

**Wholesale Electricity Market  
Rule Change Proposal Submission Form**

**RC\_2010\_25 Calculation of the Capacity Value of Intermittent  
Generation - Methodology 1 (IMO)**

**RC\_2010\_37 Calculation of the Capacity Value of Intermittent  
Generation - Methodology 2 (Griffin Energy)**

**Submitted by**

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<b>Date submitted:</b>	4 February 2011

**Submission**

- 1. Please provide your views on the proposal, including any objections or suggested revisions.**

**Background**

The penetration of renewable generation in the South West Interconnected System (SWIS) has increased significantly over the past few years, with most of the new capacity being in the form of wind farms. With the addition of Collgar Wind Farm there would have been close to 300MW of wind farm generation capacity added to the SWIS since 2005 (the other two being the Alinta Windfarm and the Emu Downs Windfarm). This is significant in the context of a system with peak demand around 3,500MW.

The Mandatory Renewable Energy Target (MRET) legislation has recently undergone major changes, including an increase of the target to achieve 20% renewable in Australia's energy mix by 2020. Other policy initiatives linked to climate change are also still being considered and may add further incentives to invest in renewable energy solutions.

Intermittent renewable technologies, including wind farms, present particular challenges when it comes to planning and operating power systems. The intermittency of the output in particular leads to an increased reliance on scheduled generators to provide balancing services by rapidly increasing output to compensate for loss of output from intermittent generators in low wind conditions and decrease output to allow for increased wind farm output during periods with good wind conditions. Not being able to guarantee a minimum level of output “at the flick of a switch” presents System Management with a dilemma in planning for peak conditions on the system.

Both the planning and operational issues outlined above have implications for both system security as well as economic efficiency. It is important that these issues are considered carefully in the ongoing development of the Wholesale Electricity Market (WEM) to ensure that the challenge of achieving renewable energy targets is done in an economically efficient manner whilst at the same time not compromising system security or reliability.

The Market Advisory Committee (MAC) established the Renewable Energy Generation Working Group (REGWG) in early 2008. The REGWG was tasked with exploring the issues relating to the further uptake of renewable generation technologies. It was also specifically asked to look into a perceived negative bias in the calculation of capacity credit values for solar based technologies.

The REGWG undertook a considerable amount of work and also commissioned McLennan Magasanik Associates (MMA) to provide an expert view in relation to calculation of capacity values for intermittent technologies.

The REGWG could not come to a consensus view. In relation to the calculation of capacity values for intermittent technologies competing views were advanced. Two of those competing views have resulted in the current two change proposals RC\_2010\_25 (the IMO proposal) and RC\_2010\_37 (the Griffin proposal).

Perth Energy provides its views on both proposals below.

## **Change Proposals**

On 29 and 30 November the IMO and Griffin Energy each submitted separate change proposals in relation to the methodology for calculating capacity credit values for intermittent generators.

### *IMO proposal*

The IMO proposal is based on assessing the performance of intermittent generators during those times when the demands on scheduled generators are the greatest. The concept of Load for Scheduled Generation (LSG) plays a central role in this proposal. LSG is defined as total system load less output by intermittent generators.

Although the IMO proposal has a detailed step by step description of the proposed calculation method it can at a high level be described as:

- calculate the average performance (output) of the SWIS intermittent generation fleet during the 12 highest LSG intervals over the past 8 years,

- allocate a pool of capacity credits to intermittent generators corresponding to the value that is equivalent to the 95% probability level of exceeding the average historic performance, and
- allocate the pool of capacity credits to individual intermittent facilities based on their relative performance during the past three years peak LSG intervals.

The IMO proposal corresponds to alternative 1 in the final report from the REGWG<sup>1</sup>. It is Perth Energy's understanding, based on information in the final REGWG report, that the IMO proposal would result in capacity factors (for the purpose of assigning capacity credits) for wind farms around or below 20%, representing about a 50% reduction compared to the outcome under the current version of the Market Rules. Solar based technologies are expected to achieve significant improvements in capacity factors compared to the status quo.

This seems to be a reasonable outcome in terms of direction of capacity credits re-allocation, notwithstanding the potential reservation over the quantum of the re-allocation. There is no doubt solar based generation does follow the system demand profile more closely than wind generation and thus should face lower cost of entry with respect to network operation and system generation support.

#### *Griffin proposal*

The Griffin proposal also makes use of the LSG concept. Griffin proposes to set the capacity credit level for each individual intermittent generation facility equal to the facility's average MW output during the 2,250 trading intervals corresponding to the 750 highest LSG intervals in each of the previous 3 years.

The Griffin proposal corresponds to alternative 2B in the final report from the REGWG. Alternative 2B was a simplification of alternative 2A which was developed and recommended by MMA. It is Perth Energy's understanding that the Griffin proposal would result in a more modest decrease in capacity factors for wind farms compared to the IMO proposal. Solar based technologies are also expected to experience significantly improved capacity factors under the Griffin proposal.

### **Perth Energy's Views**

Perth Energy considers the decision that needs to be made in relation to the IMO and Griffin proposals to be an extremely difficult one, but also at the same time an important one in setting the path for the future development of the WEM both for scheduled and intermittent generators. The inability of the REGWG to reach a consensus view after about 2 years' work illustrates how divisive the issues raised in the proposal are in the industry.

