Farm was not objectively assessed through this study due to the lack of sales data. However, the study still concluded that although three properties along Taylors Creek Road have been on the market for a long time, 'optimistic pricing' is responsible for the properties not selling, rather than the close proximity of the wind farm:

> Local agents reported that they had not seen an influx of listings since the construction of the wind farm began in the area. Consultation with local valuers revealed that the properties most likely to be affected, if at all, were a concentration of hobby farms along Taylors Creek road. A review of RP data's market history revealed that only three of these properties had been put on the market since the wind farm had been announced. It is noted that these properties have not sold and have been on the market for an extended period of time. However, discussions with the local agents

586 Submission 104, p5

587 Answers to additional written questions on notice, NSW Department of Planning, 8 December 2009, NSW Valuer General, *Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia*, August 2009

588 Answers to additional written questions on notice, NSW Department of Planning, 8 December 2009, NSW Valuer General's report on property values, p 2

589 Answers to additional written questions on notice, NSW Department of Planning, 8 December 2009, NSW Valuer General's report on property values, p 24

> revealed that potential buyers had not been discouraged by the wind farm and the reason these properties had not sold was primarily optimistic pricing.[590]

8.37 In total, the study found a reduction in property value at five properties, inconclusive results at six properties and no reduction in property value at 34 properties. The report stated "[e]vidence suggests that any such wind farm related impacts on land values can be readily alleviated by ensuring a suitable separation distance between the wind turbines and any nearest residential dwellings."[591] Setback distances are examined in Chapter 5.

8.38 Unfortunately, the report was not able to conclude whether 'lifestyle property' or rural residential property values were impacted by wind farms:

> The results for rural residential properties (commonly known as 'lifestyle prop's') were mixed and inconsistent; there were some possible reductions in sale prices identified in some locations alongside properties whose values appeared not to have been affected. Consequently, no firm conclusions can be drawn on lifestyle properties.[592]

Committee comment

8.39 The Committee notes the concern expressed by some Inquiry participants about the potential impact that wind farms may have on property values. As identified in Chapter 5, wind farm developers are sometimes required to purchase properties through conditions of consent and through orders of the NSW Land and Environment Court. This reflects the potential for wind farms to reduce surrounding property values.

8.40 The Committee acknowledges the recent findings of the report, *Preliminary assessment of the impact of wind farms surrounding land values in Australia*, commissioned by the NSW Valuer General. However, the limitations of this study must be considered alongside its conclusions. Only one wind farm was studied in NSW and only six wind farms out of Australia's 46 were included in the study. The Committee is not convinced that the conclusions drawn from this study represent NSW or the whole of Australia.

8.41 While the study concluded that the majority of properties assessed did not experience a decrease in property value, the Committee is interested to note that five properties did experience a decrease in value and there were six inconclusive results. Relevant to many of the concerns raised in this Inquiry, the report stated that no conclusions can be drawn in relation to the impact of wind farms on lifestyle properties.

8.42 In the Committee's view, therefore, no firm conclusions can be drawn about the impact of wind farms on property values in NSW based on this report. The Committee does note, however, that the report suggested that an appropriate setback distance may reduce the impact of wind farms on property values. This conclusion strengthens the importance of the

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590 Answers to additional written questions on notice, NSW Department of Planning, 8 December 2009, NSW Valuer General's report on property values, p 26

591 Answers to additional written questions on notice, NSW Department of Planning, 8 December 2009, NSW Valuer General's report on property values, p 55

592 Answers to additional written questions on notice, NSW Department of Planning, 8 December 2009, NSW Valuer General's report on property values, p 2

Committees recommendations regarding setback distances (Recommendation 7) and compensation (Recommendation 11).

8.43 In addition, the Committee believes that, as the number of wind farms in NSW increases, appropriate strategies are required to ensure that any impacts that wind farms may have on surrounding property values are adequately and consistently addressed. Further research is required to better inform those involved in the development and approval of wind farms. The Committee notes that the NSW Valuer General's report was a 'preliminary assessment' and the report itself refers to the 'inconclusive nature of the results' and concludes by stating that '[f]urther analysis (with additional data and expansion of the study area) may yield more comprehensive results.'[593] The Committee therefore recommends that the NSW Valuer General commission a further, more comprehensive and ongoing, study on the impact of wind farms on property values in NSW.

Recommendation 19

That the Minister for Lands request that the NSW Valuer General commission a comprehensive and ongoing research study into the impact of wind farms on property values in New South Wales to build on the work of the *Preliminary assessment of the impact of wind farms surrounding land values in Australia, August 2009*.

Impact on local industries

8.44 Concern was expressed during this Inquiry about the potential negative impact of wind farms on local industries, including the thoroughbred breeding industry of Scone and aviation businesses.[594]

Scone thoroughbred horse industry

8.45 In relation to the thoroughbred horse industry of Scone, concern was expressed that wind farms could have a negative impact on the health and well being of horses and the ability to market the area to prospective horse buyers.

8.46 Mr Wayne Bedgood, President of the Hunter Thoroughbred Breeders Association, queried why wind farms were to be erected in Scone, the 'Horse Capital of Australia':

> We are one of three major thoroughbred farms in the immediate area to be affected by this intrusion on our landscape and there are a dozen more breeders within several kilometres of the proposed site. How is it that Scone, 'Horse Capital of Australia', with a similar profile to that of the USA's Lexington, Kentucky and England's Newmarket, can be selected to erect these monumental eyesores?" [595]

593 Answers to additional written questions on notice, NSW Department of Planning, 8 December 2009, NSW Valuer General's report on property values, p 2

594 For example, Submissions 79, 88, 109,

595 Submission 109, Hunter Thoroughbred Breeders Association, p 3

8.47 The importance of the Hunter area for the thoroughbred industry was also identified by Mr Michael Thew, a stud owner and committee member of the Hunter Thoroughbred Breeders Association who stated that the Hunter is:

> … one of the three main breeding areas in the world, second only to Kentucky in the United States of America in horse numbers. Scone is the home of the richest country race meeting in Australia. The industry in 2006 employed over 900 full-time and part-time staff. That figure has likely to grow to in excess of 1,200 in 2009. Initial business and employment opportunities in support of the industry, such as veterinarians—in fact, the largest veterinary practice in the southern hemisphere—horse transport companies, farriers, equine therapists, saddlery, veterinary supplies, accommodation, catering and feed manufacturers and suppliers. In 2006 there were 7,500 mares resident in the upper Hunter during breeding season. The value of those horses resident in the upper Hunter in 2006 was over $900 million. That would have increased significantly since.[596]

8.48 Mr Bedgood stated that the aesthetic impact of his farm is important for marketing and sales of horses. He suggested that locating a wind farm in close proximity to such a farm may have an adverse impact on his business:

> Our Yearling parade area, adjacent to Cressfield Road, faces South-West and DIRECTLY OVERLOOKS the proposed Glen Ranges wind farm site! Over the last 2 years we have presented yearlings (that have gone to sale for a total sale value of nearly $9 million) at this parade area and always we are complimented on the magnificent backdrop to our property. It is unimaginable that we would, or could, continue to do this with 150 meter high wind turbines humming noisily in the immediate vicinity and marring the beautiful natural background of our property and its surrounds.[597]

8.49 Mr Bedgood expressed concern regarding the impact of noise, turbine lighting and flicker on his horses. He also stated that he and the Hunter Thoroughbred Breeding Association was not contacted by the developer, Pamada, in any official capacity during the wind farm planning stage.[598]

8.50 Mr Peter Sherwin and Mrs Rosemary Sherwin-Noakes, residents from Taralga, suggested that the moving blades on wind turbines may scare horses and one resident in particular may not be able to muster on horseback if the turbines are constructed near her property.[599]

8.51 Mr Paul and Mrs Sue Adams, veterinarian and local resident from Scone, do not believe that there is enough information to conclude that wind farms will not impact on horses:

> Scone's thoroughbred industry is recovering from an Equine Influenza break in the horse population. Any additional impact on tourism and equine related travel would be unfortunate. As part owner of a large Veterinary Practice servicing the thoroughbred industry in Scone, we are receiving enquiries regarding potential adverse

596 Mr Michael Thew, Committee Member, Hunter Thoroughbred Breeding Association, Evidence, 16 October 2009, p 10

597 Submission 109, p 3

598 Submission 109, pp 3-4

599 Submission 69, p 2

> affects on thoroughbred population close to the turbines. Chronic health effects take time to become evident and we can only advise our clients that there is insufficient information for us to assure them their horses are safe.[600]

Aviation industry

8.52 Some Inquiry participants claimed that wind farms have a negative impact on local aviation industries.[601] Risks to pilots and aircraft from infrastructure such as wind monitoring equipment and wind turbines were highlighted, including impacts on the ability for aerial fire bombing, weed spraying and fertiliser application to take place.

8.53 Mr Phillip Hurst is the CEO of the Aerial Agricultural Association of Australia (AAAA), which represents the aerial application industry, including crop spraying, aerial fertiliser application and fire bombing.[602] Mr Hurst stated:

> A key emerging threat to aviation safety both in Australia and overseas is developing wind farm infrastructure. In particular, wind monitoring towers are a critical threat to low level aviation safety. Wind monitoring towers are very tall in relation to aerial application operations, are erected within very short timeframes, are extremely difficult for any pilot to identify from the aircraft and are often not notified to aviation users because of the lack of a Government-mandated notification system and the desire of the developers to keep their positions a secret because of commercial issues.[603]

8.54 Mr Hurst identified the potential threat to pilot safety and aircrafts that result from wind farms. The potential economic impact on aerial applicators was also noted.[604]

8.55 The *Draft National Wind Farm Development Guidelines* identify the potential risks to aircraft safety that may result from wind farms:

> Wind farms inherently involve the construction of tall structures (towers plus blades) that may impact on the safety of commercial, private and defence aircraft. In this, wind farms are similar to tall buildings, communications towers and other tall engineered structures. They differ by virtue that they are generally located in areas remote from other tall structures, and are generally deployed along ridgelines (further exacerbating the potential impacts) and they involve components moving through shared airspace. Thus, the primary impact of a wind farm is the potential safety risk it may pose to aircraft operating in vicinity of the farm. The movement of the turbine blades and the materials and size of the turbines may also interfere with radio communications and aircraft and meteorological radar. These potential impacts would need to be considered when selecting a site and in designing a layout for the site.[605]

600 Submission 88, p 3

601 See for example, Submissions 79, 88

602 Submission 79, Aerial Agricultural Association of Australia (AAAA), p 1

603 Submission 79, p 2

604 Submission 79, p 1

605 EPHC, October 2009, p 21

8.56 Mr David Boundy is the Manager of Superair Australia Lonoaks, which is the largest aerial topdressing company in Australia.[606] He stated:

> These wind farms will become a huge obstacle in performing our main occupation as an aerial topdressing company. These wind turbine structures are approximately 110 metres above ground level. As you may or may not be aware we carry out our flying operations between 20-30 metres above ground. The problems that we face would be quite apparent from these figures.[607]

8.57 Issues that are specific to wind farms in NSW were identified by Mr Boundy:

> There are other wind farms in Australia and aerial agricultural operations take place near them. The problem is that these wind towers are erected in a totally different topographical location, be it altitude, topography, local wind strength, local wind shear, dwellings, airstrip locations and several other factors dictate the ability to carry out low level aerial operations safely and cost effectively. Therefore each proposed wind farm has to be treated on a case by case basis and not just from an overall view of how interested parties such as the aerial agricultural industry are considered in the overall planning and assessment of the proposal.[608]

8.58 Mr Boundy also stated that wind farms will:

- Decrease our safety
- Decrease our productivity
- Decrease accuracy of the fertilizer deposits
- Decrease productivity of the pastures to the landholder
- Increase costs to the landholder
- Decrease our revenue.[609]

8.59 The precedent set by *Sheather* v *Country Energy* regarding infrastructure threats to aviation was identified by the AAAA. Mr Hurst stated:

> AAAA view is that the case of *Sheather* v *Country Energy* (NSW Court of Appeals) clearly established that anyone with infrastructure posing a threat to aviation must consider the risks that infrastructure poses to aviation safety and respond appropriately through marking or other measures to safeguard aviation operations. This precedent is of critical relevance to wind farm developers although not apparently widely known to them.[610]

606 Submission 76, p 1

607 Submission 76, pp 1

608 Submission 76, p 1-2

609 Submission 76, p 2

610 Submission 72, p

8.60 Mr Colin Dooley, a resident near Crookwell I Wind Farm, stated that aerial fire bombing and weed spraying would not be able to take place on his property due to the proximity of wind turbines, which may increase the fire risk and spread of weeds.[611]

8.61 Mr Hurst suggested that improved risk management is required when co-locating wind farms with the aviation industry. For example, wind monitoring towers are not clearly marked, which may increase the risk of the towers acting as an obstacle for pilots. He stated that the following reports and activities may provide guidance on the impact of wind farms on the aviation industry. They may also offer direction for the future compatibility of these industries:

- Commonwealth Aviation White Paper (Department of Infrastructure etc)
- Commonwealth Inquiry into Safeguards for Airports and the Communities Around Them (Department of Infrastructure etc)
- CASA consultancy on safety implications of tall structures not in the vicinity of airports
- Relatively recent review and release of Australian Standard AS3891 - Air Navigation Cables and their supporting structures - Marking and safety requirements[612]

8.62 The economic impact of placing wind turbines in areas that require aerial application was also identified by the AAAA:

> The placement of wind farms in areas of highly productive agricultural land is leading to reductions in treatment areas of aerial application companies with no compensation for this externalisation of costs by wind farm developers. For example, placement of a wind farm may affect flight lines and application height or even whether the application can he conducted at all - leading directly to either an increase in cost or a reduction in income - and sometimes both - for aerial application operators.[613]

8.63 The Government's submission to the Inquiry reported that the Civil Aviation Safety Authority (CASA) is notified of wind monitoring towers prior to their construction.[614]

8.64 Mr Hurst expressed concern that the State planning approval process does not give adequate consideration to the impact of wind farms on agricultural land and the aerial application industry.[615] He suggested that a national database would assist pilots to identify obstacles to low level flying, such as power lines, wind monitoring equipment and wind turbines.

8.65 Mr Boundy identified potentially inaccurate conclusions that have been drawn in Environmental Assessment of the impact of wind turbines on the aviation industry. He stated:

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611 Mr Dooley, Evidence, 1 October 2009, p 60

612 Submission 79, p 2

613 Submission 79, p 3

614 Submission 104, p 9

615 Submission 79, p 3

> Another disturbing fact is that all our submissions or correspondence seems to fall on deaf ears eg on Page 3 Chapter 12 Para 12.2.4 of the Connell Wagner Environmental Assessment, published October 2008 (copy enclosed) quote *'the wind turbine structures are not considered to be safety hazards to aerial agriculture operations as the structures are readily visible and the pilots can readily avoid them'*. This tells me whoever wrote this has not bothered or is not interested in finding out the facts or are trying to cover up what may be a huge safety issue that they do not want to address. Another extract from this same report says quote *'The Aerial Agricultural Association of Australia (AAAA) as been provided with the details of the proposed wind farm and invited to comment on the proposal. Prior consultation with the AAAA and individual members its relocation to Crookwell, Blaney, Gunning and Capital wind farms has obtained positive support for the wind farm development'*.[616]

8.66 Mr Boundy also does not believe that increased costs associated with flying near wind farms should be born by the land owner. He stated that the wind farm developer should meet the full additional cost incurred.[617]

8.67 The Environmental Assessment Report for Gullen Range Wind Farm considered the impact on Crookwell aerodrome and recommended the removal of 11 turbines from the development. The Assessment stated "[i]n doing so, the Department has applied a precautionary approach to ensure the aerodrome can continue to operate in a safe manner for all potential users of this infrastructure." [618]

Committee comment

8.68 The Committee notes the concern expressed by some Inquiry participants regarding the potential impact that wind farms may have on local industries.

8.69 The Committee notes concern regarding potential impacts of wind farms on the visual amenity of Scone and on the health of horses. However, the Committee further notes that no evidence or research has been presented before the Inquiry which supports the view that horse health may be impacted by wind farms. The potential impact on visual amenity is addressed in Chapter 6.

8.70 The Committee notes that wind farms present a risk to aircraft safety if appropriate planning is not undertaken prior to construction. The identification of obstacles should not be left to pilot chance wherever possible. The Committee notes that CASA is advised of wind monitoring towers prior to their construction.

8.71 The current reports and activities being undertaken by CASA and the Commonwealth are acknowledged by the Committee as having an important role to play in ensuring aviation safety near wind farms. The Committee recommends that these be supported by the NSW Government to ensure national consistency, prevent duplication and improve aviation safety.

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616 Submission 76, p 2

617 Submission 76, p 3

618 NSW Department of Planning, *Director-General's Environmental Assessment Report, Major Project Assessment of Gullen Range Wind Farm*, March 2009, p i

Recommendation 20

That the Minister for Planning ensure that the Department of Planning and wind farm developers appropriately take into consideration the following reports in the planning of existing, approved and proposed wind farms:

- Commonwealth Aviation White Paper
- Commonwealth Inquiry into Safeguards for Airports and the Communities Around Them
- Australian Standard AS3891, Air Navigation Cables and their supporting structures, marking and safety requirements.

