

## Electricity Supply Industry Planning Council

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Mr John Tamblyn  
Chairman  
Australian Energy Market Commission  
PO Box H166, Australia Square, NSW 1215  
Australia  
[Submissions@aemc.gov.au](mailto:Submissions@aemc.gov.au)

Dear John,

**RE: DRAFT REPORT - CENTRAL DISPATCH AND INTEGRATION OF WIND AND OTHER INTERMITTENT GENERATION**

Thank you for the opportunity to comment on your draft report. The Planning Council wishes to commend the Commission on its acceptance of the core provisions for semi-dispatch of wind generation in the National Electricity Market. The creation of this new category of plant in the market is critical to the efficient integration of wind and other intermittent generation into the market.

Wind generation is already a significant energy source in the South Australian region of the market. South Australia has six wind farms which have been operating for some time, albeit some with commissioning limitations. They have a total nameplate rating of 387.75 MW.

Three new wind farms are currently being built in the State; Lake Bonney Stage 2, the Bluff at Hallett, and Snowtown. All of these generators were licensed in accordance with the latest ESCOSA licence conditions and hence all of these will be registered and operate as scheduled generators. These three have a combined nameplate rating of 341.7 MW.

The Hallett Hill wind farm is now committed to construction during 2008 and this will take the total installed capacity in South Australia over 800 MWs as follows:

<b>Registered Participant</b>	<b>NEM</b>	<b>Power Station</b>	<b># Units and Name-plate Rating (MW)</b>	<b>Station Capacity (MW)</b>
<u>Completed:</u>				
Babcock & Brown		Lake Bonney Stage 1	46 x 1.75	80.5
Hydro Tasmania/EHN		Cathedral Rocks	33 x 2	66
International Power		Canunda	23 x 2	46
AGL Hydro		Wattle Point	55 x 1.65	90.75
Tarong Energy		Mt Millar *	35 x 2	70
Tarong Energy		Starfish Hill	23 x 1.5	34.5
<b>Sub-Total Non-scheduled</b>				<b>387.75</b>
<u>Under Construction:</u>				
AGL		Hallett	45 x 2.1	94.5
Babcock and Brown		Lake Bonney Stage 2	53*3.0	159
Trustpower		Snowtown	42 x 2.1	88.2
<b>Sub-Total scheduled UC</b>				<b>341.7</b>
<u>Committed:</u>				
AGL		Hallett Hill	34 x 2.1	71.4
<b>Sub-Total scheduled C</b>				<b>71.4</b>
<b>TOTAL</b>				<b>800.85</b>

\* Note: Currently limited to 16 MW

New legislation to extend further support for renewable generation has been proposed in New South Wales and has been promised by the Commonwealth Government. The prospect of this legislation has prompted a new round of interest in wind generation and a number of parties are actively negotiating connection arrangements as a result. Proposed new wind farms and expansions of existing facilities that are being actively pursued in South Australia would, if they all proceeded, take South Australian installed wind generation to 1,265 MW.

South Australia already rates amongst the world's most wind intensive power systems. When the current and committed wind generation is fully operational, the 801 MW should yield around 2,385 GWhrs/a or 16.5% of forecast native energy demand in the State, while 1265 MW could be expected to yield around 3768 GWhrs/a or 26% of forecast native energy demand. These relative contributions of wind generation can be compared with those of the recognised leading international users of wind energy by percentage of total consumption:

Country	Percentage of total energy consumption generated by wind
Denmark	20%
Spain	9%
Germany	7%

The expected growth of wind generation is not just a South Australian phenomenon. The policy of the new Commonwealth Government is to

“Ensure the equivalent of at least 20 per cent of our electricity supply – or approximately 60,000 GWh – is generated from renewable sources by 2020.

Increase the Mandatory Renewable Energy Target (MRET) to 45,000 GWh to ensure that together with the approximately 15,000 GWh of existing renewable capacity, Australia reaches Labor's 20 per cent target by 2020.”