It will be important to continue to develop the WEM in accordance with the Market Objectives<sup>2</sup> and ensure that as we move towards a future with an increasing proportion of

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<sup>1</sup>See [http://www.imowa.com.au/f3086,903646/REGWG\\_Final\\_Report\\_to\\_MAC\\_v1.pdf](http://www.imowa.com.au/f3086,903646/REGWG_Final_Report_to_MAC_v1.pdf)

<sup>2</sup> The objectives of the market are:

renewable generation in the SWIS generation mix we do not compromise the principles of economic efficiency and system security. Providing cross subsidies via market mechanisms, such as by awarding higher or lower levels of capacity credits to facilities than the actual levels that they contribute towards achieving system security at times of peak demand will in general lead to inefficient economic outcomes and unfair cost burdens to different market participants. Not being able to meet system peak loads on a hot summer's day due to "the wind not blowing" is something that consumers will not tolerate.

Such potential dispatch failure can also directly impact the extent of market risk faced by other participants, market generators or market customers, and the associated risk premium they have to pay to manage such risk. Without transparent and proper costing and pricing of the system security gap caused by increasing entry of wind farms, other market participants will continue to bear an unfair burden in their operation.

Perth Energy considers that it is likely that similar hard decisions will soon need to be made with regard to other issues relating to the increased penetration of intermittent generation in the SWIS in general. In particular, the costs of providing energy balancing and ancillary services are likely to keep increasing with higher penetration of intermittent generation. Currently, the Market Rules do not provision the reflection of the true cost of balancing and ancillary services between Market Participants. Perth Energy's view is that amendment to the Rules in this regard will need to be made in conjunction with a decision on capacity credits allocation methodology for intermittent generators.

It seems evident that existing owners of wind farms will suffer different degrees of economic loss should either proposal be implemented. For example, the Collgar wind farm, which is currently accredited with about 90 capacity credits (equivalent to about 43% capacity factor) would stand to lose about 50 capacity credits or \$10m per annum at a capacity credit price of \$200,000/MW under the IMO proposal. Under the Griffin proposal the loss would be in the region of \$3m or about 15 capacity credits.

Such losses in value flowing from a single rule change could increase the perceived regulatory risk in the WEM. That in turn would make it harder to obtain funding for future

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- (a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system;
  - (b) to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors;
  - (c) to avoid discrimination in that market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions;
  - (d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and
  - (e) to encourage the taking of measures to manage the amount of electricity used and when it is used.



intermittent generation projects and most likely increase the cost of obtaining such funding. This risk could spill over to dispatchable generation projects although this is an unknown.

While acknowledging the regulatory risk, Perth Energy considers it more imperative that the WEM is developed to accommodate an increased proportion of renewable whilst maintaining the principles of economic efficiency and system security. This dual objective cannot be achieved without true cost reflection.

If system security and economic efficiency dictate that Market Rules be improved then there is no alternative but to support the IMO in this endeavour. This is the more important if the market has to provide feedback through correct pricing signals to policy makers and consumers to ensure rigorous scrutiny of the potential impact of Government policy. If renewable energy generation is to be increased to address a public policy objective, the cost benefit of such increases must be transparent for consumers and taxpayers to determine their support for such policy. The longer the market is prevented from sending back correct pricing signals the higher the risk of a market implosion along the line of unsustainable retail price caps that caused the collapse of the Californian electricity market in 2000.

For this reason, Perth Energy would be inclined to support the IMO approach and its implementation as early as practicable.

With regard the economic impact on existing intermittent plants, there may be a case to be made about a direct Government subsidy that should be explicitly separate from the operation of the WEM. A Community Service Obligation equivalent payment to existing intermittent plants impacted by the change in Market Rules can be developed and negotiated between these plants and the Government.

An often used mechanism to tackle difficult transitional issues is to grandfather current rights to existing users for a defined period. In that way, new investment can be given the right economic signals whilst existing projects (sunk investment) are not penalised for investment decisions that were made “in good faith” based on the rules as they applied at the time. This approach would normally go a long way in addressing regulatory (even sovereign) risk issues.

But grandfathering can also prolong the effect of inefficiencies that the change in question is trying to address. It would also open up discriminatory treatment of pre- and post-Rule change investment activities. There is no compelling reason why existing wind farms should be accorded preferential treatment compared to new ones. The most that could be argued for would be a defined period for adjustment just as over 2-3 years to create a gradual impact path for the Rule change. Perth Energy therefore asks the IMO to carefully consider whether

the benefits of some limited form of grandfathering in this instance would be justifiable and would outweigh any regulatory costs.

On the practical side of contractual commitment, Perth Energy's experience is that suppliers do tend to have in their power supply agreements clauses covering changes in law and in this case changes in Market Rules. It would be reasonable to assume that intermittent generators would have covered themselves with such clauses. At the end of the day, all extraneous costs of public policy encouraging renewable supplies must be borne by end consumers. This is the foundation of the user pay principle.

**2. Please provide an assessment whether the change will better facilitate the achievement of the Market Objectives.**

Perth Energy considers the most significant impacts of both proposals to be on Market Objectives (a) and (d).

Reducing the number of capacity credits awarded to intermittent facilities (which is a result of both proposals) should have a positive impact on the facilitation of Market Objective (a) as it would increase system security and improve economic efficiency. However, the validity of this depends on the analysis underpinning System Management's view that no more than a 20% capacity factor should be awarded to intermittent facilities. Perth Energy assumes that the IMO is satisfied with System Management's background analysis and finding.

The regulatory/sovereign risk issue has the potential to negatively impact on the facilitation of Market Objective (d) as the long term cost of providing electricity will increase with increased perception of sovereign risk along with an increase in the cost of obtaining funding for new projects. However, this risk is not assessable and is swamped by the risk associated with the absence of correct pricing signals associated with the true cost of entry of intermittent generators.

**3. Please indicate if the proposed change will have any implications for your organisation (for example changes to your IT or business systems) and any costs involved in implementing these changes.**

Perth Energy sees no problems in this regard.

**4. Please indicate the time required for your organisation to implement the change, should it be accepted as proposed.**



Perth Energy does not require any lead time to implement either of the changes.