Community fund

8.72 Some Inquiry participants advised that wind farm operators pay money to community funds when wind farms are established as a means to balance any negative impacts they may cause and to distribute the financial benefit more widely.[619] Issues were identified regarding whether the current community donations are of an adequate amount and the voluntary or compulsory nature of the donations.

8.73 Mr Ken McAlpine, Government Relations Manager, Vestas Wind Systems, stated that community funds mean that financial benefit from wind farms is spread broader than benefiting only the host property:

> In Australia a number of other customers set up community funds to ensure that it is not just the farmers who are hosting the turbines on their property who get a benefit from these new developments in their community. Aside from the local employment benefits you will also find that typically a developer will set up a trust fund, if you like, based on the size of the wind farm so that once that wind farm starts generating energy an amount per turbine is contributed into a community fund. The fund is administered by community representatives, and that happens a lot in Victoria and in South Australia ... [620]

8.74 Mr Nick Graham-Higgs, a consultant from nghenvironmental also confirmed that community funds are established for wind farm developments in NSW and identified some questions associated with the process:

> Proposal's that we have been involved in have investigated differing means, to spread the benefits of the proposal beyond involved landowners and to establish the project as belonging to the community. Examples include Community funds. These raise a number of issues, such as who should receive and manage any community funds? How much money is appropriate?[621]

619 See for example, Submissions 99, 93

620 Mr McAlpine, Evidence, 11 September 2009, p 17

621 Submission 93, p 5

8.75 Mr David Brooks from the Parkesbourne Mummel Landscape Guardian suggested that wind farm developers should be required to provide funds back to the general community. He stated:

> If private developers gain by exploiting a state-guaranteed market, which provides state guaranteed profits, then the private developers should return something to the public in exchange for the privilege. What the private developers return may then contribute to the compensation that the general community provides to the non-involved neighbours.[622]

8.76 Epuron stated that "[c]ommunity benefits are common practice in Australia for most major projects and for each wind farm need to be considered in context. Community fund donations are made voluntarily by wind farm companies in response to each wind farm."[623]

8.77 However, Mr Jonathan Upson, Senior Development Manager, Infigen Energy, stated that donations to community funds are mandated under section 94, rather than being voluntary. He stated:

> As a good corporate citizen, we make donations to various community funds and sporting clubs and we make donations to various organisations. Here in NSW it is basically mandated by section 94 contributions. We would do it anyway, but it is actually mandated here so it gets done anyway as a matter of course.[624]

8.78 Mr Michael Vawser, Director of Wind Prospect Group CWP stated "… when it [the wind farm] reaches planning approval, we fully expect there will conditions attached to the approval that will mandate a community fund and we would have no surprises if that mentioned the figure and we need to comply with that."[625] Mr Vawser also identified the amount of money paid to the community by the Wind Prospect Group:

> … we have always had a trust fund set up around the community. For instance, in NSW we are offering $500 per turbine per year that goes into a pot and that pot is governed by local people, local councils, et cetera, in terms of a committee, and that pot can be accessed by local community groups or whatever. The closer the community group or an individual is to the wind farm, the more likely they will be, as long as their own project has merit, to receive a grant under that scheme.[626]

8.79 Mr Vawser suggested that the amount paid to the community per turbine is determined through negotiation with the community.[627] However, the Committee did not hear evidence from the community that such negotiations have taken place. This evidence is also in contrast to the suggestion by Mr Vaswer that conditions of consent may mandate the amount required to be paid into a community fund.

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622 Submission 99, p 26

623 Submission 91, p 20

624 Mr Upson, Evidence, 11 September 2009, p 37

625 Mr Vawser, Evidence, 2 November 2009, p 25

626 Mr Vawser, Evidence, 2 November 2009, p 22

627 Mr Vawser, Evidence, 2 November 2009, p 23

8.80 The Upper Hunter Shire Council stated that a Community Enhancement Program takes place in the council area, which acts to ensure developers and operators contribute to the local community:

> We see council's role as being more pertinent in relation to the council area generally and the population generally. That is the reason why the Community Enhancement Program policy was developed by council—essentially because we feel that if these large structures are going to come into our council area then there should be a corporate social responsibility from these companies to make a contribution to the social fabric of the area in which they are being placed. We see the community contribution policy process as being a mechanism for those proponents to make that contribution.[628]

Committee comment

8.81 The Committee notes that community funds provide an opportunity to spread the financial benefit of wind farms more broadly than would otherwise take place. The Committee acknowledges that questions remain regarding how much money is appropriate and who, in particular, should be entitled to the money in community funds.

8.82 To ensure a consistent and equitable approach to the development of community funds, the Committee recommends that guidelines are developed. This will help to ensure that community funds are established, donated to and managed consistently and equitably.

Recommendation 21

That the Minister for Planning develop guidelines for the establishment of community funds by wind farm developers, to ensure that community funds are established, donated to and managed in a consistent and equitable manner.

Subsidies and incentives

8.83 Some of the Inquiry participants who raised concerns about wind farms also argued that the current incentives and subsidies for the wind power industry in NSW should be removed.[629] Conversely, others that generally supported wind power argued that further incentives should be introduced.

8.84 Incentives identified by Inquiry participants that currently exist for the wind industry include policy surrounding the Renewable Energy Target, tax incentives, mandated purchasing of wind power and changes to planning policy and legislation to expedite development applications.

628 Mr Robert Mowle, Director, Environment and Planning, Upper Lachlan Shire Council, Evidence, 1October 2009, p 11

629 See for example, Submissions 32, 49

8.85 The Government's submission identified one incentive for wind farm development to be that "… critical infrastructure fees will be waived (for projects of 30 megawatts or more) from August 2009 to 30 June 2011."[630]

8.86 As noted in Chapter 5, subsidies have recently been announced for electricity generated by turbines of up to 10KW installed in homes in NSW.[631] Sixty cents per KW will be paid, which brings micro wind turbines in-line with subsidies for solar energy generated at homes.

8.87 Reasons for suggesting that incentives and subsidies should be removed or reduced include the perception that the wind industry is receiving incentives to operate despite the adverse impacts to local communities. In this regard, Mr Humphrey and Mrs Jennifer Price-Jones stated:

> The mandatory renewable energy target will result in the cost of wind farm development being significantly subsidised and further subsidies should not be allowed by developers avoiding the social and environmental costs that they impose on nearby residents and communities.[632]

8.88 The Upper Hunter Landscape Guardian expressed the view that the large subsidies paid for renewable energy reduce the incentive to find more appropriate locations to site wind farms.[633] The Taralga Landscape Guardian, suggested that:

> 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.[634]

8.89 Mr Peter Smith from the Tamworth area also believes that wind farms should not benefit from taxpayer subsidies. He also stated that energy suppliers should not be mandated to purchase electricity generated by wind farms.[635]

8.90 Other Inquiry participants, however, thought that further incentives should be created to support the wind power industry. Incentives suggested included feed-in tariffs and an expanded Renewable Energy Target.

8.91 In this regard, Dr Diesendorf noted that the coal-fired power industry receives more subsidy than the wind power industry "… through the refusal of many governments to include the costs of coal's massive environmental and health damage in the price of coal-fired electricity. Coal also receives huge direct economic subsidies in several countries."[636]

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630 Submission 104, p 1

631 'Subsidies planned for home turbines', *The Sydney Morning Herald*, 11 November 2009

632 Submission 49, p 12

633 Submission 32, p 2

634 Submission 84, p 13

635 Submission 8a, p 1

636 Submission 116, p 5

8.92 Dr Diesendorf believes that further incentives are required to respond to the greenhouse problem, stating "… carbon pricing must be introduced and renewable energy sources also should receive temporary direct subsidies, for example through the expanded Renewable Energy Target and gross feed-in tariffs."[637]

8.93 The use of feed-in tariffs as an incentive for wind power development was also suggested by Mr Ben van den Wijngaart, who stated:

> If there is a single factor that makes renewable energy a successful proposition, whether community based or commercial, it is the existence of meaningful feed-in tariffs. A feed-in tariff is a premium rate paid for electricity fed back into the electricity grid from a designated renewable electricity generation source such as wind or solar. Over 40 countries around the world at present have feed-in tariff regulations for renewable energy.[638]

8.94 Mr van den Wijngaart also explained that "[a] net feed in tariff, also known as export metering, pays the power producer only for surplus energy they produce; whereas a gross feed in tariff pays for each kilowatt hour produced by a grid connected system."[639]

8.95 Professor Outhred, professorial visiting fellow from the School of Electrical Engineering and Telecommunications, at the University of New South Wales, asserted that "[w]e have to be able to give the right kind of incentives to commercial players who are doing the right things while distinguishing between them and commercial players that are perhaps not behaving in the way we would like."[640]

Committee comment

8.96 The Committee notes the current incentives that are in place for wind farm developments and the differing opinions regarding the suitability of these incentives, some think they are too much while others think they are not enough. The Committee observes that many of the views that were presented in objection to current wind farm incentives and subsidies came from those who raised many objections to wind farms. There was a lack of evidence and reasoning provided to support opinions against such incentives and subsidies. This Committee was not presented with sufficient information to look into this issue in greater detail.

Lease arrangements with landowners

8.97 Some Inquiry participants raised concerns about aspects of the lease arrangements between host property owners and wind farm developers.[641] However, due to the confidentiality of these agreements, some issues were difficult to verify.

637 Submission 116, p 5

638 Submission 42, p 26

639 Submission 42, p 27

640 Professor Outhred, Evidence, 2 November 2009, p 12

641 See for example, Submissions 81, 115

8.98 Ms Cate Faehrmann, Executive Director of the Conservation Council of NSW, stated that "[m]ost existing wind farms have lease agreements with farmers, where the farmers typically receive 1-2% of the gross revenue of the wind farm in return for having turbines on their land."[642]

8.99 Mr Charles Prell, a resident of Crookwell, advised that he is negotiating a "… 30-year agreement with an option, so potentially a 60-year lease agreement…" as part of his negotiations with the wind farm developer of Crookwell II Wind Farm.[643]

8.100 Mr Richard Tanner, a resident of Coolah, stated that "[l]andowners are being pestered with requests for signing up long-term leases."[644] He believes that "[t]he developers are preying on the naivety of farmers who would like the income in the future but are very busy and do not understand the legal complexity of these agreements nor some of the business practices which operate in the wind farm business."[645]

8.101 Dr David Burraston and Ms Sarah Last, residents from Cootamundra who were approached by a wind farm developer, also expressed concern about risks associated with wind farm lease agreements, stating:

> It is quite possible, and has happened with other wind developments, that landholders signing lease agreements may not end up with any turbines, but are left with an onerous long term lease agreement and extensive access roads to turbines on other properties."[646]

8.102 Dr Burraston and Ms Last also suggested that discussion of any negative aspects of wind farm developments is not allowed once wind farm hosts sign lease agreements.[647]

8.103 When Mr Prell was asked by the Committee to discuss potential 'gag clauses' that apply to wind farm lease agreements, he stated that some information is commercial in confidence and provided no additional information on the matter.[648]

8.104 Mr Tanner identified problems associated with wind farm developers selling the wind farm during construction or soon after to the detriment of the landowner:

> The agreement … imposes very stringent conditions on landowners if they were to sell their properties. This is understandable as the commercial nature of the undertaking requires long-term legal access to the land for the turbines. There is however absolutely no requirements for the developer to guarantee the terms of the agreement when they sell out. There is no obligation for the end purchasers to perform the obligations of the developer agreement ... When the developers sell out they will either sell the shares in the Development Company or the rights under the

642 Submission 107, p 5

643 Mr Prell, Evidence, 1 October 2009, p 66

644 Submission 115, p 5

645 Submission 115, p 6-7

646 Submission 81, p 7

647 Submission 81, p 7

648 Mr Prell, Evidence, 1 October 2009, p 66 -67

> lease. As the rights under the lease will be split into the cash flow component going to a superannuation investor and the rights to take the power going to a retail energy company, there are no stated obligations by these yet unnamed end parties. If a commercial dispute occurs between these as yet unnamed third parties the rights of the landowner are most unclear and in fact may not exist. [649]

8.105 Additional issues associated with wind farm lease agreements as identified by Mr Tanner include:

> 1) It is a 5 year agreement with an irrevocable option to lease the land for 30 years and longer, maybe forever.
>
> 2) There is a generous offer of $10,000 reimbursement for legal expenses in obtaining advice. The magnitude of this amount is an indication of the level of expense that individual landowner have to make out of their pocket prior to signing any agreement.
>
> 3) The agreement provides for various obligations by the landowner which is understandable for an operation for this magnitude.
>
> 4) The Wind Farm Company 'Epuron' may assign any or all of the rights under the lease without any landholder approval. Furthermore, Epuron will be automatically released from any obligations under the Agreement or Lease with only cold comfort that the Assignee should take on board obligations in the original Agreement and Lease.
>
> 5) The landholder must enter into a Security Trustee Agreement (not displayed) if requested by Wind Farm Company.
>
> 6) The landowner must assign all the green rights ie. Renewable Energy Certificates and State Certificates to the company. This is an indication that the landowners should be allowed to apply for the Renewable Energy Certificates.
>
> 7) Likewise with the Windlab Agreements there is no obligation to disclose the annual power delivered to the Australian Energy Market Operator AEMO.[650]

8.106 Mr Edward Mounsey, Wind Prospect CWP's Development Director described the benefits for properties that host wind turbines as including "… additional revenue and benefits from the lease agreement, improved roads, erosion control and passive wind protection for stock from the substation and turbine towers".[651]

8.107 The amount paid to host property owners can be either a fixed amount per wind turbine or a percentage of income turnover. Mr Mark Dixon from Pamada described the latter type of arrangements as follows:

> It is a commercial arrangement that we have with the landowner. Obviously I will not give you the details of it, but it is basically a lease arrangement that is similar to any property leased, or royalties. We pay the landowner a fee. Specifically our arrangement is per turnover of income. He gets a flat percentage of income. Then to protect his interests, there is obviously a hedging there; if it goes below a certain factor, we pay

649 Submission 115, p 5

650 Submission 115, p 6

651 Submission 67, p 8

> him that. That is the arrangement we have with the landowner. In our case it is not the turbine. It is actually a percentage of the turnover.

8.108 Mr Keith Hungerford, Vice President of the Bathurst Community Climate Action Network, highlighted the amount of income that is provided to landholders who host wind turbines and also how additional income is provided to the local community:

> Wind farms make considerable contributions to local incomes through payment of occupancy rents. Most wind farms are located on rural grazing properties that are able to continue their farming operations with minimal impact from the wind turbines. Typically these rents are $6500 pa per MW generating capacity. Importantly the deployment of wind turbines offers a diversity of income to rural and regional areas making the local economies more resilient. Auswind, the Australian Wind Energy peak body, claims that every year $2.5 million goes directly to landholders in Australia who host wind turbines on their land, while another $19 million is spent on operational and maintenance costs, much of it in rural areas.[652]

8.109 A number of Inquiry participants commented on wind farms profits in the context of the whole community. For example, Dr Diesendorf expressed the view that payment of up to $10,000 per turbine per annum to host property owners is a very high rental:

> Setting up an open and transparent framework would result in some of the revenue from a wind farm going to the whole community. I think $10,000 a turbine for farmers who have turbines on their land is a ridiculously high rental, considering that the turbines hardly occupy any space and all you need is an access road, a right of access, and 1 per cent to 3 per cent of the land occupied by the turbines, an access road and a substation. I think that $10,000 for each turbine is a ridiculous amount.[653]

8.110 Similarly, Mr Tanner posed the question "… should the development profits go to the developer or should a more equitable arrangement be made for sharing the profits between the developer and the landowner and the community?"[654]

Committee comment

8.111 The Committee notes the concern expressed by some Inquiry participants in relation to the lease arrangements between landowners and various wind farm development companies. For example, the 'gag clauses' described by some witnesses may unreasonably prevent wind farm hosts from being able to communicate adverse issues they face as a result of the wind farm. It may also prevent the experiences of current wind farm hosts being able to improve the contractual situation for future potential hosts.

8.112 The Committee notes that some wind farm development companies provide landowners with funds to obtain independent legal advice, which may reduce the level of risk they adopt. In addition, the Committee has not heard any direct evidence from landowners who have agreed to unrealistic or unfair lease agreements. The Committee acknowledges that this may be as a

652 Submission 66, p 3

653 Dr Diesendorf, Evidence, 2 November 2009, p 6

654 Submission 115, p 4

result of 'gag clauses' that landowners are required to agree to, however, it should be noted that Inquiry participants also had the option of providing confidential evidence to the Inquiry.

Concluding comments

8.113 The Committee notes the many economic advantages and disadvantages identified by Inquiry participants regarding wind farm developments. Based on the evidence received, the Committee believes that in general, there are strong economic advantages of wind power in NSW, including the provision of income and employment to local communities.

8.114 The Committee acknowledges that disadvantages include small impacts on property value and potential impact on the aviation industry. However, the Committee notes that these adverse economic impacts can be managed appropriately and that the Committee's recommendations are aimed at mitigating these negative economic impacts.

Chapter 9 Community consultation

In this chapter issues regarding community consultation conducted by wind farm developers are examined. The significant number of concerns raised by Inquiry participants about consultation practices are explored and an analysis of current consultation requirements is undertaken. Options to address the issues identified are also examined in this chapter.