Some sources of renewable energy in the existing MRET scheme such as hydro above baseline, bagasse and solar hot water are unlikely to be major contributors to any future scheme. The Planning Council considers that wind generation is currently the most commercially viable source of renewable energy and, as such, might be expected to supply over half of this target. This would imply that over 7,000 MW of

new wind generation is likely to be constructed in Australia over the next decade. The most likely area for much of this is in the Southern half of the NEM.

This implies that the current high (by world standards) proportion of wind generation in South Australia could become the norm across much of the NEM and potentially reach world leadership in South Australia. The Planning Council is therefore concerned to ensure that the detailed arrangements for semi-dispatch are derived from the objective of maintaining market efficiency with the integration of significant levels of wind generation rather than on the basis of minimising any additional requirements as implied in section 4 of the draft report.

The following sections outline a number of areas where the Planning Council considers the arrangements should be refined to meet this objective. These proposed changes would not be onerous on new wind generators or inconsistent with requirements internationally. Furthermore these changes would facilitate the ongoing development of intermittent generation such as wind by fostering an environment in which economically efficient NEM development occurs consistent with the achievement of the government's renewable energy objectives.

#### *Registration and aggregation*

The AEMC has proposed modifications to Chapter 2 which add considerable complexity to the Rules as they currently exist and may potentially confuse the situation. It is important that the Rules are clear that all generation capacity at the connection point is aggregated for the purposes of classifying a generator. The current arrangements have been successfully applied to other conventional and renewable generators consisting of multiple individual units and the value of any administrative changes in this respect is not evident. If changes were to be made in the registration arrangements, the Planning Council recommends that registration focus on the concept of the *generating system* to ensure consistency with the rest of the Rules and technical standards and so that all relevant plant items are captured for the purposes of compliance.

The expanded concept of a *generating system* was introduced during the most recent review of the technical standards in recognition of the importance of grouping all critical generation and connection assets that contribute to the generator meeting the necessary technical performance at the connection point. This is important in many wind farm designs where the compliance with technical

standards depends upon other connection equipment in addition to the wind turbines themselves.

Importantly, the provisions under Chapter 3 should continue to address aggregation for the purposes of bidding and operation. The provisions for aggregation of semi-dispatched plant should be enhanced to be more explicit and to allow aggregation of groups of similar wind turbines on a site if accepted by NEMMCO as being appropriate for the management of system security and the estimation of their generation output over the various timeframes. This would require not only that the turbines had the same technical characteristics but also that groups had similar wind regimes and that the grouping supported accurate wind forecasting. Requirements in respect to the forecasting system may change over time and aggregation arrangements may need to be reassessed from time to time. Appropriate grouping should be reflected in the AGC control arrangements rather than vice versa.

*Incorporation of semi-scheduled generators into the pre-dispatch and projected assessment of system adequacy (PASA) processes.*

The AEMC argues that the Unconstrained Intermittent Generation Forecast would negate much of the need for semi-schedule generators to participate in pre-dispatch and PASA. The Planning Council considers that this approach has value and could lead to both better management of wind generators in the market and the simplification of operating arrangements for them. The proposed utilisation of the state-of-the-art central forecasting tool has potential benefits in the longer term as it is developed and refined. However, the proposed Rule changes:

- o reduce the obligations on wind generators to provide availability data; and
- o risk removing wind generators from any accountability for forecasting.

*Implementation of forecasting*

The variability of wind generation and the operation of the market mean that accurate wind forecasting is fundamental to delivering efficient and effective outcomes. The NEM has no explicit cross-temporal optimisation but rather is based on providing information to market participants to allow them to make their own decisions on plant commitment. Efficiency will suffer if that information is not as accurate as possible as incorrect commitment decisions may be made as a result. Employing the wrong mix of plant for a given market requirement will raise costs and

potentially lead to increased market prices. In the extreme, the reliability and security of the market may be at risk.

The Planning Council therefore considers that the provisions to support wind forecasting should seek to deliver the best possible outcomes. The proposed wind forecasting process is currently being developed to be run centrally by NEMMCO, but its performance relies, to a significant extent, on the provision of accurate data and information by the wind farms. The effectiveness of these forecasts and the operation of the wind forecasting system would be eroded by the softening of the provision of availability data proposed in the draft report. That maintenance schedules for wind farms can change is true for most generators and plant operators in the market. The obligation should be for all generators to use reasonable endeavours to provide the best information available at any time. This should not be too onerous on wind farm operators, all of whom require, and to our experience have, a professional maintenance management regime.

