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Representing the Australian Wind Energy Community

May 6, 2005

Wind Energy Policy Working Group
c/- Office of Energy Planning and Conservation
GPO Box 936
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To Whom It May Concern,

Re: Integrating Wind Farms into the National Electricity Market.

Australian Wind Energy Association (AusWEA) welcomes the opportunity to comment on the Wind Energy Policy Working Group (WEPWG) paper and supports the WEPWG in its efforts to seek further feedback from industry.

As the peak body representing the wind energy industry in Australia, AusWEA is in a unique position to encourage its members to adopt design practices that will enhance the integration of wind energy into the power system. AusWEA is committed to ensuring the adoption of best practice wind farm development including wind technologies aimed at maximising the integration of wind power with the power system.

A sustainable future can be achieved for the long term benefit of all consumers through increasing the availability of renewable energy. We encourage the WEPWG to consider practical low cost solutions to the issues raised in the paper.

All power grids face similar issues when introducing wind power into the grid. Given the global urgency for the uptake of renewable energy, new technologies and control methods for wind power are continually evolving. (It is certainly unhelpful when the media promulgates misinterpretations of these still to be adequately quantified issues.)

The challenge for the wind energy industry, grid managers and governments is to find a way forward so that the projects competing for MRET can progress in the next two years, and, at the same time, implement technical standards that adequately provide for good power system integration.

The discussions on technical issues for power system control have not included input from wind turbine manufacturers or specialists on the control systems that are available for modern wind turbines. This is a critical element in addressing the first principles for the integration of wind energy and ensuring that control systems are adequate. Including manufacturers ensures they have an opportunity to advise what technology is available or what actions can be taken to resolve the issue. Without this interaction, efficient and low cost methods of wind farm performance may not be identified.

Centralised Wind Forecasting

AusWEA strongly supports the development of a centralised wind forecasting system.

The NEM is one of the most flexible energy markets in the world and enables fast self dispatch and reoffering of generation to changed circumstances. As it is in a unique position to adapt to the integration of wind energy, the NEM will need an excellent forecasting system for the provision of forward energy forecasts.

As a first step, AusWEA recommends that prior to a full functional wind forecasting system being available, a simplified system using data measured at wind farms is implemented.

Dynamic Models

AusWEA acknowledges that dynamic models are a critical requirement for the management of the power system.

The NEM runs on transparency and needs public domain models for power system studies to be made available. The development of adequate wind farm models will require continued effort by all manufacturers and NEMMCO.

Manufacturers have been working hard to produce public domain models that satisfy the requirements of the NEC, whilst protecting their intellectual property. Ongoing discussions with NEMMCO will be required to resolve outstanding concerns.

When public domain dynamic models for the various wind farm technologies are deemed adequate by NEMMCO, the concerns surrounding stability and oscillatory behaviour can be resolved through system studies. It will also enable the power system planners to develop adequate limit equations. Until such studies can be undertaken, no definitive position can be adopted concerning the performance of large scale wind farms in the power system. Most of the integration issues that WETAG has discussed will be resolved through a centralised forecasting system and power system studies using dynamic models.

Network Management - Limit Equations

There is no net benefit in making wind farms scheduled, however network constraints can be managed effectively using the WETAG 'semi-dispatch' method.

To consider the circumstance where all synchronous (thermal) machines have been displaced by wind during low load is unlikely to be viable due to the inertial contributions that are necessary for transient stability. However this debate cannot be resolved until acceptable dynamic models are available and the appropriate stability limits have been revisited. The transient stability equations have to be reconsidered with the wind farm performance included. Without this assessment on wind farm inertial contribution and damping, all discussion on stability is speculative.

AusWEA understands that all generators can contribute to line overloads or be part of a transient stability limit. When a generator contributes to the power flow on a line that is reaching its rating, then it is reasonable to expect to be kept at an output that will avoid damage to the line. However, the implementation of a generation limit is not the same as requiring wind farms to be scheduled and should not be confused with requiring wind farms to be fully scheduled. The inclusion of control systems to manage generation levels is already being implemented in South Australian connection agreements. Only those non-scheduled generators that are proven to have an affect in network constraints should actually be included in equations just as is the case for scheduled generation.

Reliability

There is no convincing evidence to suggest that reliability is an issue.

The addition of multiple small generating units into the power system will vastly improve system reliability and maintain low reserve levels. In comparison, installing single large units, detract from system reliability and require an increase to the regional reserve requirement. Further studies are required to identify what proportion of capacity can be included in long term reliability forecasting.

There is a current level of variability on the system already and wind farms will generally add to this. However, further studies are required that take into account the modern wind turbines that are being connected including the benefits of geographical diversity. Upon identification of a real issue, there are technical solutions that have already been proposed to manage variations on interconnectors.

Frequency control ancillary service – cost recovery

While, an increase in wind generation will drive SA into an export condition more often, there may be rare occasions where SA is importing. If this is the case then the interconnector will have ample provision to raise capability to be provided by the wider NEM. The situation where only a few market participants are providing the services and consequently the price escalates for long periods should not be allowed to develop in any region. Provision of FCAS services over the interconnectors must be adequately addressed.

Technical Standards

AusWEA agrees the technical standards in the national electricity code needs to be revised to reflect modern wind turbine technology.

Many current clauses are not applicable to non-scheduled or asynchronous generators. It is evident that code changes are likely to take at least a year.

Materiality

The WETAG paper is qualitative as only technical debate took place in the meetings; there was no time for technical investigation.

AusWEA requests that independent studies be performed with a national perspective, to assess the overall response of the market to the inclusion of wind energy.

The only regional system study performed to date is the SA Planning Council's report to ESCOSA. This report concentrated on rare and obscure events for a single region and on the market results for South Australia, not the NEM as a whole.

Studies are required for the whole NEM in order to identify power system management issues on for the national perspective combined with market studies to identify reform issues. A NEM wide study is the only basis on which market policy decisions should progress. Individual jurisdictional solutions should be avoided where practical low cost solutions are available to the benefit of the national market.

National studies to quantify the issues raised in the WETAG paper should be aimed at identifying the statistical probability of:

- wind roll off across all regions and the impact on the interconnector flows; and
- aggregated regional variations against periods of high import or high export.

These issues must be resolved relatively soon as there are a number of large projects in progress which will be affected by delayed decisions. As each project connects without a method to adequately address the concerns raised in the WEPWG paper, the greater the likelihood of unknown operational limits being imposed on wind power.

Our vision is to see Australians using a majority of renewable energy wherever possible to help reduce greenhouse gases, provide regional development benefits and ultimately, low cost power.

Clearly, in the interests of all current and future consumers of wind energy, the industry and relevant institutions must find ways for wind power to work in synergy with the power grid and the market. The Australian Wind Energy Association is encouraging its members to look at how the matters raised in the WEPWG paper may be addressed where appropriate on the proposed projects. We look forward to continued positive support from the institutions concerned.

Yours sincerely



Dominique La Fontaine
Chief Executive Officer