Concerns about community consultation

9.1 A large number of concerns were presented to the Committee regarding the current community consultation practices that take place as part of wind farm developments. Many Inquiry participants identified problems with the quality and quantity of community consultation that wind farm proponents conduct during planning stages. Dissatisfaction with community consultation evolved as a key issue for this Inquiry.

9.2 Issues identified regarding consultation for wind farm developments include:

- access to information
- advertising of consultation activities
- poor communication from developers and the Department of Planning
- relevant stakeholders not consulted
- lack of publicly available written information
- consultation conducted during inappropriate periods, such as Christmas
- consultation commencing late in the planning process
- provision of technical information that is difficult to understand
- divisive consultation tactics, and
- perception that wind farm design will not change regardless of consultation feedback provided to the developer.

9.3 Dr John Formby expressed the view that wind farm developers prioritise commercial decisions above siting decisions and as such, wind turbines will continue to be sited inappropriately:

> The reality is that wind farms are, and will continue to be, located in inappropriate sites with minimal consultation with those affected. Locational decisions will inevitably continue to be dominated by commercial considerations.[655]

9.4 Mr Paul and Mrs Sue Adams, residents of Scone who live next door to the proposed Kyoto Energy Park, expressed frustration that they were not contacted by the developer at any stage of the wind farm planning.[656]

655 Submission 45, p 2

656 Submission 88, p 4

9.5 Mr Keith Thompson, a resident from Scone, also felt that community consultation for the Kyoto Energy Park was inadequate, telling the Committee that he was not directly informed about the proposed development:

> An electrician happened to be at our place one day, and said, 'Look, that tower up there that is 45 metres high. I had something to do with installing that. That is where the wind farm is going.' Up until that stage we had no idea anything was going to go ahead. We had bought the property a year before that and there was nothing through the legal system of our solicitors that gave us any information about it at all. If there had been, we would not have bought the property.[657]

9.6 Consultation information provided in the Environmental Assessment for Kyoto Energy Park was not seen to be comprehensive or accurate by Mrs Beverley Atkinson, a resident from Scone:

> Readers will note that some of the statements about community consultation are window dressing. False, perhaps mistaken, statements about proximity to houses were made in several public meetings. People will laugh at the illustrations of newspaper publications used for public information, (only one of four being a real local paper). Re the list of newspapers used: why wasn't the huge circulation of the free Hunter Valley News used widely, rather than the smaller Advocate?[658]

9.7 Mr Peter Sherwin and Mrs Rosemary Sherwin-Noakes, residents from Taralga, observed in relation to the Taralga Wind Farm a "… complete disregard for the community's views."[659]

9.8 Poor responsiveness of developers and the late stage in the planning process that consultation commences was identified as a problem by the Glen Innes Landscape Guardian:

> Our overtures to the proponent to offer our assistance in reconfiguring the wind farm have not been responded to. This lack of response has been consistent with the appalling quality of the proponent's consultants' community consultation. The proponent failed to consult the affected community until their plans were well advanced and this consultation has been generally atrocious.[660]

9.9 The timing of consultation undertaken for Glen Innes Wind Farm was identified as inadequate by Dr Ashley Peake, member of the Glen Innes Landscape Guardian:

> They sent a letter out of an open day they had just before Christmas and it was at a time when a lot of people were out of town and it was sent in a manner that a lot of people did not receive notification until after the actual meeting.[661]

9.10 Mrs Mary Anne Evans, a resident from Furracabad who lives 800 metres from the recently approved Glen Innes Wind Farm, expressed numerous frustrations regarding the consultation process, including difficulty responding to planning documents:

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657 Mr Thompson, Evidence, 16 October 2009, p 40

658 Submission 26, Mrs Beverley Atkinson, pp 2-3

659 Submission 69, p 2

660 Submission 74, Glen Innes Landscape Guardian, p 3

661 Dr Peake, Evidence, 16 October 2009, p 29

> The lack of flexibility on the part of the proponents; the condescending nature of the report written by them and the lack of adequate time given to lay people like me to respond to documents that are culturally biased and lexically dense so as to intimidate and bully people and make people like me think why bother.[662]

9.11 Mr Thompson reported a similar experience regarding technical information provided. He stated "[t]he detail came to us but I had no idea how to read it or understand it. I have no acoustic background. In asking for information from the Department of Planning to explain it, nothing—you do not get an answer."[663]

9.12 Mr Thompson also expressed frustration at the difficulty in getting information from wind farm developers in writing.[664] In addition, he attended consultation meetings, took phone calls and exchanged emails with the developer of Kyoto Energy Park and believes that it is difficult to get information from developers as "… it does take a lot of what you call badgering, pushing, arguing to get the information."[665]

9.13 Ms Wendy Bell from the Molonglo Landscape Guardian stated that there is a lack of meaningful consultation that takes place:

> We now know that a lack of meaningful consultation and a corrosive pattern of dividing communities is a consistent feature of wind farm developments across the continent.[666]

9.14 Both the Molonglo Landscape Guardian and Glen Innes Landscape Guardian stated that communities feel 'disenfranchised' by current consultation processes.[667] In this regard the Molonglo Landscape Guardian stated:

> A proper consultation process, in place of the current 'tick-the-box' consultation approach favoured by the wind industry is urgently needed. This would ensure that negative impacts are properly considered and mitigated. Rural communities would not be disenfranchised from the process and left with Hobson's choice of giving up their lives to fight the proposal versus simply giving up.[668]

9.15 Mr Ben van der Wijngaart believes that the current planning process does not empower local communities, he stated that "[r]egrettably, the Part 3A process has given developers that sense of advantage and the community that sense of disadvantage."[669] Mr Ben van der Wijngaart argued that the Part 3A process does not support effective consultation and that this may cause much of the frustration experienced by communities:

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662 Mrs Evans, Evidence, 16 October 2009, p 27

663 Mr Thompson, Evidence, 16 October 2009, p 41

664 Mr Thompson, Evidence, 16 October 2009, p 42

665 Mr Thompson, Evidence, 16 October 2009, p 41

666 Submission 53, p 9

667 See for example, Submissions 74, 53

668 Submission 53, p 21

669 Mr van der Wijngaart, Evidence, 2 November 2009, p 30

> I believe the real problem is the part 3A process, which most communities now realise is the antithesis of community consultation. As soon as a part 3A process starts on a project - I know from my own experience - there is enormous community resistance and usually local government resistance as well. The part 3A process does not take into account DCPs, and that is the fundamental problem with it. The DCPs are created certainly by good councils, and I would regard mine as one of the good councils, based on a lot of community consultation and reflection on a very structured charette process and whatever else to determine what the community desires. When the part 3A process overrides that, as it often does, faith is lost in the overall planning process.[670]

9.16 The view that wind farm developments will go ahead regardless of community consultation feedback was expressed by Mrs Ruth Corrigan, a resident from Tarago, who stated:

> We were told from the first visit of the proponent that this industrial complex would go ahead, that there was no way we could stop or change it. We naively believed there was a consultation process which would provide a mechanism for robust and fair discussion and thorough examination of issues raised, this proved not to be the case.[671]

9.17 Mr Humphrey and Mrs Jennifer Price-Jones, residents from Crookwell, expressed similar frustration at the community consultation process undertaken for the Gullen Range Wind Farm and Crookwell II Wind Farm proposals:

> Community consultation regarding the Gullen Range and Crookwell II wind turbine proposals were farcical. Concerned residents and representatives of community groups were told by developers that these developments were going ahead and that there was nothing that the community could do about it.[672]

9.18 Associate Professor Richard Hindmarsh from Griffith University in Queensland informed the Committee of his research into community engagement, wind farms and renewable energy transitions. He is currently preparing a journal paper which concludes that the adequacy of community consultation by wind farm developments is contributing to social conflict:

> … existing approval processes for wind farm development and location in communities across all Australian states developing wind farms, including NSW, is increasingly open to question with regard to the adequacy of community input into decision making, and indeed appears to be strongly contributing directly to social conflict.[673]

9.19 Associate Professor Hindmarsh summarises the problems associated with wind farm consultation as follows:

> What is found is that the rationalities of the proponents' arguments appear to lack the social in any depth with regard to community consultation, and to resist important

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670 Mr van der Wijngaart, Evidence, 2 November 2009, p 30

671 Submission 72a, Mrs Ruth Corrigan, p 1

672 Submission 49, p 11

673 Submission 118, p 2. The research paper is titled: *Meeting 2020 Targets: Effective Transitions for Renewable Energy and Beyond (2009-2011).*

> international policy lessons about the need to embed wind farm development in a local context especially through enhanced participatory procedures and mechanisms. That leaves local communities largely disempowered or marginalised in developer processes of consultation, which reinforces a strong practice of tokenism or one-way information dissemination (see Hindmarsh and Matthews 2008), where affected communities become passive observers or onlookers instead of active participants in decision-making concerning 'their place', contributing to decision-making their local knowledge's and preferences in collaborative planning. That does not auger well for ESD [ecological sustainable development] considerations in a democratic society.[674]

9.20 Associate Professor Hindmarsh stated that, "[t]he conclusion is that institutional and procedural systems redesign is needed for effective renewable energy transformations and sustainability transitions, led by wind farms as the most feasible renewable energy for at least the foreseeable future.' [675]

9.21 Comments from wind farms proponents about criticisms such as those outlined above, reflected a general view that current processes and practices are sufficient.

9.22 For example, Epuron's submissions asserted that the Part 3A process provides a transparent process for community consultation, which has been tested in court:

> The Part 3A (Major Projects) planning process applies to wind farm projects and provides an integrated, thorough, rigorous and responsive assessment of environmental and community impacts. It is a transparent process that provides engagement and consultation with stakeholders and the community during the investigation and assessment of the proposal. This process has been tested by the Land and Environment court.[676]

9.23 In response to criticisms that communities are not consulted early enough in the wind planning process, Mr Michael Vawser, Director of Wind Prospect Group CWP stated that community consultation is not appropriate to be conducted prior to an appropriate level of wind data being available:

> There has been criticism in the past that communities are not consulted early enough. My point would be that without even knowing the resources are there, there is no point alerting the community or even involving the community at that stage, given that it could be somewhere that we just move on. When we get into stage two and sometimes stage three we go to a wider consultation. We ask all the government agencies and all the relevant bodies, clubs et cetera, whether they have an interest in the site, whether it affects them in any way, and then we have public meetings. We doorknock. Generally between three and five kilometres around a site we will knock on every door and if we do not talk to the people in those houses we will leave information about the wind farm proposal.[677]

9.24 Mr Jonathan Upson, Senior Development Manager of Infigen Energy described the community consultation approach that he undertakes:

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674 Submission 118, p 33

675 Submission 118, p 2

676 Submission 91, p 11

677 Mr Vawser, Evidence, 2 November 2009, p 19

> One is that I advise all the landowners in the project. If any of your neighbours have any concerns about the project, if they want to join the project, I want you to give them my phone number because I am happy to talk with them. … I proactively try to meet neighbours who have concerns about the project.[678]
>
> … I offer to see them or to talk to them on the phone one-on-one. Of course, we also have community open days when we put out information about the project, the turbine layout, photomontages showing how the wind farm will look from different areas, and information such as that. I think it is a very important part of the process to address the different concerns of the community, but it is pretty inevitable and certainly with the Capital Wind Farm some objections were lodged.[679]

9.25 Mr Upson expressed the view that local residents will sometimes state that they haven't been consulted when they disagree with the wind farm proposal, even if they have been offered appropriate opportunities:

> I think it is important to recognise that sometimes in community consultation if you talk to someone and they say: Look, this is the worst thing that could ever happen. I think these things are the most ugly monstrosities that could ever be put on a hillside. I do not want the project to go ahead in any shape or form. And then if you decide to proceed with the project, despite their objection, they can sometimes complain they have not been consulted. Of course, they were consulted but we simply did not agree with their view. On the other hand, if you talk to someone and they say: Look, I think the project is basically okay can you not have a turbine over there because that is really going to be a problem with views, or whatever, and I would really prefer if could try and find a way not to do that. We can certainly work with neighbours on that kind of basis.[680]

9.26 The NSW Government submission to the Inquiry stated that the establishment of Renewable Energy Precincts will enhance community consultation processes.[681] It stated that intensive community engagement and consultation will take place in the Precincts to "improve community understanding" of wind farms and to address community concerns.[682] The submission also envisaged that establishment Precinct Advisory Committees will also improve the community consultation process for wind farms.[683] Renewable Energy Precincts and Precinct Advisory Committees are examined in more detail in Chapter 5.

9.27 However, as outlined in Chapter 5, there is concern amongst local residents regarding the lack of consultation on the establishment of the Renewable Energy Precincts. Additional concern relates to the development of these precincts as a means to improve the community's understanding of wind farm issues rather than to provide more comprehensive consultation.

678 Mr Upson, Evidence, 11 September 2009, p 33

679 Mr Upson, Evidence, 11 September 2009, p 32

680 Mr Upson, Evidence, 11 September 2009, p 38

681 Submission 104, p 1

682 Submission 104, p 4

683 Submission 104, p 4

Developer behaviour

9.28 Several Inquiry participants told the Committee about inappropriate behaviour and tactics exhibited by some representatives of wind farm developers. This includes behaviour described as being unethical and untruthful, that pits long-term neighbours against each other and divides communities.

9.29 For example, Dr David Burraston and Ms Sarah Last, residents of Cootamundra described behaviour exhibited at the lease signing stage of a wind farm development in their area that was deliberately divisive between neighbours:

> We have also experienced at first hand the inappropriate conduct and divisive tactics employed by industrial wind energy companies within our own community, pitting neighbour against neighbour, blatantly lying and telling farmers that "everyone else is signing or has signed. We have repeatedly asked the industrial wind energy developers to get all the landholders together for a meeting rather than be divisive, but to no avail. The industrial wind developers even admitted that these tactics are divisive to us, and that we should see it from their perspective. This sentiment was stated several times. Such an admission clearly demonstrates a willful resistance towards transparency and due process, with lack of regard to the concerns landholders and residents may have about the large-scale development and impacts associated with industrial wind turbine power stations.[684]

9.30 Mr Paul Miskelly from the Taralga Landscape Guardian stated that the "… behaviours by the wind industry towards rural communities and individuals" is "totally unacceptable" and "aggressive". [685] Ms Martha Grahame, also from the Taralga Landscape Guardian stated that local property "… owners were subject to a lot of hassles and a lot of very unethical behaviour by the wind farm proponent."[686]

9.31 Inappropriate behaviour of wind farm development companies was also identified by the Molonglo Landscape Guardian:

> By any measure, this is reprehensible behaviour by the developer - they blew into our community uninvited, created anxiety and division, and then remained mute on the subject, seemingly content to just sit there keeping their options open at our expense for four, long years. No doubt they hoped that our determination would fade and, like many communities weakened by the constant fight, burn out.[687]

9.32 The Molonglo Landscape Guardian also stated that developer behaviour can be divisive for local communities:

> Subsequent consultation with the community by the developer, Acciona, was completely inadequate and thoroughly divisive. There was no meaningful

684 Submission 81, p 4

685 Submission 84, p 17

686 Ms Martha Grahame, Member, Taralga Landscape Guardian, Evidence, 1 October 2009, p 39

687 Submission 53, p 9

> communication from the developer from March 2005 until they finally announced that they were abandoning the project in May 2008.[688]

9.33 Mr Peter Smith, a resident from Wellingrove, stated that wind farm developments in his community are the most socially disruptive issue that he has observed:

> This is the most divisive and socially disruptive issue that I have seen thrust upon communities in my lifetime because developers have convinced those farmers whom they want to host turbines that their neighbors are opposing them out of jealousy and conversely those same neighbors can't believe their previous friends would sell them out for a few dollars.[689]

9.34 The attitude of some representatives of wind farm companies during community consultation was raised by some Inquiry participants as an issue. For example, Mr John Mendl, a resident from Crookwell, described a consultation meeting he attended at which wind farm developers "… insisted it was their 'God given right' to put these very large structures where ever they liked in the best interests of NSW."[690] Experiences such as this may lead to the anguish experienced by local residents such as Mrs Price-Jones who stated:

> We are left without recourse, without a voice - second-class rural citizens whose amenity can be sacrificed to assuage the conscience of urban voters who want to continue to use their air-conditioners and their clothes dryers without pangs of guilt.[691]

Current consultation requirements

9.35 As described above, the quality of consultation undertaken as part of wind farm developments in NSW was questioned by many Inquiry participants. This section examines the consultation requirements that developers are required to consider during wind farm planning. The effectiveness of 'Director-General's Requirements', the *Draft National Wind Farm Development Guidelines* and the Auswind *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia* are discussed.

Director-General's Requirements

9.36 The *Environmental Planning and Assessment Act 1979* allows the Director-General of the Department of Planning to establish 'Director-General's Requirements' during the Environmental Assessment phase of developments such as wind farms.[692] The requirements often include community consultation.