The Planning Council also recognises that the wind forecasting system is still under development. As such, the detailed data requirements for the operation of the system are likely to evolve. The provisions describing the obligations on semi-dispatched generators to ensure the range and quality of data telemetry from the site when operating, data requirements for new wind generators and any provisions for a review process where forecasts are poor and need to be reconsidered. It is likely that the full scope of the data requirements for the forecasting system will be refined as the system is developed. The Commission should consider providing a mechanism such that NEMMCO can develop and maintain a set of Forecasting System Procedures, using *Rules Consultation Procedures*, that set out detailed information requirements and a timetable of when that data needs to be supplied to support the operation of the wind forecasting system as it evolves. It is also envisaged that there will need to be an obligation to provide certain data from proponent's studies to provide "historical data" for new wind generators. The imposition of such requirements on intermittent generators should not be onerous and is consistent with the concept of having the forecasting work being done centrally on their behalf.

*NEMMCO's power to manage the voltage profile.*

The AEMC argues that the voltage control requirements proposed by NEMMCO are not necessary to implement semi-dispatch as they do not apply to non-scheduled generators. It must be remembered that the non-scheduled category has normally

contained generators that were small in capacity or contributed small amounts of energy to the network. Wind farms captured by the semi-dispatched Rules are larger than typical non-scheduled generators - in some cases, significantly larger. Intermittent generators also have, by their nature, a significant impact on the management of voltages on the grid. As such, the technical standards applied to intermittent generators often include reactive requirements and hence specialist voltage control provisions.

The Planning Council is concerned that the removal of these provisions in Chapter 4 removes the only routine power NEMMCO appears to have in the Rules to provide voltage set points and the like. We therefore consider that the voltage control provisions applying to other scheduled generators need to apply to intermittent generators to enable NEMMCO to manage the power system. NEMMCO having routine powers to fulfil this function is clearly preferable to them using *directions* to do so and should not be onerous. In fact, in most cases this would impose no costs at all on the intermittent generator.

#### *Frequency control ancillary services (FCAS) regulation causer pays provisions*

The draft report argues that semi-dispatch does not require generation at a fixed target and thus semi-scheduled generators should not be penalised if they generate below their cap. It then modifies the provisions for the recovery of FCAS services applying to semi-dispatched generators. The Planning Council considers that the more important argument is that of market efficiency. We consider that all market participants, including semi-schedule generators, should contribute to the recovery of FCAS regulation costs in proportion to their contribution to the need for the service (i.e. in accordance with the "causer pays" principle in the current Rules). This has the objective of driving more efficient outcomes.

In the short term, wind generators can be configured to provide a frequency response and there are international examples where they are required to do so. The Horns Rev offshore wind farm, constructed in 2002, is one such example and the IEA wind integration project 25 states that:

"modern wind turbines are still developing and have possibilities for both tolerance and management of voltage and frequency variations."

Wind generators could choose to do provide at least limited frequency regulation in the future if the price signals were sufficient to drive such a response. In dynamic

efficiency terms, wind generators make investment decisions on the location and size of their plant and the value of diversity needs to be part of their considerations. In the wider sense, they will be making decisions as to whether to invest in more wind generation or other generation alternatives such as solar, biomass, geothermal and the like which offer different operating modes and patterns of generation.

These dynamic efficiency impacts are critical to the longer term performance of the NEM. If efficient costs are not reflected through to generators of all types, a suboptimal mix of investment can arise. There is a significant advantage to the market in diversity of location and diversity of generation source. In fact, if efficient costs are not reflected through to wind farms in particular, there would eventually need to be a hard cap on the number of wind farms allowed to connect to the system as the "right" level would not be managed by market forces.

Exempting Semi-dispatched generators from participation in the causer pays arrangements compromises the recovery of the FACS costs and undermines the accountability of all generators for their contribution to the control of the quality of power to customers. If they do not pay for any additional costs they may cause, the potentially increased cost of ancillary services simply fall to customers, who can take no action at all in response.

Efficient allocation of ancillary service prices would be best delivered by measuring each wind farm's output against the dispatch forecast provided by the Unconstrained Intermittent Generation Forecaster or the dispatch cap if it applies for the dispatch interval. This is directly analogous to the "causer pays" approach applied to all other generators.

#### *Grandfathering provisions*

Under the Draft Rule as proposed, existing intermittent generators and those committed to construction in the 2007 Statement of Opportunities will not be required to participate in the semi-dispatch arrangements. The Planning Council supports grandfathering of technical standards as changing plant in response to changing technical expectations over time could be prohibitively expensive and an unreasonable cost on an investor who meet salient requirements at the time. However, the Commission has extended the coverage of 'grandfathering' here to protect a group of generators from efficient Rule changes and from the operation of network constraints. Other generators are not protected from subsequent changes to network constraints or the imposition of new constraints as congestion emerges.

While the imposition of changed regulations on market participants is not ideal, the Planning Council considers that the semi-dispatch arrangements should apply as broadly as possible. This will not only help in the optimisation of dispatch and the maintenance of network security but will also maximise the scope for investment in further renewable generation. In order to maintain a level playing field for the new generators entering the market the AEMC should consider the application of the semi-dispatch provisions to all wind farms over 30 MWs.

In the absence of applying the provisions to all existing wind farms over 30 MWs, the provisions should at least also apply to existing wind farms that have the requirement to control their output as part of their connection agreements or licence conditions. The market operating arrangements are based around the role of NEMMCO as the independent, central system controller. It seems inconsistent with this design, with the objective of efficiency and the need to maintain system security, to have some generators controlled by their connecting TNSP and others by NEMMCO. A provision should therefore be drafted to require existing generators with connection agreements that incorporate generation dispatch limitation clauses to be classified as semi-dispatched and for the transfer of the existing generator control arrangements in these cases.

## **Conclusion**

The new semi-dispatch arrangements under consideration provide a mechanism for intermittent generators to be included in the optimisation within the market dispatch and should allow economic efficiency to be maintained with high levels of intermittent generation. The requirements are not onerous when compared with international experience and the New Zealand electricity market has already implemented the equivalent of semi-dispatch for all wind farms in that country.

The practical experience of investment in South Australia since the introduction of the new licence requirements makes it clear that the requirements will not act to deter new entrants. Proponents in South Australia have indicated that the development of dedicated systems to enable them to participate in the market as scheduled generators have cost significantly less than \$100k. Since requiring that wind farms meet higher technical standards, support wind forecasting, classify as scheduled generators and pay ancillary services costs, ESCOSA has granted licences to more than 400 MW of wind generation. This is more wind generation than has been installed in any other State. Indeed South Australian proponents have commented

publicly that the licence provisions established in South Australia have created a situation that supports significant future wind development.

There seems to be no doubt that the wind industry is likely to experience another rapid period of growth. The Planning Council anticipates that there will be in the order of 1300-1500 MW of wind farms operating in South Australia within a few years and over 7,000 MW in Australia within a decade. We therefore appreciate the support the Commission has given to the formation of the semi-dispatch arrangements in their draft decision. This response argues for refinements in the following areas to ensure market efficiency is maintained with such high levels of intermittent generation in the market:

- o registration and aggregation;
- o incorporation of semi-scheduled generators into the pre-dispatch and projected assessment of system adequacy (PASA) processes;
- o forecasting;
- o NEMMCO's power to manage the voltage profile;
- o causer pays provisions for recovery of Frequency control ancillary services (FCAS) regulation costs; and
- o grandfathering provisions.

Not only can these provisions improve market efficiency, they should allow wind generation to maximise its role in the future development of the market without the need for arbitrary limits.

The Planning Council would welcome the opportunity to expand on any of the suggested changes if you or your staff would find that useful.

Yours sincerely,

David Swift

CHIEF EXECUTIVE