9.37 For example, the Department of Planning Director-General's Requirements for the Gullen Range Wind Farm Environmental Assessment stated that:

688 Submission 53, p 8

689 Submission 8a, p 2

690 Submission 33, p 1

691 Mrs Price-Jones, Evidence, 1 October 2009, p 52

692 *Environmental Planning and Assessment Act 1979* (NSW), s 75F

> The Proponent must undertake an appropriate and justified level of consultation with the following parties during the preparation of the EA [Environmental Assessment] … The EA must clearly describe the consultation process and indicate the issues raised by stakeholders during consultation and how these matters have been addressed.[693]

9.38 The inclusion of community consultation in Director-General's Requirements was highlighted by Ms Yolande Stone, Director of Policy, Planning and Systems Reform from the Department of Planning who stated:

> … in our Director-General's Requirements we very often require them [wind farm developers] to consult with the community before they lodge their environmental assessment, so that they can take community factors into consideration.[694]

9.39 Epuron believes that the Director-General's Requirements "… direct proponents on the focus of studies required and result from agency and stakeholder consultation aimed at adequately addressing environmental, community and planning considerations."[695]

9.40 However, others, like the Parkesbourne Mummel Landscape Guardian, do not believe that Director-General's Requirements are an obligation that wind farm developers are required to adhere to:

> In effect, the DoP [Department of Planning] has allowed the proponent to ignore the DGRs [Director-General's Requirements], at least those that bear on the issues of most concern to residents. The DoP's conduct has been weak and incompetent. The only plausible explanation for this erratic and arbitrary behaviour on the part of the DoP is that the officials are under pressure to approve wind farms, regardless of their merits, and the merits of their EAs.[696]

9.41 See also the comments of the Glen Innes Landscape Guardian in paragraph 9.46.

Auswind industry best practice guidelines

9.42 The Auswind *Best Practice Guidelines for Implementation of Wind Energy Projects in Australia* (described in Chapter 2) include best practice community consultation processes. These guidelines recommend that a detailed Stakeholder and Community Consultation Plan is prepared that is "… focused, inclusive, responsive, open and transparent in the provision of information and able to provide for timely feedback and evaluation".[697]

9.43 The guidelines also state that the Stakeholder and Community Consultation Plan should be tailored to the local area:

693 NSW Department of Planning, September 2007, p 5

694 Ms Stone, Evidence, 11 September 2009, p 5

695 Submission 91, p 13

696 Submission 99, pp 21-22

697 Auswind, *Best practice guidelines for implementation of wind energy projects in Australia*, December 2006, p 30

> The Stakeholder Communication and Consultation Plan will be tailored to the wind farm locality and thus be informed by research about the local environment and community. It should be an evolving document to keep pace with the project stages, any scheduling changes, knowledge acquired (for example, the identification of new stakeholders) and evaluations of success (for example, some methods of communication may prove unworkable and may need to be substituted with others). The plan will also include a procedure for addressing how stakeholders will be informed in the event that the project is deemed no longer feasible. The Stakeholder Communication and Consultation Plan should include a range of strategies and communication mechanisms to ensure the community is kept informed as the project proceeds.[698]

9.44 The Committee is aware that the Department of Planning requires (at least some) proposed wind farm developments to consider these Auswind guidelines, through the Director-General's Requirements. For example, this was required as part of the Gullen Range and Capital Wind Farm Environmental Assessment.[699]

9.45 Although the Committee was informed that some developments have not met the Auswind guidelines in relation to consultation. In this regard, Mr Keith Thompson, a resident from Scone expressed the view that the community consultation for Kyoto Energy Park did not comply with them:

> We let the Department of Planning know that we were unhappy with the consultation process; that it had not met any of Auswind's supposed best practice guidelines and we kept on at the consultant and the proponent; we wanted them to hear what we had to say.[700]

9.46 The Glen Innes Landscape Guardian stated in its submission that neither the Director General's Requirements or the Auswind guidelines were adequately not adequately addressed in relation to the Gullen Range Wind Farm:

> The Director-General's requirements state that "the proponent must undertake an appropriate and justified level of consultation with ... the local community" and that "the Environmental Assessment must clearly describe the consultation process and indicate the issues raised by stakeholders during consultation and how these matters have been addressed". These requirements were not adequately addressed. AUSWIND the Australian Association of Wind Farm proponents have developed Best Practice Guidelines which stress the importance of community engagement and consultation but "best practice" was certainly not achieved in the proponent's dealing with its proposed wind farm neighbors.[701]

698 Auswind, December 2006, p 30

699 NSW Department of Planning, September 2007, p 3; NSW Department of Planning, January 2006, p 4

700 Mr Thompson, Evidence, 16 October 2009, 28

701 Submission 74, p 3

Draft National Wind Farm Development Guidelines

9.47 As outlined in Chapter 2, the *Draft National Wind Farm Development Guidelines* are intended to provide a nationally consistent set of methods for addressing issues relating to wind farms, including consultation.

9.48 Similar to the Auswind guidelines, the draft national guidelines identify that consultation should be focused, inclusive, responsive, open and transparent in the provision of information and able to provide for timely feedback and evaluation.[702] The national guidelines highlight the importance of wind farm consultation in providing a voice for the community:

> As noted in Section 1.1, there is room for improvement in the wind farm development process. As a result, the community needs to be assured that they have a voice in the process of developing such facilities in or close to their communities. They also want to make sure that such developments are responsive to such input, and that the development process is open and transparent.[703]

9.49 Establishing consultation *early* in the wind farm planning process was identified as being important in the national guidelines. In addition, an ongoing commitment to consultation is suggested:

> Community and stakeholder consultation is a critical process in the successful development of wind farms. Establishing an early and ongoing commitment to community and stakeholder consultation, and ensuring that there are opportunities for input throughout the development process, can substantially assist in minimising risks to the development process. best-practice development requires the proponent to understand the community's concerns, and to ensure that such concerns are duly considered in the design and development of the wind farm project.[704]

9.50 Associate Professor Hindmarsh believes that a 'soft' approach to community consultation is adopted by Australian states and territories, due to the decision to make policy such as the *Draft National Wind Farm Development Guidelines* being 'non-statutory':

> The support by the States and Territories for softer public engagement through national guidelines is clearly indicated in the EPHC report, on the discussion around community consultation (EPHC: 31-36). Prepared by a working group of government officials representing federal and state governments, and a representative of the Local Government and Planning Ministers' Council, with wind industry consultants from Hydro Tasmania Consulting providing drafting and technical advice, the report supported non-statutory guidelines (in conjunction with the proposed National Wind Farm development Guidelines) for community consultation applied to all wind farm proposals by the applicable proponent/developer, drawing on industry (Auswind) Best Practice Guidelines and existing state guidelines and supporting documentation.[705]

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702 EPHC, October 2009, pp 48-49

703 EPHC, October 2009, p 17

704 EPHC, October 2009, p 18

705 Submission 118, p 12

9.51 The suggestion in the national guidelines of consultation occurring 'earlier' is identified by Associate Professor Hindmarsh as a small improvement, however, in general he believes that current wind farm consultation does not improve the involvement of communities in decision-making:

> In other words, reliance on the limited public engagement model appears to be the way forward, with a slight shift to inclusion through earlier engagement but with a continuation of passive consultation processes and mechanisms that offer little improvement for affected communities to input into decision-making.[706]

Improving community consultation

9.52 Many Inquiry participants emphasised the importance of timely and effective community consultation by wind farm developers, calling for an improvement in current practices and requirements.

9.53 For example, Ms Cate Faehrmann, Executive Director of the Nature Conservation Council of NSW, highlighted the importance of effective community consultation and engagement:

> Community engagement and consultation is key to a successful wind farm. The ISF report calls for proponents to effectively engage communities early in developing wind farm proposals, to improve site selection and community acceptance. As such, wind farm proponents need to go beyond the minimum consultation requirements, to genuinely engage the affected community as early as possible.[707]

9.54 Mr Nick Graham-Higgs, a consultant from nghenvironmental, stated that "[p]ublic attitudes are critically influenced by the nature of the planning and development process; the more open and participatory, the greater the level of public support."[708]

9.55 Mr Ben van der Wijngaart highlighted the importance of consultation in establishing acceptance of developments:

> Overseas and Australian evidence has shown that involving communities in the decision making process for siting and explaining to those concerned the inherent benefits of wind energy, economically and socially, are vital to establishing acceptance.[709]

9.56 Associate Professor Richard Hindmarsh believes that without good community consultation processes in place increased social and political conflict will occur as a result of wind farms:

> In the absence of inclusive participatory decision-making approaches, in reflection of the European and Australian experiences (as well as elsewhere), there is a arguably a good chance that **social and political conflict** will increase with regard to Australian wind farm development and location, as well as public distrust and divisiveness, and

706 Submission 118, p 13

707 Submission 107, p 5

708 Submission 93, p 6

709 Submission 42, p 1

> ongoing problems with democratic legitimacy and the effectiveness of environmental decision-making and interrelated energy and sustainability transitions.[710]

9.57 Dr Mark Diesendorf, the Deputy Director of the Institute of Environmental Studies at the University of NSW, explained that the approach that wind farm developers take has a significant influence on the level of objection received for wind farms. He used the experience of a wind farm at Albany, Western Australia to support this view:

> The wind farm at Albany, in Western Australia, has been extremely successful and when I visited it I could find no indication of any objection in the town. It all depends on how the developer proceeds. Some developers understand this and work very closely with the community to produce a product that is satisfactory to everyone concerned. Other developers, as in the business world generally, do not appear to take any notice of the local community and so people become suspicious and resentful. I cannot really find any way of avoiding that except perhaps State governments can place stronger requirements on community consultation. That might be one way.[711]

9.58 Another example of a successful approach to a wind farm development relates to the Hepburn Renewable Energy Association (HREA):

> HREA also ran with a philosophy that it was important to have all aspects of the community not necessarily on board, but at least involved on advisory panels so their views were considered.[712]

9.59 Mr Ben van der Wijngaart believes that changes need to be made to the current consultation process to make them transparent and to empower local communities:

> What I am suggesting is something that takes the power back to the community and allows it to be involved in the process, yes, in all cases. People are realistic; they do not expect to get 100 per cent of everything they want, but they can make rational judgements once they are given all the information and they do not believe they are being hoodwinked or forced into something. I think that is where the key is.[713]

Committee comment

9.60 The Committee notes the considerable level of concern that exists regarding current community consultation practices for wind farms. The Committee further notes that anxiety caused by this process is the antithesis of what most community consultation seeks to achieve. That is, to provide an opportunity for local residents who may be impacted by a development to voice their concerns and have them adequately addressed.

9.61 The Committee notes with concern that many Inquiry participants feel disempowered by the current wind farm consultation that takes place and many people have reported bad

710 Submission 118, p 34

711 Dr Diesendorf, Evidence, 2 November 2009, p 6

712 Submission 42, p 34

713 Mr van der Wijnaart, Evidence, 2 November 2009, p 30

experiences. The Committee notes that some of the behaviour demonstrated by wind farm developers has caused undue stress in local communities.

9.62 It is clear that community consultation is an essential part of wind farm planning. Effective consultation has the potential to result in a development that is as suitable as possible for the area in which it is proposed.

9.63 The Committee believes that the complaints process recommended in Chapter 5 (Recommendation 6) may provide a useful process for local communities to communicate concerns regarding consultation processes or inappropriate developer behaviour. In addition, development of the *NSW Planning and Assessment Guidelines for Wind Farms* may provide clarity for wind farm developers regarding what appropriate consultation involves.

9.64 The Committee further notes that the current consultation requirements for wind farms, as set out in Director General's Requirements and non-binding guidelines documents such as the Auswind guidelines, are not specific enough to ensure that the views of local communities are heard and addressed effectively. Evidence presented to the Committee indicates that an 'appropriate and justified level of consultation' has not taken place for some wind farms in NSW and has resulted in adverse impacts on local communities.

9.65 The Committee notes that the *Draft National Wind Farm Development Guidelines* and the best practice guidelines do provide some useful guidance on wind farm consultation. However, the Committee further notes that neither of these guidelines are statutory requirements. As such, the Department of Planning simply requires 'consideration' of the guidelines rather than demonstrable adherence to them. The Committee is not convinced that Renewable Energy Precincts or Precinct Advisory Committees will substantially improve current wind farm consultation processes.

9.66 The Committee has observed that the goodwill toward wind farms generated by virtue of being clean energy companies is quickly eroded when effective consultation does not take place. It is in the best interests of all concerned – local residents and developers alike – to conduct the best possible community consultation process.

9.67 The Committee further notes that undoubtedly some people will ultimately be unhappy with a wind farm development in their local area. However, the depth of feeling can be minimised if people are provided with sufficient information, listened to and their views incorporated where reasonable.

9.68 The Committee believes that the *NSW Planning and Assessment Guidelines for Wind Farms* should include robust consultation requirements for wind farm developments. This would provide a common understanding for all stakeholders regarding the minimum expectation of consultation for wind farms. Including consultation requirements in these guidelines would also inform local communities as to how they can be involved in wind farm development processes.

9.69 The Committee believes that the concerns it has about community consultation as set out above can be addressed if the Government adopts the Committee's Recommendation 18 set out in Chapter 7

Appendix 1 Submissions

No	Author
1	Mr Paul Tosti
2	Mr William Hoorweg
3	Ms Rowena Weir
4	Australian Landscape Guardian
5	Ms Helen White
6	Mt Spring Association Inc
7	Dr Ben Elwald
8	Mr Peter Smith
8a	Mr Peter Smith
9	Ms Donna Von-Stanke
10	Ms Carmelle Lymbery
11	Ms Tracey Hall
12	Mr Barry Hall
13	Mr Stuart & Mrs Heather Carter
14	Mr Warwick & Mrs Sandy Marshall
15	Mr Jim & Mrs Noreen Marshall
15a	Mr Jim & Mrs Noreen Marshall
15b	Mr Jim & Mrs Noreen Marshal
15c	Mr Jim & Mrs Noreen Marshal
15d	Mr Jim & Mrs Noreen Marshal
16	Ms Julianne Frost
17	Mr Jamie Buck
18	Mr Gordon Halliday
19	Glen Innes Severn Council
20	Mr Julle Bierling
21	Dr Ian McCausland
22	Snowy River Shire Council
23	Mr Douglas Arnott
24	Mr Graham Laurie
25	Mrs Janine Hannan
26	Mrs Beverley Atkinson
27	Mr David Page

No	Author
28	Mrs Dianne Douch
29	Mr Kevin and Mrs Ellen Williams
30	Mr Arthur and Mrs Christine Haylock
31	Mrs Barbara Whitten
32	Upper Hunter Landscape Guardian
33	Mr John Mendl
34	Ms Julie Gray
35	Ms Fiona Taylor
36	Mr John and Mrs Niki Zubrzycki
36a	Mr John and Mrs Niki Zubrzycki
37	Mrs Susan Brann
38	Mr Keith Thompson
38a	Mr Keith Thompson
38b	Mr Keith Thompson
38c	Mr Keith Thompson
38d	Mr Keith Thompson
39	Mr Leigh Prentice
40	Name suppressed
41	Upper Lachlan Shire Council
42	Mr Ben van der Wijngaart
43	Mr Alan Gillespie-Jones
44	Mr Michael Inkster
45	Dr John Formby
46	Name suppressed
47	Mr Keith Kerridge
48	Mr Christian Downie
49	Mr Humphrey and Mrs Jennifer Price-Jones
50	Woodstock Partnership
51	Mr John McGrath
52	G Lawrence & Son
53	Molonglo Landscape Guardian
54	Origin Energy
55	Clean Energy Council
56	Upper Hunter Shire Council
56a	Upper Hunter Shire Council

No	Author
57	Future Energy
58	Mr Howard Charles
59	New England Strategic Alliance of Councils
60	Acciona Energy Oceania
61	Mr Geoffrey Putland and Ms Christine Thompson
62	Ms Anne Davis
63	Ms Margaret Lynn
64	Ms Beth White
65	Mr Paul Miskelly
66	Bathurst Community Climate Action Network
67	Wind Prospect CWP
67a	Wind Prospect CWP
68	Mr Dennis Workman
69	Mr Peter Sherwin and Mrs Rosemary Noakes-Sherwin
70	Marubeni Australia Ltd
71	Dr Ashley Peake
72	Ms Ruth Corrigan
72a	Ms Ruth Corrigan
73	Ms Shirley Watson
74	Glen Innes Landscape Guardian
75	Country Energy
76	Superair Australia Lonoaks
77	Mrs Elizabeth Litchfield
78	Suzlon Energy Australia
79	Aerial Agricultural Association of Australia Ltd
80	Ms Martha Grahame
81	Dr David Burraston and Ms Sarah Last
81a	Dr David Burraston and Ms Sarah Last
82	Mr Philip and Ms Mary Anne Evans
83	Oberon Council
84	Taralga Landscape Guardians
84a	Taralga Landscape Guardians
84b	Confidential
85	Mr James William Litchfield
86	Mr D W and Mrs K G Smith

No	Author
87	Eco Energy Solutions (Australia)
88	Mr Paul and Mrs Sue Adams
89	Pamada
90	TransGrid
91	Epuron
91a	Epuron
92	Mr Paul Scherek
93	nghenvironmental
94	Philip Tilden
95	Senergy Econnect Australia
96	Ms Michaela Samman
97	Friends of Renewable Energy
98	Sydney and Northern NSW Branch of the Australian Garden History Society
99	Parkesbourne Mummel Landscape Guardian
99a	Parkesbourne Mummel Landscape Guardian
100	Planning Institute of Australia NSW Division
101	Infigen Energy
102	Green Bean Designs
103	Vestas Wind Systems A/S
104	New South Wales Government
105	Ms Vanessa D'Emanuele
106	Pacific Hydro
107	Nature Conservation Council of NSW
108	Mr George McLaughlin AM
108a	Mr George McLaughlin AM
108b	Mr George McLaughlin AM
109	Hunter Thoroughbred Breeders Association
110	Dr Alan Shaw
111	Mr John Carter and Mr Colin Dooley
112	Mr Charles Prell
113	Mr Christopher Croker
114	Black Springs Community Landscape Guardian
114a	Black Springs Community Landscape Guardian
115	Mr Richard Tanner
116	Mr Mark Diesendorf

No	Author
117	Office of the Renewable Energy Regulator
118	Associate Professor Richard Hindmarsh
119	Professor Hugh Outhred
120	Australian Energy Market Operator
121	Confidential

Appendix 2 Witnesses

Date	Name	Position and Organisation
Friday 11 September 2009, Jubilee Room, Parliament House	Ms Yolande Stone	Director, Policy, Planning Systems and Reform, NSW Department of Planning
	Mr Scott Jeffries	Director, Major Infrastructure Assessments, NSW Department of Planning
	Ms Jennifer Stace	Manager - Emissions Reduction, NSW, Department of Environment, Climate Change and Water
	Mr Robert Moore	General Manager Policy, Clean Energy Council
	Mr Ken McAlpine	Government Relations Manager, Vestas Wind Systems
	Mr Mark Dixon	Project Manager, Pamada
	Mr William Gill	Commercial Manager, Pamada
	Mr Jamie Chivers	Project Manager, Pamada
	Mr Jonathan Upson	Senior Development Manager, Infigen Energy
	Mr Christian Downie	PhD Candidate, Australian National University
	Mr Martin Poole	Managing Director, Epuron
	Mr Andrew Durran	Executive Director, Epuron
	Mr Garry Yost	Managing Director, Eco Energy Solutions Australia
	Ms Katrina Hodgkinson MP	Member for Burrinjuck
Thursday 1 October 2009, Lily Room, Trapper's Conference Centre, Goulburn	Mr George McLaughlin AM	Resident, Tarago
	Ms Julie Gray	Resident, Bungendore
	Mr Robert Mowle	Director, Environment and Planning, Upper Lachlan Shire Council
	Ms Rosalind Bush	Secretary, Molonglo Landscape Guardian
	Ms Wendy Bell	President, Molonglo Landscape Guardian
	Dr David Burraston	Resident, Cootamundra
	Ms Sarah Last	Resident, Cootamundra
	Mr Paul Miskelly	President, Taralga Landscape Guardian
	Ms Martha Grahame	Member, Taralga Landscape Guardian
	Dr John Formby	Chairman, Friends of Crookwell
	Mr David Brooks	Deputy Chair, Parkesbourne Mummel

		Landscape Guardian
	Mr Humphrey Price-Jones	Spokesperson, Friends of Crookwell
	Mrs Jennifer Price-Jones	Resident, Crookwell
	Mr Colin Dooley	Resident, Crookwell
	Mr John Carter	Resident, Crookwell
	Mr Charles Prell	Resident, Crookwell
	Mr Christopher Croker	Resident, Golspie
Friday 16 October 2009, Guy Kable Room, Quality Hotel Powerhouse, Tamworth	Mr Julle Bierling	Resident, Scone
	Mr Michael Thew	Member, Hunter Thoroughbred Breeding Association
	Mrs Judith Wheeler	Secretary, Upper Hunter Landscape Guardian
	Mr Gordon Halliday	Member, Upper Hunter Landscape Guardian
	Mrs Noreen Marshall	Resident, Scone
	Mrs Mary-Anne Evans	Secretary, Glen Innes Landscape Guardian
	Dr Ashley Peake	Member, Glen Innes Landscape Guardian
	Mr Geoffrey Putland	Member, Glen Innes Landscape Guardian
	Mr David Casson	Director, Environmental Services, Upper Hunter Shire Council
	Mr Keith Thompson	Resident, Scone
	Clr Steve Toms	Mayor, Glen Innes Severn Council
	Mr Graham Price	Director, Development and Environmental Services, Glen Innes Severn Council
	Mr Richard Tanner	Resident, Scone
Monday 2 November 2009, Room 814/815, Parliament House	Dr Mark Diesendorf	Deputy Director, Institute of Environmental Studies, University of New South Wales, appearing in an individual capacity
	Prof Hugh Outhred	Professorial Visiting Fellow, School of Electrical Engineering and Telecommunications, University of New South Wales, appearing in an individual capacity
	Mr Michael Vawser	Managing Director – Asia Pacific, Wind Prospect Group CWP
	Mr Ben van der Wijngaart	Deputy Mayor of Kiama Council, appearing in an individual capacity

Monday 9 November 2009, Waratah Room, Parliament House	Dr Eja Pedersen	Academic, Halmstad University, Sweden

Appendix 3 Site visits

Wednesday 30 September 2009

The following Committee members attended the site visit: Mr Ian Cohen *(Chair)*, Mr Rick Colless *(Deputy Chair),* Mr Robert Brown, Mr Tony Catanzariti, Mr Charlie Lynn, Ms Lynda Voltz and Ms Helen Westwood. The Committee was accompanied by the following Secretariat staff: Ms Rachel Callinan, Ms Emily Nagle and Ms Rhia Victorino.

Cullerin Range Wind Farm

The Cullerin Range Wind Farm is owned and operated by Origin Energy. The turbines are situated on privately-owned land, under a lease agreement, 12km east of Gunning and 30km west of Goulburn.

The Committee arrived at Cullerin Range Wind Farm by coach at 1.30pm where they were met by Ms Elizabeth Weaver, Communication Manager, Origin Energy, Mr Stuart Atkinson, Wind Farm Operations Leader, Origin Energy, and Mr Robert Mowle, Director Environment and Planning, Upper Lachlan Shire Council.

Mr Atkinson provided a briefing on the main features of the wind farm and the fifteen wind turbines that comprise it, including turbine model specifications, the cost of construction and the arrangements with the landowners to access the property.

The Committee was driven to the furthest point of the wind farm, Turbine no. 15, where they were invited to stand beneath the turbine to experience noise emissions, and to view the entire wind farm and the local surrounds. Mr Atkinson informed the Committee of a number of matters, including the general wind speed and direction captured by the turbines, measures to minimise fire risk by positioning transformers on the ground next to the turbine rather than within the nacelle, the wind farm's capacity factor, and its connection to the local grid.

The Committee was then taken to the transmission lines where the harnessed energy is connected to the local grid, and the nearby turbine where members were invited to step inside the base of the tower.

Before leaving the wind farm, the Committee was invited to listen to noise emission approximately 900 metres from the nearest wind turbine, just within the boundary fence.

From the Cullerin Range Wind Farm the Committee travelled to 'Glan Aber'.

'Glan Aber' property

The Glan Aber property is owned by Mr Humphrey and Ms Jennifer Price-Jones and is located within the Crookwell area.

The Committee arrived at Glan Aber at 4.10pm where they were met by Mr Humphrey Price-Jones, Ms Jennifer Price-Jones, Dr John Formby and Professor Laurie Brown.

The Committee was driven to Red Hill, the highest point on the Gullen Range, in three four-wheel-drive vehicles. Atop Red Hill, Mr Price-Jones and Dr Formby identified the existing Crookwell I and Cullerin Range Wind Farms, and indicated the areas that would house the proposed Crookwell II and Gullen Range Wind Farms. The Committee listened to the background noise of Red Hill.

Mr Price-Jones informed the Committee of a number of matters, including the number of turbines to be erected around his property and advised that the closest dwelling to a wind turbine from the proposed Crookwell II wind farm would be his son's home, approximately 600 metres away. Dr

Formby further advised that the proposed wind farms would potentially impact 150 dwellings in the surrounding area.

From Glan Aber the Committee travelled to the Dooley property.

Dooley property

The Dooley property is owned by the Dooley family and is located adjacent to Crookwell I Wind Farm, in Pejar.

The Committee arrived at the Dooley property at 6.00pm and was met by Mr Colin Dooley.

The Committee received a briefing from Mr Dooley on the history of the property, including his family's settlement in the area in 1840 and the building of the family homestead in 1860.

Mr Dooley identified the existing Crookwell I Wind Farm on the neighbouring property, and advised of the proposed site for the Crookwell II Wind Farm. The Committee were informed that Mr Dooley's property would be surrounded on three sides by land leased by the Crookwell II wind farm proponent to house up to 23 wind turbines.

The Committee also heard concerns expressed by Mr Dooley about restrictions to aerial spraying if turbines were to be erected around his property.

From the Dooley property the Committee travelled to 'Gilead'.

'Gilead' property

The Gilead property is owned by the Corrigan family and is located near Tarago.

The Committee arrived at the Gilead property at 7.45pm and was met by Ms Ruth Corrigan, Mr George McLaughlin, and Ms Sue Corrigan.

The Committee received a briefing from Ms Ruth Corrigan on the position of the property in relation to the Capital Wind Farm which can be sighted from her property, and informed the Committee of her experience of the noise generated by the wind turbines.

The Committee was given an opportunity to listen to the noise emission audible from Capital Wind Farm.

Mr McLaughlin and Ms Sue Corrigan advised the Committee that noise emission is a particular concern for the community as background noise in the area is minimal. They also discussed other matters, including the need to improve the current planning and approval process by including an independent assessment body to determine noise and visual impacts.

Appendix 4 Tabled documents

Friday 11 September 2009

Public Hearing, Jubilee Room, Parliament House

1. National Farmers' Federation Submission to the Senate Committee on Fuel and Energy – *tabled by Mr Ken McAlpine, Vestas Wind Systems*

2. Wind Farms Draft environmental noise guidelines – *tabled by Mr Jonathan Upson, Infigen Energy.*

3. NSW Rural Wind Farms Additional Information, Capacity of the Victorian Electricity Transmission, Network to integrate Wind Power, National Wind Power Study and Green on Green: Public Perception of Wind Power in Scotland and Ireland – *tabled by Mr Andrew Durran, Epuron.*

4. Gullen Range Wind Farm – *tabled by Mr Andrew Durran, Epuron.*

5. Submission to the General Purpose Standing Committee No. 5 Inquiry into Rural Wind Farms – *tabled by Ms Katrina Hodgkinson MP.*

Thursday 1 October 2009

Public Hearing, Trapper's Conference Centre, Goulburn

6. Upper Lachlan Shire Council Presentation – *tabled by Mr Robert Mowle, Upper Lachlan Shire Council.*

7. Clauses from consolidated conditions of Taralga Wind Farm Decision, Law and Environment Court, No. 11216 of 2007 – *tabled by Ms Martha Grahame, Taralga Landscape Guardian.*

8. Photograph of Row 6, Taralga ridgeline - *tabled by Ms Martha Grahame, Taralga Landscape Guardian.*

9. Confidential document - *tabled by Ms Martha Grahame, Taralga Landscape Guardians.*

10. NSW Wind Output (Cullerin and Capital Wind Farms), 29-30 September 2009 – *tabled by Mr Paul Miskelly, Taralga Landscape Guardian.*

11. Wind Turbine Impact Study, Dodge & Fond Du Lac Counties - Wisconsin, Appraisal Group One, Preliminary Draft, September 2009 – *tabled by Dr John Formby.*

12. Parkesbourne Mummel Landscape Guardian – *tabled by Mr David Brooks, Deputy Chair, Parkesbourne Mummel Landscape Guardian.*

13. Examples of developer/expert actions at Community Consultation Meetings – *tabled by Ms Jennifer Price-Jones.*

14. Union Fenosa Wind Australia - Crookwell II Wind Farm, Newsletter 3, September 2009 – *tabled by Mr Colin Dooley.*

15. Five items of correspondence regarding the proposed Crookwell II Wind Farm and its impact on the 'Elmgrove' property, aerial activity and fire suppression – *tabled by Mr Colin Dooley.*

16. Crookwell II Wind Farm speech by Mr Duncan Gay – *tabled by Mr Colin Dooley.*

17. Clean Energy Fail Photograph – *tabled by Mr John Carter.*

18. Australia's First Commercial Wind Farm press release, 28 October 1996, and Pacific Power documentation, including media information – *tabled by Mr John Carter.*

19. Letter to Committee – *tabled by Mr Christopher Croker.*

Friday 16 October 2009

Public Hearing, Quality Hotel Powerhouse, Tamworth

20. Submission papers for Mr Julle Bierling – *tabled by Mr Julle Bierling.*

21. The Upper Hunter Thoroughbred Industry, 2006 – *tabled by Mr Michael Thew, Hunter Thoroughbred Breeding Association.*

22. The Innovators, Australian Turf Monthly - *tabled by Mr Michael Thew, Hunter Thoroughbred Breeding Association.*

23. Turbines in Hawaii left to rust and rot after their use by date – *tabled by Mrs Noreen Marshall.*

24. Less than 2k? No Way! Sign - *tabled by Dr Ashley Peake, Glen Innes Landscape Guardian.*

25. Glen Innes Wind Farm – Peer Review of Noise Assessment – *tabled by Dr Ashley Peake, Glen Innes Landscape Guardians.*

26. Wind Farm Inquiry Presentation – *tabled by Mr Geoffrey Putland, Glen Innes Landscape Guardian.*

27. Inquiry Outcomes – *tabled by Mr Geoffrey Putland, Glen Innes Landscape Guardian.*

28. Opening statement to Inquiry into Rural Wind Farms – *tabled by Mr David Casson, Upper Hunter Shire Council*

29. Kyoto Energy Park (Application: 06_0055) – Exhibition of Environmental Assessment' - *tabled by Mr David Casson, Upper Hunter Shire Council*

30. Presentation to the Committee for the Rural Wind Farms Inquiry – *tabled by Keith Thompson.*

31. Documents relating to wind farms – *tabled by Ms Judith Wheeler, Secretary, Upper Hunter Landscape Guardians.*

32. Submission to the Inquiry into Rural Wind Farms– *tabled by Mr Richard Tanner.*

Friday 9 November 2009

Public Hearing, Waratah Room, Parliament House

33. Wind turbine noise – effects on humans – *tabled by Dr Eja Pedersen, Academic, Halmstad University, Sweden.*

Appendix 5 Minutes

Minutes No. 25
Thursday 24 June 2009
General Purpose Standing Committee No. 5
Room 1102, Parliament House, Sydney, at 1.00 pm

1. Members present

Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Mr Tony Catanzariti
Mr Charlie Lynn
Ms Lynda Voltz
Ms Helen Westwood

2. Correspondence

Received

- 22 January 2009 – From the Hon Rick Colless to the Chair, attaching correspondence to Mr Colless from the member for Burrinjuck, the Hon Katrina Hodgkinson MP regarding a request to establish an inquiry into the planning requirements for Wind Farms
- 24 June 2009 – From Mr Cohen, Mr Colless and Mr Lynn requesting a meeting of GPSC5 to consider a proposed self-reference into the social, environmental and economic costs and benefits of wind farms

Sent

- 10 March 2009 – From the Chair to the member for Burrinjuck, the Hon Katrina Hodgkinson MP regarding a proposed inquiry into the planning requirements for Wind Farms

3. Waiving requirement for 24 hours notice to consider TOR

The Chair sought the leave of the Committee to consider the terms of reference at 1pm today, notwithstanding that members will have only received approximately 21 hours notice.

No objection taken.

Leave granted.

4. Consideration of proposed self-reference – Wind farms

The Chair tabled a letter to the Clerk of the Committee signed by Mr Cohen, Mr Colless and Mr Lynn requesting a meeting of the Committee to consider proposed terms of reference for an inquiry into wind farms.

Resolved, on the motion of Ms Westwood: That the Committee adopt the following terms of reference, as amended:

That General Purpose Standing Committee No 5 inquire into and report on the social, environmental and economic costs and benefits of rural 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 rural wind farms to optimise wind resource use and minimise residential and environmental impacts
3. The impact of rural wind farms on property values
4. Mechanisms for encouraging local ownership and control of wind technology
5. The potential role of energy generated by rural wind farms in relation to the Australian Government's proposed Renewable Energy Target
6. Any other relevant matter.

Resolved, on the motion of Ms Voltz:

- That the call for submissions be advertised in the SMH, Daily Telegraph The land, 'Renewal' and other relevant regional media at the earliest practicable time

- That the closing date for submissions be Friday 21 August.

Resolved, on the motion of Ms Voltz: That the Committee conduct:

- one public hearing at Parliament House, preferably in September 2009
- site visits and/or public hearings at Broken Hill and in the Southern Highlands preferably in late September/early October, subject to further consideration following the receipt of submissions.
- That the Secretariat canvass potential dates for hearings/site visits with members via email, and that the decision to proceed with specific dates also be resolved via email communication with members.

Resolved, on the motion of Mr Lynn: That the Secretariat circulate via email a list of potential witnesses for the Sydney metropolitan and rural hearings and that the decision to invite particular witnesses also be resolved via email communication with members.

Resolved, on the motion of Ms Westwood: That the Secretariat circulate a list of proposed stakeholders to members by Friday 10 July. Comments on the proposed list, as well as any additional suggestions should be forwarded by members to the secretariat by Wednesday 15 July.

5. Adjournment

The Committee adjourned at 1.47 pm *sine die*.

Beverly Duffy
Clerk to the Committee

Minutes No. 26
Thursday 3 September 2009
General Purpose Standing Committee No. 5
Members Lounge, Parliament House, Sydney, at 1.00 pm

1. Members present

Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Mr Tony Catanzariti
Mr Charlie Lynn
Ms Lynda Voltz
Ms Helen Westwood

2. Minutes

Resolved, on the motion of Mr Brown: That draft Minutes No. 25 be confirmed.

3. Correspondence

Received

- 6 August 2009 – From Mr Simon Torok, Communication and Marketing Manager, CSIRO Marine and Atmospheric Research, notifying the Committee that the CSIRO will not be making a submission to the wind farms inquiry.
- 18 August 2009 – From Mr Keith Thompson, proposing a suspension of all wind farm approvals until the Inquiry into rural wind farms is completed and inviting the Committee to his property in Scone.
- 27 August 2009 – From Mr Peter Duncan, A/Director General, New South Wales Government, Department of Premier and Cabinet, alerting the Committee to the Premier's announcement on 17 August 2009 of clean energy initiatives for NSW.
- 29 August 2009 – From Mr Lane Crockett, General Manager, Australia/Pacific, Pacific Hydro, providing Pacific Hydro's submission and offering to appear as a witness at the 11 September hearing.
- 2 September 2009 – From Mr Paul Miskelly, President, Taralga Landscape Guardians, offering to make changes to his submission.

4. Submissions

Public submissions
Resolved, on the motion of Ms Westwood: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and Standing Order 223(1), the Committee authorise the publication of the submissions received to date, except for submissions 67 and 101, for which confidentiality had been requested, and submission 84.

Submission 84 (attached on purple paper)
Resolved, on the motion of Mr Colless: That the Committee Secretariat identify sections of submission 84 for suggested deletion, to be circulated to the Committee for review and comment before the next committee deliberative.

Attachments to submissions 38 and 49
Resolved on the motion of Ms Westwood: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and Standing Order 223(1), the attachments to Submissions 38 and 49 remain confidential to the Committee.

5. Public Hearing Friday 11 September
Resolved on the motion of Ms Westwood:
- That the following additional witnesses be invited to give evidence at the public hearing on 11 September:
    - Epuron
    - Hepburn Wind – to give evidence via video-conference if possible
- That the Committee Secretariat investigate Mr Peter Lang and/or Dr Mark Diesendorf as potential witnesses for the public hearing on 11 September.

6. Site Visits
Resolved on the motion of Mr Colless: That the Committee travel to:
- Crookwell/Goulburn by coach on Wednesday 30 September to conduct a site visit and public hearing on Thursday 1 October, returning to Sydney on the evening of 1 October.
- Tamworth by commercial flight in late October (possibly Friday 16 October) to conduct a public hearing, returning to Sydney that evening.

7. Adjournment
The Committee adjourned at 1.35 pm until Friday 11 September.

Beverly Duffy
Clerk to the Committee

Minutes No. 27
Friday 11 September 2009
General Purpose Standing Committee No. 5
Jubilee Room, Parliament House, Sydney, at 9.30am

1. Members present
Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Ms Kayee Griffin (Catanzariti)
Mr Charlie Lynn
Ms Helen Westwood

2. Apologies
Ms Lynda Voltz

3. Substitutions

The Chair advised that he had received written advice that the following member would be substituting for the purposes of this hearing:

- Ms Griffin to substitute for Mr Catanzariti

4. Inquiry into rural wind farms – public hearing

Witnesses, the public and media were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witnesses were sworn and examined:

- Ms Yolande Stone, Director, Policy, Planning Systems and Reform, Department of Planning
- Mr Scott Jeffries, Director, Major Infrastructure Assessments, Department of Planning
- Ms Jennifer Stace, Manager, Emissions Reduction, Department of Environment, Climate Change and Water

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Mr Rob Jackson, General Manager Policy, Clean Energy Council
- Mr Ken Alpine, Government Relations Manager, Policy, Vestas, Clean Energy Council

Mr McAlpine tabled the following document:

- National Farmers' Federation – Submission to the Senate Committee on Fuel and Energy, August 2008.

The evidence concluded and the witnesses withdrew.

The following witnesses from Pamada were sworn and examined:

- Mr Mark Dixon, Project Manager, Kyoto Energy Park
- Mr William Gill, Commercial Manager
- Mr Jamie Chivers, Project Manager

The evidence concluded and the witnesses withdrew.

5. Deliberative meeting

5.1 Minutes

Resolved, on the motion of Mr Colless: That draft Minutes No. 26 be confirmed.

5.2 Correspondence

Sent

- 9 September 2009 – From Chair to A/Director General, Department of Premier and Cabinet, Mr Peter Duncan, requesting confirmation of nominated representatives to appear at public hearing on 11 September.

5.3 Publication of submissions

Publication of submissions

Resolved on the motion of Mr Brown: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submission 109.

Submission 84 (attached on purple paper)

Resolved on the motion of Mr Colless: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the partial publication of submission 84, with highlighted sections to be omitted.

Submission 101

The Committee had previously resolved that Submission 101 from Infigen Energy remain confidential to the Committee. Advice was received from Mr Jonathan Upson from Infigen that the submission can now be made public.

Resolved on the motion of Mr Brown: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submission 101.

Submission 46
The Committee had previously resolved to publish submission 46 as a public submission. The author has subsequently requested that her name be suppressed and the submission be made partially confidential.

Resolved on the motion of Mr Lynn: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the partial publication of submission 46, with the name suppressed at the request of the author.

5.4 Dates for additional witnesses
Resolved on the motion of Ms Westwood: That Mr Peter Lang be invited as a witness to the public hearing in Goulburn on Thursday, 1 October 2009, and that the Committee Secretariat investigate the possibility of receiving evidence from Hepburn Wind by video-conference in October.

5.5 Confirmation of site visit
The Committee had previously discussed departing Sydney on Wednesday 30 September at 10am for the site visit and hearing in Goulburn.

Resolved, on the motion of Mr Brown: That the Committee depart Sydney on Wednesday 30 September as early as 8am if necessary to attend site visits at the Cullerin Range Wind Farm, the proposed site for the Gullen Range Wind Farm, Crookwell and the Capital Wind Farm.

6. Inquiry into rural wind farms – public hearing
The following witness was sworn and examined:
- Mr Jonathon Upson, Development Manager, Infigen Energy

Mr Upson tabled the following document
- Wind Farms: Draft environmental noise guidelines, South Australia EPA p15.

The evidence concluded and the witness withdrew.

The following witness was sworn and examined:
- Mr Christian Downie, PhD scholar, Australian National University

The evidence concluded and the witness withdrew.

The following witnesses from Epuron were sworn and examined:
- Mr Martin Poole, Managing Director
- Mr Andrew Durran, Executive Director

Mr Durran tabled the following documents:
- Gullen Range Wind Farm – Report on community perceptions towards wind farms in the Southern Tablelands, NSW, Oct 2007
- Additional information booklet containing four publications on health risks, grid integration, the National Electricity Market and public perceptions of wind power.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:
- Mr Garry Yost, Managing Director, Eco Energy Solutions

The evidence concluded and the witness withdrew.

The following witness was sworn and examined:

- Ms Katrina Hodgkinson MP, Member for Burrinjuck

Ms Hodgkinson tabled the following document - Opening statement.

The evidence concluded and the witness withdrew.

7. Adjournment
The Committee adjourned at 4.52pm *sine die.*

Beverly Duffy
Clerk to the Committee

Minutes No. 35
Wednesday 23 September 2009
General Purpose Standing Committee No. 5
Parkes Room, Parliament House, Sydney, at 1.00pm

1. Members present
Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Roy Smith (Brown)
Mr Tony Catanzariti
Ms Lynda Voltz
Ms Helen Westwood

2. Apologies
Mr Charlie Lynn

3. Substitutions
The Chair advised that he had received written advice from Mr Smith that he would be substituting for Mr Brown for the purposes of this meeting.

4. Minutes
Resolved, on the motion of Ms Voltz: That draft Minutes No. 27 be confirmed.

5. Inquiry into rural wind farms

Publication of submissions
Resolved on the motion of Ms Voltz: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submission 110.

Submission 67
Resolved on the motion of Ms Voltz: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submission 67 but not the attachments to that submission, which are to remain confidential to the Committee at the author's request.

Response to evidence on 11 September 2009
Resolved, on the motion of Ms Voltz: That the Committee invite a response from the wind farm proponents referred to by Ms Katrina Hodgkinson in her evidence at the public hearing on Friday, 11 September at Parliament House.

Goulburn hearing – additional witnesses
Resolved, on the motion of Mr Colless:

- That the Committee Secretariat contact the additional witnesses suggested by Mr Duncan Gay to determine their interest and availability to attend the public hearing in Goulburn on Thursday, 1 October.
- That the Committee's public hearing in Goulburn conclude at 5pm if necessary, to accommodate the appearance of these additional witnesses.

Goulbourn hearing – media
Resolved, on the motion of Ms Voltz: That the Commttee Secretariat contact the owners of all private properties to be visited by the Committee during its site visit to advise the possibility of media interest and to gauge their response.

Video-conference
The Committee confirmed their availability on Monday, 9 November at 2.30pm for a video-conference with Hepburn Wind and any additional witnesses.

6. Adjournment
The Committee adjourned at 1.20pm until Wednesday 30 September/Thursday 1 October - site visit and public hearing in Goulburn/Crookwell.

Ms Rhia Victorino
Clerk to the Committee

Minutes No. 36
Wednesday 30 September 2009
General Purpose Standing Committee No. 5
Goulburn at 1.00pm

1. Members present
Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Mr Tony Catanzariti
Mr Charlie Lynn
Ms Lynda Voltz
Ms Helen Westwood

2. Inquiry into rural wind farms – site visits
Cullerin Range Wind Farm
The Committee attended Cullerin Range Wind Farm and was met by the following:
- Ms Elizabeth Weaver – Communication Manager, Origin Energy
- Mr Stuart Atkinson – Wind Farm Operations Leader, Origin Energy
- Mr Robert Mowle – Director Environment and Planning, Upper Lachlan Shire Council.

The Committee was granted access to the Cullerin Range Wind Farm by Mr Atkinson, who provided a tour of the wind farm.

The Committee travelled to the 'Glan Aber' property, Crookwell.

'Glan Aber' property
The Committee attended the 'Glan Aber' property and was met by the following:
- Mr Humphrey Price-Jones
- Ms Jennifer Price-Jones
- Dr John Formby
- Professor Laurie Jennifer Brown.

The Committee was taken to the highest point on the Gullen Range (on the 'Glan Aber' property), where they received a briefing from Mr Price-Jones and Dr Formby on the proposed Gullen Range and Crookwell II wind farms.

The Committee travelled to the Dooley property, Pejar.

Dooley property
The Committee attended the Dooley property and was met by:
- Mr Colin Dooley.

The Committee received a briefing from Mr Dooley in relation to Crookwell I wind farm and the proposed Crookwell II wind farm.

The Committee travelled to the 'Gilead' property, Tarago.

'Gilead' property
The Committee attended the 'Gilead' property and was met by:
- Ms Ruth Corrigan
- Mr George McLaughlin
- Ms Sue Corrigan.

The Committee received a briefing from Ms Ruth and Ms Sue Corrigan, and Mr McLaughlin in relation to the Capital Wind Farm, particularly regarding noise generated by the wind turbines.

3. Adjournment
The Committee adjourned at 9.00pm until 9.15am on Thursday 1 October 2009, Trapper's Conference Centre, Goulburn.

Rachel Callinan
Clerk to the Committee

Minutes No. 37
Thursday 1 October 2009
General Purpose Standing Committee No. 5
Annie Room, Trapper's Conference Centre, Goulburn, at 9.15am

1. Members present
Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Mr Tony Catanzariti
Mr Charlie Lynn
Ms Lynda Voltz
Ms Helen Westwood

2. Inquiry into rural wind farms – public hearing
Witnesses, the public and media were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witnesses were sworn and examined:
- Ms Julie Gray, Resident, Bungendore
- Mr George McLaughlin AM, Resident, Tarago.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:
- Mr Robert Mowle, Director, Environment and Planning, Upper Lachlan Shire Council.

Mr Mowle tendered the following document:
- Upper Lachlan Shire Council Presentation.

The evidence concluded and the witness withdrew.

The following witnesses from Molonglo Landscape Guardians were sworn and examined:
- Ms Wendy Bell, President
- Ms Rosalind Bell, Secretary.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:
- Dr David Burraston, Resident, Cootamundra
- Ms Sarah Last, Resident, Cootamundra.

The evidence concluded and the witnesses withdrew.

The following witnesses from Taralga Landscape Guardians were sworn and examined:
- Mr Paul Miskelly, President
- Ms Martha Grahame, Secretary.

Ms Grahame tendered the following documents:
- Clauses from consolidated conditions of Taralga Wind Farm Decision, Law and Environment Court, No. 11216 of 2007
- Photograph of Row 6, Taralga ridgeline
- "No Taralga Windfarm", documentation outlining contact with wind farm proponents.

Mr Miskelly tendered the following document:
- NSW Wind Output (Cullerin and Capital Wind Farms), 29-30 September 2009.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:
- Dr John Formby, Resident, Binda.

Dr Formby tendered the following document:
- Wind Turbine Impact Study, Dodge & Fond Du Lac Counties - Wisconsin, Appraisal Group One, Preliminary Draft, September 2009

The evidence concluded and the witness withdrew.

The following witness was sworn and examined:
- Mr David Brooks, Deputy Chair, Parkesbourne Mummel Landscape Guardians.

Mr Brooks tendered the following document:
- Parkesbourne Mummel Landscape Guardians – supplementary submission.

The evidence concluded and the witness withdrew.

The following witnesses from Friends of Crookwell were sworn and examined:
- Mr Humphrey Price-Jones, Spokesperson
- Ms Jennifer Price-Jones, Executive Member.

Ms Price-Jones tabled the following document:
- Examples of developer/expert actions at Community Consultation Meetings.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Mr Colin Dooley, Resident, Goulburn
- Mr John Carter, Resident, Crookwell.

Mr Dooley tendered the following documents:

- Union Fenosa Wind Australia - Crookwell II Wind Farm, Newsletter 3, September 2009
- Five items of correspondence regarding the proposed Crookwell II Wind Farm and its impact on the 'Elmgrove' property, aerial activity and fire suppression
- Crookwell II Wind Farm speech by Mr Duncan Gay.

Mr Carter tendered the following documents:

- "Clean Energy Fail" Photograph
- "Australia's First Commercial Wind Farm" press release, 28 October 1996, and Pacific Power documentation, including media information.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:

- Mr Charlie Prell, Resident, Crookwell.

The evidence concluded and the witness withdrew.

The following witness was sworn and examined:

- Mr Chris Croker, Resident, Golspie.

Mr Croker tendered the following documents:

- Letter to Committee (opening statement/submission).

The evidence concluded and the witness withdrew.

The public hearing concluded at 5.38pm. The public and media withdrew.

3. Deliberative meeting

3.1 Minutes

Resolved, on the motion of Ms Voltz: That draft Minutes No. 35 be confirmed.

3.2 Correspondence

Received:

The Committee noted the following items of correspondence received:

- 21 September 2009 – From Mr K Thompson, enclosing research report, 'Low-calcium fly ash-based geopolymer concrete: Long-term properties', from Curtin University of Technology.
- 24 September 2009 – From Mr David Cole, inviting the Committee to attend the play, 'Windfall – a comic look at the impact of windfarms on our local community and environment', showing in Goulburn.
- 28 September 2009 – From Mr Paul Miskelly, President, Taralga Landscape Guardians, supplementary submission 84.

Sent:

The Committee noted the following items of correspondence sent:

- 23 September 2009 – From the Chair to Ms Donna Boton, Epuron, inviting her to respond to comments made by Ms Katrina Hodgkinson in her evidence at the public hearing on Friday, 11 September.
- 23 September 2009 – From the Chair to Mr Tim O'Grady, Origin Energy, inviting him to respond to comments made by Ms Katrina Hodgkinson in her evidence at the public hearing on Friday, 11 September.
- 23 September 2009 – From the Chair to Mr Ignacio Palacios, RES Southern Cross, inviting him to respond to comments made by Ms Katrina Hodgkinson in her evidence at the public hearing on Friday, 11 September.

3.3 Publication of submissions

Public submissions
Resolved, on the motion of Ms Voltz: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submissions 84a, 84b, 99a, 112, 113.

Partially confidential submissions
Resolved on the motion of Ms Voltz: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the partial publication of submission 111.

Confidential submissions
Resolved, on the motion of Ms Voltz: That, supplementary submission 84b be kept confidential.

3.4 Additional witness
Resolved, on the motion of Ms Voltz: That Professor Hugh Outhred be invited to appear as a witness before the Committee on a date to be determined by the Secretariat in consultation with the Committee, along with any other witnesses identified by the Secretariat in consultation with the Committee.

3.5 Publication of tendered documents

Resolved, on the motion of Ms Westwood: That all documents tendered at today's hearing be accepted, and that, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of the following documents:

- Upper Lachlan Shire Council Presentation, tendered by Mr Mowle
- Clauses from consolidated conditions of Taralga Wind Farm Decision, Law and Environment Court, No. 11216 of 2007, tendered by Ms Grahame
- Photograph of Row 6, Taralga ridgeline, tendered by Ms Grahame
- NSW Wind Output (Cullerin and Capital Wind Farms), 29-30 Sept 2009
- Wind Turbine Impact Study, Dodge & Fond Du Lac Counties - Wisconsin, Appraisal Group One, Preliminary Draft, September 2009, tendered by Dr Formby
- Examples of developer/expert actions at Community Consultation Meetings, tendered by Mrs Price-Jones
- Union Fenosa Wind Australia - Crookwell II Wind Farm, Newsletter 3, September 2009, tendered by Mr Dooley
- 5 items of correspondence regarding the proposed Crookwell II Wind Farm and its impact on the 'Elmgrove' property, aerial activity and fire suppression
- "Clean Energy Fail" Photograph, tendered by Mr Carter
- "Australia's First Commercial Wind Farm" press release, 28 October 1996, and Pacific Power media documentation, tendered by Mr Carter.

3.6 Suppressing name in transcript

Resolved, on the motion of Mr Lynn: That the name of the officer from the Department of Planning referred to by Mr Price-Jones in his evidence before the Committee on 1 October 2009 be suppressed from the transcript for publication on the website.

4. Adjournment
The Committee adjourned at 5.50pm until 10.00am, Friday 16 October 2009, Quality Hotel Powerhouse, Tamworth.

Rachel Callinan
Clerk to the Committee

Minutes No. 38
Thursday 16 October 2009
General Purpose Standing Committee No. 5
Guy Kable Room, Quality Hotel Powerhouse, Tamworth at 10.00am

1. Members present

Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Mr Tony Catanzariti
Mr Charlie Lynn
Ms Lynda Voltz
Ms Helen Westwood

2. Inquiry into rural wind farms – public hearing

Witnesses, the public and media were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witness was sworn and examined:

- Mr Julle Bierling, engineer and local resident.

Mr Bierling tendered the following documents:

- 'Submission for the Leg. Council Enquiry Hearing into Rural Windfarms', Julle Bierling
- 'Andasol Thermal Power Plant in Spain'
- Letter to the Director of Major Infrastructure Assessment, Department of Planning
- Montage of the visual impact Pamada Wind Farm
- Scone tourist brochure.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:

- Mr Michael Thew, Member, Hunter Thoroughbred Breeding Association.

Mr Thew tendered the following documents:

- 'The Innovators', Australian Turf Monthly
- 'The Upper Hunter Thoroughbred Industry, 2006', Hunter Valley Research Foundation.

The evidence concluded and the witness withdrew.

The following witnesses from Upper Hunter Landscape Guardians were sworn and examined:

- Ms Judith Wheeler, Secretary
- Mr Gordon Halliday, Member.

Mr Halliday tendered the following documents:

- Letter to Hon George Souris MP from Minister of Planning
- Letter to Ms Carmelle Lymbery from George Souris MP
- 'Wind Turbine Syndrome: A Report on a Natural Experiment'
- Letter to Ms Carmelle Lymbery from George Souris MP
- Upper Hunter Landscape Guardians letter to Minister of Plannig
- 'Allendale East wind farm opposed'
- Legislative Council Adjournment Debate, Victoria
- 'Murdoch to seek moratorium on wind turbine projects'
- 'Murdoch right in taking up cause to stall wind farms'
- Impression of some of the proposed KEP turbines as viewed from a property in Scone.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:
- Mrs Noreen Marshall, Resident.

Mrs Marshall tendered the following document:
- 'Turbines in Hawaii left to rust and rot after their use by date'.

The evidence concluded and the witnesses withdrew.

The following witnesses from Glen Innes Landscape Guardians were sworn and examined:
- Ms Mary-Anne Evans, Secretary
- Dr Ashley Peake, Member
- Mr Geoffrey Putland, Member.

Dr Peake tendered the following documents:
- Large wind turbine sign *(a photograph was taken of this sign)*
- Letter from Michael Chung, Renzo Tonin Associates to Dr Peake.

Mr Putland tendered the following documents:
- 'Wind Farm Inquiry Presentation'
- 'Inquiry Outcomes'.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:
- Mr David Casson, Director, Environmental Services, Upper Hunter Shire Council.

Mr Casson tendered the following documents:
- 'Opening statement to Inquiry into Rural Wind Farms'
- Upper Hunter Shire Council submission to Department of Planning regarding the Kyoto Energy Park.

The evidence concluded and the witness withdrew.

The following witness was sworn and examined:
- Mr Keith Thompson, local resident.

Mr Thompson tendered the following document:
- 'Presentation to the Committee for the Rural Wind Farm Inquiry'.

The evidence concluded and the witness withdrew.

The following witnesses from Glen Innes Severn Council were sworn and examined:
- Clr Stephen Toms, Mayor
- Mr Graham Price, Director, Development and Environmental Services.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:
- Mr Richard Tanner, local resident.

Mr Tanner tendered the following documents:
- 'Submission to Inquiry into Rural Wind Farms'.

The evidence concluded and the witnesses withdrew.

3. Deliberative meeting

3.1 Minutes

Resolved, on the motion of Mr Catanzariti: That draft Minutes No. 36 and No. 37 be confirmed.

3.2 Correspondence

Received:

The Committee noted the following items received:

- 6 October 2009 – From Mr Simon Holloway, Environmental Services Coordinator, Planning and Environmental Services, Palerang Council, discussing concerns about the Department of Planning's decision to make local councils responsible for measuring noise complaints from wind farms.
- 6 October 2009 – From Mr Andrew Durran, Executive Director, Epuron, answers to QON taken during hearing on 11 September 2009.
- 6 October 2009 – From Mr Mark Dixon, Project Manager, Pamada, answers to QON taken during hearing on 11 September 2009.
- 6 October 2009 – From Mr Christian Downie, Regnet, Australian National University, answers to QON taken during hearing on 11 September 2009.
- 7 October 2009 – From Ms Donna Bolton, Project Manager, Epuron, responding to statements made by Ms Katrina Hodgkinson MP during the Inquiry into rural wind farms hearing on 11 September 2009.

3.3 Publication of submissions

Resolved, on the motion of Ms Voltz: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submissions 110, 114, 91, 108a, 108b, 38c, 38d, 115(except for attachments 3 and 4).

3.4 Additional witnesses

Resolved, on the motion of Ms Voltz: That Mr Ben van den Wingaardt, Professor Mark Diesendorf and a witnesses qualified to talk about the psychology of noise pollution be invited to appear as a witness before the Committee on a date to be determined by the Secretariat in consultation with the Committee.

3.5 Publication of tendered documents

Resolved, on the motion of Ms Westwood: That all documents tendered at today's hearing be accepted, and that, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of the following documents:

- tendered by Mr Bierling:
    - 'Submission for the LC Enquiry Hearing into Rural Windfarms'
    - Letter to the Director of Major Infrastructure Assessment, Department of Planning
    - Montage of the visual impact Pamada Wind Farm
- tendered by Mr Halliday:
    - Letter to Hon George Souris MP from Minister of Planning
    - Letter to Ms Carmelle Lymbery from George Souris MP
    - 'Wind Turbine Syndrome: A Report on a Natural Experiment'
    - Letter to Ms Carmelle Lymbery from George Souris MP
    - Upper Hunter Landscape Guardians letter to Minister of Planning
    - Impression of some of the proposed KEP turbines as viewed from a property in Scone.
- tendered by Dr Peake: Letter from Michael Chung, Renzo Tonin Associates to Dr Peake
- tendered by Mr Casson: Upper Hunter Shire Council submission to Department of Planning regarding the Kyoto Energy Park.

3.6 Publication of answers to questions on notice

Resolved on the motion of Ms Voltz: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of answers to questions on notice received to date from:

- Mr Andrew Durran, Executive Director, Epuron
- Mr Mark Dixon, Project Manager, Pamada
- Mr Christian Downie, Regnet, Australian National University.

3.7 Name suppression in transcript

Resolved, on the motion of Mr Lynn: That the name of the company referred to by Mr Tanner in his evidence before the Committee on 16 October 2009 be suppressed from the transcript for publication on the website.

4. Budget Estimates 2009/2010 – Supplementary Hearings

Resolved, on the motion of Mr Brown: That no supplementary hearings be held for Budget Estimates 2009/2010.

5. Adjournment

The Committee adjourned at 3.45pm *sine die*.

Rachel Callinan
Clerk to the Committee

Minutes No. 39
Monday 2 November 2009
General Purpose Standing Committee No. 5
Room 814/815, Parliament House at 9.58 am

1. Members present

Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Ms Kayee Griffin (Catanzariti)
Mr Charlie Lynn (at 12.15)
Ms Lynda Voltz
Mr Ian West (Westwood)

2. Substitutions

The Chair advised that he had received written advice from the Government Whip that the Hon Ian West MLC would be substituting for the Hon Helen Westwood MLC and the Hon Kayee Griffin MLC will substitute for the Hon Tony Catanzariti MLC.

3. Inquiry into rural wind farms – public hearing

Witnesses, the public and media were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witness was sworn and examined:

- Dr Mark Disendorf, Deputy Director, Institute of Environmental Studies, University of NSW.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:

- Professor Hugh Outhred, Professorial Visiting Fellow, School of Electrical Engineering, University of NSW.

The evidence concluded and the witness withdrew.

The following was sworn and examined:

- Mr Michael Vawser, Managing Director – Asia Pacific, Wind Prospect Group.

The evidence concluded and the witnesses withdrew.

The following witness was sworn and examined:

- Mr Bernados van der Wijngaart.

The evidence concluded and the witnesses withdrew.

4. Deliberative meeting

4.1 Minutes

Resolved, on the motion of Mr Brown: That draft Minutes No. 38 be confirmed.

4.2 Correspondence

The Committee noted the following items of correspondence received:

- 19 October 2009 – From Ms Sarah Jones, Clean Energy Council, providing answers to QON.
- 19 October 2009 – Email from Ms Elizabeth Weaver, Communications Manager, Orign Energy requesting access to the images that the Secretariat took at the Cullerin Range Wind Farm on 30 September 2009.
- 22 October 2009 – From Ms Julie Gray, providing answers to QON and expressing dissatisfaction regarding the Inquiry.
- 22 October 2009 – From Mr J Carter, providing answers to QON.
- 22 October 2009 – Email from Mr Miskelly, President Taralga Landscape Guardian, providing answers to QON and additional information.
- 26 October 2009 – Email from Dr David Burraston and Ms Sarah Last, providing answers to QON and additional information
- 27 October 2009 – From Molonglo Landscape Guardian, providing answers to QON.
- 27 October 2009 – From Hon Greg Donnelly MLC, Government Whip advising Mr West will substitute for Ms Westwood on 2 November 2009.
- 27 October 2009 – From Hon Greg Donnelly MLC, Government Whip advising Ms Griffin will substitute for Mr Catanzariti MLC on 2 Nov 2009.
- 27 October 2009 – From Dr David Burraston, providing further information.
- 27 October 2009 - From Dr David Burraston, providing further information.

Resolved, on the motion of Mr Brown: That the Committee decline Ms Weaver's request for access to the images that the Secretariat took at the Cullerin Range Wind Farm on 30 September 2009 and that the Secretariat write to Ms Weaver to advise her of the Committee's decision.

The Committee noted the following items sent:

- 23 October 2009 - From Chair to Ms Corbyn, Director-General, DECCW, requesting a response to QON and providing additional QONs.
- 23 October 2009 - From Chair to Mr Haddad, Director-General, Dept of Planning, requesting a response to QON and providing additional QONs.

4.3 Publication of submissions

Resolved, on the motion of Mr Colless: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submissions 15d, 36a, 53a, 56a, 67a, 72a, 81a, 116, 117 and 118.

4.4 Publication of answers to questions on notice

Resolved on the motion of Mr Colless: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of answers to questions on notice received from:

- Ms Sarah Jones, Clean Energy Council
- Ms Julie Gray
- Mr John Carter
- Mrs Noreen Marshall
- Mr Paul Miskelly
- Dr David Burraston and Ms Sarah Last
- Molonglo Landscape Guardian.

4.5 Chair's draft report

The Committee discussed the process for the development of the Committee's report.

Resolved, on the motion of Mr West: That, the Secretariat circulate the report outline that it has developed in consultation with the Chair to the Committee members for their information and comment.

5. Adjournment

The Committee adjourned at 12.30pm until Monday 9 November 2009 at 5.30pm in the Waratah Room, Parliament House, Sydney.

Rachel Callinan
Clerk to the Committee

Minutes No. 40
Monday 9 November 2009
General Purpose Standing Committee No. 5
Waratah Room, Parliament House at 5.25pm

1. Members present

Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Mr Tony Catanzariti
Mr Charlie Lynn
Ms Lynda Voltz
Ms Helen Westwood

2. Inquiry into rural wind farms – public hearing

Witness, public and media were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witness was sworn and examined via videoconference from Sweden:

- Dr Eja Pedersen, Halmstad University, Sweden.

The evidence concluded and the witnesses withdrew.

3. Deliberative meeting

3.1 Minutes

Resolved, on the motion of Mr Brown: That draft Minutes No. 39 be confirmed.

3.2 Correspondence

The Committee noted the following items of correspondence received:

- 29 October 2009 – From Mrs and Mr Price-Jones providing answers to QON.
- 2 November 2009 – From Mr David Casson, Upper Hunter Shire Council, providing answers to QON.
- 2 November 2009 – From Prof Hugh Outhred, University of New South Wales, providing answers to QON.
- 4 November 2009 – From Ms Katrina Hodgkinson MP, Member for Burrinjuck, providing answers to QON
- 8 November 2009 – From Mr M Waring, Director, MirusWind PtyLtd.

3.3 Publication of submissions

Resolved, on the motion of Mr Colless: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submissions 114a, 8a, 118, 119.

3.4 Publication of answers to questions on notice

Resolved on the motion of Mr Colless: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of answers to questions on notice received from:

- Mrs and Mr Price-Jones
- Mr Casson
- Professor Outhred
- Ms Hodgkinson
- The Department of Planning
- Upper Hunter Landscape Guardians
- Upper Lachlan Shire Council

4. Adjournment

The Committee adjourned at 6.30pm until Monday 14 December 2009 at 9.00am in Room 1102, Parliament House, Sydney.

Rachel Callinan
Clerk to the Committee

Draft Minutes No. 41
Monday 14 December 2009
General Purpose Standing Committee No. 5
Room 1102, Parliament House at 9:05 am

1. Members present

Mr Ian Cohen *(Chair)*
Mr Rick Colless *(Deputy Chair)*
Mr Robert Brown
Mr Tony Catanzariti
Mr Charlie Lynn
Ms Lynda Voltz
Ms Helen Westwood

2. Confirmation of previous minutes

Resolved, on the motion of Mr Brown: That draft Minutes No. 40 be confirmed.

1. ***

5. ***

6. Inquiry into rural wind farms

6.1 Correspondence

The Committee noted the following items of correspondence received:

- 4 November 2009 – From Mr Bruce Mountain, Carbon Market Economics, declining invitation to make a submission.
- 5 November 2009 – From Clean Energy Council, providing transcript corrections.
- November 2009 – From Mr Sam Haddad, DG, Department of Planning, providing answers to QON
- 17 November 2009 – From Glen Innes Severn Council, answers to QON.
- 17 November 2009 – From Wind Prospects, providing answers to QON.
- 19 November 2009 – From Mr van der Wijngaart, providing answers to QON.
- 25 November 2009 – From Ms Lisa Corbyn, DECCW, providing answers to QON.
- 1 December 2009 – From Clean Energy Council, providing answers to QON.

- 1 December 2009 – From Dr Ashley Peake, Glen Innes Landscape Guardian, providing answers to QON
- December 2009 – Ms Yolande Stone, Dept of Planning, providing answers to QON

6.2 Publication of submissions

Resolved, on the motion of Ms Westwood: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of submission 120.

6.3 Publication of answers to questions on notice

Resolved, on the motion of Ms Westwood: That, according to section 4 of the *Parliamentary Papers (Supplementary Provisions) Act 1975* and standing order 223(1), the Committee authorise the publication of answers to questions on notice providing by:

- Department of Planning
- Glen Innes Severn Council
- Wind Prospects
- Mr van der Wijngaart
- Department of Environment, Climate Change and Water
- Clean Energy Council
- Glen Innes Landscape Guardians
- Ms Stone.

6.4 Consideration of draft report – inquiry into rural wind farms

The Chair tabled his draft report entitled Rural Wind Farms, which, having been previously circulated was taken as being read. The Committee proceeding to consider the report in detail.

Chapter 1 read.

Resolved, on the motion of Mr Colless: That Chapter 1 be adopted.

Chapter 2 read.

Resolved on the motion of Ms Voltz: That paragraph 2.64 be amended by inserting the words 'providing detailed methodologies,' after the word 'operation,'.

Resolved on the motion of Ms Voltz: That paragraph 2.65 be amended by omitting all the words after 'However', and inserting instead the words 'in relation to these issues, the guidelines "do not provide detailed methodologies because the solution is relatively simple or covered well in other documents"'.

Resolved, on the motion of Mr Colless: That paragraph 2.73 be amended by inserting after the word 'include' in the final sentence the words 'the ability to provide diversity to host farm income and'.

Resolved, on the motion of Ms Voltz: That Table 2.1 be amended by inserting the words 'Wind farms provide diversity of farm income streams in a changing economic environment' in the first empty cell in the first column.

Resolved, on the motion of Ms Voltz: That Chapter 2, as amended, be adopted.

Chapter 3 read.

Resolved, on the motion of Mr Colless: That Chapter 3 be adopted.

Chapter 4 read.

Resolved on the motion of Ms Voltz: That paragraph 4.59 be amended by omitting the words 'when the wind stops blowing' and inserting instead the words 'due to the intermittent nature of wind'.

Resolved on the motion of Mr Brown: That paragraph 4.62 be amended by omitting the words 'often results in' in the final sentence and inserting instead the words 'contributes to'.

Resolved on the motion of Mr Brown: That Recommendation 1 be amended by omitting the words 'Minister for Infrastructure' and inserting instead the words 'NSW Government'.

Resolved, on the motion of Mr Catanzariti: That Recommendation 1, as amended, be adopted.

Resolved, on the motion of Mr Brown: That Chapter 4, as amended, be adopted.

Chapter 5 read

Resolved on the motion of Mr Brown: That paragraph 5.2 be amended by omitting the words 'currently a lack of clarity regarding' in the first sentence and inserting instead the words 'contention regarding the'.

Resolved on the motion of Ms Voltz: That paragraph 5.6 be amended by omitting the word 'gaps' and inserting instead the words 'some issues that are not addressed' and by omitting the words 'specific NSW guidelines, will result in resource that does' and inserting instead the words 'the *NSW Planning and Assessment Guidelines for Wind Farms*, will result in guidelines that do'.

Resolved on the motion of Ms Voltz: That paragraph 5.8 be amended by inserting the words 'by some Inquiry participants' after the word 'suggested' in the second sentence.

Resolved on the motion of Ms Voltz: That paragraph 5.10 be amended by inserting the word ', nghenvironmental, ' after the word 'Inquiry' in the last sentence.

Resolved on the motion of Ms Voltz: That paragraph 5.12 be amended by inserting the words 'or guidelines' after the word 'policies' in the first sentence.

Resolved on the motion of Ms Voltz: That paragraph 5.15 be amended by omitting the words 'rather than by local councils, which most wind farms are' at the end of the first sentence.

Resolved, on the motion of Mr Colless: That paragraph 5.25 be amended by omitting the word 'issues' in the second sentence.

Resolved, on the motion of Ms Voltz: That paragraph 5.26 be amended by omitting all the words and inserting instead the words 'A transparent process is required that effectively balances the community views reflected in local policy with the needs of the State. The Committee notes that the development of the *NSW Planning and Assessment Guidelines for Wind Farms* presents an opportunity to vastly improve current policy. Currently the only NSW guidelines are those developed by various local councils as DCPs and local stakeholders have raised significant concerns that they are ignored when wind farms are assessed under Part 3A development applications.'

Resolved, on the motion of Mr Brown: That paragraph 5.27 be deleted.

Resolved, on the motion of Mr Brown: That paragraph 5.28 be amended by omitting
the word 'should' in the first sentence and inserting instead the word 'must', omitting the words 'adhered to' in the second sentence and inserted the words 'complied with' and inserting as a final sentence 'This process should be reflected in the *NSW Planning and Assessment Guidelines for Wind Farms*.'

Resolved, on the motion of Mr Colless: That Recommendation 2 be adopted.

Resolved, on the motion of Mr Brown: That Recommendation 3 be amended by omitting all words and inserting instead the words 'That the Minister for Planning ensure that Local Government Development Control Plans for wind power generation, where they exist, are considered by wind farm developers. Developers should demonstrate their consideration of the relevant DCP in the development application submitted to the Department of Planning, through the inclusion of information that outlines how the relevant DCP has been complied with. If certain aspects of the DCP are not complied with the reasons for non-compliance should be set out. These requirements should be incorporated into the *NSW Planning and Assessment Guidelines for Wind Farms*.'

Resolved, on the motion of Mr Brown: That Recommendation 3, as amended, be adopted.

Resolved, on the motion of Mr Colless: That the following new paragraph and Recommendation be inserted after Recommendation 3:

As discussed in paragraph 5.9, planning approval is no longer required by developers to erect wind monitoring towers to determine whether whether a particular area is suitable for a wind farm. The Committee is particularly concerned about this change to planning requirements and believes that the erection of wind monitoring towers should still need to be subject to local government approval processes and that this process needs to take into account local aviation issues. The impact of wind farms on local aviation industries is examined in Chapter 8.

Recommendation 4

That the Minister for Planning pursue appropriate policy or legislative changes to require that the erection of wind monitoring towers be subject to local government approval processes and that this process takes into account local aviation issues.

Resolved, on the motion of Mr Colless: That new Recommendation 4 be adopted.

Resolved, on the motion of Mr Colless: That (draft) Recommendation 4 be amended to reflect paragraph 5.87, by inserting the words 'to include wind power generation in the list of scheduled activities under Schedule 1, Part 1 the *Protection of the Environment Operations Act 1997*' after the word 'changes'.

Resolved, on the motion of Mr Catanzariti: That (draft) Recommendation 4, as amended, be adopted.

Resolved, on the motion of Mr Catanzariti: That Recommendation 5 be adopted.

Resolved, on the motion of Mr Colless: That paragraph 5.90 be amended by inserting the words 'some DCP's, including'.

Resolved, on the motion of Mr Colless: That paragraph 5.91 be amended by omitting the words 'approved by the Department of Planning' in the first sentence and inserting instead the word 'planned'.

Resolved, on the motion of Mr Colless: That paragraph 5.102 be amended by omitting the last sentence.

Resolved, on the motion of Mr Colless: That paragraph 5.103 be amended by omitting all words after the word 'residents' and inserting instead the words 'as a result of having wind turbines planned for construction within 600-800 meters from their houses' and by omitting the final sentence.

Resolved, on the motion of Ms Voltz: That paragraph 5.105 be amended by omitting the words 'Glen Innes Wind Farm' in the first sentence and inserting instead the words 'wind farms'.

Mr Colless moved: That Recommendation 6 be adopted.

Question put.

The Committee divided.

Ayes: Mr Brown, Mr Cohen, Mr Lynn, Mr Colless
Noes: Mr Catanzariti, Ms Voltz, Ms Westwood.

Question resolved in the affirmative.

Resolved, on the motion of Mr Brown: That the following paragraph be inserted after paragraph 5.102:

In response to a question from the Committee about whether people were less opposed to wind turbines once they were erected, Dr Eja Pedersen, an academic from Halmstad University in Sweden who appeared before the Committee via videoconference, referred to the research work of Professor Wolsink, stating:

That is from his research: that is quite correct. Not so much when it comes to big wind farms but when it comes to small wind farms and one or two turbines. I will send you the reference too so you can look it up yourself. What

happens when there are no people who know about this planning and have an attitude like this, then they get to hear that there is going to be a wind farm in their area, people are very negative from the go set and then after they are raised they are more positive. (fn, Dr Pedersen, Evidence, 9 November 2009, p4)

Resolved, on the motion of Mr Brown: That Recommendation 7 be adopted.

Resolved, on the motion of Mr Colless: That paragraph 5.149 be amended by inserting the words ', including the option of applying a bond' at the end of the final sentence.

Resolved, on the motion of Mr Catanzariti: That Recommendation 8 be amended by including as the final sentence 'And that the Government consider requiring the developer to pay a bond.'

Resolved, on the motion of Mr Colless: That Recommendation 8, as amended, be adopted.

Mr Brown moved: That paragraph 5.164 and Recommendation 9 be amended to omit the numeral '60' and insert instead '90'.

Question put.

The Committee divided.

Ayes: Mr Brown, Mr Catanzariti, Mr Cohen, Mr Lynn, Mr Colless, Ms Voltz
Noes: Ms Westwood.

Question resolved in the affirmative.

Resolved, on the motion of Mr Brown: That Recommendation 9, as amended, be adopted.

Resolved, on the motion of Mr Brown: That paragraph 5.170 be amended by omitting the word 'some' in the first sentence and inserting instead the words 'a number of'.

Resolved, on the motion of Mr Catanzariti: That Recommendation 10 be amended by inserting '/or' after the word 'and' in the second sentence and inserting at the end of the sentence the words 'by the developer'.

Resolved, on the motion of Ms Westwood: That Recommendation 11 be amended by omitting the words 'Minister for Planning and the Minister for Climate Change and the Environment' and inserting instead the words 'NSW Government'.

Resolved, on the motion of Mr Brown: That Chapter 5, as amended, be adopted.

Chapter 6 read.

Resolved, on the motion of Mr Brown: That paragraph 6.21 be amended by inserting the word 'among' after the word ' has' in the first line and by including a footnote reference for this sentence.

Resolved, on the motion of Mr Brown: That paragraph 6.37 be amended by omitting the words 'with grave concern' from the first sentence.

Resolved, on the motion of Mr Brown: That paragraph 6.42 be amended by omitting all the words after the word 'emissions'.

Resolved, on the motion of Mr Brown: That Recommendation 12 be amended by omitting the last sentence.

Resolved, on the motion of Mr Brown: That Recommendation 13 be amended by inserting after the last sentence the following sentence 'Where the results demonstrate non-compliance with the conditions of consent the Minister should apply appropriate penalties or action.'

Resolved, on the motion of Mr Brown: That Recommendation 14 be deleted.

Resolved, on the motion of Mr Brown: That Recommendation 15 be amended by omitting the word 'a' in the first line and inserting instead the words 'an appropriate' and by omitting the word 'an on-going' in the second last line and inserting instead 'a'.

Resolved, on the motion of Ms Voltz: That paragraph 6.98 be amended by omitting the second dot point and inserting instead the words 'Because of their hub height (hub height up to 150m), wind turbines can be susceptible to lightening strikes and therefore if not designed properly can cause electrical damage and possible fire risk. Lightening protection devices will be fitted to each turbine, additionally turbines will be earthed to prevent arching or surging resulting from lightening strikes which may potentially ignite fires'.

Resolved, on the motion of Mr Brown: That Recommendation 16 be adopted.

Resolved, on the motion of Mr Catanzariti: That Chapter 6, as amended, be adopted.

Chapter 7 read.

Resolved, on the motion of Ms Voltz: That Recommendation 17 be adopted.

Resolved, on the motion of Ms Voltz: That paragraph 7.61 be amended by omitting all the words after the word 'be in the fourth line and inserting instead the words "…an adverse health effect" of wind turbine noise and visibility and was associated with "… lowered sleep quality and negative emotions."

Resolved, on the motion of Ms Voltz: That parapgrpah 7.67 be amended by omitting the word 'impact' in the second sentence and inserting instead the word 'effect'.

Resolved, on the motion of Mr Brown: That Recommendation 18 be adopted.

Resolved, on the motion of Mr Brown: That paragraph 7.110 and Recommendation 19 be deleted.

Resolved, on the motion of Mr Brown: That Chapter 7, as amended, be adopted.

Chapter 8 read.

Resolved, on the motion of Mr Brown: That paragraph 8.19 be amended by omitting 'extent and' from the first sentence.

Resolved, on the motion of Mr brown: That paragraph 8.21 be amended by omitting all the words after 'that' and inserting instead the words 'wind farms have a positive impact on employment in NSW, particularly for rural communities.'

Resolved, on the motion of Ms Voltz: That paragraph 8.43 be amended by inserting 'and ongoing' after the word 'comprehensive' in the last sentence.

Resolved, on the motion of Ms Voltz: That Recommendation 20 be amended by inserting 'and ongoing' after the word 'comprehensive'.

Resolved, on the motion of Mr Brown: That Recommendation 21 be adopted.

Resolved, on the motion of Mr Catanzariti: That Recommendation 22 be adopted.

Resolved, on the motion of Mr Catanzariti: That Chapter 8, as amended, be adopted.

Chapter 9 read.

Resolved on the motion of Mr Brown: That Recommendation 23 be omitted and the following new paragraph be inserted after paragraph 9.68: 'The Committee believes that the concerns it has about community consultation as set out above can be addressed if the Government adopts the Committee's Recommendation 18 set out in Chapter 7.'

Resolved, on the motion of Mr Lynn: That Chapter 9, as amended, be adopted.

Resolved, on the motion of Mr Brown: That the Executive Summary be prepared by the Secretariat to reflect the body of the report and be adopted.

Resolved on the motion of Mr Brown: That the draft report, as amended, be the report of the Committee and presented to the Clerk of the Parliament, together with transcripts of evidence, submissions, tabled documents, minutes of proceedings, answers to questions on notice and correspondence relating to the inquiry (except for documents kept confidential by resolution of the Committee), in accordance with Standing Order 231.

Resolved, on the motion of Mr Catanzariti: That the Committee Secretariat correct any typographical and grammatical errors in the report prior to tabling.

Resolved on the motion of Mr Catanzariti: That dissenting reports be provided to the Secretariat by close of business, Tuesday 15 December 2009.

The Chair advised of his intention to table the report in the afternoon of Wednesday 16 December 2009 and distribute a press release following the tabling of the report.

6. Adjournment

The Committee adjourned at 3.00pm *sine die*.

Rachel Callinan
Clerk to the Committee

Appendix 6 Dissenting statement

NSW INQUIRY INTO RURAL WIND FARMS
RESPONSE TO COMMITTEE RECOMMENDATIONS

We refer to the Committee's recommendation that blanket setback distances of 2 kilometres between a wind turbine and the nearest non-associated residential dwelling be adopted as a planning requirement across NSW. A key purpose of this is to address noise impacts from the turbines.

We do not support this recommendation for the reasons outlined below.

1. **The setback distance required to achieve compliance with noise performance criteria is significantly less than 2 kilometres.**
   - A merits based approach based on the South Australian Noise Guidelines is used in NSW to assess noise impacts. The SA guidelines were developed in close consultation with recognised noise experts and are widely accepted as a credible, scientific and authoritative guideline on how to address noise issues. South Australia is the State with the most wind farm developments to date.
   - A merit based approach is also recommended in the current *Draft National Wind Farm Development Guidelines* released for public comment in November 2009. The National Guidelines have been developed by the Environment Protection and Heritage Council (EPHC) as a joint initiative involving all state governments.
   - Reference to assessment and approval documentation for wind farms available in the Major Development Register on the Department of Planning's website confirms that the development performance of wind farm proposals suggest a separation distances of 2 kilometre can not be justified.
   - Further the merit based outcome is consistent with the findings of an independent consultant study commissioned by the NSW Valuer General assessing the impacts of wind farms on surrounding property values. In many cases, concerns about noise impacts mask underlying concerns about property values. The study found that in a small number of cases in Victoria where wind farms were located "very close" (less than 500 metres) to a neighbouring property there was an elevated potential for the wind farm to impact on the property's value. The range of separation distances arising out a merit approach in NSW, however, were considered sufficiently large to avoid such impacts. This finding supports the continued use of a merit based approach in NSW.

2. **A blanket setback distance of 2 kilometres would unnecessarily sterilise significant areas of the state from wind farm development.**
   - The identification of suitable wind farm development sites is a complex, costly and iterative. There are limited sites in NSW which have the right balance of wind resource, proximity to the grid, absence of environmental constraints and a 2 km distance from all neighbouring residences.
   - A requirement for a 2 kilometre setback approach would significantly reduce the number of available development sites in NSW. This would, in turn, have a significant opportunity cost in terms of forgone investment in renewable energy. It would significantly hamper NSW's ability to meet its 20 per cent renewable energy target in the State Plan and to contribute to climate change mitigation and adaption efforts.

3. **A blanket 2 kilometres setback distance is inconsistent with many setback distances currently being used by councils in NSW.**
   - Goulburn Mulwaree Council's Development Control Plan (DCP) has a setback distance of 0.35 kilometres and Oberon Council has a setback distance of 1.5 kilometres. Glen Innes Severn and Upper Lachlan Councils have setback distances of 2 kilometres in their DCPs. Upper Lachlan Council has experienced more wind farm development than any other NSW council.
   - During local government elections in 2008, voters in the Upper Lachlan Council area were asked if they "support the continuing development and construction of wind farm turbines in the Upper Lachlan Council area". 70% responded in the affirmative. This surprised many people in the community – including council – in view of the apparent opposition to wind farms in the area. The result gives weight to the suggestion that the 2 kilometre setback is a product of politics rather than science and, possibly, the efforts of a vocal minority rather than the silent majority.

4. **The recommendation that no new dwellings be allowed within 2 kilometres of any existing wind farm is unreasonable and unfair.**
   - A merit based noise assessments using the South Australian Guidelines demonstrates that a lesser distance is usually adequate to maintain noise impacts within acceptable levels. The banning of any new housing within 2 km of an existing wind farm, would remove legitimate rights to develop dwellings (ie where a right currently exists, as distinct from future subdivision).
   - Banning new houses within 2km of an existing turbine, would also substantially reduce land values of neighbouring land. It would seem unreasonable and unfair that no dwellings might be allowed within 2 km of any existing wind farm. This is likely to increase opposition by neighbours to wind farm proposals.
   - The approach of prohibiting residential development within 2km of a wind turbine is inconsistent with sustainability principles – user pay, polluter pay. A better and more approach consistent with ESD principles is to require wind farm developers to provide noise mitigation where dwelling rights already exist as a condition of planning approval. This approach is used in NSW for example in the approval by the Minister for Planning for the Cullerin Wind Farm (Condition of Approval 46) and Capital Wind Farm (Condition of Approval 60).
   - Another approach consistent with the ESD principles is to require the wind farm operator to acquire a property which is likely to adversely affect by noise. This was the approach required with Taralga, Gullen Range.

In short, we consider the existing merit based approach used in NSW superior to the proposed 2 kilometre setback on every consideration including cost, efficiency, effectiveness, scientific rigour, practicality, and sustainability.

Yours sincerely,

Lynda Voltz MLC Tony Catanzariti MLC Helen Westwood MLC